

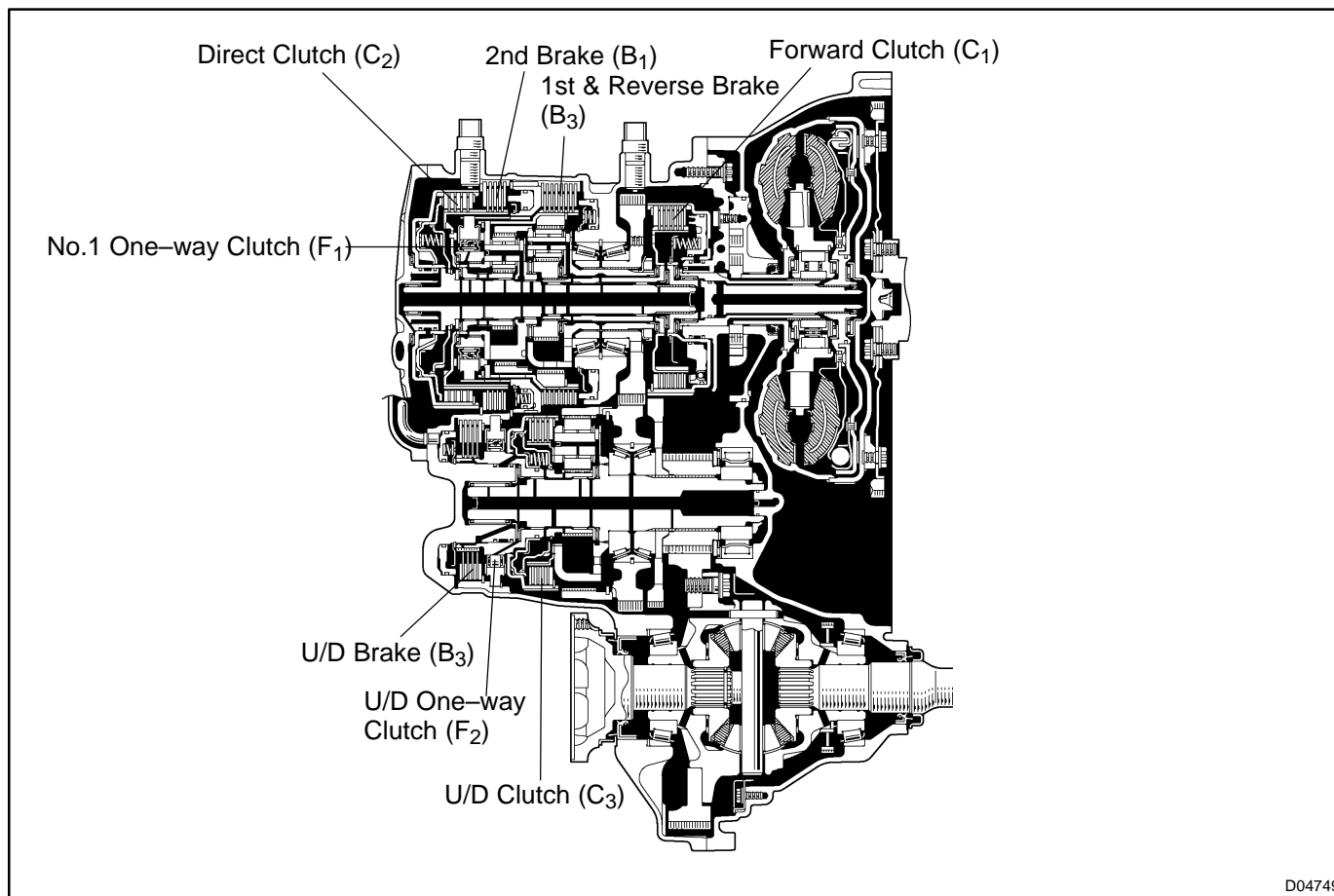
AUTOMATIC TRANSAXLE SYSTEM

PRECAUTION

AXOCL-01

If the vehicle is equipped with a mobile communication system, refer to the precautions in the IN section.

OPERATION



D04749

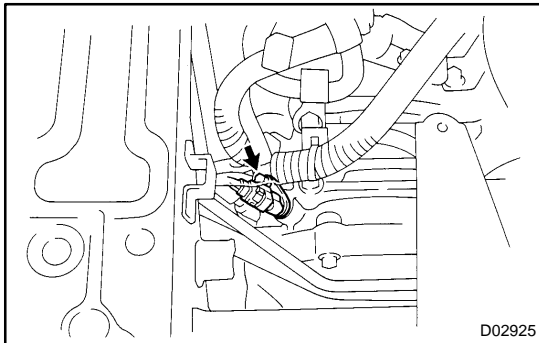
• ... Operating

Shift lever position	Gear position	C ₁	C ₂	C ₃	B ₁	B ₂	B ₃	F ₁	F ₂
P	Parking						•		
R	Reverse		•			•	•		
N	Neutral						•		
D	1st	•					•	•	•
	2nd	•			•		•		•
	3rd	•	•				•		•
	O/D	•	•	•					
2	1st	•					•	•	•
	2nd	•			•	•	•		•
L	1st	•					•	•	•

SPEED SENSOR ON-VEHICLE REPAIR

AX0CP-01

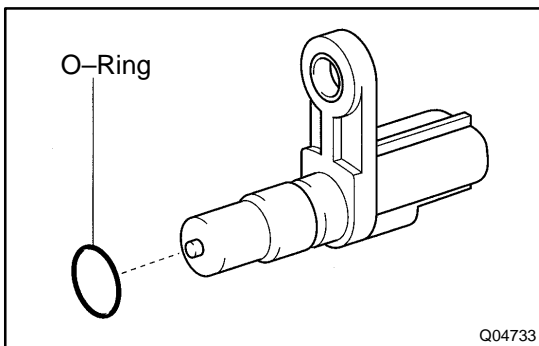
1. REMOVE BATTERY
2. REMOVE AIR CLEANER ASSEMBLY



3. DISCONNECT INPUT TURBINE SPEED SENSOR CONNECTOR

4. REMOVE INPUT TURBINE SPEED SENSOR

- (a) Remove the bolt and input turbine speed sensor.



- (b) Remove the O-ring from the input turbine speed sensor.

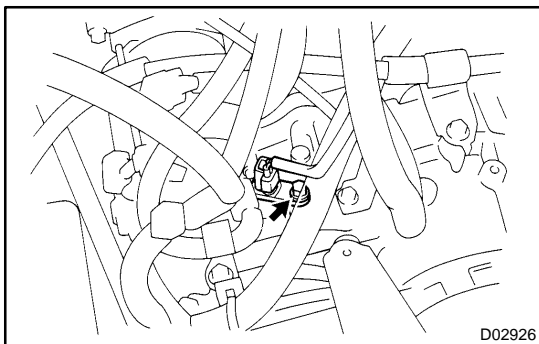
5. INSTALL INPUT TURBINE SPEED SENSOR

- (a) Coat a new O-ring with ATF and install it to the input turbine speed sensor.

- (b) Install the input turbine speed sensor with the bolt.

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

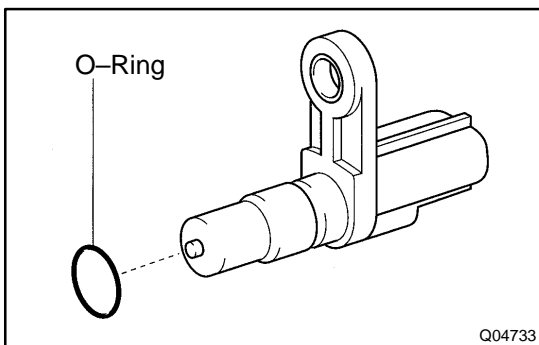
6. CONNECT INPUT TURBINE SPEED SENSOR CONNECTOR



7. DISCONNECT COUNTER GEAR SPEED SENSOR CONNECTOR

8. REMOVE COUNTER GEAR SPEED SENSOR

- (a) Remove the bolt and counter gear speed sensor.



- (b) Remove the O-ring from the counter gear speed sensor.

9. INSTALL COUNTER GEAR SPEED SENSOR

- (a) Coat a new O-ring with ATF and install it to the counter gear speed sensor.

- (b) Install the counter gear speed sensor with the bolt.

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

10. CONNECT COUNTER GEAR SPEED SENSOR CONNECTOR

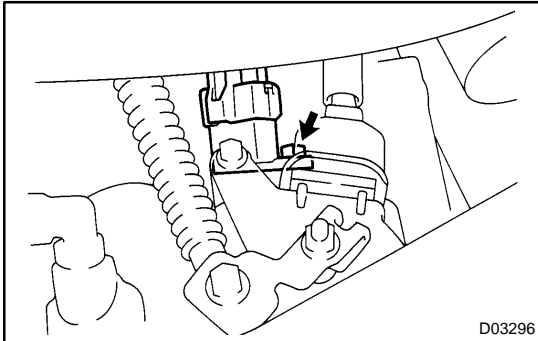
11. INSTALL AIR CLEANER ASSEMBLY

12. INSTALL BATTERY

ATF TEMPERATURE SENSOR ON-VEHICLE REPAIR

AX000-01

1. REMOVE OIL PAN AND GASKET (See page [AX-7](#))
2. DISCONNECT 5 SHIFT SOLENOID VALVE CONNECTORS (See page [AX-7](#))
3. DISCONNECT ATF TEMPERATURE SENSOR FROM VALVE BODY (See page [AX-7](#))



4. REMOVE ATF TEMPERATURE SENSOR

Remove the bolt and solenoid wire.

5. INSTALL ATF TEMPERATURE SENSOR

Install the solenoid wire with the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48 in.-lbf)

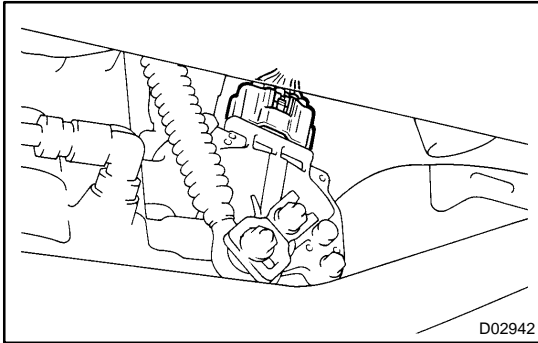
6. CONNECT ATF TEMPERATURE SENSOR TO VALVE BODY (See page [AX-7](#))
7. CONNECT 5 SHIFT SOLENOID VALVE CONNECTORS (See page [AX-7](#))
8. INSTALL OIL PAN AND GASKET (See page [AX-7](#))

PARK/NEUTRAL POSITION (PNP) SWITCH

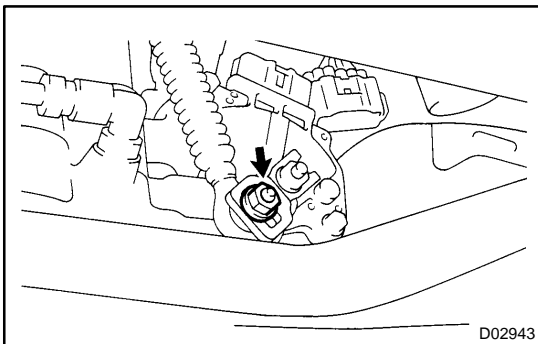
AXOCR-01

ON-VEHICLE REPAIR

1. REMOVE ENGINE UNDER COVER

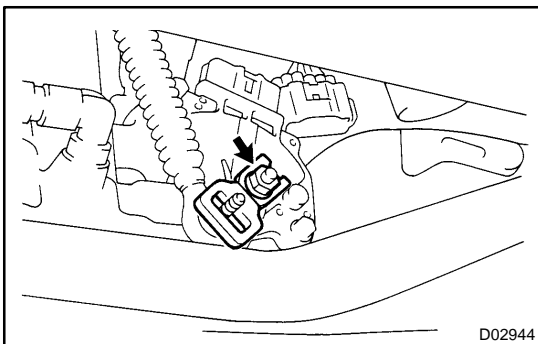


2. DISCONNECT PARK/NEUTRAL POSITION SWITCH CONNECTOR

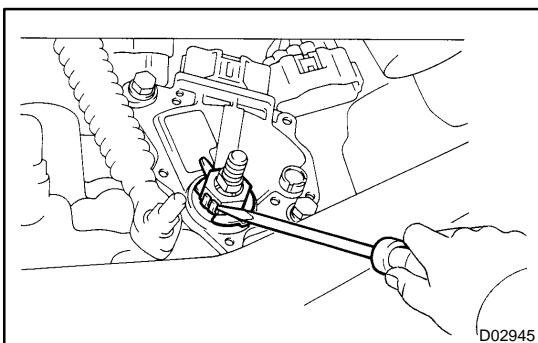


3. REMOVE PARK/NEUTRAL POSITION SWITCH

- (a) Remove the nut.

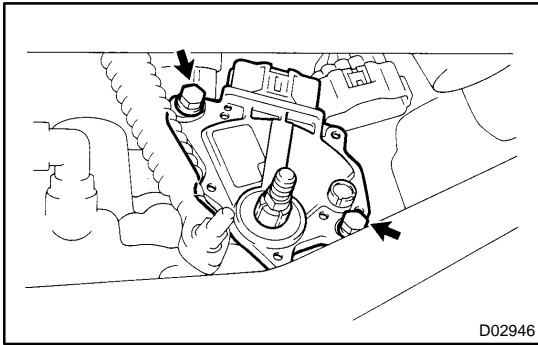


- (b) Remove the nut, washer and control shaft lever.



- (c) Using a screwdriver, pry off the lock plate.

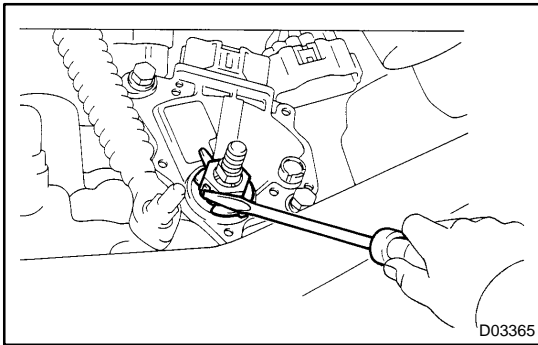
- (d) Remove the nut and lock plate.



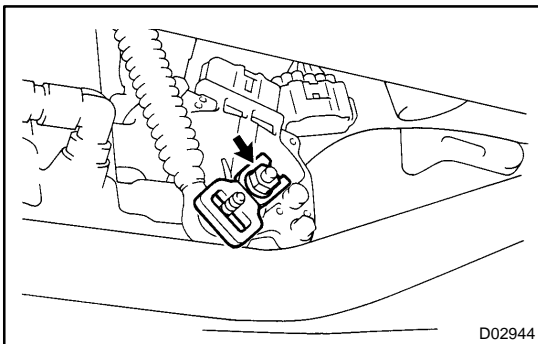
- (e) Remove the 2 bolts and pull out the park/neutral position switch.

4. INSTALL AND ADJUST PARK/NEUTRAL POSITION SWITCH

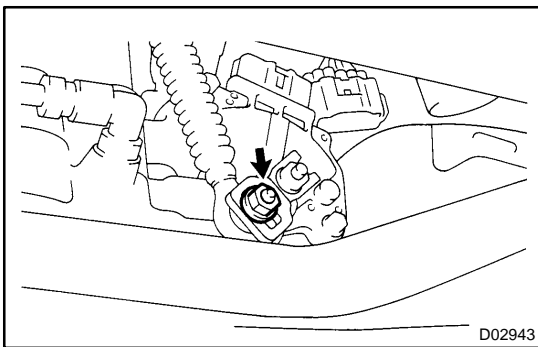
- (a) Install the park/neutral position switch with the 2 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.-lbf)



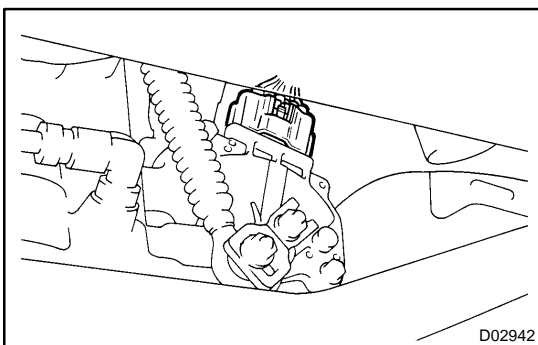
- (b) Install a new lock plate and nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.-lbf)
- (c) Bend the claws on the lock plate to fix the nut.



- (d) Install the control shaft lever with the nut.
Torque: 13 N·m (130 kgf·cm, 9 ft-lbf)



- (e) Connect the shift control cable to the control shaft lever.
- (f) Install the nut.
Torque: 15 N·m (150 kgf·cm, 11 ft-lbf)



5. CONNECT PARK/NEUTRAL POSITION SWITCH CONNECTOR

6. CHECK PARK/NEUTRAL POSITION OPERATION

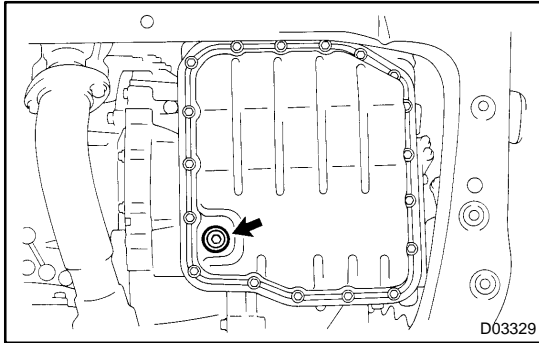
Check that the engine can be started with the shift lever only in the N or P position, but not in other position. If the engine can not be started as stated above, carry out the adjustment procedure (See page [DI-163](#)).

- 7. INSTALL ENGINE UNDER COVER**
- 8. TEST DRIVE VEHICLE**

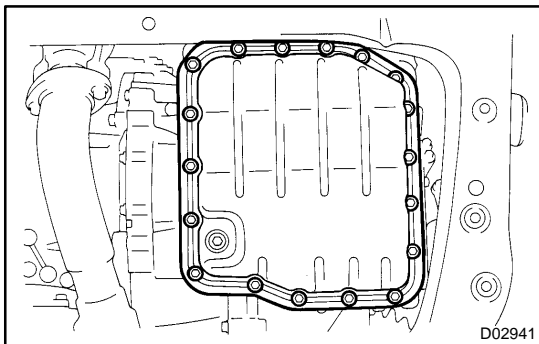
VALVE BODY ASSEMBLY ON-VEHICLE REPAIR

AX000-01

1. REMOVE ENGINE UNDER COVER



2. REMOVE DRAIN PLUG AND DRAIN ATF

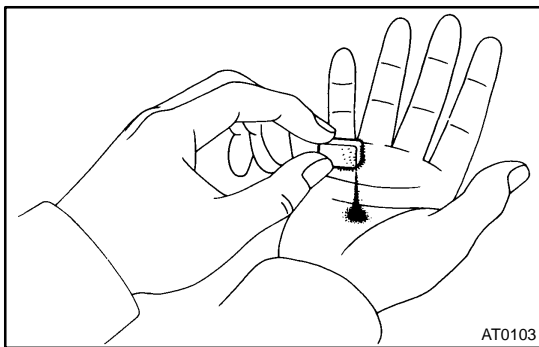


3. REMOVE OIL PAN AND GASKET

Remove the 18 bolts, and carefully remove the oil pan. Discard the gasket.

NOTICE:

Some fluid will remain in the oil pan.

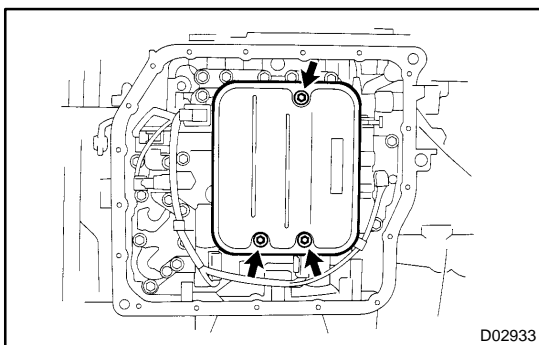


4. EXAMINE PARTICLES IN OIL PAN

Remove the magnets and use them to collect any steel chips. Look carefully at the chips and particles in the pan and on the magnet to anticipate what type of wear you will find in the trans-axle.

Steel (magnetic)...bearing, gear and plate wear

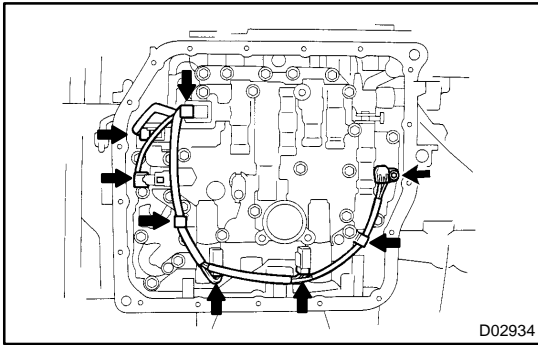
Brass (non-magnetic)... bushing wear



5. REMOVE OIL STRAINER

(a) Remove the 3 bolts and oil strainer.

(b) Remove the O-ring from the oil strainer.

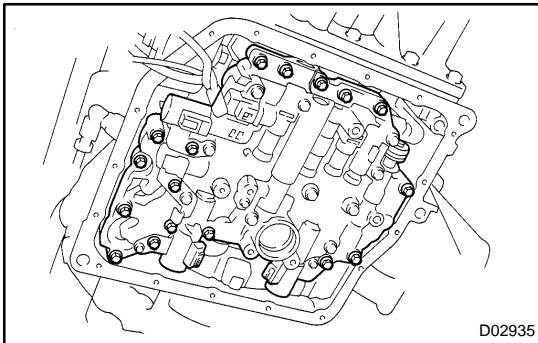


6. DISCONNECT 5 SHIFT SOLENOID VALVE CONNECTORS

7. REMOVE ATF TEMPERATURE SENSOR

Remove the bolt and lock plate, and remove the ATF temperature sensor.

8. SEPARATE WIRE HARNESS FROM 2 CLAMPS

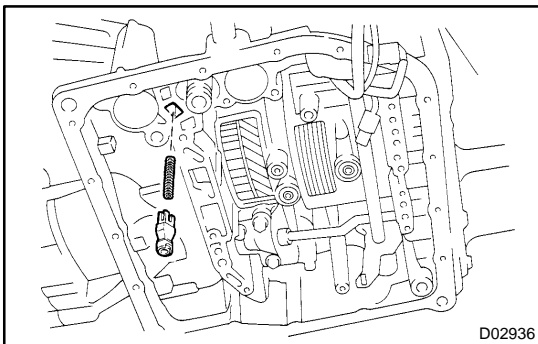


9. REMOVE VALVE BODY

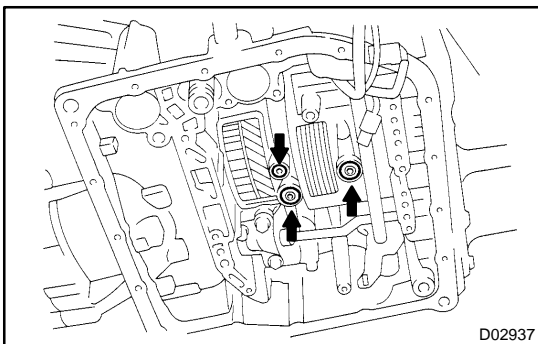
Remove the 17 bolts and valve body.

NOTICE:

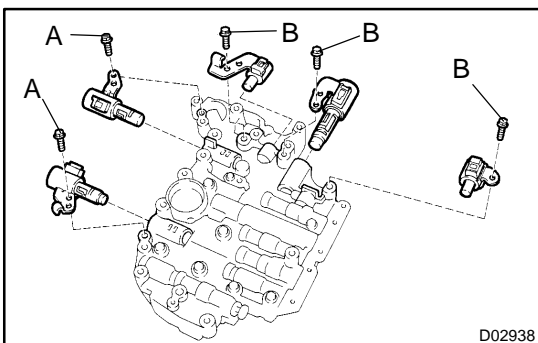
Be careful not to drop the check valve body, spring and accumulator piston.



10. REMOVE CHECK BALL BODY AND SPRING



11. REMOVE 3 APPLY GASKETS



12. REMOVE SHIFT SOLENOID VALVE

Remove the 5 bolts and shift solenoid valves.

13. INSTALL SHIFT SOLENOID VALVE

Install the 5 shift solenoid valves with the 5 bolts.

Torque:

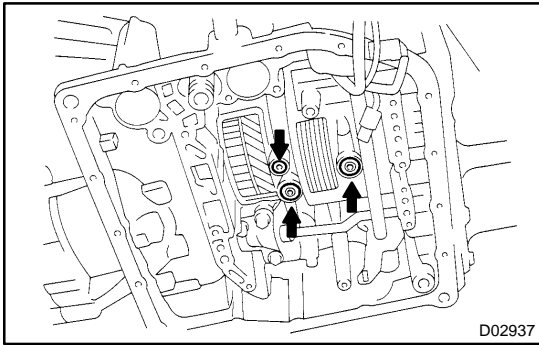
Bolt A: 6.6 N·m (67 kgf·cm, 58 in.-lbf)

Bolt B: 11 N·m (110 kgf·cm, 8 ft-lbf)

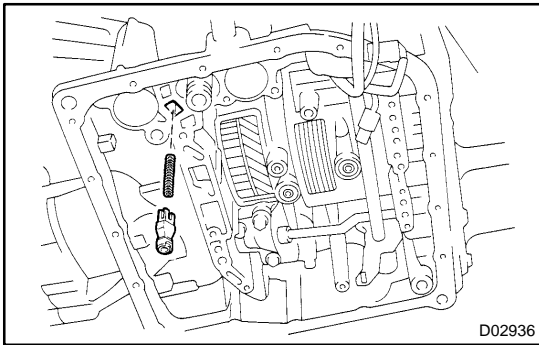
Bolt length:

Bolt A: 12 mm (0.47 in.)

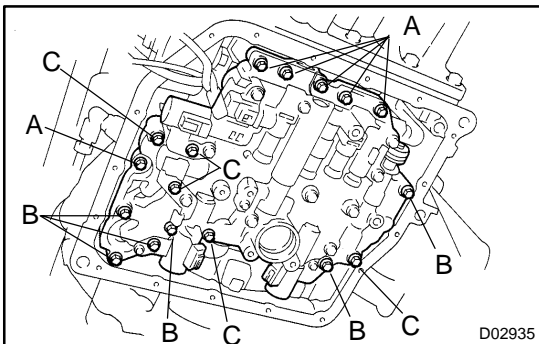
Bolt B: 45 mm (1.77 in.)



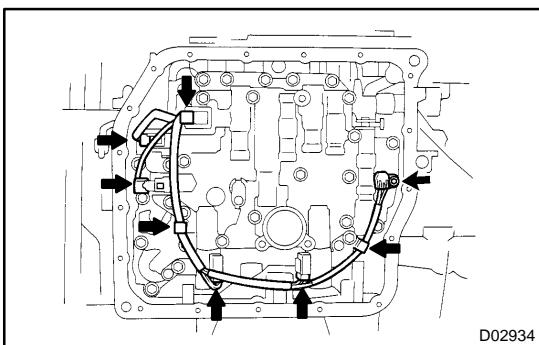
- 14. INSTALL APPLY GASKET**
 (a) Coat 3 new apply gaskets with ATF.
 (b) Install the gaskets to the transaxle case.



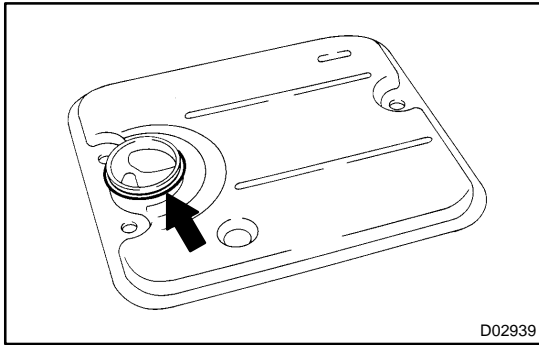
- 15. INSTALL CHECK BALL BODY AND SPRING**



- 16. INSTALL VALVE BODY**
 (a) Align the groove of the manual valve with the pin of the manual valve lever.
 (b) Temporarily install the valve body with the 17 bolts.
Bolt length:
Bolt A: 25 mm (0.98 in.)
Bolt B: 41 mm (1.61 in.)
Bolt C: 45 mm (1.77 in.)
 (c) Check that the manual valve lever contacts the center of the roller at the tip of the detent spring.
 (d) Tighten the 17 bolts.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

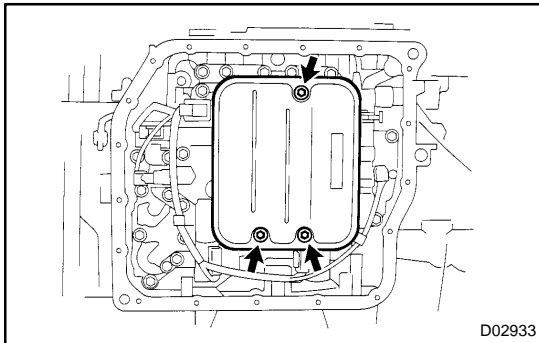


- 17. INSTALL ATF TEMPERATURE SENSOR**
 Install the ATF temperature sensor with the lock plate and bolt.
Torque: 6.6 N·m (67 kgf·cm, 58 in.-lbf)
18. CONNECT 5 SHIFT SOLENOID VALVE CONNECTORS
19. CLAMP WIRE HARNESS TO 2 CLAMPS

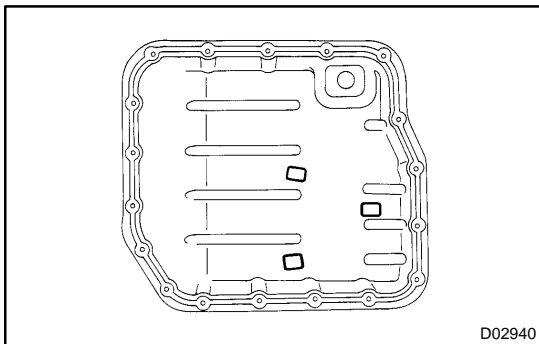


20. INSTALL OIL STRAINER

- (a) Coat a new O-ring with ATF.
- (b) Install the O-ring to the oil strainer.

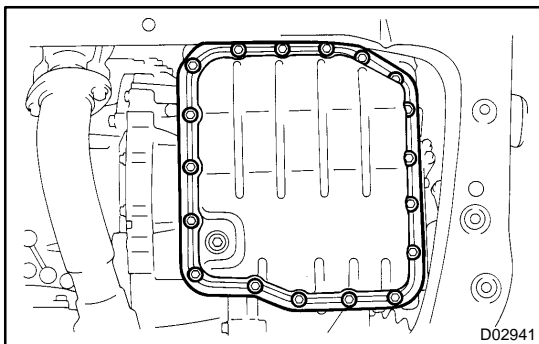


- (c) Install the oil strainer with the 3 bolts.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)



21. INSTALL MAGNET IN OIL PAN

Install the 3 magnets in the oil pan, as shown in the illustration.



22. INSTALL OIL PAN

Install the oil pan and a new gasket with the 18 bolts.

Torque: 7.8 N·m (80 kgf·cm, 69 in.-lbf)

23. INSTALL DRAIN PLUG

Install the drain plug and a new gasket.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

24. FILL ATF AND CHECK ATF LEVEL

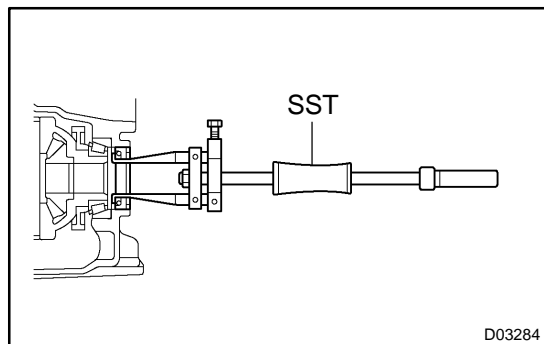
(See page [DI-163](#))

25. INSTALL ENGINE UNDER COVER

DIFFERENTIAL OIL SEAL ON-VEHICLE REPAIR

AXOCN-01

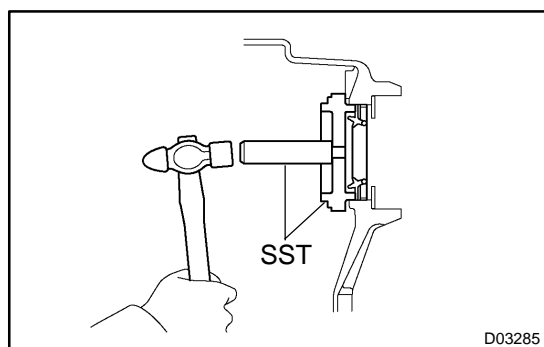
1. REMOVE DRAIN PLUG AND DRAIN ATF
2. REMOVE LH AND RH DRIVE SHAFTS
(See page SA-16)



3. REMOVE LH AND RH SIDE OIL SEAL

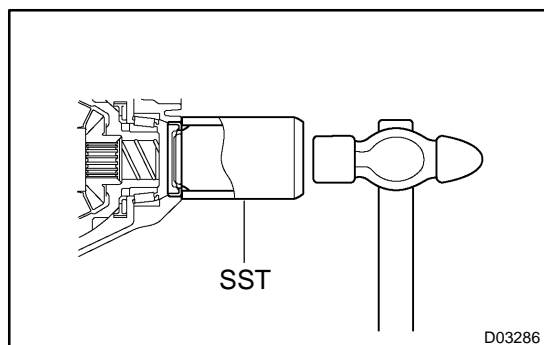
Using SST, remove both the side oil seals.

SST 09308-00010



4. INSTALL LH SIDE OIL SEAL

- (a) Using SST and a hammer, drive in a new oil seal.
SST 09350-32014 (09351-32111, 09351-32130)
Oil seal drive in depth: 0 ± 0.5 mm (0 ± 0.020 in.)
- (b) Coat the oil seal lip with MP grease.



5. INSTALL RH SIDE OIL SEAL

- (a) Using SST and a hammer, drive in a new oil seal.
SST 09223-00010
Oil seal drive in depth: 0 ± 0.5 mm (0 ± 0.020 in.)
- (b) Coat the oil seal lip with MP grease.

6. INSTALL LH AND RH DRIVE SHAFTS

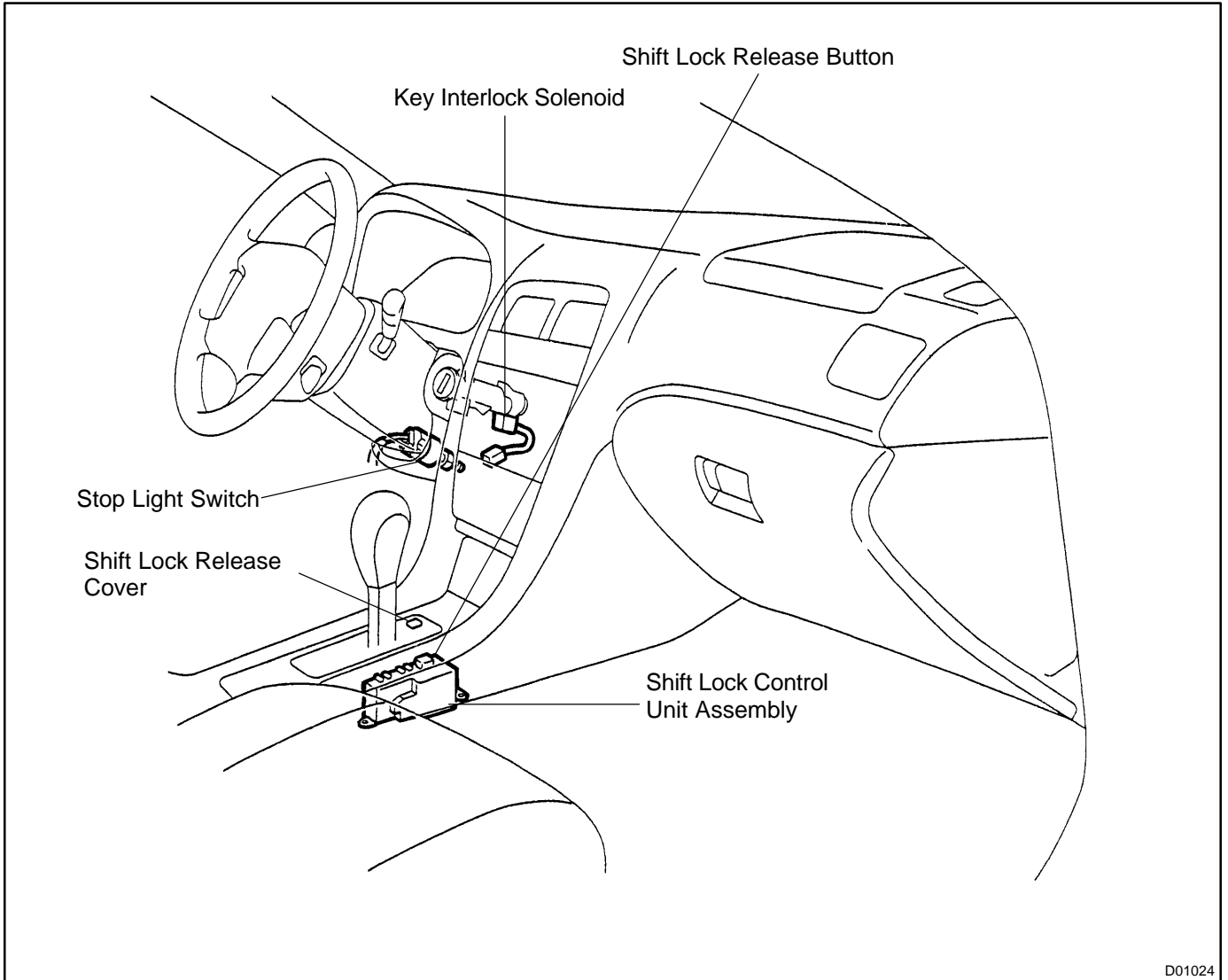
(See page SA-23)

7. FILL ATF AND CHECK ATF LEVEL

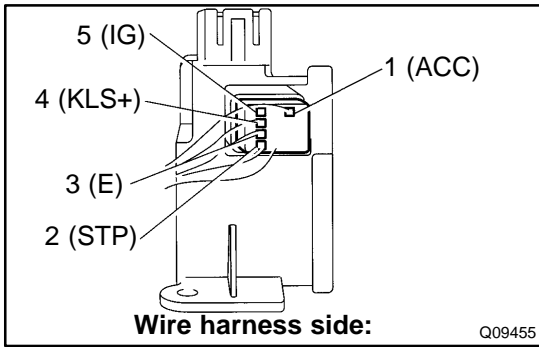
(See page DI-163)

SHIFT LOCK SYSTEM LOCATION

AX0CS-01



D01024



INSPECTION

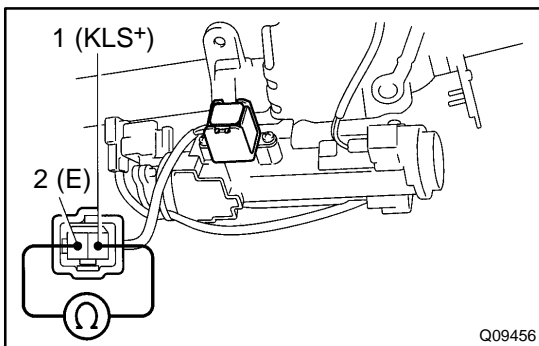
1. INSPECT SHIFT LOCK CONTROL UNIT ASSEMBLY

Using a voltmeter, measure the voltage at each terminal.

HINT:

Do not disconnect the shift lock control unit assembly connector.

Terminal (Symbol)	Measuring Condition	Voltage (V)
1 (ACC) - 3 (E)	Ignition switch ACC	10 - 14
5 (IG) - 3 (E)	Ignition switch ON	10 - 14
2 (STP) - 3 (E)	Depressing brake pedal	10 - 14
4 (KLS+) - 3 (E)	(1) Ignition switch ACC and P position	0
	(2) Ignition switch ACC and except P position	7.5 - 11
	(3) Ignition switch ACC and except P position (After approx. 1 second)	6 - 9.5

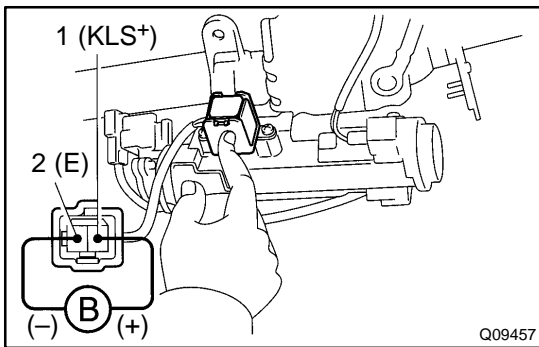


2. INSPECT KEY INTERLOCK SOLENOID

- (a) Disconnect the solenoid connector.
- (b) Using an ohmmeter, measure resistance between terminals.

Standard resistance: 12.5-16.5 Ω

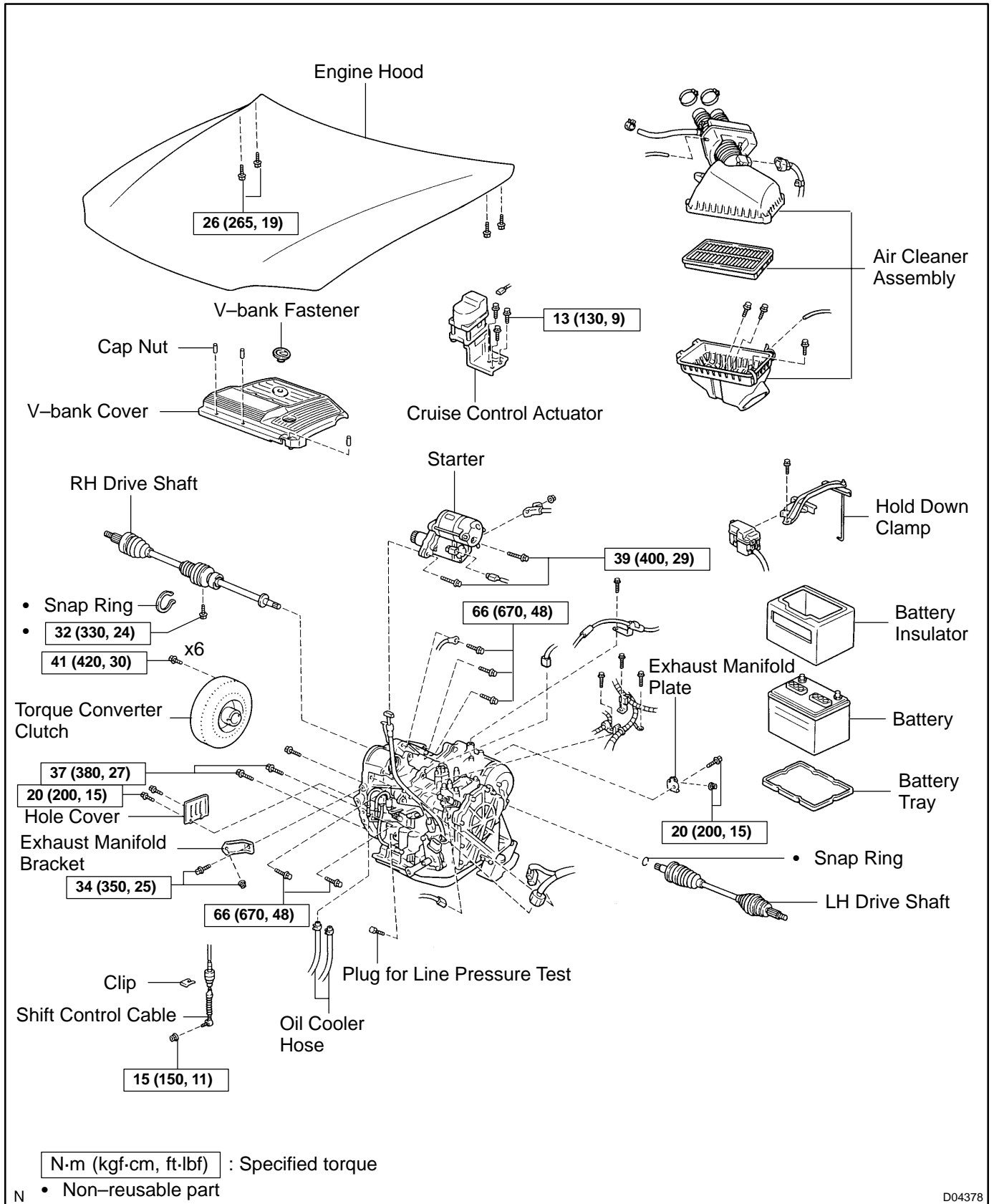
If resistance value is not as specified, replace the solenoid.



- (c) Apply battery positive voltage between terminals. Check that an operation noise can be heard from the solenoid. If the solenoid does not operated, replace the solenoid.

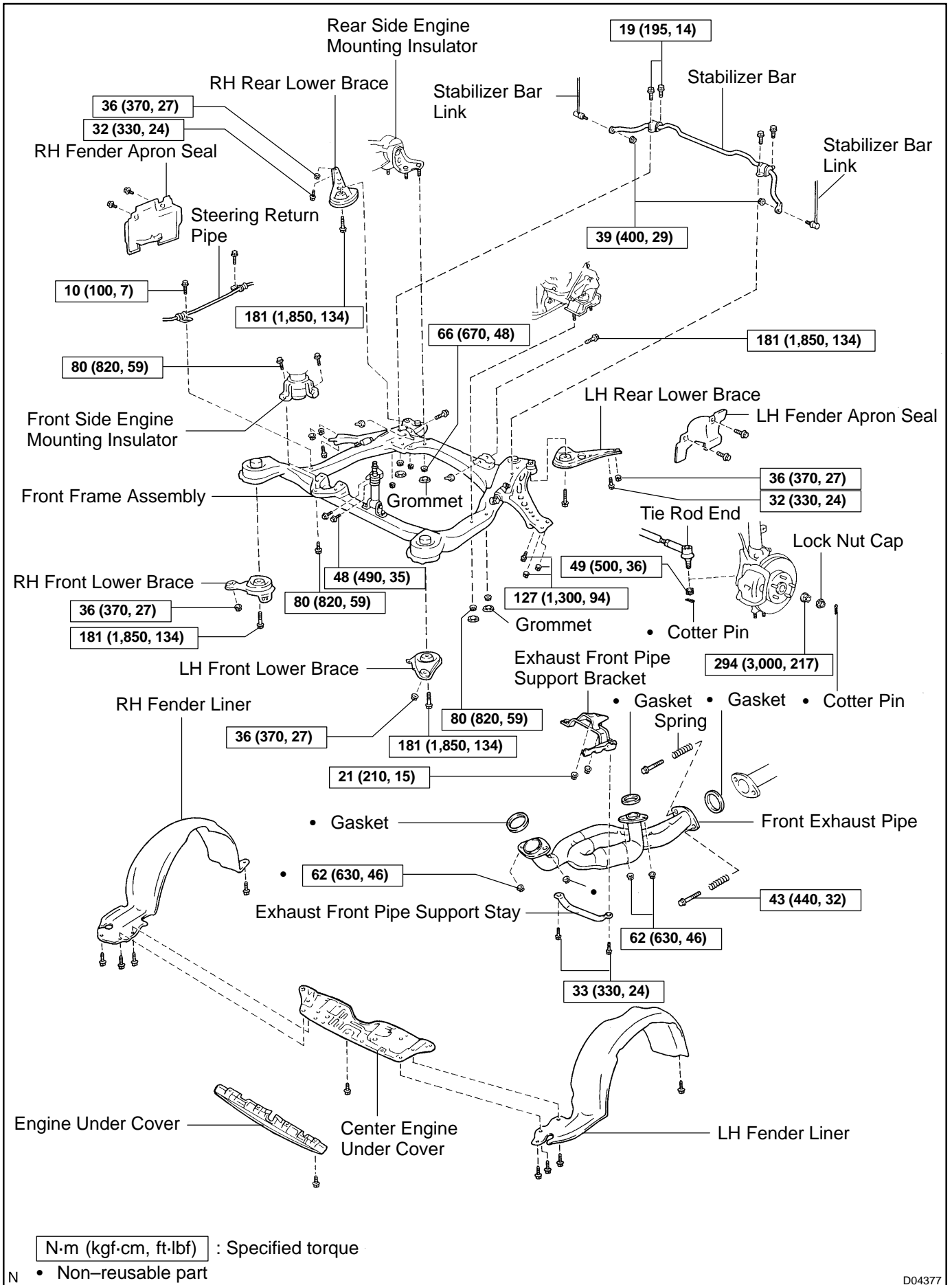
AUTOMATIC TRANSAXLE UNIT COMPONENTS

AXOCV-01



D04378

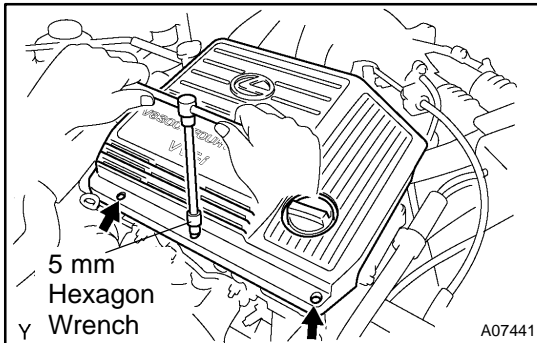
AUTOMATIC TRANSAXLE (U140E) - AUTOMATIC TRANSAXLE UNIT



D04377

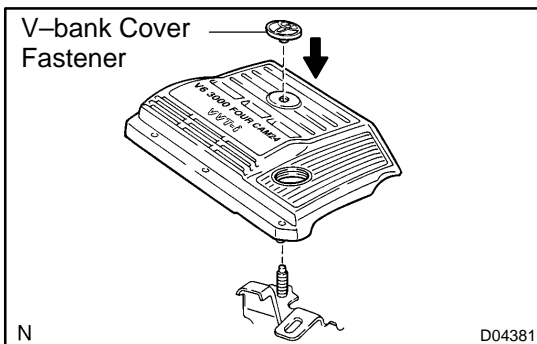
REMOVAL

1. REMOVE ENGINE HOOD (See page BO-6)



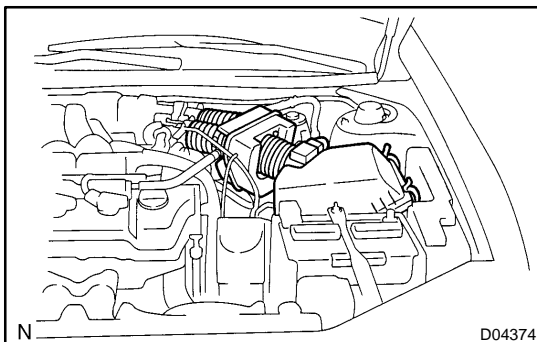
2. REMOVE V-BANK COVER

- (a) Using a 5 mm hexagon wrench, remove the 3 cap nuts.
- (b) Turn the V-bank cover fastener counterclockwise and loosen it.
- (c) Remove the V-bank cover.

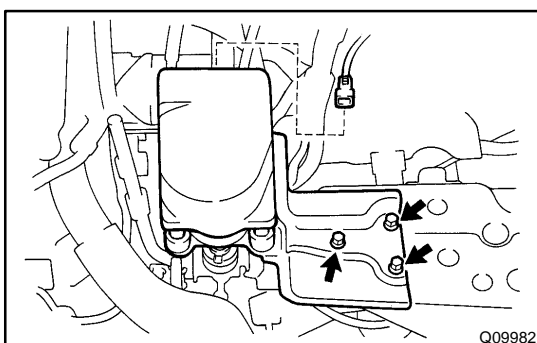


HINT:

At the time of installation, please refer to the following item. When installing the V-bank cover fastener, remove the fastener once, then position and push in it.



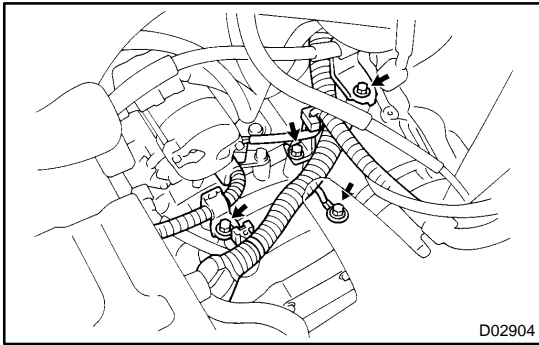
3. REMOVE AIR CLEANER ASSEMBLY
4. REMOVE BATTERY



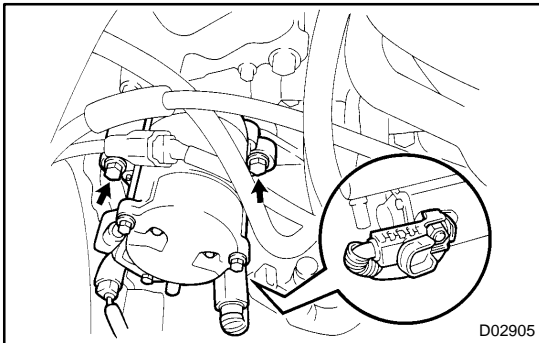
5. REMOVE CRUISE CONTROL ACTUATOR

- (a) Disconnect the connector.
- (b) Remove the 3 bolts and disconnect cruise control actuator with the bracket.

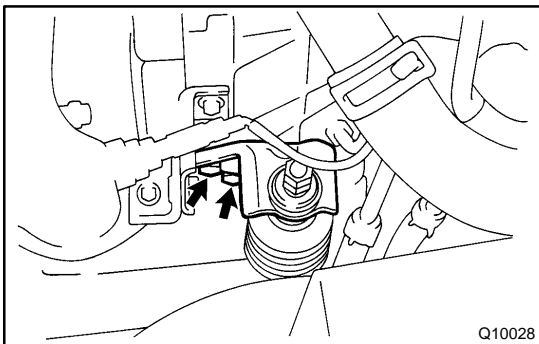
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



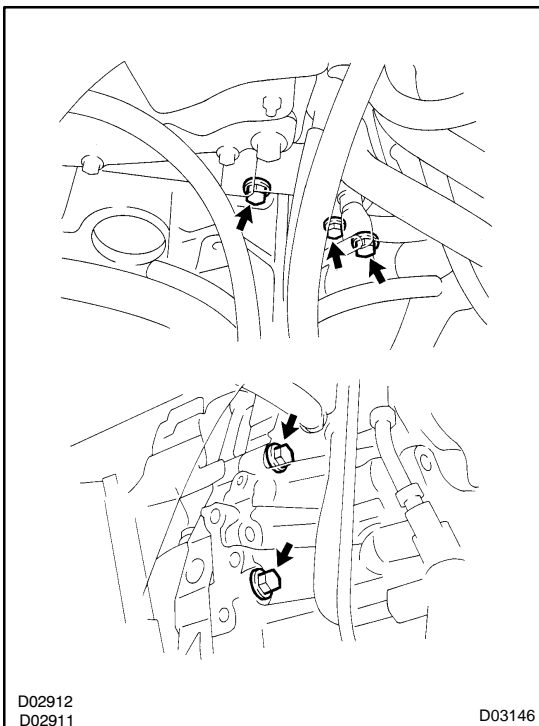
6. DISCONNECT 2 SPEED SENSOR CONNECTORS
7. REMOVE 2 WIRE HARNESS MOUNTING BOLTS
8. REMOVE GROUND TERMINAL MOUNTING BOLT
9. REMOVE SHIFT CABLE CLAMP



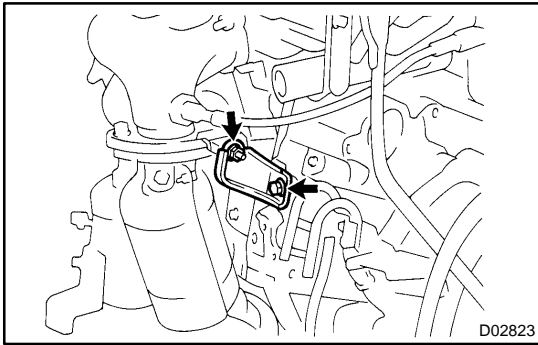
10. REMOVE STARTER
 - (a) Disconnect the connector.
 - (b) Remove the 2 starter mounting bolts.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
 - (c) Remove the nut and disconnect the terminal.
 - (d) Remove the starter.



11. REMOVE 2 ENGINE MOUNTING ABSORBER BRACKET BOLTS
Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)



12. REMOVE 5 TRANSAXLE UPPER SIDE MOUNTING BOLTS
 - (a) Remove the 5 transaxle upper side mounting bolts.
Torque: 66 N·m (670 kgf·cm, 48 ft·lbf)
 - (b) Disconnect the ground cable.



13. REMOVE EXHAUST MANIFOLD BRACKET MOUNTING BOLT

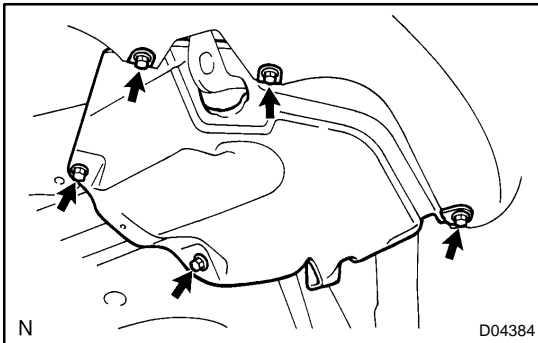
Torque: 20 N·m (200 kgf·cm, 15 ft·lbf)

14. RAISE AND SUPPORT VEHICLE SECURELY

15. REMOVE LH AND RH FRONT WHEELS

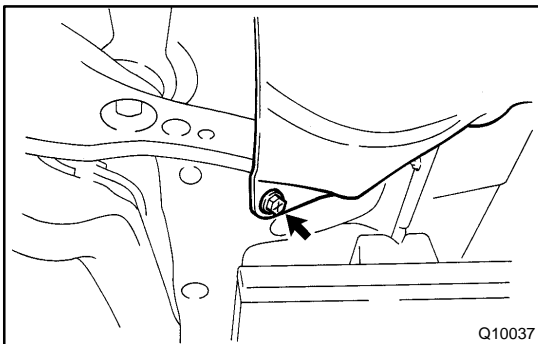
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

16. REMOVE DRAIN PLUG AND DRAIN ATF



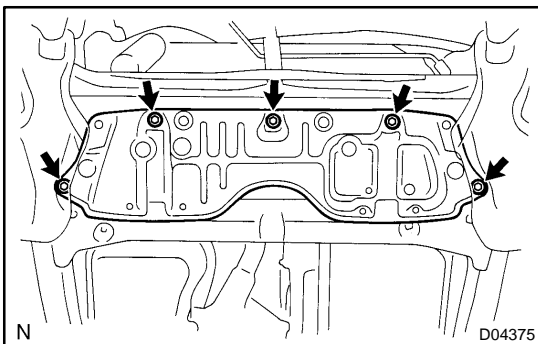
17. REMOVE ENGINE UNDER COVER

(a) Remove the 10 screws and turn over the front side of the LH and RH fender liners.



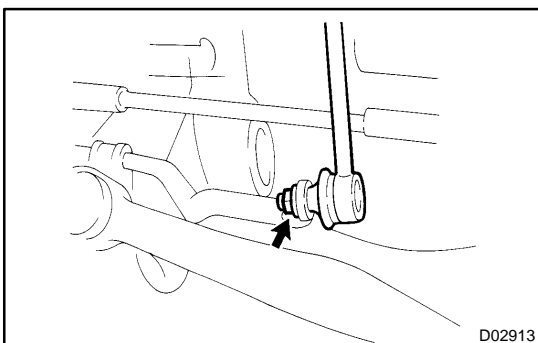
(b) Remove the 2 screws and turn over the rear side of LH and RH fender liners.

(c) Remove the engine under cover.

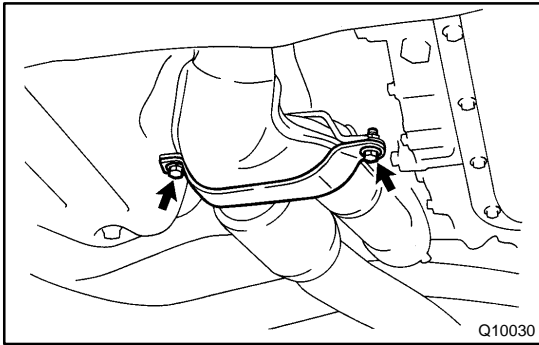


(d) Remove the 5 bolts and center engine under cover.

18. REMOVE LH AND RH FRONT DRIVE SHAFTS (See page SA-16)



19. DISCONNECT LH AND RH STABILIZER BAR LINKS (See page SA-41)



20. REMOVE FRONT EXHAUST PIPE

- (a) Remove the 2 bolts and exhaust front pipe support stay.
Torque: 33 N·m (330 kgf·cm, 24 ft·lbf)
- (b) Remove the 4 nuts from the exhaust manifold.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

HINT:

At the time of installation, please refer to the following item.
Replace the used nuts with new once.

- (c) Remove the 2 bolts and springs.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

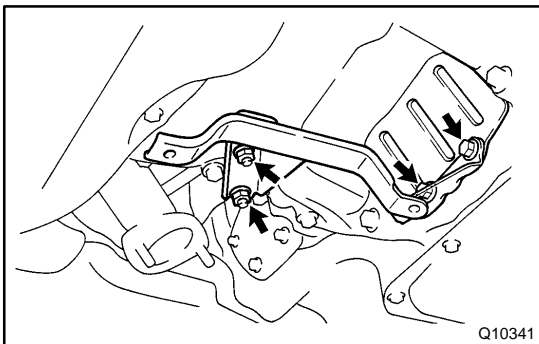
HINT:

At the time of installation, please refer to the following item.
Replace the used nuts with new once.

- (d) Remove the 3 gaskets.

HINT:

At the time of installation, please refer to the following item.
Replace the used gaskets with new once.



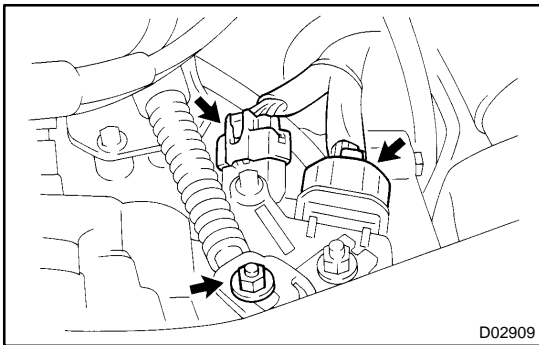
- (e) Remove the 2 nuts, bolts, exhaust front pipe support bracket and hole cover.

Torque:

**Exhaust front pipe support bracket mounting nut:
21 N·m (210 kgf·cm, 15 ft·lbf)**

Hole cover mounting bolt:

20 N·m (200 kgf·cm, 15 ft·lbf)



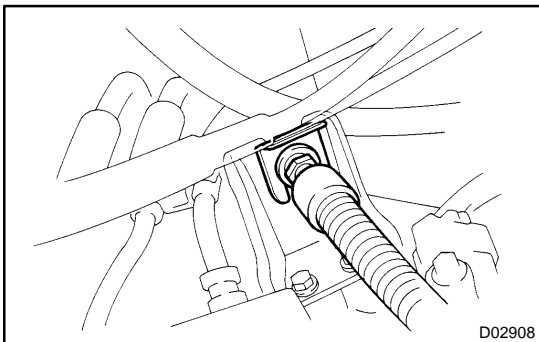
21. DISCONNECT PARK/NEUTRAL POSITION SWITCH CONNECTOR

22. DISCONNECT SOLENOID CONNECTOR

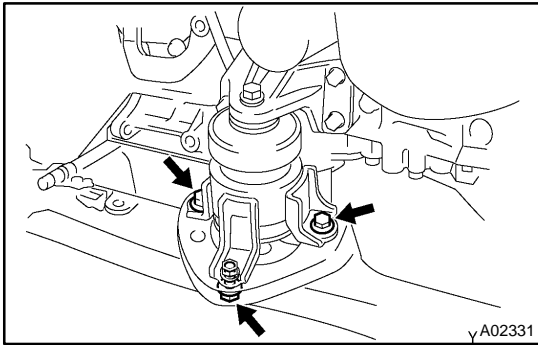
23. DISCONNECT SHIFT CONTROL CABLE

- (a) Remove the nut and disconnect the shift control cable from the lever.

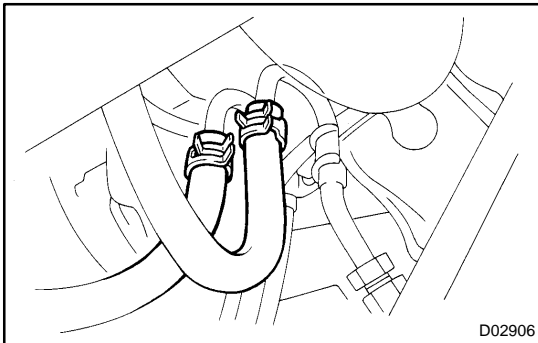
Torque: 15 N·m (150 kgf·cm, 11 ft·lbf)



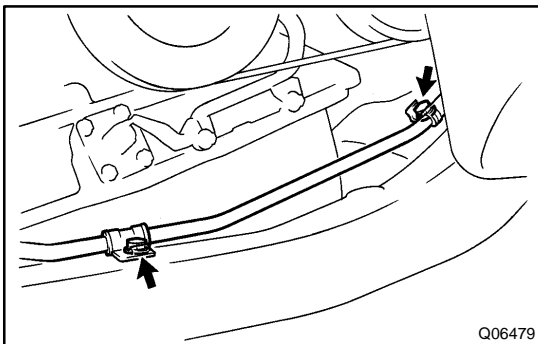
- (b) Remove the clip and disconnect the shift control cable from the bracket.



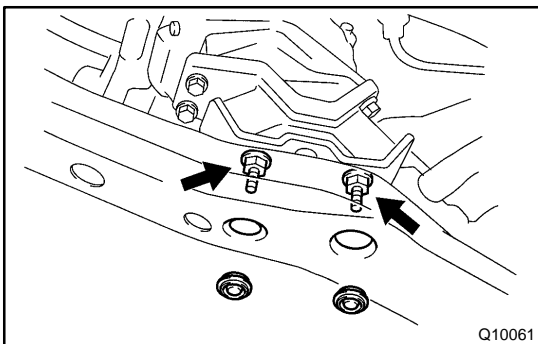
- 24. REMOVE 3 FRONT SIDE ENGINE MOUNTING BOLTS**
 Torque: 80 N·m (820 kgf·cm, 59 ft·lbf)



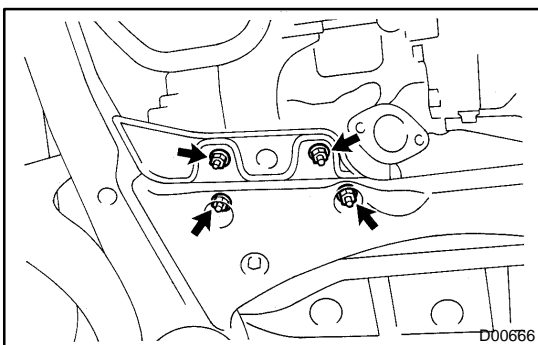
- 25. DISCONNECT OIL COOLER HOSE**
 Loosen the 2 clamps and disconnect the 2 oil cooler hoses.



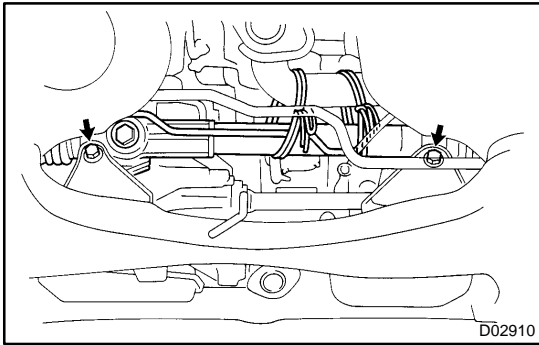
- 26. DISCONNECT STEERING RETURN PIPE**
 Remove the 2 bolts and disconnect the steering return pipe.
 Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



- 27. REMOVE LEFT SIDE TRANSAXLE MOUNTING NUT**
 Remove the 2 grommets and nuts.
 Torque: 80 N·m (820 kgf·cm, 59 ft·lbf)



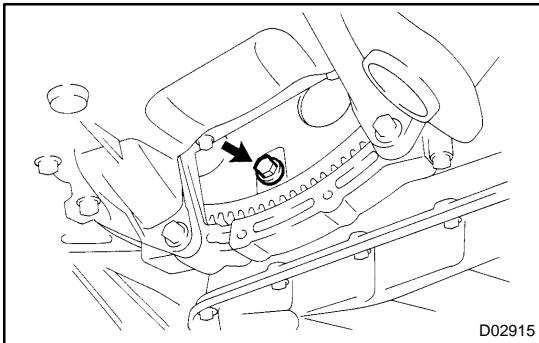
- 28. REMOVE REAR SIDE ENGINE MOUNTING NUT**
 Remove the 2 grommets and 4 nuts.
 Torque: 66 N·m (670 kgf·cm, 48 ft·lbf)
- 29. REMOVE 4 FRONT STABILIZER BAR BRACKET MOUNTING BOLTS**
 Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)



30. TIE STEERING GEAR ASSEMBLY WITH CODE OR EQUIVALENT TO SUSPEND ASSEMBLY SECURELY, AS SHOWN

31. REMOVE 2 STEERING GEAR ASSEMBLY MOUNTING BOLTS

Torque: 181 N·m (1,850 kgf·cm, 134 ft·lbf)



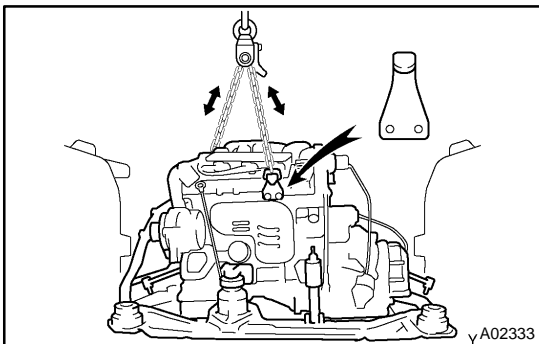
32. REMOVE TORQUE CONVERTER CLUTCH MOUNTING BOLT

Turn the crankshaft to gain access to each bolt, remove the 6 bolts with holding the crankshaft pulley bolt with a wrench.

Torque: 41 N·m (420 kgf·cm, 30 ft·lbf)

HINT:

At the time of installation, please refer to the following item. First install green colored bolt and then the 5 other bolts.



33. ATTACH ENGINE SLINK DEVICE TO ENGINE HANGER

(a) Install the No.2 engine hanger in the correct direction.

Parts No.:

No.2 engine hanger: 12282-20020

Bolt: 91621-60822

Torque: 19.5 N·m (200 kgf·cm, 14 ft·lbf)

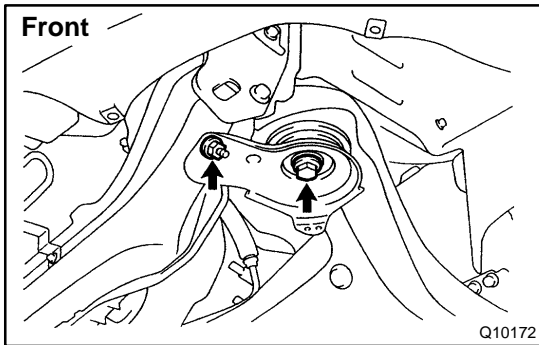
(b) Attach the engine chain hoist to the engine hangers.

CAUTION:

Do not attempt to hang the engine by hooking the chain to any other part.

(c) Support the front frame assembly with a jack.

34. SUPPORT TRANSAXLE WITH JACK



35. REMOVE FRONT FRAME ASSEMBLY

- (a) Remove the 6 bolts and 4 nuts.

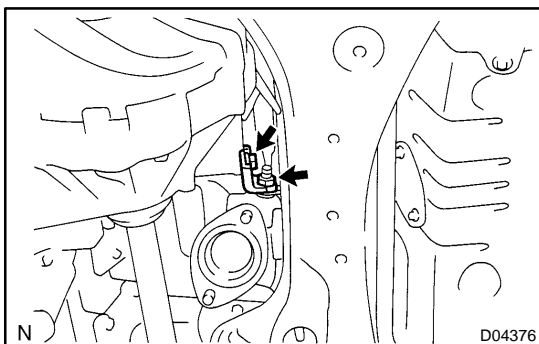
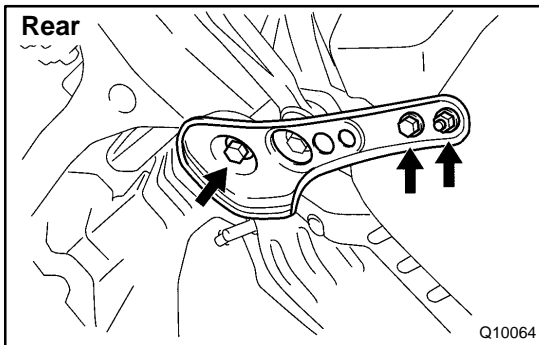
Torque:

19 mm head bolt: 181 N·m (1,850 kgf·cm, 134 ft·lbf)

14 mm head bolt: 32 N·m (330 kgf·cm, 24 ft·lbf)

Nut: 36 N·m (370 kgf·cm, 27 ft·lbf)

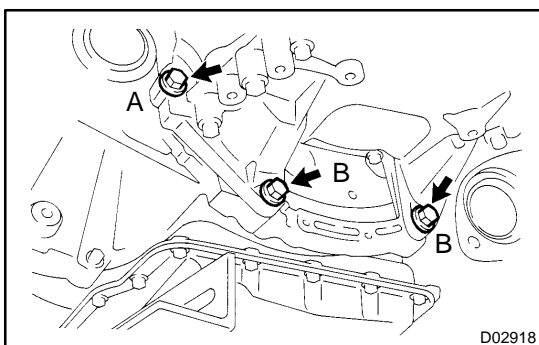
- (b) Remove the front frame assembly.



36. REMOVE EXHAUST MANIFOLD PLATE

Remove the bolt, nut and exhaust manifold plate.

Torque: 20 N·m (200 kgf·cm, 15 ft·lbf)



37. REMOVE TRANSAXLE 3 LOWER SIDE MOUNTING BOLTS

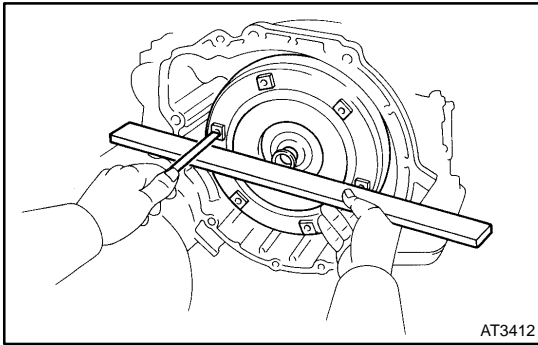
Torque:

A bolt: 48 N·m (490 kgf·cm, 35 ft·lbf)

B bolt: 37 N·m (380 kgf·cm, 27 ft·lbf)

38. REMOVE TRANSAXLE ASSEMBLY

Separate the transaxle from engine, and lower the transaxle.



INSTALLATION

1. CHECK TORQUE CONVERTER CLUTCH INSTALLATION

Using calipers and a straight edge, measure the distance between the installed surface and the front surface of the transaxle housing.

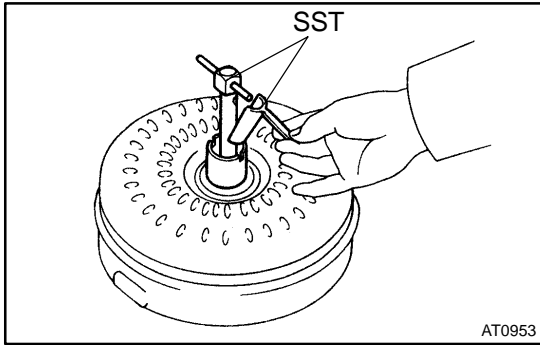
Correct distance: More than 12.75 mm (0.5020 in.)

2. TRANSAXLE INSTALLATION

Installation is in the reverse order of removal (See page [AX-16](#)).

HINT:

- After installation, adjust the shift control cable and park/neutral position switch (See page [DI-163](#)).
- Fill ATF and check the fluid level (See page [DI-163](#)).
- Perform the test drive of the vehicle.

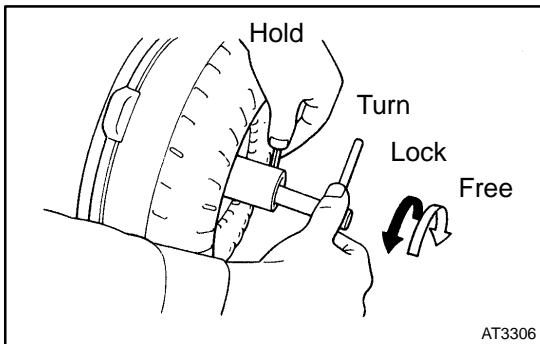


TORQUE CONVERTER CLUTCH AND DRIVE PLATE INSPECTION

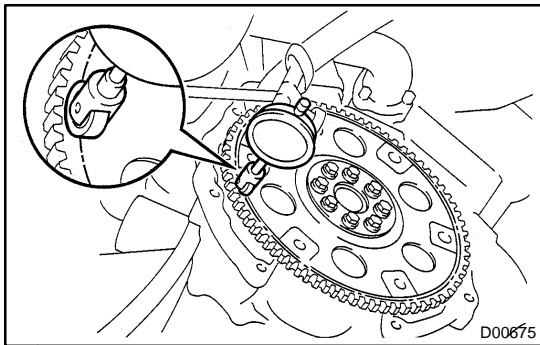
AX0CU-01

1. INSPECT ONE-WAY CLUTCH

- (a) Install SST into the inner race of the one-way clutch.
SST 09350-32014 (09351-32010)
- (b) Install SST so that it fits in the notch of the converter hub and outer race of the one-way clutch.
SST 09350-32014 (09351-32020)



- (c) With the torque converter clutch setting up on its side, check that the clutch locks when turned counterclockwise, and rotates smoothly clockwise.
If necessary, clean the converter and retest the clutch. Replace the converter clutch if the clutch still fails the test.



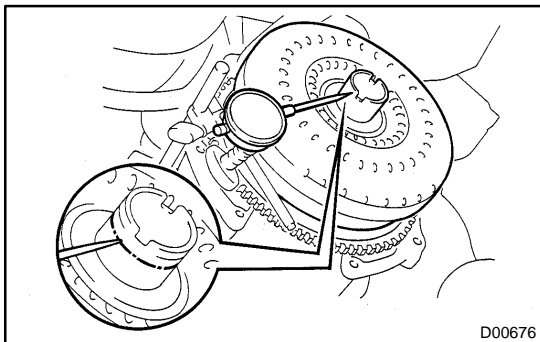
2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

- (a) Set up a dial indicator and measure the drive plate runout.
- (b) Check the damage of the ring gear.

Maximum runout: 0.20 mm (0.0079 in.)

If the runout is not within the specification or ring gear is damaged, replace the drive plate.

Torque: 83 N·m (850 kgf·cm 61 ft·lbf)



3. MEASURE TORQUE CONVERTER CLUTCH SLEEVE RUNOUT

Temporarily mount the torque converter clutch on the drive plate. Set a dial indicator and measure the torque converter clutch sleeve runout.

Maximum runout: 0.30 mm (0.0118 in.)

If the runout is not within the specification, try to correct by reorienting the installation of the converter.

HINT:

Mark the position of the converter clutch to ensure the installation is correctly performed.