

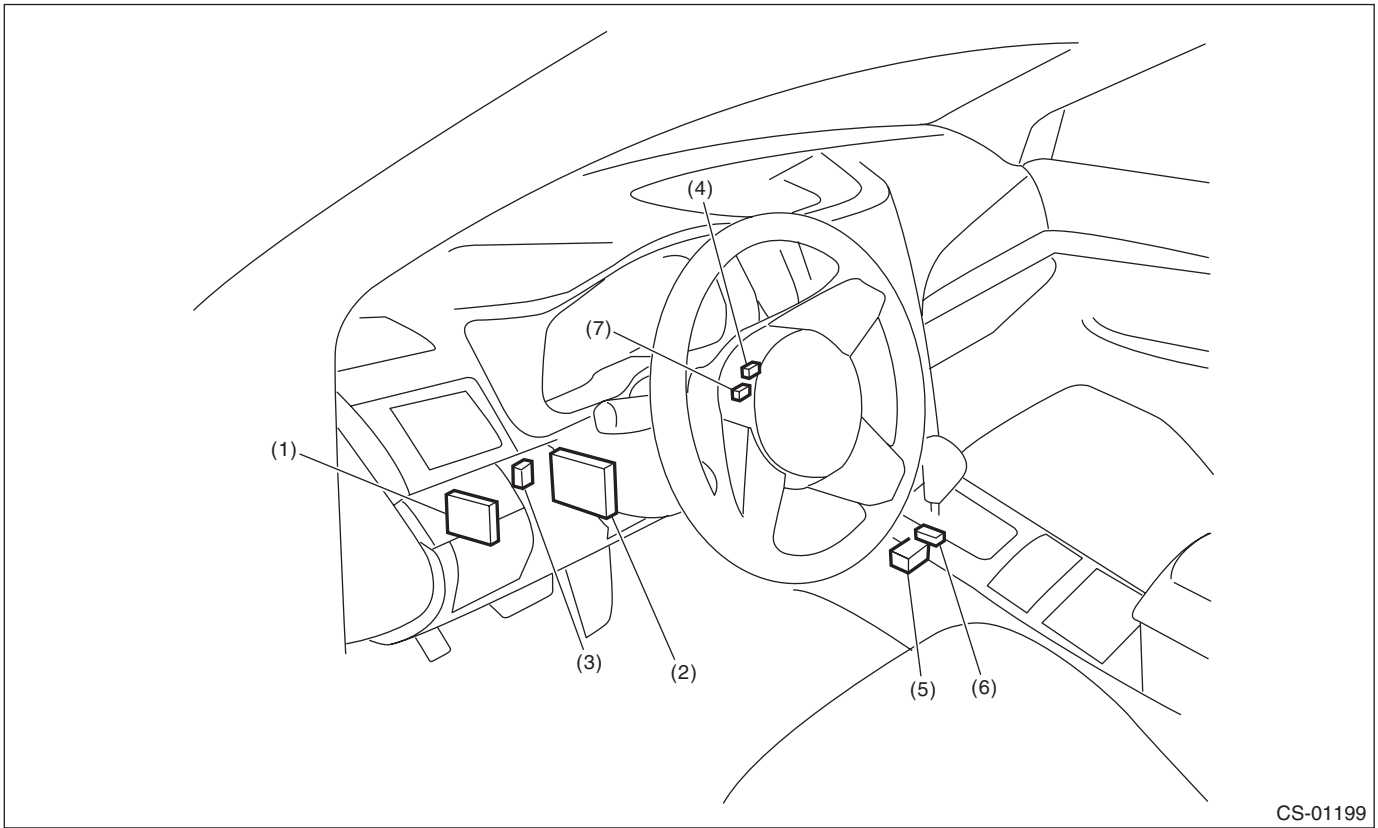
# AT Shift Lock Control System

CONTROL SYSTEMS

## 2. AT Shift Lock Control System

### A: LOCATION

#### 1. MODEL WITHOUT PUSH BUTTON IGNITION SWITCH



CS-01199

(1) TCM ("P" range)

(4) Key cylinder (with built-in key warning switch)

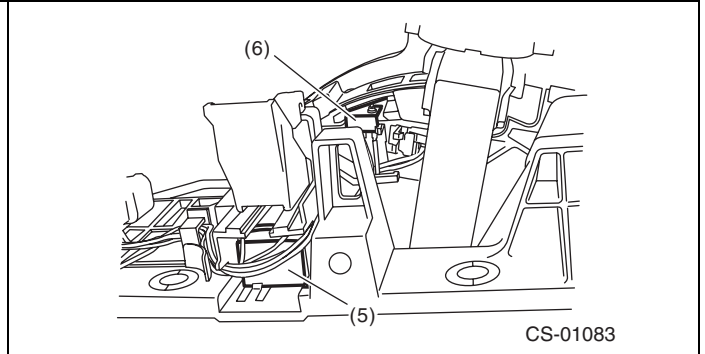
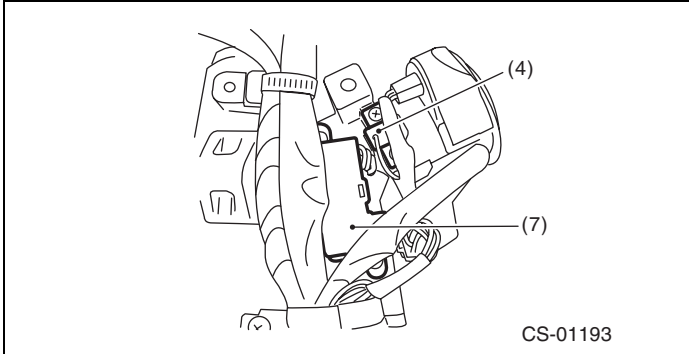
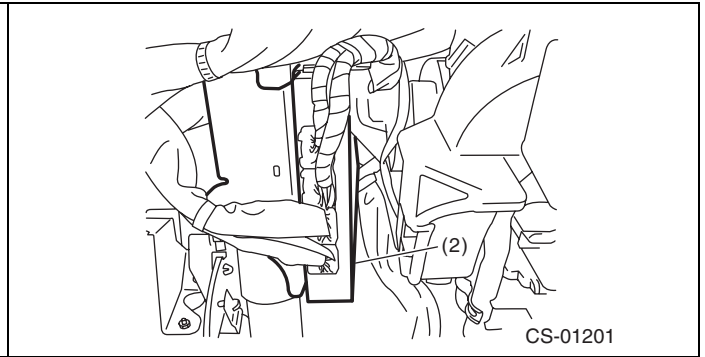
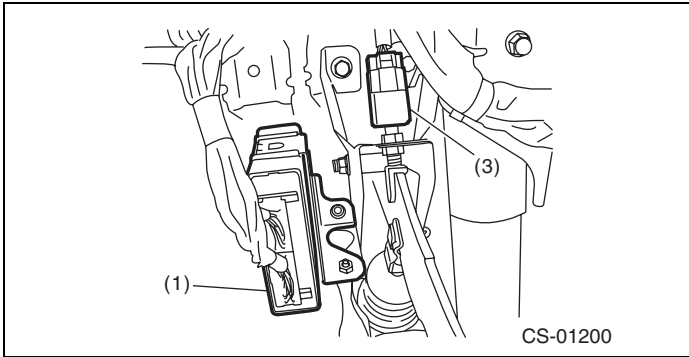
(6) "P" range switch

(2) Body integrated unit

(5) Solenoid unit

(7) Key lock solenoid

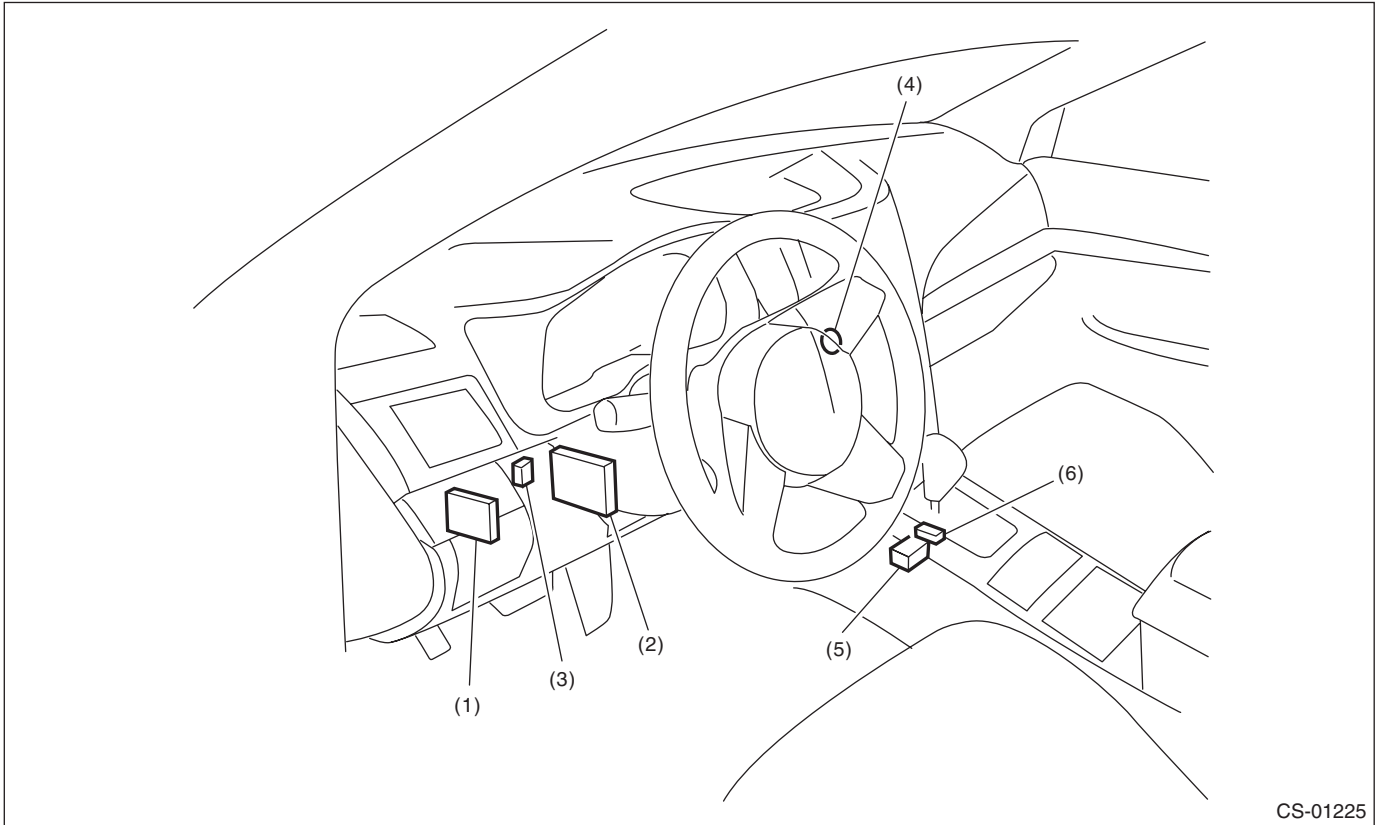
(3) Stop light switch



# AT Shift Lock Control System

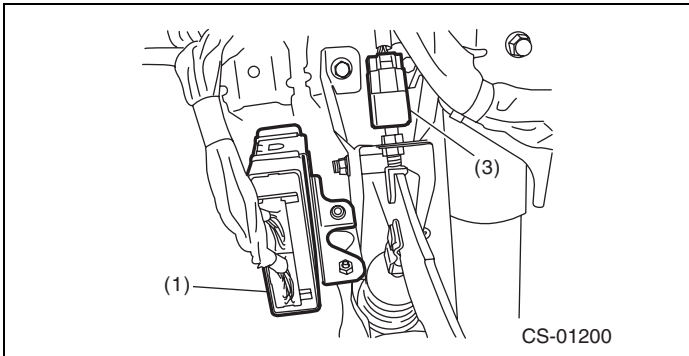
## CONTROL SYSTEMS

### 2. MODEL WITH PUSH BUTTON IGNITION SWITCH

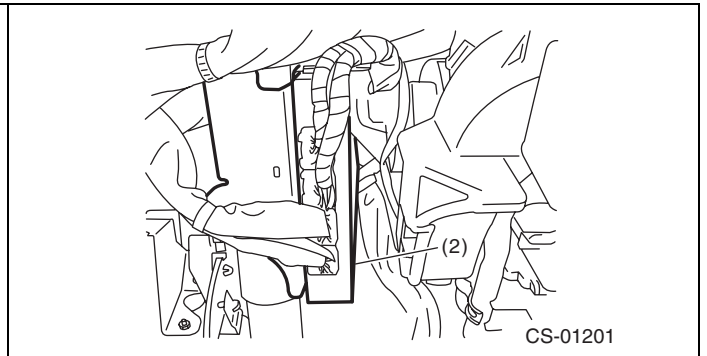


CS-01225

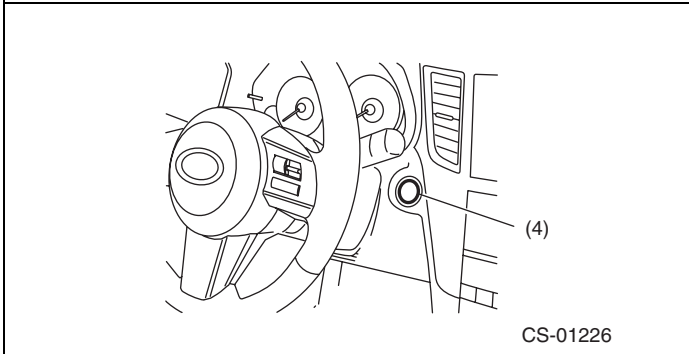
- |                          |                                 |                      |
|--------------------------|---------------------------------|----------------------|
| (1) TCM                  | (3) Stop light switch           | (5) Solenoid unit    |
| (2) Body integrated unit | (4) Push button ignition switch | (6) "P" range switch |



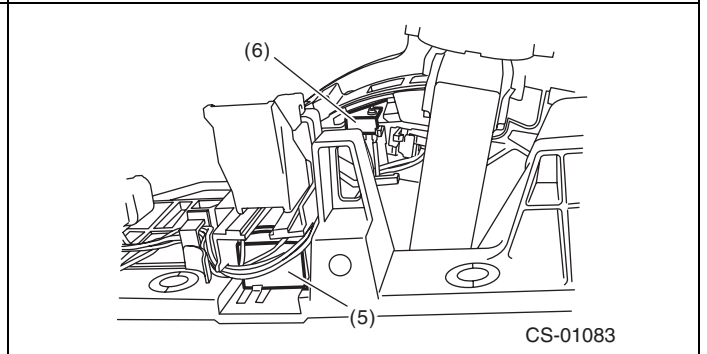
CS-01200



CS-01201

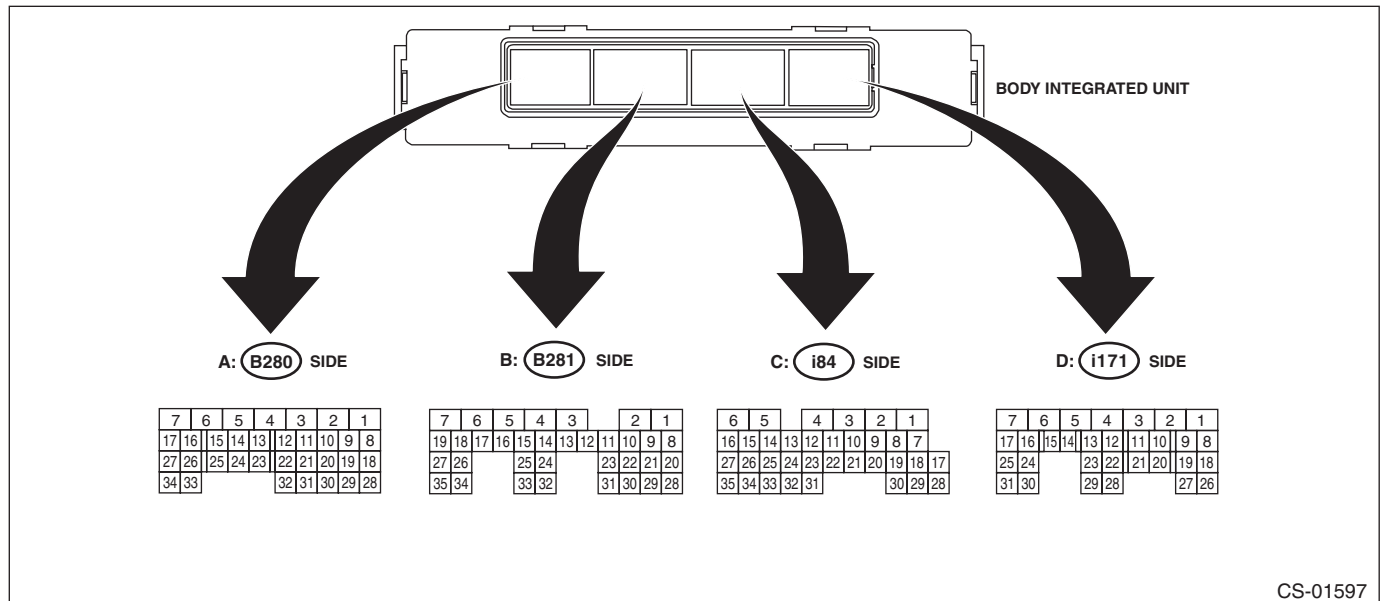


CS-01226



CS-01083

## B: ELECTRICAL SPECIFICATION



Item	Connector No.	Terminal No.	Input/Output signal
			Measured value and measuring conditions
Battery power supply	B281	6	9 — 16 V
	i84	6	
Ignition power supply	i171	17	9 — 16 V when ignition switch is at ON or START.
		25	9 — 16 V when ignition switch is at ACC.
TCM (“P” range)	B281	20	Pulse signal (CAN communication)
		28	
Stop light switch	B280	10	9 — 16 V when stop light switch is ON. Less than 1.5 V when stop light switch is OFF.
“P” range switch	B281	21	Less than 1.5 V when select lever is in “P” range. 9 — 16 V when select lever is in other positions than “P” range.
Solenoid unit output	B281	5	8.5 — 16 V when shift lock is released. Less than 1.5 V when shift lock is operating.
Key warning switch signal (Model without push button ignition switch)	B280	4	9 — 16 V when key is inserted. Less than 1.5 V when key is removed.
Key lock solenoid output (Model without push button ignition switch)	B281	3	7 — 14 V (unlock) <sup>*1</sup>
		4	7 — 14 V (lock) <sup>*1</sup>
Ground	B280	1	1 V or less
	B281	31	
	i84	1	
	i171	29	

<sup>\*1</sup>: Measuring condition

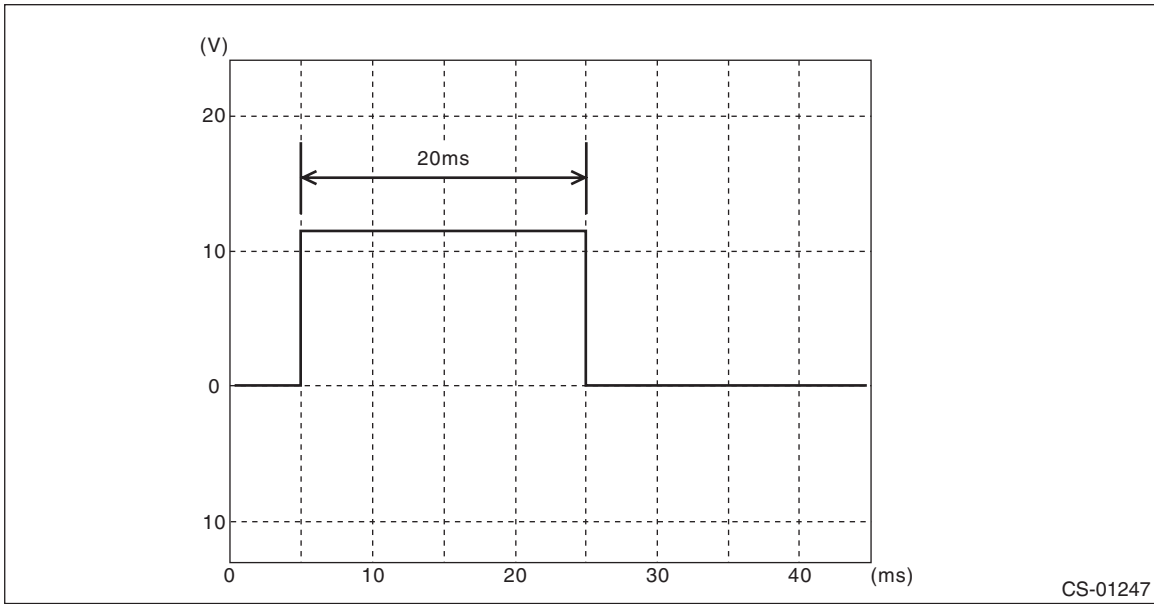
Key warning switch	“P” range switch	Ignition switch	Output
OFF	—	—	Unlock (Key can be removed)
ON	OFF	—	Lock (Key cannot be removed)
ON	ON	OFF	Unlock
ON	ON	ON	Lock

# AT Shift Lock Control System

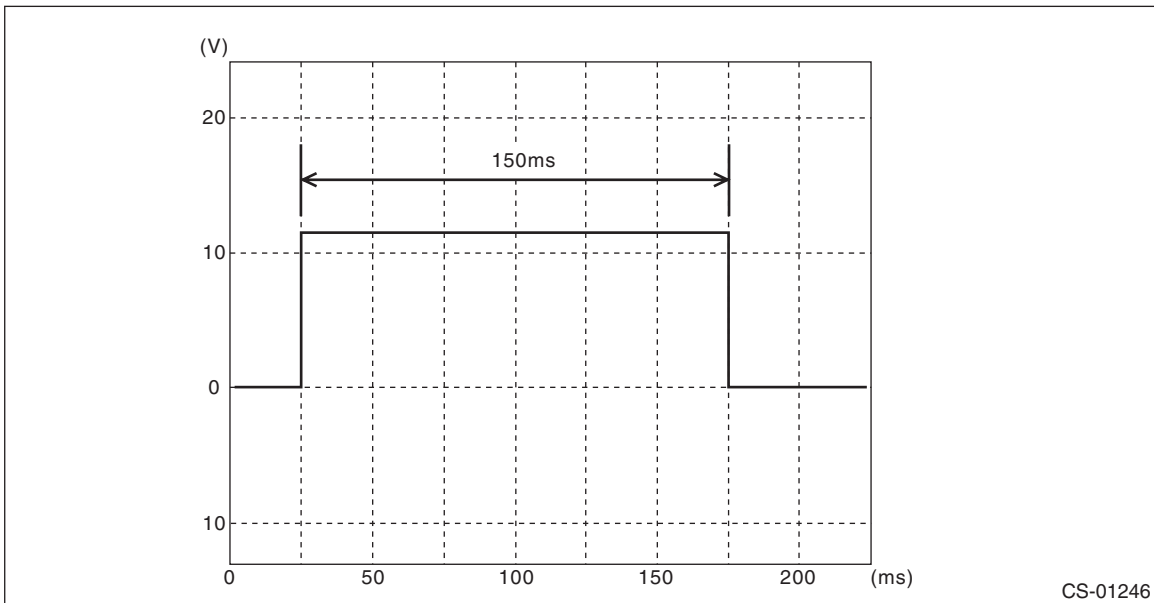
## CONTROL SYSTEMS

### Key lock solenoid output signal

#### 1. Output Signal for Unlock

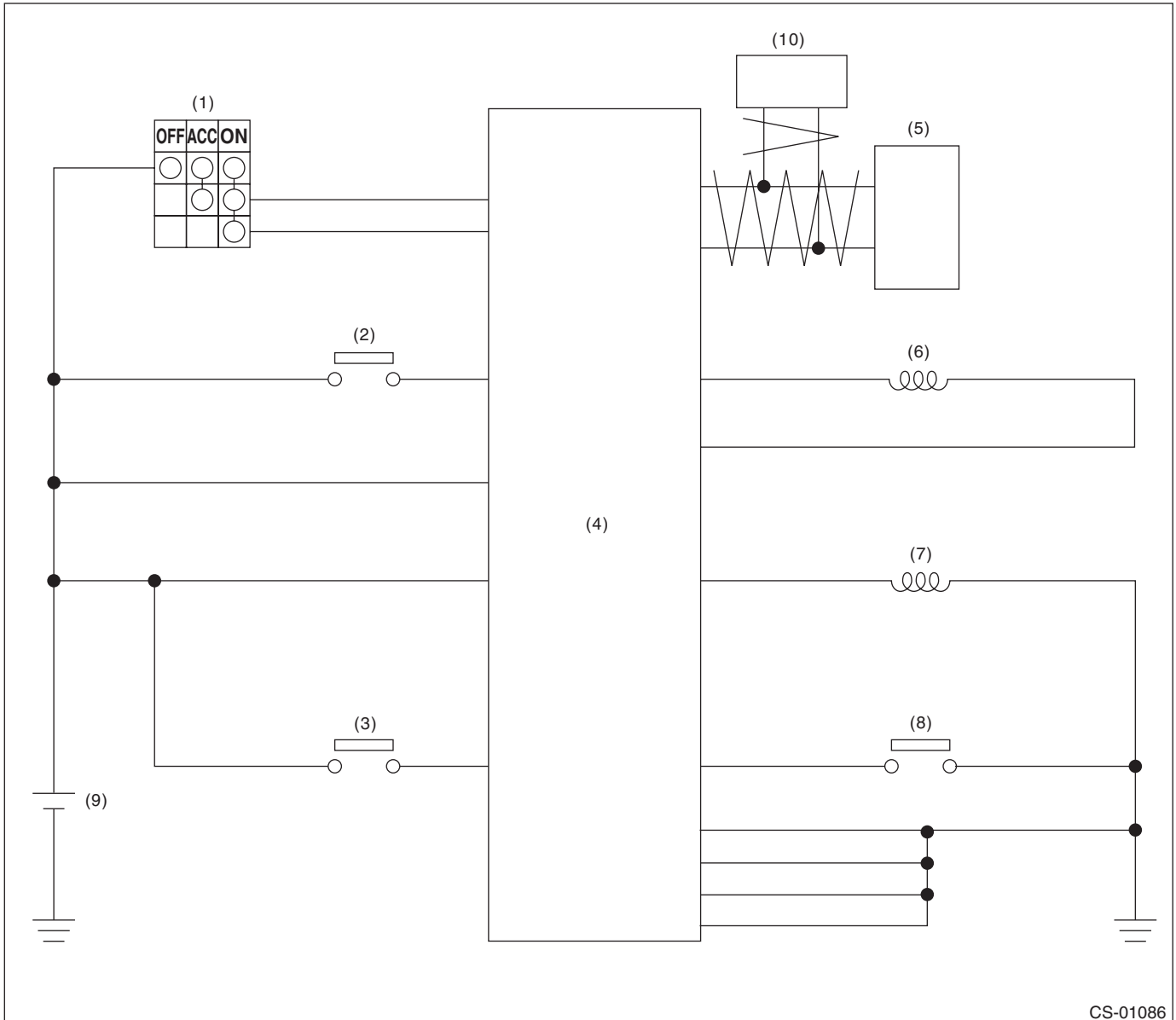


#### 2. Output Signal for Lock



## C: WIRING DIAGRAM

### 1. MODEL WITHOUT PUSH BUTTON IGNITION SWITCH



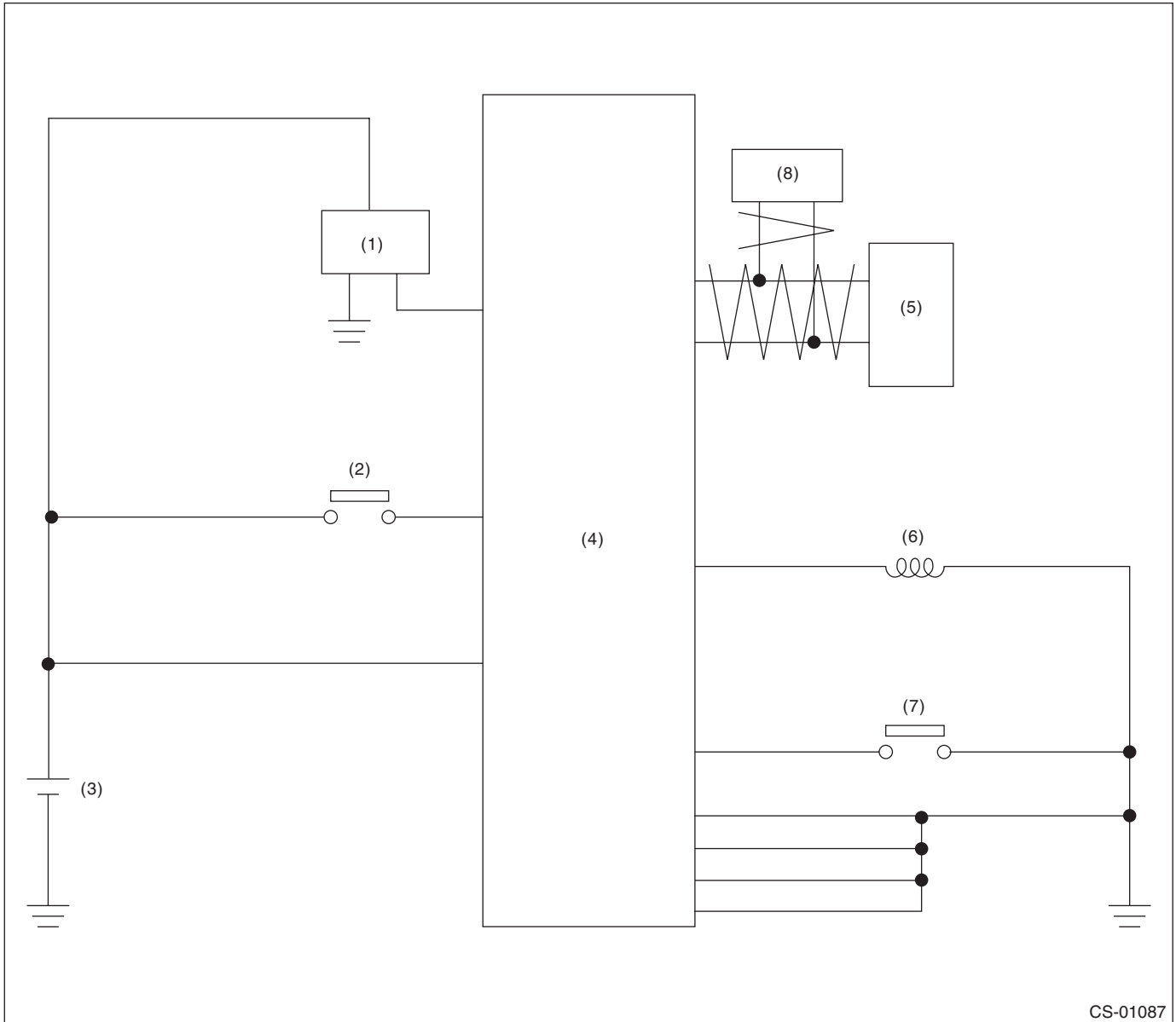
CS-01086

- |                          |                                   |   |
|--------------------------|-----------------------------------|---|
| (1) Ignition switch      | (5) TCM (shift range information) | (9) Battery                             |
| (2) Stop light switch    | (6) Key lock solenoid             | (10) VDC CM (vehicle speed information) |
| (3) Key warning switch   | (7) Shift lock solenoid           |   |
| (4) Body integrated unit | (8) "P" range switch              |   |

# AT Shift Lock Control System

CONTROL SYSTEMS

## 2. MODEL WITH PUSH BUTTON IGNITION SWITCH



(1) IG relay 1 (push button start)

(2) Stop light switch

(3) Battery

(4) Body integrated unit

(5) TCM (shift range information)

(6) Shift lock solenoid

(7) "P" range switch

(8) VDC CM (vehicle speed information)

## D: INSPECTION

### 1. SHIFT LOCK OPERATION

• Model without push button ignition switch

Step	Check	Yes	No
<b>1</b> <b>CHECK COMMUNICATION OF SUBARU SELECT MONITOR.</b> 1) Turn the ignition switch to ON. 2) Using the Subaru Select Monitor, check whether communication to all systems can be executed normally.	Is the system name displayed?	Go to step 2.	For diagnostic procedures, refer to the LAN section. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>
<b>2</b> <b>CHECK SHIFT LOCK.</b> 1) Turn the ignition switch to ON. 2) Shift the select lever to "P" range.	While brake pedal is not depressed, is it possible to move the select lever from the "P" range to other ranges?	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". <Ref. to CS-20, SELECT LEVER CANNOT BE LOCKED OR RELEASED, INSPECTION, AT Shift Lock Control System.>	Go to step 3.
<b>3</b> <b>CHECK SHIFT LOCK.</b>	While brake pedal is depressed, is it possible to move the select lever from the "P" range to other ranges?	Go to step 4.	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". <Ref. to CS-20, SELECT LEVER CANNOT BE LOCKED OR RELEASED, INSPECTION, AT Shift Lock Control System.>
<b>4</b> <b>CHECK SHIFT LOCK.</b> Shift the select lever to "N" range.	Is it possible to move the select lever from the "N" range to the "P" range?	Go to step 5.	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". <Ref. to CS-20, SELECT LEVER CANNOT BE LOCKED OR RELEASED, INSPECTION, AT Shift Lock Control System.>



# AT Shift Lock Control System

## CONTROL SYSTEMS

Step	Check	Yes	No
<b>5</b> <b>CHECK SHIFT LOCK.</b> 1) Shift the select lever to "N" range. 2) Turn the ignition switch to ACC.	While brake pedal is depressed, is it possible to move the select lever from the "N" range to the "P" range?	Go to step 6.	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". <Ref. to CS-20, SELECT LEVER CANNOT BE LOCKED OR RELEASED, INSPECTION, AT Shift Lock Control System.>
<b>6</b> <b>CHECK KEY INTERLOCK.</b> 1) Shift the select lever to other than "P" range. 2) Turn the ignition switch to OFF.	Can the ignition key be removed?	Perform the inspection of "KEY INTERLOCK CANNOT BE LOCKED OR RELEASED". <Ref. to CS-24, KEY INTERLOCK DOES NOT LOCK OR RELEASE, INSPECTION, AT Shift Lock Control System.>	Go to step 7.
<b>7</b> <b>CHECK KEY INTERLOCK.</b> Shift the select lever to "P" range.	Can the ignition key be removed?	AT shift lock system is normal.	Perform the inspection of "KEY INTERLOCK CANNOT BE LOCKED OR RELEASED". <Ref. to CS-24, KEY INTERLOCK DOES NOT LOCK OR RELEASE, INSPECTION, AT Shift Lock Control System.>

• **Model with push button ignition switch**

Step	Check	Yes	No
<b>1</b> <b>CHECK COMMUNICATION OF SUBARU SELECT MONITOR.</b> 1) Turn the ignition switch to ON. 2) Using the Subaru Select Monitor, check whether communication to all systems can be executed normally.	Is the system name displayed?	Go to step 2.	For diagnostic procedures, refer to the LAN section. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>

# AT Shift Lock Control System

Step	Check	Yes	No
<b>2</b> <b>CHECK SHIFT LOCK.</b> 1) Turn the ignition switch to ON. 2) Shift the select lever to "P" range.	While brake pedal is not depressed, is it possible to move the select lever from the "P" range to other ranges?	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". <Ref. to CS-20, SELECT LEVER CANNOT BE LOCKED OR RELEASED, INSPECTION, AT Shift Lock Control System.>	Go to step 3.
<b>3</b> <b>CHECK SHIFT LOCK.</b>	While brake pedal is depressed, is it possible to move the select lever from the "P" range to other ranges?	Go to step 4.	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". <Ref. to CS-20, SELECT LEVER CANNOT BE LOCKED OR RELEASED, INSPECTION, AT Shift Lock Control System.>
<b>4</b> <b>CHECK SHIFT LOCK.</b> Shift the select lever to "N" range.	Is it possible to move the select lever from the "N" range to the "P" range?	Go to step 5.	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". <Ref. to CS-20, SELECT LEVER CANNOT BE LOCKED OR RELEASED, INSPECTION, AT Shift Lock Control System.>
<b>5</b> <b>CHECK SHIFT LOCK.</b> 1) Shift the select lever to "N" range. 2) Turn the ignition switch to ACC.	While brake pedal is depressed, is it possible to move the select lever from the "N" range to the "P" range?	AT shift lock system is normal.	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". <Ref. to CS-20, SELECT LEVER CANNOT BE LOCKED OR RELEASED, INSPECTION, AT Shift Lock Control System.>

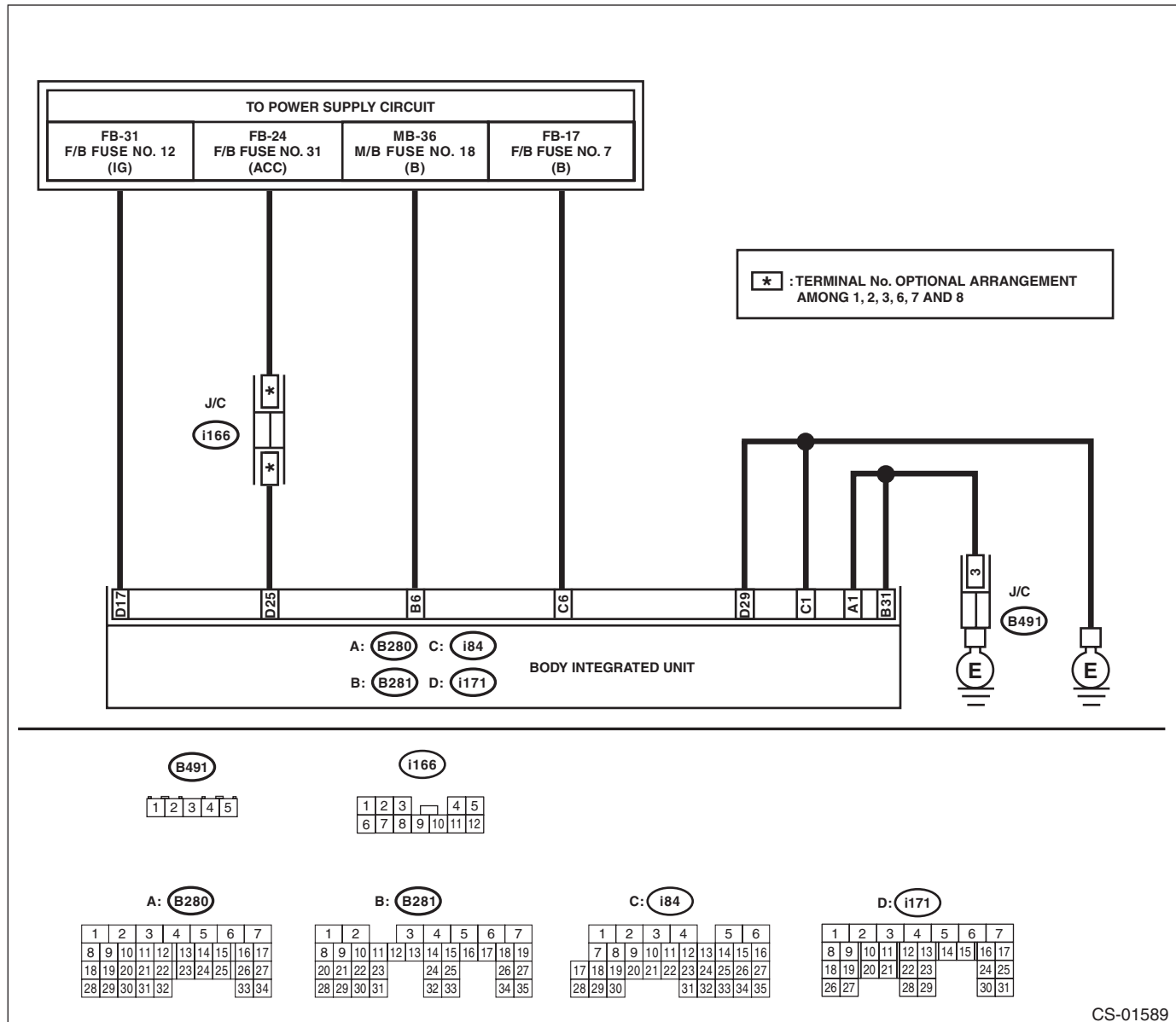
# AT Shift Lock Control System

## CONTROL SYSTEMS

### 2. BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT

NOTE:

For the DC power supply circuit, refer to "WIRING DIAGRAMS". <Ref. to WI-15, Power Supply Circuit.>



Step	Check	Yes	No
<b>1</b> <b>CHECK DTC OF BODY INTEGRATED UNIT.</b> Check DTC of body integrated unit.	Is the DTC of power line displayed on body integrated unit?	Repair or replace it according to the DTC.	Go to step 2.
<b>2</b> <b>CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND BATTERY.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between body integrated unit and chassis ground. <b>Connector &amp; terminal</b> <i>(i84) No. 6 (+) — Chassis ground (-):</i> <i>(i171) No. 17 (+) — Chassis ground (-):</i> <i>(i171) No. 25 (+) — Chassis ground (-):</i> <i>(B281) No. 6 (+) — Chassis ground (-):</i>	Is the voltage 9 — 16 V?	Go to step 3.	Check harness for open circuit between the body integrated unit and the battery or a blown fuse.

# AT Shift Lock Control System

CONTROL SYSTEMS

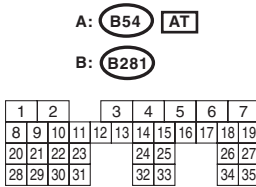
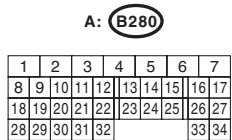
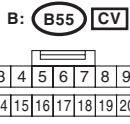
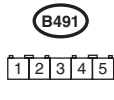
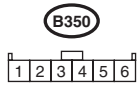
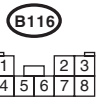
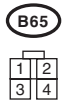
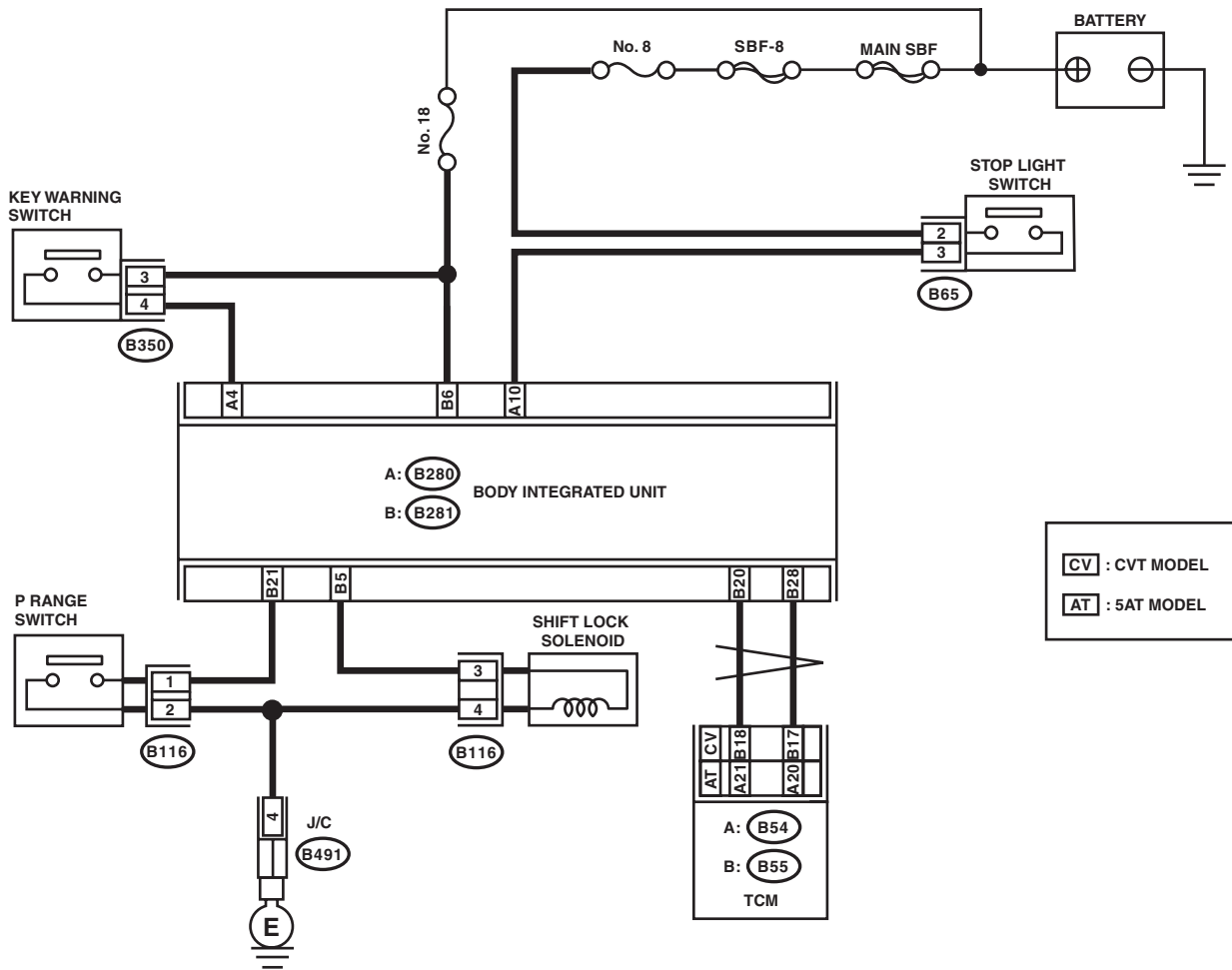
Step	Check	Yes	No
<b>3</b> <b>CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND CHASSIS GROUND.</b> 1) Turn the ignition switch to OFF. 2) Measure the harness resistance between the body integrated unit and chassis ground. <b>Connector &amp; terminal</b> <i>(B280) No. 1 — Chassis ground:</i> <i>(B281) No. 31 — Chassis ground:</i> <i>(i84) No. 1 — Chassis ground:</i> <i>(i171) No. 29 — Chassis ground:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness between the body integrated unit and chassis ground.
<b>4</b> <b>CHECK FOR POOR CONTACT.</b>	Is there poor contact of connector?	Repair the poor contact.	End.

# AT Shift Lock Control System

## CONTROL SYSTEMS

### 3. SELECT LEVER CANNOT BE LOCKED OR RELEASED

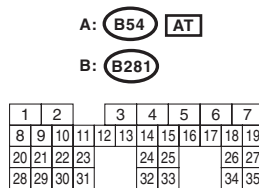
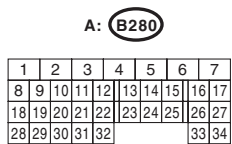
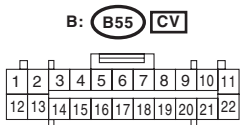
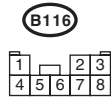
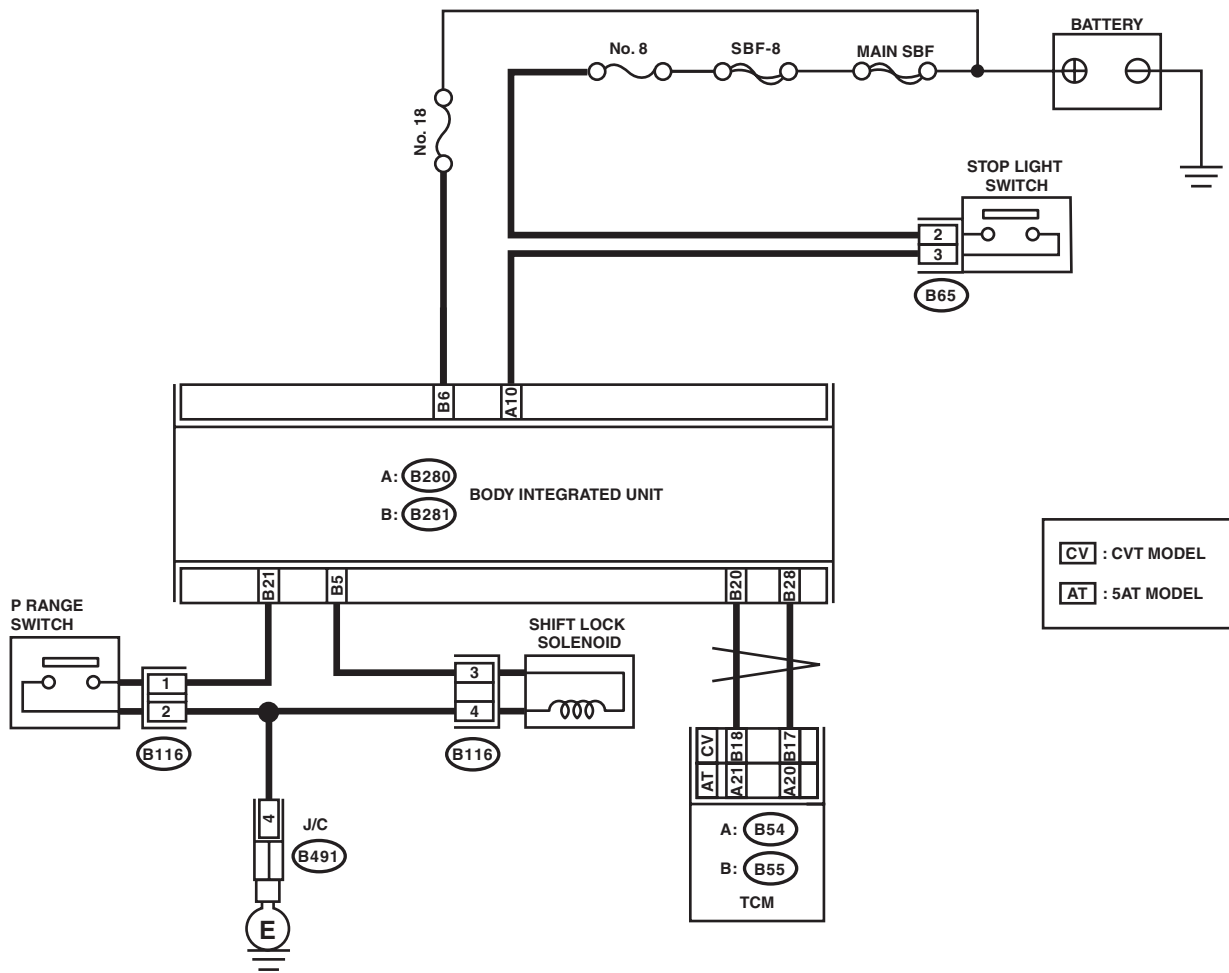
- Model without push button ignition switch



CS-01590

# AT Shift Lock Control System

• Model with push button ignition switch



# AT Shift Lock Control System

## CONTROL SYSTEMS

Step	Check	Yes	No
<b>1 CHECK BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT.</b> <Ref. to CS-18, BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT, INSPECTION, AT Shift Lock Control System.>	Is there any fault?	Follow the procedures to perform inspection and repair.	Go to step 2.
<b>2 CHECK CURRENT DATA.</b> 1) Connect the Subaru Select Monitor. 2) Shift the select lever to "P" range. 3) Turn the ignition switch to ON. 4) Select the current data display and display «P SW». <Ref. to BC(diag)-12, Read Current Data.>	Is the display "ON" in the P range and "OFF" in ranges other than P?	Go to step 3.	Go to step 8.
<b>3 CHECK CURRENT DATA.</b> Select the current data display and display «Stop Light Switch». <Ref. to BC(diag)-12, Read Current Data.>	Is "ON" displayed when the brake pedal is depressed and "OFF" displayed when the brake pedal is released?	Go to step 4.	Go to step 11.
<b>4 CHECK BODY INTEGRATED UNIT DTC.</b> Check the DTC of the body integrated unit when the brake pedal is pressed and when it is released. (Hold each condition for 5 seconds or more.)	Is there a DTC of a current malfunction?	Follow the DTC to perform inspection and repair.	Go to step 5.
<b>5 CHECK CURRENT DATA.</b> Select the current data display and display «Shift Lock Solenoid». <Ref. to BC(diag)-12, Read Current Data.>	Is "ON" displayed when the brake pedal is depressed and "OFF" displayed when the brake pedal is released?	Go to step 6.	Replace the body integrated unit. <Ref. to SL-84, Body Integrated Unit.>
<b>6 CHECK CURRENT DATA.</b> Select the current data display and display «Shift Position». <Ref. to BC(diag)-12, Read Current Data.>	Is the display "7" in the "P" range and other than "7" in ranges other than "P"?	Go to step 7.	Check the following items. <ul style="list-style-type: none"> <li>• Inhibitor switch</li> <li>• Harness between inhibitor switch and TCM</li> <li>• TCM input signal</li> <li>• TCM CAN communication</li> <li>• Body integrated unit CAN receive</li> </ul>
<b>7 CHECK CURRENT DATA.</b> 1) Select the current data display and display «Front Wheel Speed». 2) Start the engine. 3) Raise vehicle speed gradually up to approximately 20 km/h (12 miles).	Is a figure equivalent to the speedometer being indicated?	Go to step 12.	Check the following items. <ul style="list-style-type: none"> <li>• Vehicle speed sensor</li> <li>• VDC CM CAN communication</li> <li>• Body integrated unit CAN receive</li> </ul> Replace the vehicle speed sensor, VDC CM or body integrated unit, or both.

# AT Shift Lock Control System

CONTROL SYSTEMS

Step	Check	Yes	No
<b>8 CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND “P” RANGE SWITCH.</b> 1) Disconnect the connector from body integrated unit. 2) Disconnect the connector of “P” range switch. 3) Check for open circuit of harness, short circuit to battery or short circuit to ground between the body integrated unit and “P” range switch. <i><b>Connector &amp; terminal</b></i> <i><b>(B281) No. 21 — (B116) No. 1:</b></i>	Is there any fault in the harness?	Repair or replace the harness between the body integrated unit and the “P” range switch.	Go to step 9.
<b>9 CHECK HARNESS BETWEEN “P” RANGE SWITCH AND CHASSIS GROUND.</b> Measure the resistance of harness between “P” range switch and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B116) No. 2 — Chassis ground:</b></i>	Is it less than 10 Ω?	Go to step 10.	Repair the harness between the “P” range switch and chassis ground.
<b>10 CHECK “P” RANGE SWITCH.</b> Measure the resistance between “P” range switch connector terminals. <i><b>Terminals</b></i> <i><b>No. 2 — No. 1:</b></i>	Is it less than 10 Ω in the “P” range, and 1 MΩ or more in ranges other than “P”?	Replace the body integrated unit. <Ref. to SL-84, Body Integrated Unit.>	Replace the “P” range switch. <Ref. to CS-58, AT Shift Lock Solenoid and “P” Range Switch.>
<b>11 CHECK STOP LIGHT SWITCH INPUT SIGNAL.</b> 1) Disconnect the connector from body integrated unit. 2) Measure the voltage between the body integrated unit connector terminal and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B280) No. 10 (+) — Chassis ground (-):</b></i>	Is the voltage 9 — 16 V when the brake pedal is depressed, and less than 1.5 V when not pressed?	Replace the body integrated unit. <Ref. to SL-84, Body Integrated Unit.>	Check the stop light system.
<b>12 CHECK SOLENOID UNIT OPERATION.</b> Connect the battery to the solenoid unit connector terminal, and operate the solenoid unit. <i><b>Terminals</b></i> <i><b>No. 3 (+) — No. 4 (-):</b></i>	Does the solenoid unit operate normally?	Check the lock mechanism of the select lever body.	Replace the solenoid unit. <Ref. to CS-58, AT Shift Lock Solenoid and “P” Range Switch.>



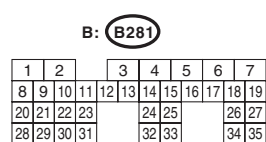
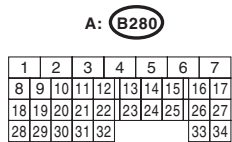
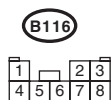
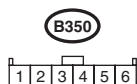
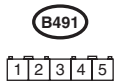
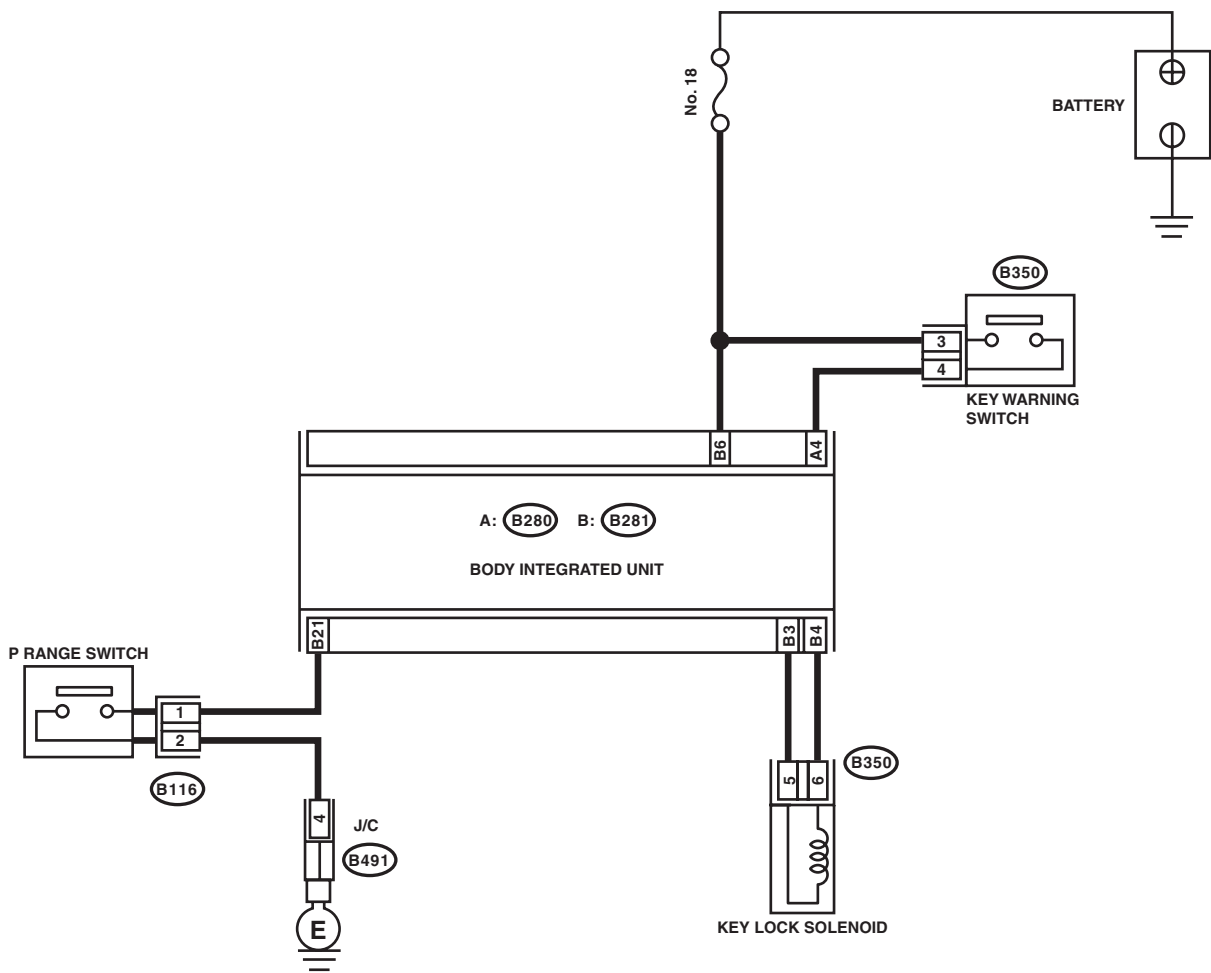
# AT Shift Lock Control System

CONTROL SYSTEMS

## 4. KEY INTERLOCK DOES NOT LOCK OR RELEASE

NOTE:

Check of this item only applies to models without a push button ignition switch.



CS-01592

# AT Shift Lock Control System

CONTROL SYSTEMS

Step	Check	Yes	No
<b>1</b> <b>CHECK BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT.</b> <Ref. to CS-18, BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT, INSPECTION, AT Shift Lock Control System.>	Is there any fault?	Follow the procedures to inspect and repair.	Go to step 2.
<b>2</b> <b>CHECK CURRENT DATA.</b> 1) Connect the Subaru Select Monitor. 2) Shift the select lever to "P" range. 3) Turn the ignition switch to ON. 4) Select the current data display and display «P SW». <Ref. to BC(diag)-12, Read Current Data.>	Is the display "ON" in the P range and "OFF" in ranges other than P?	Go to step 3.	Go to step 5.
<b>3</b> <b>CHECK CURRENT DATA.</b> 1) Select the current data display and display the «key-lock warning SW». <Ref. to BC(diag)-12, Read Current Data.> 2) Turn the ignition switch to OFF.	Does the display change from "ON" ←→ "OFF" when the key is inserted and removed?	Go to step 4.	Go to step 8.
<b>4</b> <b>CHECK CURRENT DATA.</b> 1) Turn the ignition switch to OFF. 2) Select the current data display and display «Key locking output». <Ref. to BC(diag)-12, Read Current Data.>	Is the display "Unlock" in the "P" range and "Lock" in ranges other than "P"?	Go to step 9.	Go to step 5.
<b>5</b> <b>CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND "P" RANGE SWITCH.</b> 1) Disconnect the connector from body integrated unit. 2) Disconnect the connector of "P" range switch. 3) Check for open circuit of harness, short circuit to battery or short circuit to ground between the body integrated unit and "P" range switch. <b>Connector &amp; terminal</b> <b>(B281) No. 21 — (B116) No. 1:</b>	Is there any fault in the harness?	Repair or replace the harness between the body integrated unit and the "P" range switch.	Go to step 6.
<b>6</b> <b>CHECK HARNESS BETWEEN "P" RANGE SWITCH AND CHASSIS GROUND.</b> Measure the resistance of harness between "P" range switch and chassis ground. <b>Connector &amp; terminal</b> <b>(B116) No. 2 — Chassis ground:</b>	Is it less than 10 Ω?	Go to step 7.	Repair the harness between the "P" range switch and chassis ground.
<b>7</b> <b>CHECK "P" RANGE SWITCH.</b> Measure the resistance between "P" range switch connector terminals. <b>Terminals</b> <b>No. 2 — No. 1:</b>	Is it less than 10 Ω in the "P" range, and 1 MΩ or more in ranges other than "P"?	Replace the body integrated unit. <Ref. to SL-84, Body Integrated Unit.>	Replace the "P" range switch. <Ref. to CS-58, AT Shift Lock Solenoid and "P" Range Switch.>
<b>8</b> <b>CHECK HARNESS BETWEEN BATTERY AND KEY WARNING SWITCH AND BODY INTEGRATED UNIT.</b> 1) Disconnect the connector from body integrated unit. 2) Measure the voltage between body integrated unit and chassis ground. <b>Connector &amp; terminal</b> <b>(B280) No. 4 (+) — Chassis ground (-):</b>	Is the display 9 — 16 V when the key is inserted, and less than 1.5 V with the key removed?	Replace the body integrated unit. <Ref. to SL-84, Body Integrated Unit.>	Check the following items. <ul style="list-style-type: none"> <li>• Key warning switch</li> <li>• Harness/fuse</li> <li>• Ignition circuit</li> </ul>

# AT Shift Lock Control System

## CONTROL SYSTEMS

Step	Check	Yes	No
<b>9</b> <b>CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND KEY LOCK SOLENOID.</b> 1) Disconnect the connector from body integrated unit. 2) Disconnect the connector of key lock solenoid. 3) Check for open circuit of harness, short circuit to battery or short circuit to ground between the body integrated unit and key lock solenoid. <b>Connector &amp; terminal</b> <b>(B281) No. 3 — (B350) No. 5:</b> <b>(B281) No. 4 — (B350) No. 6:</b>	Is there any fault in the harness?	Repair or replace the harness between the body integrated unit and the key lock solenoid.	Go to step 10.
<b>10</b> <b>CHECK KEY LOCK SOLENOID OPERATION.</b> Connect the battery to the key lock solenoid connector terminal, and operate the solenoid.	Does the key lock solenoid operate normally?	Go to step 11.	Replace the key lock solenoid.
<b>11</b> <b>CHECK OUTPUT OF BODY INTEGRATED UNIT.</b> 1) Connect all connectors. 2) Insert the key. 3) Shift the select lever to "P" range. 4) Turn the ignition switch to OFF. 5) Using an oscilloscope, measure the voltage between body integrated unit and chassis ground. <b>Connector &amp; terminal</b> <b>Lock</b> <b>(B281) No. 4 (+) — Chassis ground (-):</b> <b>Unlock</b> <b>(B281) No. 3 (+) — Chassis ground (-):</b>	Is the lock output voltage 7 — 14 V when the grip button of select lever is pressed? Is the unlock output voltage 7 — 14 V when the grip button of select lever is released? <Ref. to CS-11, ELECTRICAL SPECIFICATION, AT Shift Lock Control System.>	Check the lock mechanism of the steering lock body.	Replace the body integrated unit. <Ref. to SL-84, Body Integrated Unit.>