

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

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### 12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

#### **A: DTC 21 ABS WHEEL SPEED SENSOR MALFUNCTION FR SENSOR (BROKEN WIRE, INPUT VOLTAGE TOO HIGH)**

NOTE:

Refer to DTC 27 for diagnostic procedure. <Ref. to ABS(diag)-39, DTC 27 ABS WHEEL SPEED SENSOR MALFUNCTION RL SENSOR (BROKEN WIRE, INPUT VOLTAGE TOO HIGH), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

#### **B: DTC 23 ABS WHEEL SPEED SENSOR MALFUNCTION FL SENSOR (BROKEN WIRE, INPUT VOLTAGE TOO HIGH)**

NOTE:

Refer to DTC 27 for diagnostic procedure. <Ref. to ABS(diag)-39, DTC 27 ABS WHEEL SPEED SENSOR MALFUNCTION RL SENSOR (BROKEN WIRE, INPUT VOLTAGE TOO HIGH), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

#### **C: DTC 25 ABS WHEEL SPEED SENSOR MALFUNCTION RR SENSOR (BROKEN WIRE, INPUT VOLTAGE TOO HIGH)**

NOTE:

Refer to DTC 27 for diagnostic procedure. <Ref. to ABS(diag)-39, DTC 27 ABS WHEEL SPEED SENSOR MALFUNCTION RL SENSOR (BROKEN WIRE, INPUT VOLTAGE TOO HIGH), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## D: DTC 27 ABS WHEEL SPEED SENSOR MALFUNCTION RL SENSOR (BROKEN WIRE, INPUT VOLTAGE TOO HIGH)

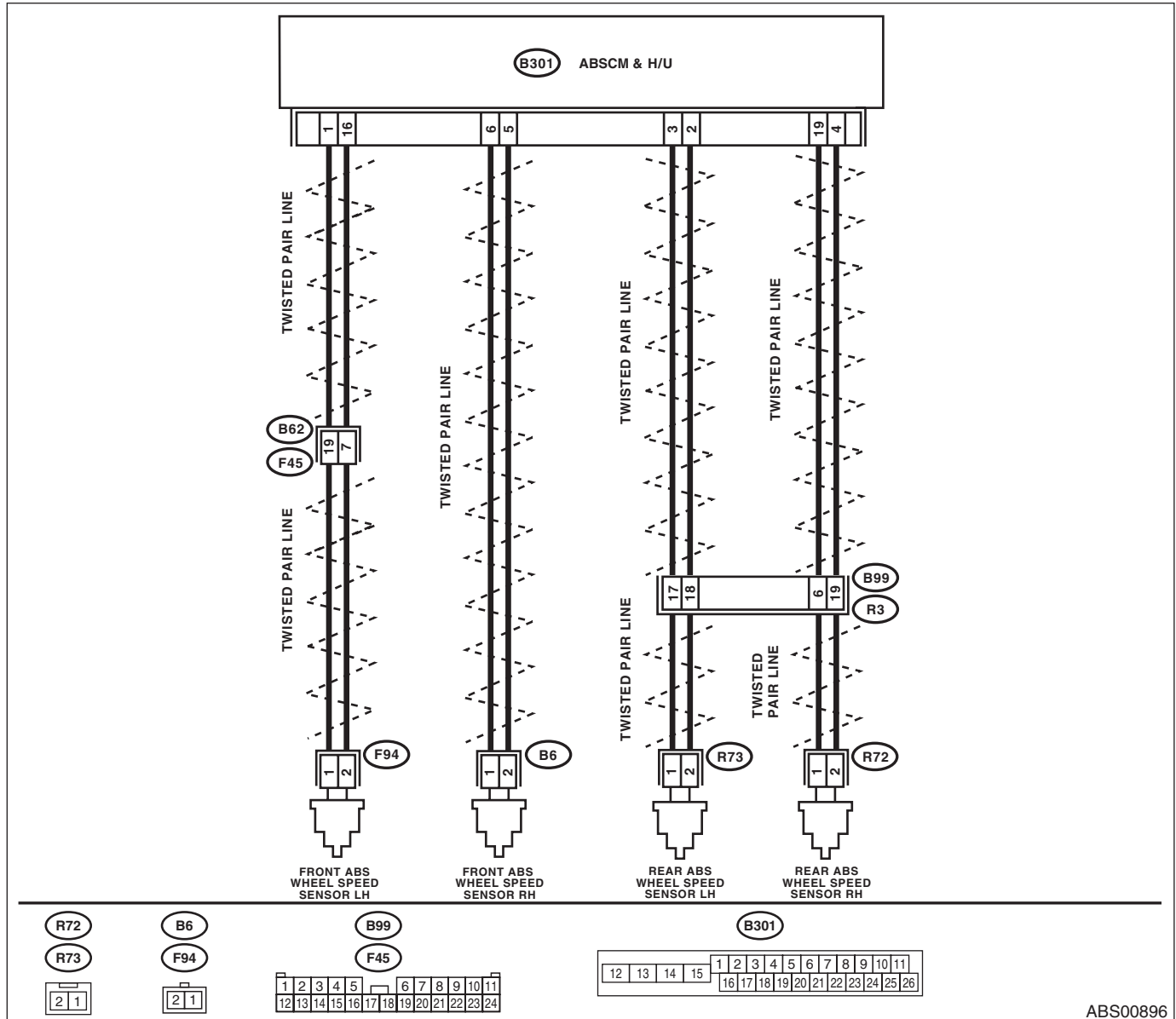
**DTC DETECTING CONDITION:**

- Defective ABS wheel speed sensor (broken wire, input voltage too high)
- Defective harness connector

**TROUBLE SYMPTOM:**

ABS does not operate.

**WIRING DIAGRAM:**



ABS00896

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK OUTPUT OF ABS WHEEL SPEED SENSOR USING SUBARU SELECT MONITOR.</b> 1) Select {Current Data Display & Save} in Subaru Select Monitor. 2) Read the ABS wheel speed sensor output corresponding to the faulty system in Subaru Select Monitor display mode.	Does the speed indicated on the display change in response to the speedometer reading during acceleration or deceleration when the steering wheel is in the straight-ahead position?	Go to step 2.	Go to step 8.
<b>2 CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.</b>	Is the ABS wheel speed sensor installation bolt tightened to 33 N·m (3.3 kgf·m, 24 ft·lb)?	Go to step 3.	Tighten the ABS wheel speed sensor installation bolts.
<b>3 CHECK ABS WHEEL SPEED SENSOR GAP.</b> Measure the gap between the ABS wheel speed sensor protrusion and tone wheel.	Is the gap within the following? Front wheel: 0.3 — 0.8 mm (0.012 — 0.031 in); Rear wheel: 0.7 — 1.2 mm (0.028 — 0.047 in)	Go to step 4.	Adjust the gap. NOTE: Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace the worn sensor or worn tone wheel.
<b>4 CHECK TONE WHEEL RUNOUT.</b> Measure the tone wheel runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 5.	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
<b>5 CHECK POOR CONTACT OF CONNECTOR.</b> Turn the ignition switch to OFF.	Is there poor contact in connectors between ABSCM&H/U and ABS wheel speed sensor?	Repair the connector.	Go to step 6.
<b>6 CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC still output?	Replace the ABSCM only. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 7.
<b>7 CHECK OTHER DTC DETECTION.</b>	Is there any other DTC detected?	Perform the diagnosis according to DTC.	Temporary poor contact occurs. NOTE: Check the harness and connector between ABSCM&H/U and ABS wheel speed sensor.
<b>8 CHECK ABS WHEEL SPEED SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ABS wheel speed sensor. 3) Measure the resistance of ABS wheel speed sensor terminals while shaking the harness lightly. <b>Terminals</b> <b>Front RH No. 1 — No. 2:</b> <b>Front LH No. 1 — No. 2:</b> <b>Rear RH No. 1 — No. 2:</b> <b>Rear LH No. 1 — No. 2:</b>	Is the resistance within the following? Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step 9.	Replace the ABS wheel speed sensor. Front: <Ref. to ABS-14, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-17, Rear ABS Wheel Speed Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>9</b>      <b>CHECK BATTERY SHORT OF ABS WHEEL SPEED SENSOR.</b>                      1) Disconnect the ABSCM&amp;H/U connectors.                      2) Measure the voltage between ABS wheel speed sensor and chassis ground.  <b>Terminals</b>  <i>Front RH No. 1 (+) — Chassis ground (-):</i>  <i>Front LH No. 1 (+) — Chassis ground (-):</i>  <i>Rear RH No. 1 (+) — Chassis ground (-):</i>  <i>Rear LH No. 1 (+) — Chassis ground (-):</i></p>	Is the voltage less than 1 V?	Go to step 10.	Replace the ABS wheel speed sensor. Front: <Ref. to ABS-14, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-17, Rear ABS Wheel Speed Sensor.>
<p><b>10</b>     <b>CHECK BATTERY SHORT OF ABS WHEEL SPEED SENSOR.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between ABS wheel speed sensor and chassis ground.  <b>Terminals</b>  <i>Front RH No. 1 (+) — Chassis ground (-):</i>  <i>Front LH No. 1 (+) — Chassis ground (-):</i>  <i>Rear RH No. 1 (+) — Chassis ground (-):</i>  <i>Rear LH No. 1 (+) — Chassis ground (-):</i></p>	Is the voltage less than 1 V?	Go to step 11.	Replace the ABS wheel speed sensor. Front: <Ref. to ABS-14, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-17, Rear ABS Wheel Speed Sensor.>
<p><b>11</b>     <b>CHECK HARNESS CONNECTOR BETWEEN ABSCM&amp;H/U AND ABS WHEEL SPEED SENSOR.</b>                      1) Turn the ignition switch to OFF.                      2) Connect the connector to the ABS wheel speed sensor.                      3) Measure the resistance between ABSCU&amp;H/U connector terminals.  <b>Connector &amp; terminal</b>  <i>DTC 21; (B301) No. 6 — No. 5:</i>  <i>DTC 23; (B301) No. 1 — No. 16:</i>  <i>DTC 25; (B301) No. 19 — No. 4:</i>  <i>DTC 27; (B301) No. 3 — No. 2:</i></p>	Is the resistance within the following? Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step 12.	Repair the harness connector between ABSCM&H/U and ABS wheel speed sensor.
<p><b>12</b>     <b>CHECK BATTERY SHORT OF HARNESS.</b>                      Measure the voltage between ABSCM&amp;H/U connector and chassis ground.  <b>Connector &amp; terminal</b>  <i>DTC 21; (B301) No. 6 (+) — Chassis ground (-):</i>  <i>DTC 23; (B301) No. 1 (+) — Chassis ground (-):</i>  <i>DTC 25; (B301) No. 19 (+) — Chassis ground (-):</i>  <i>DTC 27; (B301) No. 3 (+) — Chassis ground (-):</i></p>	Is the voltage less than 1 V?	Go to step 13.	Repair the harness between ABSCM&H/U and ABS wheel speed sensor.
<p><b>13</b>     <b>CHECK BATTERY SHORT OF HARNESS.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between ABSCM&amp;H/U connector and chassis ground.  <b>Connector &amp; terminal</b>  <i>DTC 21; (B301) No. 6 (+) — Chassis ground (-):</i>  <i>DTC 23; (B301) No. 1 (+) — Chassis ground (-):</i>  <i>DTC 25; (B301) No. 19 (+) — Chassis ground (-):</i>  <i>DTC 27; (B301) No. 3 (+) — Chassis ground (-):</i></p>	Is the voltage less than 1 V?	Go to step 14.	Repair the harness between ABSCM&H/U and ABS wheel speed sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>14</b>	<b>CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.</b>	Go to step 15.	Tighten the ABS wheel speed sensor installation bolts.
<b>15</b>	<b>CHECK ABS WHEEL SPEED SENSOR GAP.</b> Measure the gap between the ABS wheel speed sensor protrusion and tone wheel.	Go to step 16.	Adjust the gap. <b>NOTE:</b> Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace the worn sensor or worn tone wheel.
<b>16</b>	<b>CHECK TONE WHEEL RUNOUT.</b> Measure the tone wheel runout.	Go to step 17.	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
<b>17</b>	<b>CHECK GROUND SHORT OF ABS WHEEL SPEED SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the resistance between ABS wheel speed sensor and chassis ground. <b>Terminals</b> <b>Front RH No. 1 — Chassis ground:</b> <b>Front LH No. 1 — Chassis ground:</b> <b>Rear RH No. 1 — Chassis ground:</b> <b>Rear LH No. 1 — Chassis ground:</b>	Go to step 18.	Replace the ABSCM&H/U and ABS wheel speed sensor. Front: <Ref. to ABS-14, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-17, Rear ABS Wheel Speed Sensor.> and <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
<b>18</b>	<b>CHECK GROUND SHORT OF HARNESS.</b> 1) Turn the ignition switch to OFF. 2) Connect the connector to the ABS wheel speed sensor. 3) Measure the resistance between ABSCM&H/U connectors and chassis ground. <b>Connector &amp; terminal</b> <b>DTC 21; (B301) No. 6 — Chassis ground:</b> <b>DTC 23; (B301) No. 1 — Chassis ground:</b> <b>DTC 25; (B301) No. 19 — Chassis ground:</b> <b>DTC 27; (B301) No. 3 — Chassis ground:</b>	Go to step 19.	Repair the harness between ABSCM&H/U and ABS wheel speed sensor. Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
<b>19</b>	<b>CHECK POOR CONTACT OF CONNECTOR.</b>	Repair the connector.	Go to step 20.
<b>20</b>	<b>CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Replace the ABSCM only.	Go to step 21.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
21 <b>CHECK OTHER DTC DETECTION.</b>	Is there any other DTC detected?	Perform the diagnosis according to DTC.	Temporary poor contact occurs. NOTE: Check the harness and connector between ABSCM&H/U and ABS wheel speed sensor.

## **E: DTC 22 FRONT ABS WHEEL SPEED SENSOR RH MALFUNCTION (ABS WHEEL SPEED SENSOR ABNORMAL SIGNAL)**

**NOTE:**

Refer to DTC 28 for diagnostic procedure. <Ref. to ABS(diag)-44, DTC 28 REAR ABS WHEEL SPEED SENSOR LH MALFUNCTION (ABS WHEEL SPEED SENSOR ABNORMAL SIGNAL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **F: DTC 24 FRONT ABS WHEEL SPEED SENSOR LH MALFUNCTION (ABS WHEEL SPEED SENSOR ABNORMAL SIGNAL)**

**NOTE:**

Refer to DTC 28 for diagnostic procedure. <Ref. to ABS(diag)-44, DTC 28 REAR ABS WHEEL SPEED SENSOR LH MALFUNCTION (ABS WHEEL SPEED SENSOR ABNORMAL SIGNAL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **G: DTC 26 REAR ABS WHEEL SPEED SENSOR RH MALFUNCTION (ABS WHEEL SPEED SENSOR ABNORMAL SIGNAL)**

**NOTE:**

Refer to DTC 28 for diagnostic procedure. <Ref. to ABS(diag)-44, DTC 28 REAR ABS WHEEL SPEED SENSOR LH MALFUNCTION (ABS WHEEL SPEED SENSOR ABNORMAL SIGNAL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

## H: DTC 28 REAR ABS WHEEL SPEED SENSOR LH MALFUNCTION (ABS WHEEL SPEED SENSOR ABNORMAL SIGNAL)

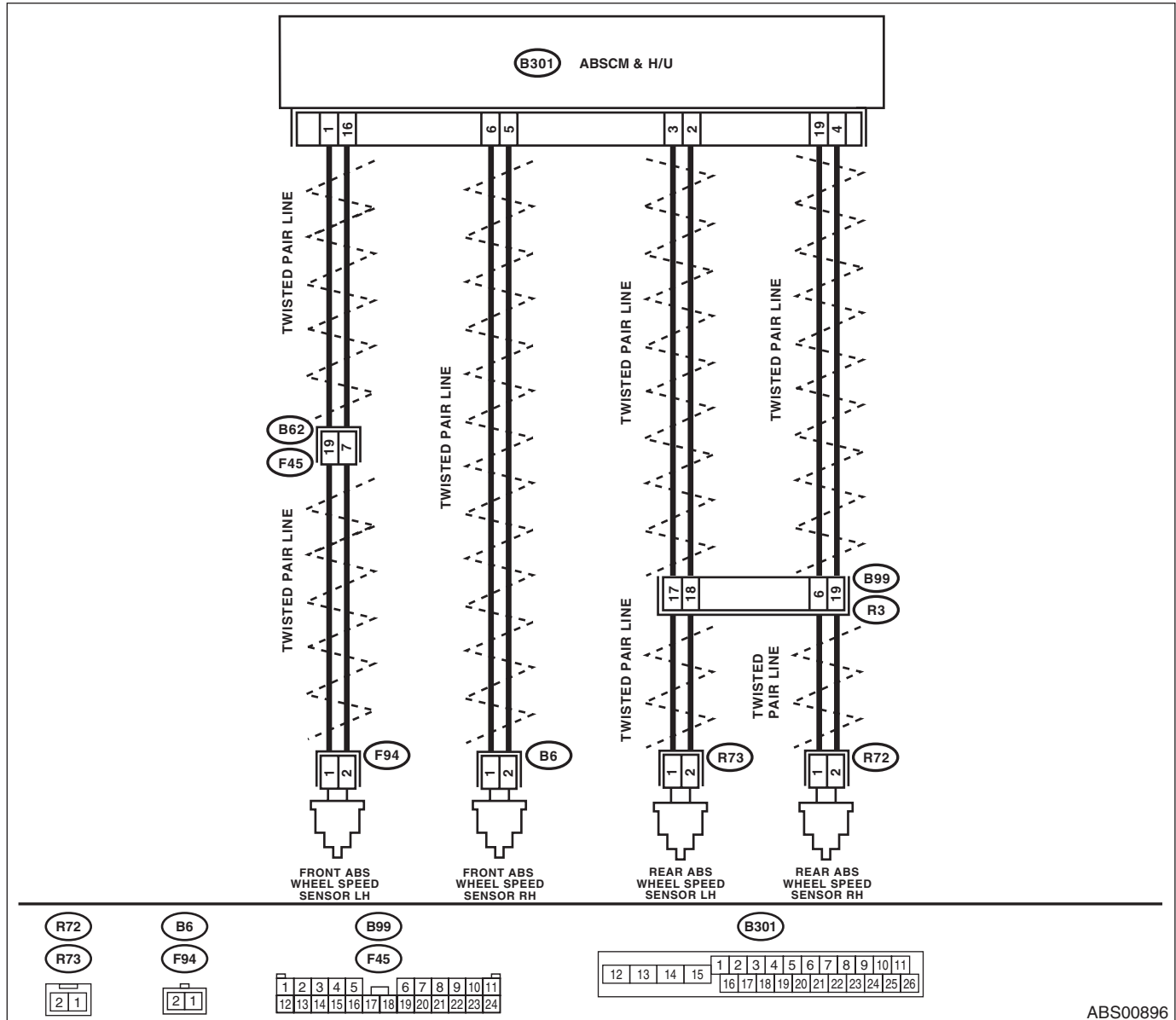
### DTC DETECTING CONDITION:

- Defective ABS wheel speed sensor signal (noise, abnormal signal, etc.)
- Defective harness connector

### TROUBLE SYMPTOM:

ABS does not operate.

### WIRING DIAGRAM:



ABS00896

Step	Check	Yes	No	
1	<p><b>CHECK OUTPUT OF ABS WHEEL SPEED SENSOR USING SUBARU SELECT MONITOR.</b></p> <p>1) Select {Current Data Display &amp; Save} in Subaru Select Monitor.</p> <p>2) Read the ABS wheel speed sensor output corresponding to the faulty system in Subaru Select Monitor display mode.</p>	Does the speed indicated on the display change in response to the speedometer reading during acceleration or deceleration when the steering wheel is in the straight-ahead position?	Go to step 2.	Go to step 7.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>2</b>	<b>CHECK POOR CONTACT OF CONNECTOR.</b> Turn the ignition switch to OFF.	Is there poor contact in connectors between ABSCM&H/U and ABS wheel speed sensor?	Repair the connector. Go to step 3.
<b>3</b>	<b>CHECK CAUSE OF SIGNAL NOISE.</b>	Is the car telephone or the radio properly installed?	Go to step 4. Install the car phone or radio properly.
<b>4</b>	<b>CHECK CAUSE OF SIGNAL NOISE.</b>	Is there a noise source (such as an antenna) installed near the sensor harness?	Install the noise source apart from the sensor harness. Go to step 5.
<b>5</b>	<b>CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC still output?	Replace the ABSCM only. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> Go to step 6.
<b>6</b>	<b>CHECK OTHER DTC DETECTION.</b>	Is there any other DTC detected?	Perform the diagnosis according to DTC. It results from a temporary noise interference.
<b>7</b>	<b>CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.</b>	Is the ABS wheel speed sensor installation bolt tightened to 33 N·m (3.3 kgf·m, 24 ft·lb)?	Go to step 8. Tighten the ABS wheel speed sensor installation bolts.
<b>8</b>	<b>CHECK ABS WHEEL SPEED SENSOR GAP.</b> Measure the gap between the ABS wheel speed sensor protrusion and tone wheel.	Is the gap within the following? Front wheel: 0.3 — 0.8 mm (0.012 — 0.031 in) Rear wheel: 0.7 — 1.2 mm (0.028 — 0.047 in)	Go to step 9. Adjust the gap. NOTE: Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace the worn sensor or worn tone wheel.
<b>9</b>	<b>PREPARE OSCILLOSCOPE.</b>	Is an oscilloscope available?	Go to step 10. Go to step 11.
<b>10</b>	<b>CHECK ABS WHEEL SPEED SENSOR SIGNAL.</b> 1) Lift-up the vehicle. 2) Turn the ignition switch to OFF. 3) Connect the oscilloscope to the connector. 4) Turn the ignition switch to ON. 5) Start the wheel, and measure the voltage at the specified frequency. <Ref. to ABS(diag)-12, ELECTRICAL SPECIFICATION, Control Module I/O Signal.> NOTE: When this inspection is completed, ABSCM&H/U may record DTC 29 or DTC 56. <b>Connector &amp; terminal</b> <b>DTC 22; (B6) No. 1 (+) — No. 2 (-):</b> <b>DTC 24; (F94) No. 1 (+) — No. 2 (-):</b> <b>DTC 26; (B99) No. 6 (+) — No. 19 (-):</b> <b>DTC 28; (B99) No. 18 (+) — No. 17 (-):</b>	Is the oscilloscope pattern the same voltage as shown in the table? <Ref. to ABS(diag)-12, ELECTRICAL SPECIFICATION, Control Module I/O Signal.>	Go to step 14. Go to step 11.
<b>11</b>	<b>CHECK CONTAMINATION OF ABS WHEEL SPEED SENSOR OR TONE WHEEL.</b> Remove the disc rotor or drum from the hub according to the DTC.	Is the ABS wheel speed sensor piece or the tone wheel contaminated by dirt or other foreign matter?	Thoroughly remove dirt or other foreign matter. Go to step 12.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>12</b> <b>CHECK DAMAGE OF ABS WHEEL SPEED SENSOR OR TONE WHEEL.</b>	Is there damage in the protrusion of the ABS wheel speed sensor or the tone wheel?	Go to step 13.	Replace the ABS wheel speed sensor or tone wheel. Front: <Ref. to ABS-14, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-17, Rear ABS Wheel Speed Sensor.> and front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
<b>13</b> <b>CHECK TONE WHEEL RUNOUT.</b> Measure the tone wheel runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 14.	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
<b>14</b> <b>CHECK RESISTANCE OF THE ABS WHEEL SPEED SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ABS wheel speed sensor. 3) Measure the resistance of the ABS wheel speed sensor connector terminals by shaking the harness lightly. <b>Connector &amp; terminal</b> <b>Front RH No. 1 — No. 2:</b> <b>Front LH No. 1 — No. 2:</b> <b>Rear RH No. 1 — No. 2:</b> <b>Rear LH No. 1 — No. 2:</b>	Is the resistance within the following? Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step 15.	Replace the ABS wheel speed sensor. Front: <Ref. to ABS-14, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-17, Rear ABS Wheel Speed Sensor.>
<b>15</b> <b>CHECK GROUND SHORT OF ABS WHEEL SPEED SENSOR.</b> Measure the resistance between ABS wheel speed sensor and chassis ground. <b>Connector &amp; terminal</b> <b>Front RH No. 1 — Chassis ground:</b> <b>Front LH No. 1 — Chassis ground:</b> <b>Rear RH No. 1 — Chassis ground:</b> <b>Rear LH No. 1 — Chassis ground:</b>	Is the resistance 1 MΩ or more?	Go to step 16.	Replace the ABS wheel speed sensor. Front: <Ref. to ABS-14, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-17, Rear ABS Wheel Speed Sensor.>
<b>16</b> <b>CHECK HARNESS CONNECTOR BETWEEN ABSCM&amp;H/U AND ABS WHEEL SPEED SENSOR.</b> 1) Connect the connector to the ABS wheel speed sensor. 2) Disconnect the ABSCM&H/U connectors. 3) Measure the resistance between ABSCM&H/U connector terminals. <b>Connector &amp; terminal</b> <b>DTC 22; (B301) No. 6 — No. 5:</b> <b>DTC 24; (B301) No. 1 — No. 16:</b> <b>DTC 26; (B301) No. 19 — No. 4:</b> <b>DTC 28; (B301) No. 3 — No. 2:</b>	Is the resistance within the following? Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step 17.	Repair the harness connector between ABSCM&H/U and ABS wheel speed sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>17 CHECK GROUND SHORT OF HARNESS.</b> Measure the resistance between the ABSCM&H/U connector and chassis ground. <i>Connector &amp; terminal</i> <i>DTC 22; (B301) No. 6 — Chassis ground:</i> <i>DTC 24; (B301) No. 1 — Chassis ground:</i> <i>DTC 26; (B301) No. 19 — Chassis ground:</i> <i>DTC 28; (B301) No. 3 — Chassis ground:</i>	Is the resistance 1 M $\Omega$ or more?	Go to step 18.	Repair the harness connector between ABSCM&H/U and ABS wheel speed sensor.
<b>18 CHECK THE ABSCM&amp;H/U GROUND CIRCUIT.</b> Measure the resistance between the ABSCM&H/U and chassis ground. <i>Connector &amp; terminal</i> <i>(B301) No. 15 — Chassis ground:</i>	Is the resistance less than 0.5 $\Omega$ ?	Go to step 19.	Repair the ABSCM&H/U ground harness.
<b>19 CHECK POOR CONTACT OF CONNECTOR.</b>	Is there poor contact in connectors between ABSCM&H/U and ABS wheel speed sensor?	Repair the connector.	Go to step 20.
<b>20 CHECK CAUSE OF SIGNAL NOISE.</b>	Is the car telephone or the radio properly installed?	Go to step 21.	Install the car phone or radio properly.
<b>21 CHECK CAUSE OF SIGNAL NOISE.</b>	Is there a noise source (such as an antenna) installed near the sensor harness?	Install the noise source apart from the sensor harness.	Go to step 22.
<b>22 CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC still output?	Replace the ABSCM only. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 23.
<b>23 CHECK OTHER DTC DETECTION.</b>	Is there any other DTC detected?	Perform the diagnosis according to DTC.	It results from a temporary noise interference.  NOTE: Though the ABS warning light remains on at this time, this is normal. Drive the vehicle at more than 12 km/h (7.46 MPH) in order to turn ABS warning light off. Be sure to drive the vehicle and check that the warning light goes off.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

## I: DTC 29 ABS WHEEL SPEED SENSOR SIGNAL MALFUNCTION IN ONE OF FOUR WHEELS

### DTC DETECTING CONDITION:

- Defective ABS wheel speed sensor signal (noise, abnormal signal, etc.)
- Defective magnetic encoder
- When a wheel is turned freely for a long time

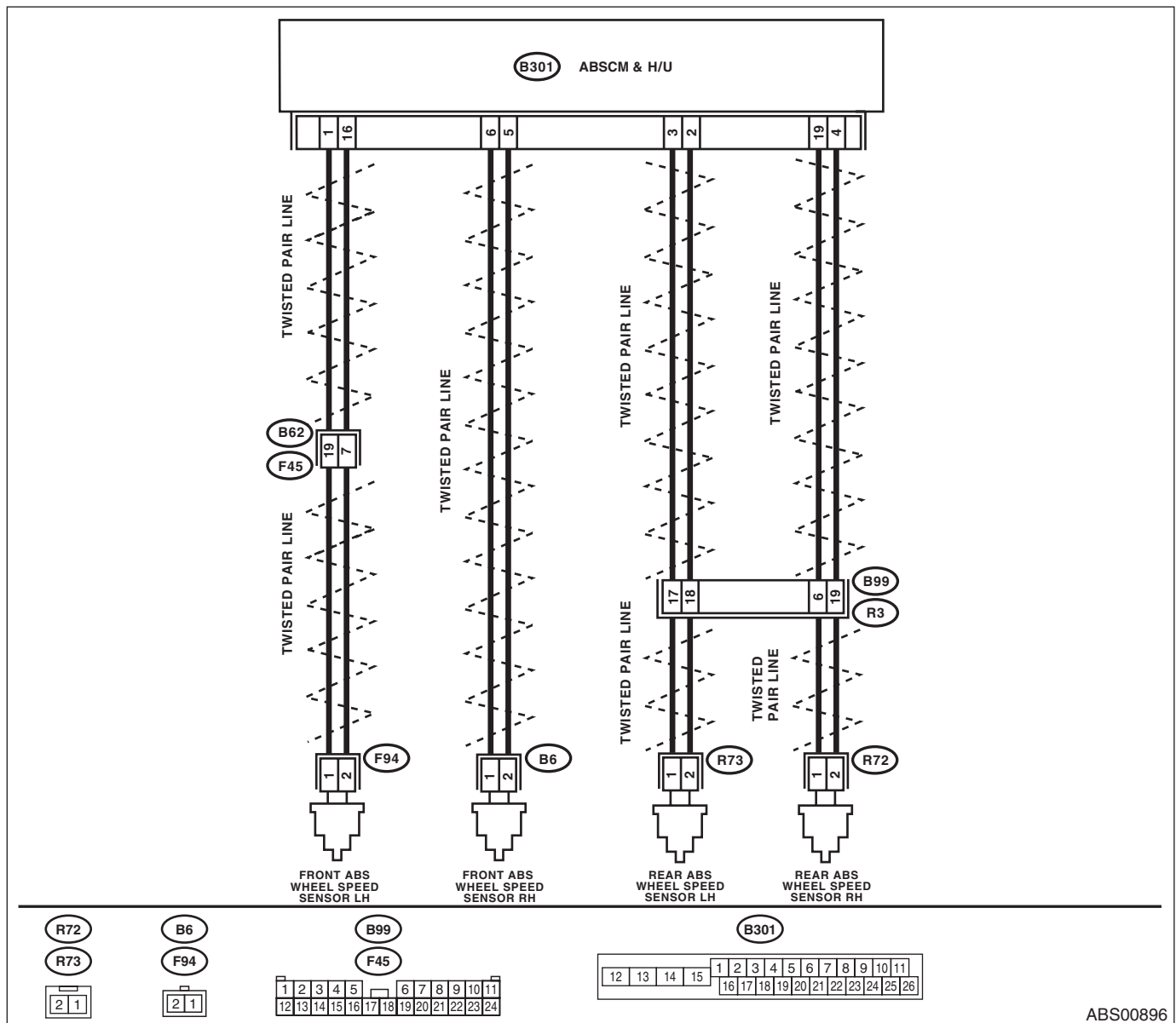
### TROUBLE SYMPTOM:

- ABS does not operate.
- EBD does not operate.

### NOTE:

Brake warning light comes on as well as the ABS warning light.

### WIRING DIAGRAM:



ABS00896

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

	Step	Check	Yes	No
1	<b>WHETHER A WHEEL TURNED FREELY OR NOT.</b>	Did the wheels turn freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when the wheels are not in contact with road surface?	ABS is normal. Erase the memory. NOTE: This diagnostic trouble code may sometimes occur if the wheels turn freely for a long time, for example when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way.	Go to step 2.
2	<b>CHECK TIRE SPECIFICATIONS.</b> Turn the ignition switch to OFF.	Are the tire specifications correct?	Go to step 3.	Replace the tire.
3	<b>CHECK WEAR OF TIRE.</b>	Is the tire worn excessively?	Replace the tire.	Go to step 4.
4	<b>CHECK TIRE PRESSURE.</b>	Is the tire pressure correct?	Go to step 5.	Adjust the tire pressure.
5	<b>CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.</b>	Is the ABS wheel speed sensor installation bolt tightened to 33 N·m (3.3 kgf-m, 24 ft-lb)?	Go to step 6.	Tighten the ABS wheel speed sensor installation bolts.
6	<b>CHECK ABS WHEEL SPEED SENSOR GAP.</b> Measure the gap between the ABS wheel speed sensor protrusion and tone wheel.	Is the gap within the following? Front wheel: 0.3 — 0.8 mm (0.012 — 0.031 in); Rear wheel: 0.7 — 1.2 mm (0.028 — 0.047 in)	Go to step 7.	Adjust the gap. NOTE: Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace the worn sensor or worn tone wheel.
7	<b>PREPARE OSCILLOSCOPE.</b>	Is an oscilloscope available?	Go to step 8.	Go to step 9.
8	<b>CHECK ABS WHEEL SPEED SENSOR SIGNAL.</b> 1) Lift-up the vehicle. 2) Turn the ignition switch to OFF. 3) Connect the oscilloscope according to the DTC. 4) Turn the ignition switch to ON. 5) Start the wheel, and measure the voltage at the specified frequency. <Ref. to ABS(diag)-12, ELECTRICAL SPECIFICATION, Control Module I/O Signal.> NOTE: When this inspection is completed, ABSCM&H/U may record DTC 29. <b>Connector &amp; terminal</b> <b>Front RH (B6) No. 1 (+) — No. 2 (-):</b> <b>Front LH (F94) No. 1 (+) — No. 2 (-):</b> <b>Rear RH (B99) No. 6 (+) — No. 19 (-):</b> <b>Rear LH (B99) No. 17 (+) — No. 18 (-):</b>	Is the oscilloscope pattern the same voltage as shown in the table? <Ref. to ABS(diag)-12, ELECTRICAL SPECIFICATION, Control Module I/O Signal.>	Go to step 12.	Go to step 9.
9	<b>CHECK CONTAMINATION OF ABS WHEEL SPEED SENSOR OR TONE WHEEL.</b> Remove the disc rotor or drum from the hub.	Is the ABS wheel speed sensor piece or the tone wheel contaminated by dirt or other foreign matter?	Thoroughly remove dirt or other foreign matter.	Go to step 10.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>10</b> <b>CHECK DAMAGE OF ABS WHEEL SPEED SENSOR OR TONE WHEEL.</b>	Are there cracked or damaged teeth in the protrusion of the ABS wheel speed sensor or the tone wheel?	Replace the ABS wheel speed sensor or tone wheel. Front: <Ref. to ABS-14, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-17, Rear ABS Wheel Speed Sensor.> and front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>	Go to step 11.
<b>11</b> <b>CHECK TONE WHEEL RUNOUT.</b> Measure the tone wheel runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 12.	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
<b>12</b> <b>CHECK ABSCM&amp;H/U.</b> 1) Turn the ignition switch to OFF. 2) Connect all the connectors. 3) Erase the memory. 4) Perform the Inspection Mode. 5) Read the DTC.	Is the same DTC still output?	Replace the ABSCM only. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 13.
<b>13</b> <b>CHECK OTHER DTC DETECTION.</b>	Is there any other DTC detected?	Perform the diagnosis according to DTC.	Temporary poor contact occurs.

## **J: DTC 31 FRONT INLET SOLENOID VALVE RH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)**

**NOTE:**

Refer to DTC 38 for diagnostic procedure. <Ref. to ABS(diag)-52, DTC 38 REAR OUTLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **K: DTC 32 FRONT OUTLET SOLENOID VALVE RH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)**

**NOTE:**

Refer to DTC 38 for diagnostic procedure. <Ref. to ABS(diag)-52, DTC 38 REAR OUTLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **L: DTC 33 FRONT INLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)**

**NOTE:**

Refer to DTC 38 for diagnostic procedure. <Ref. to ABS(diag)-52, DTC 38 REAR OUTLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **M: DTC 34 FRONT OUTLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)**

**NOTE:**

Refer to DTC 38 for diagnostic procedure. <Ref. to ABS(diag)-52, DTC 38 REAR OUTLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **N: DTC 35 REAR INLET SOLENOID VALVE RH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)**

**NOTE:**

Refer to DTC 38 for diagnostic procedure. <Ref. to ABS(diag)-52, DTC 38 REAR OUTLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **O: DTC 36 REAR OUTLET SOLENOID VALVE RH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)**

**NOTE:**

Refer to DTC 38 for diagnostic procedure. <Ref. to ABS(diag)-52, DTC 38 REAR OUTLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **P: DTC 37 REAR INLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)**

**NOTE:**

Refer to DTC 38 for diagnostic procedure. <Ref. to ABS(diag)-52, DTC 38 REAR OUTLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

## Q: DTC 38 REAR OUTLET SOLENOID VALVE LH MALFUNCTION IN ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)

### DTC DETECTING CONDITION:

- Defective harness connector
- Defective inlet solenoid valve or outlet solenoid valve in ABSCM&H/U

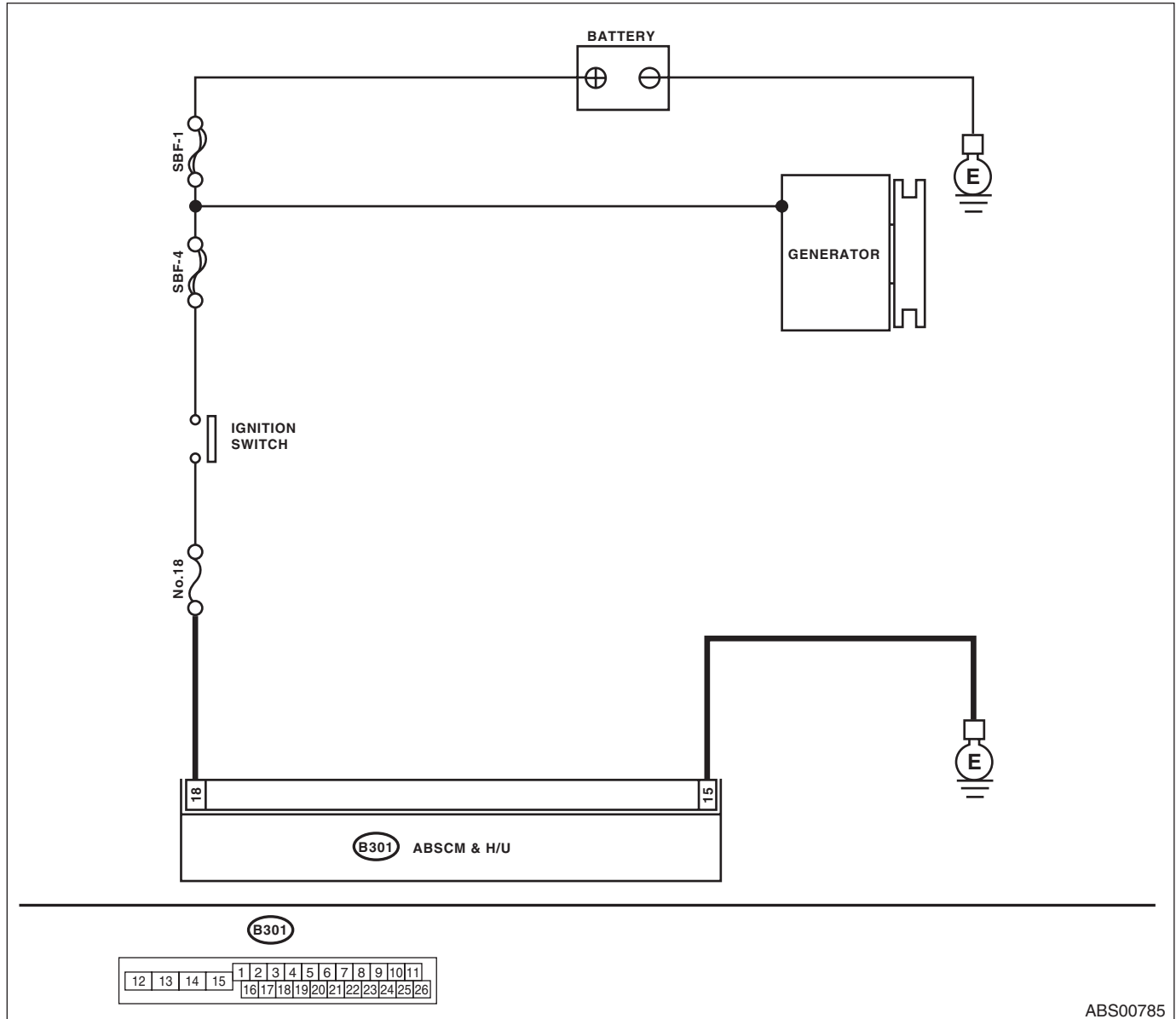
### TROUBLE SYMPTOM:

- ABS does not operate.
- EBD does not operate.

### NOTE:

Brake warning light comes on as well as the ABS warning light.

### WIRING DIAGRAM:



ABS00785

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK INPUT VOLTAGE OF ABSCM&amp;H/U.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the ABSCM&H/U connectors. 3) Run the engine at idle. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B301) No. 18 (+) — Chassis ground (-):</b></i>	Is the voltage 10 — 15 V?	Go to step 2.	Repair the ABSCM&H/U power circuit.
<b>2 CHECK THE ABSCM&amp;H/U GROUND CIRCUIT.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between the ABSCM&H/U connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B301) No. 15 — Chassis ground:</b></i>	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair the ABSCM&H/U ground harness.
<b>3 CHECK POOR CONTACT OF CONNECTOR.</b>	Is there poor contact in connector between generator, battery and ABSCM&H/U?	Repair the connector.	Go to step 4.
<b>4 CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC displayed?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 5.
<b>5 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is there any other DTC displayed?	Check DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to ABS(diag)-35, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

## R: DTC 41 ABS CONTROL MODULE MALFUNCTION

### DTC DETECTING CONDITION:

Defective ABSCM&H/U

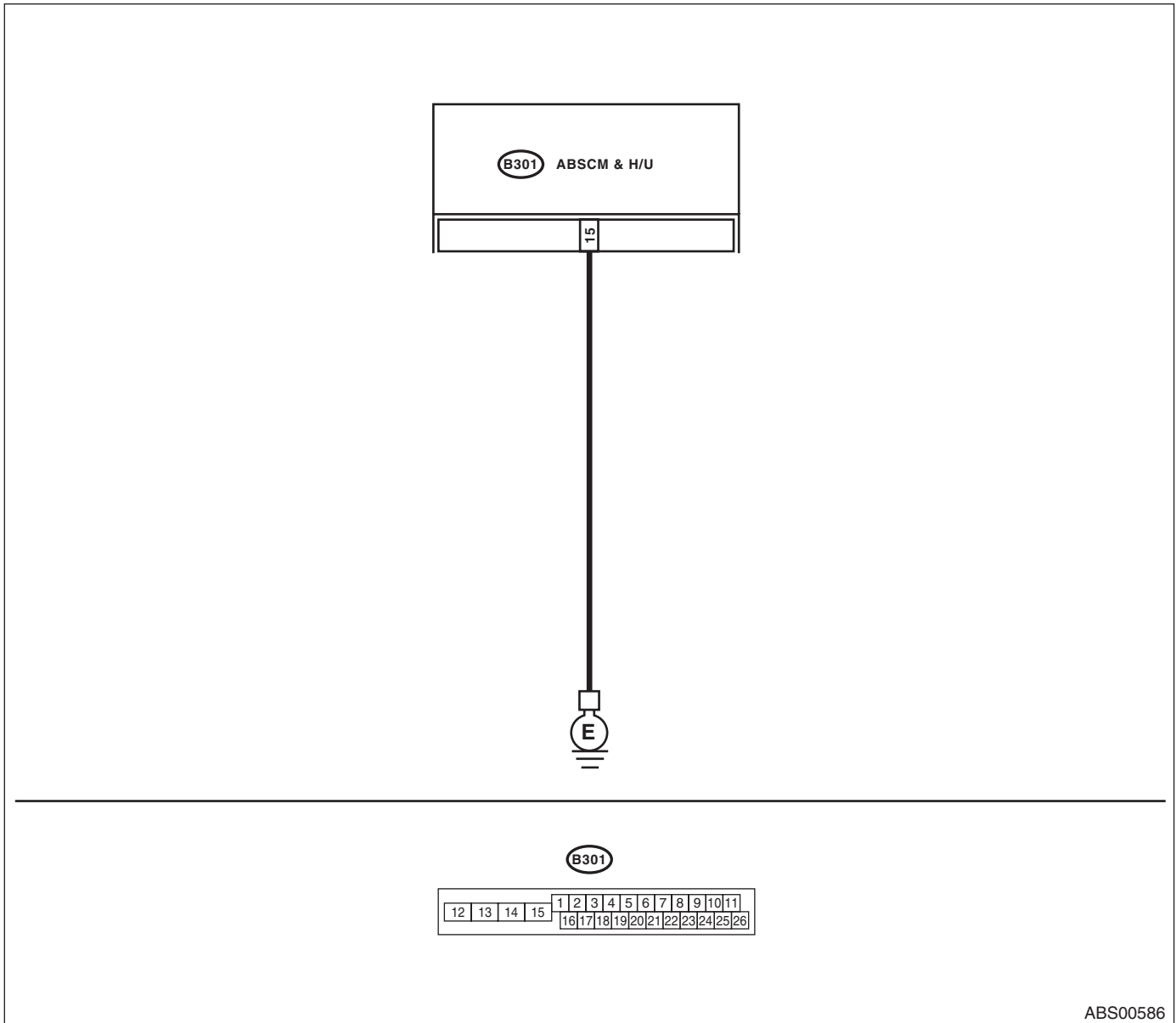
### TROUBLE SYMPTOM:

- ABS does not operate.
- EBD does not operate.

### NOTE:

Brake warning light comes on as well as the ABS warning light.

### WIRING DIAGRAM:



ABS00586

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK THE ABSCM&amp;H/U GROUND CIRCUIT.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the ABSCM&H/U connectors. 3) Measure the resistance between the ABSCM&H/U and chassis ground. <b>Connector &amp; terminal</b> <b>(B301) No. 15 — Chassis ground:</b>	Is the resistance less than 0.5 $\Omega$ ?	Go to step 2.	Repair the ABSCM&H/U ground harness.
<b>2</b> <b>CHECK POOR CONTACT OF CONNECTOR.</b>	Is there poor contact of the connector between the battery, ignition switch and ABSCM&H/U?	Repair the connector.	Go to step 3.
<b>3</b> <b>CHECK CAUSE OF SIGNAL NOISE.</b>	Is the car telephone or the radio properly installed?	Go to step 4.	Properly install the car telephone or the wireless transmitter.
<b>4</b> <b>CHECK CAUSE OF SIGNAL NOISE.</b>	Is there a noise source (such as an antenna) installed near the sensor harness?	Install the noise source apart from the sensor harness.	Go to step 5.
<b>5</b> <b>CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC displayed?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 6.
<b>6</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is there any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to ABS(diag)-35, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

## S: DTC 42 POWER VOLTAGE MALFUNCTION

### DTC DETECTING CONDITION:

Power supply voltage of the ABSCM&H/U is too low or too high.

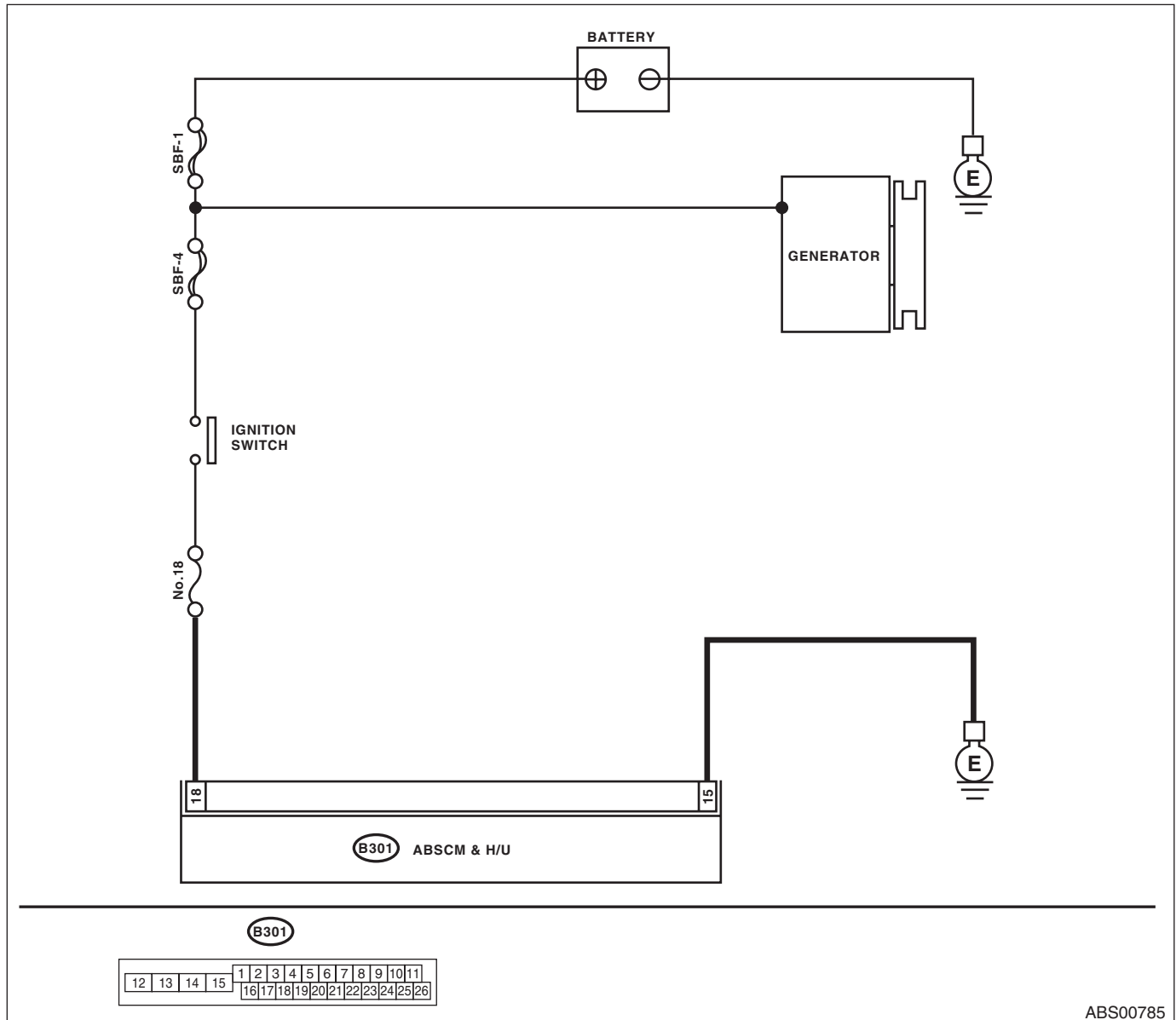
### TROUBLE SYMPTOM:

- ABS does not operate.
- EBD may not operate.

### NOTE:

If EBD does not operate, the brake warning light illuminates in addition to ABS warning light. Both warning lights go off if voltage returns.

### WIRING DIAGRAM:



ABS00785

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK GENERATOR.</b> 1) Start the engine. 2) Run the engine at idle after warming up. 3) Measure the voltage between generator terminal B and chassis ground. <b>Terminals</b> <b>Generator B terminal (+) — Chassis ground (-):</b>	Is the voltage 10 — 15 V?	Go to step 2.	Repair the generator.
<b>2 CHECK BATTERY TERMINAL.</b> Turn the ignition switch to OFF.	Are the positive and negative battery terminals tightened securely?	Go to step 3.	Tighten the terminal.
<b>3 CHECK INPUT VOLTAGE OF ABSCM&amp;H/U.</b> 1) Disconnect the ABSCM&H/U connectors. 2) Run the engine at idle. 3) Operate devices such as headlights, air conditioner, defogger, etc. which produce an electrical load. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B301) No. 18 (+) — Chassis ground (-):</b>	Is the voltage 10 — 15 V?	Go to step 4.	Repair the ABSCM&H/U power circuit.
<b>4 CHECK THE ABSCM&amp;H/U GROUND CIRCUIT.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between the ABSCM&H/U connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B301) No. 15 — Chassis ground:</b>	Is the resistance less than 0.5 $\Omega$ ?	Go to step 5.	Repair the ABSCM&H/U ground harness.
<b>5 CHECK POOR CONTACT OF CONNECTOR.</b>	Is there poor contact in connector between generator, battery and ABSCM&H/U?	Repair the connector.	Go to step 6.
<b>6 CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC displayed?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 7.
<b>7 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is there any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to ABS(diag)-35, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

## T: DTC 47 IMPROPER CAN COMMUNICATION

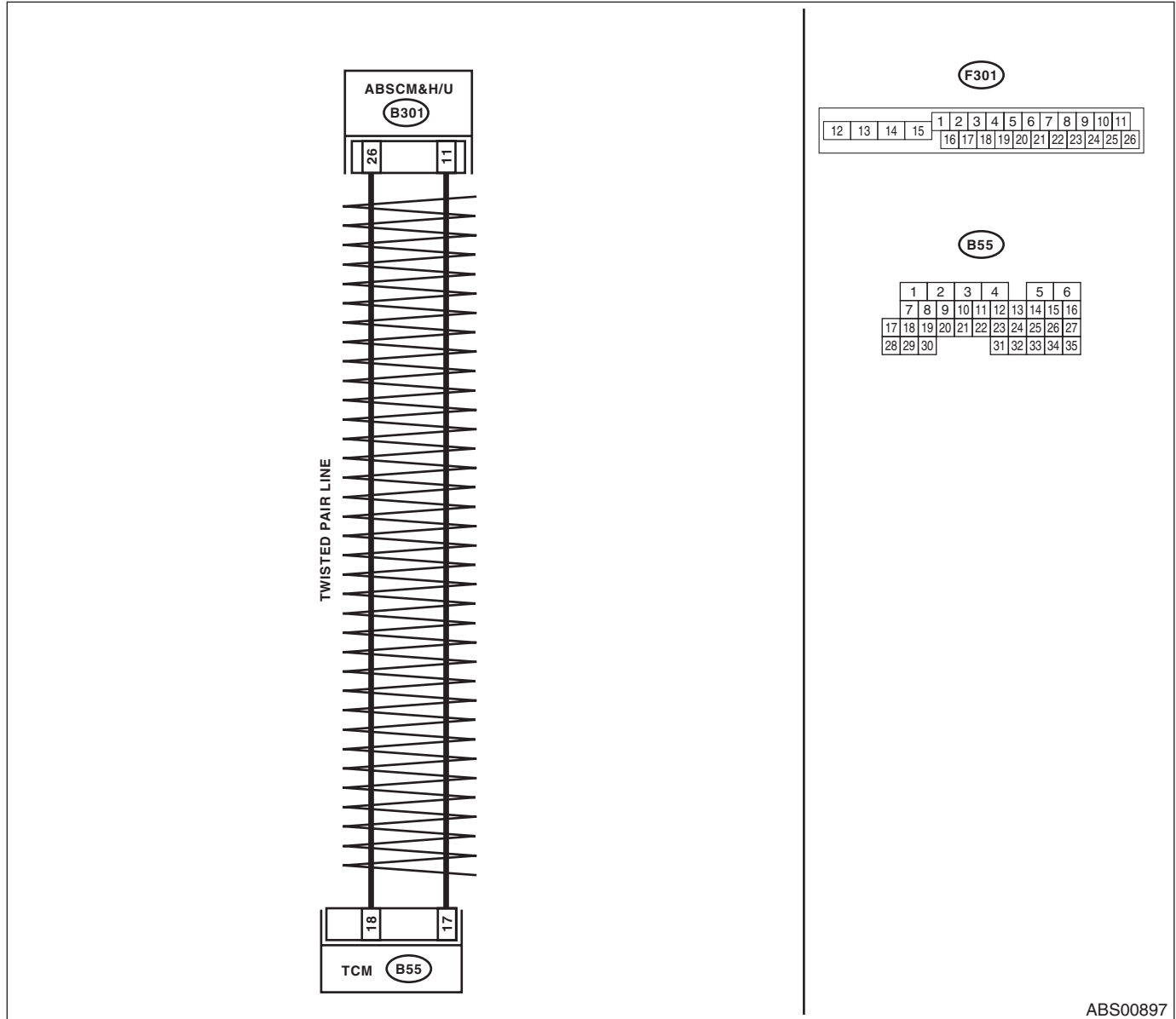
### DTC DETECTING CONDITION:

CAN communication line is damaged or circuit is shorted.

### TROUBLE SYMPTOM:

Tight corner braking phenomenon occurs.

### WIRING DIAGRAM:



ABS00897

Step	Check	Yes	No
<b>1 CHECK HARNESS CONNECTOR BETWEEN ABSCM&amp;H/U AND TCM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U and TCM. 3) Measure the resistance of the harness connector between ABSCM&H/U and TCM. <b>Connector &amp; terminal</b> (B301) No. 26 — (B55) No. 18: (B301) No. 11 — (B55) No. 17:	Is the resistance less than 0.5 Ω?	Go to step 2.	Repair or replace the harness connector between ABSCM&H/U and TCM.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>2 CHECK GROUND SHORT OF HARNESS CONNECTOR BETWEEN ABSCM&amp;H/U AND TCM.</b></p> <p>1) Measure the resistance between the ABSCM&amp;H/U connector and chassis ground.  <b>Connector &amp; terminal</b>  <b>(B301) No. 26 — Chassis ground:</b>  <b>(B301) No. 11 — Chassis ground:</b></p>	Is the resistance 1 M $\Omega$ or more?	Go to step 3.	Repair or replace the harness connector between ABSCM&H/U and TCM.
<p><b>3 CHECK BATTERY SHORT OF HARNESS CONNECTOR BETWEEN ABSCM&amp;H/U AND TCM.</b></p> <p>1) Turn the ignition switch to ON.                  2) Measure the voltage between ABSCM&amp;H/U connector and chassis ground.  <b>Connector &amp; terminal</b>  <b>(B301) No. 26 (+) — Chassis ground (-):</b>  <b>(B301) No. 11 (+) — Chassis ground (-):</b></p>	Is the voltage less than 1.0 V?	Go to step 4.	Repair or replace the harness connector between ABSCM&H/U and TCM.
<p><b>4 CHECK ABSCM&amp;H/U.</b></p> <p>1) Turn the ignition switch to OFF.                  2) Connect the connector to ABSCM&amp;H/U.                  3) Measure the resistance between TCM connector terminals.  <b>Connector &amp; terminal</b>  <b>(B55) No. 17 — (B55) No. 18:</b></p>	Is the resistance 120 $\pm$ 6 $\Omega$ ?	Go to step 6.	Go to step 5.
<p><b>5 CHECK POOR CONTACT OF ABSCM&amp;H/U.</b></p>	Is there poor contact?	Repair the poor contact of ABSCM&H/U connector.	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
<p><b>6 CHECK TCM.</b></p> <p>1) Connect the connector to TCM.                  2) Disconnect the ABSCM&amp;H/U connectors.                  3) Measure the resistance between the ABSCM&amp;H/U connector terminals.  <b>Connector &amp; terminal</b>  <b>(B301) No. 11 — (B301) No. 26:</b></p>	Is the resistance 120 $\pm$ 6 $\Omega$ ?	Go to step 8.	Go to step 7.
<p><b>7 CHECK POOR CONTACT OF TCM CONNECTORS.</b></p>	Is there poor contact?	Repair the poor contact of TCM connector.	Replace the TCM. <Ref. to 4AT-61, Transmission Control Module (TCM).>
<p><b>8 CHECK DTC DETECTION.</b></p>	Is DTC 47 output?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 9.
<p><b>9 CHECK IF DTC P1718 FOR TCM SYSTEM IS OUTPUT.</b></p>	Is DTC P1718 output?	Replace the TCM. <Ref. to 4AT-61, REMOVAL, Transmission Control Module (TCM).>	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

## U: DTC 51 VALVE RELAY MALFUNCTION

### DTC DETECTING CONDITION:

Defective valve relay

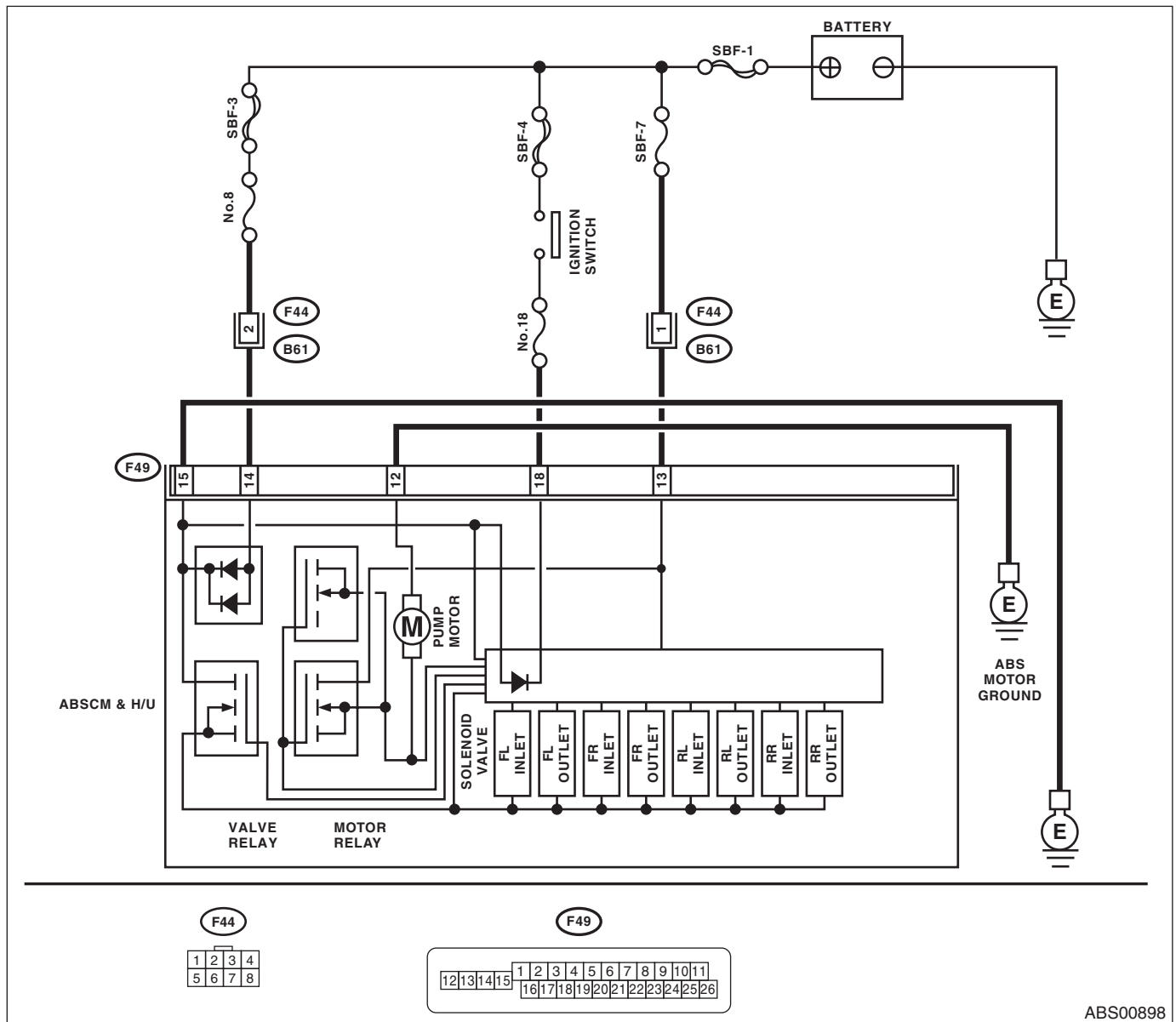
### TROUBLE SYMPTOM:

- ABS does not operate.
- EBD does not operate depending on the trouble contents.

### NOTE:

Brake warning light comes on as well as ABS warning light when EBD does not operate.

### WIRING DIAGRAM:



ABS00898

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK INPUT VOLTAGE OF ABSCM&amp;H/U.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the ABSCM&H/U connectors. 3) Run the engine at idle. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B301) No. 18 (+) — Chassis ground (-):</b></i> <i><b>(B301) No. 14 (+) — Chassis ground (-):</b></i>	Is the voltage 10 — 15 V?	Go to step 2.	Repair the harness connector between battery and ABSCM&H/U.
<b>2 CHECK THE ABSCM&amp;H/U GROUND CIRCUIT.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between the ABSCM&H/U connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B301) No. 15 — Chassis ground:</b></i>	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair the ABSCM&H/U ground harness.
<b>3 CHECK VALVE RELAY IN ABSCM&amp;H/U.</b> Measure the resistance between the ABSCM&H/U terminals. <i><b>Terminals</b></i> <i><b>No. 14 — No. 15:</b></i>	Is the resistance 1 MΩ or more?	Go to step 4.	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
<b>4 CHECK POOR CONTACT OF CONNECTOR.</b>	Is there poor contact in connector between generator, battery and ABSCM&H/U?	Repair the connector.	Go to step 5.
<b>5 CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC displayed?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 6.
<b>6 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is there any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to ABS(diag)-35, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

## V: DTC 52 MOTOR/MOTOR RELAY MALFUNCTION

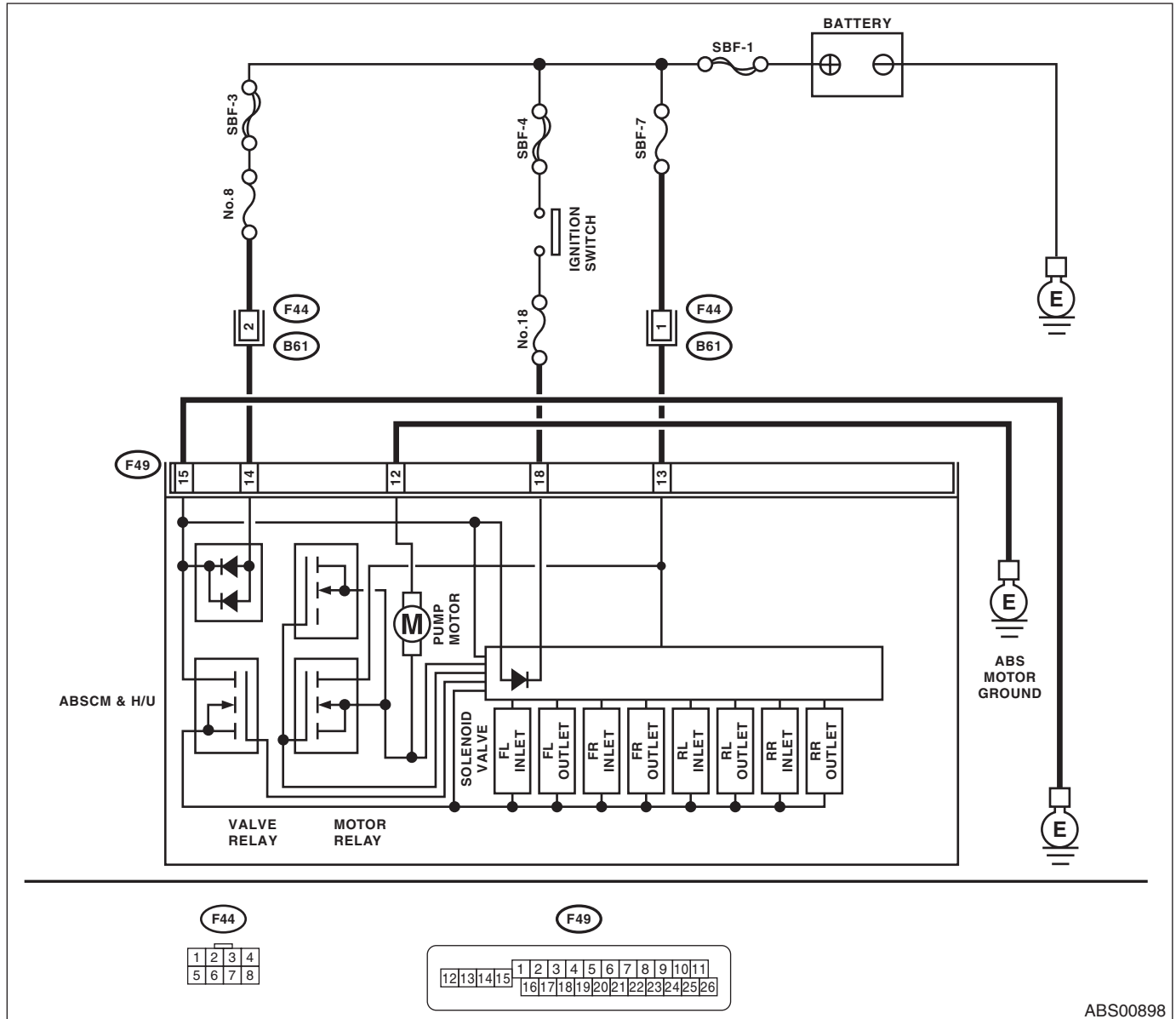
### DTC DETECTING CONDITION:

- Defective motor
- Defective motor relay
- Defective harness connector

### TROUBLE SYMPTOM:

ABS does not operate.

### WIRING DIAGRAM:



ABS00898

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK FOR LOOSENED GROUND BOLT.</b> Check for looseness in the ABSCM&H/U motor ground bolt (B302).	Is ground bolt loosened?	Tighten the bolt to 13 N·m (1.3 kgf-m, 9.4 ft-lb) torque.	Go to step 2.
<b>2 CHECK INPUT VOLTAGE OF ABSCM&amp;H/U.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the ABSCM&H/U connectors. 3) Turn the ignition switch to ON. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B301) No. 13 (+) — Chassis ground (-):</i>	Is the voltage 10 — 15 V?	Go to step 3.	Repair the harness connector between battery and ABSCM&H/U.
<b>3 CHECK GROUND CIRCUIT OF MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between the ABSCM&H/U connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B301) No. 12 — Chassis ground:</i>	Is the resistance less than 0.5 Ω?	Go to step 4.	Repair the ABSCM&H/U ground harness.
<b>4 CHECK INPUT VOLTAGE OF ABSCM&amp;H/U.</b> 1) Run the engine at idle. 2) Measure the voltage between ABSCM&H/U connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B301) No. 18 (+) — Chassis ground (-):</i>	Is the voltage 10 — 15 V?	Go to step 5.	Repair the harness connector between battery, ignition switch and ABSCM&H/U.
<b>5 CHECK THE ABSCM&amp;H/U GROUND CIRCUIT.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between the ABSCM&H/U connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B301) No. 15 — Chassis ground:</i>	Is the resistance less than 0.5 Ω?	Go to step 6.	Repair the ABSCM&H/U ground harness.
<b>6 CHECK POOR CONTACT OF CONNECTOR.</b> Turn the ignition switch to OFF.	Is there poor contact in connector between generator, battery and ABSCM&H/U?	Repair the connector.	Go to step 7.
<b>7 CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC displayed?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 8.
<b>8 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is there any other DTC displayed?	Check DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to ABS(diag)-35, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs. NOTE: Though the ABS warning light remains on at this time, this is normal. Drive the vehicle at more than 12 km/h (7 MPH) in order to turn ABS warning light off. Be sure to drive the vehicle and check that the warning light goes off.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

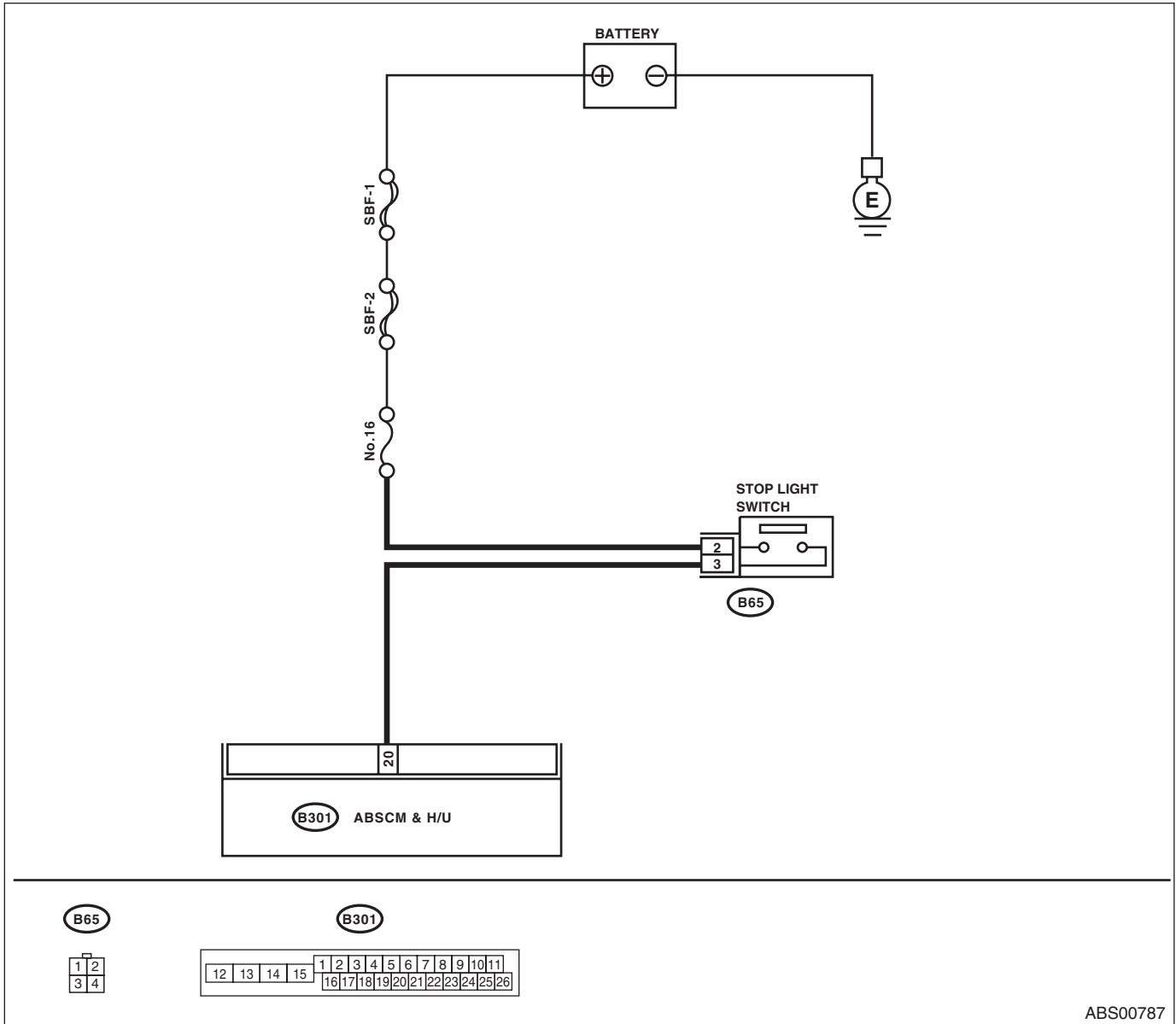
ABS (DIAGNOSTICS)

## W: DTC 54 FAULTY STOP LIGHT SWITCH

### DTC DETECTING CONDITION:

Defective stop light switch

### WIRING DIAGRAM:



ABS00787

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK OUTPUT OF STOP LIGHT SWITCH USING SUBARU SELECT MONITOR.</b> 1) Select {Current Data Display & Save} in Subaru Select Monitor. 2) Release the brake pedal. 3) Read the stop light switch signal in Subaru Select Monitor.	Is "OFF" displayed on the screen?	Go to step 2.	Go to step 3.
<b>2 CHECK OUTPUT OF STOP LIGHT SWITCH USING SUBARU SELECT MONITOR.</b> 1) Depress the brake pedal. 2) Read the stop light switch output in Subaru Select Monitor.	Is "ON" displayed on the screen?	Go to step 5.	Go to step 3.
<b>3 CHECK IF STOP LIGHTS COME ON.</b> Depress the brake pedal.	Does the stop light illuminate?	Go to step 4.	Repair the stop light circuit.
<b>4 CHECK OPEN CIRCUIT IN HARNESS.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the ABSCM&H/U connectors. 3) Depress the brake pedal. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. <i>Connector &amp; terminal (B301) No. 20 (+) — Chassis ground (-):</i>	Is the voltage 10 — 15 V?	Go to step 5.	Repair the harness between stop light switch and ABSCM&H/U connector.
<b>5 CHECK POOR CONTACT OF CONNECTOR.</b>	Is there poor contact in the connector between stop light switch and ABSCM&H/U?	Go to step 6.	Repair the connector.
<b>6 CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC displayed?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 7.
<b>7 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is there any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to ABS(diag)-35, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

## X: DTC 56 G SENSOR OUTPUT VOLTAGE MALFUNCTION

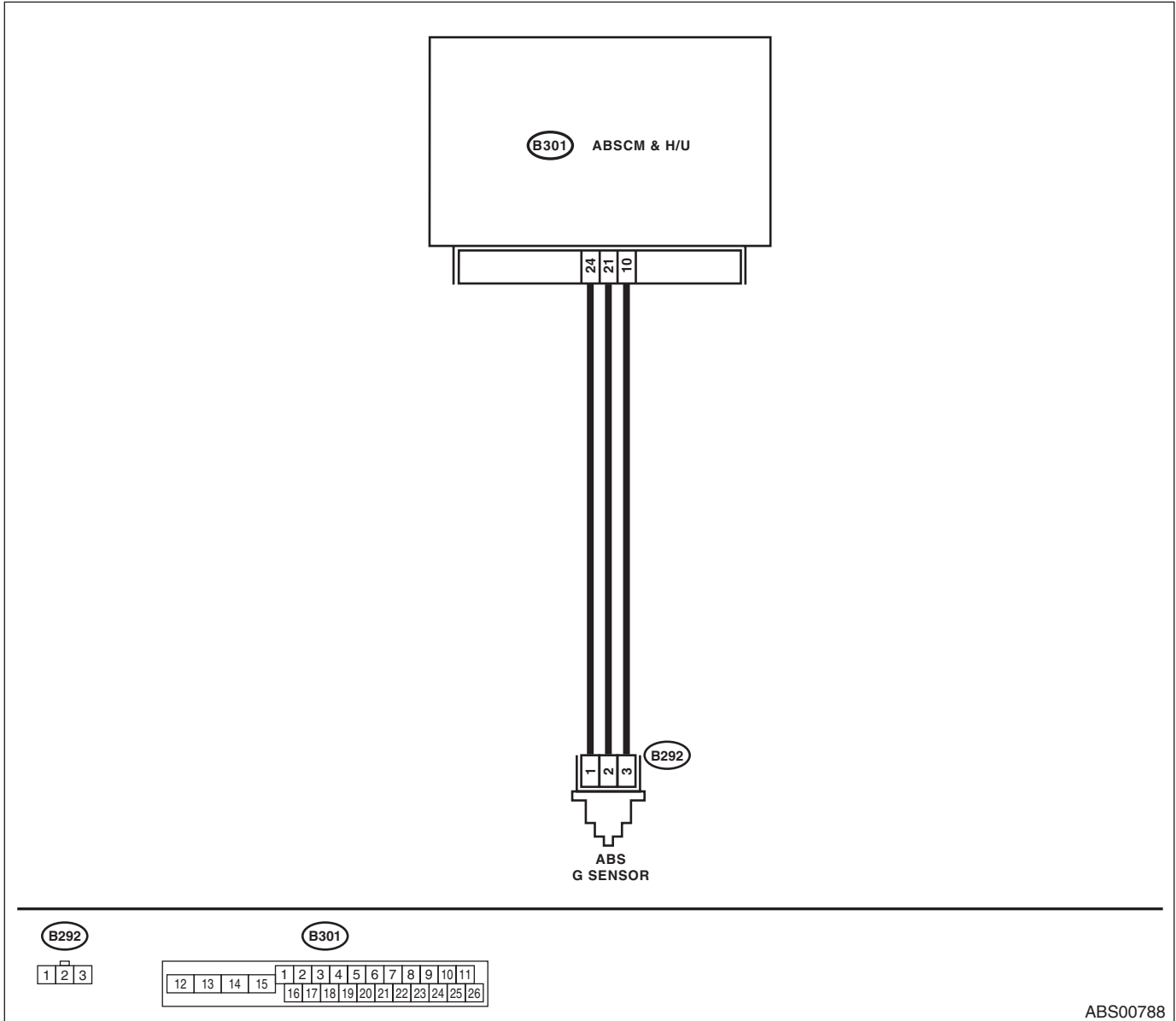
### DTC DETECTING CONDITION:

Defective G sensor

### TROUBLE SYMPTOM:

ABS does not operate.

### WIRING DIAGRAM:



ABS00788

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ABS (DIAGNOSTICS)

Step	Check	Yes	No	
<b>1</b>	<b>WHETHER A WHEEL TURNED FREELY OR NOT.</b>	Have the wheels spun free of load when the vehicle is lifted up, or during driving on a rough road?	ABS is normal. Erase the memory.	Go to step 2.
<b>2</b>	<b>CHECK OUTPUT OF G SENSOR USING SUBARU SELECT MONITOR.</b> 1) Select {Current Data Display & Save} in Subaru Select Monitor. 2) Read the G sensor output on Subaru Select Monitor.	Is the reading indicated on display -1.2 — 1.2 m/s when the G sensor is horizontal?	Go to step 3.	Go to step 6.
<b>3</b>	<b>CHECK POOR CONTACT OF CONNECTOR.</b>	Is there poor contact in connectors between ABSCM&H/U and G sensor?	Repair the connector.	Go to step 4.
<b>4</b>	<b>CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC displayed?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 5.
<b>5</b>	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is there any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to ABS(diag)-35, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs.
<b>6</b>	<b>CHECK INPUT VOLTAGE OF G SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Remove the console box. 3) Remove the G sensor from vehicle. (Do not disconnect the connector.) 4) Turn the ignition switch to ON. 5) Measure the voltage between G sensor connector terminals. <b>Connector &amp; terminal</b> <b>(B292) No. 1 (+) — No. 3 (-):</b>	Is the voltage 4.75 — 5.25 V?	Go to step 7.	Repair the harness connector between the G sensor and ABSCM&H/U.
<b>7</b>	<b>CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the ABSCM&H/U connectors. 3) Measure the resistance between ABSCU&H/U connector terminals. <b>Connector &amp; terminal</b> <b>(B301) No. 21 — No. 10:</b>	Is the resistance between 1.8 and 2.4 kΩ?	Go to step 8.	Repair the harness connector between the G sensor and ABSCM&H/U.
<b>8</b>	<b>CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.</b> 1) Disconnect the connector from the G sensor. 2) Measure the resistance between the ABSCM&H/U connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B301) No. 21 — Chassis ground:</b>	Is the resistance 1 MΩ or more?	Go to step 9.	Repair the harness between the G sensor and ABSCM&H/U.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ABS (DIAGNOSTICS)

Step	Check	Yes	No
<b>9 CHECK G SENSOR.</b> 1) Connect the connector to G sensor. 2) Connect the connector to ABSCM&H/U. 3) Turn the ignition switch to ON. 4) Measure the voltage between G sensor connector terminals. <i>Connector &amp; terminal (B292) No. 2 (+) — No. 3 (-):</i>	Is the voltage 2.1 — 2.5 V when G sensor is in horizontal position?	Go to step 10.	Replace G sensor. <Ref. to ABS-22, G Sensor.>
<b>10 CHECK G SENSOR.</b> Measure the voltage between G sensor connector terminals. <i>Connector &amp; terminal (B292) No. 2 (+) — No. 3 (-):</i>	Is the voltage 3.6 — 4.1 V when the G sensor is inclined forward to 90°?	Go to step 11.	Replace G sensor. <Ref. to ABS-22, G Sensor.>
<b>11 CHECK G SENSOR.</b> Measure the voltage between G sensor connector terminals. <i>Connector &amp; terminal (B292) No. 2 (+) — No. 3 (-):</i>	Is the voltage 0.5 — 1.0 V when G sensor is inclined back 90°?	Go to step 12.	Replace G sensor. <Ref. to ABS-22, G Sensor.>
<b>12 CHECK POOR CONTACT OF CONNECTOR.</b> Turn the ignition switch to OFF.	Is there poor contact in connectors between ABSCM&H/U and G sensor?	Repair the connector.	Go to step 13.
<b>13 CHECK ABSCM&amp;H/U.</b> 1) Connect all the connectors. 2) Erase the memory. 3) Perform the Inspection Mode. 4) Read the DTC.	Is the same DTC displayed?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step 14.
<b>14 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is there any other DTC displayed?	Check DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to ABS(diag)-35, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs.