ABS (DIAGNOSTICS)

1. Basic Diagnostic Procedure

A: PROCEDURE

CAUTION:
Remove foreign matters (dust, water, oil, etc.) from the ABSCM&H/U connector during removal and installation.

NOTE:
- To check harness for broken wires or short circuits, shake trouble spot or connector.
- Refer to “Check List for Interview”. <Ref. to ABS(diag)-4, Check List for Interview.>

	Step	Check	Yes	No
1	**CHECK PRE-INSPECTION.** 1) Ask the customer when and how the trouble occurred using interview checklist. <Ref. to ABS(diag)-4, Check List for Interview.> 2) Before performing diagnostics, check the component which might affect ABS problems. <Ref. to ABS(diag)-8, INSPECTION, General Description.>	Is the component that might influence the ABS problem normal?	Go to step **2.**	Repair or replace each unit.
2	**CHECK INDICATION OF DTC ON SCREEN.** 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor to data link connector. 3) Turn the ignition switch to ON and Subaru Select Monitor power switch to ON. NOTE: If the communication function of the Subaru Select Monitor cannot be executed normally, check the communication circuit. <Ref. to ABS(diag)-19, COMMUNICATION FOR INITIALIZING IMPOSSIBLE, INSPECTION, Subaru Select Monitor.> 4) Read the DTC. <Ref. to ABS(diag)-24, OPERATION, Read Diagnostic Trouble Code (DTC).> 5) Record all DTCs and Freeze Frame Data.	Is DTC displayed?	Go to step **4.**	Go to step **3.**
3	**PERFORM THE GENERAL DIAGNOSTICS.** 1) Inspect using “General Diagnostic Table”. <Ref. to ABS(diag)-77, General Diagnostic Table.> 2) Perform clear memory mode. <Ref. to ABS(diag)-17, CLEAR MEMORY MODE, OPERATION, Subaru Select Monitor.> 3) Perform the inspection mode. <Ref. to ABS(diag)-25, Inspection Mode.> 4) Read the DTC. <Ref. to ABS(diag)-16, READ DIAGNOSTIC TROUBLE CODE (DTC), OPERATION, Subaru Select Monitor.> Check the DTC does not displayed.	Does the ABS warning light go off after turning the ignition switch to ON?	Finish the diagnosis.	Check in accordance with “Diagnostic Procedure for ABS”. <Ref. to ABS(diag)-21, NO TROUBLE CODE, INSPECTION, Subaru Select Monitor.>

Step		Check	Yes	No
4	**PERFORM THE DIAGNOSIS.** 1) Refer to the “List of Diagnostic Trouble Code (DTC)”. <Ref. to ABS(diag)-34, LIST, List of Diagnostic Trouble Code (DTC).> 2) Fix the wrong part. 3) Perform clear memory mode. <Ref. to ABS(diag)-17, CLEAR MEMORY MODE, OPERATION, Subaru Select Monitor.> 4) Perform the inspection mode. <Ref. to ABS(diag)-25, Inspection Mode.> 5) Read the DTC. <Ref. to ABS(diag)-16, READ DIAGNOSTIC TROUBLE CODE (DTC), OPERATION, Subaru Select Monitor.>	Is DTC displayed?	Repeat step 1 to 4 until DTC is not shown.	Finish the diagnosis.

2. Check List for Interview

A: CHECK

Check the following items about the vehicle's state.

1. STATE OF ABS WARNING LIGHT

ABS warning light comes on.	❑ Always ❑ Sometimes ❑ Only once ❑ Not come on • When / how long does it come on?		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after Engine starting, engine is running) ❑ ON (after Engine starting, engine is at a standstill)		
Timing	❑ Immediately after turning the ignition to ON ❑ Immediately after turning the ignition to START		
	❑ When accelerating	—	km/h
		—	MPH
	❑ When driving at a constant speed	km/h	MPH
	❑ When decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ When operating other electrical parts		
	• Parts name: • Operating condition:		

2. STATE OF BRAKE WARNING LIGHT

Brake warning light comes on.	❑ Always ❑ Sometimes ❑ Only once ❑ Not come on ❑ When pulling the parking brake lever up. ❑ When releasing the parking brake lever down. • When / how long does it come on?		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after Engine starting, engine is running) ❑ ON (after Engine starting, engine is at a standstill)		
Timing	❑ Immediately after turning the ignition to ON ❑ Immediately after turning the ignition to START		
	❑ When accelerating	—	km/h
		—	MPH
	❑ When driving at a constant speed	km/h	MPH
	❑ When decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ When operating other electrical parts		
	• Parts name: • Operating condition:		

3. SYMPTOMS

<table>
<tr><td rowspan="11">ABS operating condition</td><td colspan="2">❑ Does not move.</td><td></td></tr>
<tr><td>❑ Operates only when applying an abrupt brake.</td><td rowspan="2">Vehicle speed:</td><td>km/h
MPH</td></tr>
<tr><td colspan="3">• How to step on brake pedal:</td></tr>
<tr><td>a) Operating time:</td><td colspan="2">Sec.</td></tr>
<tr><td colspan="3">b) Operating noise: ❑ Occurs. / ❑ Does not occur.</td></tr>
<tr><td>• What kind of noise?</td><td colspan="2">❑ Knocking
❑ Gong gong
❑ Bong
❑ Buzz
❑ Gong gong buzz
❑ Others:</td></tr>
<tr><td colspan="3">c) Reaction force of brake pedal</td></tr>
<tr><td></td><td colspan="2">❑ Stick
❑ Weak pedal resistance
❑ Strong pedal resistance
❑ Others:</td></tr>
<tr><td colspan="3">a) Directional stability cannot be obtained or the steering refuses to work when applying brakes:
❑ Yes / ❑ No</td></tr>
<tr><td>• When:</td><td colspan="2">❑ When turning to the right
❑ When turning to the left
❑ When spinning
❑ Others:</td></tr>
<tr><td colspan="3">b) Directional stability cannot be obtained or the steering refuses to work when accelerating:
❑ Yes / ❑ No</td></tr>
<tr><td>• When:</td><td colspan="2">❑ When turning to the right
❑ When turning to the left
❑ When spinning
❑ Others:</td></tr>
<tr><td colspan="3">c) Poor brake performance: ❑ Yes / ❑ No</td></tr>
<tr><td>• What kind:</td><td colspan="2">❑ Long braking/stopping distance
❑ Brakes lock or drag
❑ Long pedal stroke
❑ Pedal sticks.
❑ Others:</td></tr>
<tr><td colspan="3">d) Poor acceleration: ❑ Yes / ❑ No</td></tr>
<tr><td>• What kind:</td><td colspan="2">❑ Not accelerate
❑ Engine stalls.
❑ Others:</td></tr>
<tr><td colspan="3">e) Occurrence of vibration: ❑ Yes / ❑ No</td></tr>
<tr><td colspan="3">• Where
• What kind:</td></tr>
<tr><td colspan="3">f) Occurrence of noise: ❑ Yes / ❑ No</td></tr>
<tr><td colspan="3">• Where
• What kind:</td></tr>
<tr><td colspan="3">g) Other troubles occurred: ❑ Yes / ❑ No</td></tr>
<tr><td colspan="3">• What kind:</td></tr>
</table>

4. CONDITIONS UNDER WHICH TROUBLE OCCURS

Environment	a) Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Others:
	b) Ambient temperature	°C (°F)
	c) Road	❑ Inner city ❑ Suburbs ❑ Highway ❑ Local street ❑ Uphill ❑ Downhill ❑ Paved road ❑ Gravel road ❑ Muddy road ❑ Sandy place ❑ Others:
	d) Road surface	❑ Dried ❑ Wet ❑ Covered with fresh snow ❑ Covered with hardened snow ❑ Frozen slope ❑ Others:
Condition	a) Brakes	Deceleration: G
		❑ Intermittent / ❑ Temporary
	b) Accelerator	Acceleration: G
		❑ Intermittent / ❑ Temporary
	c) Vehicle speed	km/h | MPH
		❑ Advancing ❑ When accelerating ❑ When decelerating ❑ At low speed ❑ When turning ❑ Others:
	d) Tire inflation pressure	Front RH tire: kPa
		Front LH tire: kPa
		Rear RH tire: kPa
		Rear LH tire: kPa
	e) Degree of wear	Front RH tire:
		Front LH tire:
		Rear RH tire:
		Rear LH tire:
	f) Genuine parts are used.: ❑ Yes / ❑ No	
	g) Tire chain is attached.: ❑ Yes / ❑ No	
	h) T-type tire is used.: ❑ Yes / ❑ No	
	i) Condition of suspension alignment:	
	j) Loading state:	
	k) Repair parts are used.: ❑ Yes / ❑ No	
	• Contents:	
	l) Others:	

3. General Description

A: CAUTION

1. SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

Airbag system wiring harness is routed near the ABS wheel speed sensor and ABSCM&H/U.

CAUTION:
• Airbag system connectors are colored yellow. Do not use the electrical test equipment on these circuits.
• Be careful not to damage the airbag system wiring harness when servicing the ABS wheel speed sensor and ABSCM&H/U.

B: INSPECTION

Before performing diagnosis, check the following items which might affect ABS problems.

1. BATTERY

Measure battery voltage and check electrolyte.

Standard voltage: 12 V or more

Specific gravity: More than 1.260

2. GROUND

Check the ABS ground (B302) bolt, tightening torque.

Tightening torque:
13 N·m (1.3 kgf-m, 9.4 ft-lb)

3. BRAKE FLUID

1) Check the brake fluid level.
2) Check the brake fluid for leaks.

4. HYDRAULIC UNIT

Check the hydraulic unit.
• With brake tester <Ref. to ABS-9, CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH BRAKE TESTER, INSPECTION, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
• Without brake tester <Ref. to ABS-8, CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE, INSPECTION, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

5. BRAKE DRAG

Check for brake drag.

6. BRAKE PAD AND ROTOR

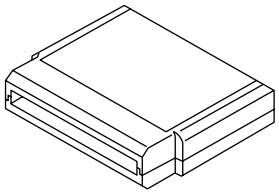
Check the brake pad and rotor.
• FRONT <Ref. to BR-19, INSPECTION, Front Brake Pad.> <Ref. to BR-21, INSPECTION, Front Disc Rotor.>
• REAR <Ref. to BR-30, INSPECTION, Rear Brake Pad.> <Ref. to BR-32, INSPECTION, Rear Disc Rotor.>

7. TIRE

Check the tire specifications, tire wear and air pressure. <Ref. to WT-2, SPECIFICATION, General Description.>

C: PREPARATION TOOL

1. SPECIAL TOOL

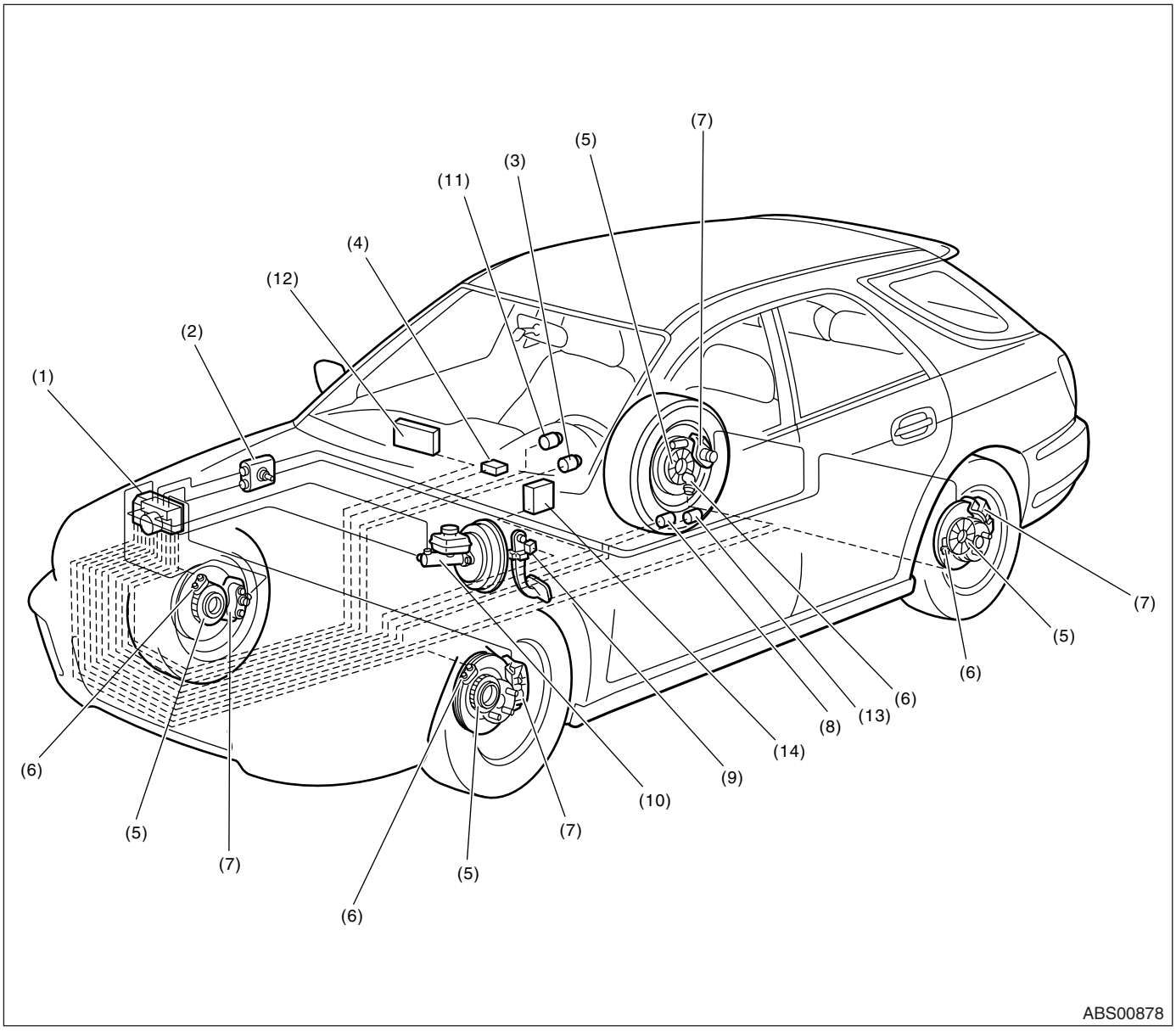
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18482AA010	18482AA010 (Newly adopted tool)	CARTRIDGE	Troubleshooting for electrical systems.
 ST22771AA030	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for electrical systems.

2. GENERAL PURPOSE TOOL

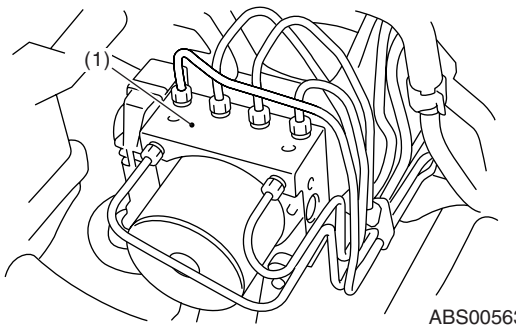
TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and amperage.
Oscilloscope	Used for measuring sensor.

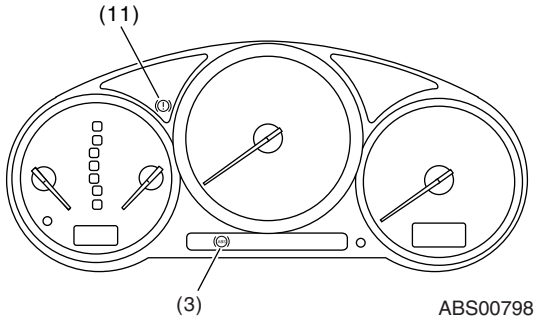
4. Electrical Component Location

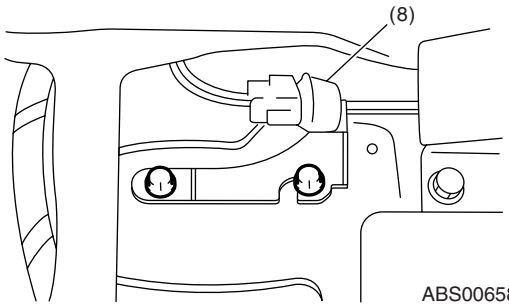
A: LOCATION

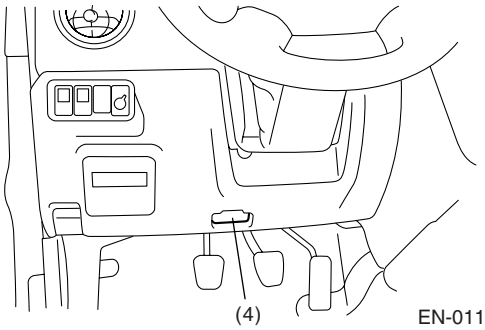


(1) ABS control module and hydraulic control unit (ABSCM&H/U)
(2) Connector
(3) ABS warning light
(4) Data link connector (for Subaru Select Monitor)
(5) Tone wheel
(6) ABS wheel speed sensor
(7) Wheel cylinder
(8) G sensor
(9) Stop light switch
(10) Master cylinder
(11) Brake and EBD warning light
(12) Driver's control center differential control module (STI model)
(13) Yaw rate & lateral G sensor (STI model)
(14) Transmission control module (AT model)

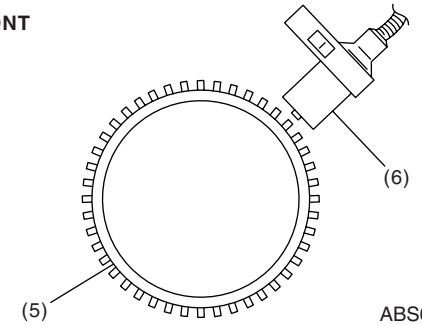

(1)
ABS00563


(11)
(3)
ABS00798

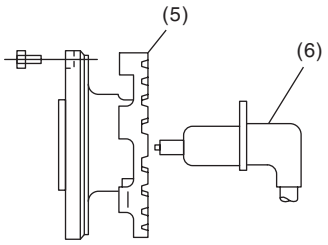

(8)
ABS00658

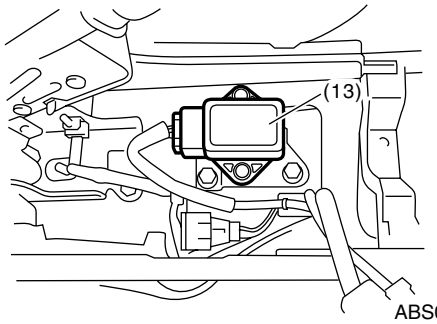

(4)
EN-01150

FRONT


(6)
(5)
ABS00659

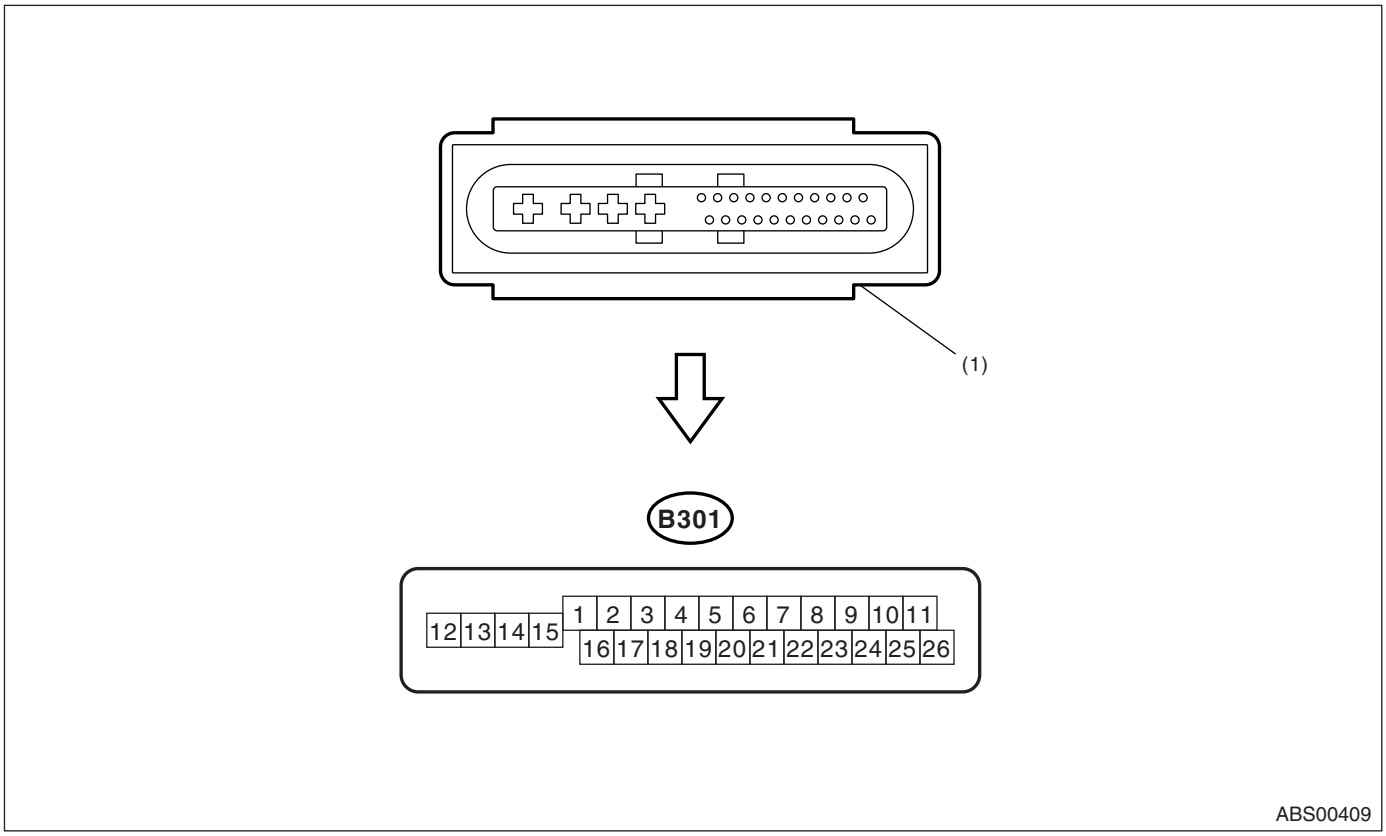
REAR


(5)
(6)
ABS00660


(13)
ABS00651

5. Control Module I/O Signal

A: ELECTRICAL SPECIFICATION



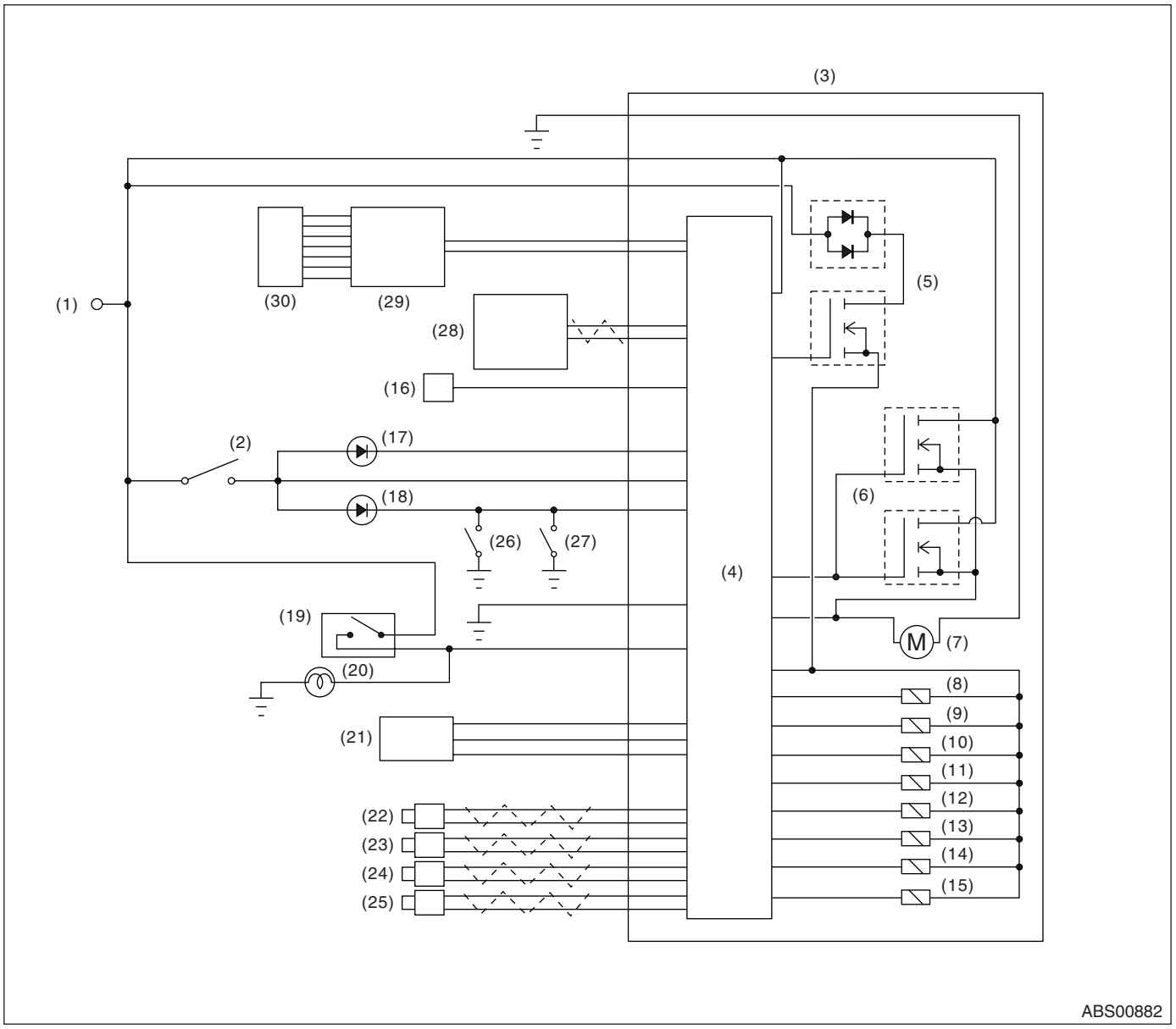
(1) ABS control module and hydraulic control unit (ABSCM&H/U) connector

NOTE:
- Terminal numbers in ABSCM&H/U connector are as shown in the figure.
- ABS warning light is illuminates when the connector is removed from ABSCM&H/U.

Description			Terminal No. (+) — (–)	Input/Output signal Measured value and measuring conditions
ABS wheel speed sensor (Wheel speed sensor)	Front LH wheel	Ground	16	—
		Signal	1 — 16	When the 20 Hz. 0.12 — 1 V
	Front RH wheel	Ground	5	—
		Signal	6 — 5	When the 20 Hz. 0.12 — 1 V
	Rear LH wheel	Ground	2	—
		Signal	3 — 2	When the 20 Hz. 0.12 — 1 V
	Rear RH wheel	Ground	4	—
		Signal	19 — 4	When the 20 Hz. 0.12 — 1 V
CAN communication line (+)			26	2.5 — 1.5 V pulse signal
CAN communication line (–)			11	3.5 — 2.5 V pulse signal
Valve relay power supply *1			14 — 15	10 — 15 V
Motor relay power supply *1			13 — 15	10 — 15 V
G sensor	Power supply		24 — 10	4.75 — 5.25 V
	Ground		10	—
	Output		21 — 10	2.1 — 2.5 V when the vehicle is on a level surface
Stop light switch *1			20 — 15	Less than 1.5 V when the stop light is OFF; otherwise, 10 — 15 V when the stop light is ON.
ABS warning light			22 — 15	After turning the ignition switch to ON, 10 — 15 V during 1.5 seconds and less than 1.5 V after 1.5 seconds passed.
Brake warning light (EBD warning light)			8 — 15	After turning the ignition switch to ON, 10 — 15 V during 1.5 seconds and less than 1.5 V after 1.5 seconds passed.
Subaru Select Monitor			7 — 15	Less than 1.5 V when no data is received. 0 ←→ 12 V pulse (in communication)
Power supply *1			18 — 15	When the ignition switch is ON, 10 — 15 V.
Grounding line			12	—
Grounding line			15	—

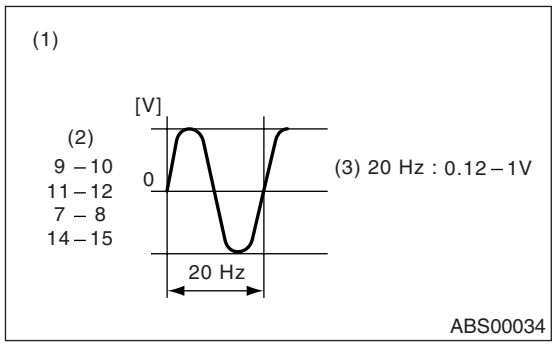
*1: Measure the I/O signal voltage after removing the connector from the ABSCM&H/U terminal.

B: WIRING DIAGRAM



(1) Battery
(2) Ignition switch
(3) ABS control module and hydraulic control unit (ABSCM&H/U)
(4) ABS control module
(5) Valve relay
(6) Motor relay
(7) Motor
(8) Front inlet solenoid valve LH
(9) Front outlet solenoid valve LH
(10) Front inlet solenoid valve RH
(11) Front outlet solenoid valve RH
(12) Rear inlet solenoid valve LH
(13) Rear outlet solenoid valve LH
(14) Rear inlet solenoid valve RH
(15) Rear outlet solenoid valve RH
(16) Data link connector
(17) ABS warning light
(18) Brake warning light
(19) Stop light switch
(20) Stop light
(21) G sensor
(22) Front ABS wheel speed sensor LH
(23) Front ABS wheel speed sensor RH
(24) Rear ABS wheel speed sensor LH
(25) Rear ABS wheel speed sensor RH
(26) Parking brake switch
(27) Brake fluid level switch
(28) Transmission control module (AT model)
(29) Driver's control center differential control module (STI model)
(30) Yaw rate & lateral G sensor (STI model)

C: WAVEFORM



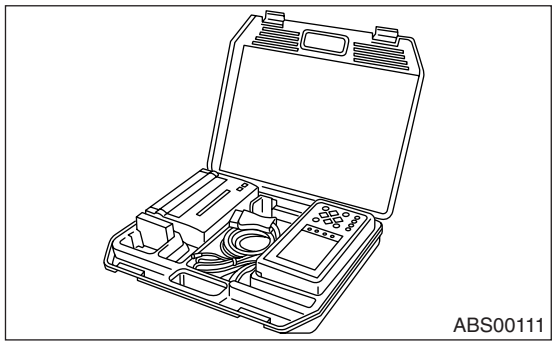
(1) ABS wheel speed sensor
(2) Terminal No.
(3) Standard output voltage

6. Subaru Select Monitor

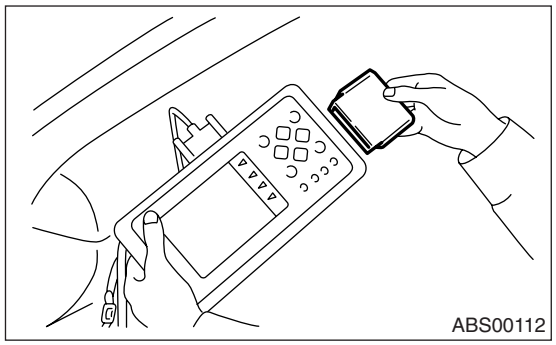
A: OPERATION

1. READ DIAGNOSTIC TROUBLE CODE (DTC)

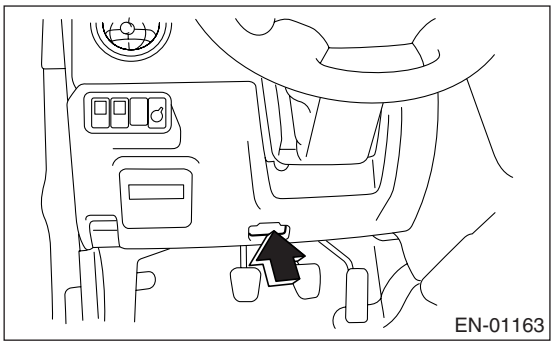
1) Prepare the Subaru Select Monitor kit.



2) Connect the diagnosis cable to Subaru Select Monitor.
3) Insert the cartridge into Subaru Select Monitor. <Ref. to ABS(diag)-9, SPECIAL TOOL, PREPARATION TOOL, General Description.>



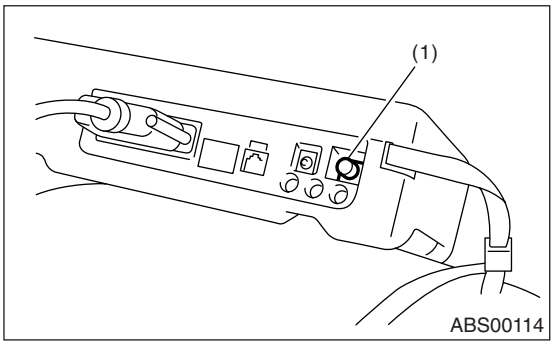
4) Connect the Subaru Select Monitor to data link connector.
(1) Data link connector located in the lower portion of instrument panel (on the driver's side).



(2) Connect the diagnosis cable to data link connector.

CAUTION:
Do not connect the scan tools except for Subaru Select Monitor and general scan tool.

5) Turn the ignition switch to ON (engine OFF) and Subaru Select Monitor power switch to ON.



(1) Power switch

6) On the «Main Menu» display screen, select the {Each System Check} and press [YES] key.
7) On the «System Selection Menu» display screen, select the {Brake Control System} and press [YES] key.
8) Press the [YES] key after the information of engine type is displayed.
9) On the «ABS Diagnosis» display screen, select the {DTC Display} and press [YES] key.
10) On the «DTC Display» display screen, select the {Current DTC} or {History DTC} and press [YES] key.

NOTE:
• For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
• For detailed concerning the DTC, refer to the LIST OF DTC. <Ref. to ABS(diag)-34, List of Diagnostic Trouble Code (DTC).>
• A maximum of 3 DTCs are displayed in order of occurrence.
• If a particular DTC is not properly stored in memory (due to a drop in ABSCM&H/U power supply, etc.) when a problem occurs, the DTC, followed by a question mark "?", appears on the Subaru Select Monitor display. This shows it may be an unreliable reading.

Display screen	Contents to be monitored
Latest	The most recent DTC appears on Subaru Select Monitor display.
Old	The second most recent DTC appears on Subaru Select Monitor display.
Older	The third most recent DTC appears on Subaru Select Monitor display.
Reference	DTC issued after elapse of a specified period of time.

2. READ CURRENT DATA

1) On the «Main Menu» display screen, select the {Each System Check} and press «YES» key.
2) On the «System Selection Menu» display screen, select the {Brake Control System} and press «YES» key.
3) Press the «YES» key after the information of ABS type is displayed.
4) On the «Brake Control Diagnosis» display screen, select the {Current Data Display & Save} and press «YES» key.
5) On the «Data Display Menu» display screen, select the {Data Display} and press «YES» key.
6) Using the scroll key, move the display screen up or down until desired data is shown.
• A list of the support data is shown in the following table.

Display screen	Contents to be monitored	Unit of measure
FR Wheel Speed	Wheel speed detected by Front ABS wheel speed sensor RH is displayed	km/h or MPH
FL Wheel Speed	Wheel speed detected by Front ABS wheel speed sensor LH is displayed	km/h or MPH
RR Wheel Speed	Wheel speed detected by Rear ABS wheel speed sensor RH is displayed	km/h or MPH
RL Wheel Speed	Wheel speed detected by Rear ABS wheel speed sensor LH is displayed	km/h or MPH
Stop Light Switch	Stop light switch signal	ON or OFF
G Sensor Output Signal	Vehicle acceleration detected by analog G sensor is displayed.	m/s (m/s^2)
Lateral G Sensor Output Signal	Lateral G detected by Lateral G sensor is displayed in voltage. (STI model)	m/s (m/s^2)
Valve Relay Signal	Valve Relay Signal	ON or OFF
ABS Warning Lamp	ON operation of ABS warning light is displayed.	ON or OFF
EBD Warning Light	ON operation of EBD warning light is displayed.	ON or OFF
Motor Relay Monitor	Monitor voltage of motor relay is displayed.	V
IG power supply voltage	Voltage supplied to ABSCM&H/U is displayed.	V
ABS Control Flag	ABS control condition is displayed.	ON or OFF
ABS OK B Signal	ABS system normal/abnormal is displayed.	ON or OFF

NOTE:
For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.

3. CLEAR MEMORY MODE

1) On the «Main Menu» display screen, select the {2. Each System Check} and press «YES» key.
2) On the «System Select Menu» display screen, select the {Brake System} and press «YES» key.
3) Press the «YES» key after the information of engine type is displayed.
4) On the «Brake Control Diagnosis» display screen, select the {Clear Memory} and press «YES» key.

Display screen	Contents to be monitored
Clear memory?	Function of clearing DTC.

5) When the “Done” and “turn ignition switch to OFF” are shown on display screen, turn the Subaru Select Monitor power switch and ignition switch to OFF.

NOTE:
For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.

4. ABS SEQUENCE CONTROL

Display screen	Contents to be monitored	Index No.
ABS sequence control	Perform ABS sequence control by operating valve and pump motor sequentially.	<Ref. to ABS-10, ABS Sequence Control.>

5. FREEZE FRAME DATA

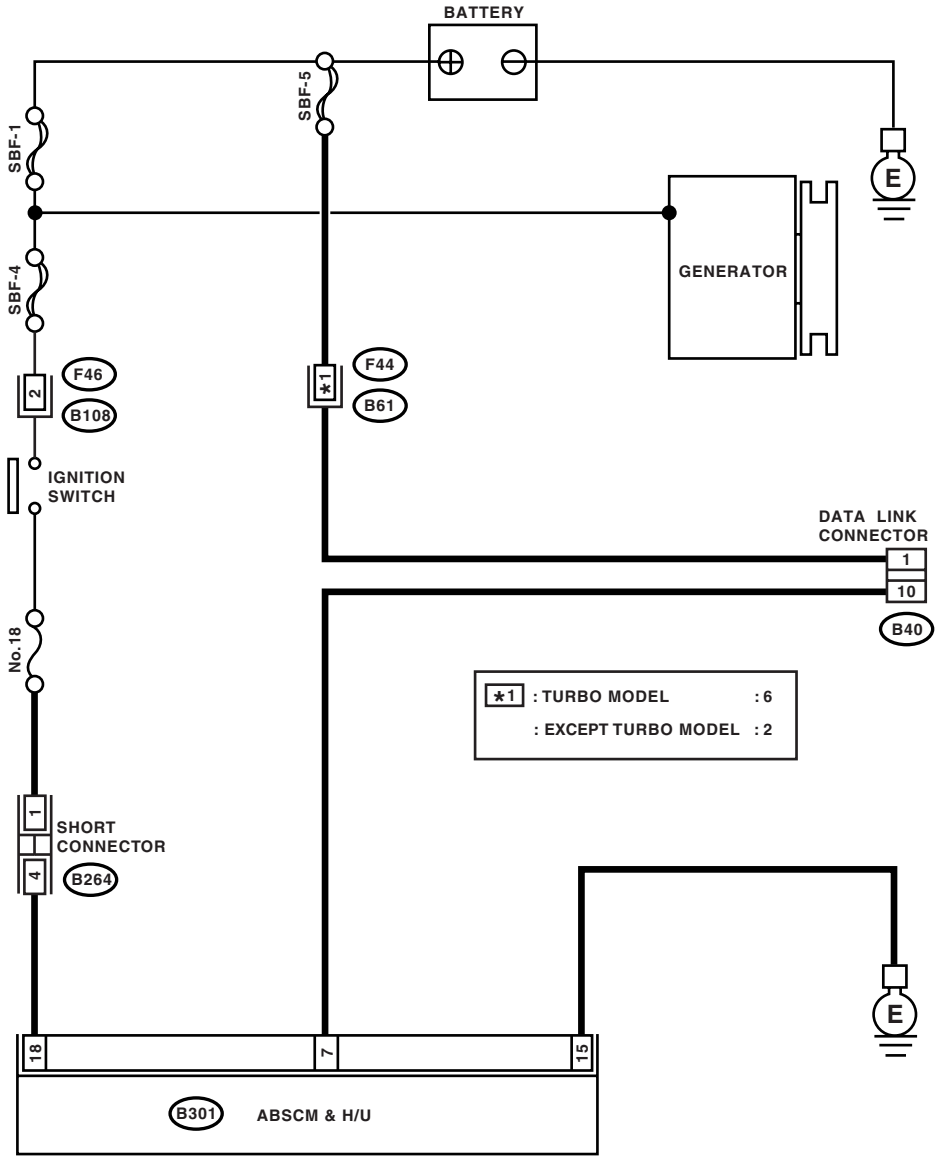
NOTE:
• Data stored at the time of trouble occurrence is shown on display.
• Each time trouble occurs, the latest information is stored in the freeze frame data in memory.
• Freeze frame data will be memorized maximum to three.
• If freeze frame data is not properly stored in memory (due to a drop in ABSCM power supply, etc.), a DTC, preceded by a question mark “?”, appears on the Subaru Select Monitor display. This shows it may be an unreliable reading.

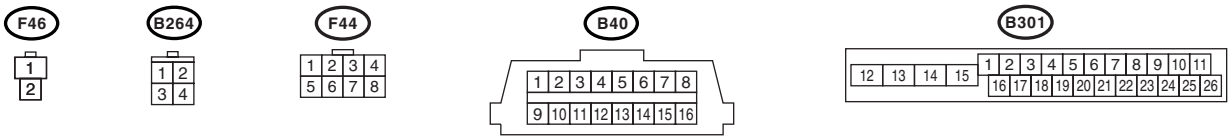
Display screen	Contents to be monitored
FR wheel speed	Wheel speed detected by Front ABS wheel speed sensor RH is displayed in km/h or mile/h.
FL wheel speed	Wheel speed detected by Front ABS wheel speed sensor LH is displayed in km/h or mile/h.
RR wheel speed	Wheel speed detected by Rear ABS wheel speed sensor RH is displayed in km/h or mile/h.
RL wheel speed	Wheel speed detected by Rear ABS wheel speed sensor LH is displayed in km/h or mile/h.
IG power voltage	Power (in volts) supplied to ABSCM& H/U appears on the Subaru Select Monitor display.
G sensor output voltage	Voltage equivalent to vehicle acceleration detected by analog G sensor is displayed.
Lateral G sensor output voltage	Voltage equivalent to Lateral G detected by analog Lateral G sensor is displayed.
Motor relay monitor	Motor relay operation monitor signal
Stop light switch	Stop light switch signal
ABS operation signal	ABS operation signal
Power Supply Failure	Occurrence of abnormal voltage during malfunction is displayed.
Vehicle speed	Vehicle speed is displayed.

B: INSPECTION

1. COMMUNICATION FOR INITIALIZING IMPOSSIBLE

DETECTING CONDITION:
Faulty harness connector
TROUBLE SYMPTOM:
Communication cannot be executed between ABS and Subaru select monitor.
WIRING DIAGRAM:





ABS00832

	Step	Check	Yes	No
1	**CHECK IGNITION SWITCH.**	Is the ignition switch turned to ON?	Go to step **2.**	Turn the ignition switch to ON, and select ABS mode using Subaru Select Monitor.
2	**CHECK BATTERY.** 1) Turn the ignition switch to OFF. 2) Measure the battery voltage.	Is the voltage more than 11 V?	Go to step **3.**	Charge or replace the battery.
3	**CHECK BATTERY TERMINAL.**	Is there poor contact at battery terminal?	Repair or tighten the battery terminal.	Go to step **4.**
4	**CHECK COMMUNICATION OF SUBARU SELECT MONITOR.** 1) Turn the ignition switch to ON. 2) Using the Subaru Select Monitor, check whether communication to other system can be executed normally.	Are the name and year of system displayed on Subaru Select Monitor?	Go to step **8.**	Go to step **5.**
5	**CHECK COMMUNICATION OF SUBARU SELECT MONITOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the ABSCM&H/U connector. 3) Turn the ignition switch to ON. 4) Check whether communication to other systems can be executed normally.	Are the name and year of system displayed on Subaru Select Monitor?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **6.**
6	**CHECK HARNESS CONNECTOR BETWEEN EACH CONTROL MODULE AND DATA LINK CONNECTOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the ABSCM&H/U, ECM and TCM connectors. 3) Measure the resistance between data link connector and chassis ground. ***Connector & terminal*** ***(B40) No. 10 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **7.**	Repair the harness and connector between each control module and data link connector.
7	**CHECK OUTPUT SIGNAL FOR ABSCM& H/U.** 1) Turn the ignition switch to ON. 2) Measure the voltage between ABSCM&H/U and chassis ground. ***Connector & terminal*** ***(B40) No. 10 (+) — Chassis ground (−):***	Is the voltage less than 1 V?	Go to step **8.**	Repair the harness and connector between each control module and data link connector.
8	**CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND DATA LINK CONNECTOR.** Measure the resistance between ABSCM&H/U connector and data link connector. ***Connector & terminal*** ***(B301) No. 7 — (B40) No. 10:***	Is the resistance less than 0.5 Ω?	Go to step **9.**	Repair the harness and connector between ABSCM&H/U and data link connector.
9	**CHECK INSTALLATION OF ABSCM&H/U CONNECTOR.** Turn the ignition switch to OFF.	Is the ABSCM&H/U connector inserted into ABSCM&H/U until the clamp locks onto it?	Go to step **10.**	Insert the ABSCM&H/U connector into ABSCM&H/U.

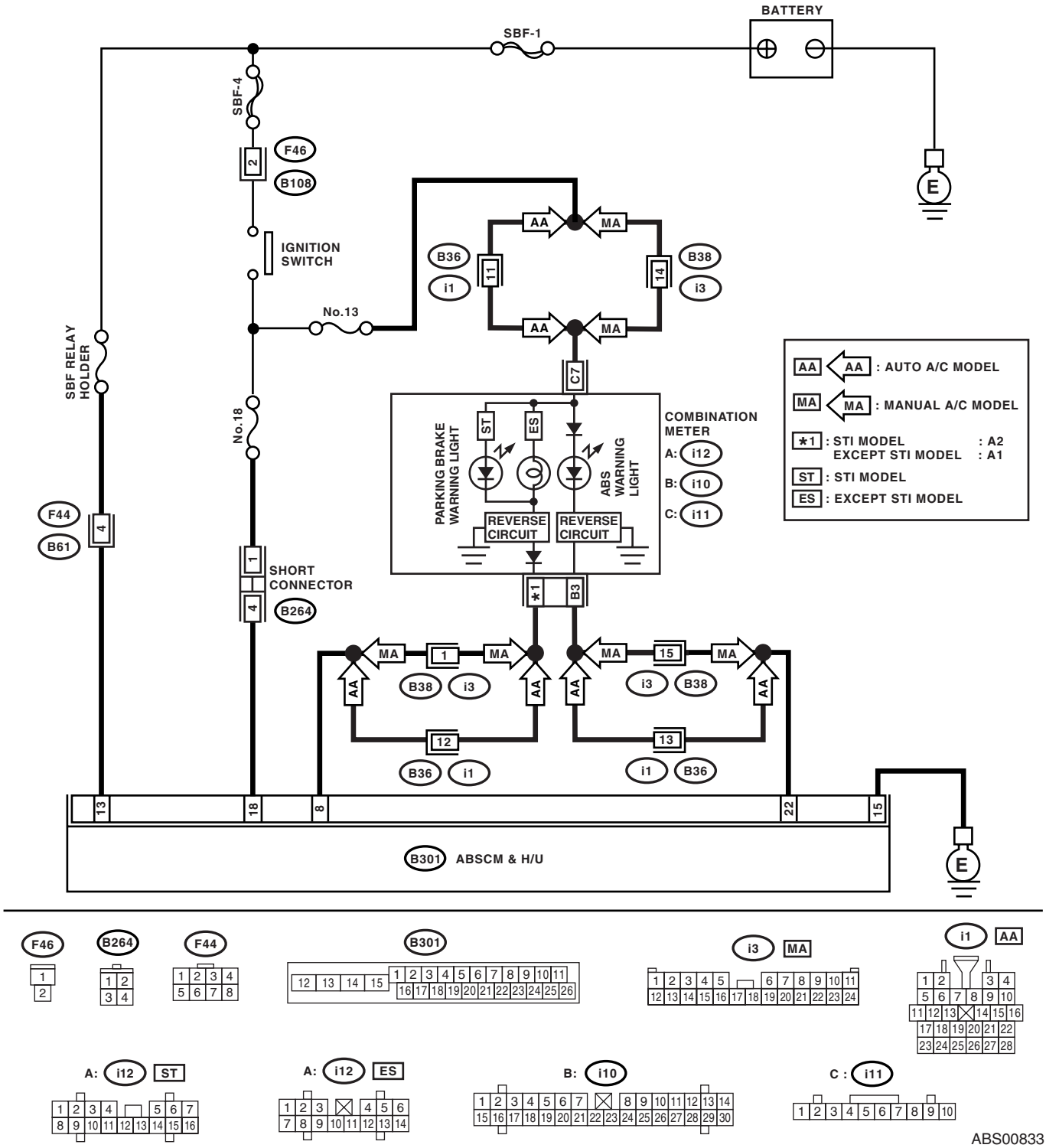
	Step	Check	Yes	No
10	**CHECK POWER SUPPLY CIRCUIT.** 1) Turn the ignition switch to ON (engine OFF). 2) Measure the ignition power supply voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 18 (+) — Chassis ground (−):***	Is the voltage 10 — 15 V?	Go to step **11.**	Repair the open circuit in harness between ABSCM&H/U and battery.
11	**CHECK HARNESS CONNECTOR BETWEEN ABSCM&H/U AND CHASSIS GROUND.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U and transmission. 3) Measure the resistance of harness between ABSCM&H/U and chassis ground. ***Connector & terminal*** ***(B301) No. 15 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Go to step **12.**	Repair the open circuit in harness between ABSCM&H/U and inhibitor side connector, and poor contact in coupling connector.
12	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in control module power supply, ground line and data link connector?	Repair the connector.	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

2. NO TROUBLE CODE

DETECTING CONDITION:
ABS warning light circuit is shorted.
TROUBLE SYMPTOM:
- ABS warning light remains on.
- “NO TROUBLE CODE” displayed on the Subaru Select Monitor.

NOTE:
When the ABS warning light is OFF and “NO TROUBLE CODE” is displayed on Subaru Select Monitor, the system is in normal condition.

WIRING DIAGRAM:



ABS00833

	Step	Check	Yes	No
1	**DATA CHECK SUBARU SELECT MONITOR.** 1) Select {Current Data Display & Save} in Subaru Select Monitor. 2) Read the condition of “ABS warning light”.	Is “ON” indicated?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **2.**
2	**CHECK WIRING HARNESS.** Measure the resistance between ABSCM connector and combination meter connector. ***Connector & terminal*** ***(i10) No. 3 — (B301) No. 22:***	Is the resistance less than 0.5 Ω?	Go to step **3.**	Repair harness and connector between ABSCM&H/U and combination meter connector.
3	**CHECK POOR CONTACT IN CONNECTOR.**	Is there poor contact in ABSCM connector and combination meter connector?	Repair the connector.	Check the combination meter.

7. Read Diagnostic Trouble Code (DTC)

A: OPERATION

Refer to SUBARU SELECT MONITOR for details about reading of DTCs. <Ref. to ABS(diag)-16, Subaru Select Monitor.>

8. Inspection Mode

A: PROCEDURE

Reproduce the condition under which the problem has occurred as much as possible.
Drive the vehicle at a speed more than 40 km/h (25 MPH) for at least 1 minute.

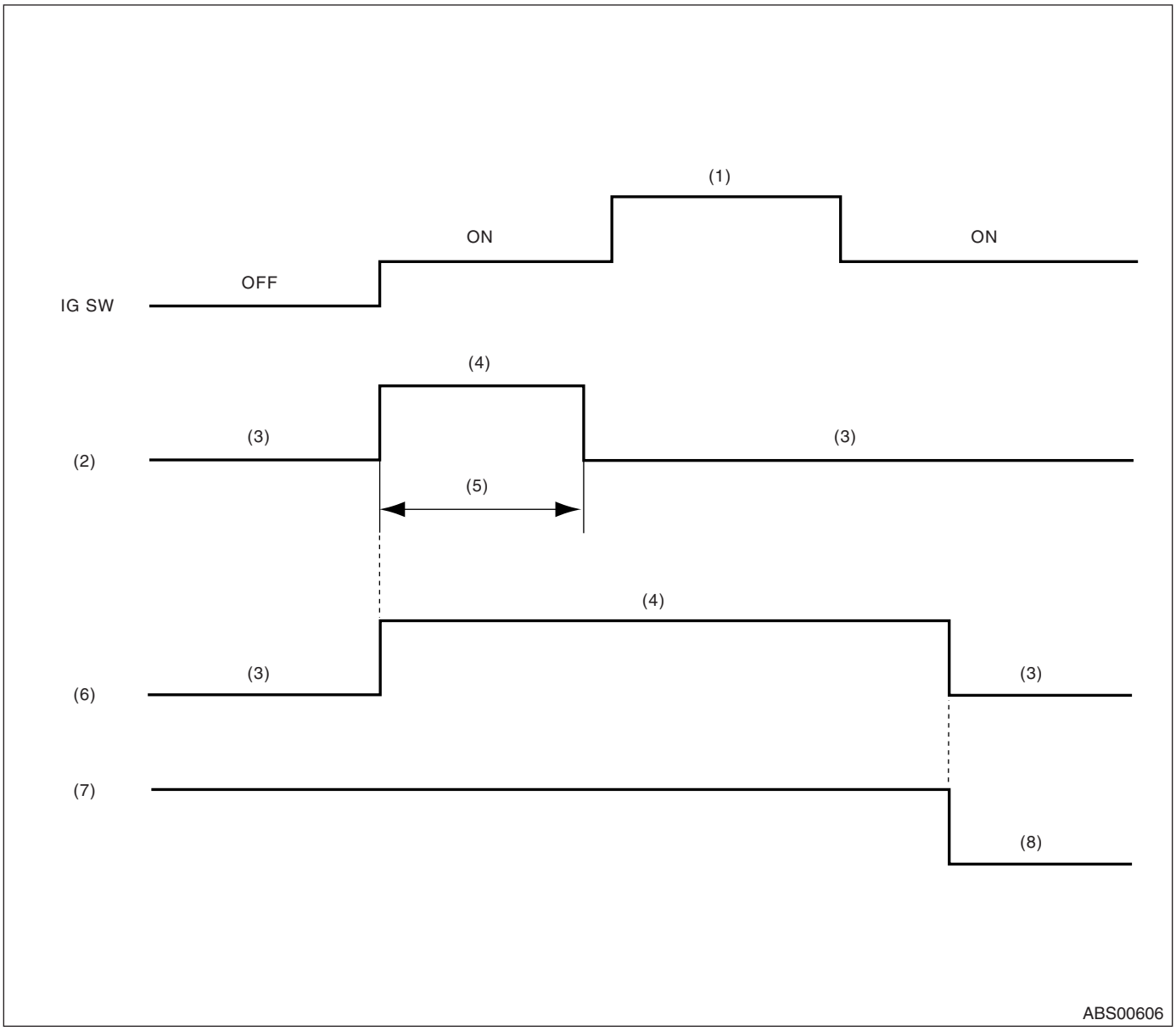
9. Clear Memory Mode

A: OPERATION

Refer to SUBARU SELECT MONITOR for details about how to clear DTC. <Ref. to ABS(diag)-16, Subaru Select Monitor.>

10.ABS Warning Light/Brake Warning Light Illumination Pattern

A: INSPECTION



(1) Start
(2) ABS warning light
(3) Goes out
(4) Illuminates
(5) About 2 sec.
(6) Brake warning light (EBD warning light)
(7) Parking brake
(8) Release

1) When the ABS warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
2) When the ABS warning light remains constantly OFF, repair the ABS warning light circuit or diagnosis circuit.

NOTE:
Even though the ABS warning light does not go out about 2 seconds after it illuminates, the ABS system operates normally when the warning light goes out while driving at approx. 12 km/h (7 MPH). However, the Anti-lock brakes do not work while ABS warning light is illuminated.

B: ABS WARNING LIGHT DOES NOT COME ON

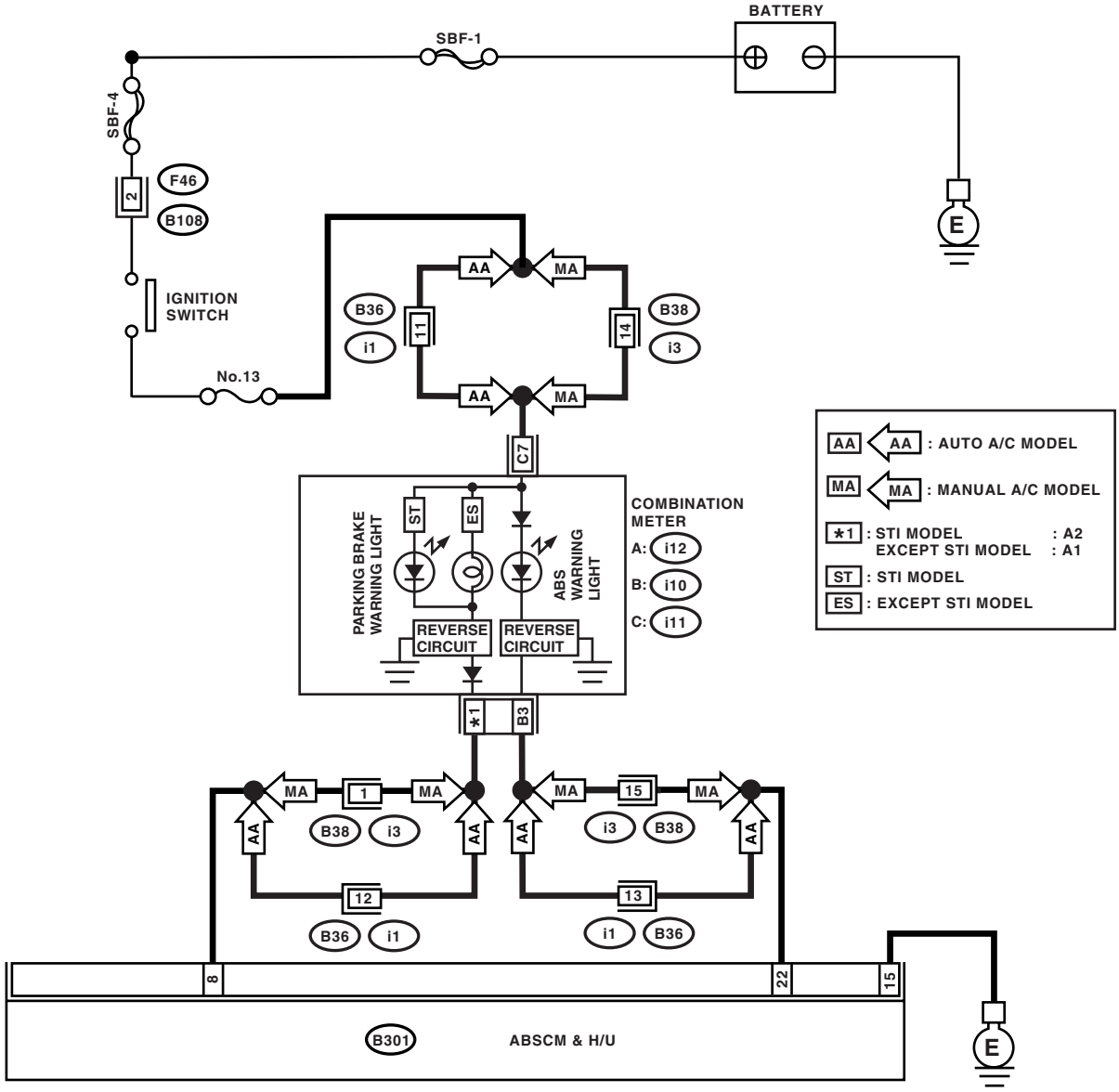
DETECTING CONDITION:

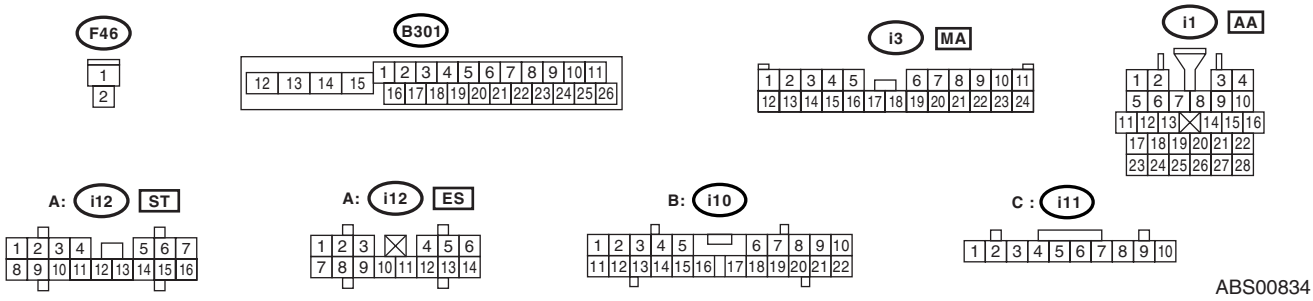
- Defective combination meter
- Defective harness

TROUBLE SYMPTOM:

When the ignition switch is turned to ON (engine OFF), ABS warning light does not come on.

WIRING DIAGRAM:





ABS00834

	Step	Check	Yes	No
1	**CHECK ILLUMINATION OF OTHER LIGHTS.** Turn the ignition switch to ON. (engine OFF)	Do other warning lights illuminate?	Go to step **2.**	Check the combination meter.
2	**READ DTC.** Read the DTC. <Ref. to ABS(diag)-24, Read Diagnostic Trouble Code (DTC).>	Is DTC displayed?	Perform the diagnosis according to DTC.	Go to step **3.**
3	**CHECK GROUND SHORT OF HARNESS.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U. 3) Disconnect the connector from the combination meter. 4) Measure the resistance between ABSCM connector and chassis ground. ***Connector & terminal*** ***(B301) No. 22 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **4.**	Repair harness and connector between ABSCM&H/U and combination meter connector.
4	**CHECK ABSCM.** 1) Connect the connector to the ABSCM&H/U. 2) Turn the ignition to ON. 3) Immediately after turning ignition switch to ON (within 1.5 seconds), measure the resistance of harness between the combination meter connector and chassis ground. ***Connector & terminal*** ***(i10) No. 3 — Chassis ground:***	Is the resistance more than 1 MΩ?	Check the combination meter.	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

C: ABS WARNING LIGHT DOES NOT GO OFF

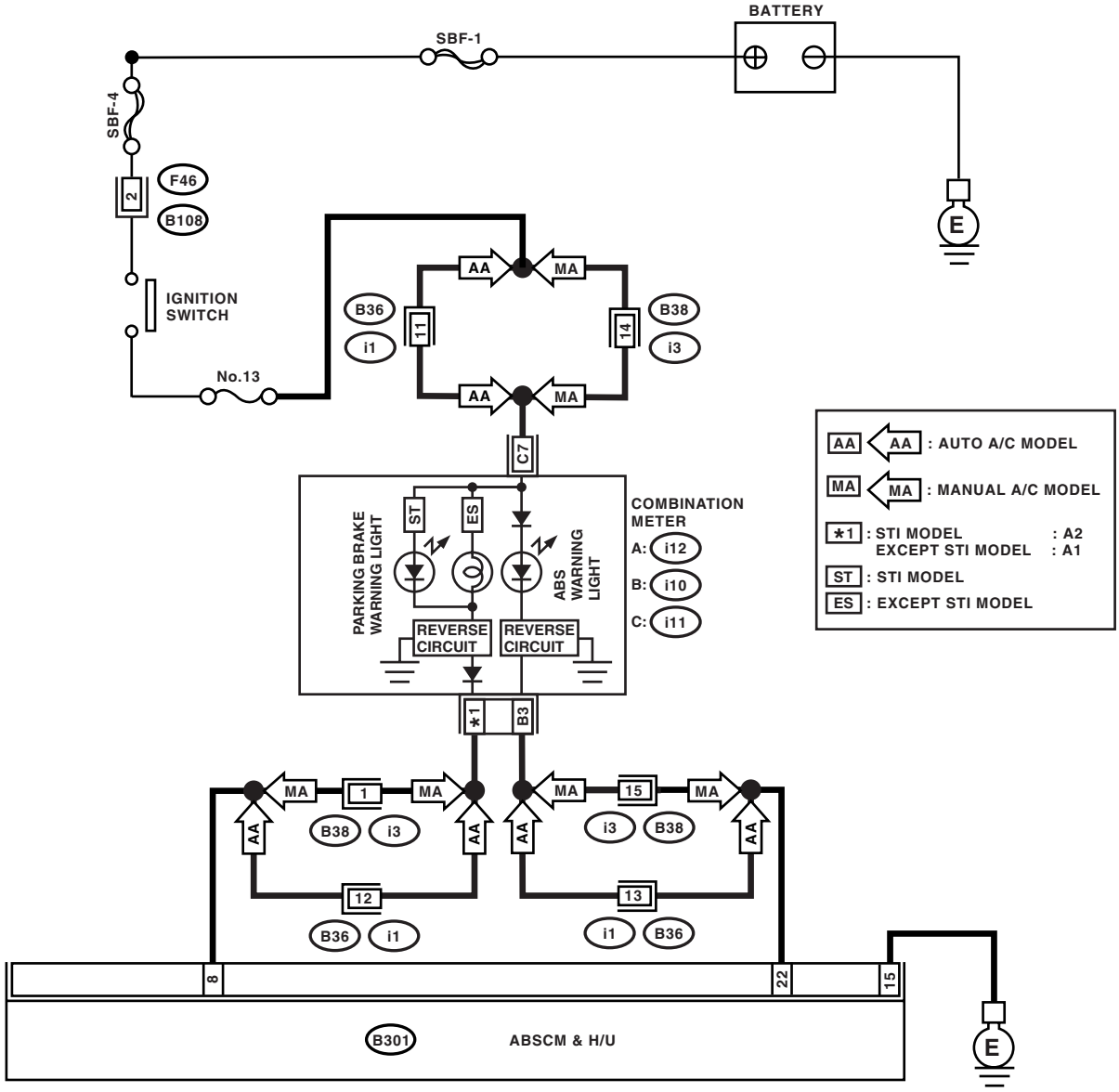
DETECTING CONDITION:

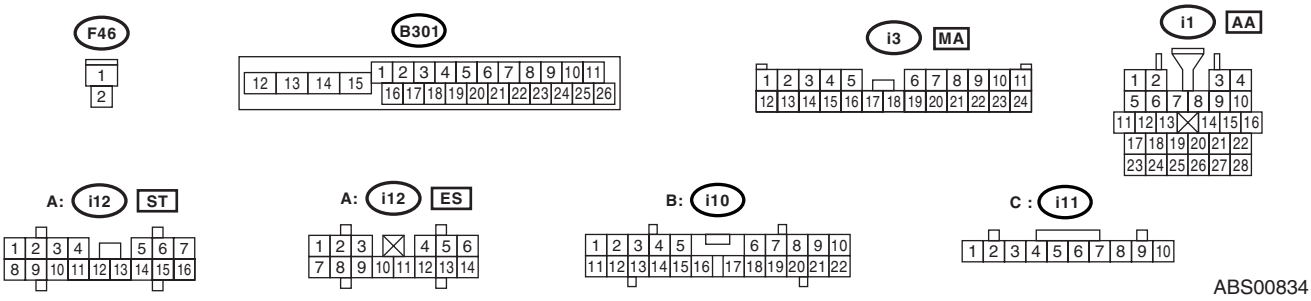
- Defective combination meter
- Open in harness

TROUBLE SYMPTOM:

When starting the engine, the ABS warning light is kept on.

WIRING DIAGRAM:





ABS00834

	Step	Check	Yes	No
1	**READ DTC.** Read the DTC. <Ref. to ABS(diag)-24, Read Diagnostic Trouble Code (DTC).>	Is DTC displayed?	Perform the diagnosis according to DTC.	Go to step **2.**
2	**CHECK WIRING HARNESS.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U. 3) Disconnect the connector from the combination meter. 4) Measure the resistance between ABSCM connector and combination meter connector. ***Connector & terminal*** ***(B301) No. 22 — (i10) No. 3:***	Is the resistance less than 0.5 Ω?	Go to step **3.**	Repair harness and connector between ABSCM&H/U and combination meter connector.
3	**CHECK POOR CONTACT IN CONNECTOR.** Check poor contact in all connectors.	Is there poor contact?	Repair the connector.	Go to step **4.**
4	**CHECK ABSCM.** 1) Connect the connector to the ABSCM&H/U. 2) Turn the ignition switch to ON. 3) Measure the resistance between combination meter connector and chassis ground. ***Connector & terminal*** ***(i10) No. 3 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Check the combination meter.	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

D: BRAKE WARNING LIGHT DOES NOT GO OFF

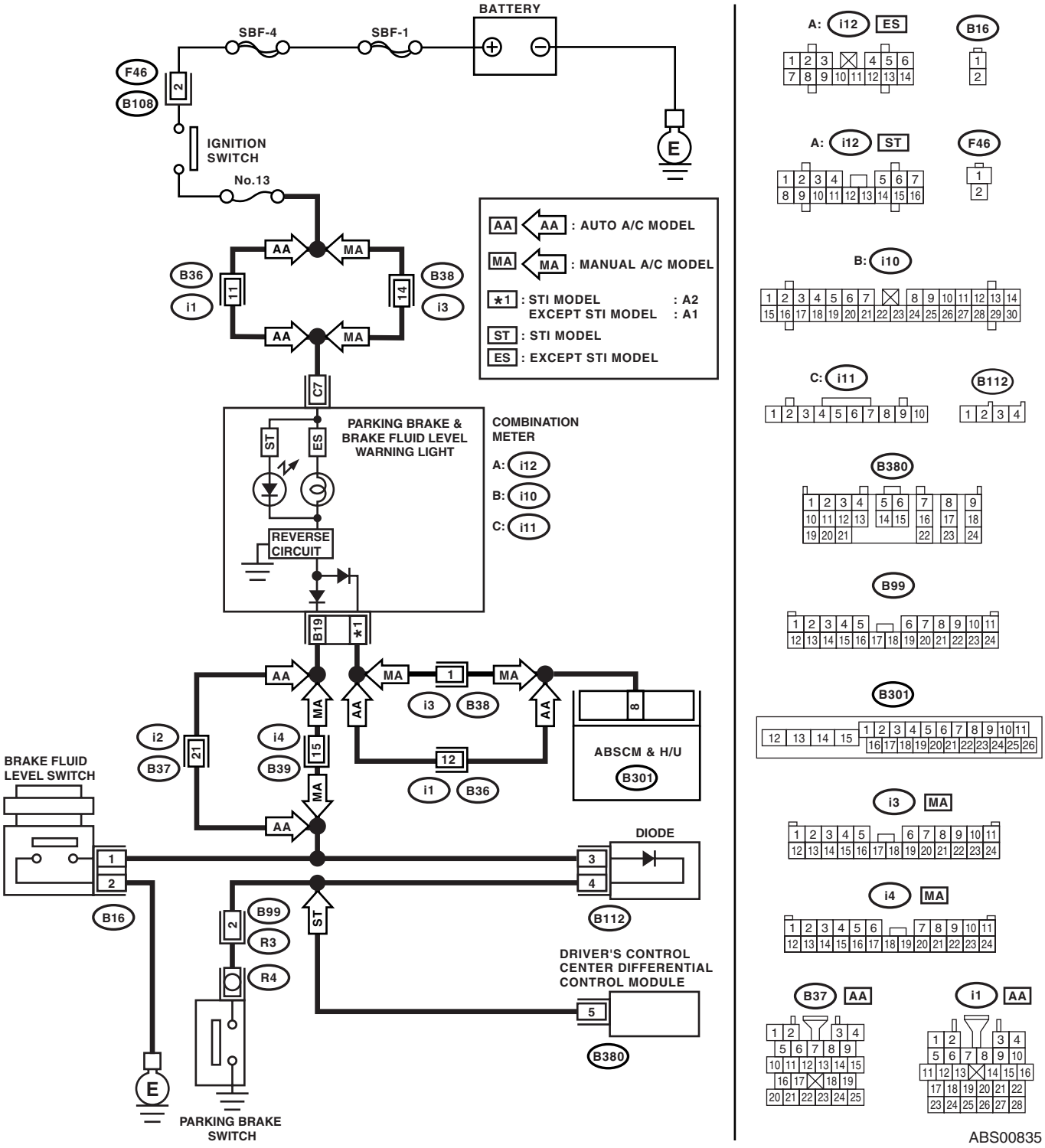
DETECTING CONDITION:

- Brake warning light circuit is shorted.
- Defective sensor/connector

TROUBLE SYMPTOM:

After starting the engine, the brake warning light is kept on though the parking lever is released.

WIRING DIAGRAM:



ABS00835

ABS Warning Light/Brake Warning Light Illumination Pattern

	Step	Check	Yes	No
1	**CHECK INSTALLATION OF ABSCM&H/U CONNECTOR.** 1) Turn the ignition switch to OFF. 2) Check that the ABSCM&H/U connector is inserted to ABSCM&H/U until the clamp locks onto it.	Is the connector correctly inserted?	Go to step **2.**	Insert the ABSCM&H/U connector until the clamp locks onto it.
2	**READ DTC.** Read the DTC. <Ref. to ABS(diag)-24, Read Diagnostic Trouble Code (DTC).>	Is DTC displayed?	Perform the diagnosis according to DTC.	Go to step **3.**
3	**CHECK THE BRAKE FLUID AMOUNT.** Check the amount of brake fluid in the reservoir tank of master cylinder.	Is the amount of brake fluid between the lines of MAX and MIN?	Go to step **4.**	Replenish brake fluid to the specified value.
4	**CHECK BRAKE FLUID LEVEL SWITCH.** 1) Disconnect the brake fluid level switch connector (B16) from master cylinder. 2) Measure the resistance of brake fluid switch terminals. ***Terminals*** ***No. 1 — No. 2:***	Is the resistance more than 1 MΩ?	Go to step **5.**	Replace the master cylinder.
5	**CHECK PARKING BRAKE SWITCH.** 1) Disconnect the connector (R4) from parking brake switch. 2) Release the parking brake. 3) Measure the resistance between parking brake switch terminal and chassis ground.	Is the resistance more than 1 MΩ?	Go to step **6.**	Replace the parking brake switch.
6	**CHECK GROUND SHORT OF HARNESS.** 1) Disconnect the connector from combination meter. 2) Measure the resistance between combination meter connector and chassis ground. ***Connector & terminal*** ***(i10) No. 19 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **7.**	Repair the harness connector between combination meter and parking brake switch.
7	**CHECK HARNESS.** 1) Disconnect the connector from ABSCM&H/U. 2) Disconnect the connector from the combination meter. 3) Measure the resistance between ABSCM&H/U connector and combination meter connector. ***Connector & terminal*** ***(B301) No. 8 — (i12) No. 1:***	Is the resistance less than 0.5 Ω?	Go to step **8.**	Repair harness between ABSCM&H/U and combination meter connector.
8	**CHECK POOR CONTACT IN CONNECTOR.** Check poor contact in all connectors.	Is there poor contact?	Repair the connector.	Go to step **9.**
9	**CHECK ABSCM.** 1) Connect the connector to the ABSCM&H/U. 2) Turn the ignition switch to ON. 3) Measure the resistance between combination meter connector and chassis ground. ***Connector & terminal*** ***(i12) No. 1 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Check the combination meter.	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

11.List of Diagnostic Trouble Code (DTC)

A: LIST

DTC	Display screen	Contents of diagnosis	Index No.
—	Communication for initializing impossible	Subaru Select Monitor communication failure	<Ref. to ABS(diag)-19, COMMUNICATION FOR INITIALIZING IMPOSSIBLE, INSPECTION, Subaru Select Monitor.>
—	No DTC	Although no DTC appears on the Subaru Select Monitor display, the ABS warning light remains on.	<Ref. to ABS(diag)-21, NO TROUBLE CODE, INSPECTION, Subaru Select Monitor.>
21	Open or short circuit in Front ABS wheel speed sensor RH circuit	Open or short circuit in Front ABS wheel speed sensor RH circuit	<Ref. to ABS(diag)-36, DTC 21 OPEN OR SHORT CIRCUIT IN FRONT RIGHT ABS WHEEL SPEED SENSOR CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
22	Front ABS wheel speed sensor RH abnormal signal	Front ABS wheel speed sensor RH abnormal signal	<Ref. to ABS(diag)-42, DTC 22 FRONT RIGHT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
23	Open or short circuit in Front ABS wheel speed sensor LH circuit	Open or short circuit in Front ABS wheel speed sensor LH circuit	<Ref. to ABS(diag)-36, DTC 23 OPEN OR SHORT CIRCUIT IN FRONT LEFT ABS WHEEL SPEED SENSOR CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
24	Front ABS wheel speed sensor LH abnormal signal	Front ABS wheel speed sensor LH abnormal signal	<Ref. to ABS(diag)-42, DTC 24 FRONT LEFT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
25	Open or short circuit in Rear ABS wheel speed sensor RH circuit	Open or short circuit in Rear ABS wheel speed sensor RH circuit	<Ref. to ABS(diag)-36, DTC 25 OPEN OR SHORT CIRCUIT IN REAR RIGHT ABS WHEEL SPEED SENSOR CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
26	Rear ABS wheel speed sensor RH abnormal signal	Rear ABS wheel speed sensor RH abnormal signal	<Ref. to ABS(diag)-42, DTC 26 REAR RIGHT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
27	Open or short circuit in Rear ABS wheel speed sensor LH circuit	Open or short circuit in Rear ABS wheel speed sensor LH circuit	<Ref. to ABS(diag)-37, DTC 27 OPEN OR SHORT CIRCUIT IN REAR LEFT ABS WHEEL SPEED SENSOR CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
28	Rear ABS wheel speed sensor LH abnormal signal	Rear ABS wheel speed sensor LH abnormal signal	<Ref. to ABS(diag)-43, DTC 28 REAR LEFT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
29	Abnormal ABS wheel speed sensor signal on any one of four sensor	Abnormal ABS wheel speed sensor signal on any one of four	<Ref. to ABS(diag)-47, DTC 29 ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL ON ANY ONE OF FOUR SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
31	Front inlet valve RH malfunction	Front inlet valve RH malfunction	<Ref. to ABS(diag)-51, DTC 31 FRONT RIGHT INLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
32	Front outlet valve RH malfunction	Front outlet valve RH malfunction	<Ref. to ABS(diag)-53, DTC 32 FRONT RIGHT OUTLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
33	Front inlet valve LH malfunction	Front inlet valve LH malfunction	<Ref. to ABS(diag)-51, DTC 33 FRONT LEFT INLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
34	Front outlet valve LH malfunction	Front outlet valve LH malfunction	<Ref. to ABS(diag)-53, DTC 34 FRONT LEFT OUTLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
35	Rear inlet valve RH malfunction	Rear inlet valve RH malfunction	<Ref. to ABS(diag)-51, DTC 35 REAR RIGHT INLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

DTC	Display screen	Contents of diagnosis	Index No.
36	Rear outlet valve RH malfunction	Rear outlet valve RH malfunction	<Ref. to ABS(diag)-53, DTC 36 REAR RIGHT OUTLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
37	Rear inlet valve LH malfunction	Rear inlet valve LH malfunction	<Ref. to ABS(diag)-51, DTC 37 REAR LEFT INLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
38	Rear outlet valve LH malfunction	Rear outlet valve LH malfunction	<Ref. to ABS(diag)-53, DTC 38 REAR LEFT OUTLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
41	ABS control module malfunction	ABSCM&H/U	<Ref. to ABS(diag)-56, DTC 41 ABS CONTROL MODULE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
42	Power supply voltage Failure	Power voltage malfunction	<Ref. to ABS(diag)-57, DTC 42 POWER VOLTAGE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
47	Improper CAN Communication	CAN communication circuit failure	<Ref. to ABS(diag)-60, DTC 47 IMPROPER CAN COMMUNICATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
51	Valve relay malfunction	Valve relay malfunction	<Ref. to ABS(diag)-63, DTC 51 VALVE RELAY MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
52	Motor and motor Relay	Motor/motor relay on failure	<Ref. to ABS(diag)-66, DTC 52 MOTOR / MOTOR RELAY ON FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
54	Stop light switch signal circuit malfunction	Stop light switch signal circuit malfunction	<Ref. to ABS(diag)-69, DTC 54 STOP LIGHT SWITCH SIGNAL CIRCUIT MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
56	G sensor Failure	Faulty G sensor output voltage or output signal	<Ref. to ABS(diag)-71, DTC 56 FAULTY G SENSOR OUTPUT VOLTAGE OR OUTPUT SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
73	Lateral G sensor Failure	Lateral G sensor output voltage or output signal malfunction	<Ref. to ABS(diag)-74, DTC 73 LATERAL G SENSOR OUTPUT VOLTAGE OR OUTPUT SIGNAL MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

12.Diagnostic Procedure with Diagnostic Trouble Code (DTC)

A: DTC 21 OPEN OR SHORT CIRCUIT IN FRONT RIGHT ABS WHEEL SPEED SENSOR CIRCUIT

NOTE:
For the diagnostic procedure, refer to DTC 27. <Ref. to ABS(diag)-37, DTC 27 OPEN OR SHORT CIRCUIT IN REAR LEFT ABS WHEEL SPEED SENSOR CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

B: DTC 23 OPEN OR SHORT CIRCUIT IN FRONT LEFT ABS WHEEL SPEED SENSOR CIRCUIT

NOTE:
For the diagnostic procedure, refer to DTC 27. <Ref. to ABS(diag)-37, DTC 27 OPEN OR SHORT CIRCUIT IN REAR LEFT ABS WHEEL SPEED SENSOR CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

C: DTC 25 OPEN OR SHORT CIRCUIT IN REAR RIGHT ABS WHEEL SPEED SENSOR CIRCUIT

NOTE:
For the diagnostic procedure, refer to DTC 27. <Ref. to ABS(diag)-37, DTC 27 OPEN OR SHORT CIRCUIT IN REAR LEFT ABS WHEEL SPEED SENSOR CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

D: DTC 27 OPEN OR SHORT CIRCUIT IN REAR LEFT ABS WHEEL SPEED SENSOR CIRCUIT

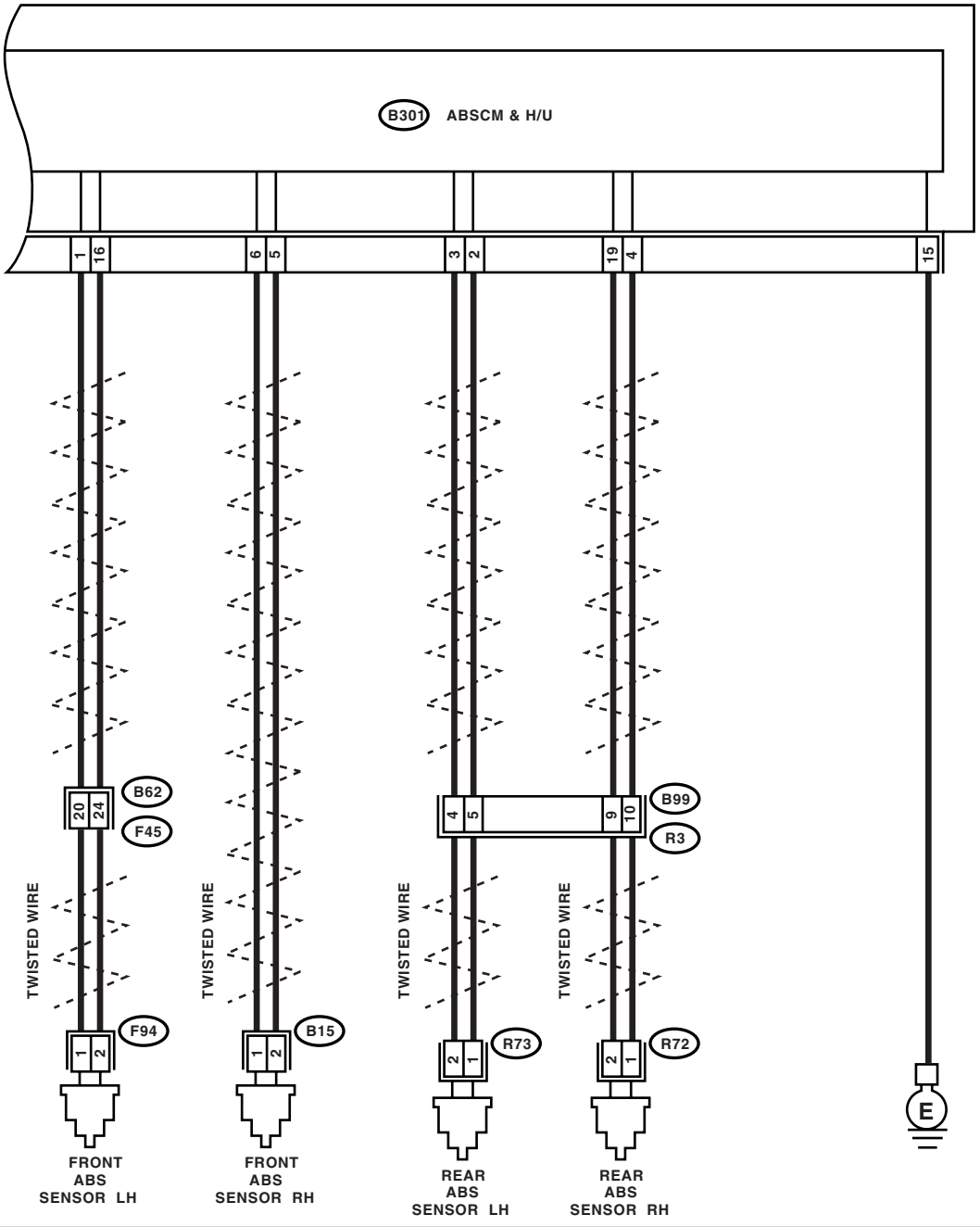
DIAGNOSIS:

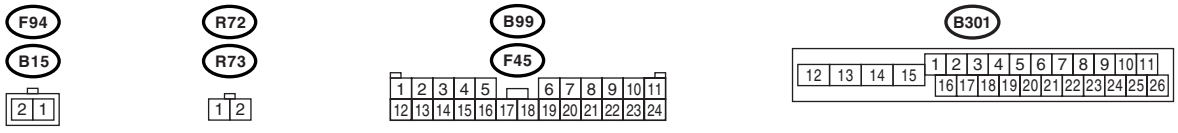
- Faulty ABS wheel speed sensor (Broken wire, input voltage too high)
- Faulty harness connector

TROUBLE SYMPTOM:

ABS does not operate.

WIRING DIAGRAM:





ABS00607

	Step	Check	Yes	No
1	**CHECK OUTPUT OF ABS WHEEL SPEED SENSOR USING SUBARU SELECT MONITOR.** 1) Select “Current data display & Save” on the Subaru Select Monitor. 2) Read the ABS wheel speed sensor output corresponding to faulty system in the Subaru Select Monitor data display mode.	Does the speed indicated on display change in response to speedometer reading during acceleration/deceleration when the steering wheel is in straight-ahead position?	Go to step **2.**	Go to step **8.**
2	**CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.**	Are the ABS wheel speed sensor installation bolts tightened 33 N·m (3.3 kgf-m, 24 ft-lb)?	Go to step **3.**	Tighten the ABS wheel speed sensor installation bolts securely.
3	**CHECK ABS WHEEL SPEED SENSOR GAP.** Measure the tone wheel to ABS wheel speed sensor piece gap over entire perimeter of the wheel.	Is the gap as following value? 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 the spacers cannot correct gap, replace worn sensor or worn tone wheel.
4	**CHECK TONE WHEEL RUNOUT.** 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-19, Front Tone Wheel.> Rear: <Ref. to ABS-20, Rear Tone Wheel.>
5	**CHECK POOR CONTACT IN CONNECTORS.** 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.**
6	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in the current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **7.**
7	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact. NOTE: Check the harness and connectors between ABSCM&H/U and ABS wheel speed sensor.

	Step	Check	Yes	No
8	**CHECK ABS WHEEL SPEED SENSOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABS wheel speed sensor. 3) Measure the resistance of ABS wheel speed sensor connector terminals while shaking the harness lightly. ***Terminals*** ***Front RH No. 1 — No. 2:*** ***Front LH No. 1 — No. 2:*** ***Rear RH No. 1 — No. 2:*** ***Rear LH No. 1 — No. 2:***	Is the resistance as following value? 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-13, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-16, Rear ABS Wheel Speed Sensor.>
9	**CHECK BATTERY SHORT OF ABS WHEEL SPEED SENSOR.** 1) Disconnect the connector from ABSCM&H/U. 2) Measure the voltage between ABS wheel speed sensor and chassis ground. ***Terminals*** ***Front RH No. 1 (+) — Chassis ground (−):*** ***Front LH No. 1 (+) — Chassis ground (−):*** ***Rear RH No. 1 (+) — Chassis ground (−):*** ***Rear LH No. 1 (+) — Chassis ground (−):***	Is the voltage less than 1 V?	Go to step **10.**	Replace the ABS wheel speed sensor. Front: <Ref. to ABS-13, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-16, Rear ABS Wheel Speed Sensor.>
10	**CHECK BATTERY SHORT OF ABS WHEEL SPEED SENSOR.** 1) Turn the ignition switch to ON. 2) Measure the voltage between ABS wheel speed sensor and chassis ground. ***Terminals*** ***Front RH No. 1 (+) — Chassis ground (−):*** ***Front LH No. 1 (+) — Chassis ground (−):*** ***Rear RH No. 1 (+) — Chassis ground (−):*** ***Rear LH No. 1 (+) — Chassis ground (−):***	Is the voltage less than 1 V?	Go to step **11.**	Replace the ABS wheel speed sensor. Front: <Ref. to ABS-13, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-16, Rear ABS Wheel Speed Sensor.>
11	**CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS WHEEL SPEED SENSOR.** 1) Turn the ignition switch to OFF. 2) Connect the connector to ABS wheel speed sensor. 3) Measure the resistance between ABSCM&H/U connector terminals. ***Connector & terminal*** ***DTC 21*** ***(B301) No. 6 — No. 5:*** ***DTC 23*** ***(B301) No. 1 — No. 16:*** ***DTC 25*** ***(B301) No. 19 — No. 4:*** ***DTC 27*** ***(B301) No. 3 — No. 2:***	Is the resistance as following value? 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.

	Step	Check	Yes	No
12	**CHECK BATTERY SHORT OF HARNESS.** Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***DTC 21*** ***(B301) No. 6 (+) — Chassis ground (−):*** ***DTC 23*** ***(B301) No. 1 (+) — Chassis ground (−):*** ***DTC 25*** ***(B301) No. 19 (+) — Chassis ground (−):*** ***DTC 27*** ***(B301) No. 3 (+) — Chassis ground (−):***	Is the voltage less than 1 V?	Go to step **13.**	Repair the harness between ABSCM&H/U and ABS wheel speed sensor.
13	**CHECK BATTERY SHORT OF HARNESS.** 1) Turn the ignition switch to ON. 2) Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***DTC 21*** ***(B301) No. 6 (+) — Chassis ground (−):*** ***DTC 23*** ***(B301) No. 1 (+) — Chassis ground (−):*** ***DTC 25*** ***(B301) No. 19 (+) — Chassis ground (−):*** ***DTC 27*** ***(B301) No. 3 (+) — Chassis ground (−):***	Is the voltage less than 1 V?	Go to step **14.**	Repair the harness between ABSCM&H/U and ABS wheel speed sensor.
14	**CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.**	Are the ABS wheel speed sensor installation bolts tightened 33 N·m (3.3 kgf-m, 24 ft-lb)?	Go to step **15.**	Tighten the ABS wheel speed sensor installation bolts securely.
15	**CHECK ABS WHEEL SPEED SENSOR GAP.** Measure the tone wheel to ABS wheel speed sensor piece gap over entire perimeter of the wheel.	Is the gap as following value? 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 **16.**	Adjust the gap. NOTE: Adjust the gap using spacers (Part No. 26755AA000). If the spacers cannot correct gap, replace worn sensor or worn tone wheel.
16	**CHECK TONE WHEEL RUNOUT.** Measure the tone wheel runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step **17.**	Replace the tone wheel. Front: <Ref. to ABS-19, Front Tone Wheel.> Rear: <Ref. to ABS-20, Rear Tone Wheel.>

	Step	Check	Yes	No
17	**CHECK GROUND SHORT OF ABS WHEEL SPEED SENSOR.** 1) Turn the ignition switch to ON. 2) Measure the resistance between ABS wheel speed sensor and chassis ground. ***Terminals*** ***Front RH No. 1 — Chassis ground:*** ***Front LH No. 1 — Chassis ground:*** ***Rear RH No. 1 — Chassis ground:*** ***Rear LH No. 1 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **18.**	Replace the ABS wheel speed sensor and ABSCM&H/U. Front: <Ref. to ABS-13, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-16, Rear ABS Wheel Speed Sensor.> and <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
18	**CHECK GROUND SHORT OF HARNESS.** 1) Turn the ignition switch to OFF. 2) Connect the connector to ABS wheel speed sensor. 3) Measure the resistance between ABSCM&H/U connector terminal and chassis ground. ***Connector & terminal*** ***DTC 21*** ***(B301) No. 6 — Chassis ground:*** ***DTC 23*** ***(B301) No. 1 — Chassis ground:*** ***DTC 25*** ***(B301) No. 19 — Chassis ground:*** ***DTC 27*** ***(B301) No. 3 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **19.**	Repair the harness between ABSCM&H/U and ABS wheel speed sensor. And replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
19	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in connectors between ABSCM&H/U and ABS wheel speed sensor?	Repair the connector.	Go to step **20.**
20	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in current diagnosis still being output?	Replace the ABSCM&H/U.	Go to step **21.**
21	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact. NOTE: Check the harness and connectors between ABSCM&H/U and ABS wheel speed sensor.

E: DTC 22 FRONT RIGHT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL

NOTE:
For the diagnostic procedure, refer to DTC 28. <Ref. to ABS(diag)-43, DTC 28 REAR LEFT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

F: DTC 24 FRONT LEFT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL

NOTE:
For the diagnostic procedure, refer to DTC 28. <Ref. to ABS(diag)-43, DTC 28 REAR LEFT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

G: DTC 26 REAR RIGHT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL

NOTE:
For the diagnostic procedure, refer to DTC 28. <Ref. to ABS(diag)-43, DTC 28 REAR LEFT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

H: DTC 28 REAR LEFT ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL

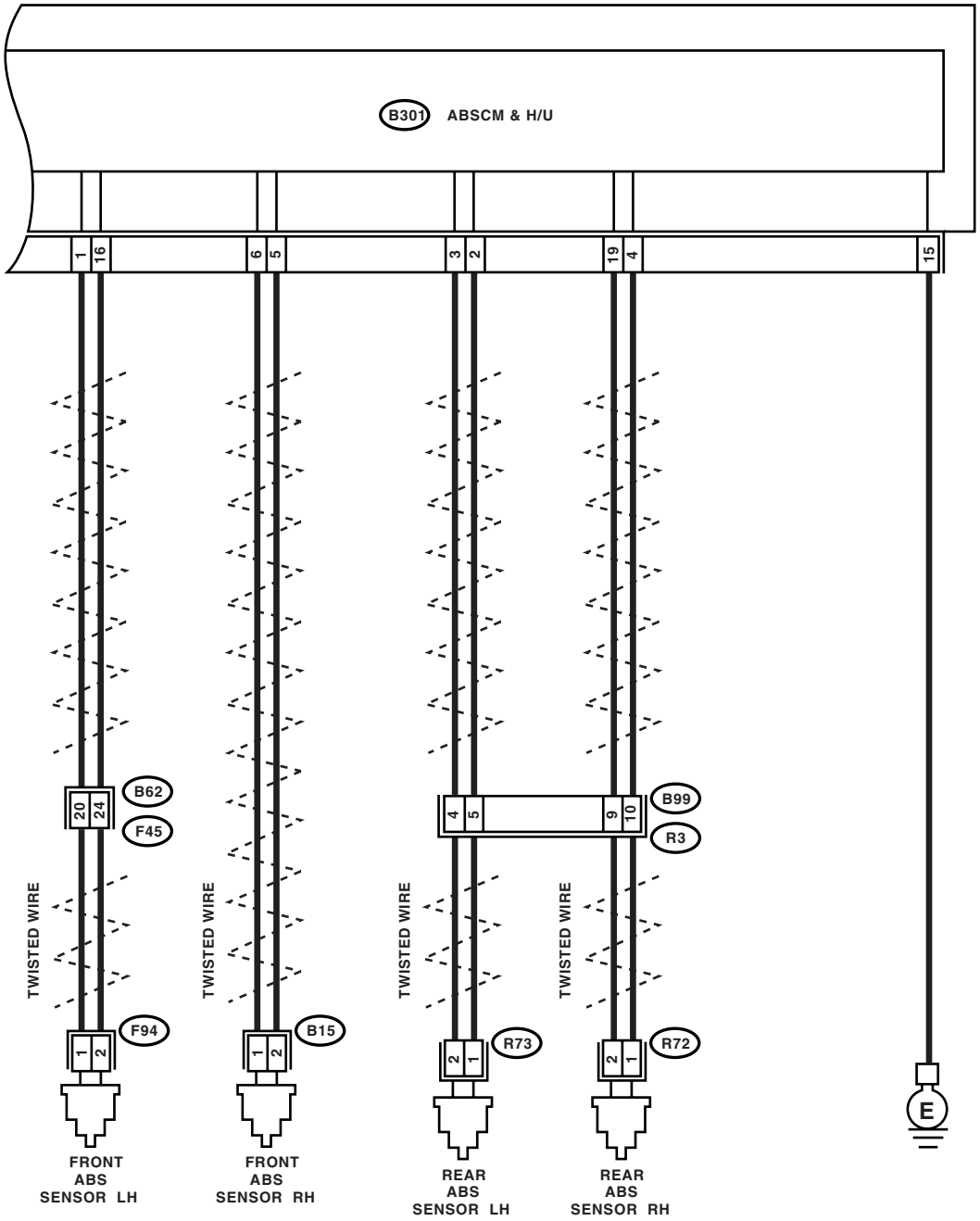
DIAGNOSIS:

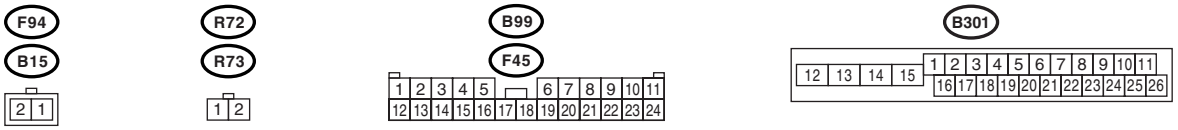
- Faulty ABS wheel speed sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:

ABS does not operate.

WIRING DIAGRAM:





ABS00607

	Step	Check	Yes	No
1	**CHECK OUTPUT OF ABS WHEEL SPEED SENSOR USING SUBARU SELECT MONITOR.** 1) Select “Current data display & Save” on the Subaru Select Monitor. 2) Read the ABS wheel speed sensor output corresponding to faulty system in the Subaru Select Monitor data display mode.	Does the speed indicated on display change in response to speedometer reading during acceleration/deceleration when the steering wheel is in straight-ahead position?	Go to step **2.**	Go to step **7.**
2	**CHECK POOR CONTACT IN CONNECTORS.** 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.**
3	**CHECK SOURCES OF SIGNAL NOISE.**	Is the car telephone or wireless transmitter properly installed?	Go to step **4.**	Properly install the car telephone or wireless transmitter.
4	**CHECK SOURCES OF SIGNAL NOISE.**	Are noise sources (such as an antenna) installed near the sensor harness?	Install the noise sources apart from sensor harness.	Go to step **5.**
5	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in the current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **6.**
6	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary noise interference.
7	**CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.**	Are the ABS wheel speed sensor installation bolts tightened 33 N·m (3.3 kgf-m, 24 ft-lb)?	Go to step **8.**	Tighten the ABS wheel speed sensor installation bolts securely.
8	**CHECK ABS WHEEL SPEED SENSOR GAP.** Measure the tone wheel to ABS wheel speed sensor piece gap over entire perimeter of wheel.	Is the gap as following value? 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 spacer (Part No. 26755AA000). If the spacers cannot correct gap, replace worn sensor or worn tone wheel.
9	**PREPARE OSCILLOSCOPE.**	Is an oscilloscope available?	Go to step **10.**	Go to step **11.**

	Step	Check	Yes	No
10	**CHECK ABS WHEEL SPEED SENSOR SIGNAL.** 1) Raise all four wheels off ground. 2) Turn the ignition switch to OFF. 3) Connect the oscilloscope to the connector. 4) Turn the ignition switch to ON. 5) Rotate the wheels and measure voltage at specified frequency. <Ref. to ABS(diag)-15, WAVEFORM, Control Module I/O Signal.> NOTE: When this inspection is completed, the ABSCM&H/U sometimes stores DTC 29 or DTC 56. ***Connector & terminal*** ***DTC 22*** ***(B15) No. 1 (+) — No. 2 (–):*** ***DTC 24*** ***(B62) No. 20 (+) — No. 24 (–):*** ***DTC 26*** ***(B99) No. 10 (+) — No. 9 (–):*** ***DTC 28*** ***(B99) No. 5 (+) — No. 4 (–):***	Is the waveform pattern on oscilloscope as shown in the figure?	Go to step **14.**	Go to step **11.**
11	**CHECK CONTAMINATION OF ABS WHEEL SPEED SENSOR OR TONE WHEEL.** Remove the disc rotor or drum from hub in accordance with DTC.	Is the ABS wheel speed sensor piece or tone wheel contaminated by dirt or other foreign matter?	Thoroughly remove dirt or other foreign matter.	Go to step **12.**
12	**CHECK DAMAGE OF ABS WHEEL SPEED SENSOR OR TONE WHEEL.**	Are there broken or damaged in the ABS wheel speed sensor piece or tone wheel?	Go to step **13.**	Replace the ABS wheel speed sensor or tone wheel. Front: <Ref. to ABS-13, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-16, Rear ABS Wheel Speed Sensor.> and Front: <Ref. to ABS-19, Front Tone Wheel.> Rear: <Ref. to ABS-20, Rear Tone Wheel.>
13	**CHECK TONE WHEEL RUNOUT.** 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-19, Front Tone Wheel.> Rear: <Ref. to ABS-20, Rear Tone Wheel.>

	Step	Check	Yes	No
14	**CHECK RESISTANCE OF ABS WHEEL SPEED SENSOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABS wheel speed sensor. 3) Measure the resistance between ABS wheel speed sensor connector terminals while shaking the harness lightly. ***Terminals*** ***Front RH No. 1 — No. 2:*** ***Front LH No. 1 — No. 2:*** ***Rear RH No. 1 — No. 2:*** ***Rear LH No. 1 — No. 2:***	Is the resistance as following value? 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-13, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-16, Rear ABS Wheel Speed Sensor.>
15	**CHECK GROUND SHORT OF ABS WHEEL SPEED SENSOR.** Measure the resistance between ABS wheel speed sensor and chassis ground. ***Terminals*** ***Front RH No. 1 — Chassis ground:*** ***Front LH No. 1 — Chassis ground:*** ***Rear RH No. 1 — Chassis ground:*** ***Rear LH No. 1 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **16.**	Replace the ABS wheel speed sensor. Front: <Ref. to ABS-13, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-16, Rear ABS Wheel Speed Sensor.>
16	**CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS WHEEL SPEED SENSOR.** 1) Connect the connector to ABS wheel speed sensor. 2) Disconnect the connector from ABSCM&H/U. 3) Measure the resistance at ABSCM&H/U connector terminals. ***Connector & terminal*** ***DTC 22*** ***(B301) No. 6 — No. 5:*** ***DTC 24*** ***(B301) No. 1 — No. 16:*** ***DTC 26*** ***(B301) No. 19 — No. 4:*** ***DTC 28*** ***(B301) No. 3 — No. 2:***	Is the resistance as following value? 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.
17	**CHECK GROUND SHORT OF HARNESS.** Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***DTC 22*** ***(B301) No. 6 — Chassis ground:*** ***DTC 24*** ***(B301) No. 1 — Chassis ground:*** ***DTC 26*** ***(B301) No. 19 — Chassis ground:*** ***DTC 28*** ***(B301) No. 3 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **18.**	Repair the harness/connector between ABSCM&H/U and ABS wheel speed sensor.
18	**CHECK GROUND CIRCUIT OF ABSCM&H/U.** Measure the resistance between ABSCM&H/U and chassis ground. ***Connector & terminal*** ***(B301) No. 15 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Go to step **19.**	Repair the ABSCM&H/U ground harness.
19	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in connectors between ABSCM&H/U and ABS wheel speed sensor?	Repair the connector.	Go to step **20.**

	Step	Check	Yes	No
20	**CHECK SOURCES OF SIGNAL NOISE.**	Is the car telephone or the wireless transmitter properly installed?	Go to step **21.**	Properly install the car telephone or wireless transmitter.
21	**CHECK SOURCES OF SIGNAL NOISE.**	Are noise sources (such as an antenna) installed near the sensor harness?	Install the noise sources apart from sensor harness.	Go to step **22.**
22	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in the current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **23.**
23	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary noise interference. NOTE: Although the ABS warning light remains illuminating at this point, this is a normal condition. Vehicle must be driven at approx. 12 km/h (7.46 MPH) or faster to turn off ABS warning light. Make sure that the ABS warning light goes off after driving vehicle.

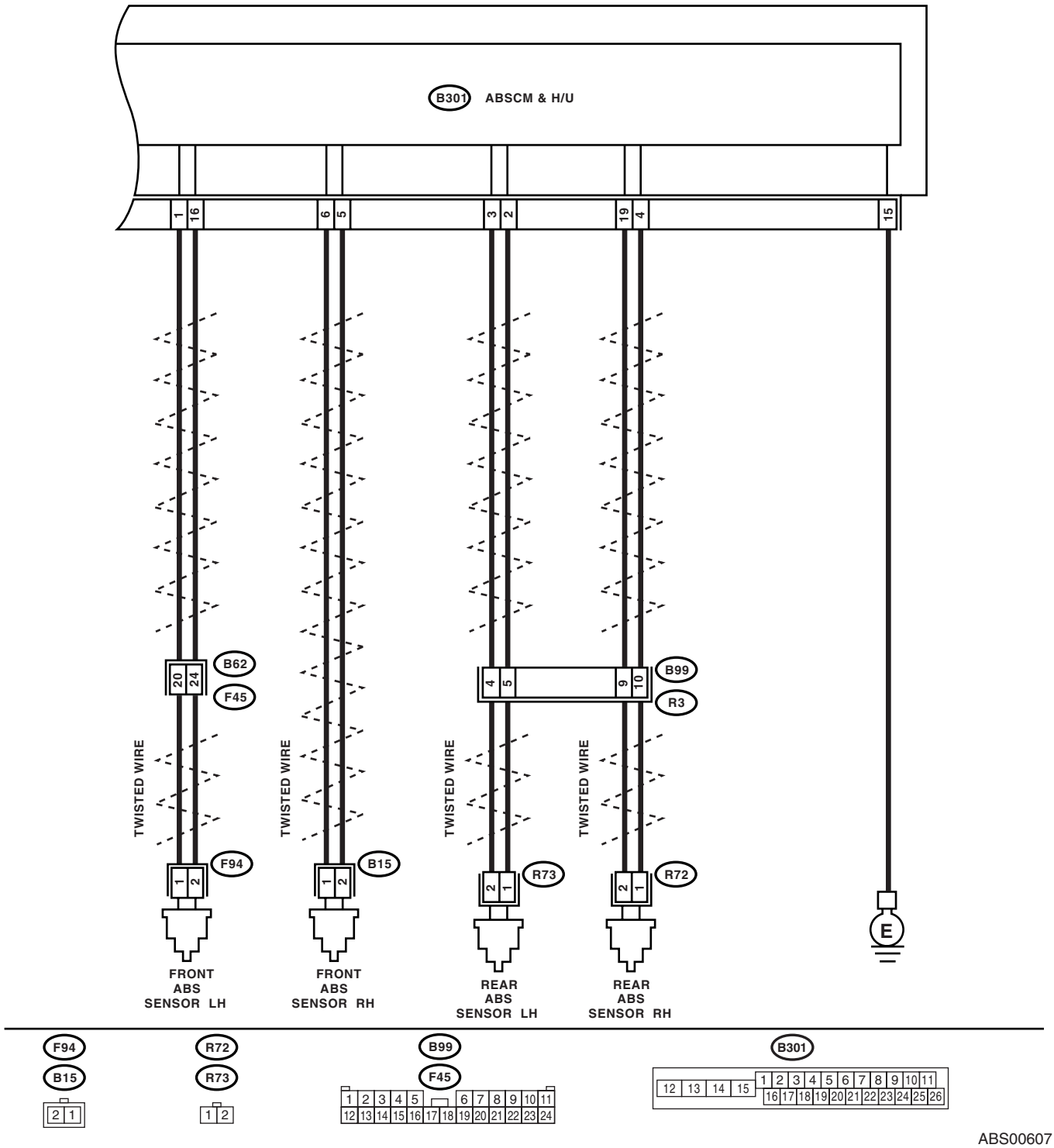
I: DTC 29 ABNORMAL ABS WHEEL SPEED SENSOR SIGNAL ON ANY ONE OF FOUR SENSOR

DIAGNOSIS:
- Faulty ABS wheel speed sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

TROUBLE SYMPTOM:
- ABS does not operate.
- EBD does not operate.

NOTE:
In addition to the ABS warning light, brake warning light illuminates.

WIRING DIAGRAM:



ABS00607

	Step	Check	Yes	No
1	**CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.**	Is the wheels have been turned freely for more than one minute, such as when vehicle is jacked-up, under full-lock cornering or the tires not in contact with road surface?	The ABS is normal. Erase the DTC. NOTE: When the wheels turn freely for a long time, such as when vehicle is towed or jacked-up, or when steering wheel is continuously turned all way, this DTC may sometimes occur.	Go to step **2.**
2	**CHECK TIRE SPECIFICATIONS.** Turn the ignition switch to OFF.	Are the tire specifications correct?	Go to step **3.**	Replace the tire.
3	**CHECK WEAR OF TIRE.**	Is the tire worn excessively?	Replace the tire.	Go to step **4.**
4	**CHECK TIRE PRESSURE.**	Is the tire pressure correct?	Go to step **5.**	Adjust the tire pressure.
5	**CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.**	Are the ABS wheel speed sensor installation bolts tightened 33 N·m (3.3 kgf-m, 24 ft-lb)?	Go to step **6.**	Tighten the ABS wheel speed sensor installation bolts securely.
6	**CHECK ABS WHEEL SPEED SENSOR GAP.** Measure the tone wheel to ABS wheel speed sensor piece gap over entire perimeter of the wheel.	Is the gap as following value? 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 spacer (Part No. 26755AA000). If the spacers cannot correct gap, replace worn sensor or worn tone wheel.
7	**PREPARE OSCILLOSCOPE.**	Is an oscilloscope available?	Go to step **8.**	Go to step **9.**
8	**CHECK ABS WHEEL SPEED SENSOR SIGNAL.** 1) Raise all four wheels off ground. 2) Turn the ignition switch to OFF. 3) Connect the oscilloscope to the connector. 4) Turn the ignition switch to ON. 5) Rotate the wheels and measure voltage at specified frequency. <Ref. to ABS(diag)-15, WAVEFORM, Control Module I/O Signal.> NOTE: When this inspection is completed, ABSCM& H/U sometimes stores the DTC 29. ***Connector & terminal*** ***Front RH*** ***(B15) No. 1 (+) — No. 2 (−):*** ***Front LH*** ***(B62) No. 20 (+) — No. 24 (−):*** ***Rear RH*** ***(B99) No. 10 (+) — No. 9 (−):*** ***Rear LH*** ***(B99) No. 5 (+) — No. 4 (−):***	Is the waveform pattern on oscilloscope as shown in the figure?	Go to step **12.**	Go to step **9.**
9	**CHECK CONTAMINATION OF ABS WHEEL SPEED SENSOR OR TONE WHEEL.** Remove the disc rotor or drum from hub.	Is the ABS wheel speed sensor piece or tone wheel contaminated by dirt or other foreign matter?	Thoroughly remove dirt or other foreign matter.	Go to step **10.**

	Step	Check	Yes	No
10	**CHECK DAMAGE OF ABS WHEEL SPEED SENSOR OR TONE WHEEL.**	Are there broken or damaged teeth in the ABS wheel speed sensor piece or tone wheel?	Replace the ABS wheel speed sensor or tone wheel. Front: <Ref. to ABS-13, Front ABS Wheel Speed Sensor.> Rear: <Ref. to ABS-16, Rear ABS Wheel Speed Sensor.> and Front: <Ref. to ABS-19, Front Tone Wheel.> Rear: <Ref. to ABS-20, Rear Tone Wheel.>	Go to step **11.**
11	**CHECK TONE WHEEL RUNOUT.** 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-19, Front Tone Wheel.> Rear: <Ref. to ABS-20, Rear Tone Wheel.>
12	**CHECK ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Connect all connectors. 3) Erase the memory. 4) Perform the inspection mode. 5) Read out the DTC.	Is the same DTC as in the current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **13.**
13	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact.

J: DTC 31 FRONT RIGHT INLET VALVE MALFUNCTION

NOTE:
For the diagnostic procedure, refer to DTC 37. <Ref. to ABS(diag)-51, DTC 37 REAR LEFT INLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

K: DTC 33 FRONT LEFT INLET VALVE MALFUNCTION

NOTE:
For the diagnostic procedure, refer to DTC 37. <Ref. to ABS(diag)-51, DTC 37 REAR LEFT INLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

L: DTC 35 REAR RIGHT INLET VALVE MALFUNCTION

NOTE:
For the diagnostic procedure, refer to DTC 37. <Ref. to ABS(diag)-51, DTC 37 REAR LEFT INLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

M: DTC 37 REAR LEFT INLET VALVE MALFUNCTION

DIAGNOSIS:

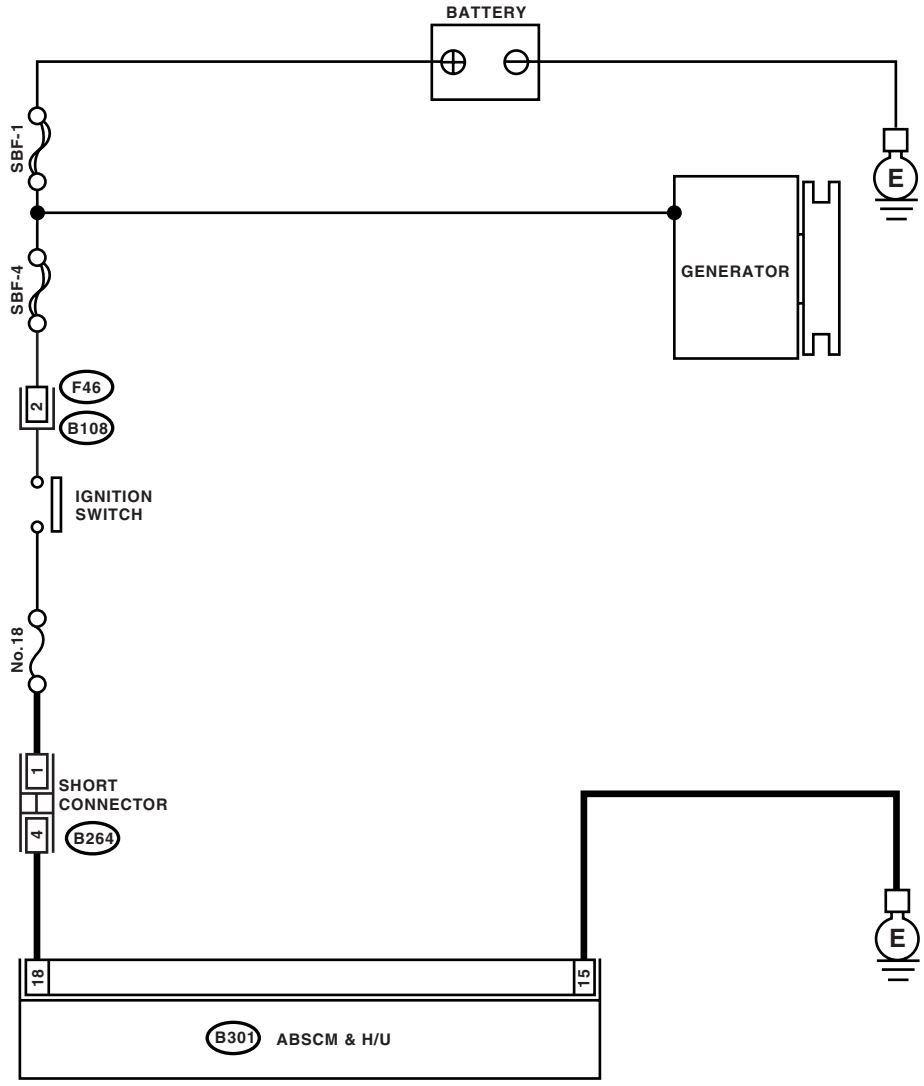
- Faulty harness/connector
- Faulty inlet solenoid valve

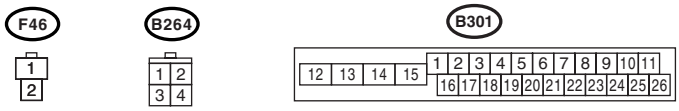
TROUBLE SYMPTOM:

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

NOTE:
In addition to the ABS warning light, brake warning light illuminates.

WIRING DIAGRAM:





ABS00836

	Step	Check	Yes	No
1	**CHECK INPUT VOLTAGE OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U. 3) Run the engine at idle. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 18 (+) — Chassis ground (−):***	Is the voltage 10 — 15 V?	Go to step **2.**	Repair the harness connector between battery, ignition switch and ABSCM&H/U.
2	**CHECK GROUND CIRCUIT OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 15 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Go to step **3.**	Repair the ABSCM&H/U ground harness.
3	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in connectors between generator, battery and ABSCM&H/U?	Repair the connector.	Go to step **4.**
4	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in the current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **5.**
5	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact.

N: DTC 32 FRONT RIGHT OUTLET VALVE MALFUNCTION

NOTE:
For the diagnostic procedure, refer to DTC 38. <Ref. to ABS(diag)-53, DTC 38 REAR LEFT OUTLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

O: DTC 34 FRONT LEFT OUTLET VALVE MALFUNCTION

NOTE:
For the diagnostic procedure, refer to DTC 38. <Ref. to ABS(diag)-53, DTC 38 REAR LEFT OUTLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

P: DTC 36 REAR RIGHT OUTLET VALVE MALFUNCTION

NOTE:
For the diagnostic procedure, refer to DTC 38. <Ref. to ABS(diag)-53, DTC 38 REAR LEFT OUTLET VALVE MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

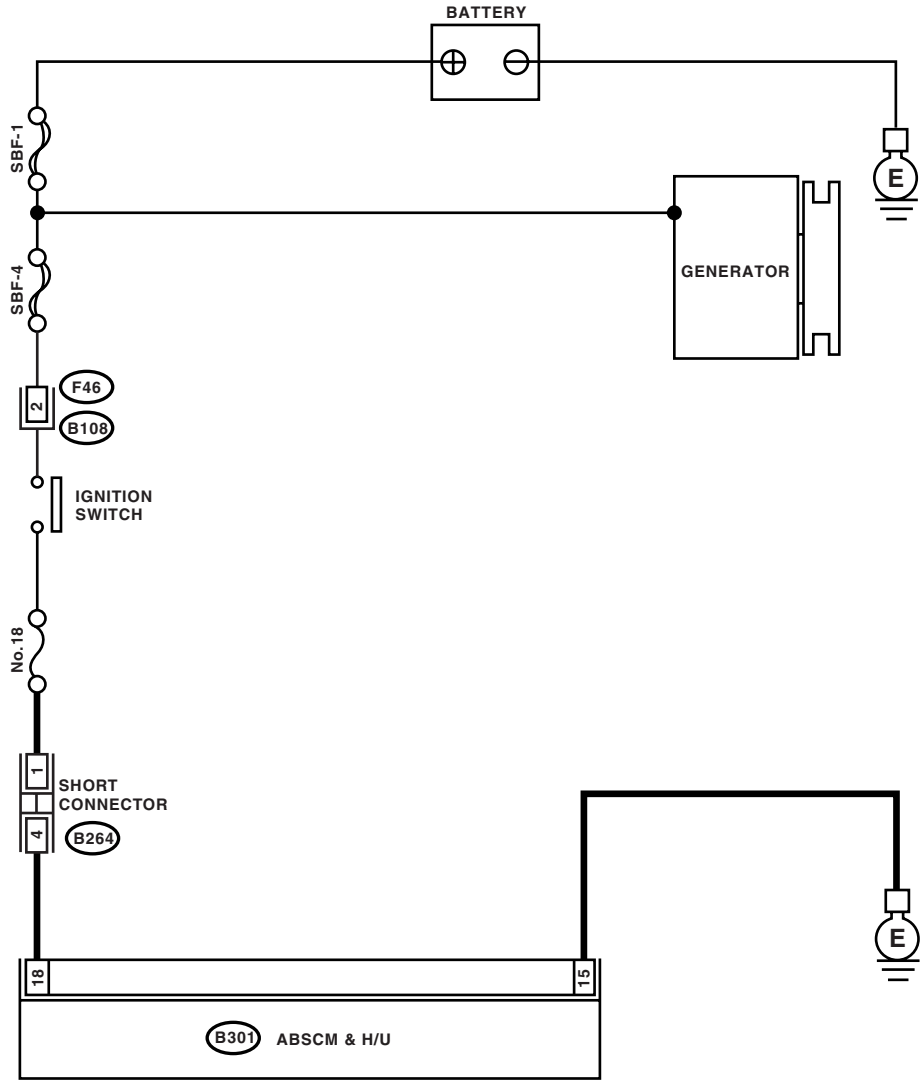
Q: DTC 38 REAR LEFT OUTLET VALVE MALFUNCTION

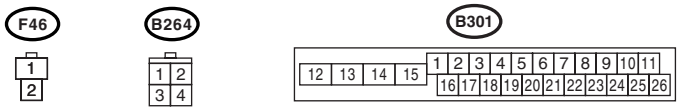
DIAGNOSIS:
- Faulty harness/connector
- Faulty outlet solenoid valve

TROUBLE SYMPTOM:
- ABS does not operate.
- EBD does not operate.

NOTE:
In addition to the ABS warning light, brake warning light illuminates.

WIRING DIAGRAM:





ABS00836

	Step	Check	Yes	No
1	**CHECK INPUT VOLTAGE OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U. 3) Run the engine at idle. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 18 (+) — Chassis ground (−):***	Is the voltage 10 — 15 V?	Go to step **2.**	Repair the harness connector between battery, ignition switch and ABSCM&H/U.
2	**CHECK GROUND CIRCUIT OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 15 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Go to step **3.**	Repair the ABSCM&H/U ground harness.
3	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in connectors between generator, battery and ABSCM&H/U?	Repair the connector.	Go to step **4.**
4	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in the current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **5.**
5	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact.

R: DTC 41 ABS CONTROL MODULE MALFUNCTION

DIAGNOSIS:

Faulty ABSCM&H/U

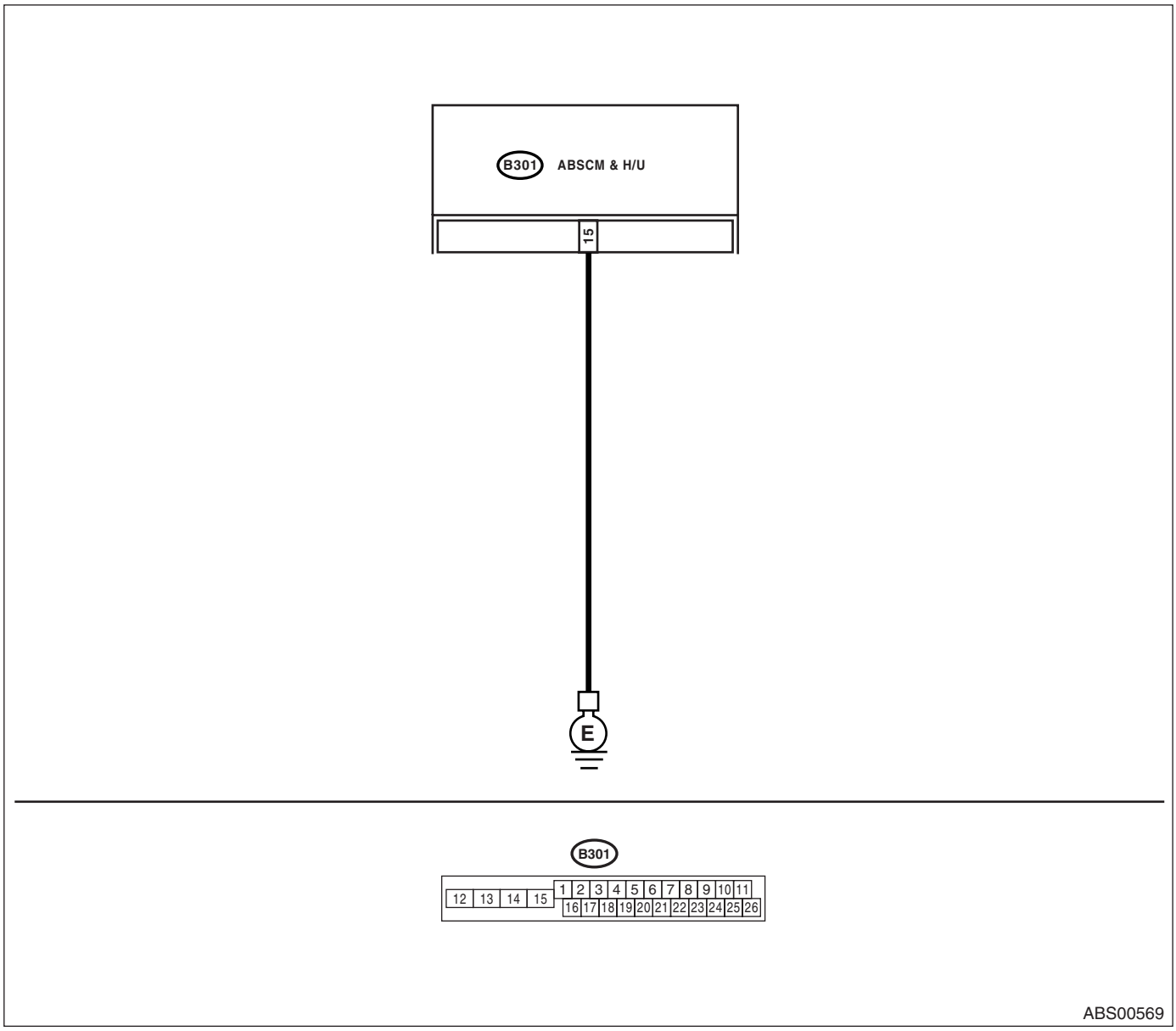
TROUBLE SYMPTOM:

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

NOTE:

In addition to the ABS warning light, brake warning light illuminates.

WIRING DIAGRAM:



	Step	Check	Yes	No
1	**CHECK GROUND CIRCUIT OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U. 3) Measure the resistance between ABSCM&H/U and chassis ground. ***Connector & terminal*** ***(B301) No. 15 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Go to step **2.**	Repair the ABSCM&H/U ground harness.
2	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in connectors between battery, ignition switch and ABSCM&H/U?	Repair the connector.	Go to step **3.**
3	**CHECK SOURCES OF SIGNAL NOISE.**	Is the car telephone or wireless transmitter properly installed?	Go to step **4.**	Properly install the car telephone or wireless transmitter.
4	**CHECK SOURCES OF SIGNAL NOISE.**	Are noise sources (such as an antenna) installed near the sensor harness?	Install the noise sources apart from sensor harness.	Go to step **5.**
5	**CHECK ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Connect all connectors. 3) Erase the memory. 4) Perform the inspection mode. 5) Read out the DTC.	Is the same DTC as in current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **6.**
6	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact.

S: DTC 42 POWER VOLTAGE MALFUNCTION

DIAGNOSIS:

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

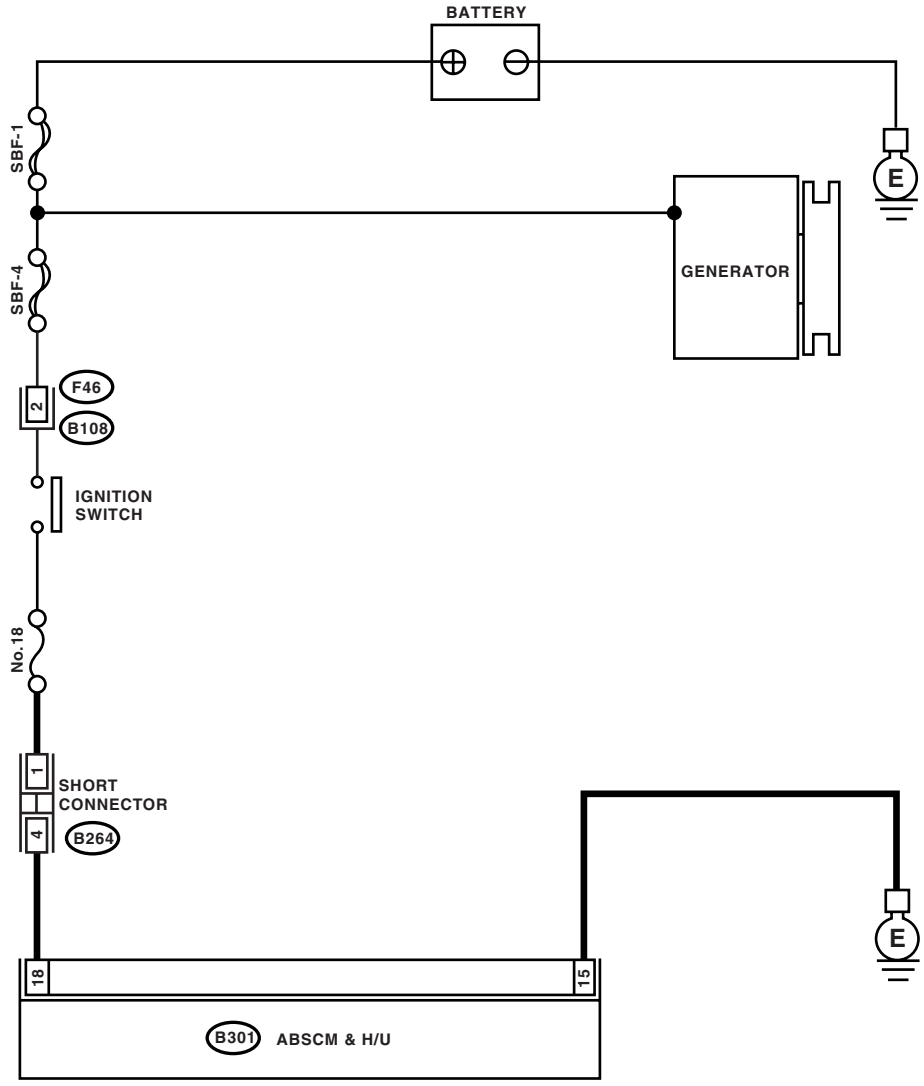
TROUBLE SYMPTOM:

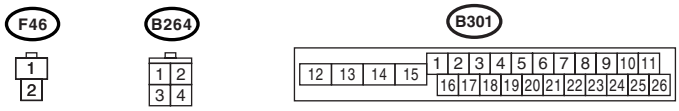
- ABS does not operate.
- EBD may not operate.

NOTE:

If EBD does not operate, brake warning light comes on as well as ABS warning light. Both warning lights go off if voltage returns.

WIRING DIAGRAM:





ABS00836

	Step	Check	Yes	No
1	**CHECK GENERATOR.** 1) Start the engine. 2) Idle after warm-up. 3) Measure the voltage between generator B terminal and chassis ground. ***Terminals*** ***Generator B terminal (+) — Chassis ground (−):***	Is the voltage 10 — 17 V?	Go to step **2.**	Repair the generator. <Ref. to SC(H4SO)-14, Generator.>
2	**CHECK BATTERY TERMINAL.** Turn the ignition switch to OFF.	Are the positive and negative battery terminals tightly clamped?	Go to step **3.**	Tighten the clamp of terminal.
3	**CHECK INPUT VOLTAGE OF ABSCM&H/U.** 1) Disconnect the connector from ABSCM&H/U. 2) Run the engine at idle. 3) Operate the electric load applying devices, such as the headlight, A/C, and defogger. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 18 (+) — Chassis ground (−):***	Is the voltage 10 — 17 V?	Go to step **4.**	Repair the harness connector between battery, ignition switch and ABSCM&H/U.
4	**CHECK GROUND CIRCUIT OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 15 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Go to step **5.**	Repair the ABSCM&H/U ground harness.
5	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in connectors between generator, battery and ABSCM&H/U?	Repair the connector.	Go to step **6.**
6	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in the current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **7.**
7	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact.

T: DTC 47 IMPROPER CAN COMMUNICATION

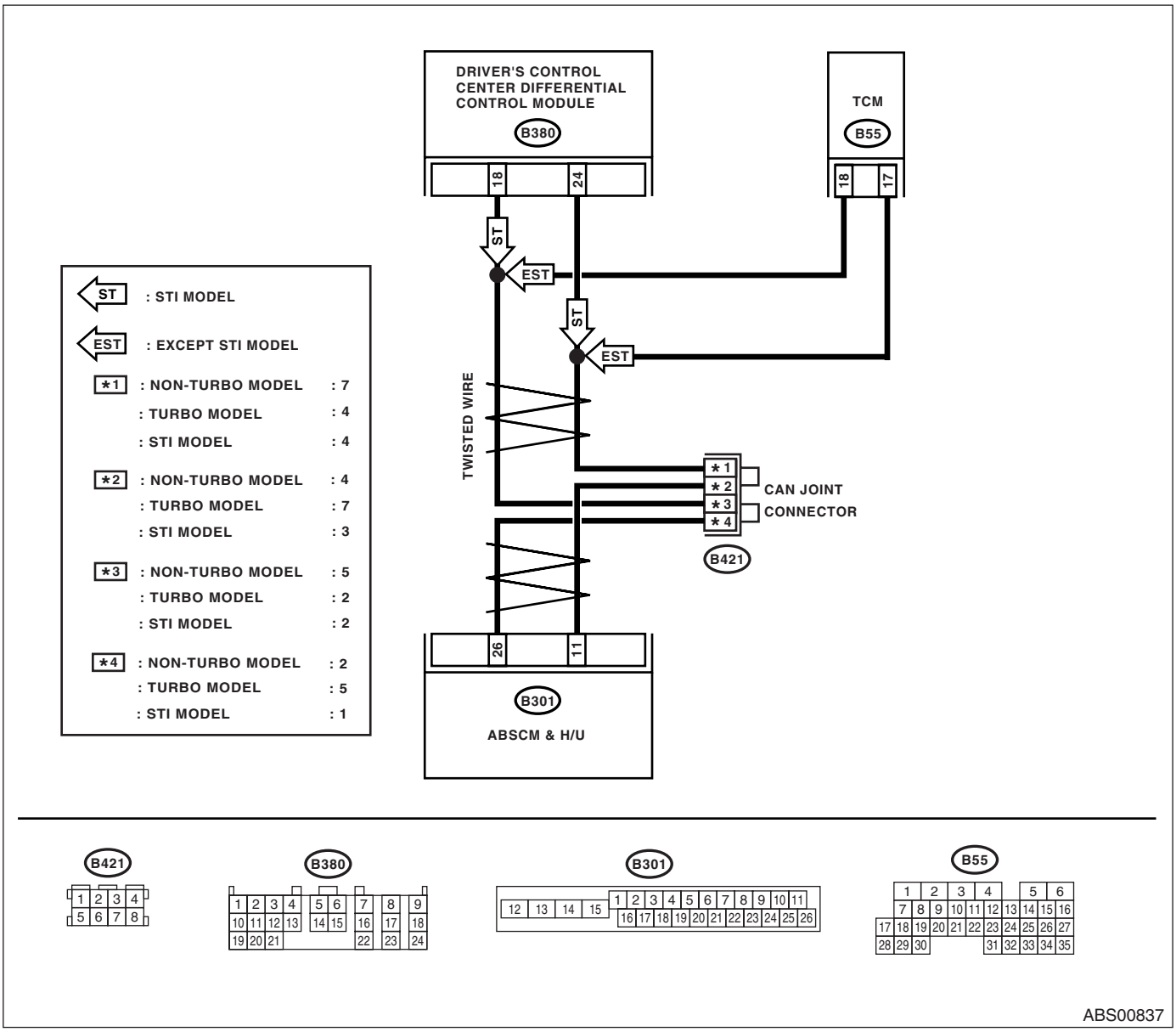
DIAGNOSIS:

CAN communication circuit is damaged or shorted.

TROUBLE SYMPTOM:

- ABS does not operate. (STI model)
- Tight corner braking phenomenon occurs. (AT model)

WIRING DIAGRAM:



ABS00837

	Step	Check	Yes	No
1	**CHECK MODEL TYPE.**	Is the vehicle STI model?	Go to step **2.**	Go to step **11.**
2	**CHECK HARNESS CONNECTOR BETWEEN ABSCM AND DRIVER'S CONTROL CENTER DIFFERENTIAL CONTROL MODULE.** 1) Turn the ignition switch to ON. 2) Disconnect the connector from ABSCM and driver's control center differential control module. 3) Measure the resistance of harness connector between ABSCM and driver's control center differential control module. ***Connector & terminal*** ***(B301) No. 26 — (B380) No. 18:*** ***(B301) No. 11 — (B380) No. 24:***	Is the resistance less than 0.5 Ω?	Go to step **3.**	Repair or replace the harness connector between ABSCM and driver's control center differential control module.
3	**CHECK GROUND SHORT OF HARNESS CONNECTOR BETWEEN ABSCM AND DRIVER'S CONTROL CENTER DIFFERENTIAL CONTROL MODULE.** Measure the resistance between ABSCM connector and chassis ground. ***Connector & terminal*** ***(B301) No. 26 — Chassis ground:*** ***(B301) No. 11 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **4.**	Repair or replace the harness connector between ABSCM and driver's control center differential control module.
4	**CHECK BATTERY SHORT OF HARNESS CONNECTOR BETWEEN ABSCM AND DRIVER'S CONTROL CENTER DIFFERENTIAL CONTROL MODULE.** 1) Turn the ignition switch to ON. 2) Measure the resistance between ABSCM connector and chassis ground. ***Connector & terminal*** ***(B301) No. 26 — Chassis ground:*** ***(B301) No. 11 — Chassis ground:***	Is the voltage less than 0.5 V?	Go to step **5.**	Repair or replace the harness connector between ABSCM and driver's control center differential control module.
5	**CHECK ABSCM.** 1) Turn the ignition switch to OFF. 2) Connect the connector to ABSCM. 3) Measure the resistance between driver's control center differential control module connector terminals. ***Connector & terminal*** ***(B380) No. 18 — (B380) No. 24:***	Is the resistance 120 ± 6 Ω?	Go to step **7.**	Go to step **6.**
6	**CHECK POOR CONTACT IN ABSCM CONNECTOR.**	Is there poor contact?	Repair poor contact in ABSCM connector.	Replace the ABSCM. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
7	**CHECK DRIVER'S CONTROL CENTER DIFFERENTIAL CONTROL MODULE.** 1) Connect the connector to driver's control differential control module. 2) Disconnect the connector from ABSCM. 3) Measure the resistance between ABSCM connector terminals. ***Connector & terminal*** ***(B301) No. 11 — (B301) No. 26:***	Is the resistance 120 ± 6 Ω?	Go to step **9.**	Go to step **8.**

	Step	Check	Yes	No
8	**CHECK POOR CONTACT IN DRIVER'S CONTROL CENTER DIFFERENTIAL CONTROL MODULE CONNECTOR.**	Is there poor contact?	Repair poor contact in driver's control center differential control module connector.	Replace the driver's control center differential control module. <Ref. to 6MT-126, Driver's Control Center Differential Control Module.>
9	**CHECK DTC.**	Is DTC 47 detected?	Replace the ABSCM. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **10.**
10	**CHECK DTC P1720 INDICATION FOR DRIVER'S CONTROL CENTER DIFFERENTIAL AUTO SYSTEM.**	Is DTC P1720 displayed?	Replace the driver's control center differential control module. <Ref. to 6MT-126, Driver's Control Center Differential Control Module.>	Replace the ABSCM. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
11	**CHECK HARNESS CONNECTOR BETWEEN ABSCM AND TCM.** 1) Turn the ignition switch to ON. 2) Disconnect the connector from ABSCM and TCM. 3) Measure the resistance of harness connector between ABSCM and TCM. ***Connector & terminal*** ***(B301) No. 26 — (B55) No. 18:*** ***(B301) No. 11 — (B55) No. 17:***	Is the resistance less than 0.5 Ω?	Go to step **12.**	Repair or replace the harness connector between ABSCM and TCM.
12	**CHECK GROUND SHORT OF HARNESS CONNECTOR BETWEEN ABSCM AND TCM.** Measure the resistance between ABSCM connector and chassis ground. ***Connector & terminal*** ***(B301) No. 26 — Chassis ground:*** ***(B301) No. 11 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **13.**	Repair or replace the harness connector between ABSCM and TCM.
13	**CHECK BATTERY SHORT OF HARNESS CONNECTOR BETWEEN ABSCM AND TCM.** 1) Turn the ignition switch to ON. 2) Measure the resistance between ABSCM connector and chassis ground. ***Connector & terminal*** ***(B301) No. 26 — Chassis ground:*** ***(B301) No. 11 — Chassis ground:***	Is the voltage less than 1.0 V?	Go to step **14.**	Repair or replace the harness connector between ABSCM and TCM.
14	**CHECK ABSCM.** 1) Turn the ignition switch to OFF. 2) Connect the connector to ABSCM. 3) Measure the resistance between TCM connector terminals. ***Connector & terminal*** ***(B55) No. 17 — (B55) No. 18:***	Is the resistance 120 ± 6 Ω?	Go to step **16.**	Go to step **15.**

	Step	Check	Yes	No
15	**CHECK POOR CONTACT IN ABSCM CONNECTOR.**	Is there poor contact?	Repair poor contact in ABSCM connector.	Replace the ABSCM. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
16	**CHECK TCM.** 1) Connect the connector to TCM. 2) Disconnect the connector from ABSCM. 3) Measure the resistance between ABSCM connector terminals. ***Connector & terminal (B301) No. 11 — (B301) No. 26:***	Is the resistance 120 ± 6 Ω?	Go to step **18.**	Go to step **17.**
17	**CHECK POOR CONTACT IN TCM CONNECTOR.**	Is there poor contact?	Repair poor contact in TCM connector.	Replace the TCM. <Ref. to 4AT-62, Transmission Control Module (TCM).>
18	**CHECK DTC.**	Is DTC 47 detected?	Replace the ABSCM. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **19.**
19	**CHECK DTC P1718 INDICATION FOR TCM SYSTEM.**	Is DTC P1718 displayed?	Replace the TCM. <Ref. to 4AT-62, Transmission Control Module (TCM).>	Replace the ABSCM. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

U: DTC 51 VALVE RELAY MALFUNCTION

DIAGNOSIS:

Faulty valve relay

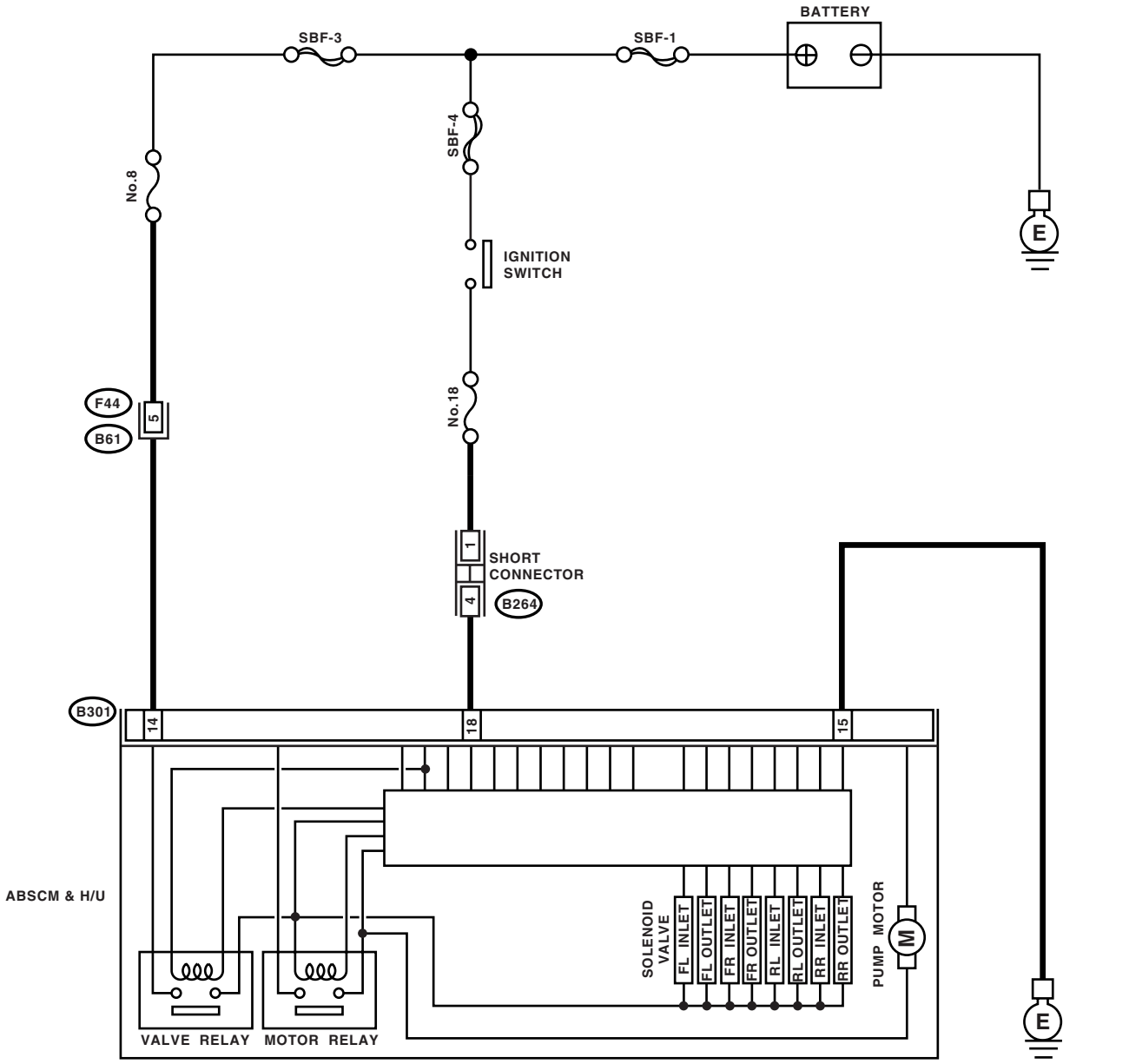
TROUBLE SYMPTOM:

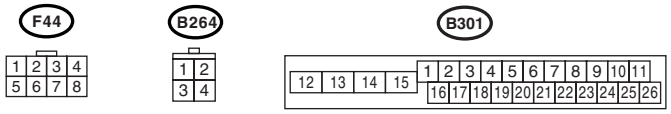
- ABS does not operate.
- EBD does not operate depending on the trouble contents.

NOTE:

In addition to the ABS warning light, brake warning light illuminates.

WIRING DIAGRAM:





ABS00872

	Step	Check	Yes	No
1	**CHECK INPUT VOLTAGE OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U. 3) Run the engine at idle. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 18 (+) — Chassis ground (−):*** ***(B301) No. 14 (+) — Chassis ground (−):***	Is the voltage 10 — 15 V?	Go to step **2.**	Repair the harness connector between battery and ABSCM&H/U.
2	**CHECK GROUND CIRCUIT OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 15 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Go to step **3.**	Repair the ABSCM&H/U ground harness.
3	**CHECK VALVE RELAY IN ABSCM&H/U.** Measure the resistance between ABSCM&H/U terminals. ***Terminals*** ***No. 14 — No. 15:***	Is the resistance more than 1 MΩ?	Go to step **4.**	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
4	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in connectors between generator, battery and ABSCM&H/U?	Repair the connector.	Go to step **5.**
5	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC still displayed?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **6.**
6	**CHECK ANY OTHER DTC.**	Is any other DTC displayed?	Inspect the DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to ABS(diag)-34, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact.

V: DTC 52 MOTOR / MOTOR RELAY ON FAILURE

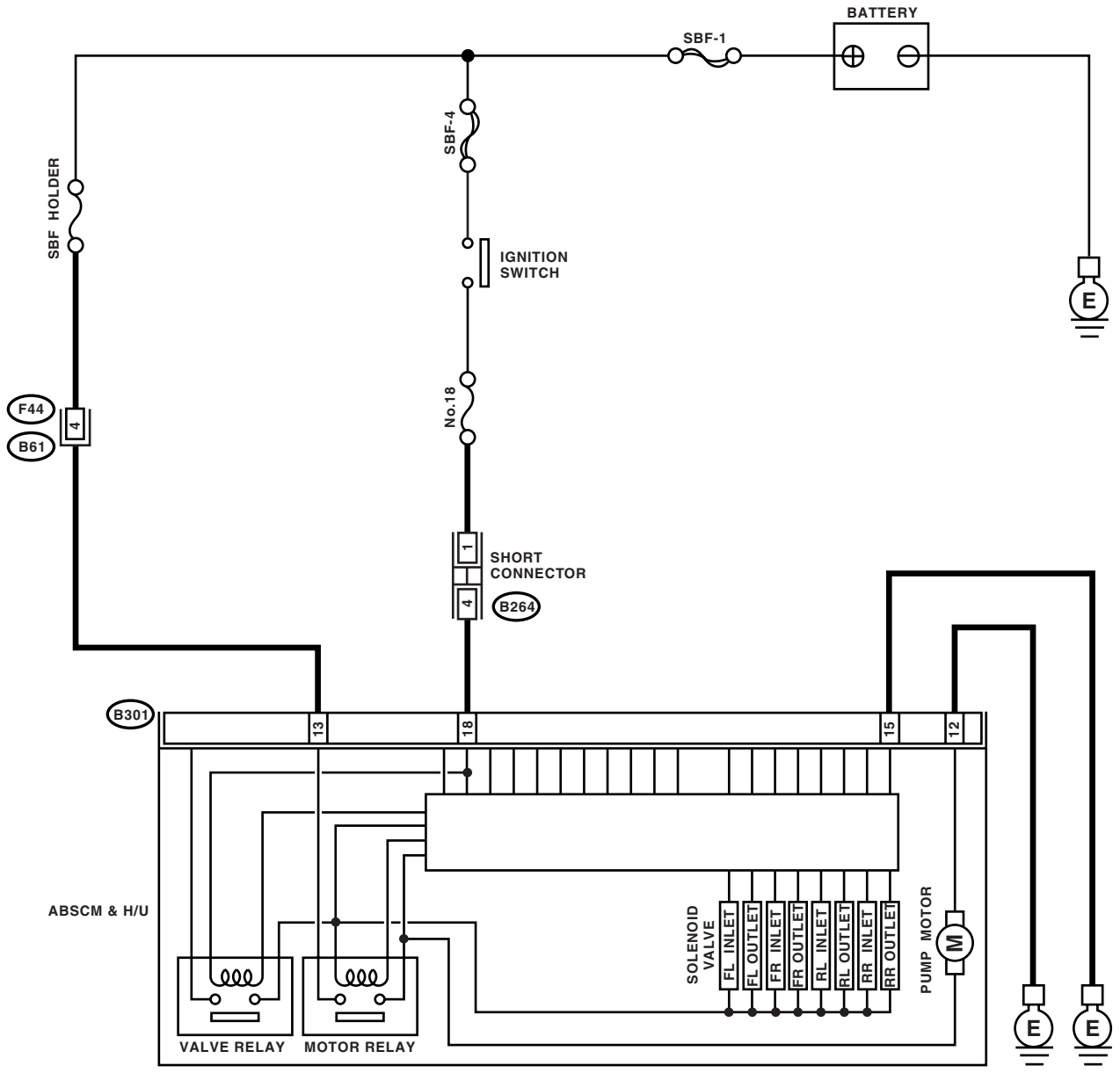
DIAGNOSIS:

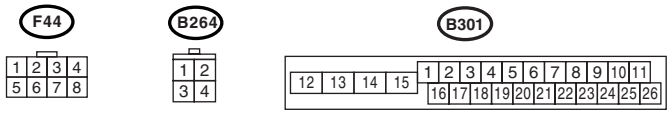
- Faulty motor
- Faulty motor relay
- Faulty harness connector
- Insufficient tightening of earth bolt

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:





ABS00873

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

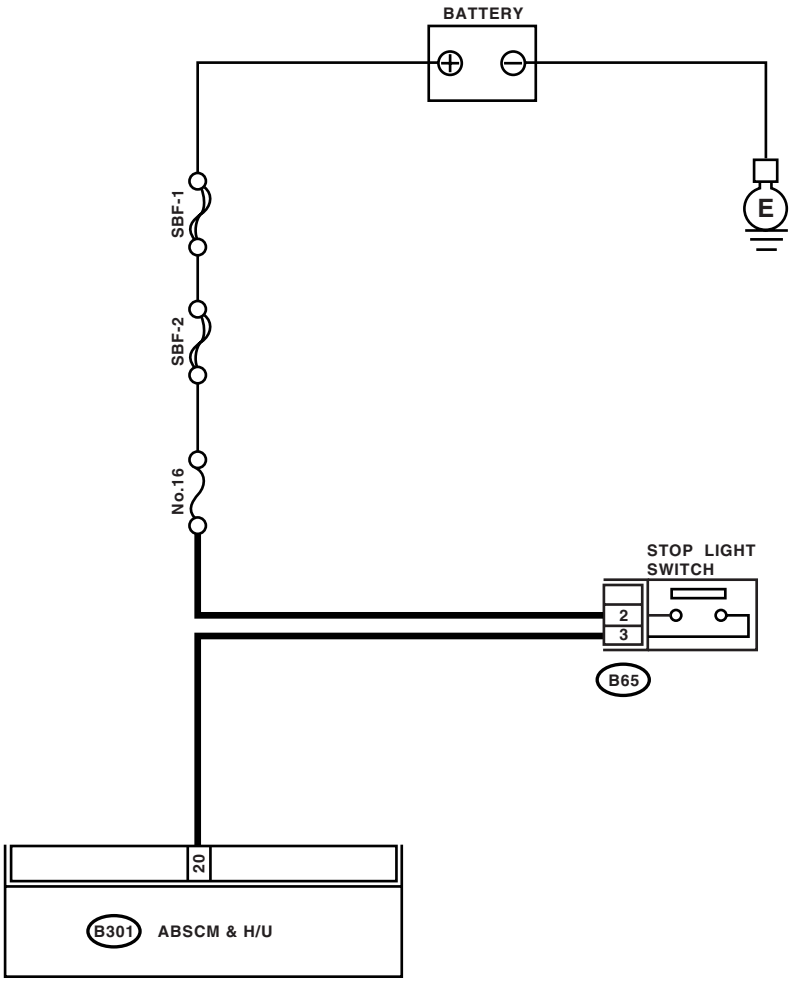
	Step	Check	Yes	No
1	**CHECK INPUT VOLTAGE OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U. 3) Turn the ignition switch to ON. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 13 (+) — Chassis ground (−):***	Is the voltage 10 — 15 V?	Go to step **2.**	Repair the harness/connector between battery and ABSCM&H/U and check fuse SBF8.
2	**CHECK GROUND CIRCUIT OF MOTOR.** 1) Turn the ignition switch to OFF. 2) Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 12 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Go to step **3.**	Repair the ABSCM&H/U ground harness.
3	**CHECK INPUT VOLTAGE OF ABSCM&H/U.** 1) Run the engine at idle. 2) Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 18 (+) — Chassis ground (−):***	Is the voltage 10 — 15 V?	Go to step **4.**	Repair the harness connector between battery, ignition switch and ABSCM&H/U.
4	**CHECK GROUND CIRCUIT OF ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 15 — Chassis ground:***	Is the resistance less than 0.5 Ω?	Go to step **5.**	Repair the ABSCM&H/U ground harness.
5	**CHECK MOTOR OPERATION.** Operate the sequence control. <Ref. to ABS-10, ABS Sequence Control.> NOTE: Use the diagnosis connector to operate sequence control.	Can motor revolution noise (buzz) be heard when carrying out the sequence control?	Go to step **6.**	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
6	**CHECK POOR CONTACT IN CONNECTORS.** 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.**
7	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **8.**
8	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact.

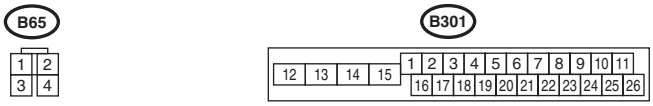
W: DTC 54 STOP LIGHT SWITCH SIGNAL CIRCUIT MALFUNCTION

DIAGNOSIS:

Faulty stop light switch

WIRING DIAGRAM:



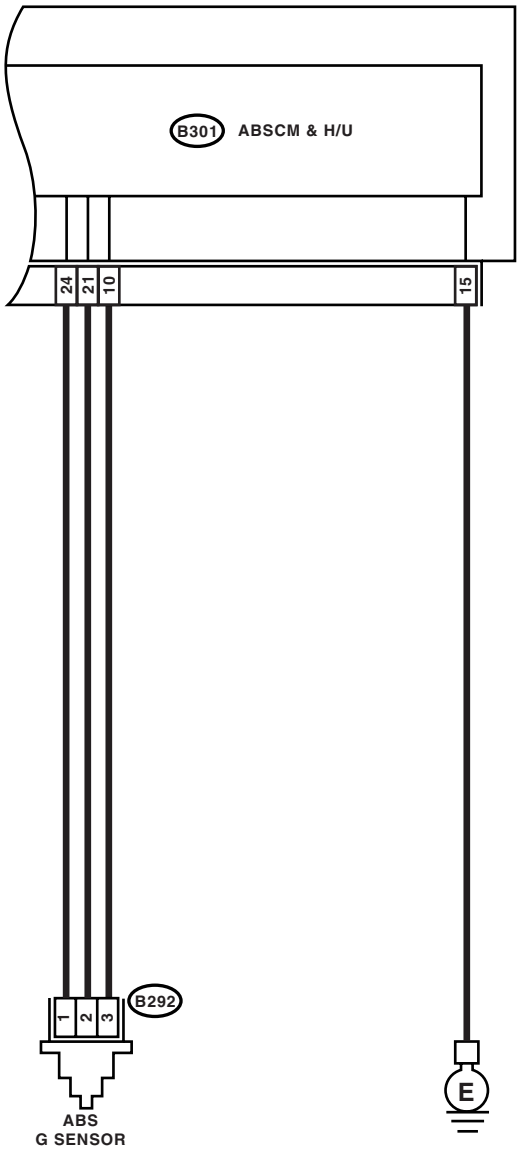


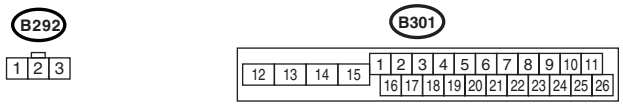
ABS00573

	Step	Check	Yes	No
1	**CHECK OUTPUT OF STOP LIGHT SWITCH USING SUBARU SELECT MONITOR.** 1) Select “Current data display & Save” on the Subaru Select Monitor. 2) Release the brake pedal. 3) Read the stop light switch signal in Subaru Select Monitor data display.	Is “OFF” indicated?	Go to step **2.**	Go to step **3.**
2	**CHECK OUTPUT OF STOP LIGHT SWITCH USING SUBARU SELECT MONITOR.** 1) Depress the brake pedal. 2) Read the stop light switch signal in Subaru Select Monitor data display.	Is “ON” indicated?	Go to step **5.**	Go to step **3.**
3	**CHECK IF STOP LIGHTS COME ON.** Depress the brake pedal.	Do the stop lights turn on?	Go to step **4.**	Repair the stop lights circuit.
4	**CHECK OPEN CIRCUIT IN HARNESS.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U. 3) Depress the brake pedal. 4) Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 20 (+) — Chassis ground (−):***	Is the voltage 10 — 15 V?	Go to step **5.**	Repair the harness between stop light switch and ABSCM&H/U connector.
5	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in connector between stop light switch and ABSCM&H/U?	Go to step **6.**	Repair the connector.
6	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **7.**
7	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact.

X: DTC 56 FAULTY G SENSOR OUTPUT VOLTAGE OR OUTPUT SIGNAL

DIAGNOSIS:
Faulty G sensor
TROUBLE SYMPTOM:
ABS does not operate.
WIRING DIAGRAM:





ABS00574

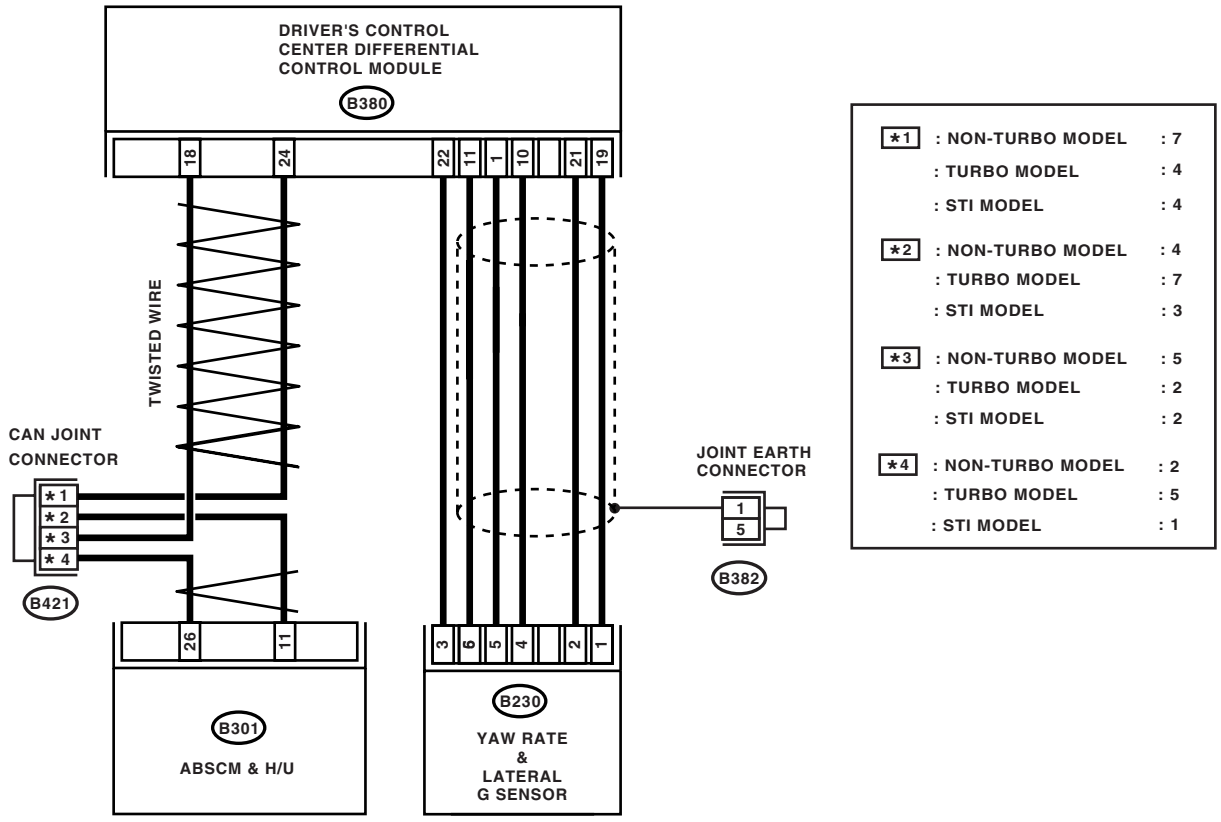
Diagnostic Procedure with Diagnostic Trouble Code (DTC)

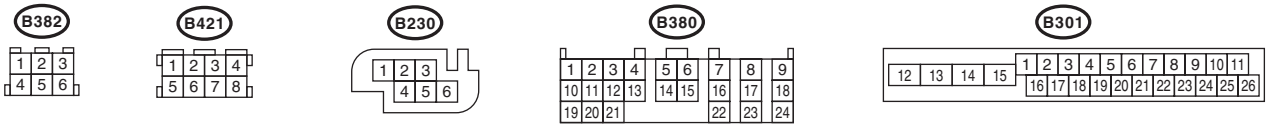
	Step	Check	Yes	No
1	**WHETHER A WHEEL TURNED FREELY OR NOT.**	Have the wheels been turned freely when the vehicle is lifted up or drove on a rolling road?	ABS is normal. Erase the memory.	Go to step **2.**
2	**CHECK OUTPUT OF G SENSOR USING SUBARU SELECT MONITOR.** 1) Select {Current Data Display & Save} 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 G sensor is horizontal?	Go to step **3.**	Go to step **6.**
3	**CHECK POOR CONTACT IN CONNECTORS.**	Is there poor contact in connector between ABSCM&H/U and G sensor?	Repair the connector.	Go to step **4.**
4	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC still displayed?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **5.**
5	**CHECK ANY OTHER DTC ON DISPLAY.**	Is any other DTC displayed?	Inspect the DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to ABS(diag)-34, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs.
6	**CHECK INPUT VOLTAGE OF G SENSOR.** 1) Turn the ignition switch to OFF. 2) Remove the console box. 3) Remove the G sensor from vehicle. (Do not disconnect connector.) 4) Turn the ignition switch to ON. 5) Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 1 (+) — No. 3 (−):***	Is the voltage 4.75 — 5.25 V?	Go to step **7.**	Repair the harness connector between G sensor and ABSCM&H/U.
7	**CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ABSCM&H/U. 3) Measure the resistance between ABSCM&H/U connector terminals. ***Connector & terminal*** ***(B301) No. 21 — No. 10:***	Is the resistance 3.6 — 3.8 kΩ?	Go to step **8.**	Repair the harness connector between G sensor and ABSCM&H/U.
8	**CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.** 1) Disconnect the connector from G sensor. 2) Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B301) No. 21 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **9.**	Repair the harness/connector between G sensor and ABSCM&H/U.

	Step	Check	Yes	No
9	**CHECK G SENSOR.** 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. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):***	Is the voltage 2.1 — 2.5 V when G sensor is on a level?	Go to step **10.**	Replace the G sensor. <Ref. to ABS-21, G Sensor.>
10	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):***	Is the voltage 3.6 — 4.1 V when G sensor is inclined forwards to 90°?	Go to step **11.**	Replace the G sensor. <Ref. to ABS-21, G Sensor.>
11	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):***	Is the voltage 0.5 — 1.0 V when G sensor is inclined backward to 90°?	Go to step **12.**	Replace the G sensor. <Ref. to ABS-21, G Sensor.>
12	**CHECK POOR CONTACT IN CONNECTOR.** Turn the ignition switch to OFF.	Is there poor contact in connector between ABSCM&H/U and G sensor?	Repair the connector.	Go to step **13.**
13	**CHECK ABSCM&H/U.** 1) Connect all the connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read the DTC.	Is the same DTC still displayed?	Replace the ABSCM only. <Ref. to ABS-7, REPLACEMENT, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **14.**
14	**CHECK ANY OTHER DTC.**	Is any other DTC displayed?	Inspect the DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to ABS(diag)-34, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact.

Y: DTC 73 LATERAL G SENSOR OUTPUT VOLTAGE OR OUTPUT SIGNAL MALFUNCTION

DIAGNOSIS:
Faulty Lateral G sensor
TROUBLE SYMPTOM:
ABS does not operate.
WIRING DIAGRAM:





ABS00838

	Step	Check	Yes	No
1	**CHECK ALL FOUR WHEELS FOR FREE TURNING.**	Have the wheels been turned freely such as when vehicle is lifted up, or operated on a rolling road?	The ABS is normal. Erase the DTC.	Go to step **2.**
2	**CHECK OUTPUT OF YAW RATE & LATERAL G SENSOR USING SUBARU SELECT MONITOR.** 1) Select "Current data display & Save" on the Subaru Select Monitor. 2) Read the Subaru Select Monitor display.	Is the lateral G sensor output on monitor display −1.5 — 1.5 m/s^2 when the vehicle is in horizontal position?	Go to step **3.**	Go to step **8.**
3	**CHECK OUTPUT OF YAW RATE & LATERAL G SENSOR USING SUBARU SELECT MONITOR.** 1) Turn the ignition switch to OFF. 2) Remove the console box. 3) Remove the yaw rate & lateral G sensor from vehicle. (Do not disconnect the connector.) 4) Turn the ignition switch to ON. 5) Select "Current data display & Save" on the Subaru Select Monitor. 6) Read the Subaru Select Monitor display.	Is the voltage 6.8 — 12.8 m/s^2 when lateral G sensor is inclined right to 90°?	Go to step **4.**	Replace the yaw rate & lateral G sensor. <Ref. to 6MT-125, Yaw Rate and Lateral G Sensor.>
4	**CHECK OUTPUT OF YAW RATE & LATERAL G SENSOR USING SUBARU SELECT MONITOR.** Read the Subaru Select Monitor display.	Is the voltage 6.8 — 12.8 m/s^2 when lateral G sensor is inclined left to 90°?	Go to step **5.**	Replace the yaw rate & lateral G sensor. <Ref. to 6MT-125, Yaw Rate and Lateral G Sensor.>
5	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF.	Is there poor contact in connector between driver's control center differential control module and yaw rate & lateral G sensor?	Repair the connector.	Go to step **6.**
6	**CHECK ABSCM&H/U.** 1) Connect all connectors. 2) Erase the memory. 3) Perform the inspection mode. 4) Read out the DTC.	Is the same DTC as in current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **7.**
7	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact.
8	**CHECK OPEN CIRCUIT IN YAW RATE & LATERAL G SENSOR OUTPUT HARNESS AND GROUND HARNESS.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from driver's control center differential control module. 3) Measure the resistance between driver's control center differential control module connector terminals. ***Connector & terminal*** ***(B380) No. 1 — No. 11:***	Is the resistance 4.3 — 4.9 kΩ?	Go to step **9.**	Repair the harness/connector between yaw rate & lateral G sensor and ABSCM&H/U.

	Step	Check	Yes	No
9	**CHECK GROUND SHORT OF HARNESS.** Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***(B380) No. 11 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **10.**	Repair the harness between yaw rate & lateral G sensor and driver's control center differential control module. Replace the driver's control center differential control module. <Ref. to 6MT-126, Driver's Control Center Differential Control Module.>
10	**CHECK YAW RATE & LATERAL G SENSOR.** 1) Remove the console box. 2) Remove the yaw rate & lateral G sensor from vehicle. 3) Connect the connector to yaw rate & lateral G sensor. 4) Connect the connector to ABSCM&H/U. 5) Turn the ignition switch to ON. 6) Measure the voltage between yaw rate & lateral G sensor connector terminals. ***Connector & terminal*** ***(B230) No. 5 (+) — (B230) No. 6 (–):***	Is the voltage 2.1 — 2.5 V when yaw rate & lateral G sensor is in horizontal position?	Go to step **11.**	Replace the yaw rate & lateral G sensor. <Ref. to 6MT-125, Yaw Rate and Lateral G Sensor.>
11	**CHECK YAW RATE & LATERAL G SENSOR.** Measure the voltage between yaw rate & lateral G sensor connector terminals. ***Connector & terminal*** ***(B230) No. 5 (+) — (B230) No. 6 (–):***	Is the voltage 3.3 — 3.7 V when yaw rate & lateral G sensor is inclined right to 90°?	Go to step **12.**	Replace the lateral G sensor. <Ref. to 6MT-125, Yaw Rate and Lateral G Sensor.>
12	**CHECK YAW RATE & LATERAL G SENSOR.** Measure the voltage between yaw rate & lateral G sensor connector terminals. ***Connector & terminal*** ***(B230) No. 5 (+) — (B230) No. 6 (–):***	Is the voltage 0.5 — 0.9 V when yaw rate & lateral G sensor is inclined left to 90°?	Go to step **13.**	Replace the lateral G sensor. <Ref. to 6MT-125, Yaw Rate and Lateral G Sensor.>
13	**CHECK ABSCM&H/U.** 1) Turn the ignition switch to OFF. 2) Connect all connectors. 3) Erase the memory. 4) Perform the inspection mode. 5) Read out the DTC.	Is the same DTC as in current diagnosis still being output?	Replace the ABSCM&H/U. <Ref. to ABS-6, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Go to step **14.**
14	**CHECK ANY OTHER DTC APPEARANCE.**	Are other DTCs being output?	Proceed with the diagnosis corresponding to DTC.	A temporary poor contact.

13.General Diagnostic Table

A: INSPECTION

Symptom		Probable faulty units/parts
Vehicle instability during braking	Vehicle pulls to either side.	• ABSCM&H/U (solenoid valve) • ABS wheel speed sensor • Brake (caliper & piston, pads) • Wheel alignment • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections • Road surface (uneven, camber)
	Vehicle spins.	• ABSCM&H/U (solenoid valve) • ABS wheel speed sensor • Brake (pads) • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections
Poor braking	Long braking/stopping distance	• ABSCM&H/U (solenoid valve) • Brake (pads) • Air in brake line • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections
	Wheel locks.	• ABSCM&H/U (solenoid valve, motor) • ABS wheel speed sensor • Incorrect wiring or piping connections
	Brake dragging	• ABSCM&H/U (solenoid valve) • ABS wheel speed sensor • Master cylinder • Brake (caliper & piston) • Parking brake • Axle & wheels • Brake pedal play
	Long brake pedal stroke	• Air in brake line • Brake pedal play
	Vehicle pitching	• Suspension play or fatigue (reduced damping) • Incorrect wiring or piping connections • Road surface (uneven)
	Unstable or uneven braking	• ABSCM&H/U (solenoid valve) • ABS wheel speed sensor • Brake (caliper & piston, pads) • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections • Road surface (uneven)
Vibration and/or noise (while driving on slippery roads)	Excessive pedal vibration	• Incorrect wiring or piping connections • Road surface (uneven)
	Noise from ABSCM&H/U	• ABSCM&H/U (mount bushing) • ABS wheel speed sensor • Brake piping
	Noise from front of vehicle	• ABSCM&H/U (mount bushing) • ABS wheel speed sensor • Master cylinder • Brake (caliper & piston, pads, rotor) • Brake piping • Brake booster & check valve • Suspension play or fatigue
	Noise from rear of vehicle	• ABS wheel speed sensor • Brake (caliper & piston, pads, rotor) • Parking brake • Brake piping • Suspension play or fatigue