ABS (DIAGNOSTICS)

ABS

1. Basic Diagnostic Procedure

A: PROCEDURE

1. WITHOUT SUBARU SELECT MONITOR

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

NOTE:
- To check the harness for broken wires or short circuits, shake it while holding it or the connector.
- When the ABS warning light illuminates, read and record the diagnostic trouble code (DTC) indicated by ABS warning light.

	Step	Value	Yes	No
1	**CHECK PRE-INSPECTION.** 1)Ask the customer when and how trouble occurred using interview checklist. <Ref. to ABS-6, Check List for Interview.> 2)Before performing diagnosis, inspect the unit which might influence ABS problem. <Ref. to ABS-10, INSPECTION, General Description.> Is the unit that might influence the ABS problem normal?	Unit is normal.	Go to step **2.**	Repair or replace each unit.
2	**CHECK INDICATION OF DIAGNOSTIC TROUBLE CODE (DTC).** Calling up the DTC. <Ref. to ABS-21, Read Diagnostic Trouble Code (DTC).> Is the ABS warning light normal?	ABS warning light is normal.	Go to step **3.**	Inspect using diagnostic chart for ABS warning light failure.<Ref. to ABS-29, Diagnostics Chart with Diagnosis Connector.> NOTE: Call up DTC again after inspecting ABS warning light. <Ref. to ABS-21, Read Diagnostic Trouble Code (DTC).>
3	**CHECK DIAGNOSTIC TROUBLE CODE (DTC).** Record all DTCs. Is only the start code issued?	Only the start code is issued.	Go to step **4.**	Go to step **5.**
4	**PERFORM THE GENERAL DIAGNOSTICS.** 1)Inspect using “General Diagnostics Table”. <Ref. to ABS-175, General Diagnostics Table.> 2)Perform the clear memory mode. <Ref. to ABS-23, WITHOUT SUBARU SELECT MONITOR, OPERATION, Clear Memory Mode.> 3)Perform the inspection mode. <Ref. to ABS-22, Inspection Mode.> Calling up the DTC. <Ref. to ABS-21, Read Diagnostic Trouble Code (DTC).> Is only the start code issued?	Only the start code is issued.	Complete the diagnosis.	Go to step **5.**

Step		Value	Yes	No
5	**PERFORM THE DIAGNOSIS.** 1)Repair trouble cause. NOTE: For DTC list, refer to “List of Diagnostics Trouble Code (DTC)”.<Ref. to ABS-25, WITHOUT SUBARU SELECT MONITOR, LIST, List of Diagnostics Trouble Code (DTC).> 2)Perform the clear memory mode. <Ref. to ABS-23, WITHOUT SUBARU SELECT MONITOR, OPERATION, Clear Memory Mode.> 3)Perform the inspection mode. <Ref. to ABS-22, Inspection Mode.> 4)Calling up the DTC. <Ref. to ABS-21, Read Diagnostic Trouble Code (DTC).> Is only the start code issued?	Only the start code is issued.	Complete the diagnosis.	Repeat the step5 until only start code is issued.

2. WITH SUBARU SELECT MONITOR

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

NOTE:
- To check the harness for broken wires or short circuits, shake it while holding it or the connector.
- Check list for interview. <Ref. to ABS-6, Check List for Interview.>

	Step	Value	Yes	No
1	**CHECK PRE-INSPECTION.** 1)Ask the customer when and how trouble occurred using interview checklist. <Ref. to ABS-6, Check List for Interview.> 2)Before performing diagnosis, inspect the unit which might influence the ABS problem. <Ref. to ABS-10, INSPECTION, General Description.> Is the unit that might influence the ABS problem normal?	Unit is normal.	Go to step **2.**	Repair or replace each unit.
2	**CHECK INDICATION OF DIAGNOSTIC TROUBLE CODE (DTC) DISPLAY.** 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 to ON. NOTE: If the communication function of select monitor cannot be executed normally, check communication circuit. <Ref. to ABS-95, COMMUNICATION FOR INITIALIZING IMPOSSIBLE, Diagnostics Chart with Subaru Select Monitor.> 4)Read the DTC. <Ref. to ABS-19, READ CURRENT DATA, OPERATION, Subaru Select Monitor.> 5)Record all DTCs and frame data. Is DTC displayed?	DTC is not displayed.	Go to step **3.**	Go to step **4.**
3	**PERFORM THE GENERAL DIAGNOSTICS.** 1)Inspect using “General Diagnostics Table”. <Ref. to ABS-175, General Diagnostics Table.> 2)Perform the clear memory mode. <Ref. to ABS-19, CLEAR MEMORY MODE, OPERATION, Subaru Select Monitor.> 3)Perform the inspection mode. <Ref. to ABS-22, Inspection Mode.> 4)Calling up the DTC. <Ref. to ABS-18, READ DIAGNOSTIC TROUBLE CODE (DTC), OPERATION, Subaru Select Monitor.> Check DTC is not displayed. Is the ABS warning light turned off?	ABS warning light is turned off.	Complete the diagnosis.	Go to step **4.**

	Step	Value	Yes	No
4	**PERFORM THE DIAGNOSIS.** 1)For DTC list, refer to “List of Diagnostics Trouble Code (DTC)”.<Ref. to ABS-27, WITH SUBARU SELECT MONITOR, LIST, List of Diagnostics Trouble Code (DTC).> 2)Repair trouble cause. 3)Perform the clear memory mode. <Ref. to ABS-19, CLEAR MEMORY MODE, OPERATION, Subaru Select Monitor.> 4)Perform the inspection mode. <Ref. to ABS-22, Inspection Mode.> 5)Calling up the DTC. <Ref. to ABS-18, READ DIAGNOSTIC TROUBLE CODE (DTC), OPERATION, Subaru Select Monitor.> Check DTC is not displayed. Is the ABS warning light turned off?	ABS warning light is turned off.	Complete the diagnosis.	Inspect using “Diagnostics Chart with Subaru Select Monitor”. <Ref. to ABS-95, Diagnostics Chart with Subaru Select Monitor.>

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 ❑ Does not come on • When / how long does it come on?:		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ On after starting (Engine is running) ❑ On after starting (Engine is stop)		
Timing	❑ Immediately after ignition is ON. ❑ Immediately after ignition starts.		
	❑ When advancing	km/h to	km/h
		MPH to	MPH
	❑ While traveling at a constant speed	km/h	MPH
	❑ When decelerating	km/h to	km/h
		MPH to	MPH
	❑When turning to right	Steering angle :	deg
		Steering time :	sec
	❑ When turning to left	Steering angle :	deg
		Steering time :	sec
	❑ When moving other electrical parts		
	• Parts name : • Operating condition :		

2. STATE OF BRAKE WARNING LIGHT

Brake warning light comes on.	❑ Always ❑ Sometimes ❑ Only once ❑ Does not come on ❑ When parking brake lever is pulled ❑ When parking brake lever is released • When / how long does it come on?:
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ On after starting (Engine is running) ❑ On after starting (Engine is stop)

Timing	❑ Immediately after ignition is ON. ❑ Immediately after ignition starts.		
	❑ When advancing		km/h to km/h
			MPH to MPH
	❑ While traveling at a constant speed	km/h	MPH
	❑ When decelerating		km/h to km/h
			MPH to MPH
	❑When turning to right	Steering angle :	deg
		Steering time :	sec
	❑ When turning to left	Steering angle :	deg
		Steering time :	sec
	❑ When moving other electrical parts		
	• Parts name : • Operating condition :		

3. SYMPTOMS

ABS operating condition	❑ Performs no work.		
	❑ Operates only when abruptly applying brakes.	Vehicle speed :	km/h
			MPH
	• How to step on brake pedal :		
	a) Operating time :		sec
	b) Operating noise : ❑ Produce / ❑ Does not produce		
	• What kind of noise?	❑ Knock ❑ Gong gong ❑ Bong ❑ Buzz ❑ Gong gong buzz ❑ Others :	
	c) Reaction force of brake pedal		
		❑ Stick ❑ Press down once with a clunk ❑ Press and released ❑ Others :	

CHECK LIST FOR INTERVIEW

Behavior of vehicle	a) Directional stability cannot be obtained or steering refuses to work when applying brakes : ❑ Yes / ❑ No	
	• When :	❑ Vehicle turns to right ❑ Vehicle turns to left ❑ Spins ❑ Others :
	b) Directional stability cannot be obtained or steering refuses to work when accelerating : ❑ Yes / ❑ No	
	• When :	❑ Vehicle turns to right ❑ Vehicle turns to left ❑ Spins ❑ Others :
	c) Brakes out of order : ❑ Yes / ❑ No	
	• What :	❑ Braking distance is long ❑ Brakes lock or drag ❑ Pedal stroke is long ❑ Pedal sticks ❑ Others :
	d) Poor acceleration : ❑ Yes / ❑ No	
	• What :	❑ Fails to accelerate ❑ Engine stalls ❑ Others :
	e) Occurrence of vibration : ❑ Yes / ❑ No	
	• Where • What kind :	
	f) Occurrence of abnormal noise : ❑ Yes / ❑ No	
	• Where • What kind :	
	g) Occurrence of other phenomena : ❑ Yes / ❑ No	
	• What kind :	

4. CONDITIONS UNDER WHICH TROUBLE OCCURS

Environment	a) Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Various/Others :
	b) Ambient temperature	°F (°C)
	c) Road	❑ Urban area ❑ Suburbs ❑ Highway ❑ General road ❑ Ascending slope ❑ Descending slope ❑ Paved road ❑ Gravel road ❑ Muddy road ❑ Sandy place ❑ Others :
	d) Road surface	❑ Dry ❑ Wet ❑ New-fallen snow ❑ Compressed snow ❑ Frozen slope ❑ Others :
Condition	a) Brakes	Deceleration : g
		❑ Continuous / ❑ Intermittent
	b) Accelerator	Acceleration : g
		❑ Continuous / ❑ Intermittent
	c) Vehicle speed	km/h | MPH
		❑ Advancing ❑ Accelerating ❑ Reducing speed ❑ Low speed ❑ 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) Chain is passed around tires. : ❑ Yes / ❑ No	
	h) T tire is used. : ❑ Yes / ❑ No	
	i) Condition of suspension alignment :	
	j) Loading state :	
	k) Repair parts are used. : ❑ Yes / ❑ No	
	• What :	
	l) Others :	

3. General Description

A: CAUTION

1. SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

Airbag system wiring harness is routed near the ABS sensor, ABS control module and hydraulic control unit.

CAUTION:
• All airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
• Be careful not to damage the airbag system wiring harness when servicing the ABS sensor, ABS control module and hydraulic control unit.

B: INSPECTION

Before performing diagnostics, check the following items which might affect ABS problems:

1. BATTERY

Measure the battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more

Specific gravity: Above 1.260

2. BRAKE FLUID

1) Check the brake fluid level.
2) Check the brake fluid leakage.

3. 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).>

4. BRAKE DRAG

Check for brake drag.

5. BRAKE PAD AND ROTOR

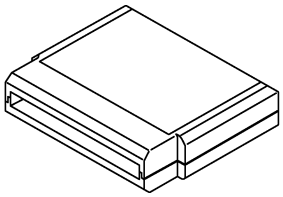
Check the brake pad and rotor.
• Front <Ref. to BR-19, INSPECTION, Front Brake Pad.> and <Ref. to BR-20, INSPECTION, Front Disc Rotor.>
• Rear <Ref. to BR-24, INSPECTION, Rear Brake Pad.> and <Ref. to BR-25, INSPECTION, Rear Disc Rotor.> or <Ref. to BR-30, INSPECTION, Rear Drum Brake Shoe.> and <Ref. to BR-31, INSPECTION, Rear Drum Brake Drum.>

6. TIRE

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

C: PREPARATION TOOL

1. SPECIAL TOOLS

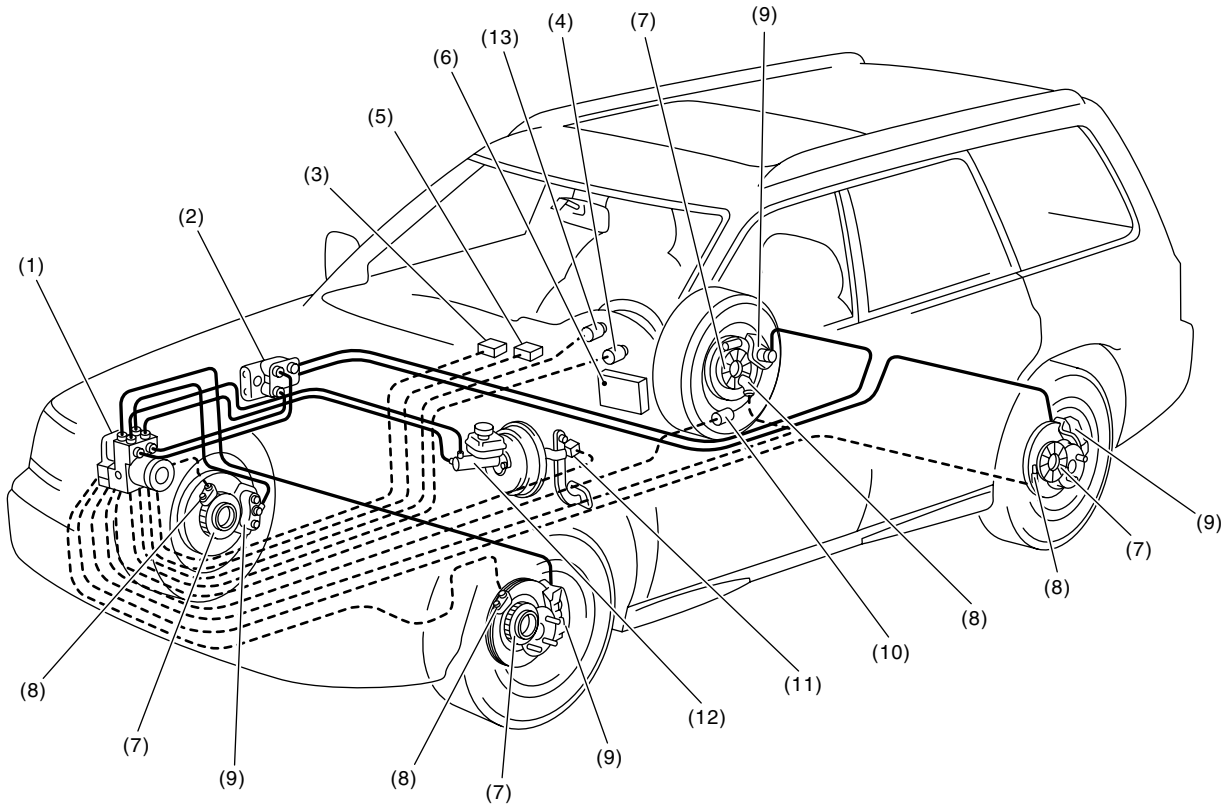
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST24082AA210	24082AA210	CARTRIDGE	Troubleshooting for electrical systems.
 ST22771AA030	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for electrical systems.

2. GENERAL PURPOSE TOOLS

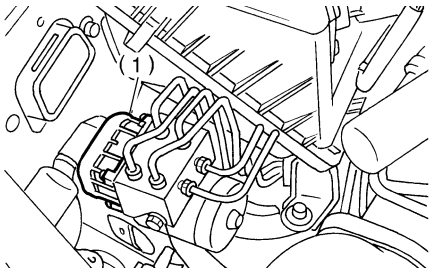
TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and ampere.
Oscilloscope	Used for measuring sensor.

4. Electrical Components Location

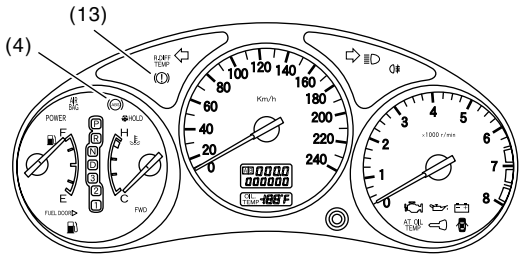
A: LOCATION



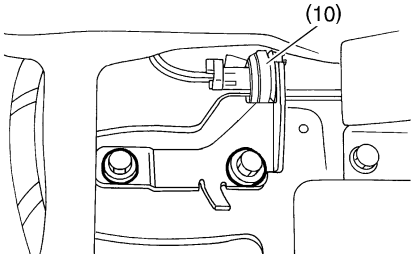
(1)	ABS control module and hydraulic control unit (ABSCM&H/U)	(6)	Transmission control module (AT vehicles only)	(11)	Stop light switch
(2)	Proportioning valve (without EBD)	(7)	Tone wheel	(12)	Master cylinder
(3)	Diagnosis connector	(8)	ABS sensor	(13)	Brake warning light
(4)	ABS warning light	(9)	Wheel cylinder		
(5)	Data link connector (for Subaru Select Monitor)	(10)	G sensor		



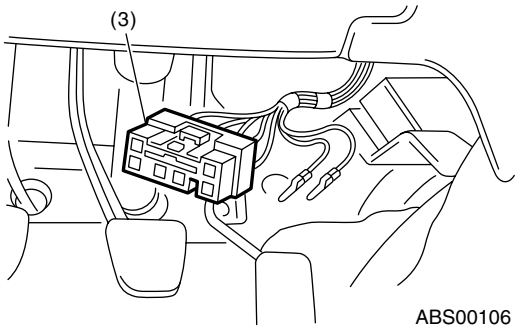
ABS00101



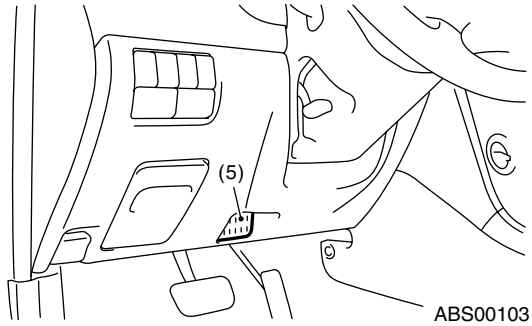
ABS00177



ABS00102

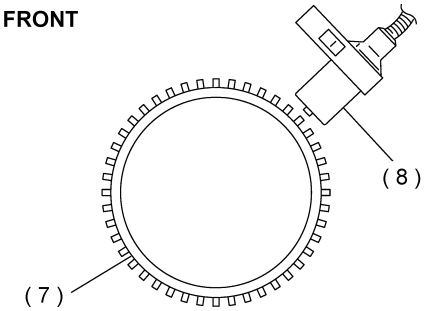


ABS00106



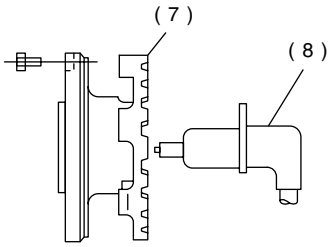
ABS00103

FRONT



ABS00107

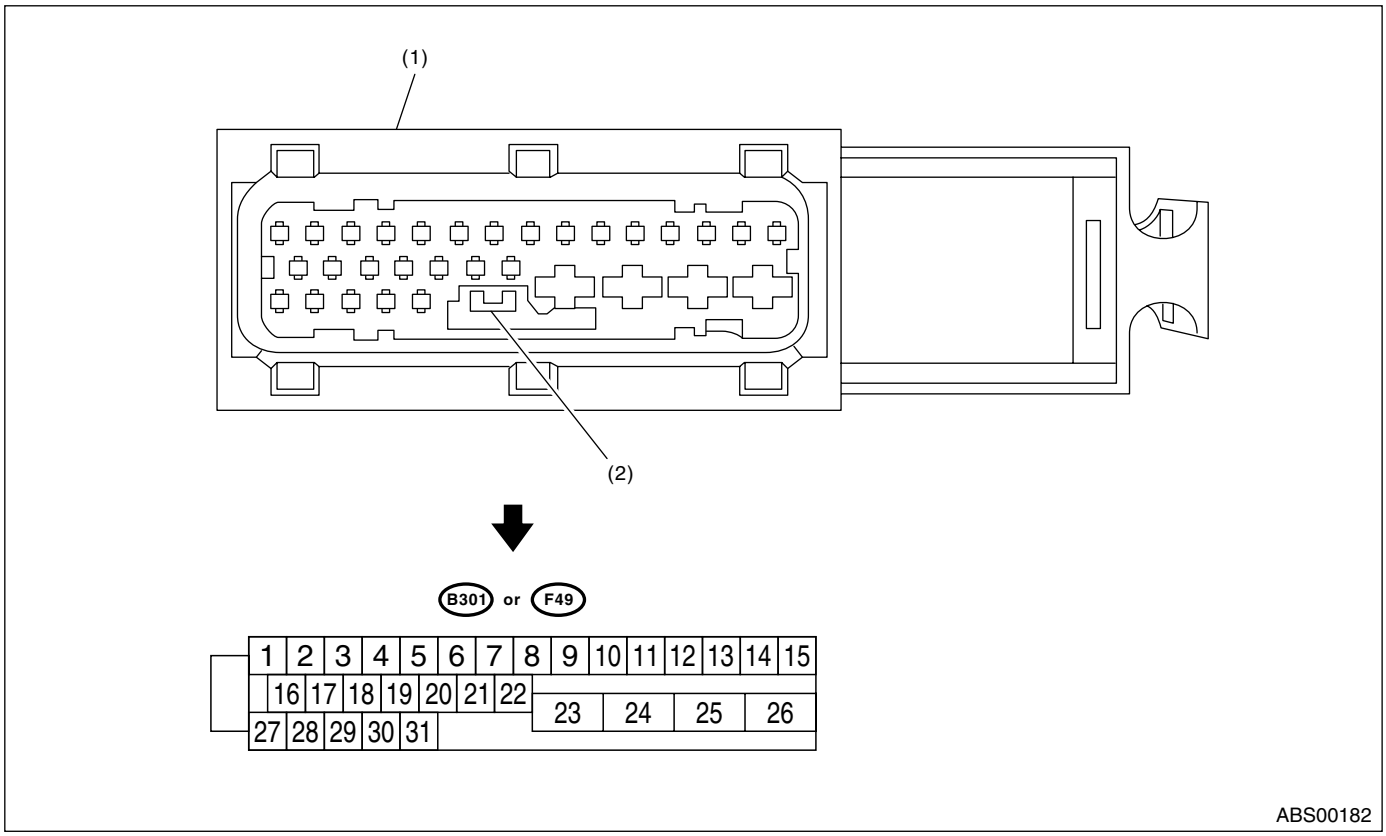
REAR



ABS00104

5. Control Module I/O Signal

A: ELECTRICAL SPECIFICATION



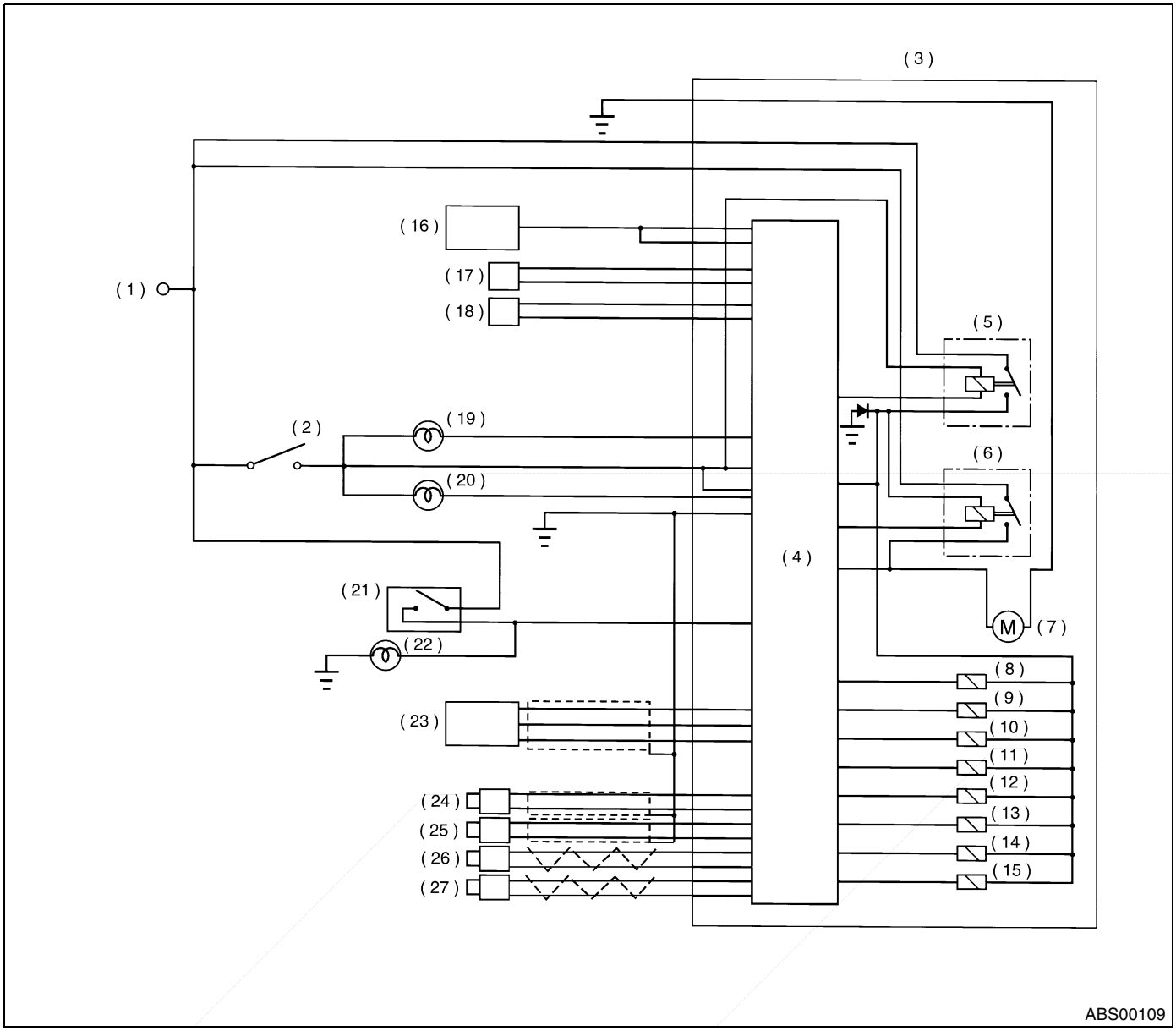
(1) ABS control module and hydraulic control unit connector
(2) Connector switch

NOTE:
• The terminal numbers in ABS control module and hydraulic control unit connector are as shown in the figure.
• When the connector is removed from ABSCM&H/U, the connector switch closes the circuit between terminal No. 22 and No. 23. The ABS warning light illuminates.

Contents		Terminal No. (+) — (–)	Input/Output signal Measured value and measuring conditions
ABS sensor*2 (Wheel speed sensor)	Front left wheel	9 — 10	0.12 — 1 V (When it is 20 Hz.)
	Front right wheel	11 — 12	
	Rear left wheel	7 — 8	
	Rear right wheel	14 — 15	
Valve relay power supply*1		24 — 23	10 — 15 V
Motor relay power supply*1		25 — 23	10 — 15 V
G sensor*2	Power supply	30 — 28	4.75 — 5.25 V
	Ground	28	—
	Output	6 — 28	2.1 — 2.5 V when vehicle is in horizontal position.
Stop light switch*1		2 — 23	Less than 1.5 V when the stop light is OFF and, 10 — 15 V when the stop light is ON.
ABS warning light*2		22 — 23	Less than 1.5 V within 1.5 seconds immediately after ignition switch has been turned to ON, and 10 — 15 V after 1.5 seconds has elapsed.
Brake warning light*2 (EBD warning light)		21 — 23	Less than 1.5 V within 1.5 seconds immediately after ignition switch has been turned to ON, and 10 — 15 V after 1.5 seconds has elapsed.
AT ABS signal (AT vehicles only)		31 — 23	Less than 1.5 V when the ABS control still operates and more than 5.5 V when ABS does not operate.
ABS operation signal monitor		3 — 23	Less than 1.5 V when the ABS control still operates and more than 5.5 V when ABS does not operate.
Select monitor*2	Data is received.	20 — 23	Less than 1.5 V when no data is received.
	Data is sent.	5 — 23	4.75 — 5.25 V when no data is sent.
ABS diagnosis connector	Terminal No. 3	29 — 23	10 — 15 V when ignition switch is ON.
	Terminal No. 6	4 — 23	10 — 15 V when ignition switch is ON.
Power supply*1		1 — 23	10 — 15 V when ignition switch is ON.
Grounding line		23	—
Grounding line		26	—

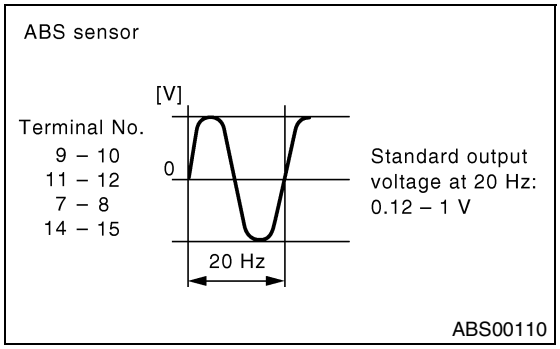
*1: Measure the I/O signal voltage after removing the connector from the ABSCM&H/U terminal.
*2: Measure the I/O signal voltage at connector (B98), (B37) ,(B38), (F48) or (F103).

B: SCHEMATIC



(1) Battery
(2) IGN
(3) ABS control module and hydraulic control unit (ABSCM&H/U)
(4) ABS control module area
(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) Transmission control module (AT vehicles only)
(17) Diagnosis connector
(18) Data link connector
(19) Brake warning light
(20) ABS warning light
(21) Stop light switch
(22) Stop light
(23) G sensor
(24) Front ABS sensor LH
(25) Front ABS sensor RH
(26) Rear ABS sensor LH
(27) Rear ABS sensor RH

C: WAVEFORM

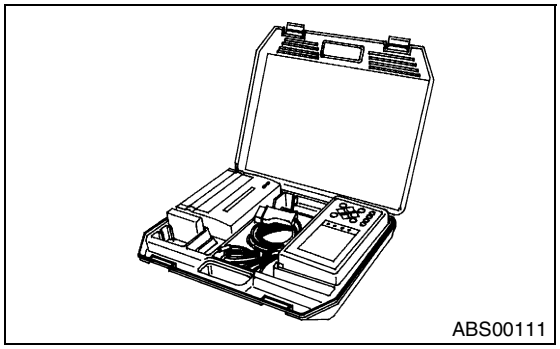

ABS sensor
[V]
Terminal No.
9 – 10
11 – 12
7 – 8
14 – 15
0
20 Hz
Standard output voltage at 20 Hz: 0.12 – 1 V
ABS00110

6. Subaru Select Monitor

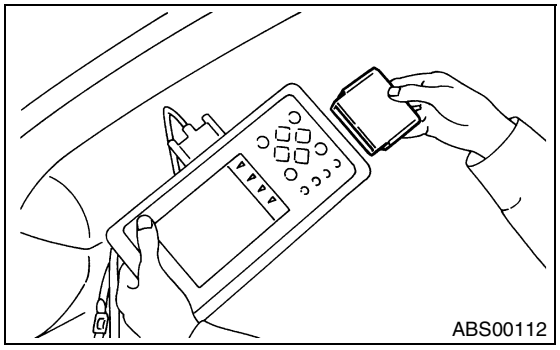
A: OPERATION

1. READ DIAGNOSTIC TROUBLE CODE (DTC)

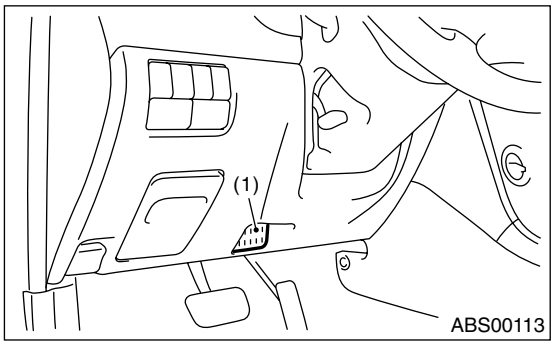
1) Prepare the Subaru Select Monitor kit.



2) Connect the diagnosis cable to Subaru Select Monitor.
3) Insert the cartridge into Subaru Select Monitor. <Ref. to ABS-11, SPECIAL TOOLS, 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).

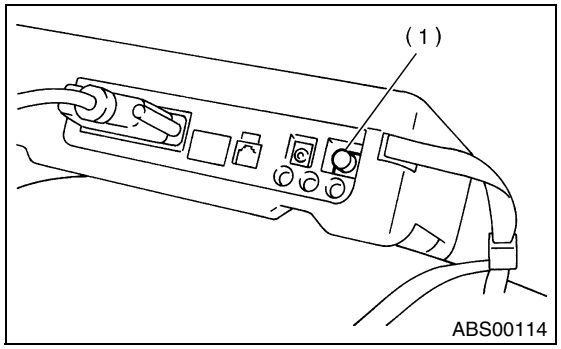


(1) Data link connector

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

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

5) Turn the ignition switch to ON (engine OFF) and Subaru Select Monitor 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 displayed information of engine type.
9) On the «ABS Diagnosis» display screen, select the {Diagnostic Code(s) Display} and press [YES] key.
10) On the «Diagnostic Code(s) Display» display screen, select the {Current Diagnostic Code(s)} or {History Diagnostic Code(s)} 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 DIAGNOSTICS TROUBLE CODE (DTC). <Ref. to ABS-25, List of Diagnostics 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 select monitor display.
Old	The second most recent DTC appears on select monitor display.
Older	The third most recent DTC appears on 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 displayed the information of ABS type.
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 sensor RH is displayed	km/h or MPH
FL Wheel Speed	Wheel speed detected by Front ABS sensor LH is displayed	km/h or MPH
RR Wheel Speed	Wheel speed detected by Rear ABS sensor RH is displayed	km/h or MPH
RL Wheel Speed	Wheel speed detected by Rear ABS sensor LH is displayed	km/h or MPH
Stop Light Switch	Stop light switch signal	ON or OFF
Stop Light Switch	Stop light switch monitor voltage is displayed.	V
G sensor output Signal	Voltage equivalent to vehicle acceleration detected by analog G sensor is displayed.	V
Valve Relay Signal	Valve Relay Signal	ON or OFF
Motor Relay Signal	Motor Relay Signal	ON or OFF
ABS Signal to TCM	ABS operation signal from ABS control module to TCM	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	Operating condition of motor relay is displayed.	ON or OFF
Valve Relay Monitor	Operating condition of the valve relay is displayed.	ON or OFF
CCM Signal	ABS operation signal from ABS control module to TCM	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 displayed the information of engine type.
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 and freeze frame data.

5) When the “Done” and “turn ignition switch to OFF” are shown on display screen, turn the Subaru Select Monitor 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-11, 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 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 sensor RH is displayed in km/h or mile/h.
FL wheel speed	Wheel speed detected by Front ABS sensor LH is displayed in km/h or mile/h.
RR wheel speed	Wheel speed detected by Rear ABS sensor RH is displayed in km/h or mile/h.
RL wheel speed	Wheel speed detected by Rear ABS sensor LH is displayed in km/h or mile/h.
ABSCM power voltage	Power (in volts) supplied to ABSCM& H/U appears on the select monitor display.
G sensor output voltage	Voltage equivalent to vehicle acceleration detected by analog G sensor is displayed.
Motor relay monitor	Motor relay operation monitor signal
Stop light switch	Stop light switch signal
ABS signal to TCM	ABS operation signal from ABS control module to TCM
ABS-AT control	ABS operation signal from ABS control module to TCM
ABS operation signal	ABS operation signal
Condition of malfunction	Displays if the malfunction has occurred to ABS only, or to ABS and EBD.

6. ANALOG DATA ARE DISPLAYED

Display screen	Contents to be monitored
FR wheel speed	Wheel speed detected by Front ABS sensor RH is displayed in km/h or mile/h.
FL wheel speed	Wheel speed detected by Front ABS sensor LH is displayed in km/h or mile/h.
RR wheel speed	Wheel speed detected by Rear ABS sensor RH is displayed in km/h or mile/h.
RL wheel speed	Wheel speed detected by Rear ABS sensor LH is displayed in km/h or mile/h.
Stop light switch	Stop light switch monitor voltage is displayed.
G sensor output voltage	Refers to vehicle acceleration detecting by analog G sensor. It appears on the select monitor display in volts.

7. ON/OFF DATA ARE DISPLAYED

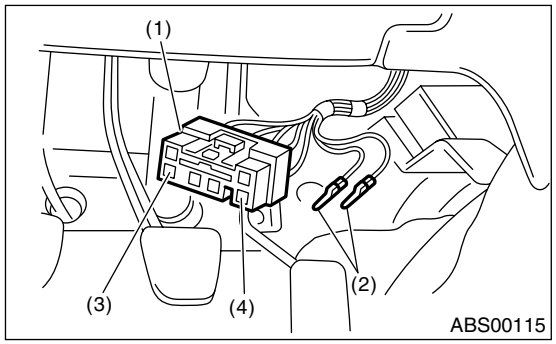
Display screen	Contents to be monitored
Stop light switch	Stop light switch signal
Valve relay signal	Valve relay signal
Motor relay signal	Motor relay signal
ABS signal to TCM	ABS operation signal from ABS control module to TCM
ABS warning light	ABS warning light
Valve relay monitor	Valve relay operation monitor signal
Motor relay monitor	Motor relay operation monitor signal
CCM signal	ABS operation signal from ABS control module to TCM

7. Read Diagnostic Trouble Code (DTC)

A: OPERATION

1. WITHOUT SUBARU SELECT MONITOR

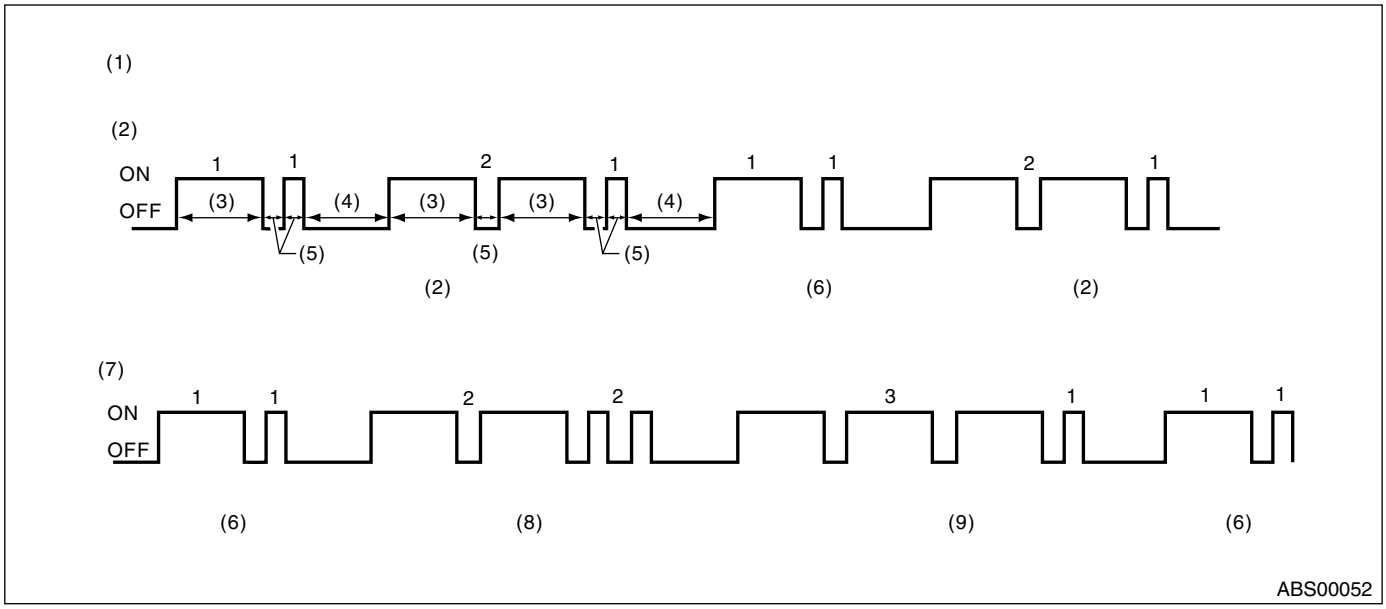
1) Take out the diagnosis connector from side of driver's seat.



(1) Diagnosis connector
(2) Diagnosis terminal
(3) Terminal No. 3
(4) Terminal No. 6

2) Turn the ignition switch to OFF.
3) Connect the diagnosis connector terminal 6 to diagnosis terminal.
4) Turn the ignition switch to ON.
5) ABS warning light is set in the diagnostic mode and blinks to identify DTC.
6) After the start code (11) is shown, the DTCs will be shown in order of the last information first.
These repeat for a maximum of 3 minutes.

NOTE:
• When there are no DTCs in memory, only the start code (11) is shown.
• When on-board diagnosis of the ABS control module detects a problem, the information (up to a maximum of three) will be stored in EEP ROM as a DTC. When there are more than three, the most recent three will be stored. (Stored codes will stay in memory until they are cleared.)



(1) Example of DTC indication
(2) DTC: 21
(3) 1.2 sec.
(4) 1.0 sec.
(5) 0.3 sec.
(6) Start code
(7) DTC: 22, 31
(8) DTC: 22
(9) DTC: 31

2. WITH SUBARU SELECT MONITOR

Refer to SUBARU SELECT MONITOR for information about how to obtain and understand DTCs. <Ref. to ABS-18, Subaru Select Monitor.>

8. Inspection Mode

A: OPERATION

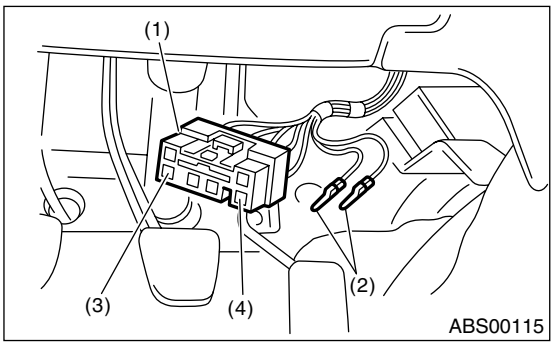
Reproduce the condition under which the problem has occurred as much as possible.
Drive the vehicle at a speed more than 40 km/h (25 MPH) for at least 1 minute.

9. Clear Memory Mode

A: OPERATION

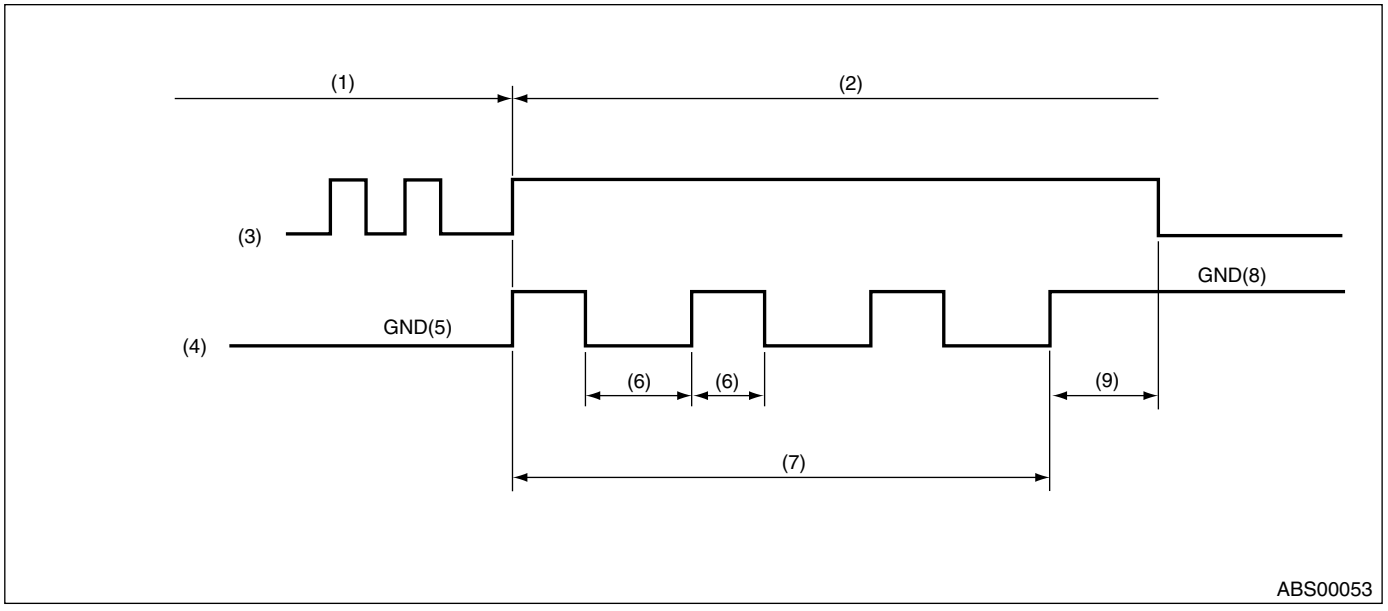
1. WITHOUT SUBARU SELECT MONITOR

1) After calling up a DTC, disconnect the diagnosis connector terminal 6 from diagnosis terminal.



(1) Diagnosis connector
(2) Diagnosis terminal
(3) Terminal No. 3
(4) Terminal No. 6

2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal 6 and diagnosis terminal for at least 0.2 seconds each time.



(1) Diagnostic trouble code (DTC) indication mode
(2) Memory erase mode
(3) ABS warning lamp
(4) Terminal No.8
(5) Low level
(6) 0.2 sec. or more
(7) 12 sec. or less
(8) Open (high level)
(9) 1.5 sec.

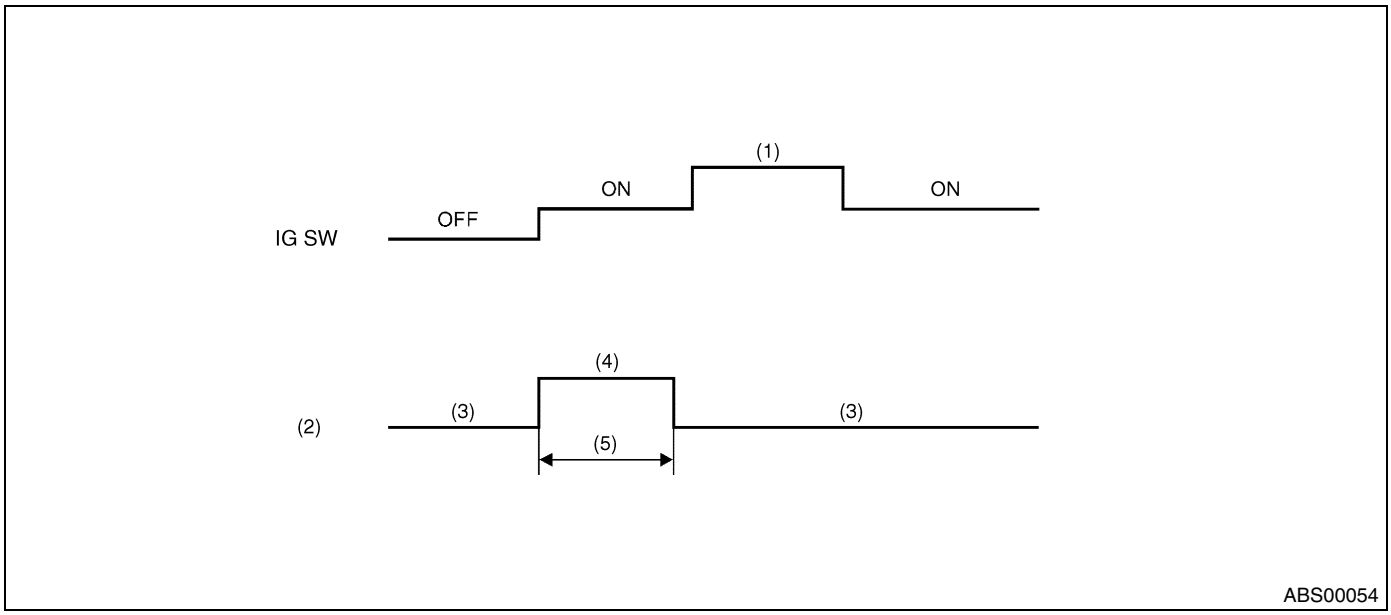
NOTE:
After the diagnostics is completed, make sure to clear memory. Make sure only start code (11) is shown after memory is cleared.

2. WITH SUBARU SELECT MONITOR

Refer to SUBARU SELECT MONITOR for information about how to clear DTC. <Ref. to ABS-18, Subaru Select Monitor.>

10.ABS Warning Light Illumination Pattern

A: INSPECTION



(1) START
(2) ABS warning light
(3) Goes out
(4) Illuminates
(5) 1.5 sec.

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. <Ref. to ABS-29, Diagnostics Chart with Diagnosis Connector.>

NOTE:
Even though the ABS warning light does not go out 1.5 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.

11.List of Diagnostics Trouble Code (DTC)

A: LIST

1. WITHOUT SUBARU SELECT MONITOR

DTC No.	Contents of diagnosis		Index No.
11	Start code • DTC is shown after start code. • Only start code is shown in normal condition.		—
21	Abnormal ABS sensor (Open circuit or input voltage too high)	Front ABS sensor RH	<Ref. to ABS-44, DTC 21 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (FRONT RH) —, Diagnostics Chart with Diagnosis Connector.>
23		Front ABS sensor LH	<Ref. to ABS-44, DTC 23 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (FRONT LH) —, Diagnostics Chart with Diagnosis Connector.>
25		Rear ABS sensor RH	<Ref. to ABS-44, DTC 25 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR RH) —, Diagnostics Chart with Diagnosis Connector.>
27		Rear ABS sensor LH	<Ref. to ABS-45, DTC 27 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>
22	Abnormal ABS sensor (Abnormal ABS sensor signal)	Front ABS sensor RH	<Ref. to ABS-52, DTC 22 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (FRONT RH) —, Diagnostics Chart with Diagnosis Connector.>
24		Front ABS sensor LH	<Ref. to ABS-52, DTC 24 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (FRONT LH) —, Diagnostics Chart with Diagnosis Connector.>
26		Rear ABS sensor RH	<Ref. to ABS-52, DTC 26 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (REAR RH) —, Diagnostics Chart with Diagnosis Connector.>
28		Rear ABS sensor LH	<Ref. to ABS-53, DTC 28 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>
29		Any one of four	<Ref. to ABS-60, DTC 29 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (ANY ONE OF FOUR) —, Diagnostics Chart with Diagnosis Connector.>

DTC No.	Contents of diagnosis		Index No.
31	Abnormal solenoid valve circuit(s) in ABS control module and hydraulic unit	Front inlet valve RH	<Ref. to ABS-66, DTC 31 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT RH) —, Diagnostics Chart with Diagnosis Connector.>
32		Front outlet valve RH	<Ref. to ABS-70, DTC 32 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT RH) —, Diagnostics Chart with Diagnosis Connector.>
33		Front inlet valve LH	<Ref. to ABS-66, DTC 33 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT LH) —, Diagnostics Chart with Diagnosis Connector.>
34		Front outlet valve LH	<Ref. to ABS-70, DTC 34 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT LH) —, Diagnostics Chart with Diagnosis Connector.>
35		Rear inlet valve RH	<Ref. to ABS-66, DTC 35 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR RH) —, Diagnostics Chart with Diagnosis Connector.>
36		Rear outlet valve RH	<Ref. to ABS-70, DTC 36 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR RH) —, Diagnostics Chart with Diagnosis Connector.>
37		Rear inlet valve LH	<Ref. to ABS-67, DTC 37 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>
38		Rear outlet valve LH	<Ref. to ABS-71, DTC 38 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>
41	Abnormal ABS control module		<Ref. to ABS-74, DTC 41 — ABNORMAL ABS CONTROL MODULE —, Diagnostics Chart with Diagnosis Connector.>
42	Source voltage is abnormal.		<Ref. to ABS-76, DTC 42 — SOURCE VOLTAGE IS ABNORMAL. —, Diagnostics Chart with Diagnosis Connector.>
44	A combination of AT control abnormal		<Ref. to ABS-79, DTC 44 — A COMBINATION OF AT CONTROL ABNORMAL —, Diagnostics Chart with Diagnosis Connector.>
51	Abnormal valve relay		<Ref. to ABS-82, DTC 51 — ABNORMAL VALVE RELAY —, Diagnostics Chart with Diagnosis Connector.>
52	Abnormal motor and/or motor relay		<Ref. to ABS-85, DTC 52 — ABNORMAL MOTOR AND/OR MOTOR RELAY —, Diagnostics Chart with Diagnosis Connector.>
54	Abnormal stop light switch		<Ref. to ABS-88, DTC 54 — ABNORMAL STOP LIGHT SWITCH —, Diagnostics Chart with Diagnosis Connector.>
56	Abnormal G sensor output voltage		<Ref. to ABS-90, DTC 56 — ABNORMAL G SENSOR OUTPUT VOLTAGE —, Diagnostics Chart with Diagnosis Connector.>

2. WITH SUBARU SELECT MONITOR

DTC No.	Sub code No.	Display screen	Contents of diagnosis	Index No.
—	—	Communication for initializing impossible	Select monitor communication failure	<Ref. to ABS-95, COMMUNICATION FOR INITIALIZING IMPOSSIBLE, Diagnostics Chart with Subaru Select Monitor.>
—	—	No trouble code	Although no trouble code appears on the select monitor display, the ABS warning light remains on.	<Ref. to ABS-98, NO TROUBLE CODE, Diagnostics Chart with Subaru Select Monitor.>
21	4A02	Open or short circuit in Front ABS sensor RH circuit	Open or short circuit in Front ABS sensor RH circuit	<Ref. to ABS-102, DTC 21 — OPEN OR SHORT CIRCUIT IN FRONT RIGHT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
22	48C5, 4945 48E5, 4845 4905, 4885	Front ABS sensor RH abnormal signal	Front ABS sensor RH abnormal signal	<Ref. to ABS-110, DTC 22 — FRONT RIGHT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>
23	4202	Open or short circuit in Front ABS sensor LH circuit	Open or short circuit in Front ABS sensor LH circuit	<Ref. to ABS-102, DTC 23 — OPEN OR SHORT CIRCUIT IN FRONT LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
24	40C5, 4145 40E5, 4045 4105, 4085	Front ABS sensor LH abnormal signal	Front ABS sensor LH abnormal signal	<Ref. to ABS-110, DTC 24 — FRONT LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>
25	4602	Open or short circuit in Rear ABS sensor RH circuit	Open or short circuit in Rear ABS sensor RH circuit	<Ref. to ABS-102, DTC 25 — OPEN OR SHORT CIRCUIT IN REAR RIGHT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
26	44C5, 4545 44E5, 4445 4505, 4485	Rear ABS sensor RH abnormal signal	Rear ABS sensor RH abnormal signal	<Ref. to ABS-110, DTC 26 — REAR RIGHT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>
27	4E02	Open or short circuit in Rear ABS sensor LH circuit	Open or short circuit in Rear ABS sensor LH circuit	<Ref. to ABS-103, DTC 27 — OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
28	4CC5, 4D45 4CE5, 4C45 4D05, 4C85	Rear ABS sensor LH abnormal signal	Rear ABS sensor LH abnormal signal	<Ref. to ABS-111, DTC 28 — REAR LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>
29	5080 50C0	Abnormal ABS sensor signal on any one of four sensor	Abnormal ABS sensor signal on any one of four	<Ref. to ABS-118, DTC 29 — ABNORMAL ABS SENSOR SIGNAL ON ANY ONE OF FOUR SENSOR —, Diagnostics Chart with Subaru Select Monitor.>
31	3200	Front inlet valve RH malfunction	Front inlet valve RH malfunction	<Ref. to ABS-124, DTC 31 — FRONT RIGHT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
32	3600	Front outlet valve RH malfunction	Front outlet valve RH malfunction	<Ref. to ABS-128, DTC 32 — FRONT RIGHT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
33	2200	Front inlet valve LH malfunction	Front inlet valve LH malfunction	<Ref. to ABS-124, DTC 33 — FRONT LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
34	2600	Front outlet valve LH malfunction	Front outlet valve LH malfunction	<Ref. to ABS-128, DTC 34 — FRONT LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
35	2A00	Rear inlet valve RH malfunction	Rear inlet valve RH malfunction	<Ref. to ABS-124, DTC 35 — REAR RIGHT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
36	2E00	Rear outlet valve RH malfunction	Rear outlet valve RH malfunction	<Ref. to ABS-128, DTC 36 — REAR RIGHT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

LIST OF DIAGNOSTICS TROUBLE CODE (DTC)

DTC No.	Sub code No.	Display screen	Contents of diagnosis	Index No.
37	3A00	Rear inlet valve LH malfunction	Rear inlet valve LH malfunction	<Ref. to ABS-125, DTC 37 — REAR LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
38	3E00	Rear outlet valve LH malfunction	Rear outlet valve LH malfunction	<Ref. to ABS-129, DTC 38 — REAR LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
41	02A0, 0040, 0020, 02C0, 00E0, 0340, 0140, 0160, 0280, 0080, 0300	ABS control module malfunction	ABS control module and hydraulic control unit malfunction	<Ref. to ABS-132, DTC 41 — ABS CONTROL MODULE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
42	5A00	Power supply voltage too low	Power supply voltage too low	<Ref. to ABS-134, DTC 42 — POWER SUPPLY VOLTAGE TOO LOW —, Diagnostics Chart with Subaru Select Monitor.>
42	5A80	Power supply voltage too high	Power supply voltage too high	<Ref. to ABS-137, DTC 42 — POWER SUPPLY VOLTAGE TOO HIGH —, Diagnostics Chart with Subaru Select Monitor.>
44	1600	ABS-AT control (Non Controlled)	ABS-AT control (Non Controlled)	<Ref. to ABS-140, DTC 44 — ABS-AT CONTROL (NON CONTROLLED) —, Diagnostics Chart with Subaru Select Monitor.>
44	1500	ABS-AT control (Controlled)	ABS-AT control (Controlled)	<Ref. to ABS-142, DTC 44 — ABS-AT CONTROL (CONTROLLED) —, Diagnostics Chart with Subaru Select Monitor.>
51	0C80 0EA0	Valve relay malfunction	Valve relay malfunction	<Ref. to ABS-144, DTC 51 — VALVE RELAY MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
51	0C40	Valve relay ON failure	Valve relay ON failure	<Ref. to ABS-147, DTC 51 — VALVE RELAY ON FAILURE —, Diagnostics Chart with Subaru Select Monitor.>
52	10A1	Open circuit in motor relay circuit	Open circuit in motor relay circuit	<Ref. to ABS-149, DTC 52 — OPEN CIRCUIT IN MOTOR RELAY CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
52	10E1	Motor relay ON failure	Motor relay ON failure	<Ref. to ABS-151, DTC 52 — MOTOR RELAY ON FAILURE —, Diagnostics Chart with Subaru Select Monitor.>
52	10C1	Motor malfunction	Motor malfunction	<Ref. to ABS-153, DTC 52 — MOTOR MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
54	5600	Stop light switch signal circuit malfunction	Stop light switch signal circuit malfunction	<Ref. to ABS-156, DTC 54 — STOP LIGHT SWITCH SIGNAL CIRCUIT MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
56	7600	Open or short circuit in G sensor circuit	Open or short circuit in G sensor circuit	<Ref. to ABS-158, DTC 56 — OPEN OR SHORT CIRCUIT IN G SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
56	7580	Battery short in G sensor circuit	Battery short in G sensor circuit	<Ref. to ABS-162, DTC 56 — BATTERY SHORT IN G SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
56	7540	Abnormal G sensor high μ output	Abnormal G sensor high μ output	<Ref. to ABS-167, DTC 56 — Abnormal G Sensor High μ Output —, Diagnostics Chart with Subaru Select Monitor.>
56	7500	Detection of G sensor stick	Detection of G sensor stick	<Ref. to ABS-171, DTC 56 — DETECTION OF G SENSOR STICK —, Diagnostics Chart with Subaru Select Monitor.>

NOTE:
High μ means high friction coefficient against road surface.

12.Diagnostics Chart with Diagnosis Connector

A: ABS WARNING LIGHT DOES NOT COME ON.

DIAGNOSIS:

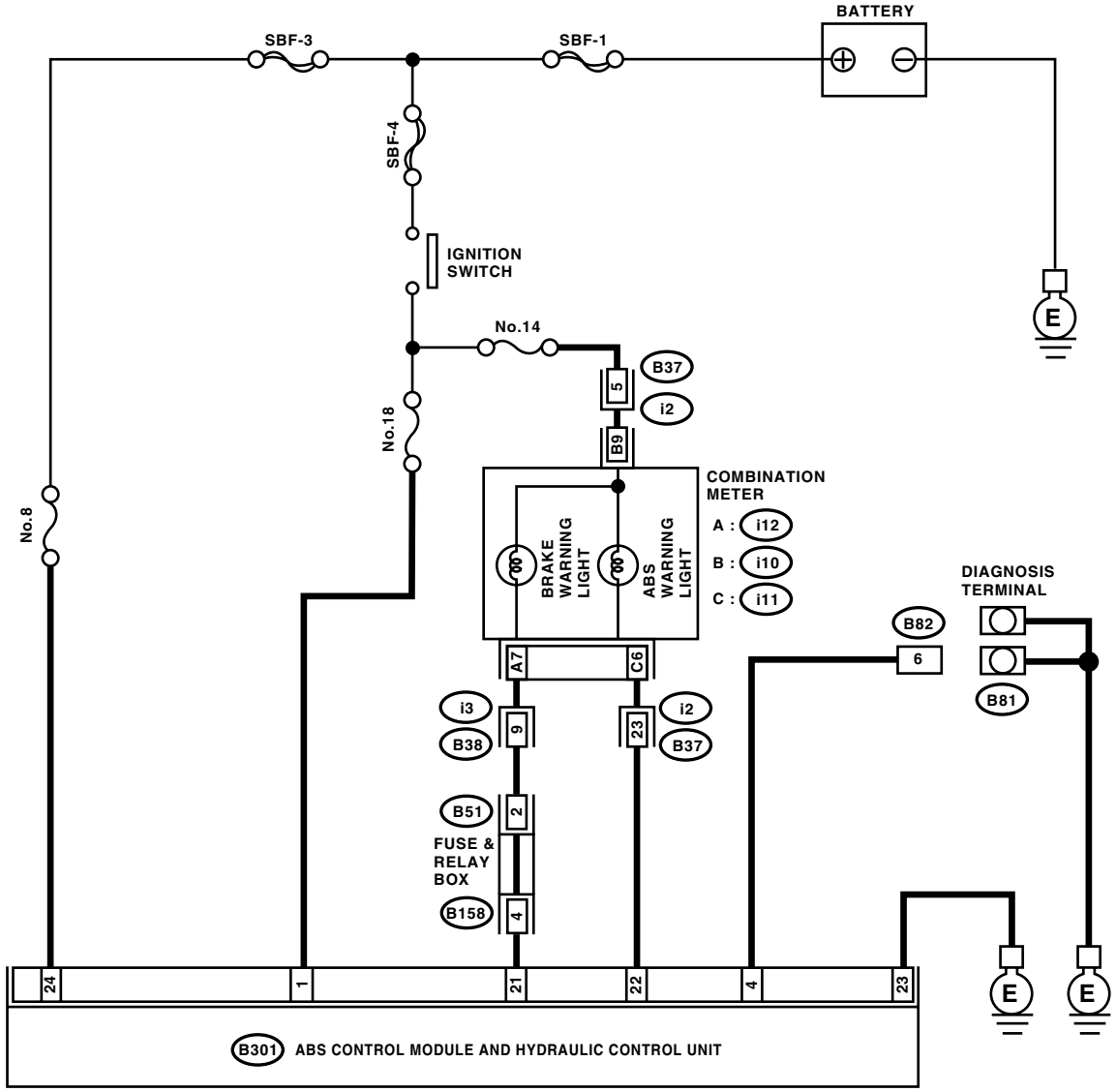
- ABS warning light circuit is open or shorted.

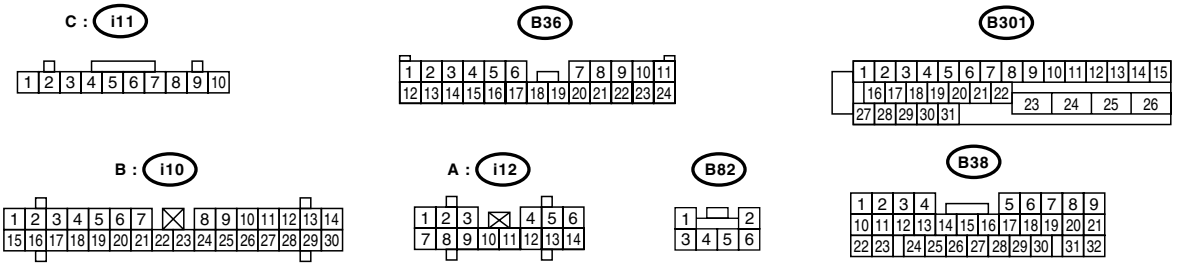
TROUBLE SYMPTOM:

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

WIRING DIAGRAM:

LHD MODEL

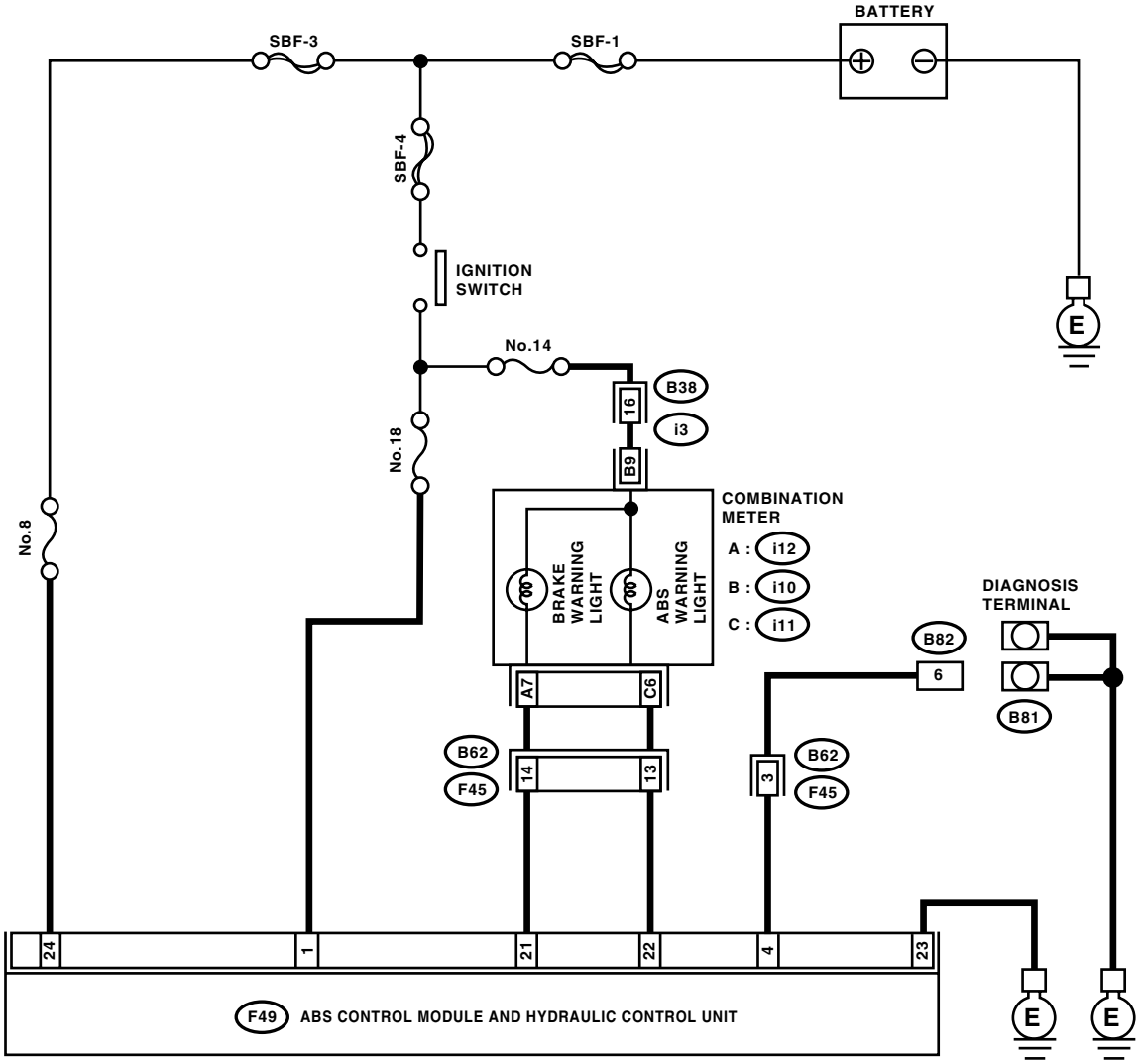


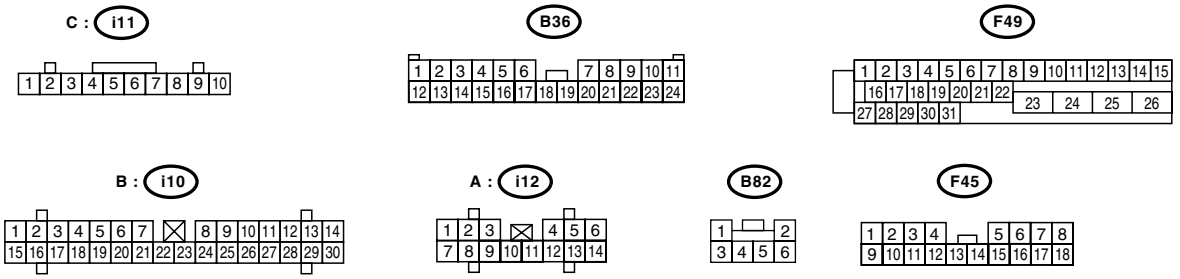


ABS00199

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

RHD MODEL





ABS00204

	Step	Value	Yes	No
1	**CHECK IF OTHER WARNING LIGHTS TURN ON.** Turn the ignition switch to ON (engine OFF). Are other warning lights turned on?	Other warning lights are turned on.	Go to step **2.**	Repair the combination meter. <Ref. to IDI-12, Combination Meter Assembly.>

	Step	Value	Yes	No
2	**CHECK ABS AND BRAKE WARNING LIGHT BULB.** 1)Turn the ignition switch to OFF. 2)Remove the combination meter. 3)Remove the ABS warning light and brake warning light. Is the ABS warning light bulb open?	Valves are not blown out.	Go to step **3.**	Replace the ABS and brake warning light bulb. <Ref. to IDI-12, Combination Meter Assembly.>
3	**CHECK BATTERY SHORT OF ABS AND BRAKE WARNING LIGHT HARNESS.** 1)Disconnect the connector (i2) or (B62) from connector (B37) or (F45). 2)Measure the voltage between connector (i2) or (B62) and chassis ground. ***Connector & terminal*** ***LHD: (i2) No. 23 (+) — Chassis ground (–):*** ***RHD: (B62) No. 13 (+) — Chassis ground (–):*** Is the measured value less than specified value?	3 V	Go to step **4.**	Repair the warning light harness.
4	**CHECK BATTERY SHORT OF ABS AND BRAKE WARNING LIGHT HARNESS.** 1)Turn the ignition switch to ON. 2)Measure the voltage between connector (i2) or (B62) and chassis ground. ***Connector & terminal*** ***LHD: (i2) No. 23 (+) — Chassis ground (–):*** ***RHD: (B62) No. 13 (+) — Chassis ground (–):*** Is the measured value less than specified value?	3 V	Go to step **5.**	Repair the warning light harness.
5	**CHECK WIRING HARNESS.** 1)Turn the ignition switch to OFF. 2)Install the combination meter. 3)Turn the ignition switch to ON. 4)Measure the voltage between connector (i2) or (B62) and chassis ground. ***Connector & terminal*** ***LHD: (i2) No. 23 (+) — Chassis ground (–):*** ***RHD: (B62) No. 13 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **6.**	Repair the wiring harness.
6	**CHECK BATTERY SHORT OF ABS AND BRAKE WARNING LIGHT HARNESS.** 1)Turn the ignition switch to OFF. 2)Measure the voltage between connector (B37) or (F45) and chassis ground. ***Connector & terminal*** ***LHD: (B37) No. 23 (+) — Chassis ground (–):*** ***RHD: (F45) No. 13 (+) — Chassis ground (–):*** Is the measured value less than specified value?	3 V	Go to step **7.**	Repair the wiring harness.

	Step	Value	Yes	No
7	**CHECK BATTERY SHORT OF ABS AND BRAKE WARNING LIGHT HARNESS.** 1)Turn the ignition switch to ON. 2)Measure the voltage between connector (B37) or (F45) and chassis ground. ***Connector & terminal*** ***LHD: (B37) No. 23 (+) — Chassis ground (–):*** ***RHD: (F45) No. 13 (+) — Chassis ground (–):*** Is the measured value less than specified value?	3 V	Go to step **8.**	Repair the wiring harness.
8	**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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **9.**	Repair the ABSCM&H/U ground harness.
9	**CHECK WIRING HARNESS.** Measure the resistance between connector (B37) or (F45) and chassis ground. ***Connector & terminal*** ***LHD: (B37) No. 23 — Chassis ground:*** ***RHD: (F45) No. 13 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **10.**	Repair the harness/connector.
10	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connectors between combination meter and ABSCM&H/U?	There is no poor contact.	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Repair the connector.

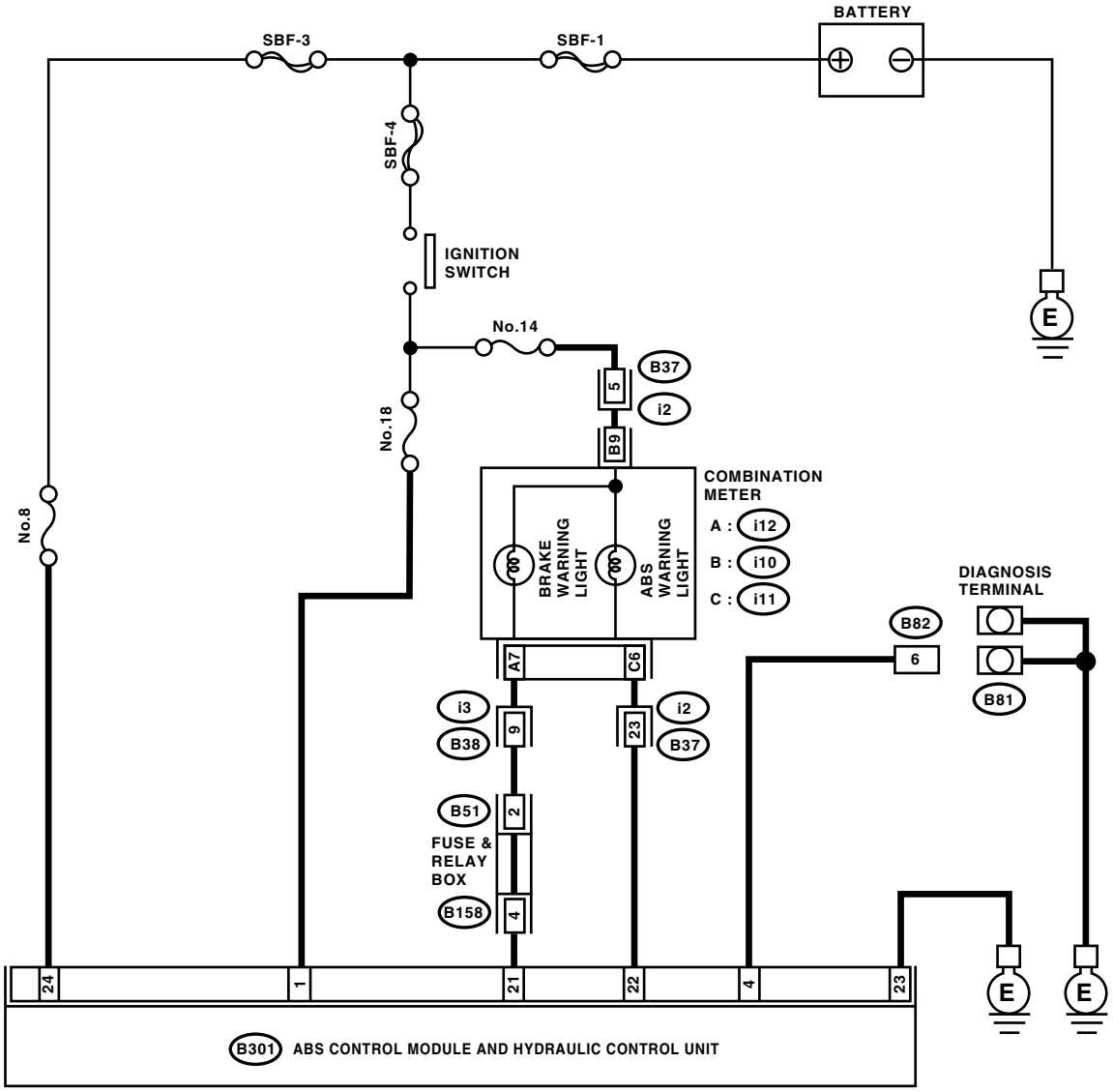
B: ABS WARNING LIGHT DOES NOT GO OFF.

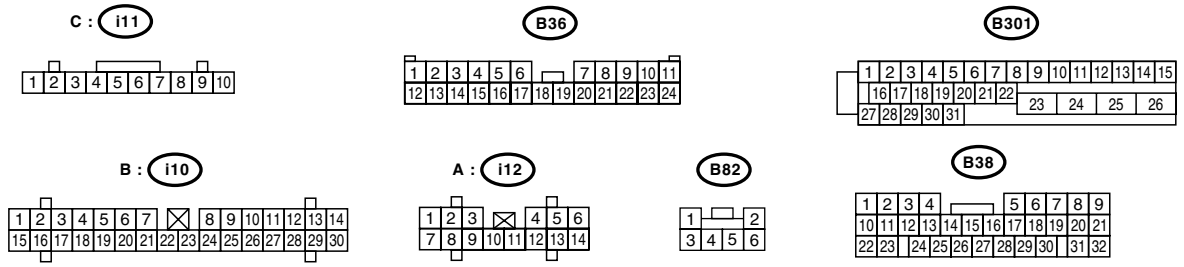
TROUBLE SYMPTOM:

- When starting the engine and while ABS warning light is kept ON.

WIRING DIAGRAM:

LHD MODEL

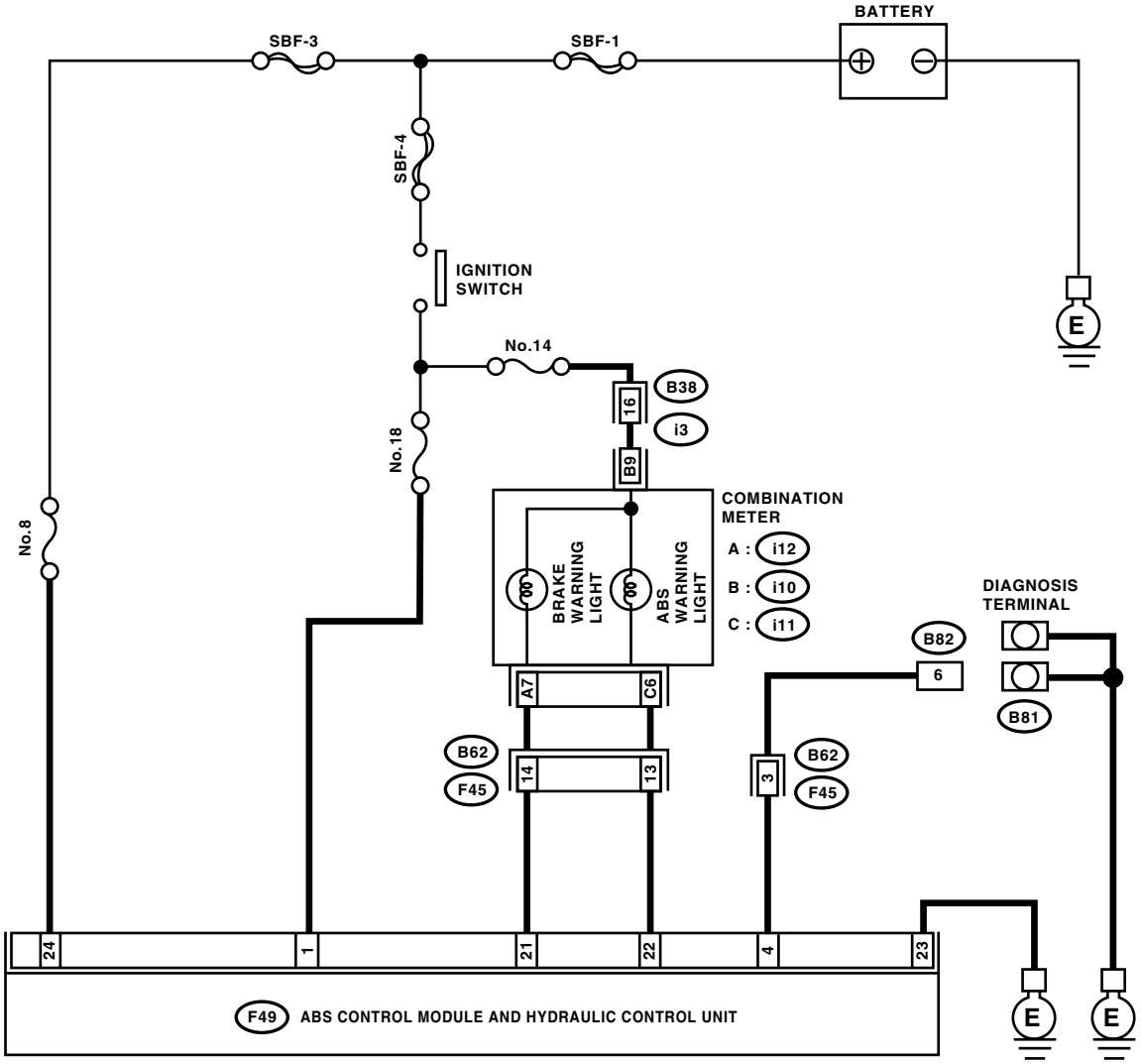


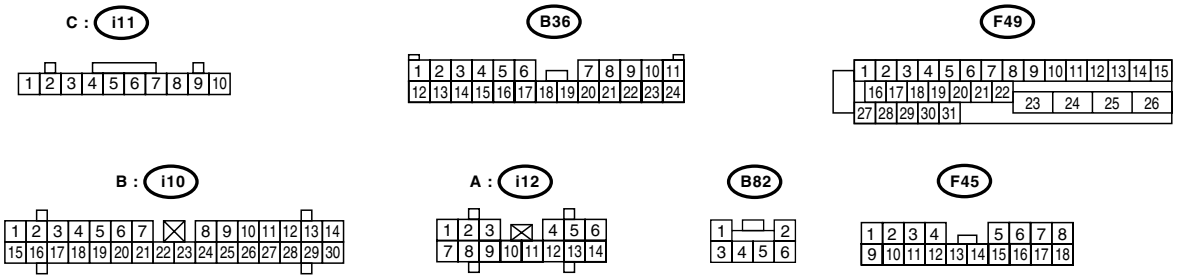


ABS00199

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

RHD MODEL





ABS00204

Step		Value	Yes	No
1	**CHECK INSTALLATION OF ABSCM&H/U CONNECTOR.** Turn the ignition switch to OFF. Is the ABSCM&H/U connector inserted into ABSCM until the clamp locks onto it?	Connector is inserted securely.	Go to step **2.**	Insert the ABSCM&H/U connector into ABSCM&H/U until the clamp locks onto it.

	Step	Value	Yes	No
2	**CHECK DIAGNOSIS TERMINAL.** Measure the resistance between diagnosis terminals (B81) and chassis ground. ***Terminals*** ***Diagnosis terminal (A) — Chassis ground:*** ***Diagnosis terminal (B) — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **3.**	Repair the diagnosis terminal harness.
3	**CHECK DIAGNOSIS LINE.** 1)Connect the diagnosis terminal (B81) to diagnosis connector (B82) No. 6. 2)Disconnect the connector from ABSCM&H/U. 3)Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 4 — Chassis ground:*** ***RHD: (F49) No. 4 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **4.**	Repair the harness connector between ABSCM&H/U and diagnosis connector.
4	**CHECK GENERATOR.** 1)Start the engine. 2)Idle the engine. 3)Measure the voltage between generator and chassis ground. ***Terminal*** ***Generator B terminal (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **5.**	Repair the generator. <Ref. to SC(SOHC)-15, Generator.>
5	**CHECK BATTERY TERMINAL.** Turn the ignition switch to OFF. Is there poor contact at battery terminal?	There is no poor contact.	Go to step **6.**	Repair or tighten the battery terminal.
6	**CHECK POWER SUPPLY OF ABSCM.** 1)Start the engine. 2)Idle the engine. 3)Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **7.**	Repair the ABSCM&H/U power supply circuit.
7	**CHECK WIRING HARNESS.** 1)Disconnect the connector (i2) or (B62) from connector (B37) or (F45). 2)Turn ignition switch to ON. Does the ABS warning light turn on?	ABS warning light does not turn on.	Go to step **8.**	Repair the front or body wiring harness.
8	**CHECK PROJECTION AT ABSCM&H/U.** 1)Turn the ignition switch to OFF. 2)Check for damage at the ABSCM&H/U terminal. Is there damage on terminal?	There is no damage on terminal.	Go to step **9.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

	Step	Value	Yes	No
9	**CHECK ABSCM&H/U.** Measure the resistance between ABSCM&H/U terminals. ***Terminal*** ***No. 22 — No. 23:*** Is the measured value more than specified value?	1 MΩ	Go to step **10.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
10	**CHECK WIRING HARNESS.** Measure the resistance between connector (B37) or (F45) and chassis ground. ***Connector & terminal*** ***LHD: (B37) No. 23 — Chassis ground:*** ***RHD: (F45) No. 13 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **11.**	Repair the harness.
11	**CHECK WIRING HARNESS.** 1)Connect the connector to ABSCM&H/U. 2)Measure the resistance between connector (B37) or (F45) and chassis ground. ***Connector & terminal*** ***LHD: (B37) No. 23 — Chassis ground:*** ***RHD: (F45) No. 13 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **12.**	Repair the harness.
12	**CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.** Is there poor contact in ABSCM&H/U connector?	There is no poor contact.	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Repair the connector.

C: ABS AND BRAKE WARNING LIGHT DO NOT GO OFF.

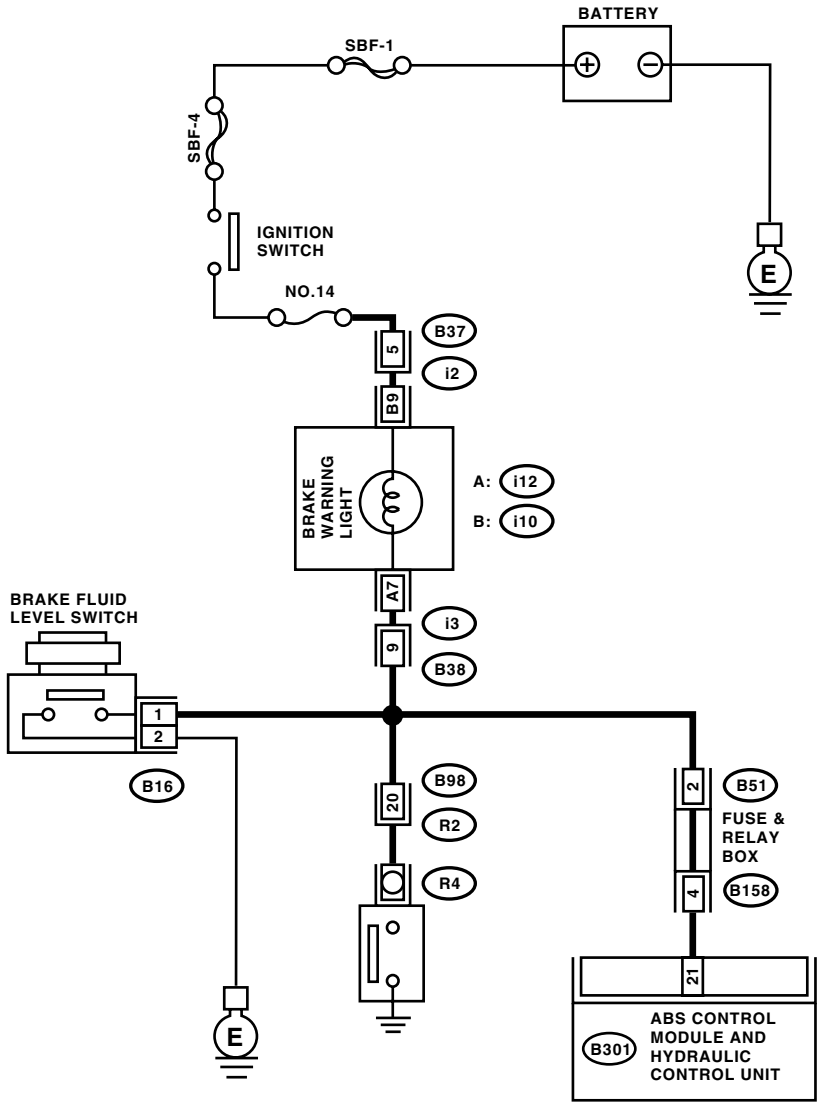
DIAGNOSIS:

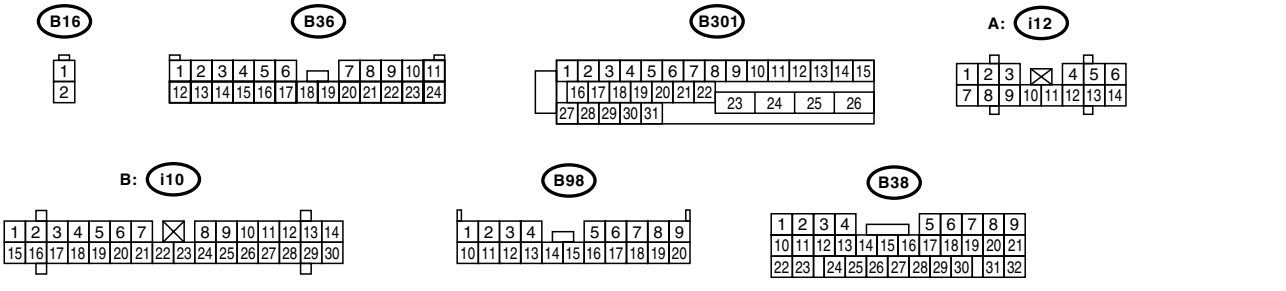
- ABS warning light circuit is open or shorted.
- Brake warning light circuit is shorted.
- Faulty sensor/connector

TROUBLE SYMPTOM:

- When starting the engine, ABS warning light is kept ON.
- After starting the engine, brake warning light is kept ON, even if the parking brake lever has been released.

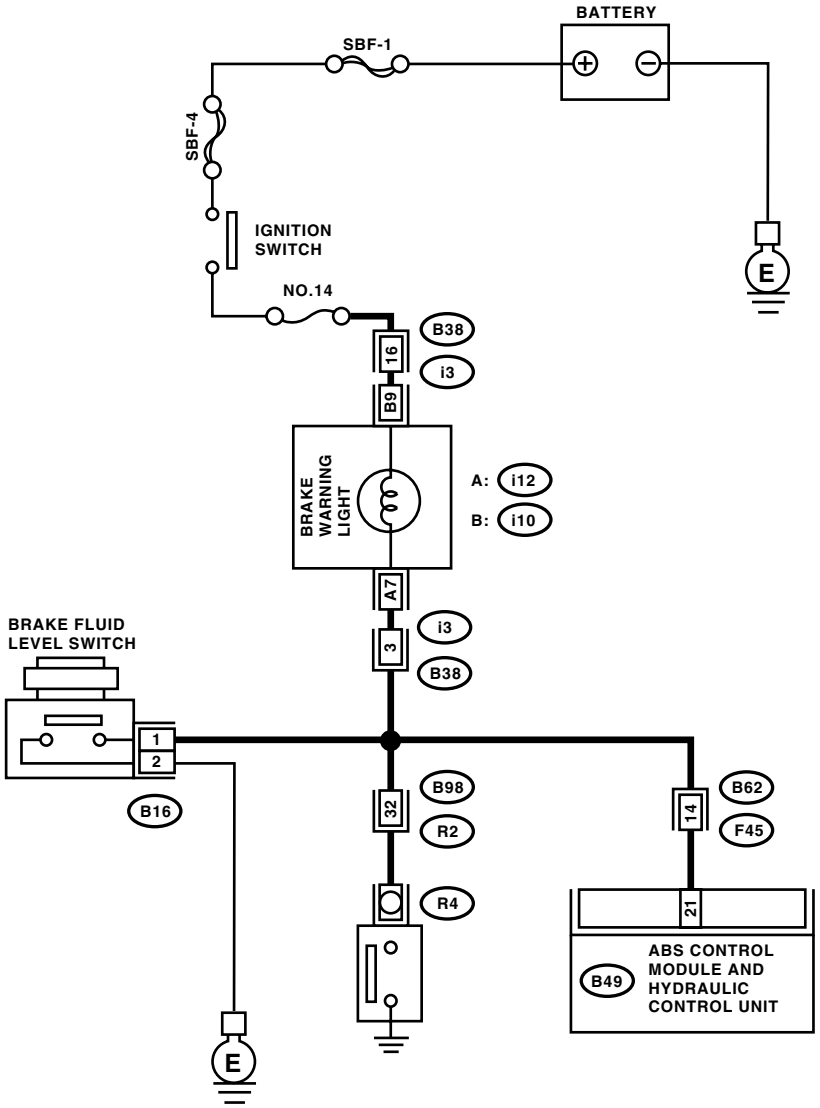
WIRING DIAGRAM:
LHD MODEL

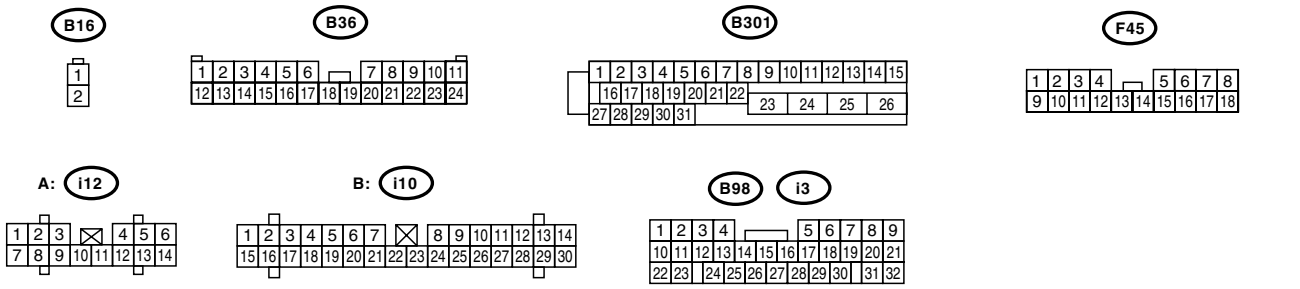




ABS00209

RHD MODEL





ABS00214

	Step	Value	Yes	No
1	**CHECK BRAKE FLUID AMOUNT.** Check the amount of brake fluid in reservoir tank of master cylinder. Is the brake fluid amount within specified value?	Brake fluid amount is between "MAX" line and "MIN" line.	Go to step **2.**	Fill the brake fluid to specified amount.

	Step	Value	Yes	No
2	**CHECK BRAKE FLUID LEVEL SWITCH.** 1)Disconnect the level switch connector (B16) from master cylinder. 2)Measure the resistance of master cylinder terminals. ***Terminals*** ***No.1 — No.2:*** Is the measured value more than specified value?	1 MΩ	Go to step **3.**	Replace the master cylinder.
3	**CHECK PARKING BRAKE SWITCH.** 1)Disconnect the connector (R4) from parking brake switch. 2)Release the parking brake switch. 3)Measure the resistance between parking brake switch terminal and chassis ground. Is the measured value more than specified value?	1 MΩ	Go to step **4.**	Replace the parking brake switch.
4	**CHECK GROUND SHORT OF HARNESS.** 1)Disconnect the connector form ABSCM & H/U. 2)Disconnect the connector (i12) from combination meter. 3)Turn the ignition switch to ON. Does the brake warning light go off?	Brake warning light goes off.	Go to step **5.**	Repair the harness.
5	**CHECK POOR CONTACT IN ABSCM & H/U.** Is there poor contact in ABSCM & H/U connector?	There is no poor contact.	Replace the ABSCM & H/U.<Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Repair the connector.

D: TROUBLE CODE DOES NOT APPEAR.

DIAGNOSIS:

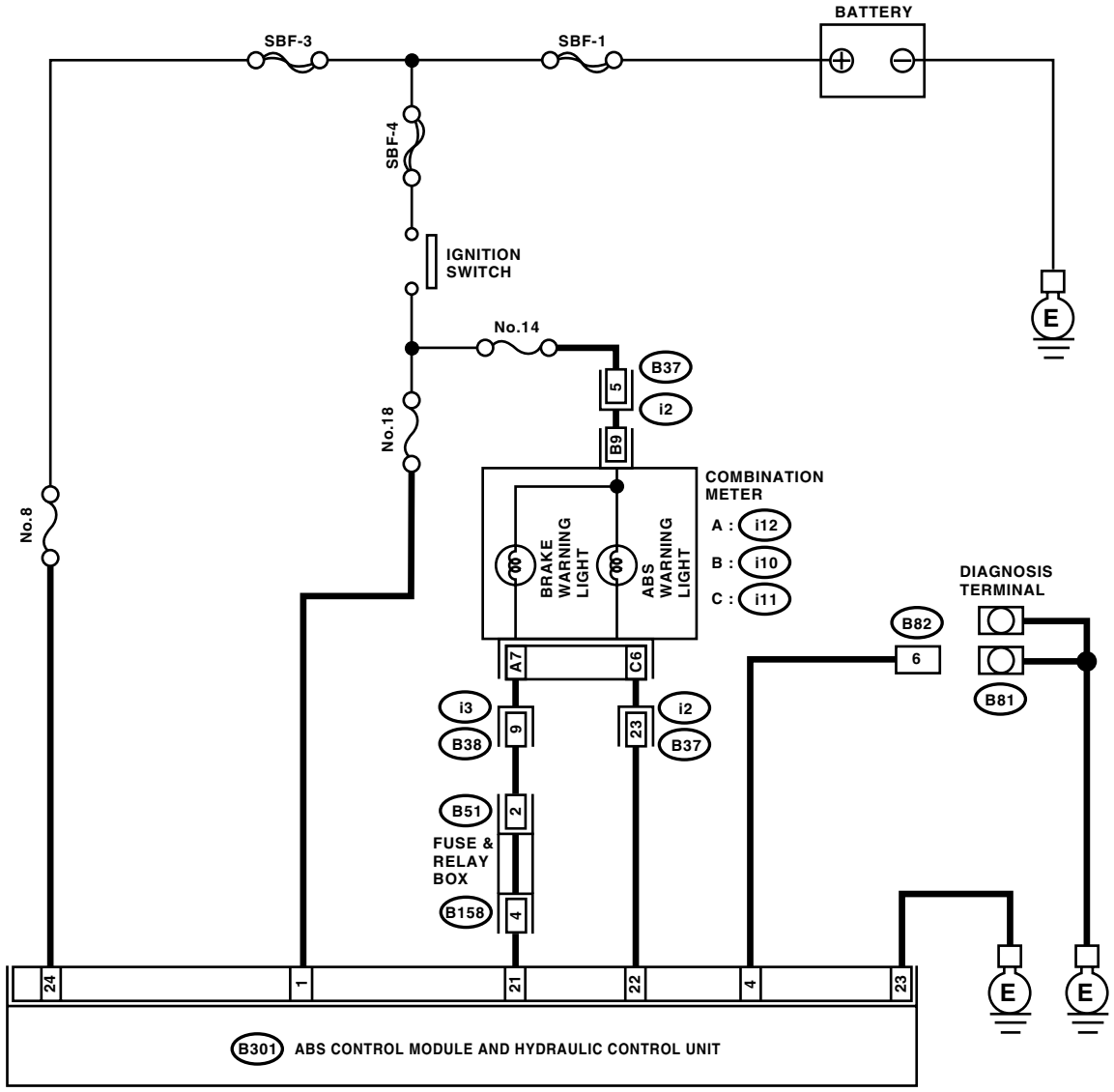
- Diagnosis circuit is open.

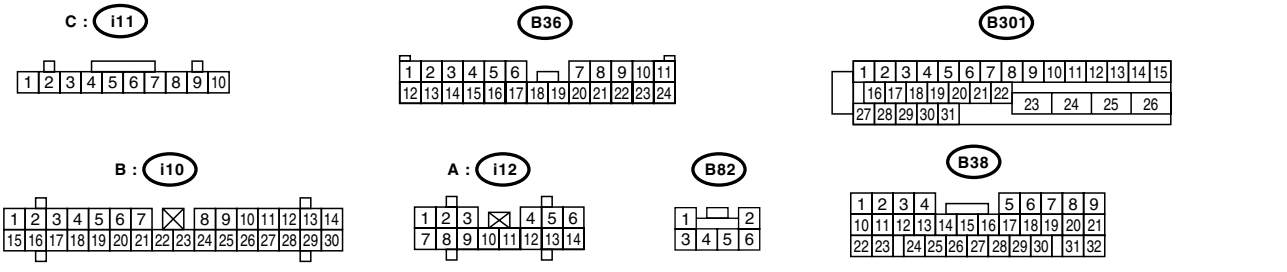
TROUBLE SYMPTOM:

- The ABS warning light turns on or off normally but the start code cannot be read out in diagnostic mode.

WIRING DIAGRAM:

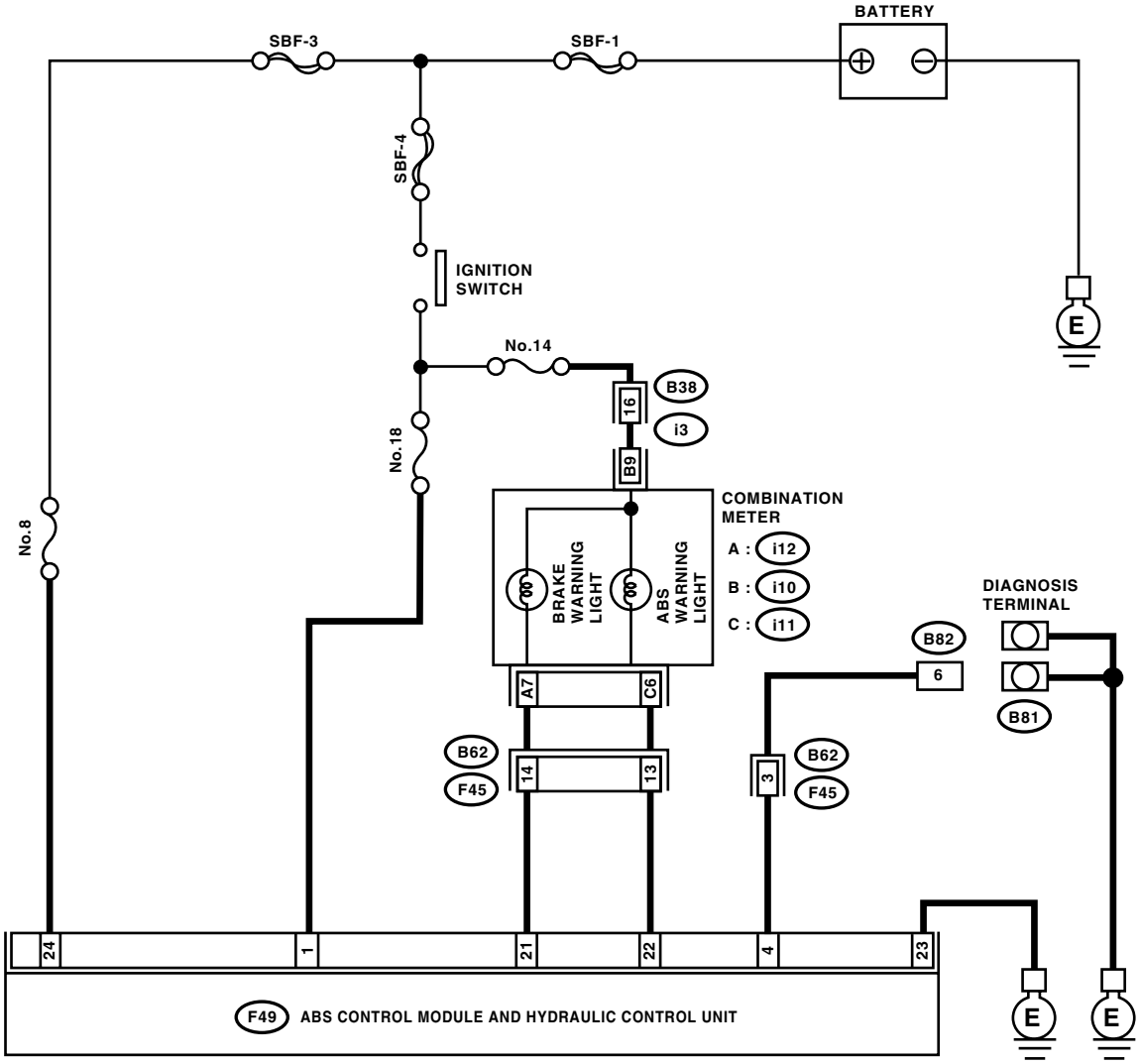
LHD MODEL

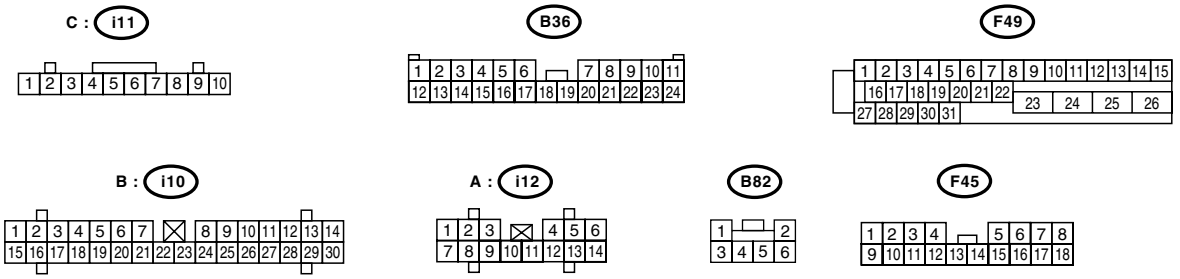




ABS00199

RHD MODEL





ABS00204

	Step	Value	Yes	No
1	**CHECK DIAGNOSIS TERMINAL.** 1)Turn the ignition switch to OFF. 2)Measure the resistance between diagnosis terminals (B81) and chassis ground. ***Terminals*** ***Diagnosis terminal (A) — Chassis ground:*** ***Diagnosis terminal (B) — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **2.**	Repair the diagnosis terminal harness.
2	**CHECK DIAGNOSIS LINE.** 1)Connect the diagnosis terminal (B81) to diagnosis connector (B82) No. 6. 2)Disconnect the connector from ABSCM&H/U. 3)Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 4 — Chassis ground:*** ***RHD: (F49) No. 4 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **3.**	Repair the harness connector between ABSCM&H/U and diagnosis connector.
3	**CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.** Is there poor contact in ABSCM&H/U connector?	There is no poor contact.	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Repair the connector.

E: DTC 21 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (FRONT RH) —

NOTE:
For the diagnostic procedure, refer to DTC 27. <Ref. to ABS-45, DTC 27 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

F: DTC 23 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (FRONT LH) —

NOTE:
For the diagnostic procedure, refer to DTC 27. <Ref. to ABS-45, DTC 27 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

G: DTC 25 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR RH) —

NOTE:
For the diagnostic procedure, refer to DTC 27. <Ref. to ABS-45, DTC 27 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

H: DTC 27 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) —

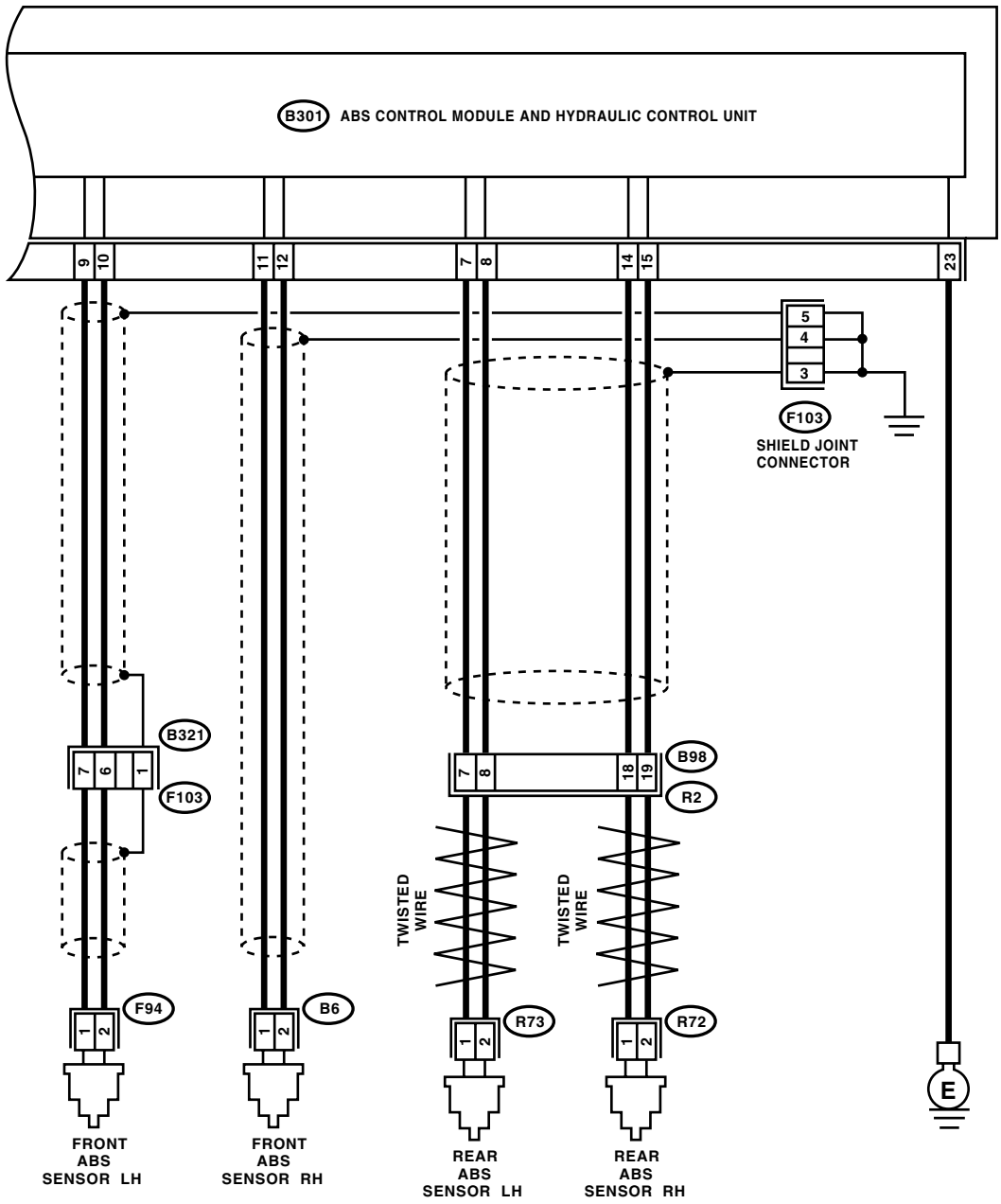
DIAGNOSIS:

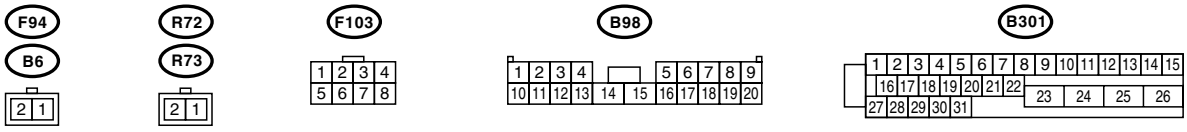
- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

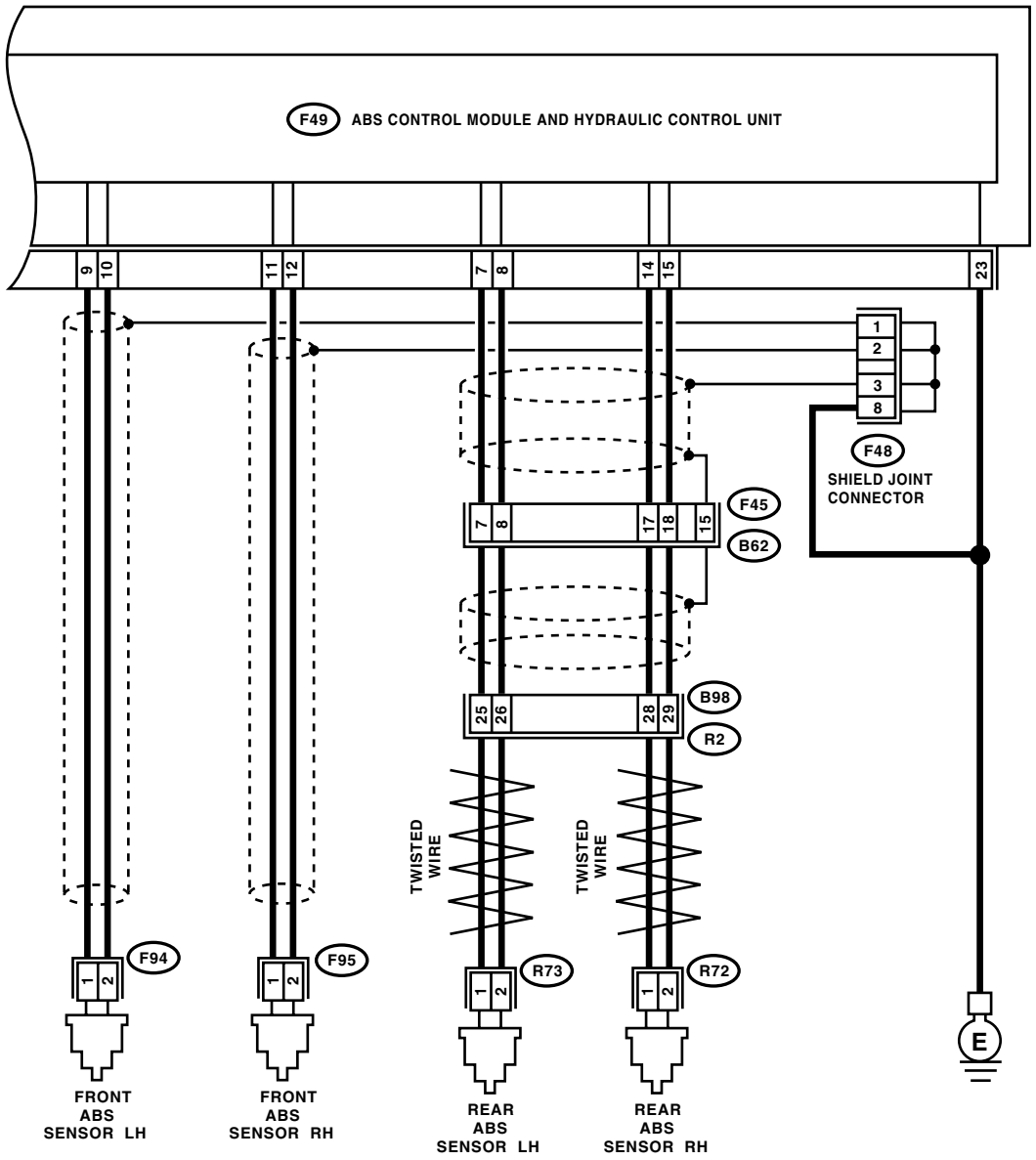
WIRING DIAGRAM:
LHD MODEL

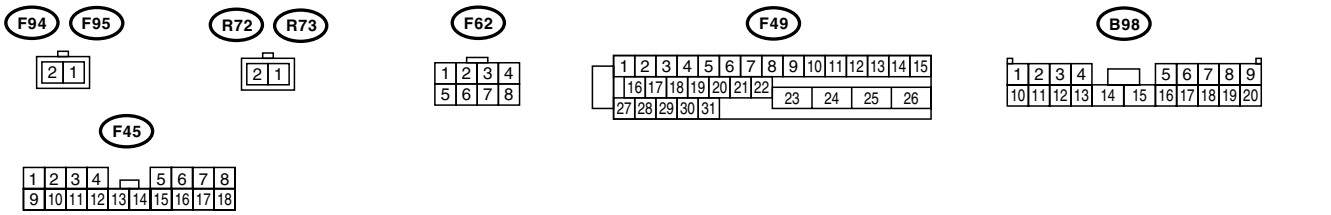




ABS00219

RHD MODEL





ABS00224

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

	Step	Value	Yes	No
1	**CHECK ABS SENSOR.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ABS sensor. 3)Measure the resistance of ABS sensor connector terminals while shaking the harness lightly. ***Terminal*** ***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 measured value within specified value?	Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step **2.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
2	**CHECK BATTERY SHORT OF ABS SENSOR.** 1)Disconnect the connector from ABSCM&H/U. 2)Measure the voltage between ABS sensor and chassis ground. ***Terminal*** ***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 measured value less than specified value?	1 V	Go to step **3.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
3	**CHECK BATTERY SHORT OF ABS SENSOR.** 1)Turn the ignition switch to ON. 2)Measure the voltage between ABS sensor and chassis ground. ***Terminal*** ***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 measured value less than specified value?	1 V	Go to step **4.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
4	**CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.** 1)Turn the ignition switch to OFF. 2)Connect the connector to ABS sensor. 3)Measure the resistance between ABSCM&H/U connector terminals. ***Connector & terminal*** ***DTC 21*** ***LHD: (B301) No. 11 — No. 12:*** ***RHD: (F49) No. 11 — No. 12:*** ***DTC 23*** ***LHD:(B301) No. 9 — No. 10:*** ***RHD: (F49) No. 9 — No. 10:*** ***DTC 25*** ***LHD:(B301) No. 14 — No. 15:*** ***RHD: (F49) No. 14 — No. 15:*** ***DTC 27*** ***LHD:(B301) No. 7 — No. 8:*** ***RHD: (F49) No. 7 — No. 8:*** Is the measured value within specified value?	Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step **5.**	Repair the harness/connector between ABSCM&H/U and ABS sensor.

	Step	Value	Yes	No
5	**CHECK BATTERY SHORT OF HARNESS.** Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***DTC 21*** ***LHD:(B301) No. 11 (+) — Chassis ground (–):*** ***RHD: (F49) No. 11 (+) — Chassis ground (–):*** ***DTC 23*** ***LHD: (B301) No. 9 (+) — Chassis ground (–):*** ***RHD: (F49) No. 9 (+) — Chassis ground (–):*** ***DTC 25*** ***LHD:(B301) No. 14 (+) — Chassis ground (–):*** ***RHD: (F49) No. 14 (+) — Chassis ground (–):*** ***DTC 27*** ***LHD: (B301) No. 7 (+) — Chassis ground (–):*** ***RHD: (F49) No. 7 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **6.**	Repair the harness between ABSCM&H/U and ABS sensor.
6	**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*** ***LHD:(B301) No. 11 (+) — Chassis ground (–):*** ***RHD: (F49) No. 11 (+) — Chassis ground (–):*** ***DTC 23*** ***LHD: (B301) No. 9 (+) — Chassis ground (–):*** ***RHD: (F49) No. 9 (+) — Chassis ground (–):*** ***DTC 25*** ***LHD:(B301) No. 14 (+) — Chassis ground (–):*** ***RHD: (F49) No. 14 (+) — Chassis ground (–):*** ***DTC 27*** ***LHD: (B301) No. 7 (+) — Chassis ground (–):*** ***RHD: (F49) No. 7 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **7.**	Repair the harness between ABSCM&H/U and ABS sensor.
7	**CHECK INSTALLATION OF ABS SENSOR.** Turn the ignition switch to OFF. Are the ABS sensor installation bolts tightened securely?	33 N·m (3.4 kgf-m, 24.6 ft-lb)	Go to step **8.**	Tighten the ABS sensor installation bolts securely.

	Step	Value	Yes	No
8	**CHECK ABS SENSOR GAP.** Measure the tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Is the measured value within specified 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 spacers (Part No. 26755AA000). If the spacers cannot correct gap, replace worn sensor or worn tone wheel.
9	**CHECK TONE WHEEL RUNOUT.** Measure the tone wheel runout. Is the measured value less than specified value?	0.05 mm (0.0020 in)	Go to step **10.**	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
10	**CHECK GROUND SHORT OF ABS SENSOR.** 1)Turn the ignition switch to ON. 2)Measure the resistance between ABS sensor and chassis ground. ***Terminal*** ***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 measured value more than specified value?	1 MΩ	Go to step **11.**	Replace the ABS sensor and ABSCM&H/U. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.> and <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
11	**CHECK GROUND SHORT OF HARNESS.** 1)Turn the ignition switch to OFF. 2)Connect the connector to ABS sensor. 3)Measure the resistance between ABSCM&H/U connector terminal and chassis ground. ***Connector & terminal*** ***DTC 21*** ***LHD: (B301) No. 11 — Chassis ground:*** ***RHD: No. 11 — Chassis ground:*** ***DTC 23*** ***LHD: (B301) No. 9 — Chassis ground:*** ***RHD: No. 9 — Chassis ground:*** ***DTC 25*** ***LHD: (B301) No. 14 — Chassis ground:*** ***RHD: No. 14 — Chassis ground:*** ***DTC 27*** ***LHD: (B301) No. 7 — Chassis ground:*** ***RHD: No. 7 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **12.**	Repair the harness between ABSCM&H/U and ABS sensor. Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
12	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connectors between ABSCM&H/U and ABS sensor?	There is no poor contact.	Go to step **13.**	Repair the connector.

	Step	Value	Yes	No
13	**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?	Same DTC is not output.	Go to step **14.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
14	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact. NOTE: Check the harness and connectors between ABSCM&H/U and ABS sensor.	Proceed with the diagnosis corresponding to the DTC.

I: DTC 22 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (FRONT RH) —

NOTE:
For the diagnostic procedure, refer to DTC 28. <Ref. to ABS-53, DTC 28 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

J: DTC 24 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (FRONT LH) —

NOTE:
For the diagnostic procedure, refer to DTC 28. <Ref. to ABS-53, DTC 28 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

K: DTC 26 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (REAR RH) —

NOTE:
For the diagnostic procedure, refer to DTC 28. <Ref. to ABS-53, DTC 28 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

L: DTC 28 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (REAR LH) —

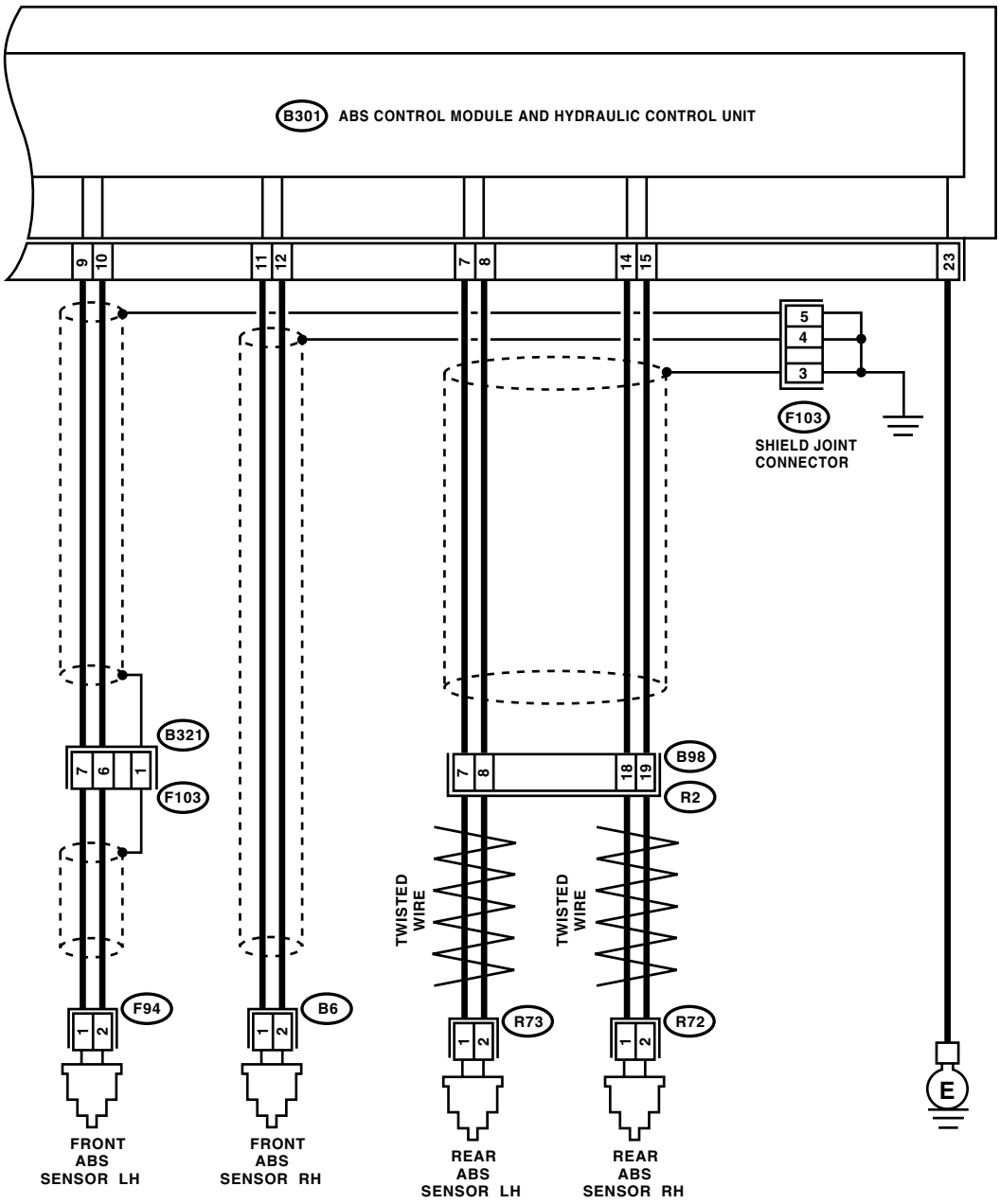
DIAGNOSIS:

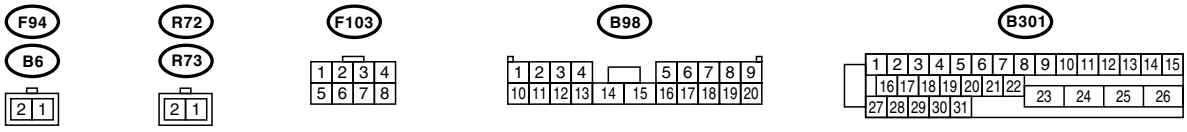
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.

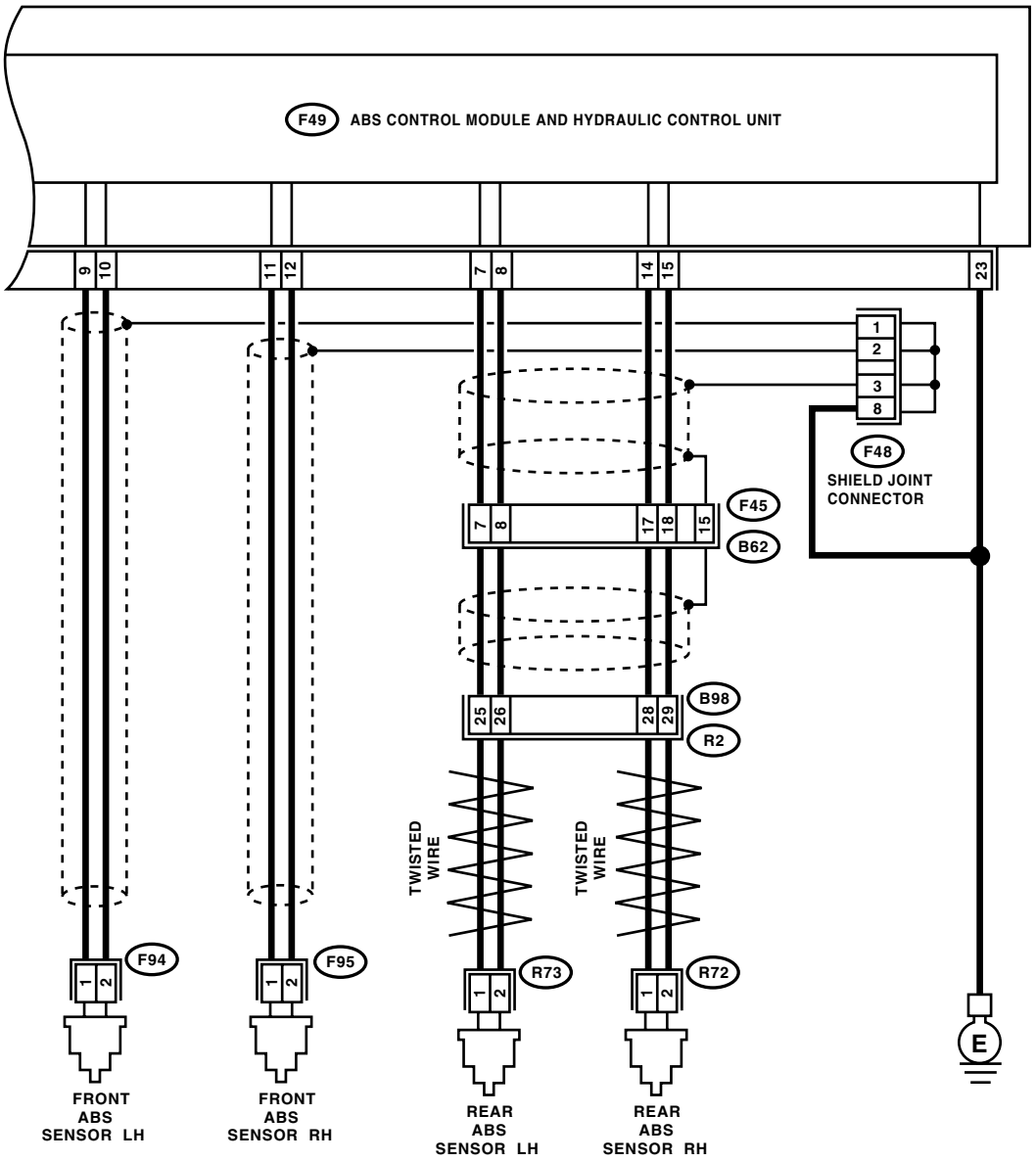
WIRING DIAGRAM:
LHD MODEL

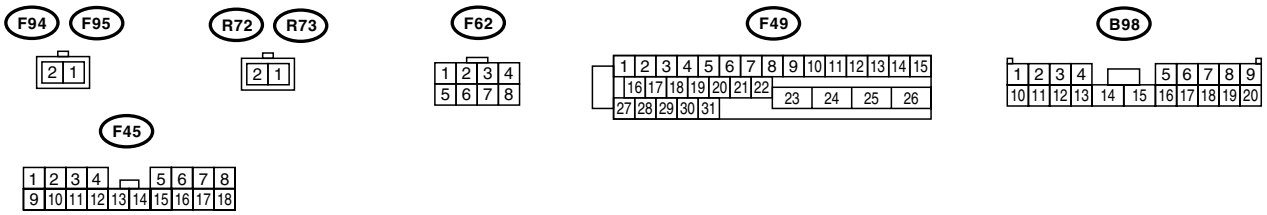




ABS00219

RHD MODEL





ABS00224

	Step	Value	Yes	No
1	**CHECK INSTALLATION OF ABS SENSOR.** Turn the ignition switch to OFF. Are the ABS sensor installation bolts tightened securely?	33 N·m (3.4 kgf-m, 24.6 ft-lb)	Go to step **2.**	Tighten the ABS sensor installation bolts securely.

	Step	Value	Yes	No
2	**CHECK ABS SENSOR GAP.** Measure the tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Is the measured value within specified 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 **3.**	Adjust the gap. NOTE: Adjust the gap using spacer (Part No. 26755AA000). If the spacer cannot correct gap, replace worn sensor or worn tone wheel.
3	**PREPARE OSCILLOSCOPE.** Is an oscilloscope available?	Oscilloscope is available.	Go to step **4.**	Go to step **5.**
4	**CHECK ABS 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-17, WAVEFORM, Control Module I/O Signal.> NOTE: When this inspection is completed, the ABS control module sometimes stores DTC 29 or DTC 56. ***Connector & terminal*** ***DTC 22*** ***LHD: (B6) No. 1 (+) — No. 2 (–):*** ***RHD: (F95) No. 1 (+) — No. 2 (–):*** ***DTC 24*** ***LHD: (F103) No. 1 (+) — No. 2 (–):*** ***RHD: (F94) No. 1 (+) — No. 2 (–):*** ***DTC 26*** ***LHD: (B98) No. 18 (+) — No. 19 (–):*** ***RHD: (B98) No. 28 (+) — No. 29 (–):*** ***DTC 28*** ***LHD: (B98) No. 7 (+) — No. 8 (–):*** ***RHD: (B98) No. 25 (+) — No. 26 (–):*** Is the measured value as specified value?	Oscilloscope pattern is smooth, as shown in the figure.	Go to step **8.**	Go to step **7.**
5	**CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.** Remove the disc rotor or drum from hub in accordance with DTC. Is the ABS sensor piece or the tone wheel contaminated by dirt or other foreign matter?	ABS sensor piece or tone wheel is not contaminated.	Go to step **6.**	Thoroughly remove dirt or other foreign matter.
6	**CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.** Are there broken or damaged in the ABS sensor piece or the tone wheel?	There are no broken or damaged in the ABS sensor piece or tone wheel.	Go to step **7.**	Replace the ABS sensor or tone wheel. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.> and Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>

	Step	Value	Yes	No
7	**CHECK TONE WHEEL RUNOUT.** Measure the tone wheel runout. Is the measured value less than specified value?	0.05 mm (0.0020 in)	Go to step **8.**	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
8	**CHECK RESISTANCE OF ABS SENSOR.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ABS sensor. 3)Measure the resistance between ABS sensor connector terminals while shaking the harness lightly. ***Terminal*** ***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 measured value within specified value?	Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step **9.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
9	**CHECK GROUND SHORT OF ABS SENSOR.** Measure the resistance between ABS sensor and chassis ground. ***Terminal*** ***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 measured value more than specified value?	1 MΩ	Go to step **10.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
10	**CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.** 1)Connect the connector to ABS sensor. 2)Disconnect the connector from ABSCM&H/U. 3)Measure the resistance at ABSCM&H/U connector terminals. ***Connector & terminal*** ***DTC 22*** ***LHD: (B301) No. 11 — No. 12:*** ***RHD: (F49) No. 11 — No. 12:*** ***DTC 24*** ***LHD: (B301) No. 9 — No. 10:*** ***RHD: (F49) No. 9 — No. 10:*** ***DTC 26*** ***LHD: (B301) No. 14 — No. 15:*** ***RHD: (F49) No. 14 — No. 15:*** ***DTC 28*** ***LHD: (B301) No. 7 — No. 8:*** ***RHD: (F49) No. 7 — No. 8:*** Is the measured value within specified value?	Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step **11.**	Repair the harness/connector between ABSCM&H/U and ABS sensor.

	Step	Value	Yes	No
11	**CHECK GROUND SHORT OF HARNESS.** Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***DTC 22*** ***LHD: (B301) No. 11 — Chassis ground:*** ***RHD: (F49) No. 11 — Chassis ground:*** ***DTC 24*** ***LHD: (B301) No. 9 — Chassis ground:*** ***RHD: (F49) No. 9 — Chassis ground:*** ***DTC 26*** ***LHD: (B301) No. 14 — Chassis ground:*** ***RHD: (F49) No. 14 — Chassis ground:*** ***DTC 28*** ***LHD: (B301) No. 7 — Chassis ground:*** ***RHD: (F49) No. 7 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **12.**	Repair the harness/connector between ABSCM&H/U and ABS sensor.
12	**CHECK GROUND CIRCUIT OF ABSCM&H/U.** Measure the resistance between ABSCM&H/U and chassis ground. ***Connector & terminal*** ***(B301) No. 23 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **13.**	Repair the ABSCM&H/U ground harness.
13	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connectors between ABSCM&H/U and ABS sensor?	There is no poor contact.	Go to step **14.**	Repair the connector.
14	**CHECK SOURCES OF SIGNAL NOISE.** Is the car telephone or wireless transmitter properly installed?	Correctly installed.	Go to step **15.**	Properly install the car telephone or wireless transmitter.
15	**CHECK SOURCES OF SIGNAL NOISE.** Are noise sources (such as an antenna) installed near the sensor harness?	Not installed.	Go to step **16.**	Install the noise sources apart from sensor harness.
16	**CHECK SHIELD CIRCUIT.** 1)Disconnect the connectors (B303) and (F62). 2)Measure the resistance between shield connector and chassis ground. ***Connector & terminal*** ***DTC 22*** ***LHD: (F103) No. 4 — Chassis ground:*** ***RHD: (F48) No. 2 — Chassis ground:*** ***DTC 24*** ***LHD: (F103) No. 5 — Chassis ground:*** ***RHD: (F48) No. 1 — Chassis ground:*** ***DTC 26*** ***LHD: (F103) No. 3 — Chassis ground:*** ***RHD: (F48) No. 3 — Chassis ground:*** ***DTC 28*** ***LHD: (F103) No. 3 — Chassis ground:*** ***RHD: (F48) No. 3 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **17.**	Repair the shield harness.

	Step	Value	Yes	No
17	**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?	Same DTC is not output.	Go to step **18.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
18	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	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.	Proceed with the diagnosis corresponding to DTC.

M: DTC 29 — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) (ANY ONE OF FOUR) —

DIAGNOSIS:

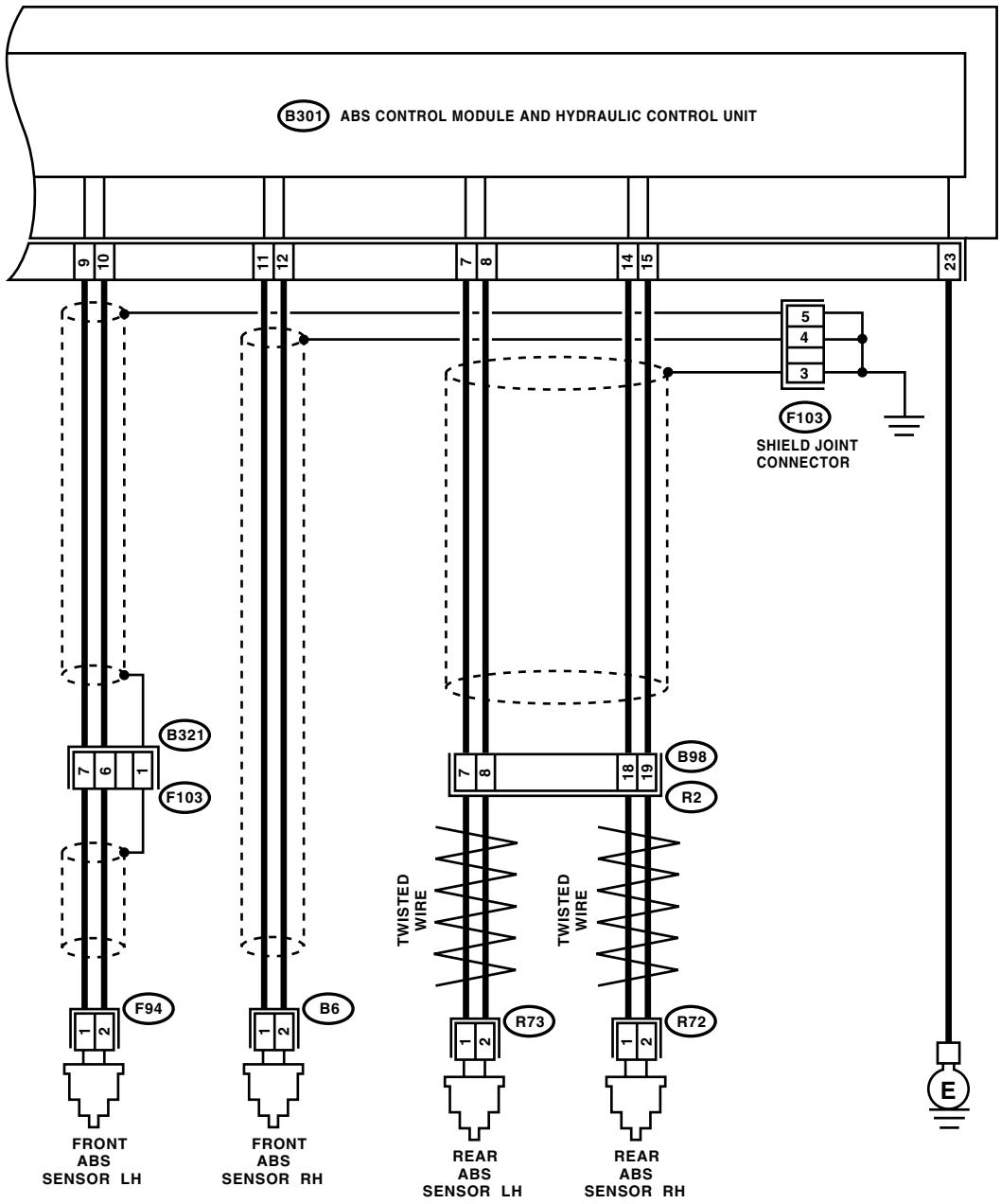
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

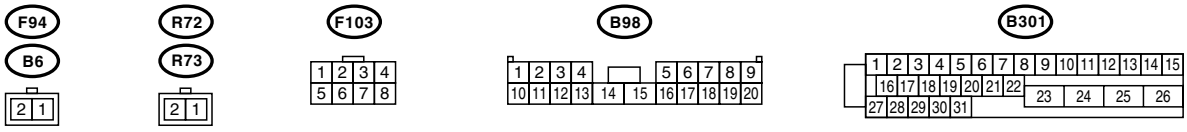
TROUBLE SYMPTOM:

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

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

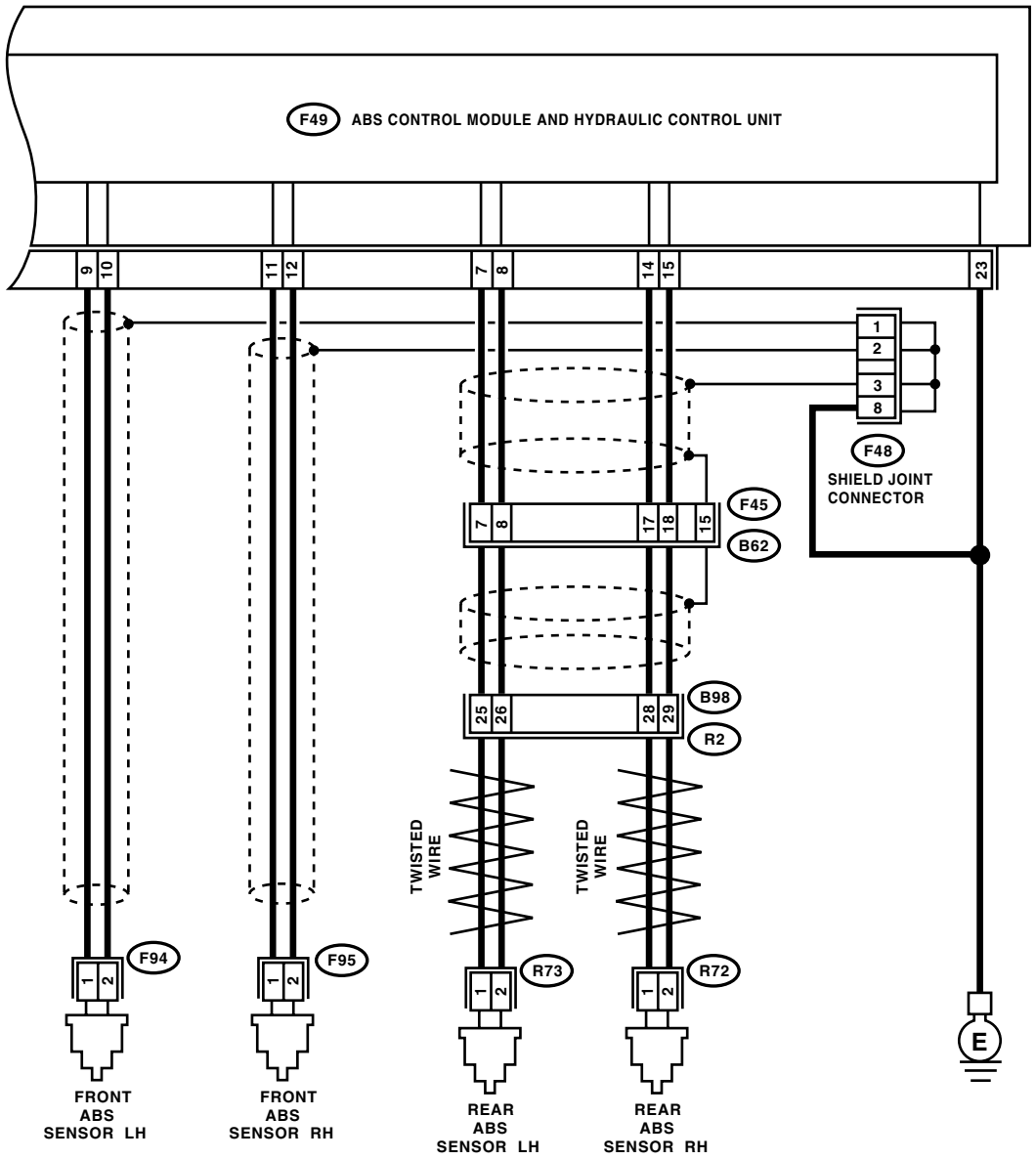
WIRING DIAGRAM:
LHD MODEL

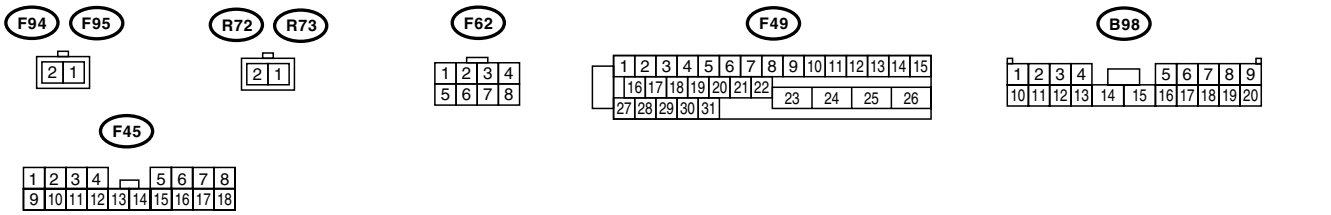




ABS00219

RHD MODEL





ABS00224

	Step	Value	Yes	No
1	**CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.** Check if the wheels have been turned freely for more than 1 minute, such as when vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.	Wheels have not been turned freely.	Go to step **2.**	The ABS is normal. Erase the DTC. NOTE: When the wheels turn freely for a long time, such as when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way, this DTC may sometimes occur.
2	**CHECK TIRE SPECIFICATIONS.** Turn the ignition switch to OFF. Are the tire specifications correct?	Tire specifications are correct.	Go to step **3.**	Replace the tire.
3	**CHECK WEAR OF TIRE.** Is the tire worn excessively?	Tire is not worn excessively.	Go to step **4.**	Replace tire.
4	**CHECK TIRE PRESSURE.** Is the tire pressure correct?	Tire pressure is correct.	Go to step **5.**	Adjust tire pressure.
5	**CHECK INSTALLATION OF ABS SENSOR.** Are the ABS sensor installation bolts tightened securely?	33 N·m (3.4 kgf-m, 24.6 ft-lb)	Go to step **6.**	Tighten the ABS sensor installation bolts securely.
6	**CHECK ABS SENSOR GAP.** Measure the tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Is the measured value within specified 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 spacer cannot correct gap, replace worn sensor or worn tone wheel.
7	**PREPARE OSCILLOSCOPE.** Is an oscilloscope available?	Oscilloscope is available.	Go to step **8.**	Go to step **9.**

	Step	Value	Yes	No
8	**CHECK ABS 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-17, WAVEFORM, Control Module I/O Signal.> NOTE: When this inspection is completed, the ABSCM&H/U sometimes stores the DTC 29. ***Connector & terminal*** ***Front RH*** ***LHD: (B6) No. 1 (+) — No. 2 (–):*** ***RHD: (F95) No. 1 (+) — No. 2 (–):*** ***Front LH*** ***LHD: (F94) No. 1 (+) — No. 2 (–):*** ***RHD: (F94) No. 1 (+) — No. 2 (–):*** ***Rear RH*** ***LHD: (B98) No. 18 (+) — No. 19 (–):*** ***RHD: (B98) No. 28 (+) — No. 29 (–):*** ***Rear LH*** ***LHD: (B98) No. 7 (+) — No. 8 (–):*** ***RHD: (B98) No. 25 (+) — No. 26 (–):*** Is the measured value as specified value?	Oscilloscope pattern is smooth, as shown in the figure.	Go to step **12.**	Go to step **9.**
9	**CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.** Remove the disc rotor or drum from hub. Is the ABS sensor piece or the tone wheel contaminated by dirt or other foreign matter?	ABS sensor piece or tone wheel is not contaminated.	Go to step **10.**	Thoroughly remove dirt or other foreign matter.
10	**CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.** Are there broken or damaged teeth in the ABS sensor piece or the tone wheel?	There are no broken or damaged in the ABS sensor piece or tone wheel.	Go to step **11.**	Replace the ABS sensor or tone wheel. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.> and Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
11	**CHECK TONE WHEEL RUNOUT.** Measure the tone wheel runout. Is the measured value less than specified value?	0.05 mm (0.0020 in)	Go to step **12.**	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>

	Step	Value	Yes	No
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 current diagnosis still being output?	Same DTC is not output.	Go to step **13.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
13	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

N: DTC 31 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT RH) —

NOTE:
For the diagnostic procedure, refer to DTC 37. <Ref. to ABS-67, DTC 37 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

O: DTC 33 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT LH) —

NOTE:
For the diagnostic procedure, refer to DTC 37. <Ref. to ABS-67, DTC 37 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

P: DTC 35 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR RH) —

NOTE:
For the diagnostic procedure, refer to DTC 37. <Ref. to ABS-67, DTC 37 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

Q: DTC 37 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —

DIAGNOSIS:

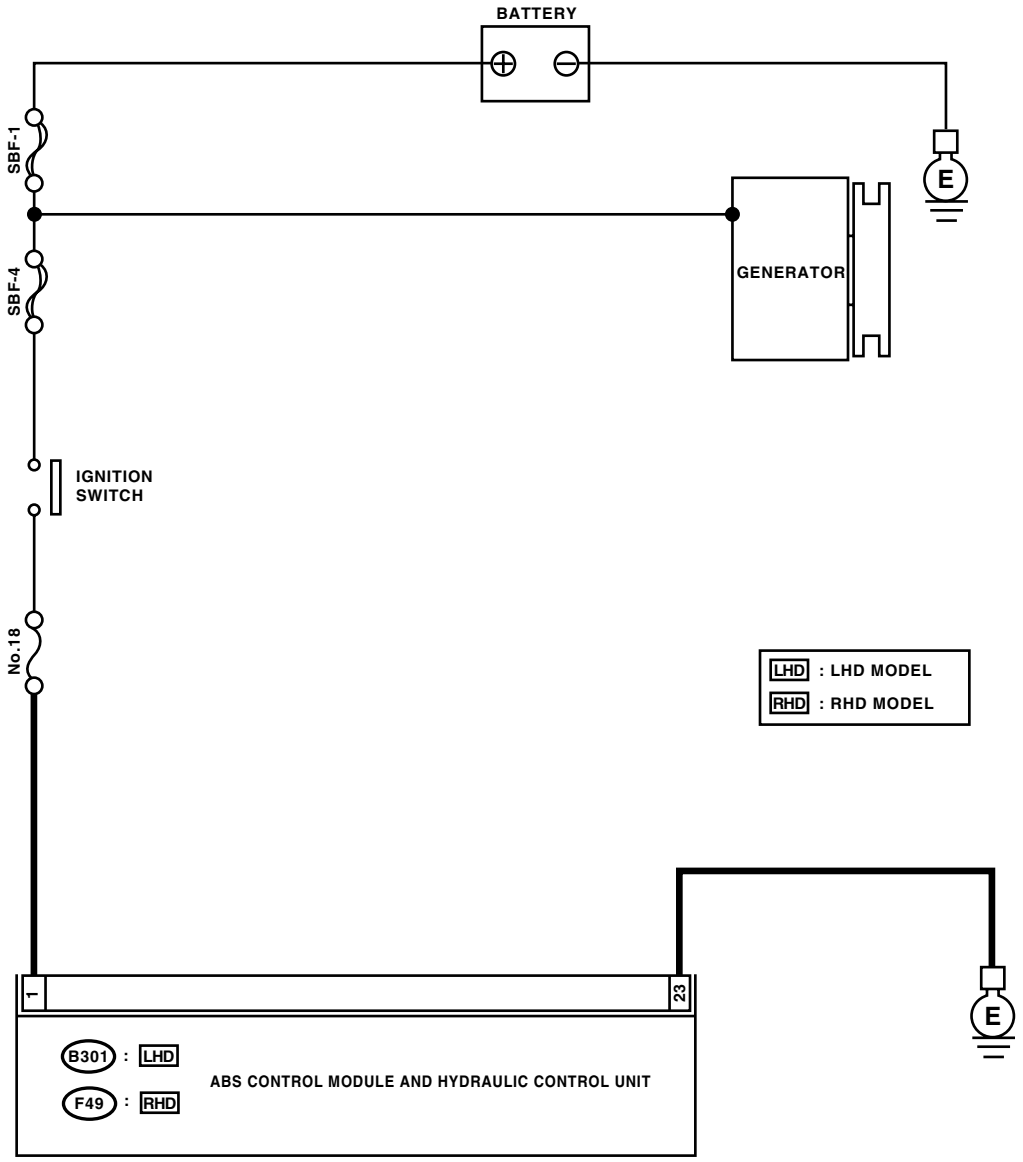
- Faulty harness/connector
- Faulty inlet solenoid valve in ABSCM&H/U

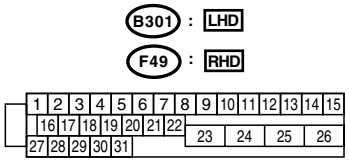
TROUBLE SYMPTOM:

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

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

WIRING DIAGRAM:





ABS00229

	Step	Value	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. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **2.**	Repair the harness connector between ABS relay 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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	Go to step **4.**	Repair the connector.
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?	Same DTC is not output.	Go to step **5.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
5	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

R: DTC 32 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT RH) —

NOTE:
For the diagnostic procedure, refer to DTC 38. <Ref. to ABS-71, DTC 38 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

S: DTC 34 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT LH) —

NOTE:
For the diagnostic procedure, refer to DTC 38. <Ref. to ABS-71, DTC 38 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

T: DTC 36 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR RH) —

NOTE:
For the diagnostic procedure, refer to DTC 38. <Ref. to ABS-71, DTC 38 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

U: DTC 38 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —

DIAGNOSIS:

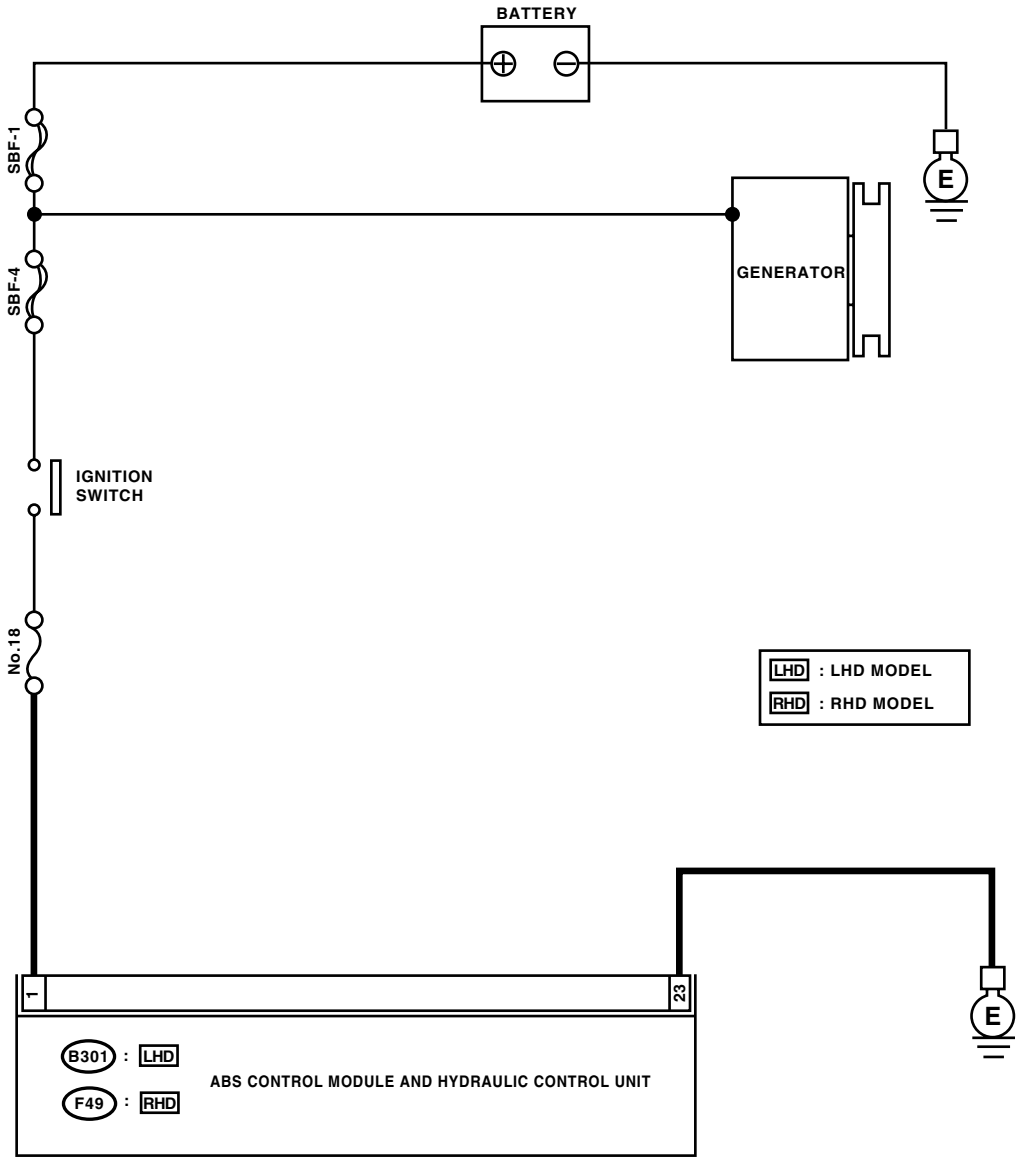
- Faulty harness/connector
- Faulty outlet solenoid valve in ABSCM&H/U

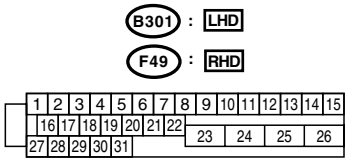
TROUBLE SYMPTOM:

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

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

WIRING DIAGRAM:





ABS00229

	Step	Value	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*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	Go to step **4.**	Repair the connector.
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?	Same DTC is not output.	Go to step **5.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
5	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

V: DTC 41
— ABNORMAL ABS CONTROL MODULE —

DIAGNOSIS:

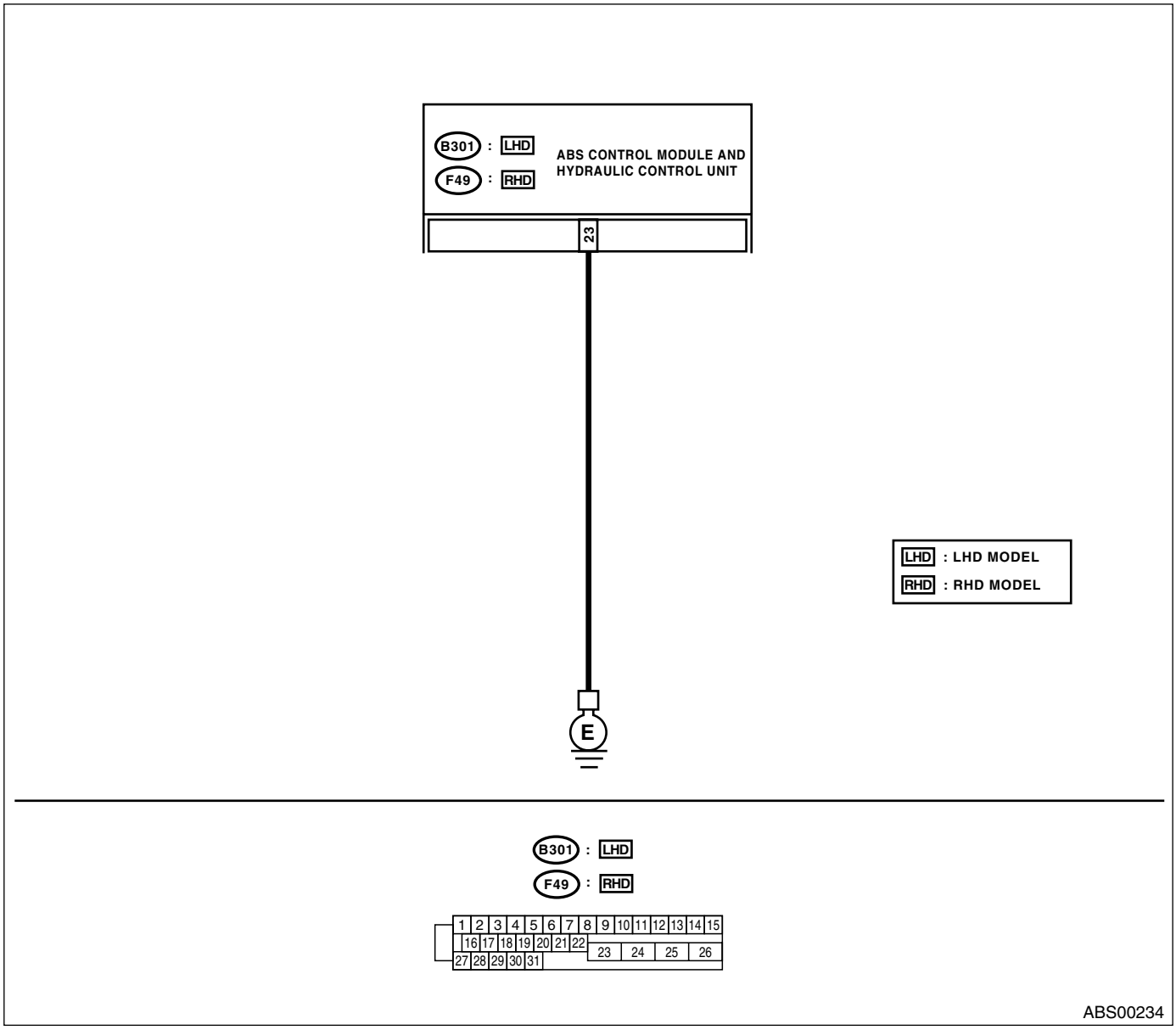
- Faulty ABSCM&H/U.

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	Value	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	Go to step **3.**	Repair the connector.
3	**CHECK SOURCES OF SIGNAL NOISE.** Is the car telephone or the wireless transmitter properly installed?	Correctly 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?	Not installed.	Go to step **5.**	Install the noise sources apart from the sensor harness.
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 current diagnosis still being output?	Same DTC is not output.	Go to step **6.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
6	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

W: DTC 42
— SOURCE VOLTAGE IS ABNORMAL. —

DIAGNOSIS:

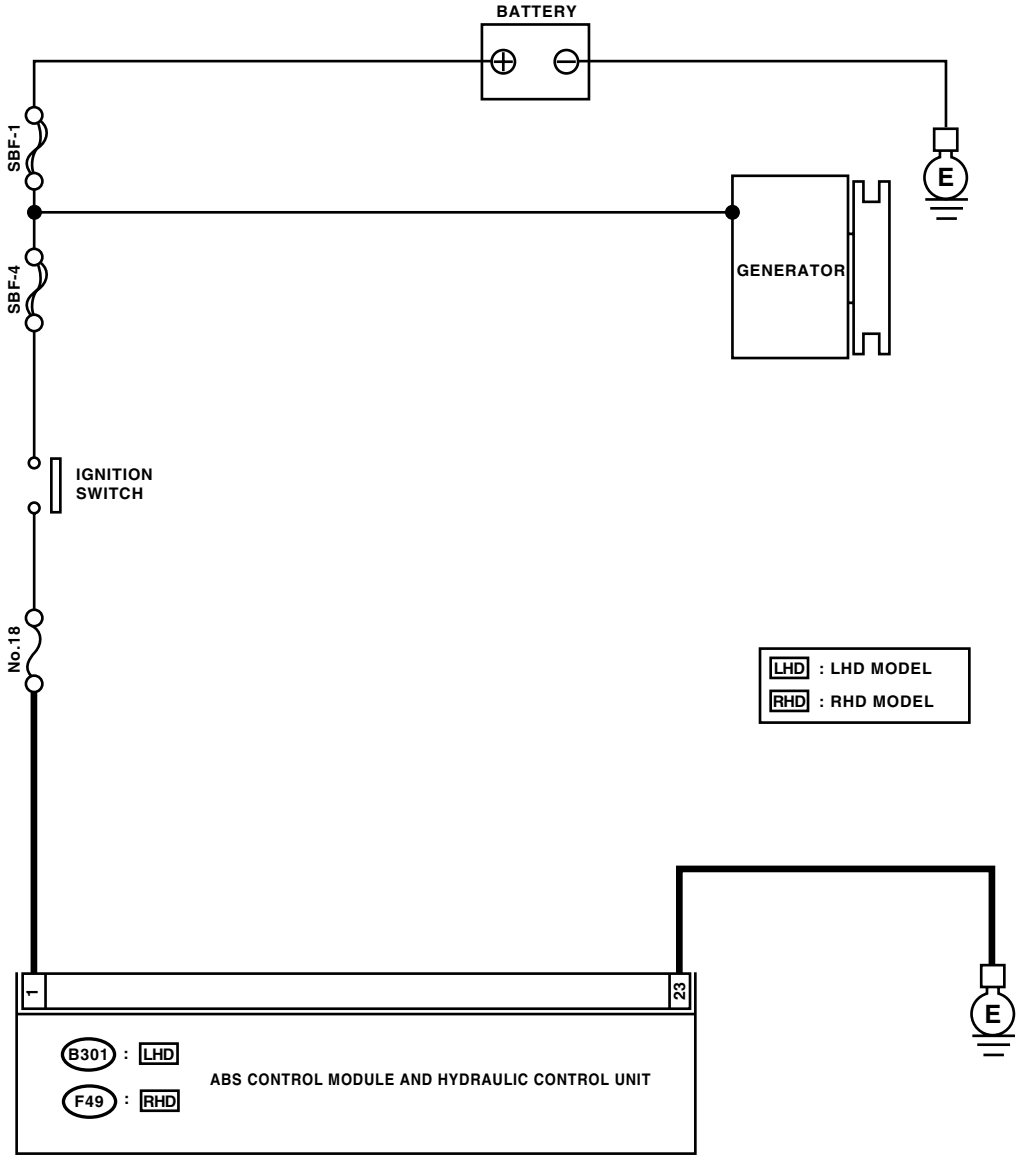
- Power source voltage of the ABSCM&H/U is low or high.

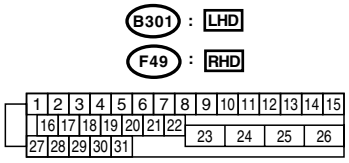
TROUBLE SYMPTOM:

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

NOTE:
In addition to the ABS warning light, brake warning light illuminates temporarily. Both warning lights go off on the recovery of voltage.

WIRING DIAGRAM:





ABS00229

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

	Step	Value	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. ***Terminal*** ***Generator B terminal (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 17 V	Go to step **2.**	Repair the generator. <Ref. to SC(SOHC)-15, Generator.>
2	**CHECK BATTERY TERMINAL.** Turn the ignition switch to OFF. Are the positive and negative battery terminals tightly clamped?	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*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	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?	Same DTC is not output.	Go to step **7.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
7	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

X: DTC 44
— A COMBINATION OF AT CONTROL ABNORMAL —

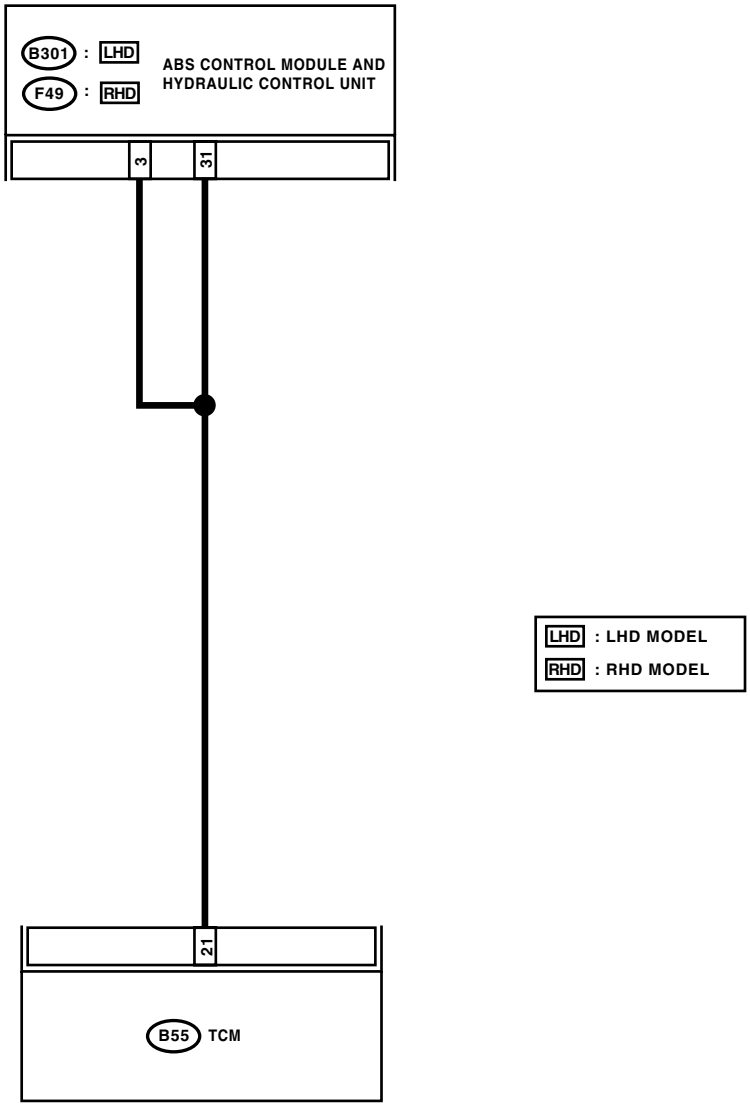
DIAGNOSIS:

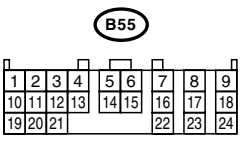
- Combination of AT control faults

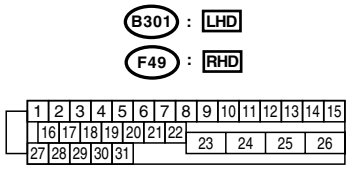
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:







ABS00239

	Step	Value	Yes	No
1	**CHECK SPECIFICATIONS OF THE ABSCM&H/U.** Check specifications of the mark to on ABSCM&H/U. ***CO: AT*** ***CD: MT*** Specifications between vehicle and ABSCM&H/U are matched?	Specifications are matched.	Go to step **2.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
2	**CHECK GROUND SHORT OF HARNESS.** 1)Turn the ignition switch to OFF. 2)Disconnect all connectors from TCM. 3)Disconnect the connector from ABSCM&H/U. 4)Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 3 — Chassis ground:*** ***RHD: (F49) No. 3 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **3.**	Repair the harness between TCM and ABSCM&H/U.
3	**CHECK BATTERY SHORT OF HARNESS.** Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 3 (+) — Chassis ground (–):*** ***RHD: (F49) No. 3 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **4.**	Repair the harness between TCM and ABSCM&H/U.
4	**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*** ***LHD: (B301) No. 3 (+) — Chassis ground (–):*** ***RHD: (F49) No. 3 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **5.**	Repair the harness between TCM and ABSCM&H/U.
5	**CHECK TCM.** 1)Turn the ignition switch to OFF. 2)Connect all connectors to TCM. 3)Turn the ignition switch to ON. 4)Measure the voltage between TCM connector terminal and chassis ground. ***Connector & terminal*** ***(B55) No. 21 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **7.**	Go to step **6.**
6	**CHECK AT.** Is the AT functioning normally?	AT functioning normally.	Replace the TCM.	Repair the AT.

	Step	Value	Yes	No
7	**CHECK OPEN CIRCUIT OF HARNESS.** Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD:*** ***(B301) No. 3 (+) — Chassis ground (–):*** ***(B301) No. 31 (+) — Chassis ground (–):*** ***RHD:*** ***(F49) No. 3 (+) — Chassis ground (–):*** ***(F49) No. 31 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **8.**	Repair the harness/connector between TCM and ABSCM&H/U.
8	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connectors between TCM and ABSCM&H/U?	There is no poor contact.	Go to step **9.**	Repair the connector.
9	**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?	Same DTC is not output.	Go to step **10.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
10	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

Y: DTC 51
— ABNORMAL VALVE RELAY —

DIAGNOSIS:

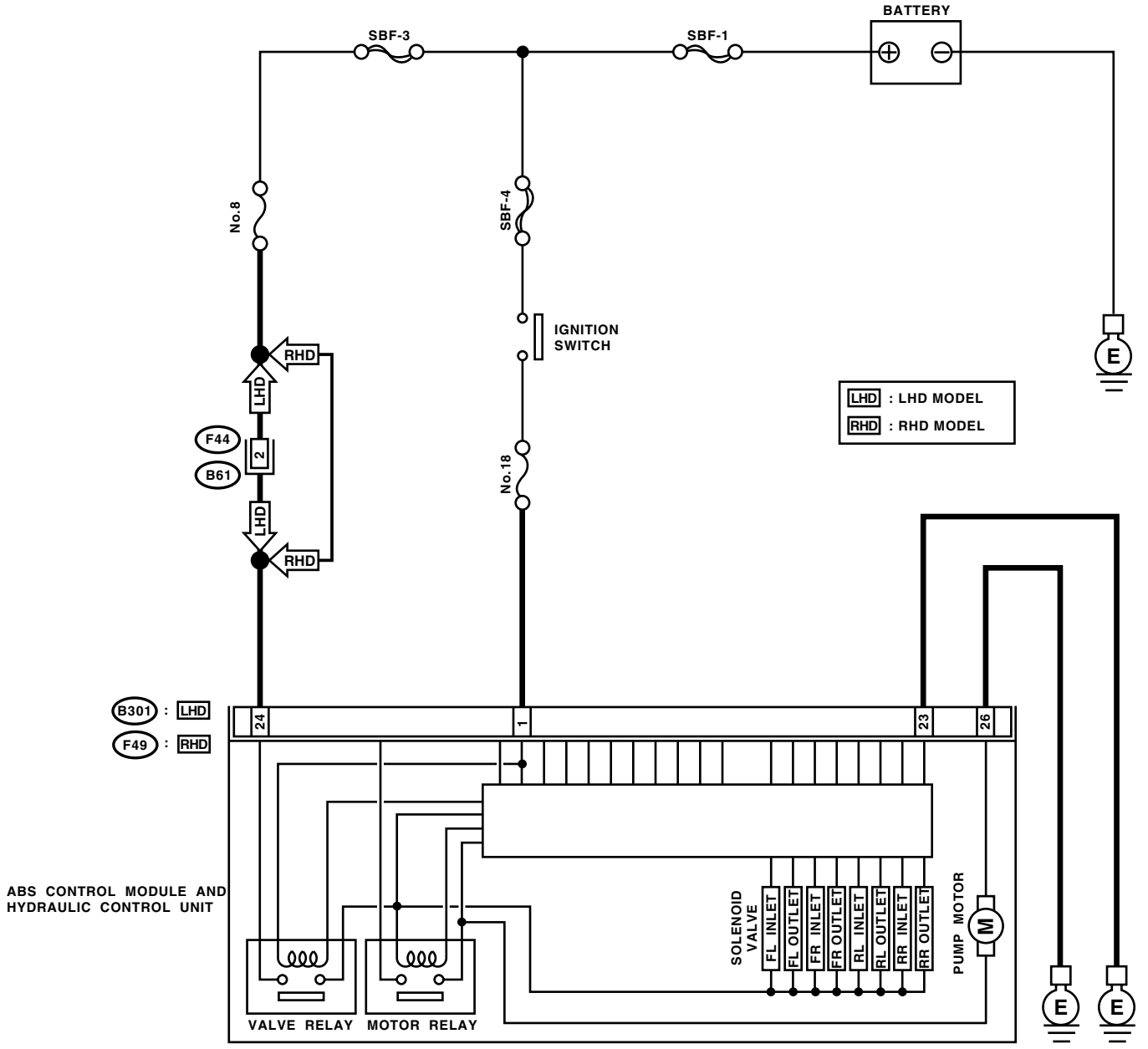
- Faulty valve relay

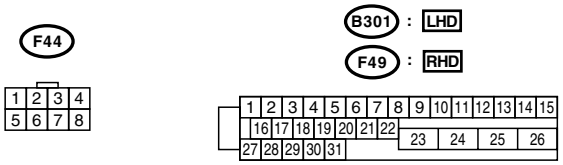
TROUBLE SYMPTOM:

- ABS does not operate.
- EBD does not operate in some malfunctions.

NOTE:
In addition to the ABS warning light, brake warning light illuminates, if the EBD does not operate.

WIRING DIAGRAM:





ABS00244

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

	Step	Value	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*** ***LHD:*** ***(B301) No. 1 (+) — Chassis ground (–):*** ***(B301) No. 24 (+) — Chassis ground (–):*** ***RHD:*** ***(F49) No. 1 (+) — Chassis ground (–):*** ***(B301) No. 24 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **2.**	Repair the harness connector between battery, ABS relay 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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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 and terminals. ***Terminals*** ***No. 23 — No. 24:*** Is the measured value more than specified value?	1 MΩ	Go to step **4.**	Replace the ABSCM&H/U. <Ref. to ABS-7, 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?	There is no poor contact.	Go to step **5.**	Repair the connector.
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?	Same DTC is not output.	Go to step **6.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
6	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

Z: DTC 52
— ABNORMAL MOTOR AND/OR MOTOR RELAY —

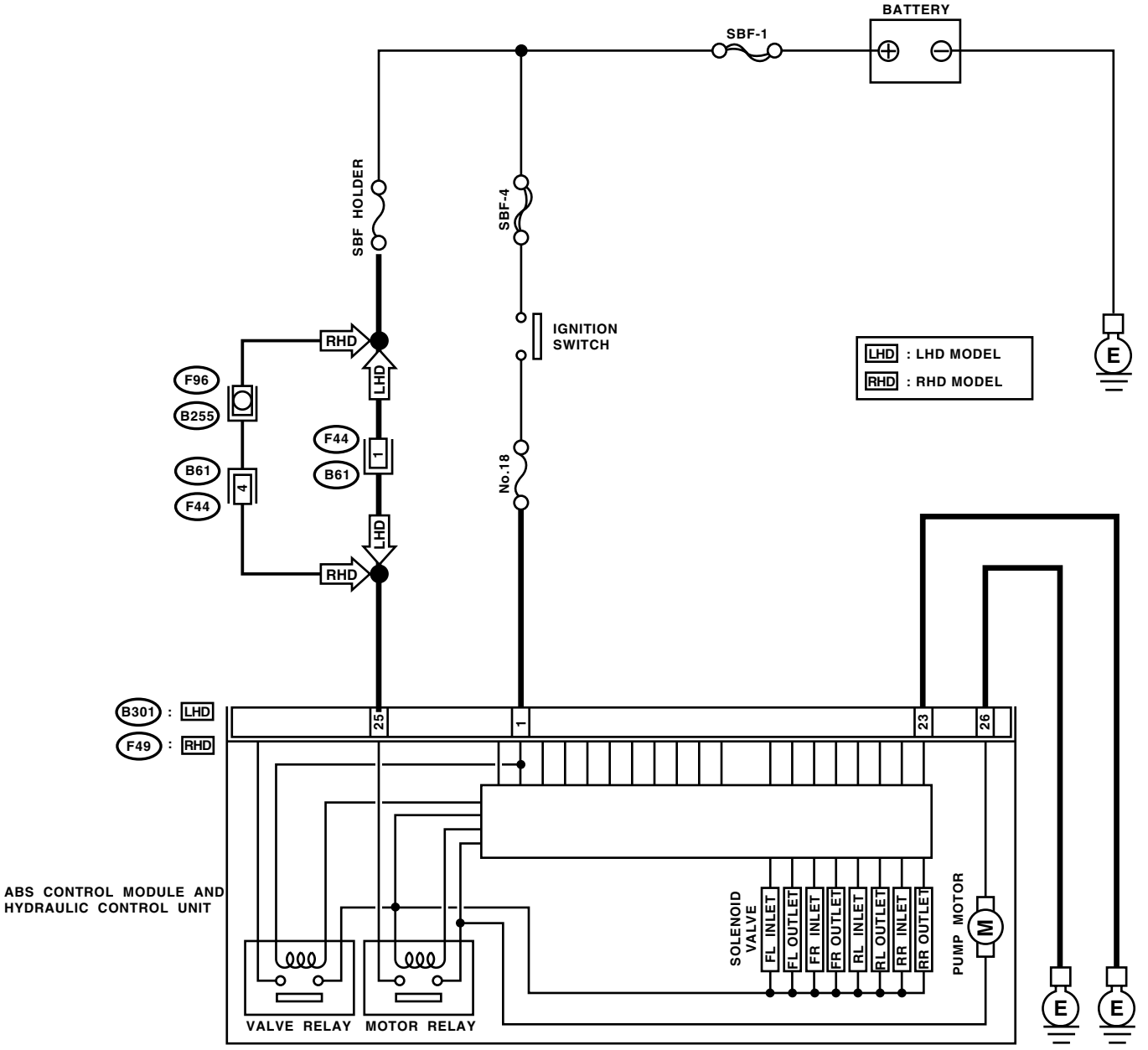
DIAGNOSIS:

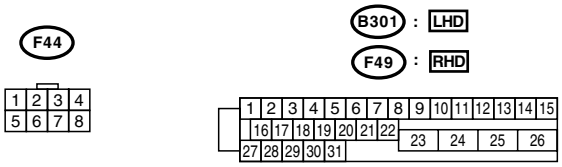
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





ABS00249

	Step	Value	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*** ***LHD: (B301) No. 25 (+) — Chassis ground (–):*** ***RHD: (F49) No. 25 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **2.**	Repair the harness/connector between battery and ABSCM&H/U and check fuse SBF-holder.
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*** ***LHD: (B301) No. 26 — Chassis ground:*** ***RHD: (F49) No. 26 — Chassis ground:*** Is the measured value less than specified value?	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*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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-11, ABS Sequence Control.> NOTE: Use the diagnosis connector to operate the sequence control. Can motor revolution noise (buzz) be heard when carrying out the sequence control?	Motor revolution noise (buzz) can be heard.	Go to step **6.**	Replace the ABSCM&H/U. <Ref. to ABS-7, 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?	There is no poor contact.	Go to step **7.**	Repair the connector.

	Step	Value	Yes	No
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 the current diagnosis still being output?	Same DTC is not output.	Go to step **8.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
8	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact. 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.	Proceed with the diagnosis corresponding to DTC.

AA:DTC 54
— ABNORMAL STOP LIGHT SWITCH —

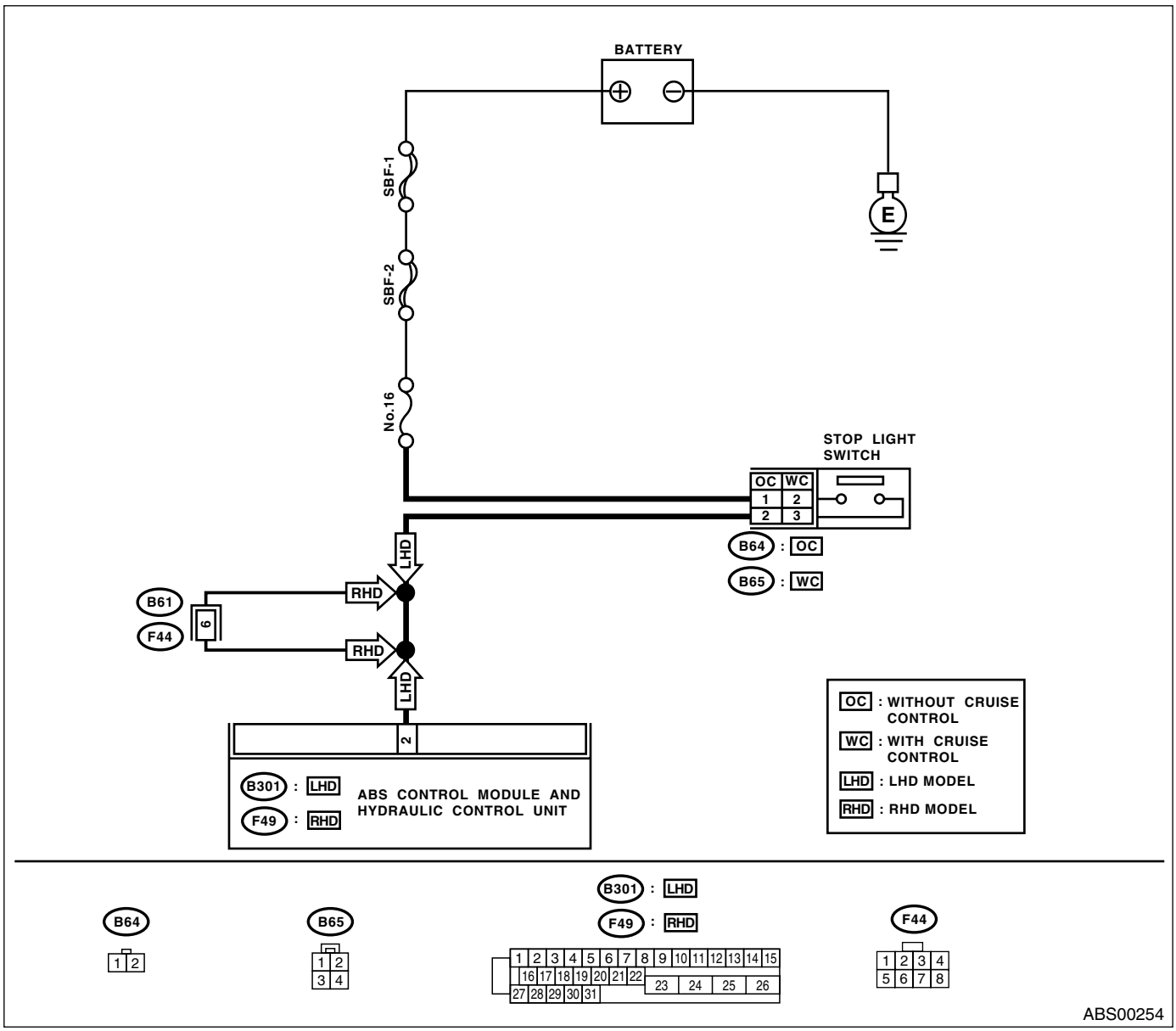
DIAGNOSIS:

- Faulty stop light switch

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



	Step	Value	Yes	No
1	**CHECK STOP LIGHTS COME ON.** Depress the brake pedal. Do the stop lights come on?	Stop lights come on.	Go to step **2.**	Repair the stop lights circuit.

	Step	Value	Yes	No
2	**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*** ***LHD: (B301) No. 2 (+) — Chassis ground (–):*** ***RHD: (F49) No. 2 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **3.**	Repair the harness between stop light switch and ABSCM&H/U.
3	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connector between stop light switch and ABSCM&H/U?	There is no poor contact.	Go to step **4.**	Repair the connector.
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?	Same DTC is not output.	Go to step **5.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
5	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

AB:DTC 56
— ABNORMAL G SENSOR OUTPUT VOLTAGE —

DIAGNOSIS:

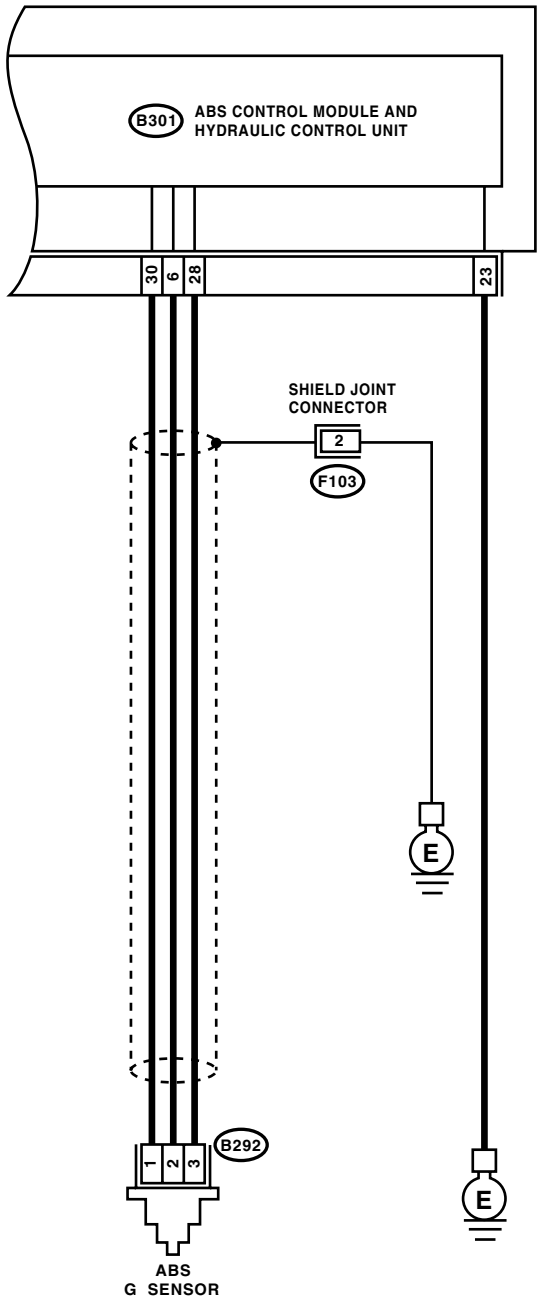
- Faulty G sensor output voltage

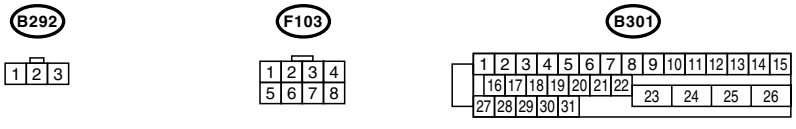
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

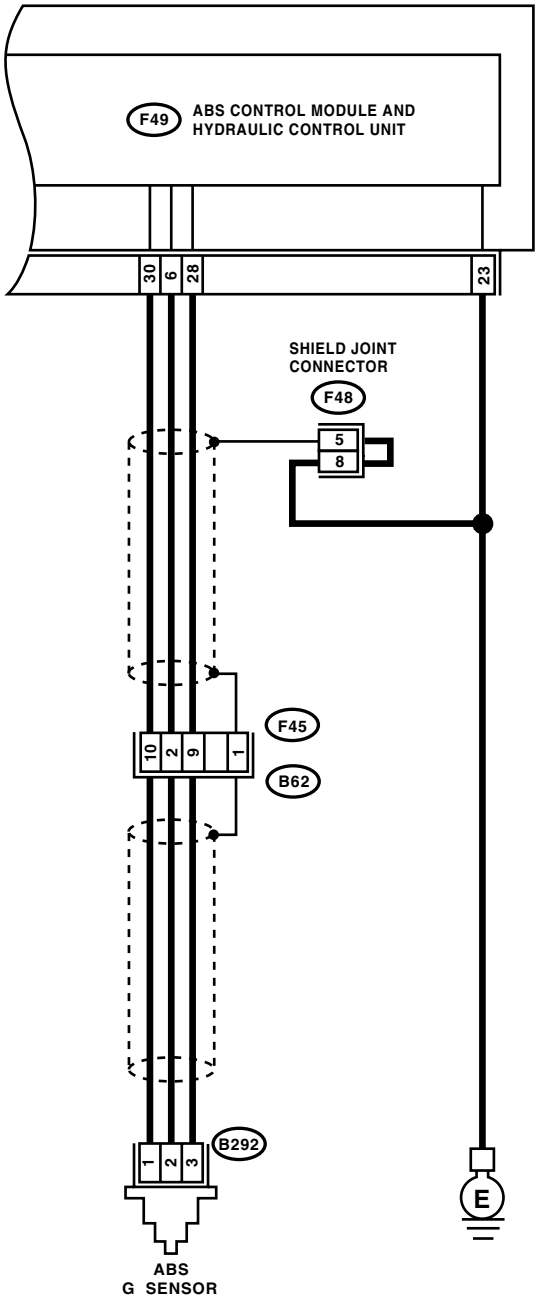
LHD MODEL

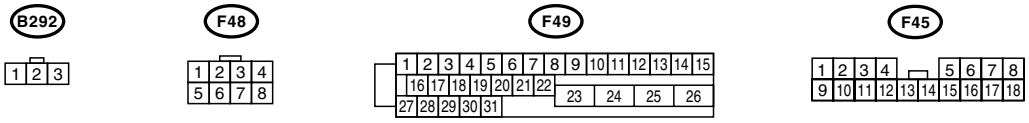




ABS00259

RHD MODEL





ABS00264

Step		Value	Yes	No
1	**CHECK ALL FOUR WHEELS FOR FREE TURNING.** Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a free roller or rolling road?	Wheels have not been turned freely.	Go to step **2.**	The ABS is normal. Erase the DTC.

	Step	Value	Yes	No
2	**CHECK SPECIFICATIONS OF ABSCM&H/U.** Check the specifications of the mark to the ABSCM&H/U. ***CO: AT*** ***CP: MT*** Does the vehicle specification and ABSCM&H/U specification match?	Specifications are matched.	Go to step **3.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
3	**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 the 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 measured value within specified value?	4.75 — 5.25 V	Go to step **4.**	Repair the harness/connector between G sensor and ABSCM&H/U.
4	**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*** ***LHD: (B301) No. 6 — No. 28:*** ***RHD: (F49) No. 6 — No. 28:*** Is the measured value within specified value?	5.0 — 5.6 kΩ	Go to step **5.**	Repair the harness/connector between G sensor and ABSCM&H/U.
5	**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*** ***LHD: (B301) No. 6 — Chassis ground:*** ***RHD: (F49) No. 6 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **6.**	Repair the harness between G sensor and ABSCM&H/U.
6	**CHECK BATTERY SHORT OF HARNESS.** Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 6 (+) — Chassis ground (–):*** ***RHD: (F49) No. 6 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **7.**	Repair the harness between G sensor and ABSCM&H/U.

	Step	Value	Yes	No
7	**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*** ***LHD: (B301) No. 6 (+) — Chassis ground (–):*** ***RHD: (F49) No. 6 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **8.**	Repair the harness between G sensor and ABSCM&H/U.
8	**CHECK GROUND SHORT OF HARNESS.** Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 28 — Chassis ground:*** ***RHD: (F49) No. 28 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **9.**	Repair the harness between G sensor and ABSCM&H/U. Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
9	**CHECK G SENSOR.** 1)Turn the ignition switch to OFF. 2)Remove the G sensor from vehicle. 3)Connect the connector to G sensor. 4)Connect the connector to ABSCM&H/U. 5)Turn the ignition switch to ON. 6)Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is horizontal?	2.1 — 2.4 V	Go to step **10.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
10	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined forwards to 90°?	3.7 — 4.1 V	Go to step **11.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
11	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined backwards to 90°?	0.5 — 0.9 V	Go to step **12.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
12	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connector between ABSCM&H/U and G sensor?	There is no poor contact.	Go to step **13.**	Repair the connector.
13	**CHECK ABSCM&H/U.** 1)Connect all connectors. 2)Erase the memory. 3)Perform inspection mode. 4)Read out the DTC. Is the same DTC as in the current diagnosis still being output?	Same DTC is not output.	Go to step **14.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

Step		Value	Yes	No
14	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

13.Diagnostics Chart with Subaru Select Monitor

A: COMMUNICATION FOR INITIALIZING IMPOSSIBLE

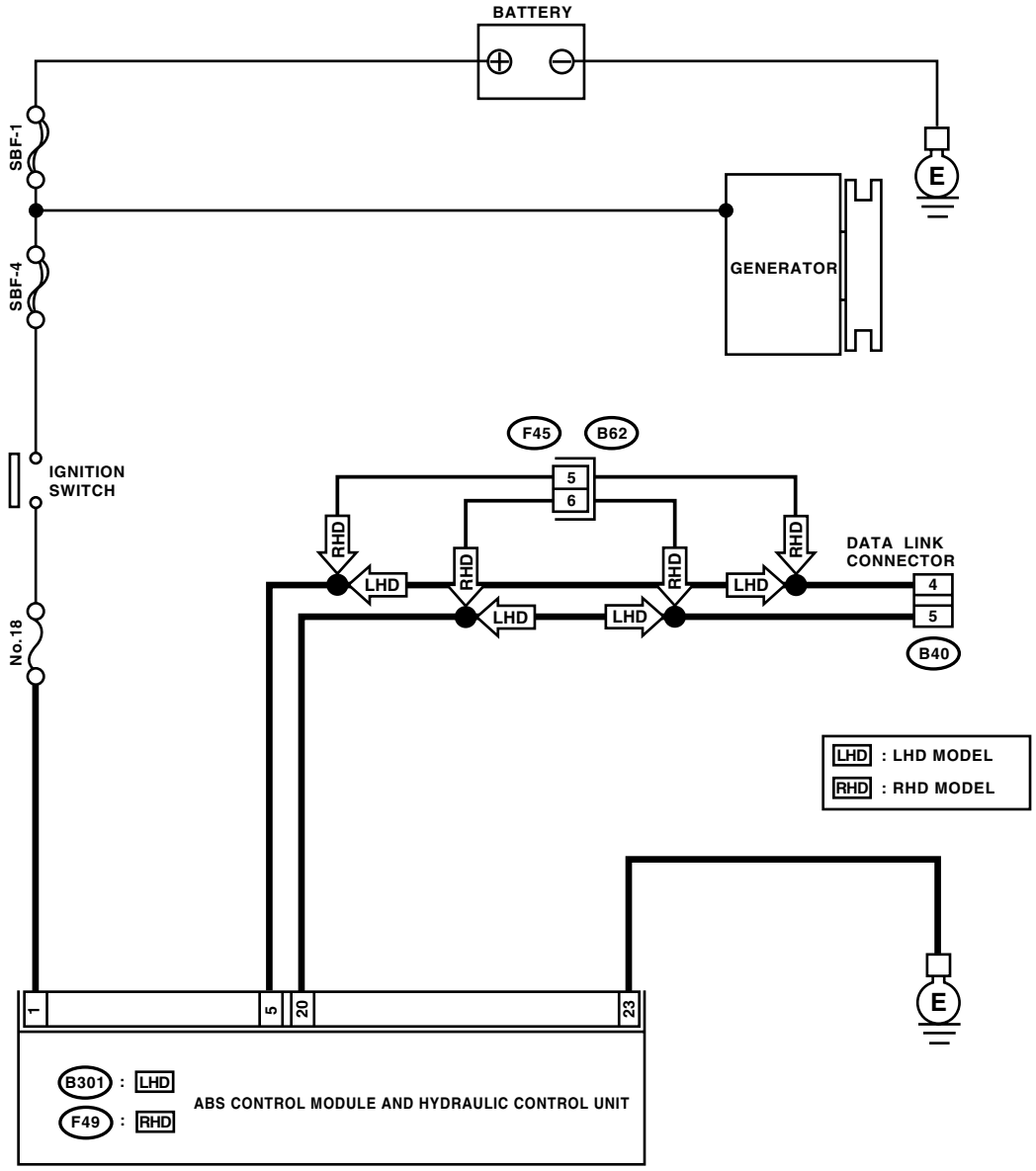
DIAGNOSIS:

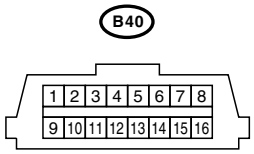
- Faulty harness connector

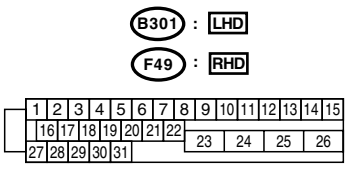
TROUBLE SYMPTOM:

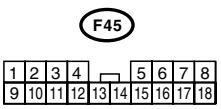
- ABS warning light remains on.

WIRING DIAGRAM:









ABS00269

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

	Step	Value	Yes	No
1	**CHECK IGNITION SWITCH.** Is the ignition switch turned to ON?	Ignition switch is turned to ON.	Go to step **2.**	Turn the ignition switch to ON, and select ABS mode using select monitor.
2	**CHECK BATTERY.** 1)Turn the ignition switch to OFF. 2)Measure the battery voltage. Is the measured value more than specified value?	11 V	Go to step **3.**	Charge or replace the battery.
3	**CHECK BATTERY TERMINAL.** Is there poor contact at battery terminal?	There is no poor contact.	Go to step **4.**	Repair or tighten the battery terminal.
4	**CHECK COMMUNICATION OF SELECT MONITOR.** 1)Turn the ignition switch to ON. 2)Using the select monitor, check whether communication to other system can be executed normally. Are the name and year of system displayed on select monitor?	System name and model year are displayed.	Go to step **7.**	Go to step **5.**
5	**CHECK COMMUNICATION OF 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 select monitor?	System name and model year are displayed.	Go to step **7.**	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, cruise control module and immobilizer control module connectors. 3)Measure the resistance between data link connector and chassis ground. ***Connector & terminal*** ***(B40) No. 5 — Chassis ground:*** ***(B40) No. 4 — Chassis ground:*** Is the measured value more than specified value?	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. 5 (+) — Chassis ground (–):*** ***(B40) No. 4 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **8.**	Repair the harness and connector between each control module and data link connector.

	Step	Value	Yes	No
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*** ***LHD:*** ***(B301) No. 20 — (B40) No. 5:*** ***(B301) No. 5 — (B40) No. 4:*** ***RHD:*** ***(F49) No. 20 — (B40) No. 5:*** ***(F49) No. 5 — (B40) No. 4:*** Is the measured value less than specified value?	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?	Correctly installed.	Go to step **10.**	Insert the ABSCM&H/U connector into ABSCM&H/U.
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*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value more than specified value?	10 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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	1 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?	There is no poor contact.	Repair the connector.	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

B: NO TROUBLE CODE

DIAGNOSIS:

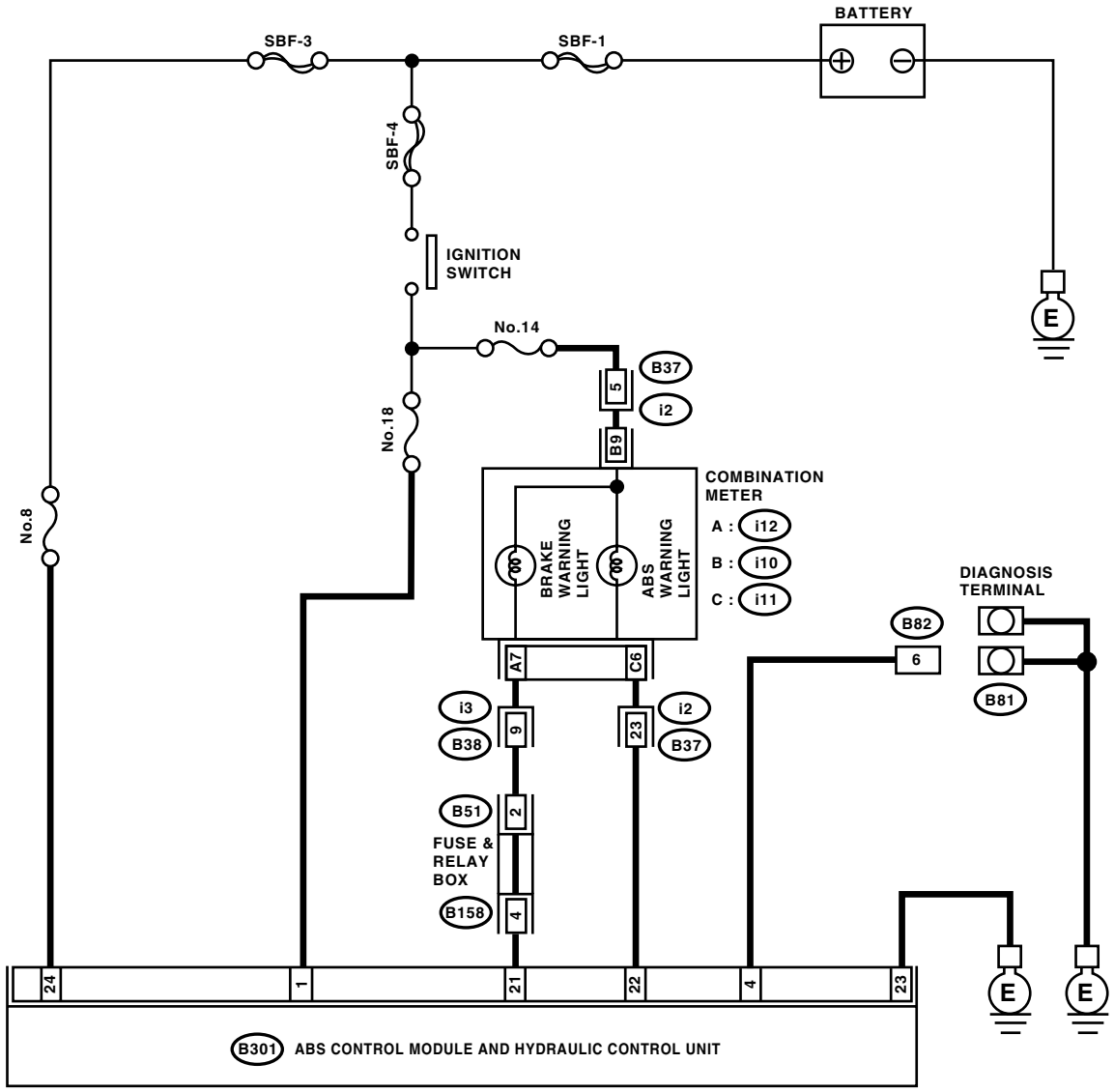
- ABS warning light circuit is shorted.

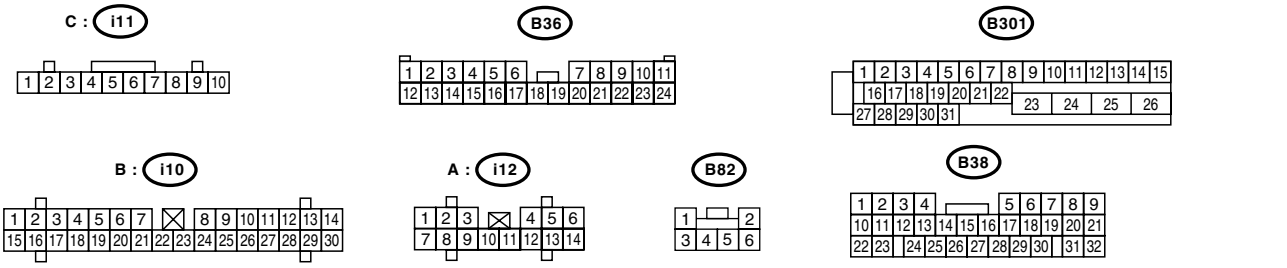
TROUBLE SYMPTOM:

- ABS warning light remains on.
- NO TROUBLE CODE displayed on the select monitor.

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

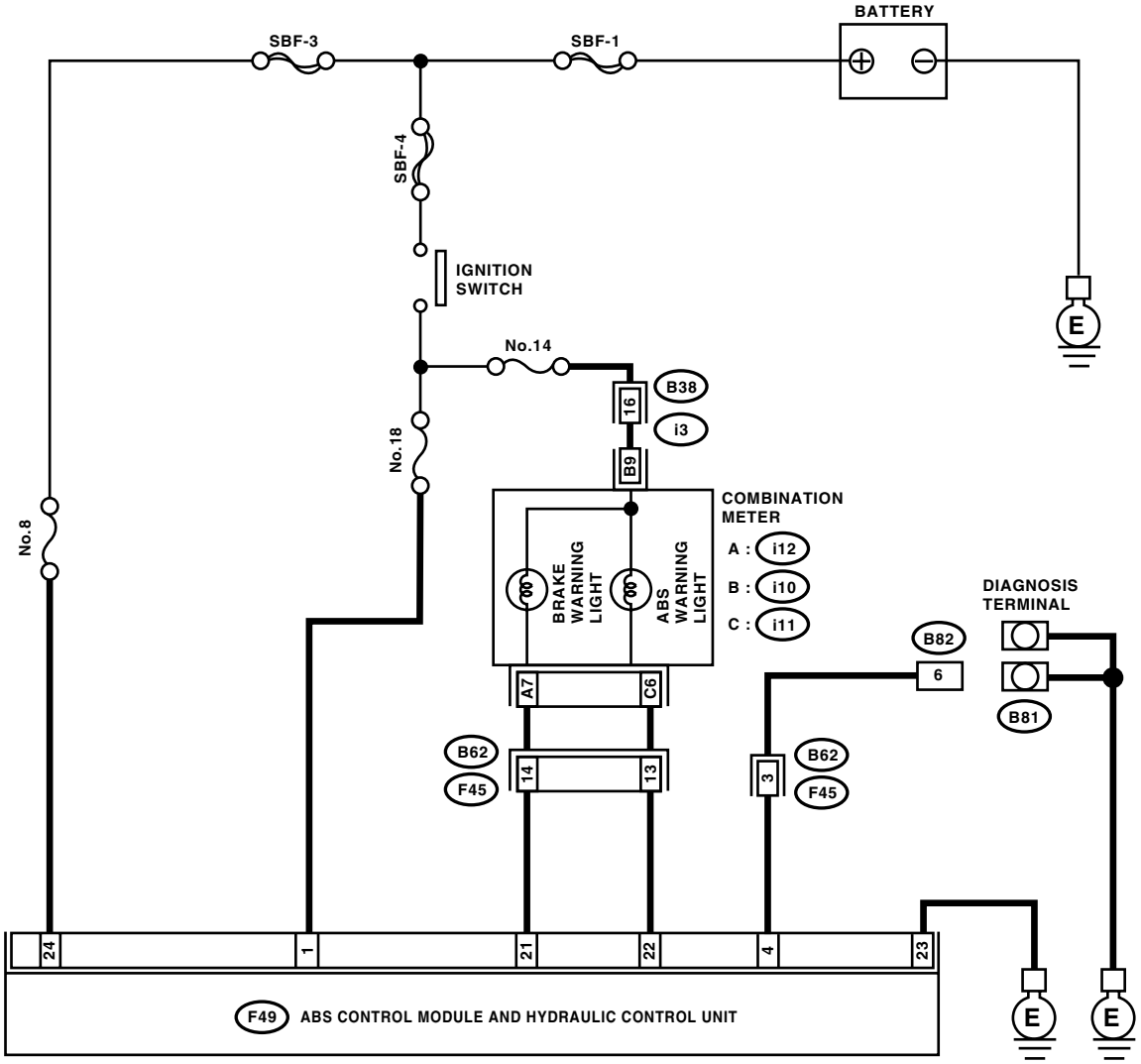
WIRING DIAGRAM:
LHD MODEL

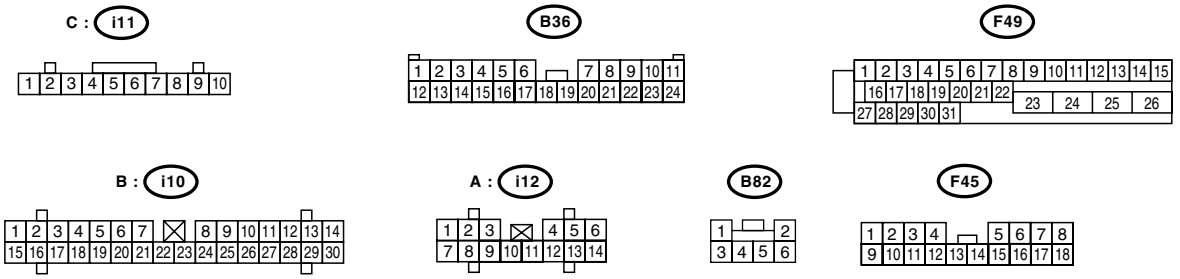




ABS00199

RHD MODEL





ABS00204

	Step	Value	Yes	No
1	**CHECK WIRING HARNESS.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector (i2) or (B62) from connector (B37) or (F45). 3)Turn ignition switch to ON. Does the ABS warning light turn on?	ABS warning light does not turn on.	Go to step **2.**	Repair the front wiring harness.

	Step	Value	Yes	No
2	**CHECK PROJECTION AT ABSCM&H/U.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ABSCM&H/U. 3)Check for broken at the ABSCM&H/U.	Terminal is not broken.	Go to step **3.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
3	**CHECK ABSCM&H/U.** Measure the resistance between ABSCM&H/U terminals. ***Terminals*** ***No. 22 — No. 23:*** Is the measured value more than specified value?	1 MΩ	Go to step **4.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
4	**CHECK WIRING HARNESS.** Measure the resistance between connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 22 — Chassis ground:*** ***RHD: (F49) No. 22 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **5.**	Repair the harness.
5	**CHECK WIRING HARNESS.** 1)Connect the connector to ABSCM&H/U. 2)Measure the resistance between connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 22 — Chassis ground:*** ***RHD: (F49) No. 22 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **6.**	Repair the harness.
6	**CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.** Is there poor contact in ABSCM&H/U connector?	There is no poor contact.	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>	Repair the connector.

C: DTC 21
— OPEN OR SHORT CIRCUIT IN FRONT RIGHT ABS SENSOR CIRCUIT —

NOTE:
For the diagnostic procedure, refer to DTC 27. <Ref. to ABS-103, DTC 27 — OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>

D: DTC 23
— OPEN OR SHORT CIRCUIT IN FRONT LEFT ABS SENSOR CIRCUIT —

NOTE:
For the diagnostic procedure, refer to DTC 27. <Ref. to ABS-103, DTC 27 — OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>

E: DTC 25
— OPEN OR SHORT CIRCUIT IN REAR RIGHT ABS SENSOR CIRCUIT —

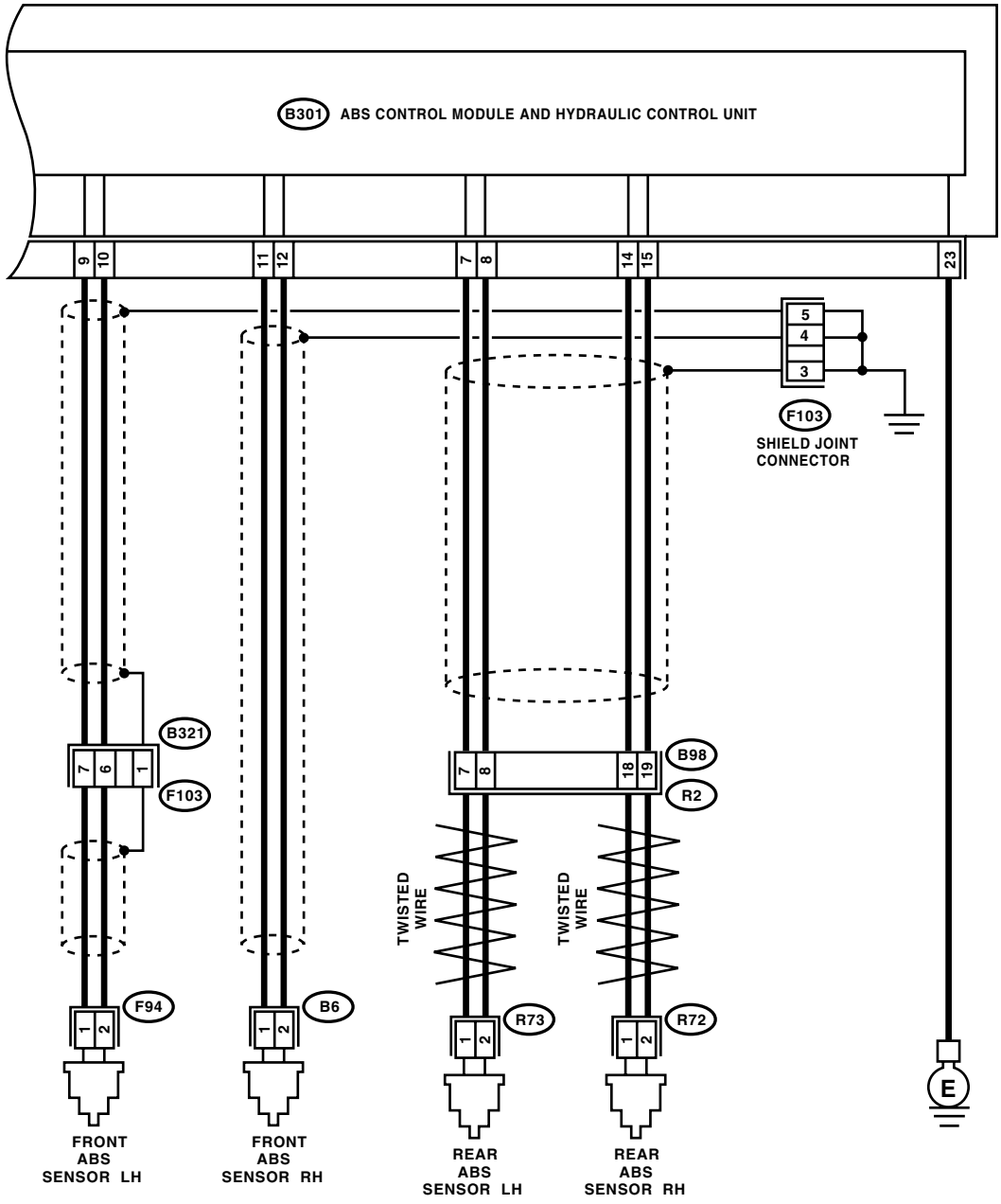
NOTE:
For the diagnostic procedure, refer to DTC 27. <Ref. to ABS-103, DTC 27 — OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>

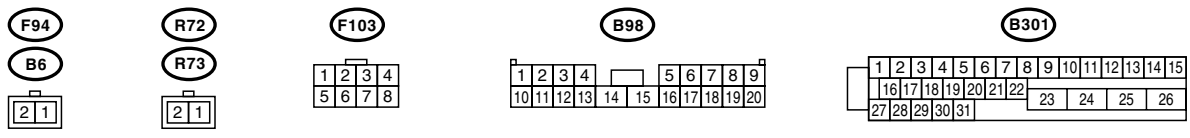
F: DTC 27
— OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —

DIAGNOSIS:
- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

TROUBLE SYMPTOM:
- ABS does not operate.

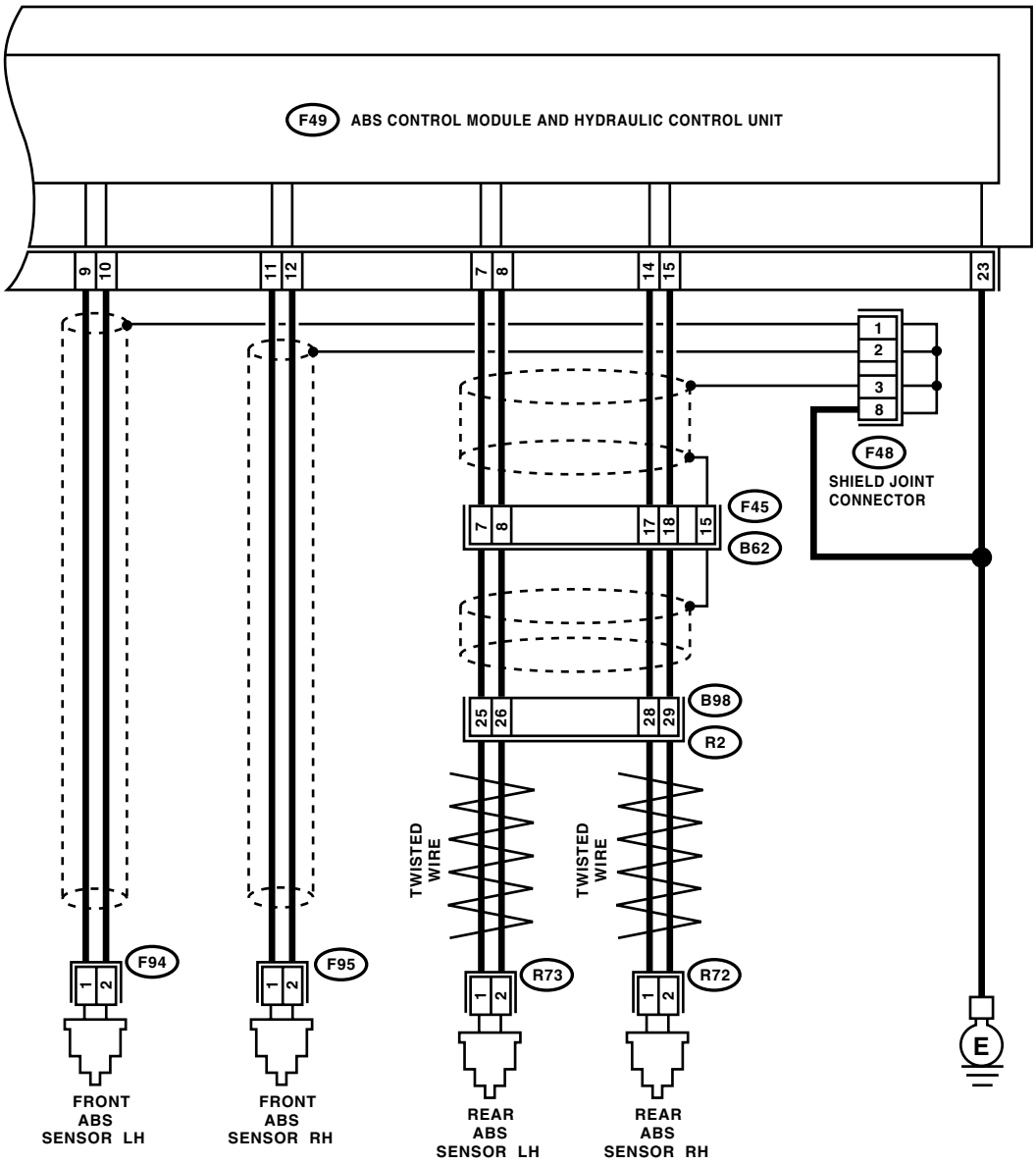
WIRING DIAGRAM:
LHD MODEL

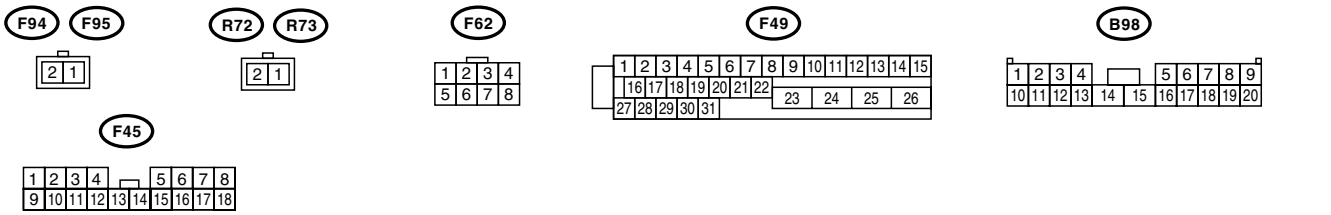




ABS00219

RHD MODEL





ABS00224

	Step	Value	Yes	No
1	**CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.** 1)Select “Current data display & Save” on the select monitor. 2)Read the ABS sensor output corresponding to faulty system in the 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?	Speed indicated on display changes.	Go to step **2.**	Go to step **8.**
2	**CHECK INSTALLATION OF ABS SENSOR.** Are the ABS sensor installation bolts tightened securely?	33 N·m (3.4 kgf-m, 24.6 ft-lb)	Go to step **3.**	Tighten the ABS sensor installation bolts securely.
3	**CHECK ABS SENSOR GAP.** Measure the tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Is the measured value within specified 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 measured value less than specified value?	0.05 mm (0.0020 in)	Go to step **5.**	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
5	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connectors between ABSCM&H/U and ABS sensor?	There is no poor contact.	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 the current diagnosis still being output?	Same DTC is not output.	Go to step **7.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
7	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact. NOTE: Check the harness and connectors between ABSCM&H/U and ABS sensor.	Proceed with the diagnosis corresponding to DTC.

	Step	Value	Yes	No
8	**CHECK ABS SENSOR.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ABS sensor. 3)Measure the resistance of ABS sensor connector terminals while shaking the harness lightly. ***Terminal*** ***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 measured value within specified value?	Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step **9.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
9	**CHECK BATTERY SHORT OF ABS SENSOR.** 1)Disconnect the connector from ABSCM&H/U. 2)Measure the voltage between ABS sensor and chassis ground. ***Terminal*** ***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 measured value less than specified value?	1 V	Go to step **10.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
10	**CHECK BATTERY SHORT OF ABS SENSOR.** 1)Turn the ignition switch to ON. 2)Measure the voltage between ABS sensor and chassis ground. ***Terminal*** ***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 measured value less than specified value?	1 V	Go to step **11.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
11	**CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.** 1)Turn the ignition switch to OFF. 2)Connect the connector to ABS sensor. 3)Measure the resistance between ABSCM&H/U connector terminals. ***Connector & terminal*** ***DTC 21*** ***LHD: (B301) No. 11 — No. 12:*** ***RHD: (F49) No. 11 — No. 12:*** ***DTC 23*** ***LHD: (B301) No. 9 — No. 10:*** ***RHD: (F49) No. 9 — No. 10:*** ***DTC 25*** ***LHD: (B301) No. 14 — No. 15:*** ***RHD: (F49) No. 14 — No. 15:*** ***DTC 27*** ***LHD: (B301) No. 7 — No. 8:*** ***RHD: (F49) No. 7 — No. 8:*** Is the measured value within specified 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 sensor.

	Step	Value	Yes	No
12	**CHECK BATTERY SHORT OF HARNESS.** Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***DTC 21*** ***LHD: (B301) No. 11 (+) — Chassis ground (–):*** ***RHD: (F49) No. 11 (+) — Chassis ground (–):*** ***DTC 23*** ***LHD: (B301) No. 9 (+) — Chassis ground (–):*** ***RHD: (F49) No. 9 (+) — Chassis ground (–):*** ***DTC 25*** ***LHD: (B301) No. 14 (+) — Chassis ground (–):*** ***RHD: (F49) No. 14 (+) — Chassis ground (–):*** ***DTC 27*** ***LHD: (B301) No. 7 (+) — Chassis ground (–):*** ***RHD: (F49) No. 7 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **13.**	Repair the harness between ABSCM&H/U and ABS 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*** ***LHD: (B301) No. 11 (+) — Chassis ground (–):*** ***RHD: (F49) No. 11 (+) — Chassis ground (–):*** ***DTC 23*** ***LHD: (B301) No. 9 (+) — Chassis ground (–):*** ***RHD: (F49) No. 9 (+) — Chassis ground (–):*** ***DTC 25*** ***LHD: (B301) No. 14 (+) — Chassis ground (–):*** ***RHD: (F49) No. 14 (+) — Chassis ground (–):*** ***DTC 27*** ***LHD: (B301) No. 7 (+) — Chassis ground (–):*** ***RHD: (F49) No. 7 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **14.**	Repair the harness between ABSCM&H/U and ABS sensor.
14	**CHECK INSTALLATION OF ABS SENSOR.** Are the ABS sensor installation bolts tightened securely?	33 N·m (3.4 kgf-m, 24.6 ft-lb)	Go to step **15.**	Tighten the ABS sensor installation bolts securely.

	Step	Value	Yes	No
15	**CHECK ABS SENSOR GAP.** Measure the tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Is the measured value within specified 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 measured value within specified value?	0.05 mm (0.0020 in)	Go to step **17.**	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
17	**CHECK GROUND SHORT OF ABS SENSOR.** 1)Turn the ignition switch to ON. 2)Measure the resistance between ABS sensor and chassis ground. ***Terminal*** ***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 measured value more than specified value?	1 MΩ	Go to step **18.**	Replace the ABS sensor and ABSCM&H/U. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.> and <Ref. to ABS-7, 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 sensor. 3)Measure the resistance between ABSCM&H/U connector terminal and chassis ground. ***Connector & terminal*** ***DTC 21*** ***LHD: (B301) No. 11 — Chassis ground:*** ***RHD: (F49) No. 11 — Chassis ground:*** ***DTC 23*** ***LHD: (B301) No. 9 — Chassis ground:*** ***RHD: (F49) No. 9 — Chassis ground:*** ***DTC 25*** ***LHD: (B301) No. 14 — Chassis ground:*** ***RHD: (F49) No. 14 — Chassis ground:*** ***DTC 27*** ***LHD: (B301) No. 7 — Chassis ground:*** ***RHD: (F49) No. 7 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **19.**	Repair the harness between ABSCM&H/U and ABS sensor. And replace the ABSCM&H/U. <Ref. to ABS-7, 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 sensor?	There is no poor contact.	Go to step **20.**	Repair the connector.

	Step	Value	Yes	No
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?	Same DTC is not output.	Go to step **21.**	Replace the ABSCM&H/U.
21	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact. NOTE: Check the harness and connectors between ABSCM&H/U and ABS sensor.	Proceed with the diagnosis corresponding to DTC.

G: DTC 22 — FRONT RIGHT ABNORMAL ABS SENSOR SIGNAL —

NOTE:
For the diagnostic procedure, refer to DTC 28. <Ref. to ABS-111, DTC 28 — REAR LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>

H: DTC 24 — FRONT LEFT ABNORMAL ABS SENSOR SIGNAL —

NOTE:
For the diagnostic procedure, refer to DTC 28. <Ref. to ABS-111, DTC 28 — REAR LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>

I: DTC 26 — REAR RIGHT ABNORMAL ABS SENSOR SIGNAL —

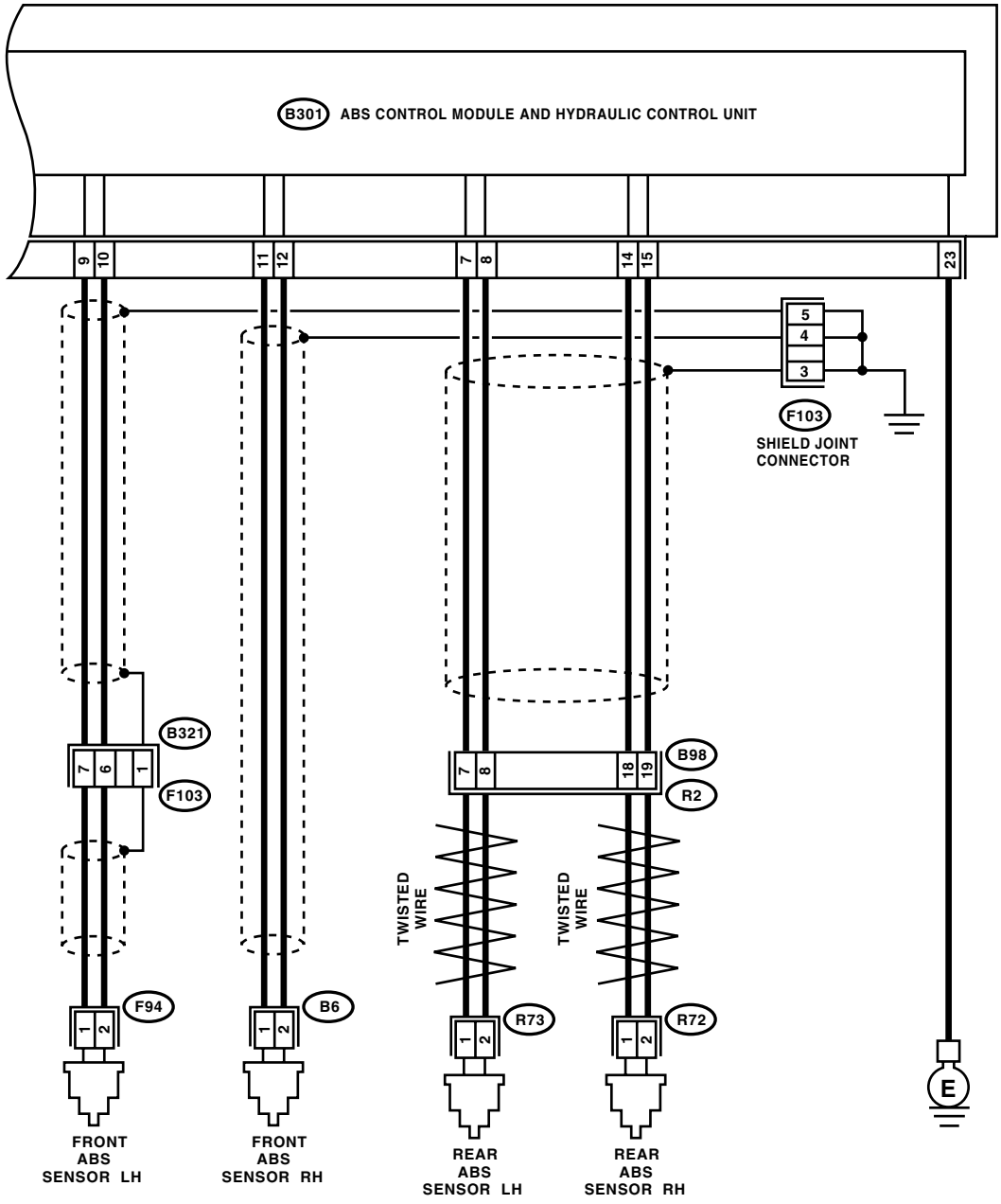
NOTE:
For the diagnostic procedure, refer to DTC 28. <Ref. to ABS-111, DTC 28 — REAR LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>

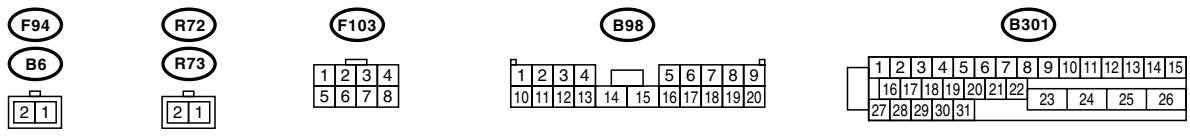
J: DTC 28
— REAR LEFT ABNORMAL ABS SENSOR SIGNAL —

DIAGNOSIS:
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:
- ABS does not operate.

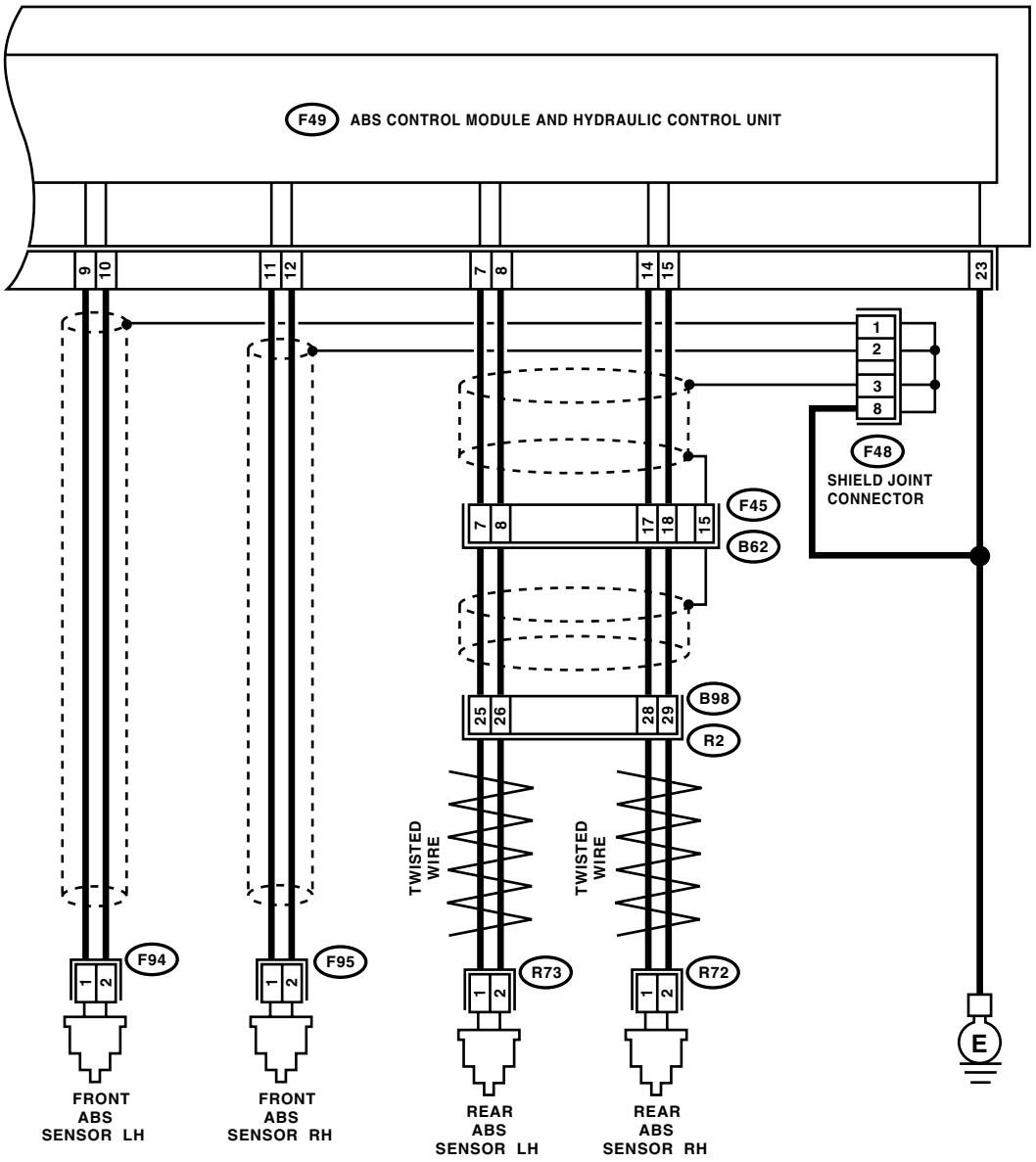
WIRING DIAGRAM:
LHD MODEL

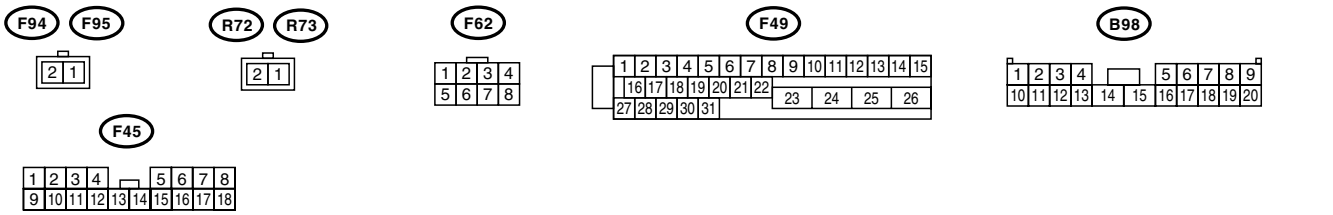




ABS00219

RHD MODEL





ABS00224

	Step	Value	Yes	No
1	**CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.** 1)Select “Current data display & Save” on the select monitor. 2)Read the ABS sensor output corresponding to faulty system in the 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?	Speed indicate on display changes.	Go to step **2.**	Go to step **8.**
2	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connectors between ABSCM&H/U and ABS sensor?	There is no poor contact.	Go to step **3.**	Repair the connector.
3	**CHECK SOURCES OF SIGNAL NOISE.** Is the car telephone or wireless transmitter properly installed?	Correctly 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?	Not installed.	Go to step **5.**	Install the noise sources apart from sensor harness.
5	**CHECK SHIELD CIRCUIT.** 1)Turn the ignition switch to OFF. 2)Connect all connectors. 3)Measure the resistance between shield connector and chassis ground. ***Connector & terminal*** ***DTC 22*** ***LHD: (F103) No. 4 — Chassis ground:*** ***RHD: (F48) No. 2 — Chassis ground:*** ***DTC 24*** ***LHD: (F103) No. 5 — Chassis ground:*** ***RHD: (F48) No. 1 — Chassis ground:*** ***DTC 26*** ***LHD: (F103) No. 3 — Chassis ground:*** ***RHD: (F48) No. 3 — Chassis ground:*** ***DTC 28*** ***LHD: (F103) No. 3 — Chassis ground:*** ***RHD: (F48) No. 3 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **6.**	Repair the shield harness.
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?	Same DTC is not output.	Go to step **7.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
7	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary noise interference.	Proceed with the diagnosis corresponding to DTC.
8	**CHECK INSTALLATION OF ABS SENSOR.** Are the ABS sensor installation bolts tightened securely?	33 N·m (3.4 kgf-m, 24.6 ft-lb)	Go to step **9.**	Tighten the ABS sensor installation bolts securely.

	Step	Value	Yes	No
9	**CHECK ABS SENSOR GAP.** Measure the tone wheel to ABS sensor piece gap over entire perimeter of wheel. Is the measured value within specified 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 **10.**	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.
10	**PREPARE OSCILLOSCOPE.** Is an oscilloscope available?	Oscilloscope is available.	Go to step **11.**	Go to step **12.**
11	**CHECK ABS 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-17, WAVEFORM, Control Module I/O Signal.> NOTE: When this inspection is completed, the ABSCM&H/U sometimes stores DTC 29 or DTC 56. ***Connector 0& terminal*** ***DTC 22*** ***LHD: (B6) No. 1 (+) — No. 2 (–):*** ***RHD: (F95) No. 1 (+) — No. 2 (–):*** ***DTC 24*** ***LHD: (F94) No. 1 (+) — No. 2 (–):*** ***RHD: (F94) No. 1 (+) — No. 2 (–):*** ***DTC 26*** ***LHD: (B98) No. 18 (+) — No. 19 (–):*** ***RHD: (B98) No. 28 (+) — No. 29 (–):*** ***DTC 28*** ***LHD: (B98) No. 7 (+) — No. 8 (–):*** ***RHD: (B98) No. 25 (+) — No. 26 (–):*** Is the measured value as same as specified value?	Oscilloscope pattern is smooth, as shown in the figure.	Go to step **15.**	Go to step **12.**
12	**CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.** Remove the disc rotor or drum from hub in accordance with DTC. Is the ABS sensor piece or tone wheel contaminated by dirt or other foreign matter?	ABS sensor piece or tone wheel is not contaminated.	Go to step **13.**	Thoroughly remove dirt or other foreign matter.
13	**CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.** Are there broken or damaged in the ABS sensor piece or tone wheel?	There are no broken or damaged in the ABS sensor piece or tone wheel.	Go to step **14.**	Replace the ABS sensor or tone wheel. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.> and Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>

	Step	Value	Yes	No
14	**CHECK TONE WHEEL RUNOUT.** Measure the tone wheel runout. Is the measured value less than specified value?	0.05 mm (0.0020 in)	Go to step **15.**	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
15	**CHECK RESISTANCE OF ABS SENSOR.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ABS sensor. 3)Measure the resistance between ABS sensor connector terminals while shaking the harness lightly. ***Terminal*** ***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 measured value within specified value?	Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step **16.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
16	**CHECK GROUND SHORT OF ABS SENSOR.** Measure the resistance between ABS sensor and chassis ground. ***Terminal*** ***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 measured value more than specified value?	1 MΩ	Go to step **17.**	Replace the ABS sensor. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.>
17	**CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.** 1)Connect the connector to ABS sensor. 2)Disconnect the connector from ABSCM&H/U. 3)Measure the resistance at ABSCM&H/U connector terminals. ***Connector & terminal*** ***DTC 22*** ***LHD: (B301) No. 11 — No. 12:*** ***RHD: (F49) No. 11 — No. 12:*** ***DTC 24*** ***LHD: (B301) No. 9 — No. 10:*** ***RHD: (F49) No. 9 — No. 10:*** ***DTC 26*** ***LHD: (B301) No. 14 — No. 15:*** ***RHD: (F49) No. 14 — No. 15:*** ***DTC 28*** ***LHD: (B301) No. 7 — No. 8:*** ***RHD: (F49) No. 7 — No. 8:*** Is the measured value within specified value?	Front: 1 — 1.5 kΩ Rear: 1.025 — 1.265 kΩ	Go to step **18.**	Repair the harness/connector between ABSCM&H/U and ABS sensor.

	Step	Value	Yes	No
18	**CHECK GROUND SHORT OF HARNESS.** Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***DTC 22*** ***LHD: (B301) No. 11 — Chassis ground:*** ***RHD: (F49) No. 11 — Chassis ground:*** ***DTC 24*** ***LHD: (B301) No. 9 — Chassis ground:*** ***RHD: (F49) No. 9 — Chassis ground:*** ***DTC 26*** ***LHD: (B301) No. 14 — Chassis ground:*** ***RHD: (F49) No. 14 — Chassis ground:*** ***DTC 28*** ***LHD: (B301) No. 7 — Chassis ground:*** ***RHD: (F49) No. 7 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **19.**	Repair the harness/connector between ABSCM&H/U and ABS sensor.
19	**CHECK GROUND CIRCUIT OF ABSCM&H/U.** Measure the resistance between ABSCM&H/U and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **20.**	Repair the ABSCM&H/U ground harness.
20	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connectors between ABSCM&H/U and ABS sensor?	There is no poor contact.	Go to step **21.**	Repair the connector.
21	**CHECK SOURCES OF SIGNAL NOISE.** Is the car telephone or the wireless transmitter properly installed?	Correctly installed.	Go to step **22.**	Properly install the car telephone or wireless transmitter.
22	**CHECK SOURCES OF SIGNAL NOISE.** Are noise sources (such as an antenna) installed near the sensor harness?	Not installed	Go to step **23.**	Install the noise sources apart from sensor harness.
23	**CHECK SHIELD CIRCUIT.** 1)Connect all connectors. 2)Measure the resistance between shield connector and chassis ground. ***Connector & terminal*** ***DTC 22*** ***LHD: (F103) No. 4 — Chassis ground:*** ***RHD: (F48) No. 2 — Chassis ground:*** ***DTC 24*** ***LHD: (F103) No. 5 — Chassis ground:*** ***RHD: (F48) No. 1 — Chassis ground:*** ***DTC 26*** ***LHD: (F103) No. 3 — Chassis ground:*** ***RHD: (F48) No. 3 — Chassis ground:*** ***DTC 28*** ***LHD: (F103) No. 3 — Chassis ground:*** ***RHD: (F48) No. 3 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **24.**	Repair the shield harness.

	Step	Value	Yes	No
24	**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?	Same DTC is not output.	Go to step **25.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
25	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	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.	Proceed with the diagnosis corresponding to DTC.

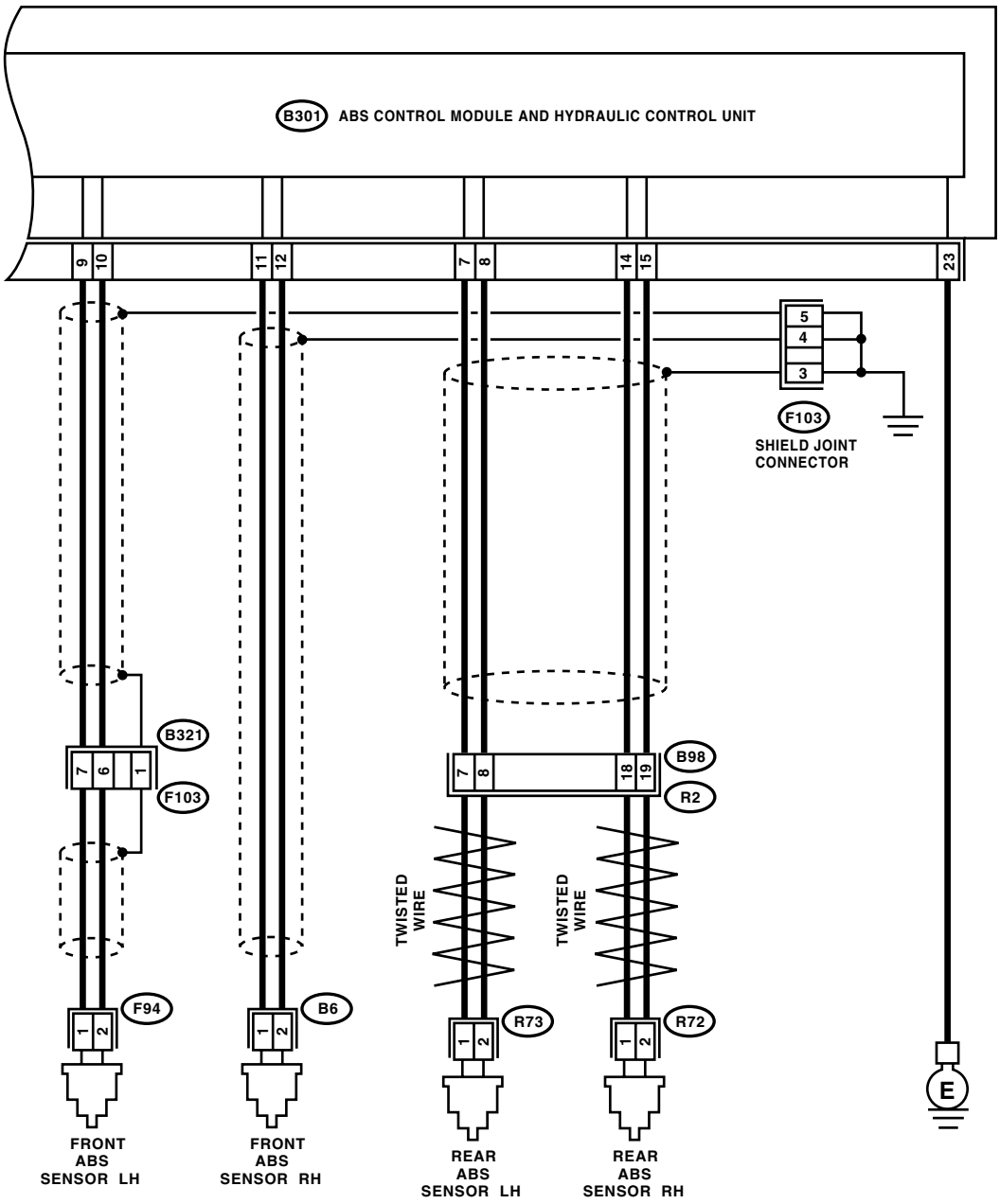
K: DTC 29
— ABNORMAL ABS SENSOR SIGNAL ON ANY ONE OF FOUR SENSOR —

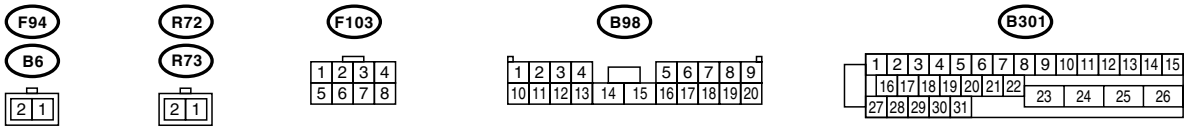
DIAGNOSIS:
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

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

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

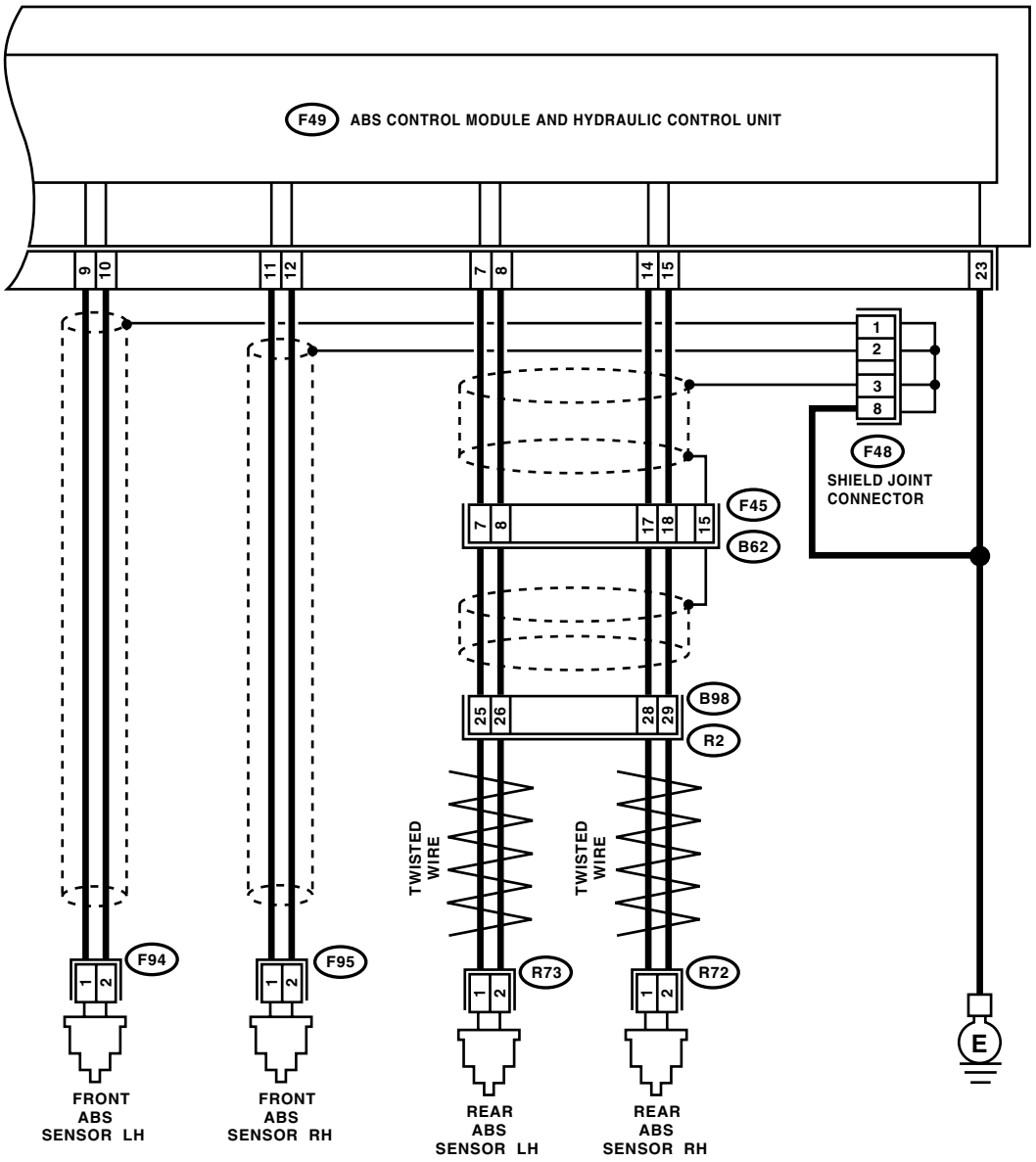
WIRING DIAGRAM:
LHD MODEL

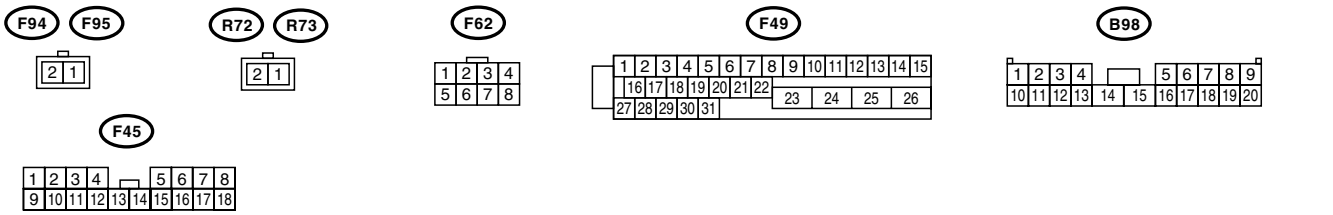




ABS00219

RHD MODEL





ABS00224

	Step	Value	Yes	No
1	**CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.** Check if the wheels have been turned freely for more than one minute, such as when vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.	Wheels have not been turned freely.	Go to step **2.**	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 trouble code may sometimes occur.
2	**CHECK TIRE SPECIFICATIONS.** Turn the ignition switch to OFF. Are the tire specifications correct?	Tire specifications are correct.	Go to step **3.**	Replace the tire.
3	**CHECK WEAR OF TIRE.** Is the tire worn excessively?	Tire is not worn excessively.	Go to step **4.**	Replace the tire.
4	**CHECK TIRE PRESSURE.** Is the tire pressure correct?	Tire pressure is correct.	Go to step **5.**	Adjust the tire pressure.
5	**CHECK INSTALLATION OF ABS SENSOR.** Are the ABS sensor installation bolts tightened securely?	33 N·m (3.4 kgf-m, 24.6 ft-lb)	Go to step **6.**	Tighten the ABS sensor installation bolts securely.
6	**CHECK ABS SENSOR GAP.** Measure the tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Is the measured value within specified 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?	Oscilloscope is available.	Go to step **8.**	Go to step **9.**

	Step	Value	Yes	No
8	**CHECK ABS SENSOR SIGNAL.** 1)Raise all four wheels off ground. 2)Turn the ignition switch to OFF. 3)Connect the oscilloscope to connector (B6), (B99) or (F94) in accordance with DTC. 4)Turn the ignition switch to ON. 5)Rotate the wheels and measure voltage at specified frequency. <Ref. to ABS-17, WAVEFORM, Control Module I/O Signal.> NOTE: When this inspection is completed, ABSCM& H/U sometimes stores the DTC 29. ***Connector & terminal*** ***Front RH*** ***LHD: (B6) No. 1 (+) — No. 2 (–):*** ***RHD: (F95) No. 1 (+) — No. 2 (–):*** ***Front LH*** ***LHD: (F94) No. 1 (+) — No. 2 (–):*** ***RHD: (F94) No. 1 (+) — No. 2 (–):*** ***Rear RH*** ***LHD: (B98) No. 18 (+) — No. 19 (–):*** ***RHD: (B98) No. 28 (+) — No. 29 (–):*** ***Rear LH*** ***LHD: (B98) No. 7 (+) — No. 8 (–):*** ***RHD: (B98) No. 25 (+) — No. 26 (–):*** Is the measured value as specified value?	Oscilloscope pattern is smooth, as shown in the figure.	Go to step **12.**	Go to step **9.**
9	**CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.** Remove the disc rotor or drum from hub. Is the ABS sensor piece or tone wheel contaminated by dirt or other foreign matter?	ABS sensor piece or tone wheel is not contaminated.	Go to step **10.**	Thoroughly remove dirt or other foreign matter.
10	**CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.** Are there broken or damaged teeth in the ABS sensor piece or tone wheel?	There are no broken or damaged in the ABS sensor piece or tone wheel.	Go to step **11.**	Replace the ABS sensor or tone wheel. Front: <Ref. to ABS-14, Front ABS Sensor.> Rear: <Ref. to ABS-17, Rear ABS Sensor.> and Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>
11	**CHECK TONE WHEEL RUNOUT.** Measure the tone wheel runout. Is the measured value less than specified value?	0.05 mm (0.0020 in)	Go to step **12.**	Replace the tone wheel. Front: <Ref. to ABS-20, Front Tone Wheel.> Rear: <Ref. to ABS-21, Rear Tone Wheel.>

	Step	Value	Yes	No
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?	Same DTC is not output.	Go to step **13.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
13	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

L: DTC 31
— FRONT RIGHT INLET VALVE MALFUNCTION —

NOTE:
For the diagnostic procedure, refer to DTC 37. <Ref. to ABS-125, DTC 37 — REAR LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

M: DTC 33
— FRONT LEFT INLET VALVE MALFUNCTION —

NOTE:
For the diagnostic procedure, refer to DTC 37. <Ref. to ABS-125, DTC 37 — REAR LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

N: DTC 35
— REAR RIGHT INLET VALVE MALFUNCTION —

NOTE:
For the diagnostic procedure, refer to DTC 37. <Ref. to ABS-125, DTC 37 — REAR LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

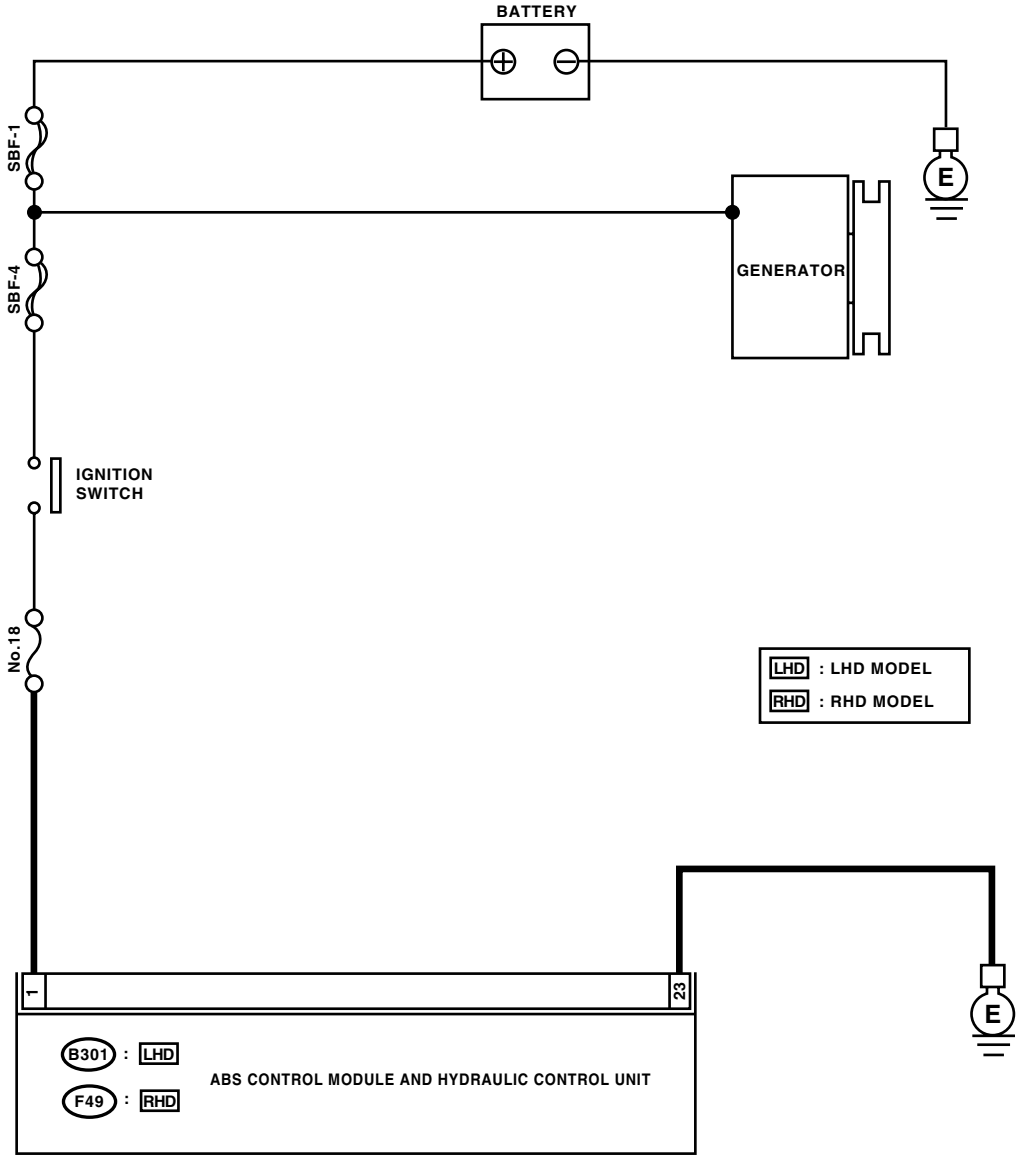
O: DTC 37
— REAR LEFT INLET VALVE MALFUNCTION —

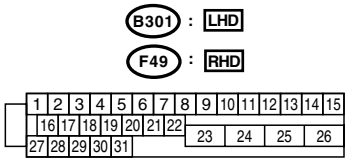
DIAGNOSIS:
- Faulty harness/connector
- Faulty inlet solenoid valve

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

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

WIRING DIAGRAM:





ABS00229

	Step	Value	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*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	Go to step **4.**	Repair the connector.
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?	Same DTC is not output.	Go to step **5.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
5	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

P: DTC 32
— FRONT RIGHT OUTLET VALVE MALFUNCTION —

NOTE:
For the diagnostic procedure, refer to DTC 38. <Ref. to ABS-129, DTC 38 — REAR LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

Q: DTC 34
— FRONT LEFT OUTLET VALVE MALFUNCTION —

NOTE:
For the diagnostic procedure, refer to DTC 38. <Ref. to ABS-129, DTC 38 — REAR LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

R: DTC 36
— REAR RIGHT OUTLET VALVE MALFUNCTION —

NOTE:
For the diagnostic procedure, refer to DTC 38. <Ref. to ABS-129, DTC 38 — REAR LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

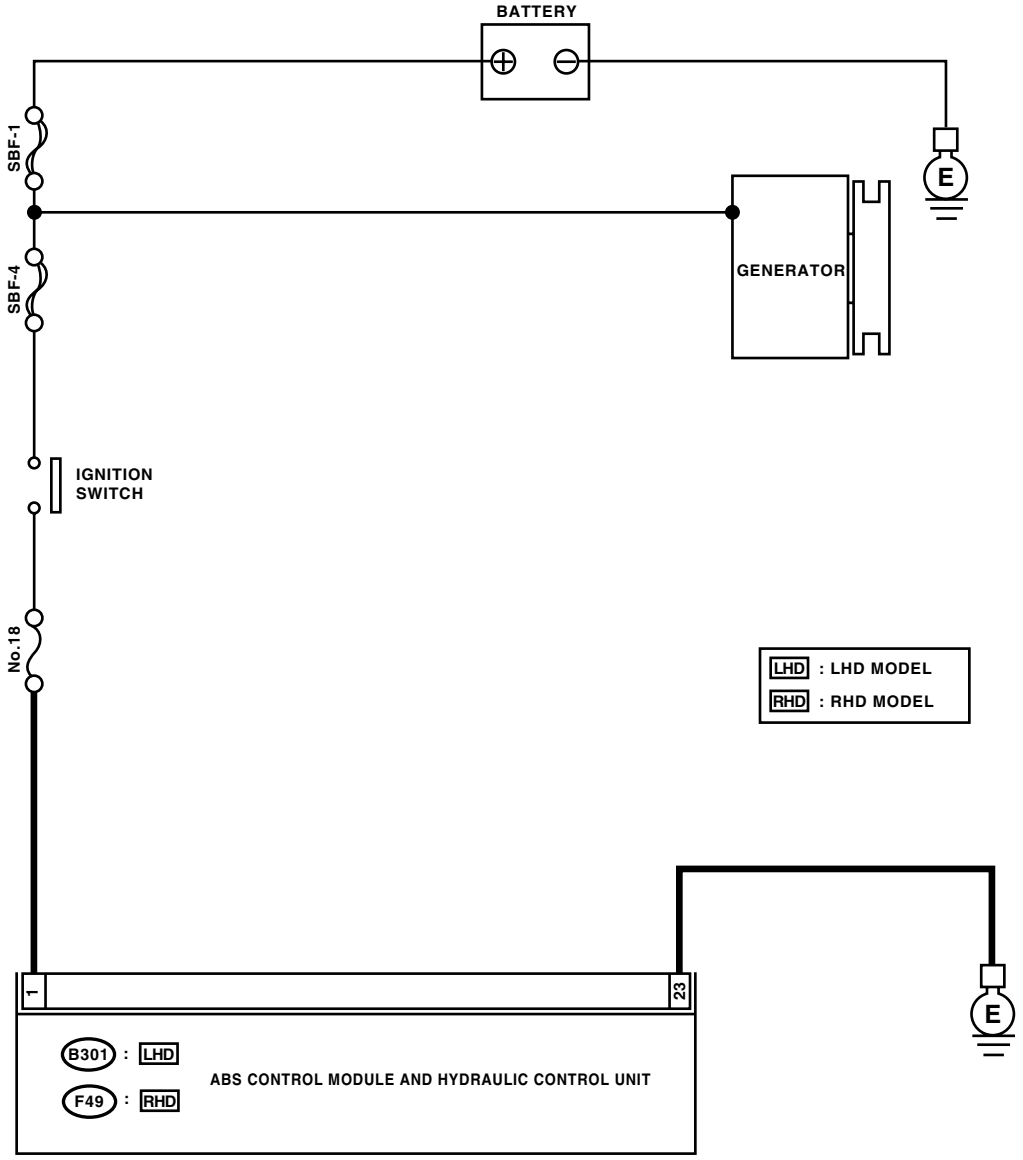
S: DTC 38
— REAR LEFT OUTLET VALVE MALFUNCTION —

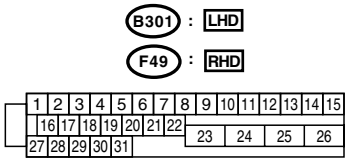
DIAGNOSIS:
- Faulty harness/connector
- Faulty outlet solenoid valve

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

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

WIRING DIAGRAM:





ABS00229

	Step	Value	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*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	Go to step **4.**	Repair the connector.
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?	Same DTC is not output.	Go to step **5.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
5	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

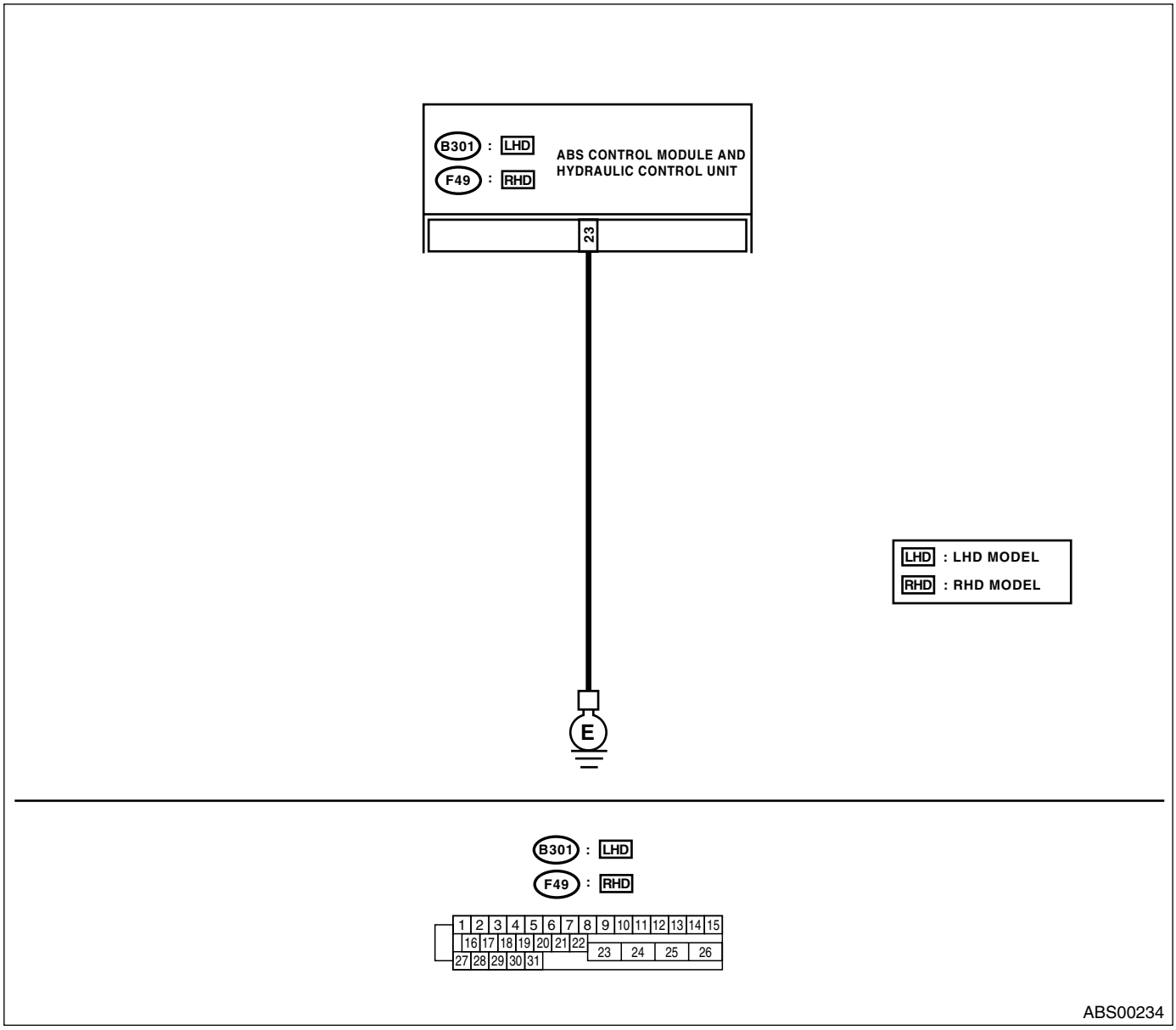
T: DTC 41
— ABS CONTROL MODULE MALFUNCTION —

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	Value	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	Go to step **3.**	Repair the connector.
3	**CHECK SOURCES OF SIGNAL NOISE.** Is the car telephone or wireless transmitter properly installed?	Correctly 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?	Not installed.	Go to step **5.**	Install the noise sources apart from sensor harness.
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?	Same DTC is not output.	Go to step **6.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
6	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

U: DTC 42
— POWER SUPPLY VOLTAGE TOO LOW —

DIAGNOSIS:

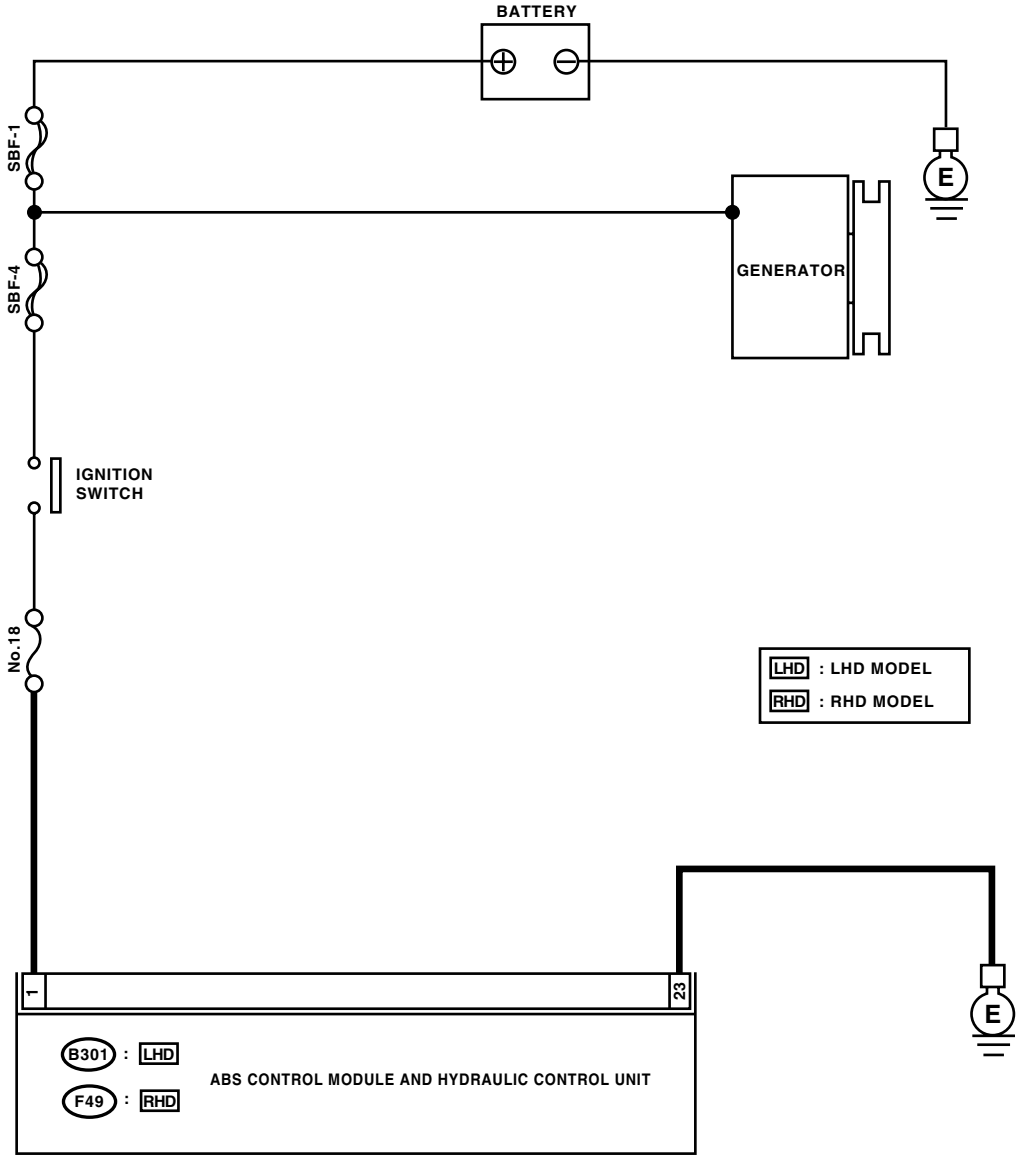
- Power source voltage of the ABSCM&H/U is low.

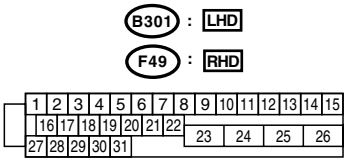
TROUBLE SYMPTOM:

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

NOTE:
In addition to the ABS warning light, brake warning light illuminates temporarily. Both warning lights go off on the recovery of voltage.

WIRING DIAGRAM:





ABS00229

	Step	Value	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. ***Terminal*** ***Generator B terminal (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **2.**	Repair the generator. <Ref. to SC(SOHC)-15, Generator.>
2	**CHECK BATTERY TERMINAL.** Turn the ignition switch to OFF. Are the positive and negative battery terminals tightly clamped?	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*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	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 the current diagnosis still being output?	Same DTC is not output.	Go to step **7.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
7	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

V: DTC 42
— POWER SUPPLY VOLTAGE TOO HIGH —

DIAGNOSIS:

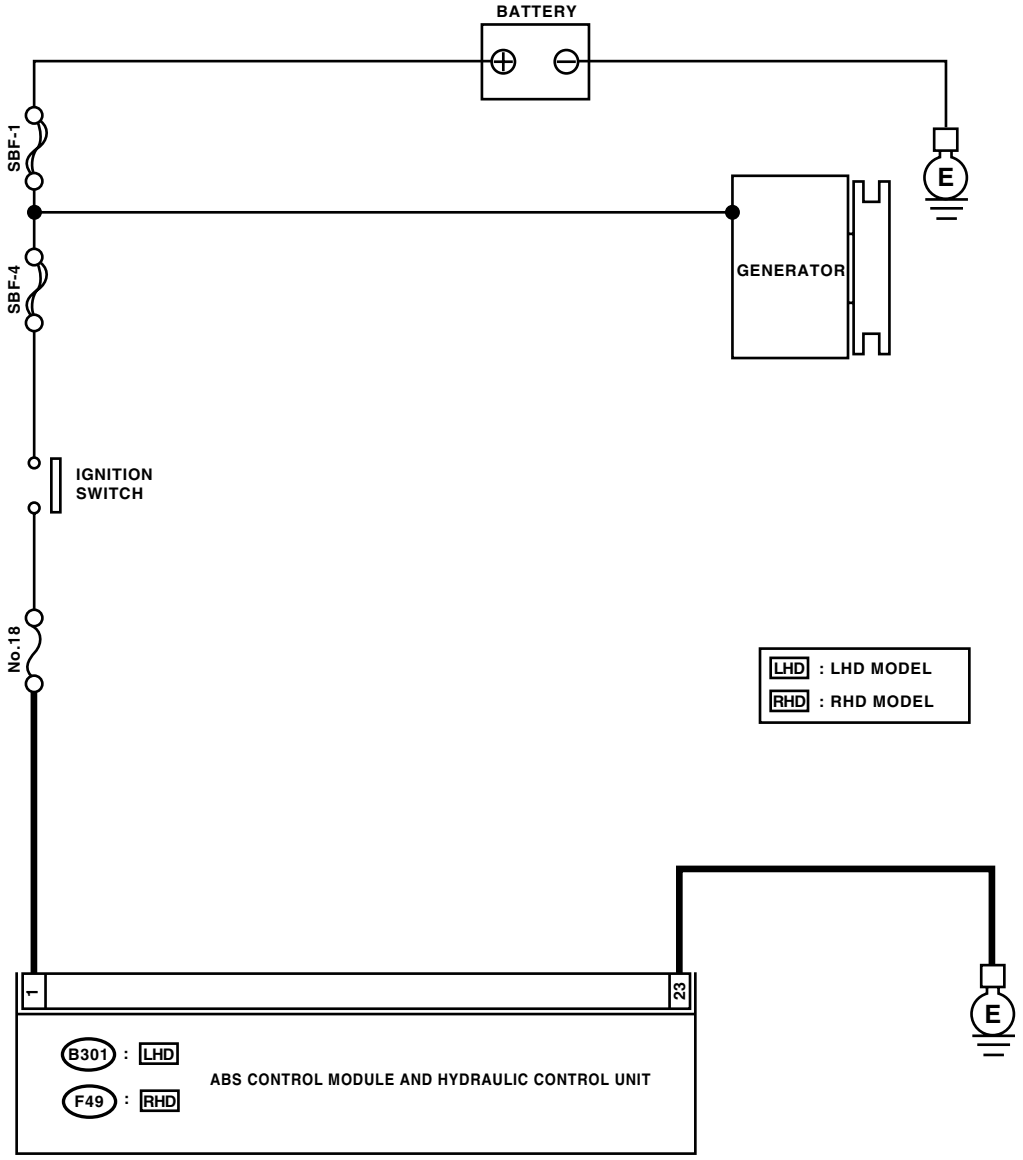
- Power source voltage of the ABSCM&H/U is high.

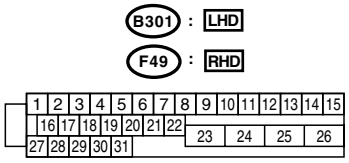
TROUBLE SYMPTOM:

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

NOTE:
In addition to the ABS warning light, brake warning light illuminates temporarily. Both warning lights go off on the recovery of voltage.

WIRING DIAGRAM:





ABS00229

	Step	Value	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. ***Terminal*** ***Generator B terminal (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 17 V	Go to step **2.**	Repair the generator. <Ref. to SC(SOHC)-15, Generator.>
2	**CHECK BATTERY TERMINAL.** Turn the ignition switch to OFF. Are the positive and negative battery terminals tightly clamped?	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*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	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 the current diagnosis still being output?	Same DTC is not output.	Go to step **7.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
7	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

W: DTC 44
— ABS-AT CONTROL (NON CONTROLLED) —

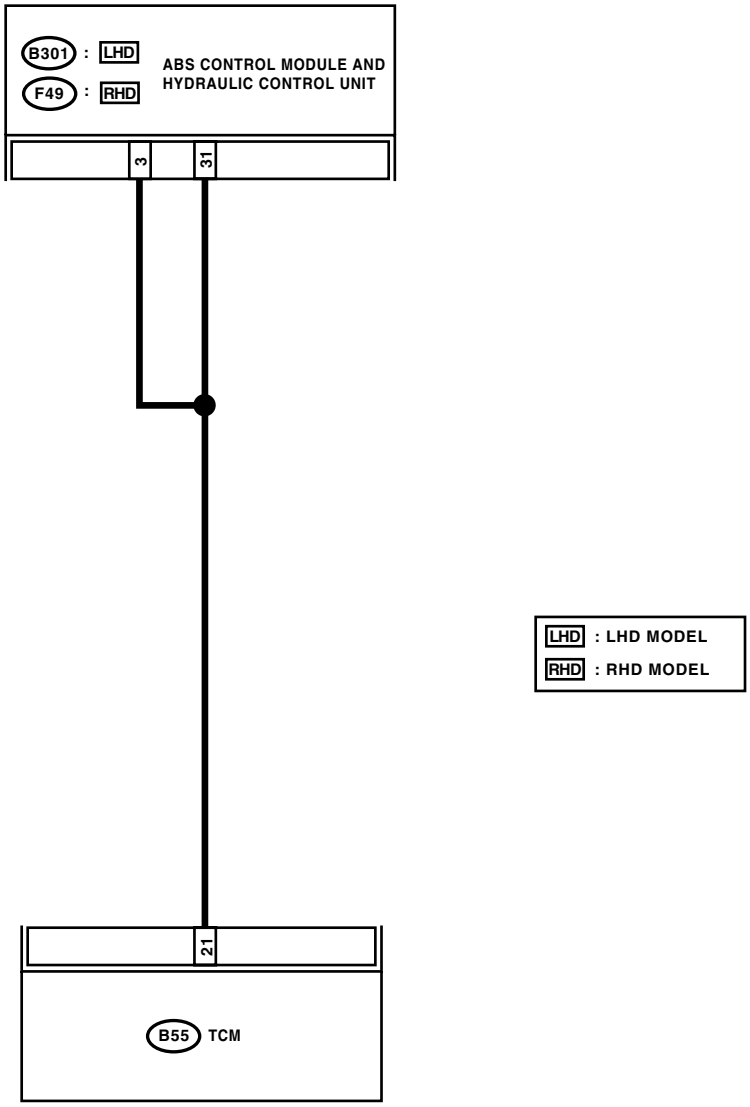
DIAGNOSIS:

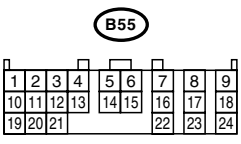
- Combination of AT control faults

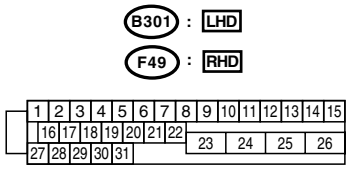
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:







ABS00239

	Step	Value	Yes	No
1	**CHECK SPECIFICATIONS OF THE ABSCM&H/U.** Check specifications of the mark on the ABSCM&H/U. ***CO: AT*** ***CP: MT*** Does the vehicle specification and ABSCM&H/U specification match?	Specifications are match.	Go to step **2.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
2	**CHECK GROUND SHORT OF HARNESS.** 1)Turn the ignition switch to OFF. 2)Disconnect the two connectors from TCM. 3)Disconnect the connector from ABSCM&H/U. 4)Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 3 — Chassis ground:*** ***RHD: (F49) No. 3 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **3.**	Repair the harness between TCM and ABSCM&H/U.
3	**CHECK TCM.** 1)Connect all connectors to TCM. 2)Turn the ignition switch to ON. 3)Measure the voltage between TCM connector terminal and chassis ground. ***Connector & terminal*** ***(B55) No. 21 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 15 V	Go to step **5.**	Go to step **4.**
4	**CHECK AT.** Is the AT functioning normally?	AT functioning normally.	Replace the TCM.	Repair the AT.
5	**CHECK OPEN CIRCUIT OF HARNESS.** Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD:*** ***(B301) No. 3 (+) — Chassis ground (–):*** ***(B301) No. 31 (+) — Chassis ground (–):*** ***RHD:*** ***(F49) No. 3 (+) — Chassis ground (–):*** ***(F49) No. 31 (+) — Chassis ground (–):*** Is the measured value more than specified value?	10 V	Go to step **6.**	Repair the harness/connector between TCM and ABSCM&H/U.
6	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connectors between TCM and ABSCM&H/U?	There is no poor contact.	Go to step **7.**	Repair the connector.
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 the current diagnosis still being output?	Same DTC is not output.	Go to step **8.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
8	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

X: DTC 44
— ABS-AT CONTROL (CONTROLLED) —

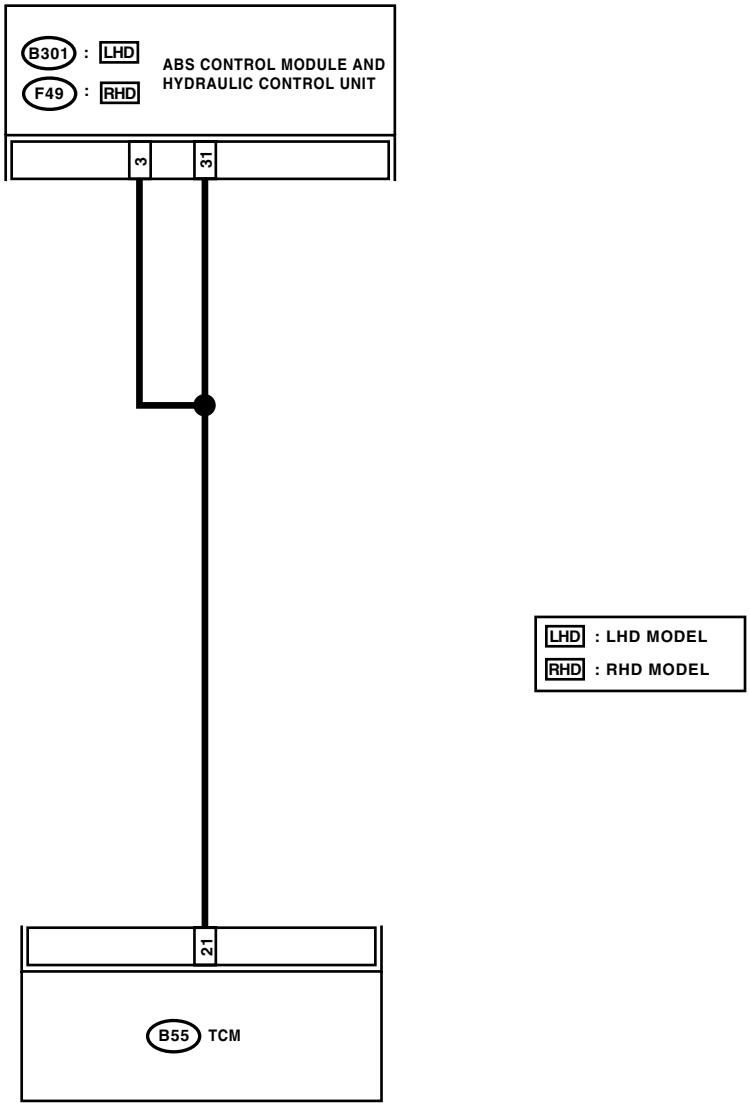
DIAGNOSIS:

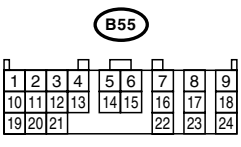
- Combination of AT control faults

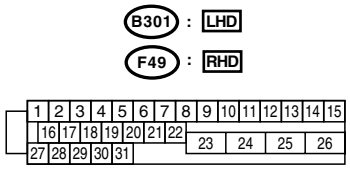
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:







ABS00239

	Step	Value	Yes	No
1	**CHECK BATTERY SHORT OF HARNESS.** 1)Turn the ignition switch to OFF. 2)Disconnect all connectors from TCM. 3)Disconnect the connector from ABSCM&H/U. 4)Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 3 (+) — Chassis ground (–):*** ***RHD: (F49) No. 3 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **2.**	Repair the harness between TCM and ABSCM&H/U.
2	**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*** ***LHD: (B301) No. 3 (+) — Chassis ground (–):*** ***RHD: (F49) No. 3 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **3.**	Repair the harness between TCM and ABSCM&H/U.
3	**CHECK OPEN CIRCUIT OF HARNESS.** 1)Turn the ignition switch to OFF. 2)Connect all connectors to TCM. 3)Turn the ignition switch to ON. 4)Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD:*** ***(B301) No. 3 (+) — Chassis ground (–):*** ***(B301) No. 31 (+) — Chassis ground (–):*** ***RHD:*** ***(F49) No. 3 (+) — Chassis ground (–):*** ***(F49) No. 31 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 13 V	Go to step **4.**	Repair the harness/connector between TCM and ABSCM&H/U.
4	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connectors between TCM and ABSCM&H/U?	There is no poor contact.	Go to step **5.**	Repair the connector.
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 current diagnosis still being output?	Same DTC is not output.	Go to step **6.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
6	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

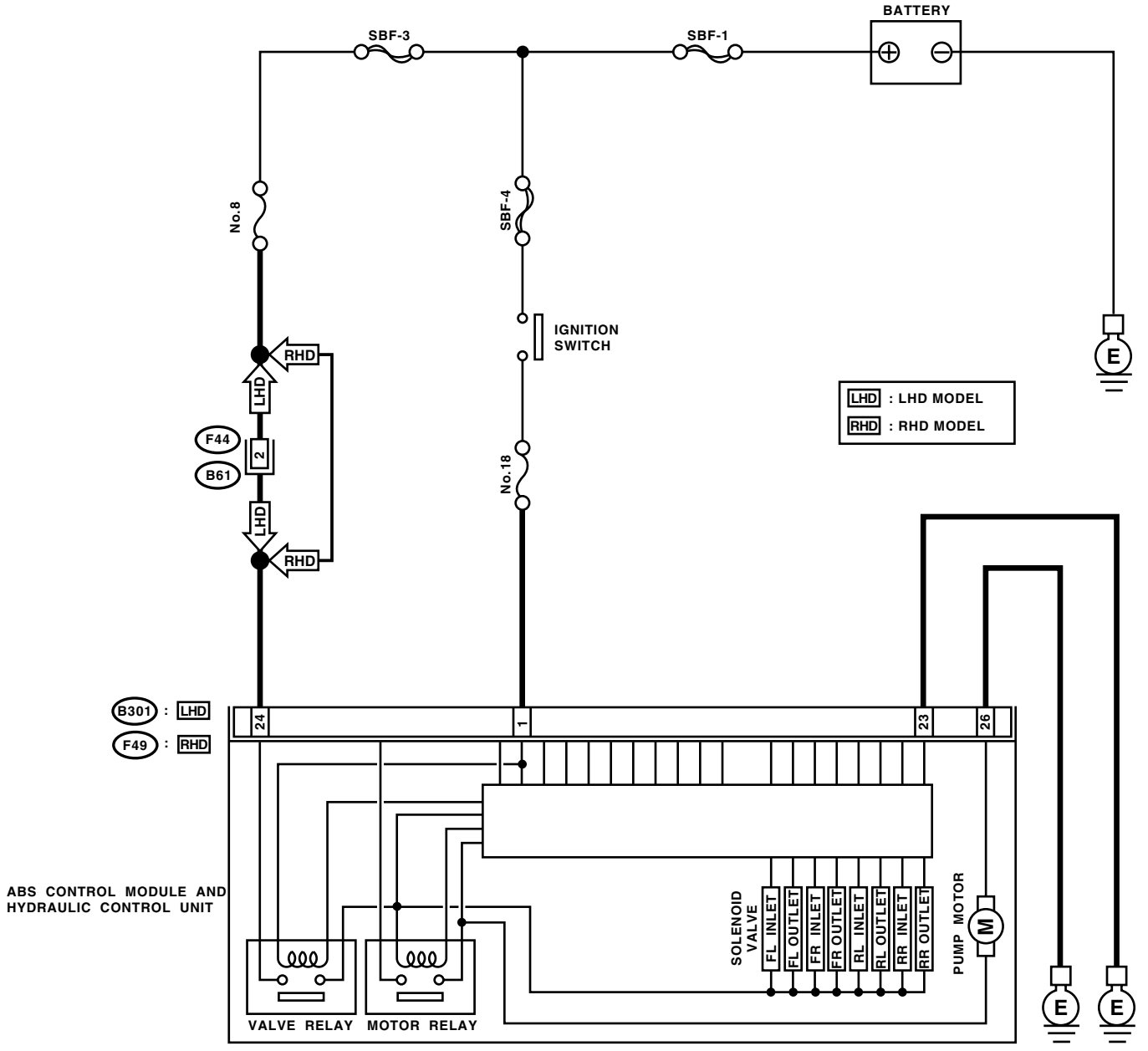
Y: DTC 51
— VALVE RELAY MALFUNCTION —

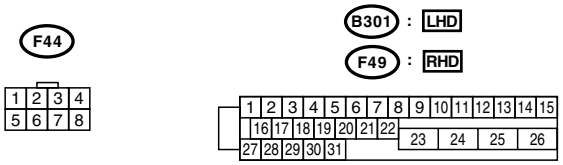
DIAGNOSIS:
- Faulty valve relay

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

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

WIRING DIAGRAM:





ABS00244

	Step	Value	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*** ***LHD:*** ***(B301) No. 1 (+) — Chassis ground (–):*** ***(B301) No. 24 (+) — Chassis ground (–):*** ***RHD:*** ***(F49) No. 1 (+) — Chassis ground (–):*** ***(F49) No. 24 (+) — Chassis ground (–):*** Is the measured value within specified value?	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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?	There is no poor contact.	Go to step **4.**	Repair the connector.
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 current diagnosis still being output?	Same DTC is not output.	Go to step **5.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
5	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

Z: DTC 51
— VALVE RELAY ON FAILURE —

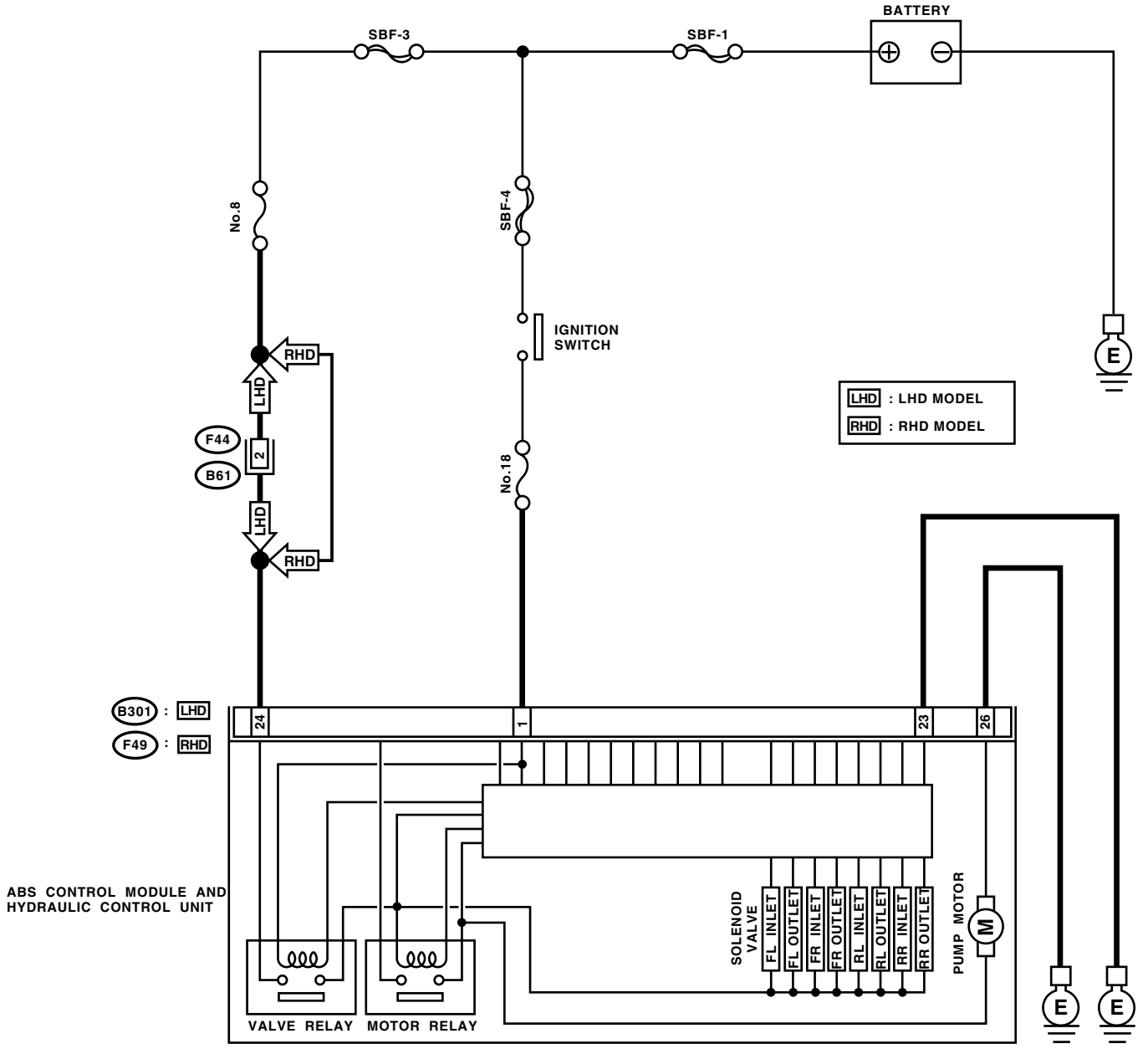
DIAGNOSIS:

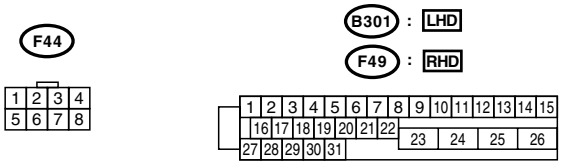
- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





ABS00244

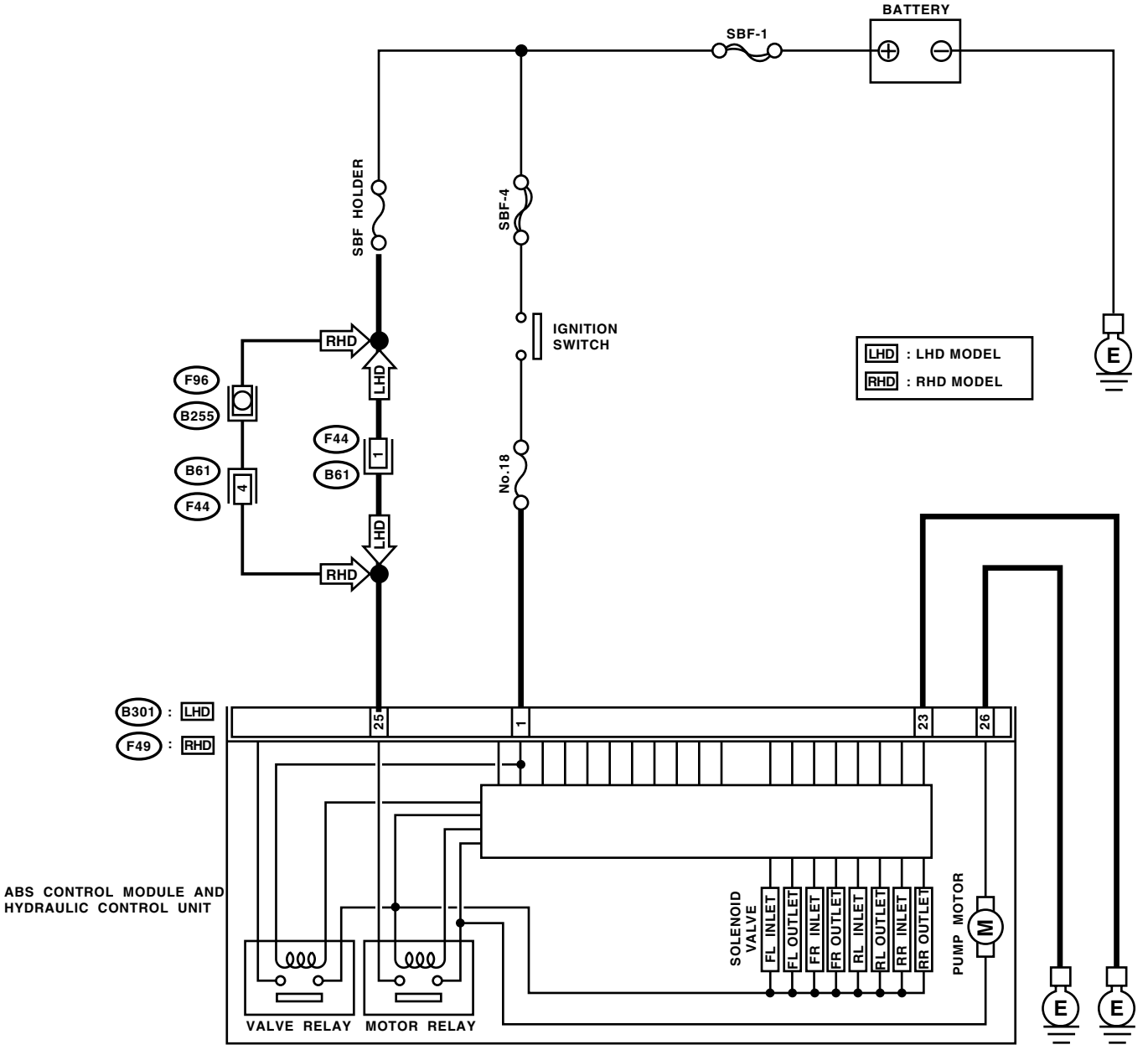
	Step	Value	Yes	No
1	**CHECK VALVE RELAY IN ABSCM&H/U.** 1)Disconnect the connector from ABSCM&H/U. 2)Measure the resistance between ABSCM&H/U terminals. ***Terminals*** ***No. 23 — No. 24:*** Is the measured value more than specified value?	1 MΩ	Go to step **2.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
2	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connectors between generator, battery and ABSCM&H/U?	There is no poor contact.	Go to step **3.**	Repair the connector.
3	**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?	Same DTC is not output.	Go to step **4.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
4	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

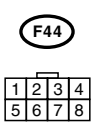
AA:DTC 52
— OPEN CIRCUIT IN MOTOR RELAY CIRCUIT —

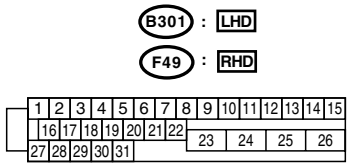
DIAGNOSIS:
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:
- ABS does not operate.

WIRING DIAGRAM:







ABS00249

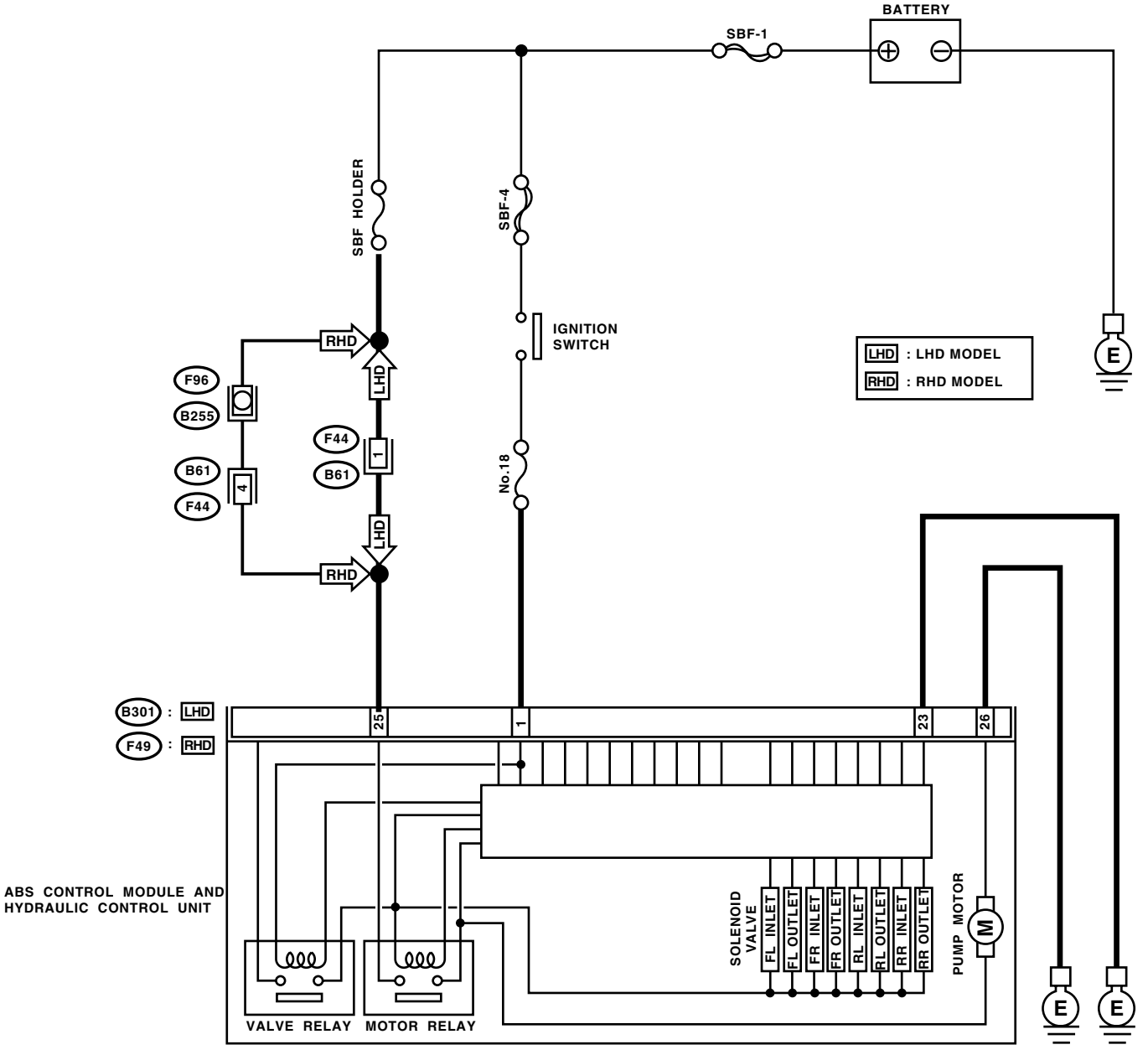
	Step	Value	Yes	No
1	**CHECK INPUT VOLTAGE OF ABSCM&H/U.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ABSCM&H/U. 3)Turn the ignition switch to ON. 4)Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 25 (+) — Chassis ground (–):*** ***RHD: (F49) No. 25 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 13 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*** ***LHD: (B301) No. 26 — Chassis ground:*** ***RHD: (F49) No. 26 — Chassis ground:*** Is the measured value less than specified value?	0.5 Ω	Go to step **3.**	Repair the ABSCM&H/U ground harness.
3	**CHECK MOTOR OPERATION.** Operate the sequence control. <Ref. to ABS-11, ABS Sequence Control.> NOTE: Use the diagnosis connector to operate sequence control. Can motor revolution noise (buzz) be heard when carrying out the check sequence?	Motor revolution noise (buzz) can be heard.	Go to step **4.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
4	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connector between generator, battery and ABSCM&H/U?	There is no poor contact.	Go to step **5.**	Repair the connector.
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 current diagnosis still being output?	Same DTC is not output.	Go to step **6.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
6	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

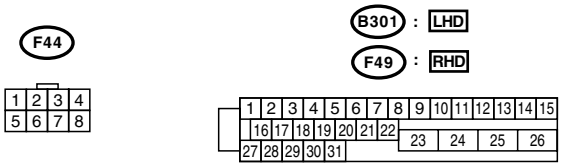
AB:DTC 52
— MOTOR RELAY ON FAILURE —

DIAGNOSIS:
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:
- ABS does not operate.

WIRING DIAGRAM:





ABS00249

	Step	Value	Yes	No
1	**CHECK MOTOR RELAY IN ABSCM&H/U.** 1)Disconnect the connector from ABSCM&H/U. 2)Measure the resistance between ABSCM&H/U terminals. ***Terminals*** ***No. 25 — No. 26:*** Is the measured value more than specified value?	1 MΩ	Go to step **2.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
2	**CHECK MOTOR OPERATION.** Operate the sequence control. <Ref. to ABS-11, 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?	Motor revolution noise (buzz) can be heard.	Go to step **3.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
3	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connector between generator, battery and ABSCM&H/U?	There is no poor contact.	Go to step **4.**	Repair the connector.
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 current diagnosis still being output?	Same DTC is not output.	Go to step **5.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
5	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact. 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.	Proceed with the diagnosis corresponding to DTC.

AC:DTC 52
— MOTOR MALFUNCTION —

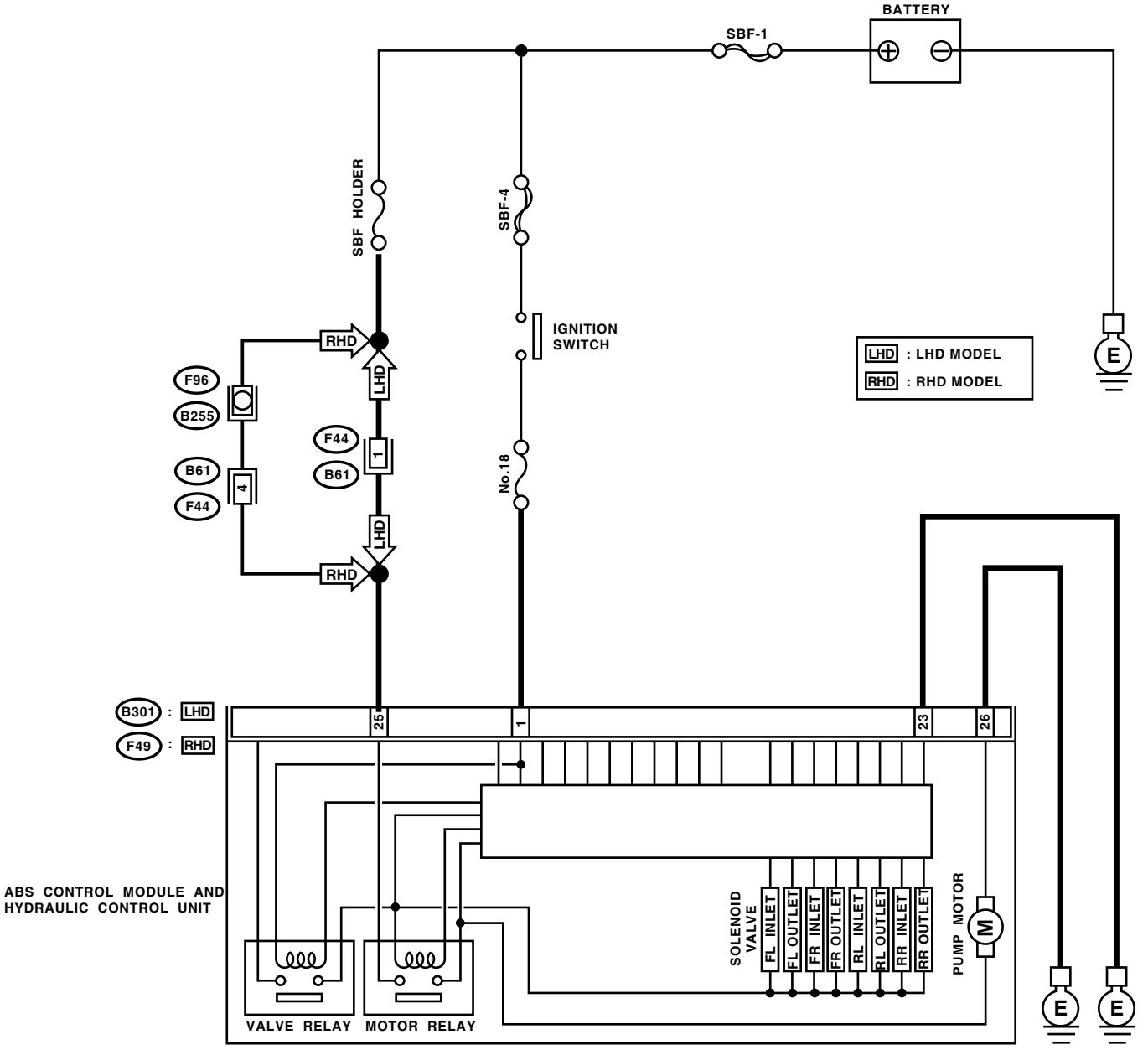
DIAGNOSIS:

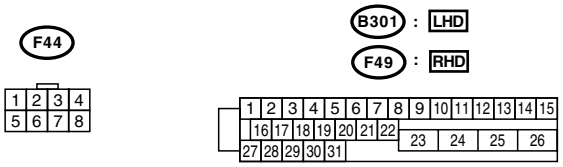
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





ABS00249

	Step	Value	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*** ***LHD: (B301) No. 25 (+) — Chassis ground (–):*** ***RHD: (F49) No. 25 (+) — Chassis ground (–):*** Is the measured value within specified value?	10 — 13 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*** ***LHD: (B301) No. 26 — Chassis ground:*** ***RHD: (F49) No. 26 — Chassis ground:*** Is the measured value less than specified value?	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*** ***LHD: (B301) No. 1 (+) — Chassis ground (–):*** ***RHD: (F49) No. 1 (+) — Chassis ground (–):*** Is the measured value within specified value?	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*** ***LHD: (B301) No. 23 — Chassis ground:*** ***RHD: (F49) No. 23 — Chassis ground:*** Is the measured value less than specified value?	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-11, 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?	Motor revolution noise (buzz) can be heard.	Go to step **6.**	Replace the ABSCM&H/U. <Ref. to ABS-7, 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?	There is no poor contact.	Go to step **7.**	Repair the connector.

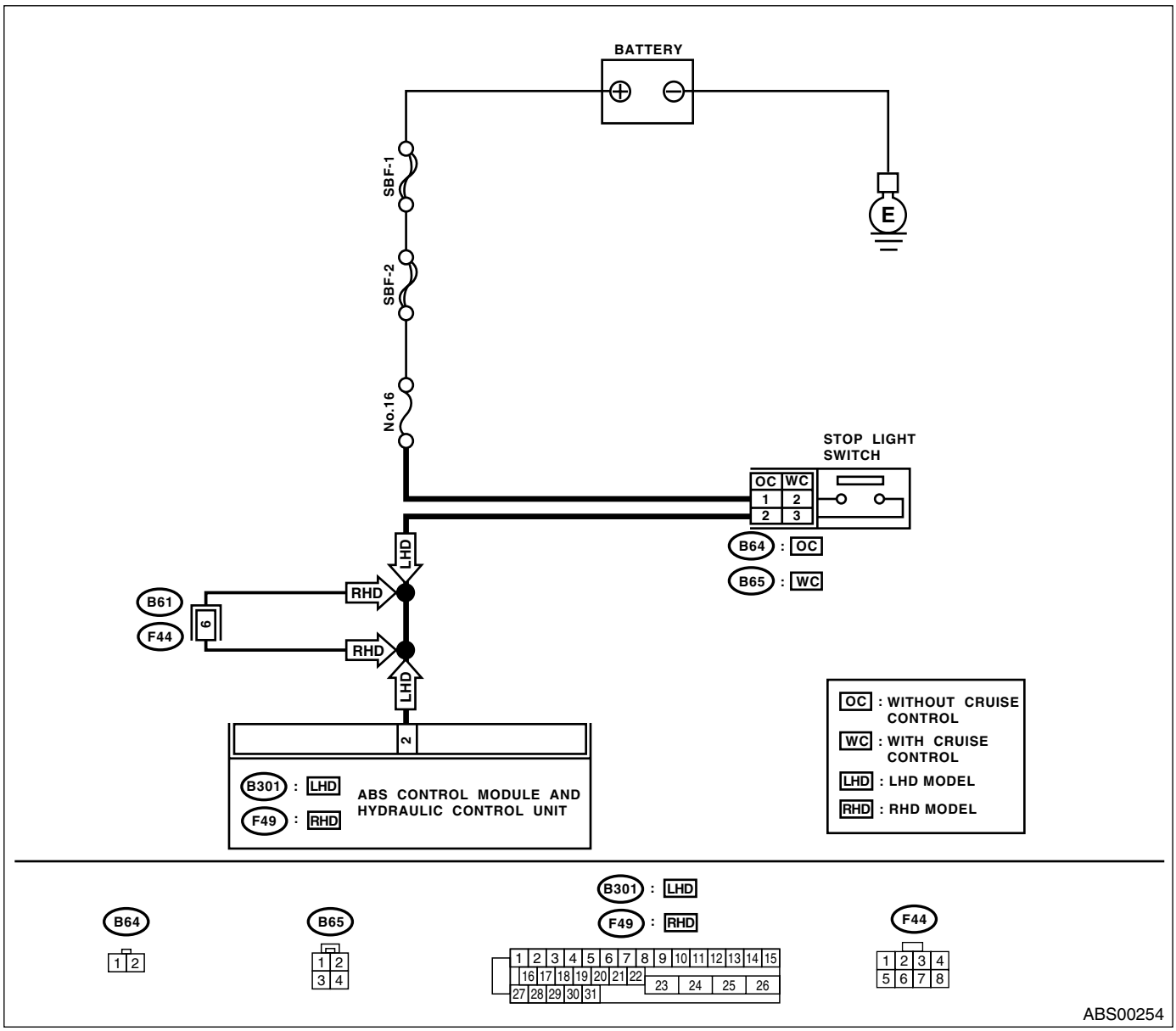
	Step	Value	Yes	No
7	**CHECK ABSCM&H/U.** 1)Connect all connectors. 2)Erase the memory. 3)Perform the inspection mode. 4)Read out the DTC. Is the same DTC as in current diagnosis still being output?	Same DTC is not output.	Go to step **8.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
8	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

AD:DTC 54
— STOP LIGHT SWITCH SIGNAL CIRCUIT MALFUNCTION —

DIAGNOSIS:
- Faulty stop light switch

TROUBLE SYMPTOM:
- ABS does not operate.

WIRING DIAGRAM:



Step		Value	Yes	No
1	**CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.** 1)Select “Current data display & Save” on the select monitor. 2)Release the brake pedal. 3)Read the stop light switch output in select monitor data display. Is the reading indicated on monitor display less than specified value?	1.5 V	Go to step **2.**	Go to step **3.**

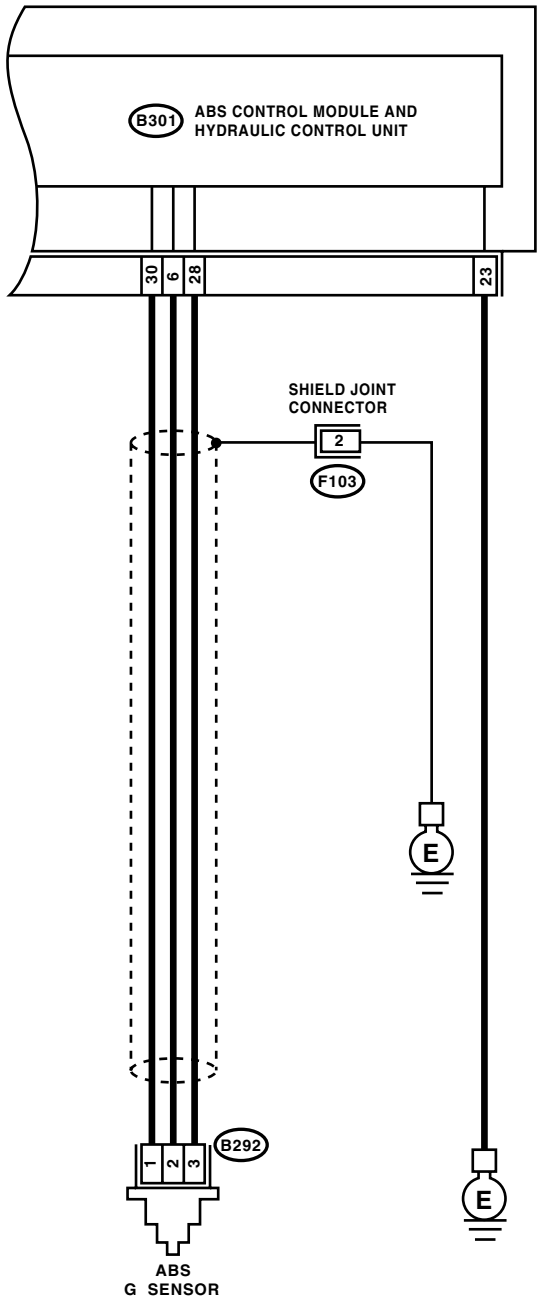
	Step	Value	Yes	No
2	**CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.** 1)Depress the brake pedal. 2)Read the stop light switch output in select monitor data display. Is the reading indicated on monitor display within specified value?	10 — 15 V	Go to step **5.**	Go to step **3.**
3	**CHECK IF STOP LIGHTS COME ON.** Depress the brake pedal. Do the stop lights turn on?	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*** ***LHD: (B301) No. 2 (+) — Chassis ground (–):*** ***RHD: (F49) No. 2 (+) — Chassis ground (–):*** Is the measured value within specified value?	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?	There is no poor contact.	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?	Same DTC is not output.	Go to step **7.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
7	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

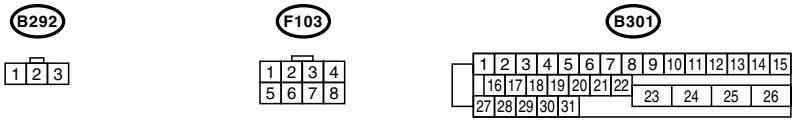
AE:DTC 56
— OPEN OR SHORT CIRCUIT IN G SENSOR CIRCUIT —

DIAGNOSIS:
- Faulty G sensor output voltage

TROUBLE SYMPTOM:
- ABS does not operate.

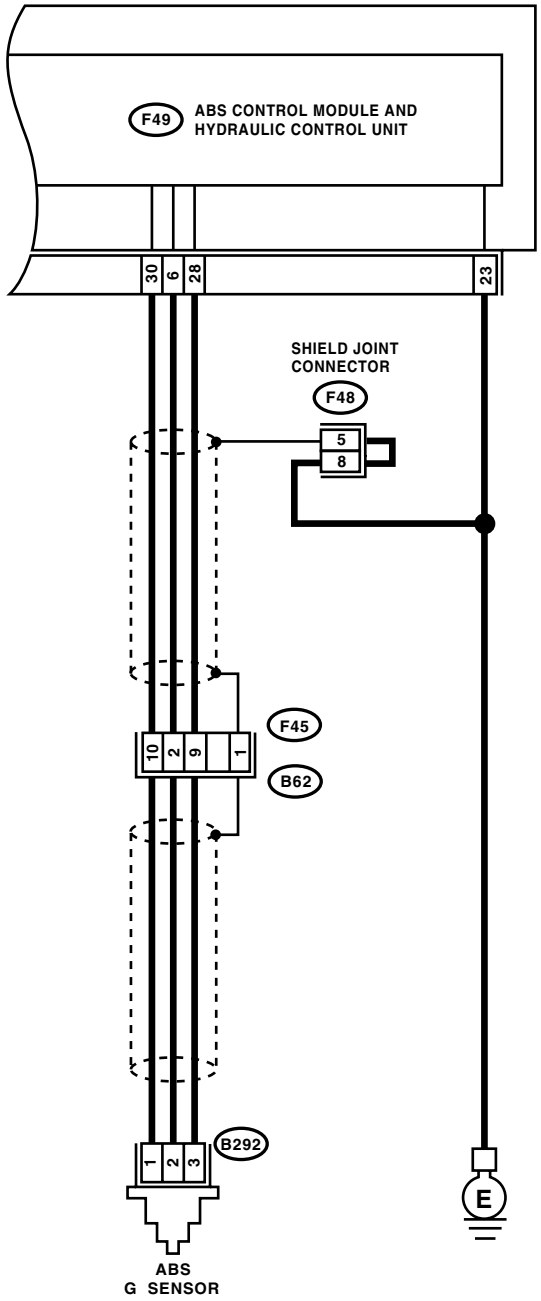
WIRING DIAGRAM:
LHD MODEL

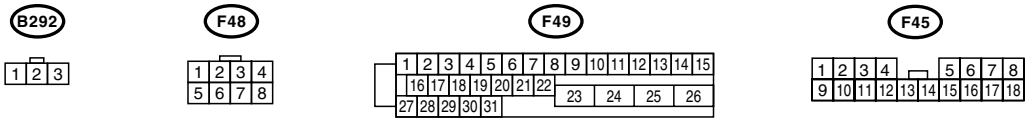




ABS00259

RHD MODEL





ABS00264

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

	Step	Value	Yes	No
1	**CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.** 1)Select “Current data display & Save” on the select monitor. 2)Read the G sensor output in select monitor data display. Is the G sensor output on monitor display within specified value when G sensor is in horizontal position?	2.1 — 2.5 V	Go to step **2.**	Go to step **5.**
2	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connector between ABSCM&H/U and G sensor?	There is no poor contact.	Go to step **3.**	Repair the connector.
3	**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?	Same DTC is not output.	Go to step **4.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
4	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.
5	**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 measured value within specified value?	4.75 — 5.25 V	Go to step **6.**	Repair the harness/connector between G sensor and ABSCM&H/U.
6	**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*** ***LHD: (B301) No. 6 — No. 28:*** ***RHD: (F49) No. 6 — No. 28:*** Is the measured value within specified value?	5.0 — 5.6 kΩ	Go to step **7.**	Repair the harness/connector between G sensor and ABSCM&H/U.
7	**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*** ***LHD: (B301) No. 6 — Chassis ground:*** ***RHD: (F49) No. 6 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **8.**	Repair the harness between G sensor and ABSCM&H/U.

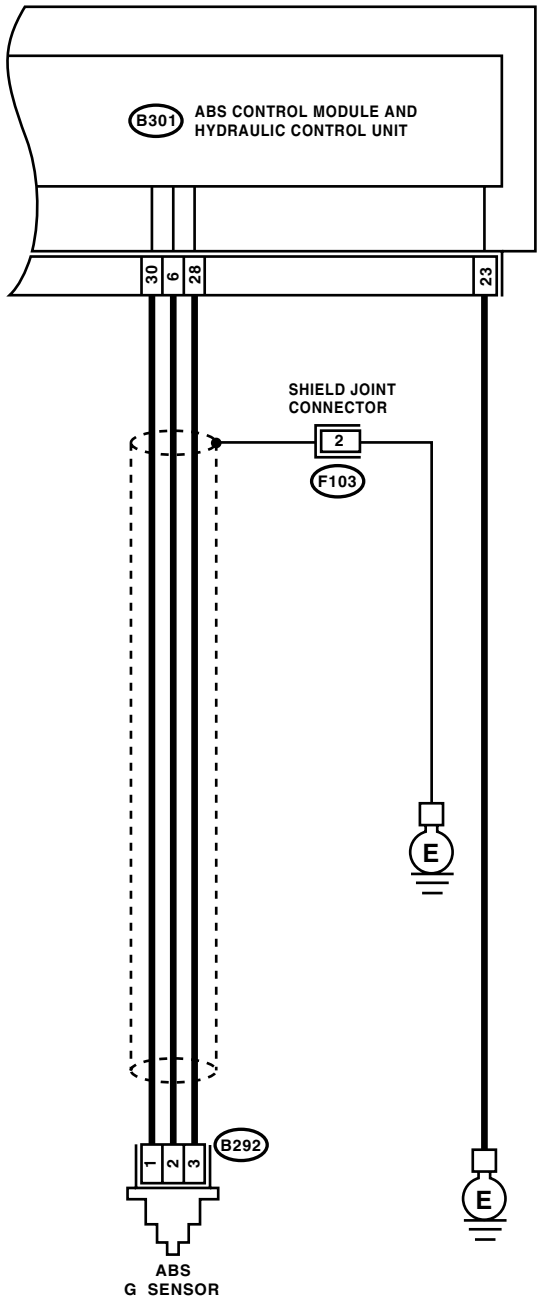
	Step	Value	Yes	No
8	**CHECK G SENSOR.** 1)Connect the connector to G sensor. 2)Connect the connector to ABSCM&H/U. 3)Turn the ignition switch to ON. 4)Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is in horizontal position?	2.1 — 2.5 V	Go to step **9.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
9	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined forwards to 90°?	3.7 — 4.1 V	Go to step **10.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
10	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined backwards to 90°?	0.5 — 0.9 V	Go to step **11.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
11	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connector between ABSCM&H/U and G sensor?	There is no poor contact.	Go to step **12.**	Repair the connector.
12	**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?	Same DTC is not output.	Go to step **13.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
13	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

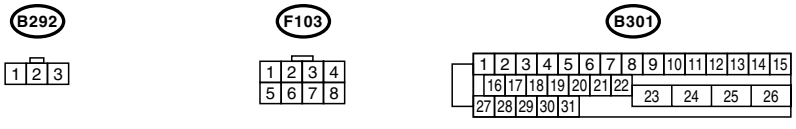
AF:DTC 56
— BATTERY SHORT IN G SENSOR CIRCUIT —

DIAGNOSIS:
- Faulty G sensor output voltage

TROUBLE SYMPTOM:
- ABS does not operate.

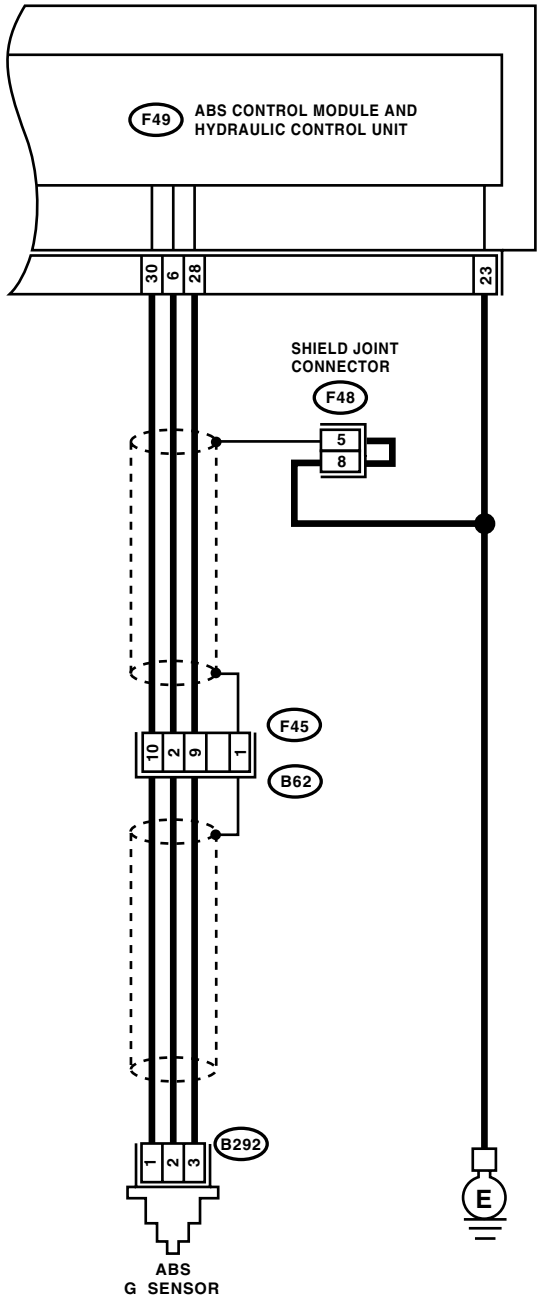
WIRING DIAGRAM:
LHD MODEL

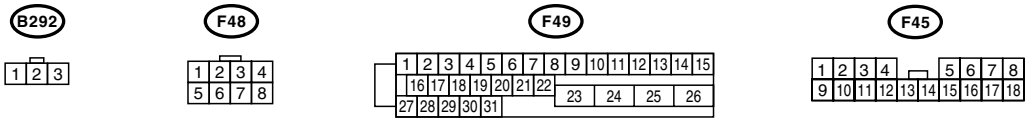




ABS00259

RHD MODEL





ABS00264

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

	Step	Value	Yes	No
1	**CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.** 1)Select “Current data display & Save” on the select monitor. 2)Read the G sensor output in select monitor data display. Is the measured value within specified value when G sensor is in horizontal position?	2.1 — 2.5 V	Go to step **2.**	Go to step **5.**
2	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connector between ABSCM&H/U and G sensor?	There is no poor contact.	Go to step **3.**	Repair the connector.
3	**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?	Same DTC is not output.	Go to step **4.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
4	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.
5	**CHECK FREEZE FRAME DATA.** 1)Select “Freeze frame data” on the select monitor. 2)Read front right wheel speed on the select monitor display. Is the front right wheel speed on monitor display 0 km/h (0 MPH)?	Monitor is displayed 0 km/h (0 MPH).	Go to step **6.**	Go to step **16.**
6	**CHECK FREEZE FRAME DATA.** Read front left wheel speed on the select monitor display. Is the front left wheel speed on monitor display 0 km/h (0 MPH)?	Monitor is displayed 0 km/h (0 MPH).	Go to step **7.**	Go to step **16.**
7	**CHECK FREEZE FRAME DATA.** Read rear right wheel speed on the select monitor display. Is the rear right wheel speed on monitor display 0 km/h (0 MPH)?	Monitor is displayed 0 km/h (0 MPH).	Go to step **8.**	Go to step **16.**
8	**CHECK FREEZE FRAME DATA.** Read rear left wheel speed on the select monitor display. Is the rear left wheel speed on monitor display 0 km/h (0 MPH)?	Monitor is displayed 0 km/h (0 MPH).	Go to step **9.**	Go to step **16.**
9	**CHECK FREEZE FRAME DATA.** Read G sensor output on the select monitor display. Is the G sensor output on monitor display more than specified value?	3.65 V	Go to step **10.**	Go to step **16.**
10	**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*** ***LHD: (B301) No. 6 — No. 28:*** ***RHD: (F49) No. 6 — No. 28:*** Is the measured value within specified value?	4.3 — 4.9 kΩ	Go to step **11.**	Repair the harness/connector between G sensor and ABSCM&H/U.

	Step	Value	Yes	No
11	**CHECK BATTERY SHORT OF HARNESS.** 1)Turn the ignition switch to OFF. 2)Remove the console box. 3)Disconnect the connector from G sensor. 4)Disconnect the connector from ABSCM&H/U. 5)Measure the voltage between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 6 (+) — Chassis ground (–):*** ***RHD: (F49) No. 6 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **12.**	Repair the harness between G sensor and ABSCM&H/U.
12	**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*** ***LHD: (B301) No. 6 (+) — Chassis ground (–):*** ***RHD: (F49) No. 6 (+) — Chassis ground (–):*** Is the measured value less than specified value?	1 V	Go to step **13.**	Repair the harness between G sensor and ABSCM&H/U.
13	**CHECK POOR CONTACT IN CONNECTORS.** Is there poor contact in connector between ABSCM&H/U and G sensor?	There is no poor contact.	Go to step **14.**	Repair the connector.
14	**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?	Same DTC is not output.	Go to step **15.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
15	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.
16	**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 measured value within specified value?	4.75 — 5.25 V	Go to step **17.**	Repair the harness/connector between G sensor and ABSCM&H/U.

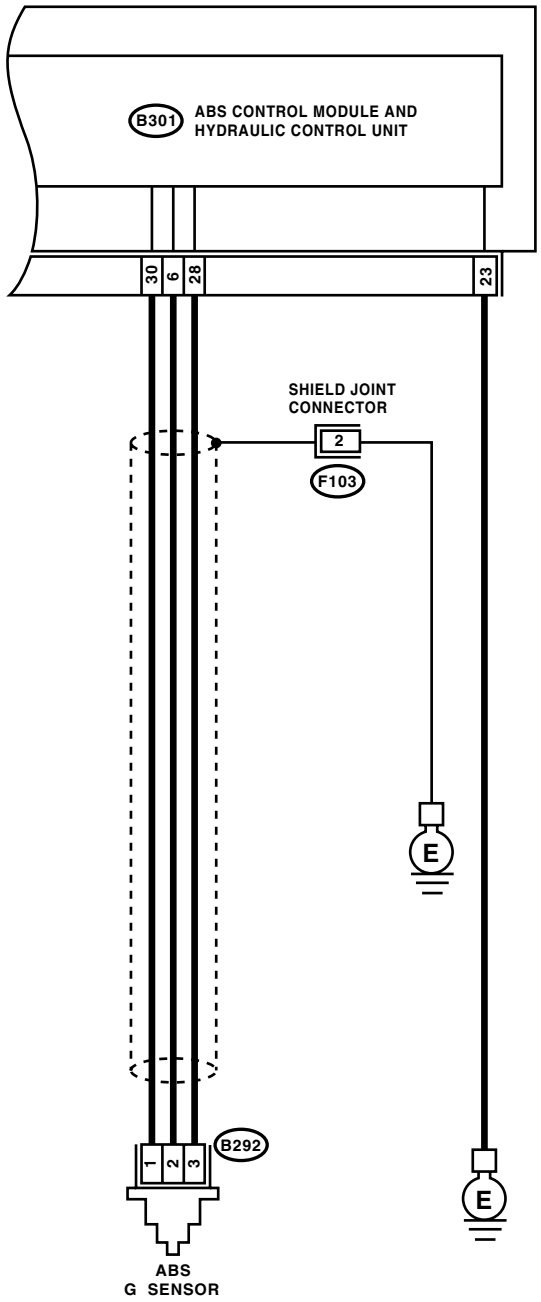
	Step	Value	Yes	No
17	**CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ABSCM&H/U. 3)Measure the resistance between ABSCM&H/U connector terminals. ***Connector & terminal*** ***LHD: (B301) No. 6 — No. 28:*** ***RHD: (F49) No. 6 — No. 28:*** Is the measured value within specified value?	5.0 — 5.6 kΩ	Go to step **18.**	Repair the harness/connector between G sensor and ABSCM&H/U.
18	**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 measured value within specified value when G sensor is in horizontal position?	2.1 — 2.5 V	Go to step **19.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
19	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined forwards to 90°?	3.7 — 4.1 V	Go to step **20.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
20	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined backwards to 90°?	0.5 — 0.9 V	Go to step **21.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
21	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connector between ABSCM&H/U and G sensor?	There is no poor contact.	Go to step **22.**	Repair the connector.
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 current diagnosis still being output?	Same DTC is not output.	Go to step **23.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
23	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

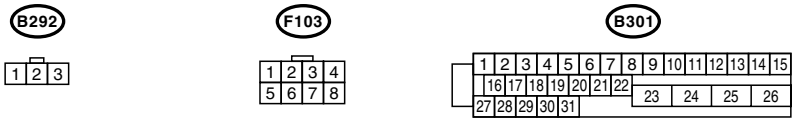
AG:DTC 56
— ABNORMAL G SENSOR HIGH μ OUTPUT —

DIAGNOSIS:
- Faulty G sensor output voltage

TROUBLE SYMPTOM:
- ABS does not operate.

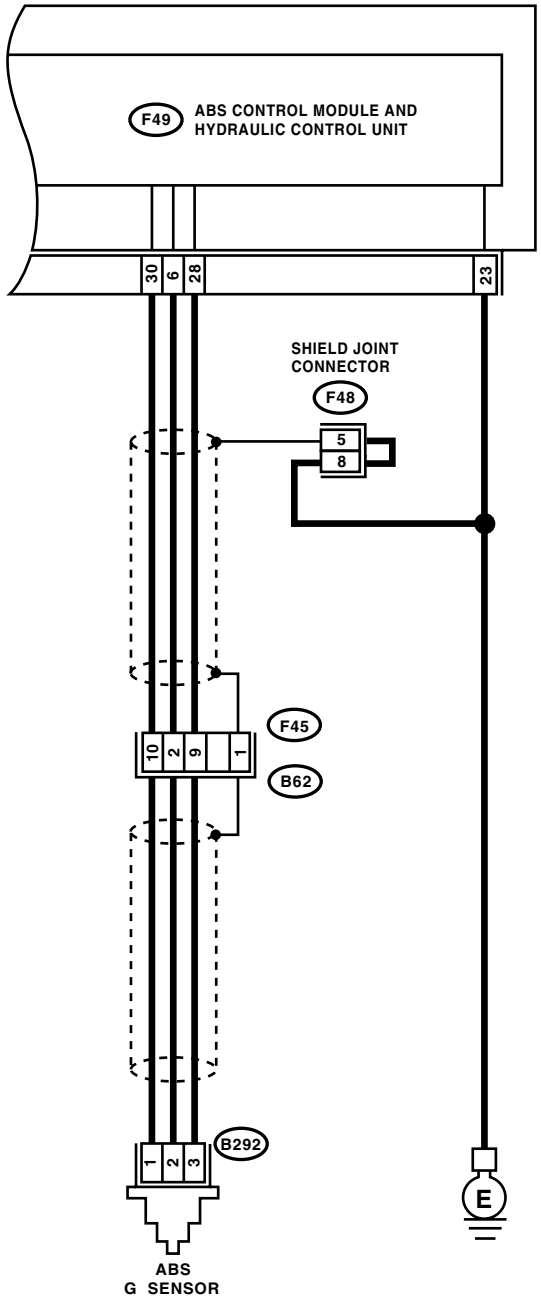
WIRING DIAGRAM:
LHD MODEL

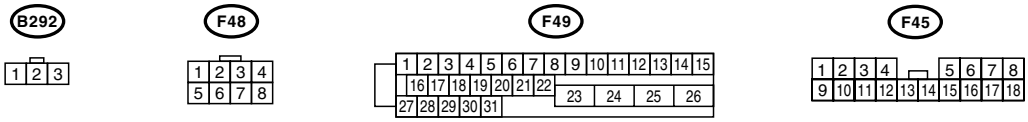




ABS00259

RHD MODEL





ABS00264

	Step	Value	Yes	No
1	**CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.** 1)Select “Current data display & Save” on the select monitor. 2)Read G sensor output on the select monitor display. Is the measured value within specified value when G sensor is in horizontal position?	2.1 — 2.5 V	Go to step **2.**	Go to step **6.**
2	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connector between ABSCM&H/U and G sensor?	There is no poor contact.	Go to step **3.**	Repair the connector.
3	**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?	Same DTC is not output.	Go to step **4.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
4	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.
5	**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*** ***LHD: (B301) No. 6 — No. 28:*** ***RHD: (F49) No. 6 — No. 28:*** Is the measured value within specified value?	5.0 — 5.6 kΩ	Go to step **6.**	Repair the harness/connector between G sensor and ABSCM&H/U.
6	**CHECK GROUND SHORT OF HARNESS.** Measure the resistance between ABSCM&H/U connector and chassis ground. ***Connector & terminal*** ***LHD: (B301) No. 28 — Chassis ground:*** ***RHD: (F49) No. 28 — Chassis ground:*** Is the measured value more than specified value?	1 MΩ	Go to step **7.**	Repair the harness between G sensor and ABSCM&H/U. Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
7	**CHECK G SENSOR.** 1)Remove the console box. 2)Remove the G sensor from vehicle. 3)Connect the connector to G sensor. 4)Connect the connector to ABSCM&H/U. 5)Turn the ignition switch to ON. 6)Measure the voltage between G sensor connector terminals. ***Connector & terminal*** ***(B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is in horizontal position?	2.1 — 2.5 V	Go to step **8.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>

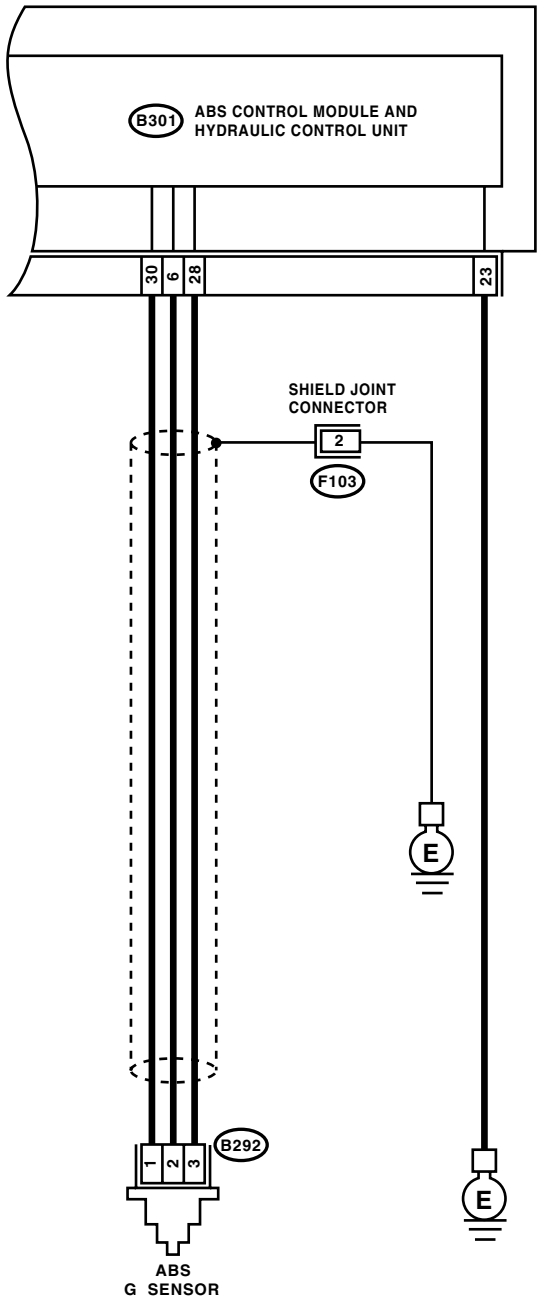
	Step	Value	Yes	No
8	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal (B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined forwards to 90°?	3.7 — 4.1 V	Go to step **9.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
9	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal (B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined backwards to 90°?	0.5 — 0.9 V	Go to step **10.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
10	**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?	Same DTC is not output.	Go to step **11.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
11	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

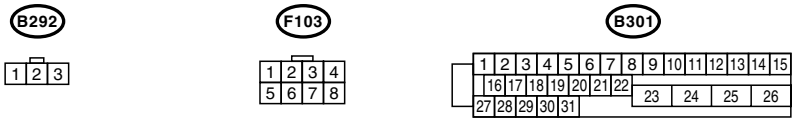
AH:DTC 56
— DETECTION OF G SENSOR STICK —

DIAGNOSIS:
- Faulty G sensor output voltage

TROUBLE SYMPTOM:
- ABS does not operate.

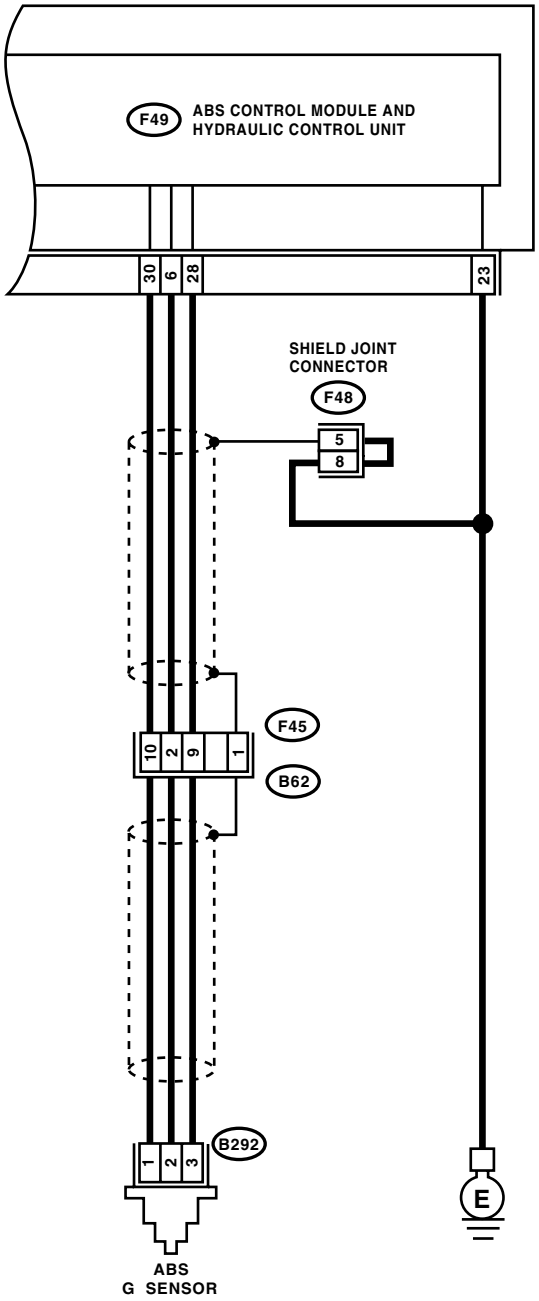
WIRING DIAGRAM:
LHD MODEL

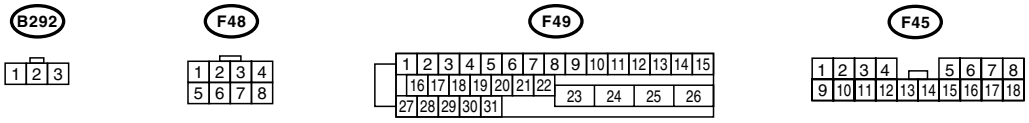




ABS00259

RHD MODEL





ABS00264

Step		Value	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?	Wheels have not been turned freely.	Go to step **2.**	The ABS is normal. Erase the DTC.

	Step	Value	Yes	No
2	**CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.** 1)Select “Current data display & Save” on the select monitor. 2)Read the select monitor display. Is the G sensor output on monitor display within specified value when the vehicle is in horizontal position?	2.1 — 2.5 V	Go to step **3.**	Go to step **8.**
3	**CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.** 1)Turn the ignition switch to OFF. 2)Remove the console box. 3)Remove the G sensor from vehicle. (Do not disconnect the connector.) 4)Turn the ignition switch to ON. 5)Select “Current data display & Save” on the select monitor. 6)Read the select monitor display. Is the measured value within specified value when G sensor is inclined forwards to 90°?	3.7 — 4.1 V	Go to step **4.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
4	**CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.** Read the select monitor display. Is the measured value within specified value when G sensor is inclined backwards to 90°?	0.5 — 0.9 V	Go to step **5.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
5	**CHECK POOR CONTACT IN CONNECTORS.** Turn the ignition switch to OFF. Is there poor contact in connector between ABSCM&H/U and G sensor?	There is no poor contact.	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?	Same DTC is not output.	Go to step **7.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
7	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.
8	**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*** ***LHD: (B301) No. 6 — No. 28:*** ***RHD: (F49) No. 6 — No. 28:*** Is the measured value within specified value?	5.0 — 5.6 kΩ	Go to step **9.**	Repair the harness/connector between G sensor and ABSCM&H/U.

	Step	Value	Yes	No
9	**CHECK G SENSOR.** 1)Remove the console box. 2)Remove the G sensor from vehicle. 3)Connect the connector to G sensor. 4)Connect the connector to ABSCM&H/U. 5)Turn the ignition switch to ON. 6)Measure the voltage between G sensor connector terminals. ***Connector & terminal (B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is in horizontal position?	2.1 — 2.5 V	Go to step **10.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
10	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal (B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined forwards to 90°?	3.7 — 4.1 V	Go to step **11.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
11	**CHECK G SENSOR.** Measure the voltage between G sensor connector terminals. ***Connector & terminal (B292) No. 2 (+) — No. 3 (–):*** Is the measured value within specified value when G sensor is inclined backwards to 90°?	0.5 — 0.9 V	Go to step **12.**	Replace the G sensor. <Ref. to ABS-22, G Sensor.>
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 current diagnosis still being output?	Same DTC is not output.	Go to step **13.**	Replace the ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
13	**CHECK ANY OTHER DIAGNOSTIC TROUBLE CODES (DTCs) APPEARANCE.** Are other DTCs being output?	Other DTC is not output.	A temporary poor contact.	Proceed with the diagnosis corresponding to DTC.

14.General Diagnostics Table

A: INSPECTION

Symptom		Probable faulty units/parts
Vehicle instability during braking	Vehicle pulls to either side.	• ABSCM&H/U (solenoid valve) • ABS 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 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 sensor • Incorrect wiring or piping connections
	Brake dragging	• ABSCM&H/U (solenoid valve) • ABS 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 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 sensor • Brake piping
	Noise from front of vehicle	• ABSCM&H/U (mount bushing) • ABS sensor • Master cylinder • Brake (caliper & piston, pads, rotor) • Brake piping • Brake booster & check valve • Suspension play or fatigue
	Noise from rear of vehicle	• ABS sensor • Brake (caliper & piston, pads, rotor) • Parking brake • Brake piping • Suspension play or fatigue