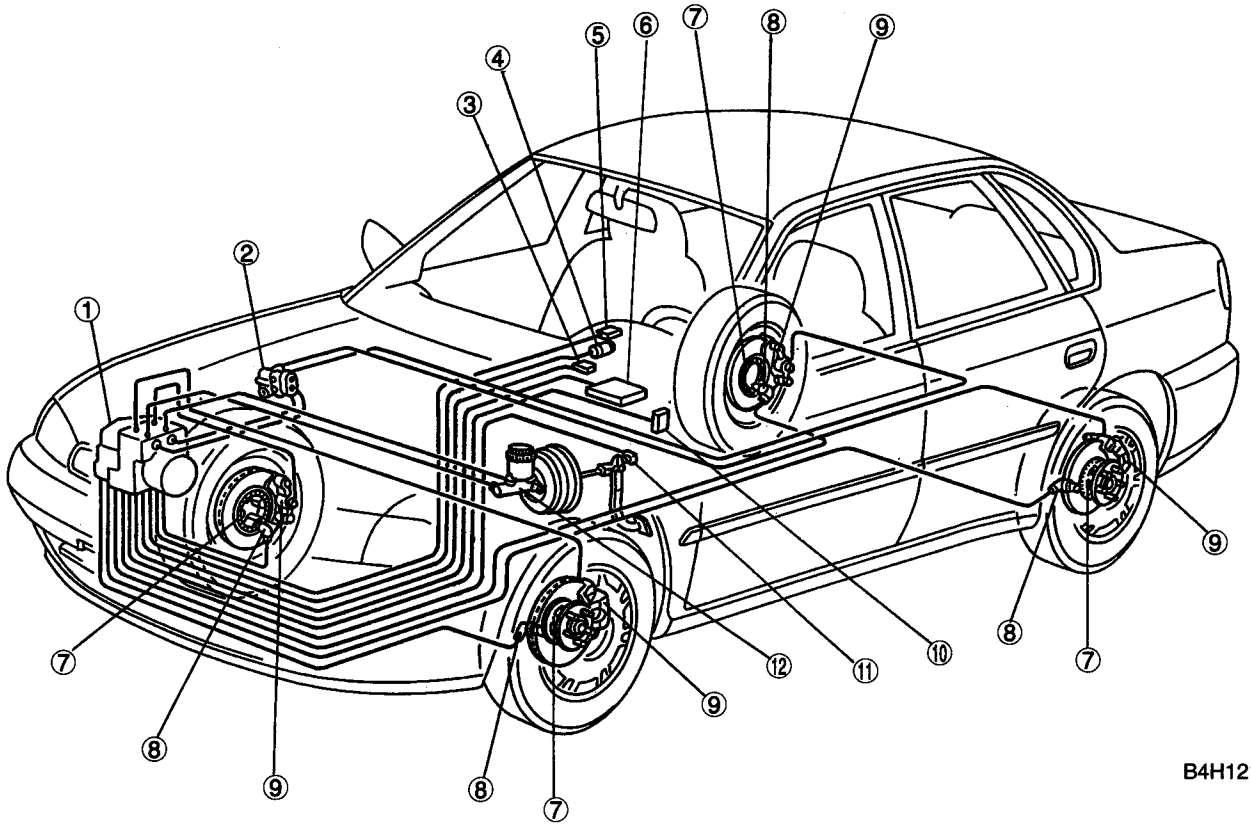
13. Anti-lock Brake System (ABS) [5.3i Type]

1. FEATURE

- This ABS 5.3i type incorporates the hydraulic control unit, ABS control module, valve relay and motor relay in one unit for better productivity and lightweight.
- The ABS (Anti-lock brake system) electrically controls brake fluid pressure to prevent wheel "lock" during braking on slippery road surfaces, thereby improving directional/steering stability as well as shortening the braking distance.
- If the ABS becomes inoperative, the fail-safe system activates to ensure it acts as a conventional brake system. The warning light also comes on to indicate that the ABS is malfunctioning.
- The front-and-rear wheels utilize a 4-sensor, 4-channel control design: the front wheels have an independent control design*1 and the rear wheels have a select low control design*2.

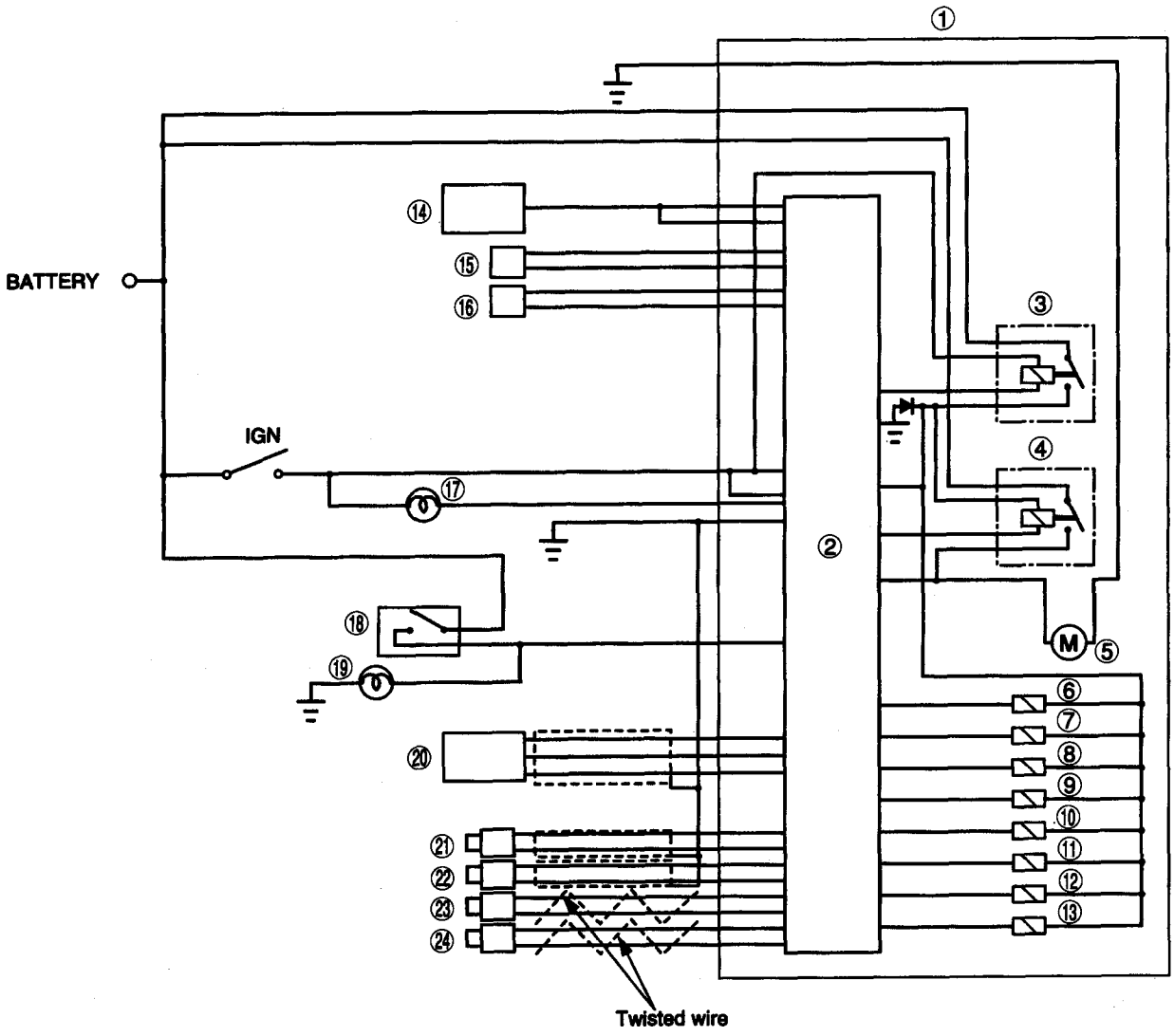
*1: A system which independently controls fluid pressure to left and right front wheels.
*2: A system which provides the same fluid pressure control for the two rear wheels if either wheel starts to "lock."



① ABS control module and hydraulic control unit (ABSCM&H/U)
② Proportioning valve
③ Diagnosis connector
④ ABS warning light
⑤ Data link connector (for SUBARU select monitor)
⑥ Transmission control module (only AT vehicle)
⑦ Tone wheel
⑧ ABS sensor
⑨ Wheel cylinder
⑩ G sensor (only AWD vehicle)
⑪ Brake switch
⑫ Master cylinder

2. FUNCTIONS OF SENSORS AND ACTUATORS

Name		Function
ABS control module and hydraulic control unit (ABSCM&H/U)	ABSCM-section	• Calculates and determine the conditions of the wheels and body from the wheel speeds and makes a proper decision suitable for the current situation to control the hydraulic unit. • In the ABS operation mode, the module outputs a cooperative control signal to the AT control module. (AT vehicles only) • Whenever the ignition switch is placed at ON, the module makes a self diagnosis. When anything wrong is detected, the module cuts off the system. • Communicates with the Subaru select monitor.
	H/U-section	In the ABS operation mode, the H/U changes fluid passages to control the fluid pressure of the wheel cylinders in response to an instruction from the ABSCM. The H/U also constitutes the brake fluid passage from the master cylinder to the wheel cylinders together with pipings.
	Valve relay-section	Serves as a power switch for the solenoid valve and motor relay coil in response to an instruction from the ABSCM.
	Motor relay-section	Serves as a power switch for the pump motor in response to an instruction from the ABSCM.
Wheel speed sensor (ABS sensor)		Detects the wheel speed in terms of a change in the magnetic flux density passing through the sensor, converts it into an electrical signal, and outputs the electrical signal to the ABSCM.
Tone wheel		Gives a change in the magnetic flux density by the teeth around the tone wheel to let the ABS sensor generate an electrical signal.
G sensor (AWD vehicle only)		Detects a change in G in the longitudinal direction of the vehicle and outputs it to the ABSCM in terms of a change in voltage.
Stop light switch		Transmits the information on whether the brake pedal is depressed or not to the ABSCM for use as a condition in determining ABS operation.
ABS warning light		Alerts the driver to an ABS fault. When the diagnosis connector and diagnosis terminal are connected, the light flashes to indicate a trouble codes in response to an instruction from the ABSCM.
AT control module (TCM) (AT vehicles only)		Provides shift controls (fixing the speed at 3rd or changing front and rear wheel transmission characteristics on 4WD vehicle) in response to an instruction from the ABSCM.



B4H1216A

① ABS control module and hydraulic control unit
② ABS control module section
③ Valve relay
④ Motor relay
⑤ Motor
⑥ Front left inlet solenoid valve
⑦ Front left outlet solenoid valve
⑧ Front right inlet solenoid valve
⑨ Front right outlet solenoid valve
⑩ Rear left inlet solenoid valve
⑪ Rear left outlet solenoid valve
⑫ Rear right inlet solenoid valve
⑬ Rear right outlet solenoid valve
⑭ Transmission control module (only AT module)
⑮ Diagnosis connector
⑯ Data link connector
⑰ ABS warning light
⑱ Stop light switch
⑲ Stop light
⑳ G sensor (only AWD model)
㉑ Front left ABS sensor
㉒ Front right ABS sensor
㉓ Rear left ABS sensor
㉔ Rear right ABS sensor

3. THEORY OF ABS CONTROL

Refer to 4-4 [M8-3].☆1

4. ABS SENSOR

Refer to 4-4 [M8-4].☆1

5. ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)

• ABS CONTROL MODULE SECTION (ABSCM)

The ABSCM is a digital control type electronic control module accommodating two microcontrol modules (MCMs); master and slave. Both MCMs process the same program and monitor the respective outputs, and when a mismatch occurs, cut off the system to activate the fail-safe function.

A maximum of 3 trouble codes are stored in the EEP ROM and if 3 or more areas fail, then only the 3 most recent failures are stored. The trouble codes remain stored until they are erased.
This ABSCM induces a sequence control pattern and facilitates the checking of the hydraulic unit.

• ABS control

Based on the four wheel speed signals, the ABSCM calculates a simulated body speed or body deceleration rate, while referencing the G sensor output as an auxiliary means, and compares them with the wheel speeds and wheel deceleration rates. If it determines that the wheels are about to lock, it controls the solenoid valve or motor pump of the H/U to adjust the brake fluid pressures that act on the wheel cylinders, thereby preventing the wheels from locking.
The ABSCM controls the right and left front wheel fluid pressures independently and controls the rear wheel fluid pressures on the basis of the wheel which is more likely to lock (Select-low control).

• Select monitor associated functions

The Subaru select monitor may be used to perform the following operations.
① To read out analog data
② To read out ON/OFF data
③ To read out or erase trouble code
④ To read out status information in the event of trouble (Freeze frame data)
⑤ To initiate ABS sequence control pattern

• Indication functions

The ABS warning light can be made to indicate the following three states.
① ABS trouble
② Flashes to indicate trouble codes in diagnosis mode.
③ Valve ON/OFF when sequence control pattern is in effect

• HYDRAULIC CONTROL UNIT SECTION (H/U)

The H/U is a fluid pressure controller comprising a motor, solenoid valve, housing, relay, etc. It constitutes two diagonally independent brake fluid circuits for a cross piping vehicle.

- The pump motor rotates an eccentric cam to let the plunger pump generate a hydraulic pressure.
- The housing accommodates the pump motor, solenoid valve, reservoir, etc., and also constitutes a brake fluid passage.
- The plunger pump is a hydraulic pump which drains off the brake fluid which, when the pressure is reduced, is discharged to the reservoir, and sends it toward the master cylinder.
- The solenoid valve is a 2-position type solenoid valve which switches the brake fluid passages between the wheel and master cylinder and reservoir sides in response to an instruction from the ABSCM.

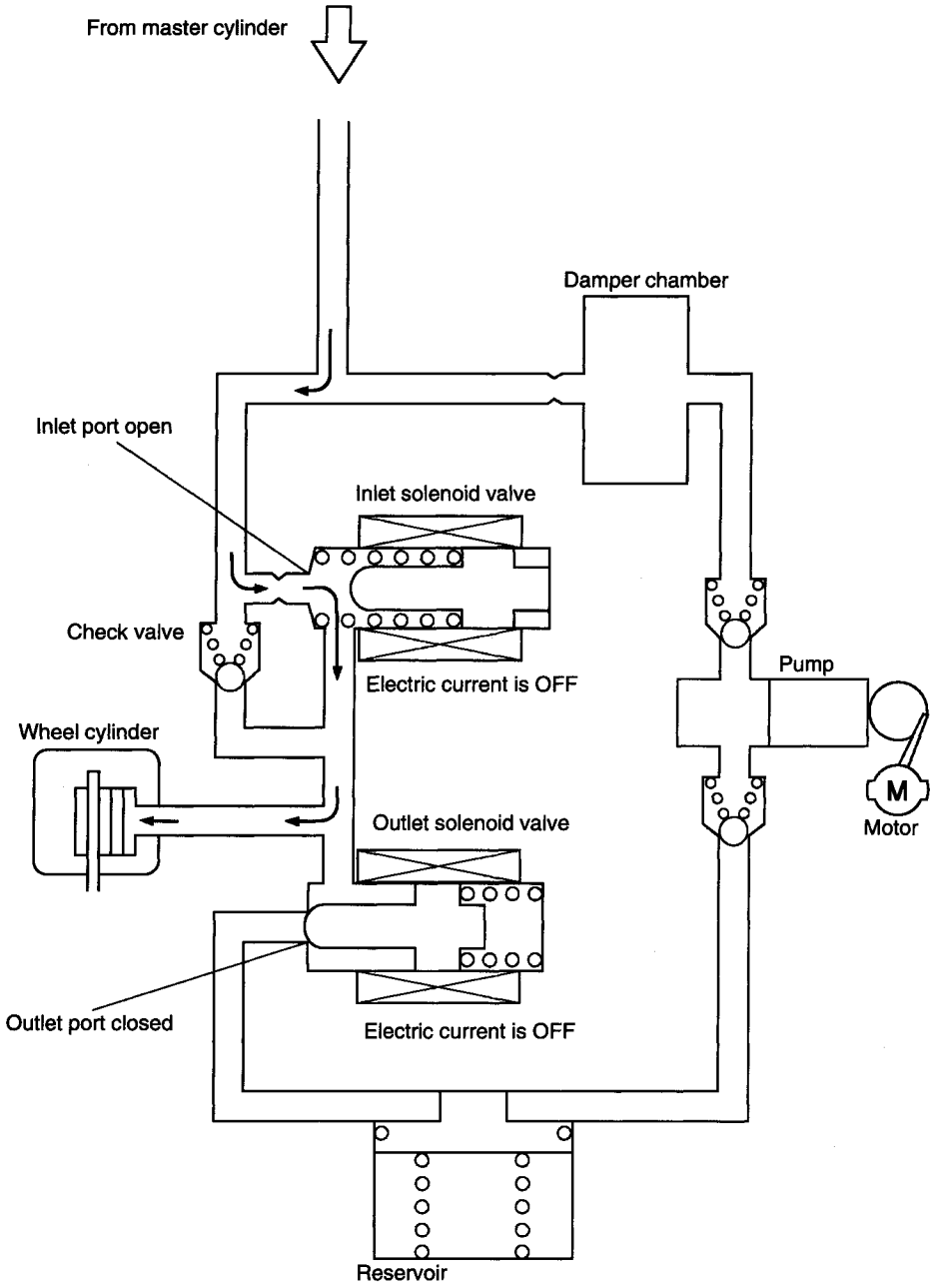
For each wheel cylinder, a pair of normally-closed and -opened solenoid valves are provided.

- The inlet solenoid valve is duty-controlled to reduce brake fluid pulsation for lower ABS operation noise.
- The reservoir is a fluid chamber which temporarily stores the brake fluid to be discharged from the wheel cylinder when the pressure is reduced.
- The damper chamber suppresses the pulsation of the brake fluid which, when the pressure is reduced, is discharged from the plunger pump, thereby minimizing the kickbacks to the brake pedal.
- The valve relay controls the solenoid valve and motor relay energizing power supply in response to an instruction from the ABSCM. In normal (IG ON) condition, the relay is actuated to supply power to the solenoid valve and motor relay. When an error occurs in the system, the valve relay is forced to OFF to keep the fluid pressure circuit in the normal mode (normal brake mode) and also constitute the ABS warning light operating circuit.
- The motor relay supplies power to the pump motor to operate the plunger pump in response to an instruction from the ABSCM in the ABS control mode.

The H/U has four operating modes; normal mode (control OFF: normal brake mode), "increase", "hold" and "decrease" modes (control ON in all the three modes).

1) During normal braking (Explained with one wheel's control as an example)

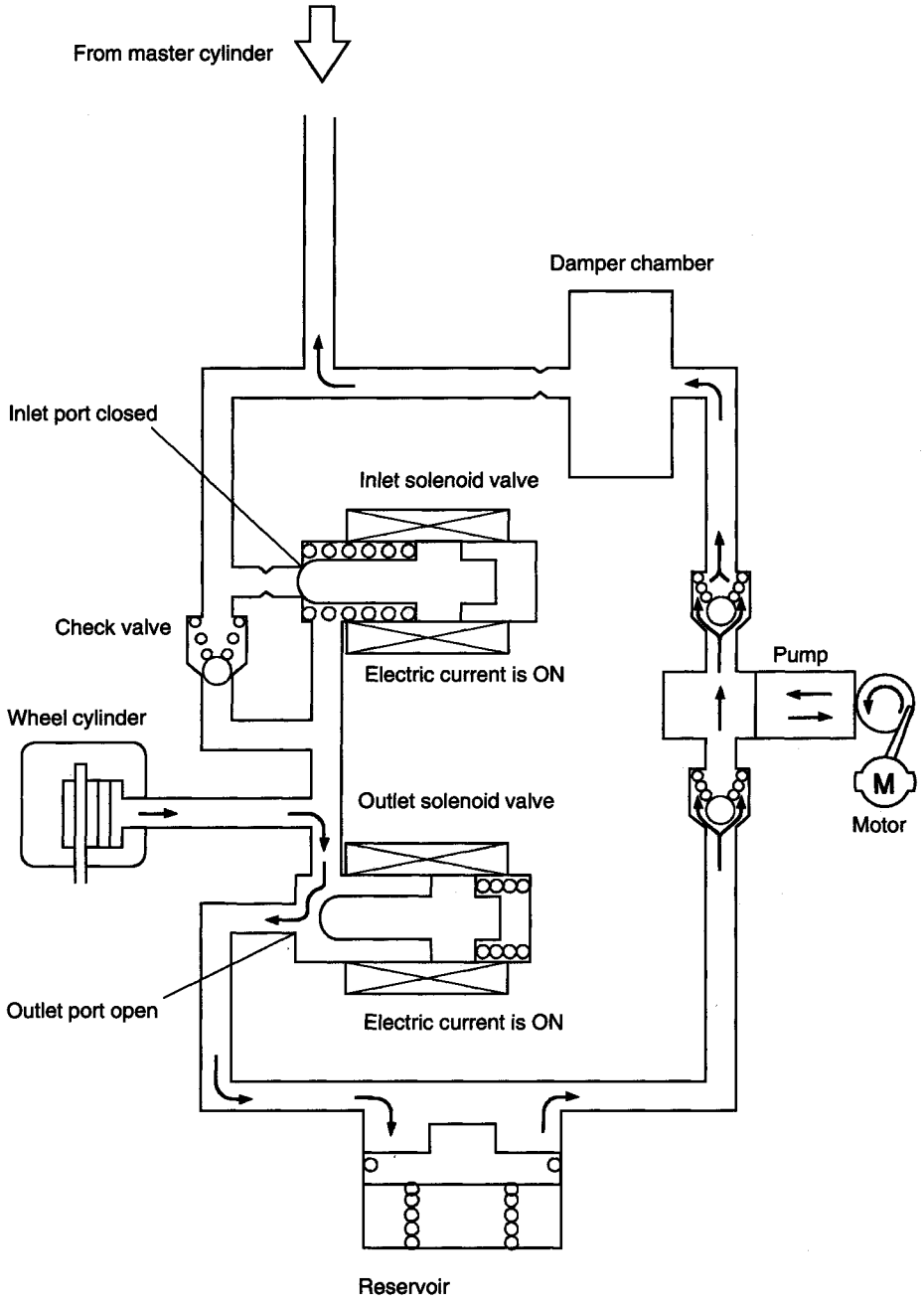
Since no current is supplied to the inlet and outlet solenoid valves, no solenoid valve attracting force is generated. So the valves remain stationary.
Accordingly, the inlet port of the inlet solenoid valve is in an opened state, whereas the outlet port of the outlet solenoid valve is in a closed state. So the fluid pressure of the master cylinder is transmitted to the wheel cylinder to produce a brake force in the wheel cylinder.



B4H0989

2) Pressure "decrease" action with ABS in operation (Explained with one wheel's control as an example)

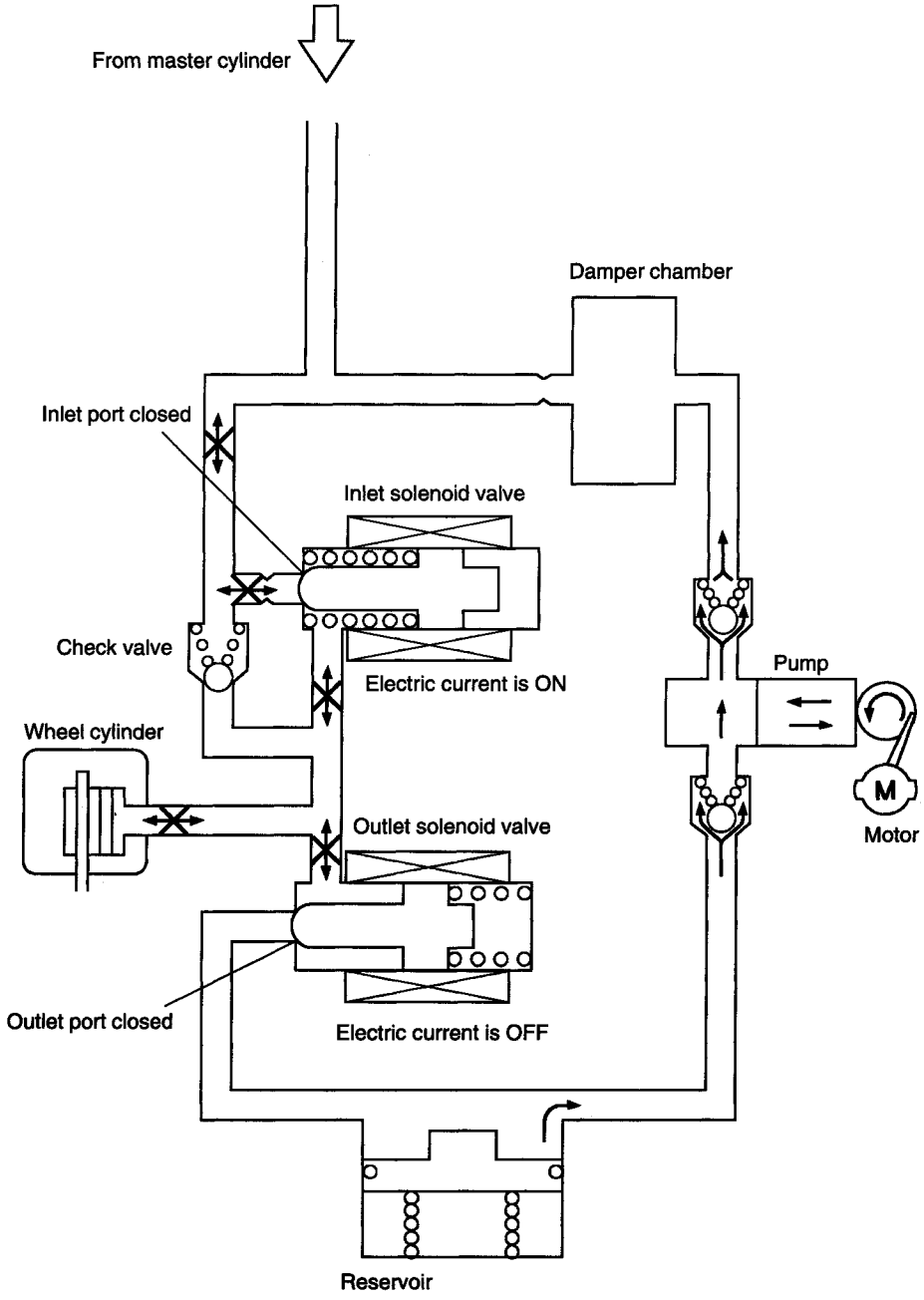
Current is supplied to the inlet and outlet solenoid valves, and the generated solenoid valve attracting forces close the inlet port and open the outlet port.
Accordingly, the wheel cylinder is isolated from the master cylinder and becomes clear to the reservoir, allowing the brake fluid to flow to the reservoir. So the fluid pressure of the wheel cylinder is decreased.
The brake fluid collected in the reservoir is fed to the master cylinder by the pump.



B4H0990

3) Pressure "hold" action with ABS in operation (Explained with one wheel's control as an example)

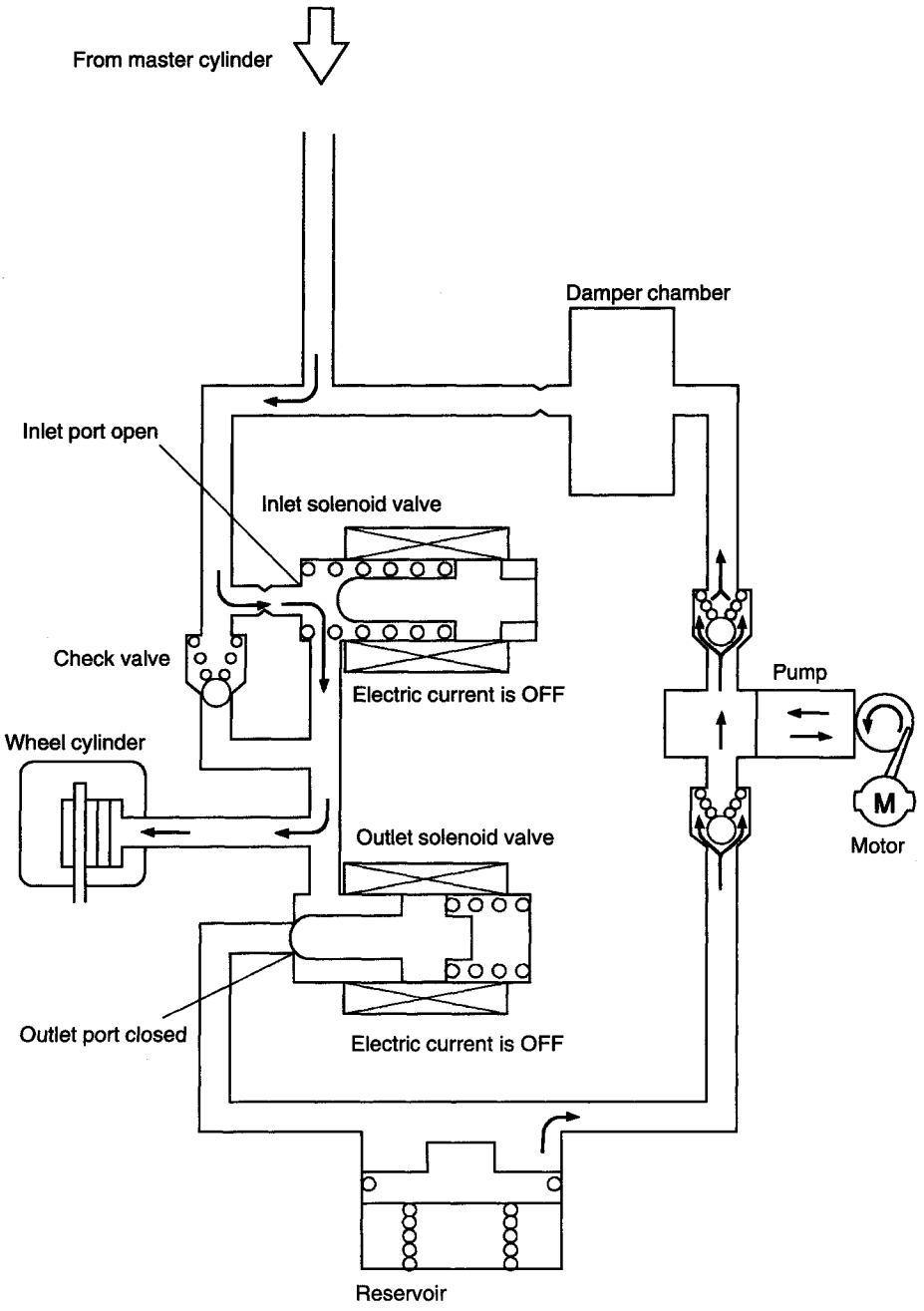
Current is supplied to the inlet solenoid valve, and the generated solenoid valve attracting force closes the inlet port.
Since no current is supplied to the outlet solenoid valve, the output port remains in a closed state. As a result, the wheel cylinder, master cylinder and reservoir are blocked, and the fluid pressure of the wheel cylinder is maintained constant.
During ABS operation, the pump motor continues to operate.



B4H0991

4) Pressure "increase" action with ABS in operation (Explained with one wheel's control as an example)

Since no current is supplied to the inlet and outlet solenoid valves, no solenoid valve attracting force is generated. So the valves remain stationary.
Accordingly, the inlet port of the inlet solenoid valve is in an opened state, whereas the outlet port of the outlet solenoid valve is in a closed state. So the fluid pressure of the master cylinder is transmitted to the wheel cylinder to increase the brake force in the wheel cylinder.
During ABS operation, the pump motor continues to operate.



B4H0992

6. ABS CONTROL CYCLE CURVES

Refer to 4-4 [M8-6].☆1

7. ABS WARNING LIGHT

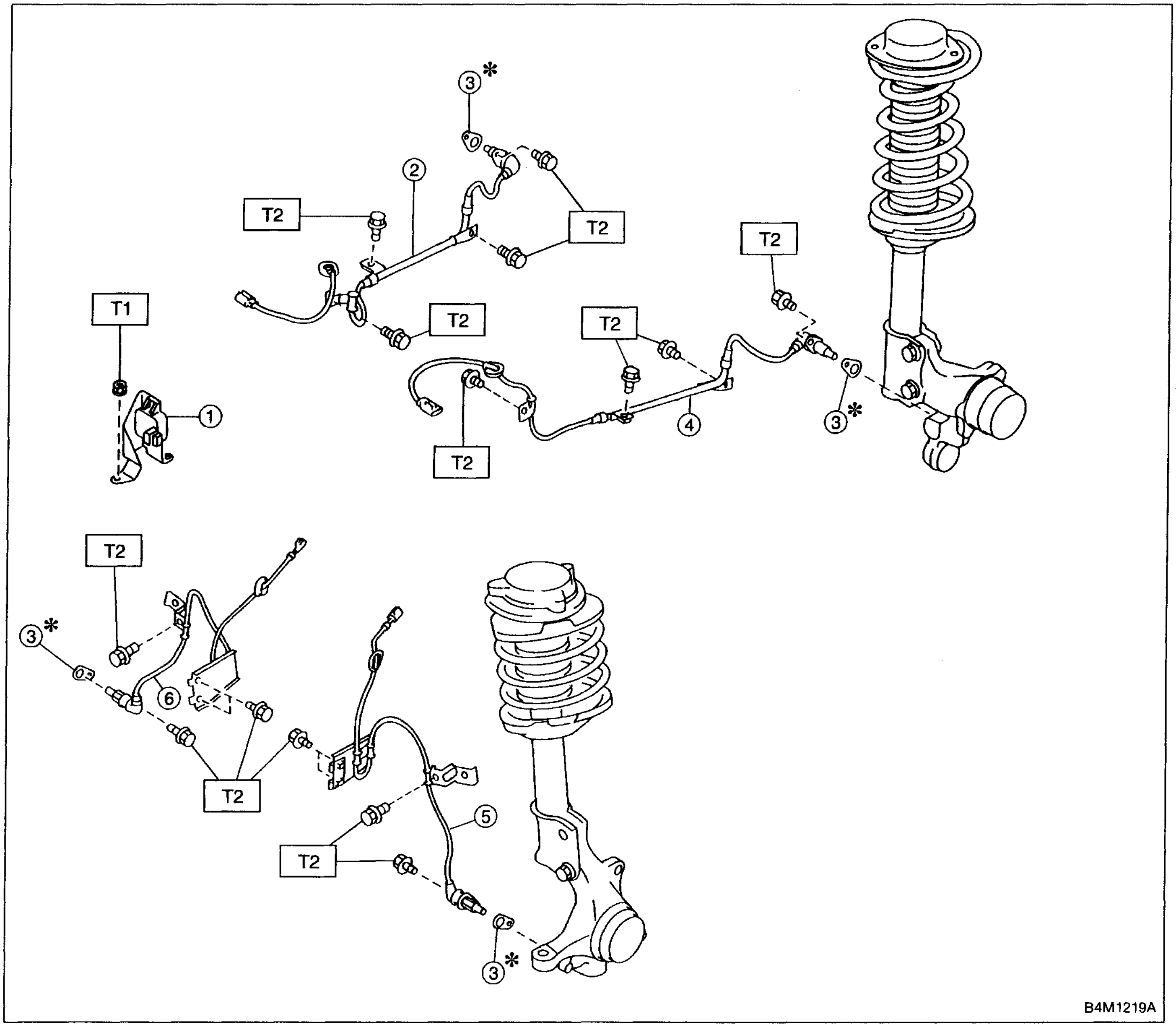
Refer to 4-4 [M8-7].☆1

8. G SENSOR

Refer to 4-4 [M12-8].☆5

10. ABS System (ABS 5.3i Type)

1. SENSOR



① G sensor (AWD only)
② Rear ABS sensor RH
③ ABS spacer
④ Rear ABS sensor LH
⑤ Front ABS sensor LH
⑥ Front ABS sensor RH

Tightening torque: N·m (kg-m, ft-lb)
T1: 7.4±2.0 (0.75±0.2, 5.4±1.4)
T2: 32±10 (3.3±1.0, 24±7)

Page

PRECAUTION FOR SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

The Supplemental Restraint System "Airbag" helps to reduce the risk or severity of injury to the driver in a frontal collision.

The Supplemental Restraint System consists of an airbag module (located in the center of the steering wheel), sensors, a control module, warning light, wiring harness and roll connector.

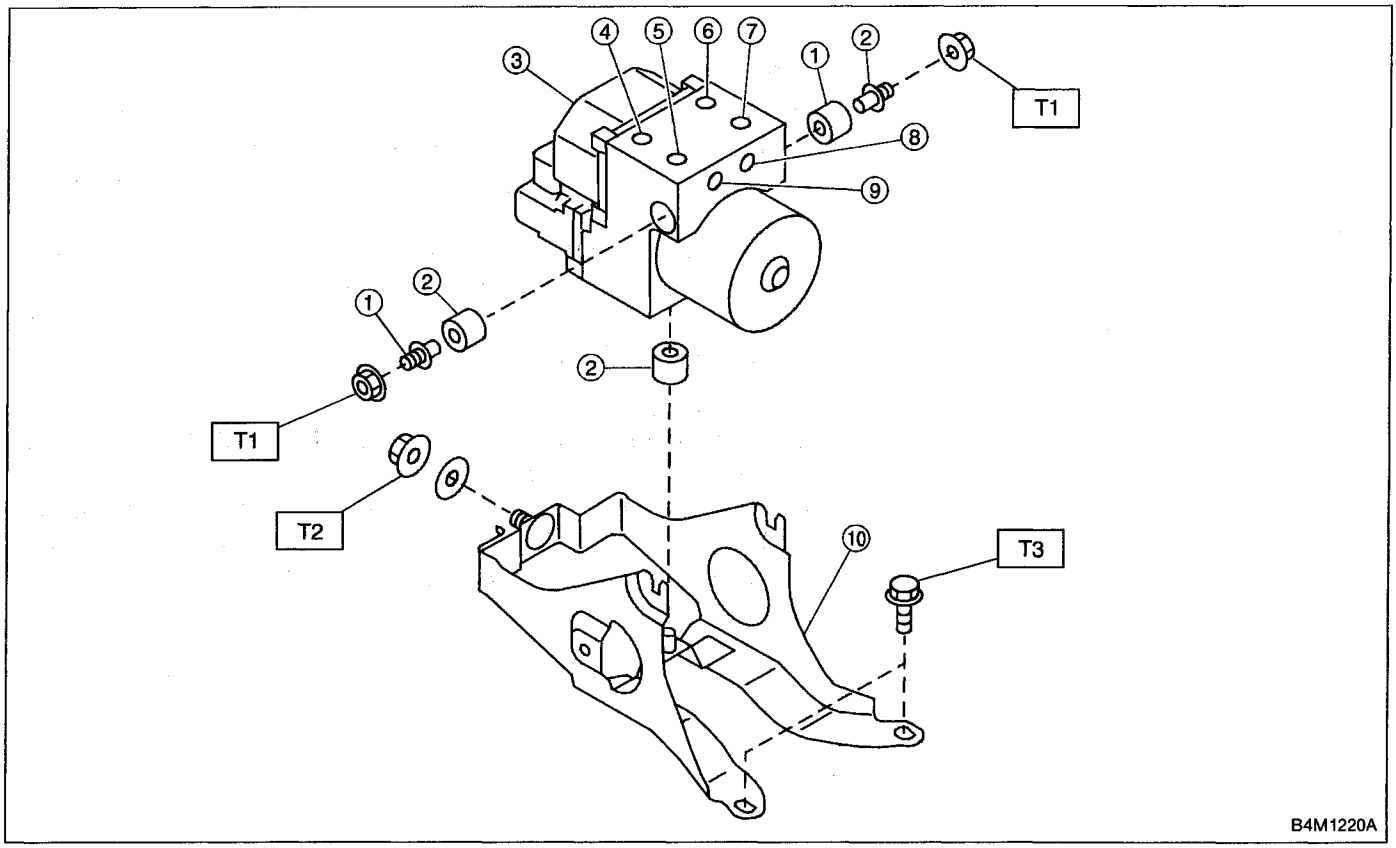
Information necessary to service the safety is included in the "5-5. SUPPLEMENTAL RESTRAINT SYSTEM" of this Service Manual.

WARNING:

- **To avoid rendering the Airbag system inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized SUBARU dealer.**
- **Improper maintenance, including incorrect removal and installation of the Airbag system, can lead to personal injury caused by unintentional activation of the Airbag system.**
- **All Airbag system electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the Supplemental Restraint System "Airbag".**

TABLE OF CONTENTS

2. ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U)



① Stud bolt
② Damper
③ ABS control module and hydraulic control unit
④ Front-LH outlet
⑤ Secondary inlet
⑥ Front-RH outlet
⑦ Primary inlet
⑧ Rear-LH outlet
⑨ Rear-RH outlet
⑩ Bracket

Tightening torque: N·m (kg-m, ft-lb)
T1: 18 ± 5 (1.8 ± 0.5, 13.0 ± 3.6)
T2: 29 ± 7 (3.0 ± 0.7, 21.7 ± 5.1)
T3: 32 ± 10 (3.3 ± 1.0, 24 ± 7)

18. Brake Hose and Pipe AIRBAG

SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

Airbag system wiring harness is routed near the center brake pipe.

CAUTION:

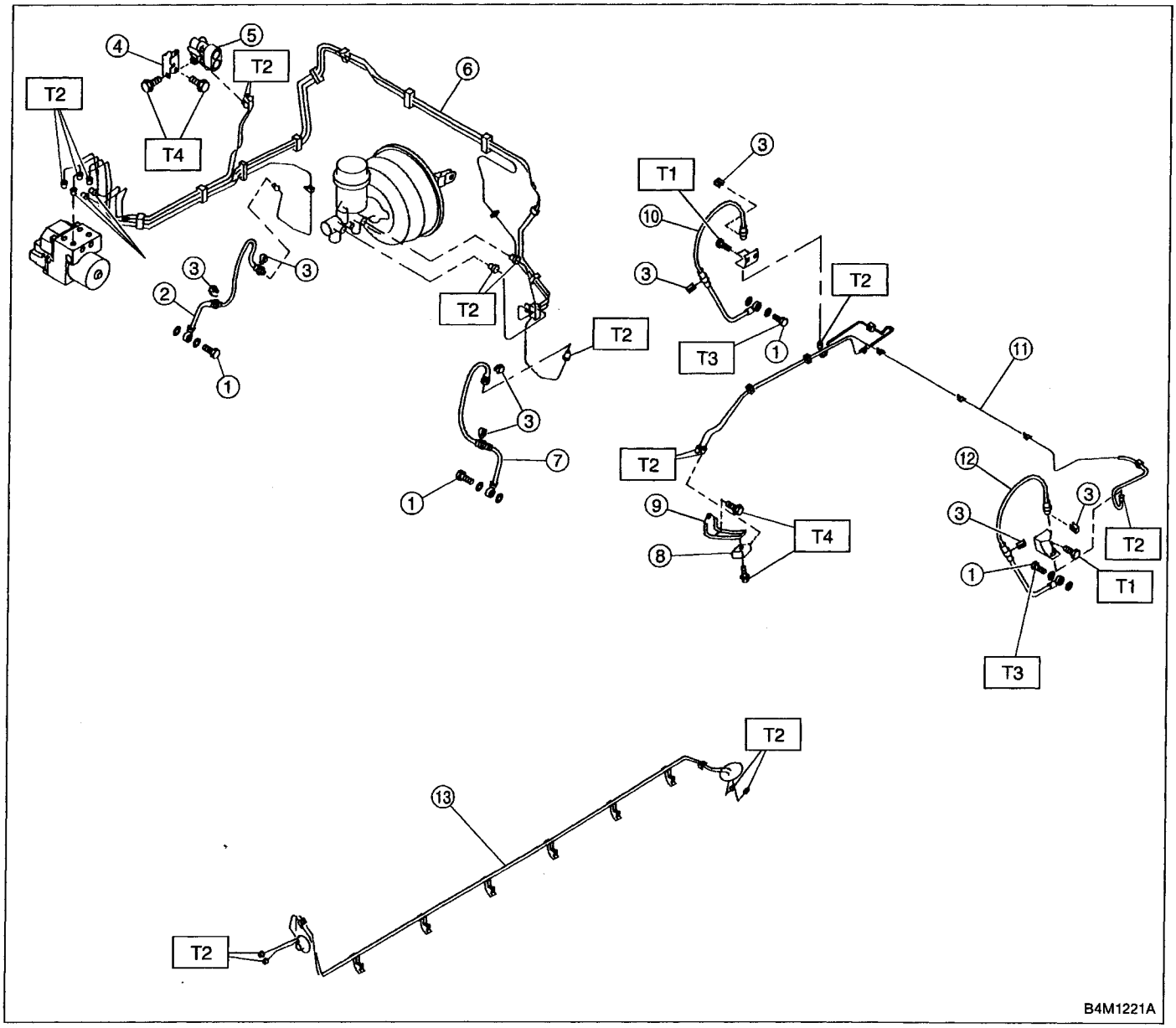
- **All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.**
- **Be careful not to damage Airbag system wiring harness when servicing the center brake pipe.**

A: REMOVAL AND INSTALLATION

CAUTION:

- **When removing and installing the brake pipe, make sure that it is not bent.**
- **After installing the brake pipe and hose, bleed the air.**
- **After installing the brake hose, make sure that it does not touch the tire or suspension assembly, etc.**

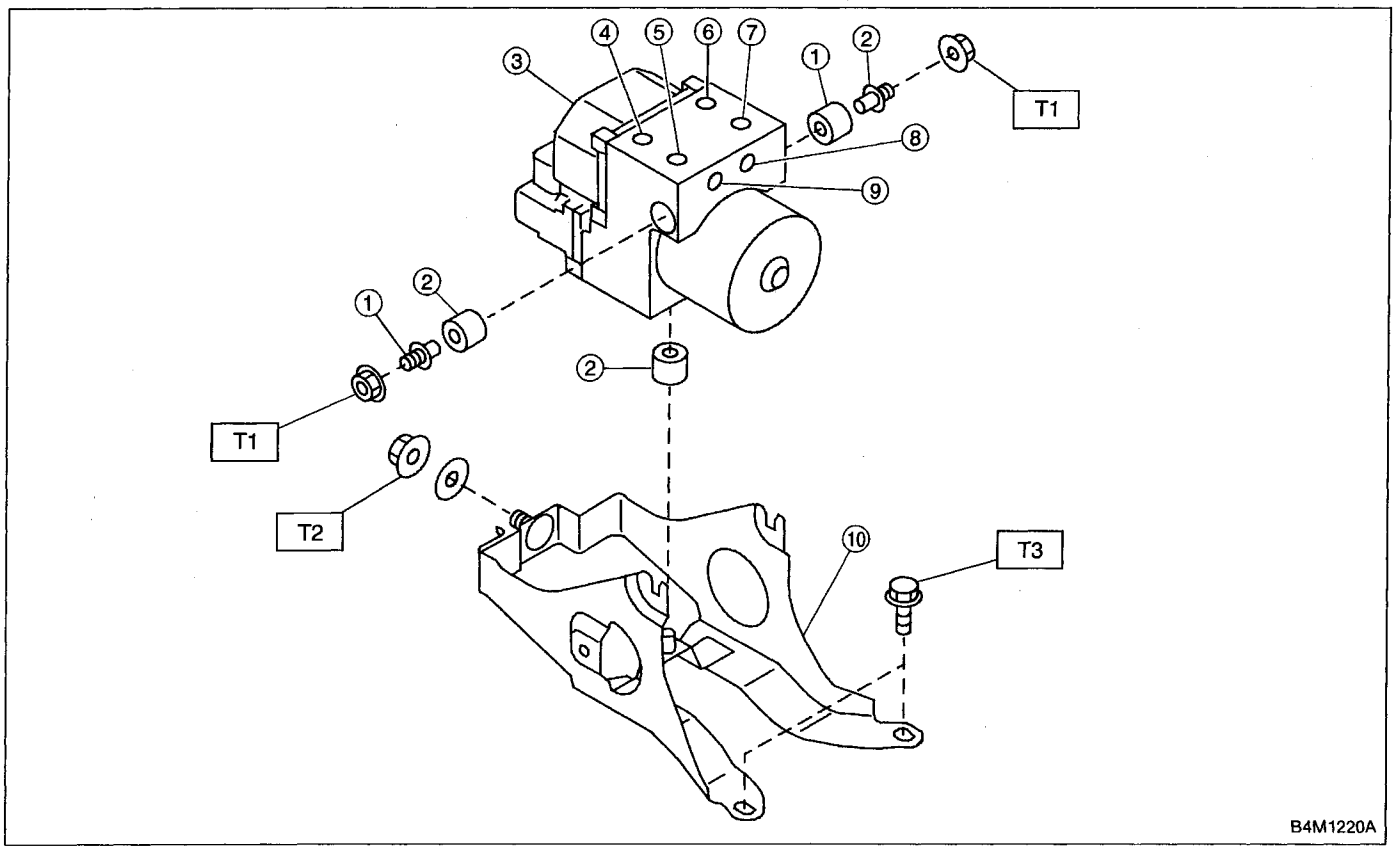
5. MODELS WITH ABS (ABS 5.3i TYPE)



① Union bolt
② Front brake hose RH
③ Clip
④ Valve bracket
⑤ Proportioning valve
⑥ Front brake pipe ASSY
⑦ Front brake hose LH
⑧ Two-way connector
⑨ Connector bracket
⑩ Rear brake hose RH
⑪ Rear brake pipe ASSY
⑫ Rear brake hose LH
⑬ Center brake pipe ASSY

Tightening torque: N·m (kg-m, ft-lb)
T1: 13 ± 3 (1.3 ± 0.3, 9.4 ± 2.2)
T2: 15^{+3}_{-2} ($1.5^{+0.3}_{-0.2}$, $10.8^{+2.2}_{-1.4}$)
T3: 18 ± 3 (1.8 ± 0.3, 13.0 ± 2.2)
T4: 18 ± 5 (1.8 ± 0.5, 13.0 ± 3.6)

25. ABS Control Module and Hydraulic Control Unit (ABSCM&H/U) [ABS 5.3i Type]



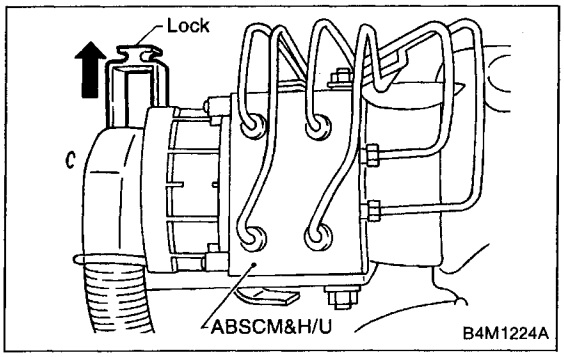
① Stud bolt
② Damper
③ ABS control module and hydraulic control unit
④ Front-LH outlet
⑤ Secondary inlet
⑥ Front-RH outlet
⑦ Primary inlet
⑧ Rear-LH outlet
⑨ Rear-RH outlet
⑩ Bracket

Tightening torque: N·m (kg-m, ft-lb)
T1: 18 ± 5 (1.8 ± 0.5, 13.0 ± 3.6)
T2: 29 ± 7 (3.0 ± 0.7, 21.7 ± 5.1)
T3: 32 ± 10 (3.3 ± 1.0, 24 ± 7)

A: REMOVAL

1) Disconnect ground cable from battery.
2) Remove air intake duct from engine compartment to facilitate removal of ABSCM&H/U.
3) Use an air-gun to get rid of water around the ABSCM&H/U.

CAUTION:
The contact will be insufficient if the terminal gets wet.

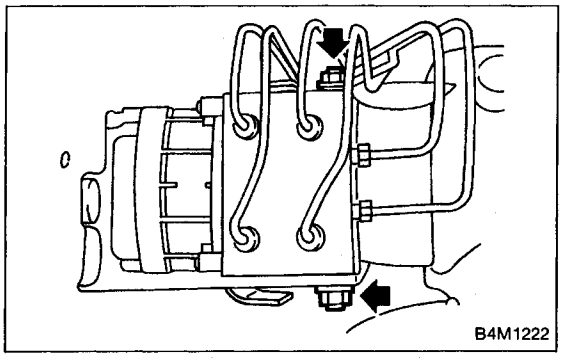


4) Pull on the lock of the ABSCM&H/U connector to remove it.
5) Disconnect connector from ABSCM&H/U.

CAUTION:
Be careful not to let water or other foreign matter contact the ABSCM&H/U terminal.

6) Unlock cable clip.
7) Disconnect brake pipes from ABSCM&H/U.

CAUTION:
Wrap brake pipes with vinyl bag to avoid spilling brake fluid on vehicle body.

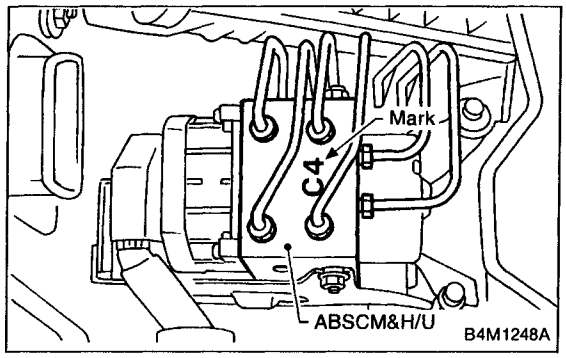


8) Remove ABSCM&H/U from engine compartment.

CAUTION:
- **ABSCM&H/U cannot be disassembled. Do not attempt to loosen bolts and nuts.**
- **Do not drop or bump ABSCM&H/U.**
- **Do not turn the ABSCM&H/U upside down or place it on its side.**
- **Be careful to prevent foreign particles from getting into ABSCM&H/U.**
- **Apply a coat of rust-preventive wax (Nippeco LT or GB) to bracket attaching bolt after tightening.**
- **Do not pull harness disconnecting harness connector.**

B: INSPECTION

1) Check connected and fixed condition of connector.



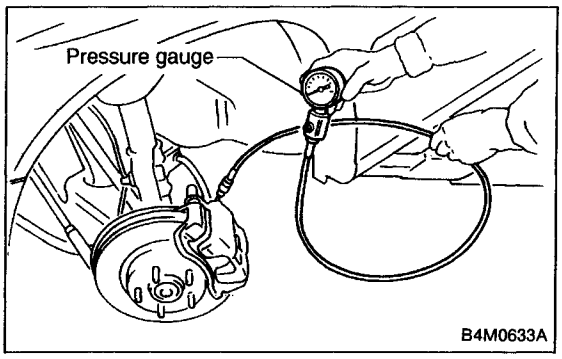
2) Check specifications of the mark with ABSCM&H/U.

Mark	Model
C3	AWD AT
C4	AWD MT

C: CHECKING THE HYDRAULIC UNIT ABS OPERATION

1. CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE

1) Lift-up vehicle and remove wheels.
2) Disconnect the air bleeder screws from the FL and FR caliper bodies.



3) Connect two pressure gauges to the FL and FR caliper bodies.

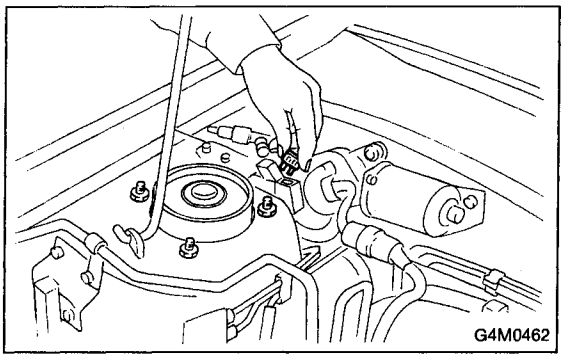
CAUTION:
- **Pressure gauges used exclusively for brake fluid must be used.**
- **Do not employ pressure gauge previously used for transmission since the piston seal is expanded which may lead to malfunction of the brake.**

NOTE:
Wrap sealing tape around the pressure gauge.

4) Bleed air from the pressure gauges.
5) Perform ABS sequence control.
<Ref. to [W25D0].☆10>
6) When the hydraulic unit begins to work, and first the FL side performs decompression, holding, and compression, and then the FR side performs decompression, holding, and compression.
7) Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets the standard values. Also check if any irregular brake pedal tightness is felt.

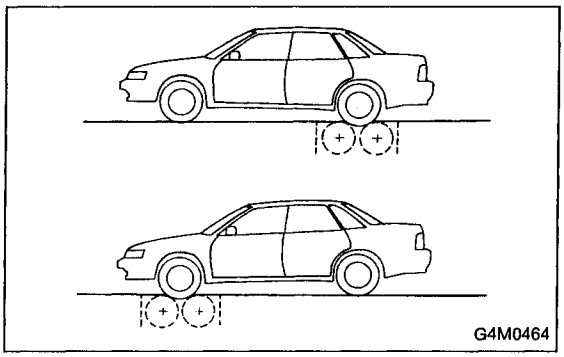
	Initial value	When decompressed	When compressed
Front wheel	3,432 kPa (35 kg/cm^2, 498 psi)	490 kPa (5 kg/cm^2, 71 psi) or less	3,432 kPa (35 kg/cm^2, 498 psi) or more
Rear wheel	3,432 kPa (35 kg/cm^2, 498 psi)	490 kPa (5 kg/cm^2, 71 psi) or less	3,432 kPa (35 kg/cm^2, 498 psi) or more

8) Remove pressure gauges from FL and FR caliper bodies.
9) Remove air bleeder screws from the RL and RR caliper bodies.
10) Connect the air bleeder screws to the FL and FR caliper bodies.
11) Connect two pressure gauges to the RL and RR caliper bodies.
12) Bleed air from the pressure gauges and the FL and FR caliper bodies.
13) Perform ABS sequence control.
<Ref. to [W25D0].☆10>
14) When the hydraulic unit begins to work, at first the RR side performs decompression, holding, and compression, and then the RL side performs decompression, holding, and compression.
15) Read values indicated on the pressure gauges and check if they meet the standard value.
16) After checking, remove the pressure gauges from caliper bodies.
17) Connect the air bleeder screws to RL and RR caliper bodies.
18) Bleed air from brake line.



2. CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH BRAKE TESTER

1) In the case of AWD AT vehicles, install a spare fuse with the FWD connector in the engine compartment to simulate FWD vehicles.
2) Prepare for operating ABS sequence control. <Ref. to [W25D1]☆10 or [W25D2].☆10>



3) Set the front wheels or rear wheels on the brake tester and set the select lever's position at "neutral".
4) Operate the brake tester.
5) Perform ABS sequence control. <Ref. to [W25D1]☆10 step 1 or [W25D2]☆10 step 1.>
6) Hydraulic unit begins to work; and check the following working sequence.
   (1) The FL wheel performs decompression, holding, and compression in sequence, and subsequently the FR wheel repeats the cycle.
   (2) The RR wheel performs decompression, holding, and compression in sequence, and subsequently the RL wheel repeats the cycle.
7) Read values indicated on the brake tester and check if the fluctuation of values, when decompressed and compressed, meet the standard values.

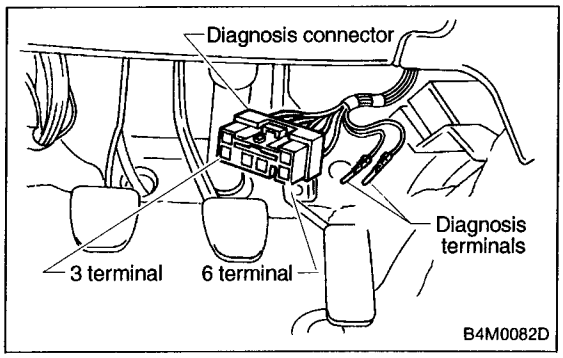
Unit: N (kg, lb)

	Initial value	When decompressed	When compressed
Front wheel	981 (100, 221)	490 (50, 110) or less	981 (100, 221) or more
Rear wheel	981 (100, 221)	490 (50, 110) or less	981 (100, 221) or more

8) After checking, also check if any irregular brake pedal tightness is felt.

D: ABS SEQUENCE CONTROL

1) Under the ABS sequence control, after the hydraulic unit solenoid valve is driven, the operation of the hydraulic unit can be checked by means of the brake tester or pressure gauge.
2) ABS sequence control can be started by diagnosis connector or select monitor.



1. OPERATIONAL GUIDELINES OF THE ABS SEQUENCE CONTROL WITH DIAGNOSIS CONNECTOR

1) Connect diagnosis terminals to terminals No. 3 and No. 6 of the diagnosis connector beside driver's seat heater unit.
2) Set the speed of all wheels at 4 km/h (2 MPH) or less.
3) Turn ignition switch OFF.
4) Within 0.5 seconds after the ABS warning light goes out, depress the brake pedal and hold it immediately after ignition switch is turned to ON.

CAUTION:
Do not depress the clutch pedal.

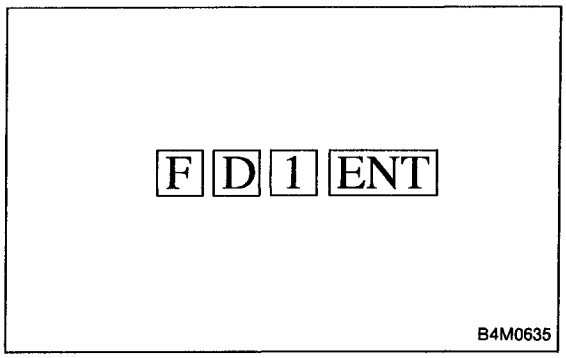
NOTE:
- When the ignition switch is set to on, the brake pedal must not be depressed.
- Engine must not operate.

5) After completion of ABS sequence control, turn ignition switch OFF.

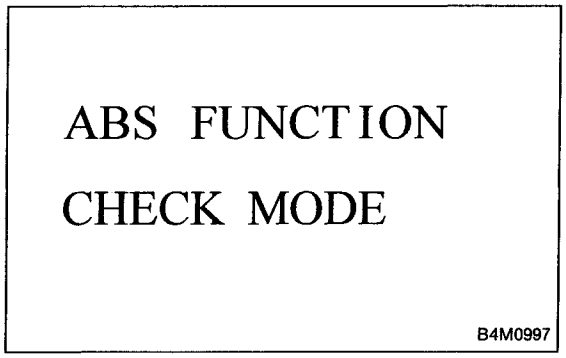
2. OPERATIONAL GUIDELINES OF THE ABS SEQUENCE CONTROL WITH SELECT MONITOR

NOTE:
In the event of any trouble, the sequence control may not be operative. In such a case, activate the sequence control, referring to "OPERATIONAL GUIDELINES OF THE ABS SEQUENCE CONTROL WITH DIAGNOSIS CONNECTOR ". <Ref. to 4-4 [W25D1].☆10>

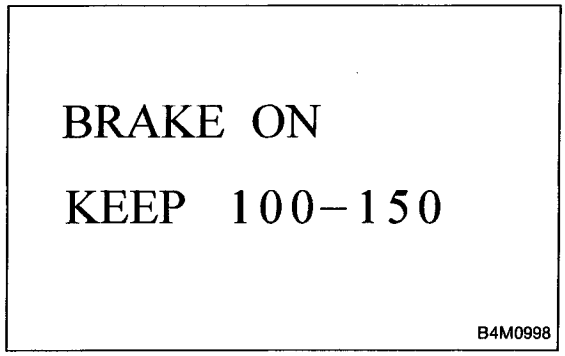
1) Connect select monitor to data link connector beside driver's seat heater unit.
2) Turn ignition switch ON.
3) Put select monitor to ABS mode.



4) Press F D 1 ENT key.



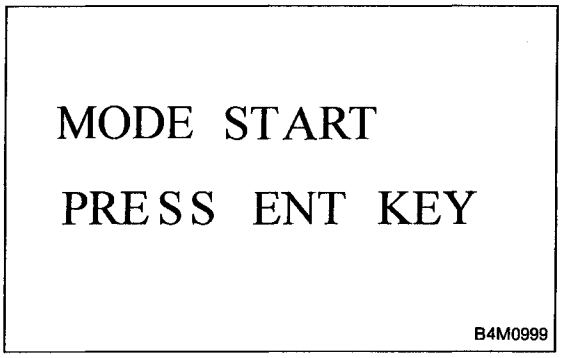
5) The message shown in the figure is displayed.



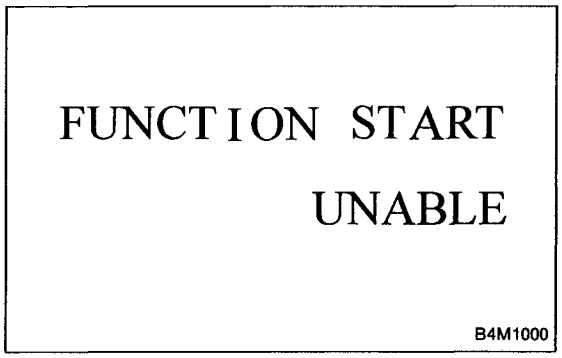
6) The message shown in the figure is displayed as follows:

(1) When using the brake tester, depress brake pedal with braking force of 981 N (100 kg, 221 lb).
(2) When using the pressure gauge, depress brake pedal so as to make the pressure gauge indicate 3,432 kPa (35 kg/cm^2, 498 psi).

CAUTION:
Do not depress the clutch pedal.

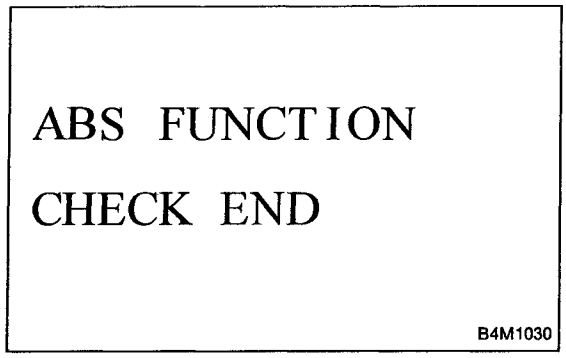


7) When the message shown in the figure is displayed, press ENT key.
8) Check points will be displayed on select monitor.

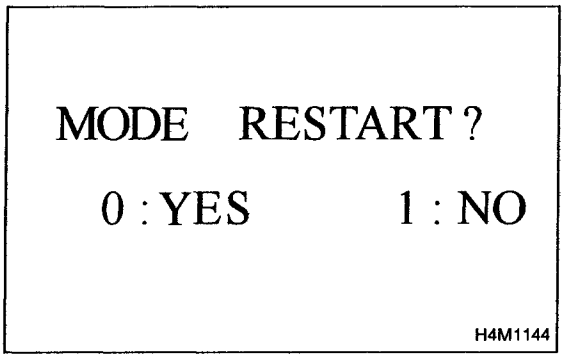


9) When ABS sequence control cannot be started (by system malfunction, etc.), the message shown in the figure will be displayed.

NOTE:
Read the trouble codes. Repair faulty parts.



10) After completion of ABS sequence control.



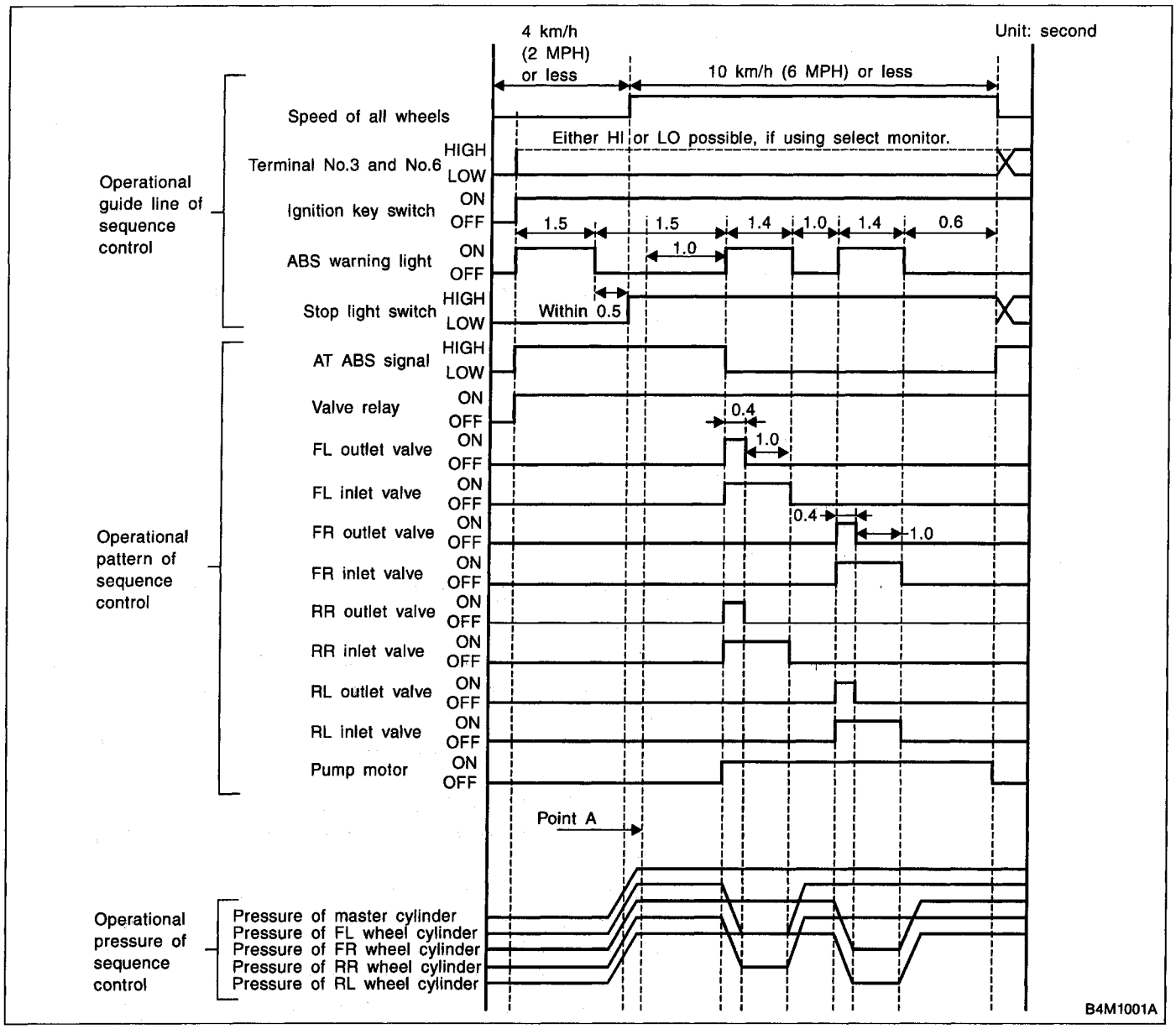
11) Press 0 key to start ABS sequence control again and press 1 key to end.

3. CONDITIONS FOR COMPLETION OF ABS SEQUENCE CONTROL

When the following conditions develop, the ABS sequence control stops and ABS operation is returned to the normal control mode.

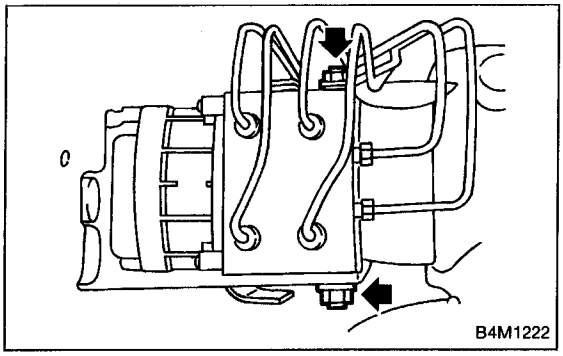
1) When the speed of at least one wheel reaches 10 km/h (6 MPH).
2) When terminal No. 3 or No. 6 are separated from diagnosis terminals. (When select monitor is not used.)
3) When the brake pedal is released during sequence control and the braking lamp switch is set to off.
4) When brake pedal is depressed after ignition key is turned to ON, and before ABS warning light goes out. (When select monitor is not used.)
5) When brake pedal is not depressed after ignition key is turned to ON, and within 0.5 seconds after ABS warning light goes out. (When select monitor is not used.)
6) After completion of the sequence control.
7) When malfunction is detected. (When select monitor is used.)

4. CONDITIONS FOR ABS SEQUENCE CONTROL



NOTE:

- When select monitor is used, control operation starts at point A. The patterns from IGN key ON to the point A show that operation is started by diagnosis connector.
- HIGH means high voltage.
- LOW means low voltage.



E: INSTALLATION

1) Install ABSCM&H/U.

CAUTION:
Confirm that the specifications of the ABSCM&H/U conforms to the vehicle specifications.

Tightening torque:
18 ± 5 N·m (1.8 ± 0.5 kg-m, 13.0 ± 3.6 ft-lb)

2) Connect brake pipes to their correct ABSCM&H/U connections. <Ref. to [W18A4].☆10>

3) Using cable clip, secure ABSCM&H/U harness to bracket.

4) Connect connector to ABSCM&H/U.

CAUTION:
- **Be sure to remove all foreign matter from inside the connector before connecting.**
- **Ensure that the ABSCM&H/U connetor is securely locked.**

5) Install air intake duct.
6) Connect ground cable to battery.
7) Bleed air from the brake system.

26. ABS Sensor (ABS 5.3i Type)

<Ref. to 4-4 [W1400].☆1>

27. G Sensor (ABS 5.3i Type)

<Ref. to 4-4 [W2400].☆5>

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 Airbag system wiring harness when servicing the ABS sensor, ABS control module and hydraulic control unit.**

2. Pre-inspection

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

A: MECHANICAL INSPECTION

1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more
Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. BRAKE FLUID

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

3. BRAKE DRAG

Check brake drag. <Ref. to 4-4 [K100].☆1>

4. BRAKE PAD AND ROTOR

Check brake pad and rotor. <Ref. to 4-4 [K100].☆1>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A1], [S1A2].☆1>

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 Airbag system wiring harness when servicing the ABS sensor, ABS control module and hydraulic control unit.**

2. Pre-inspection

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

A: MECHANICAL INSPECTION

1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more
Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. BRAKE FLUID

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

3. BRAKE DRAG

Check brake drag. <Ref. to 4-4 [K100].☆1>

4. BRAKE PAD AND ROTOR

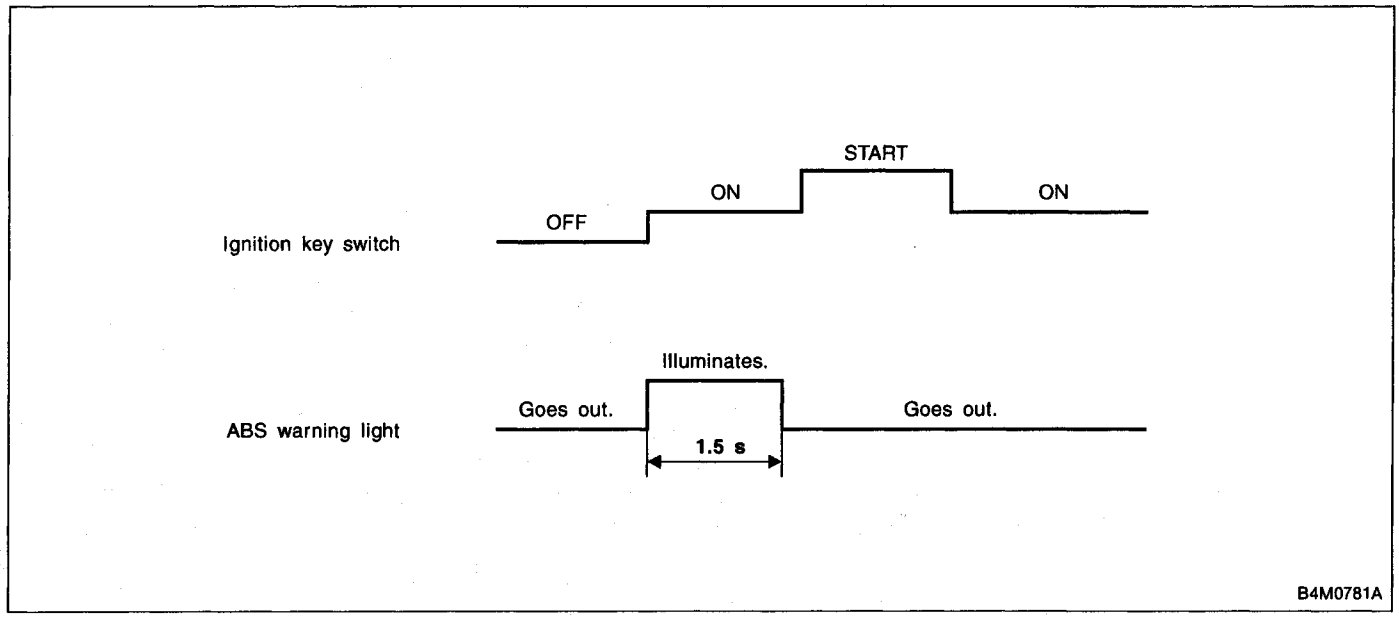
Check brake pad and rotor. <Ref. to 4-4 [K100].☆1>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A1], [S1A2].☆1>

B: ELECTRICAL INSPECTION

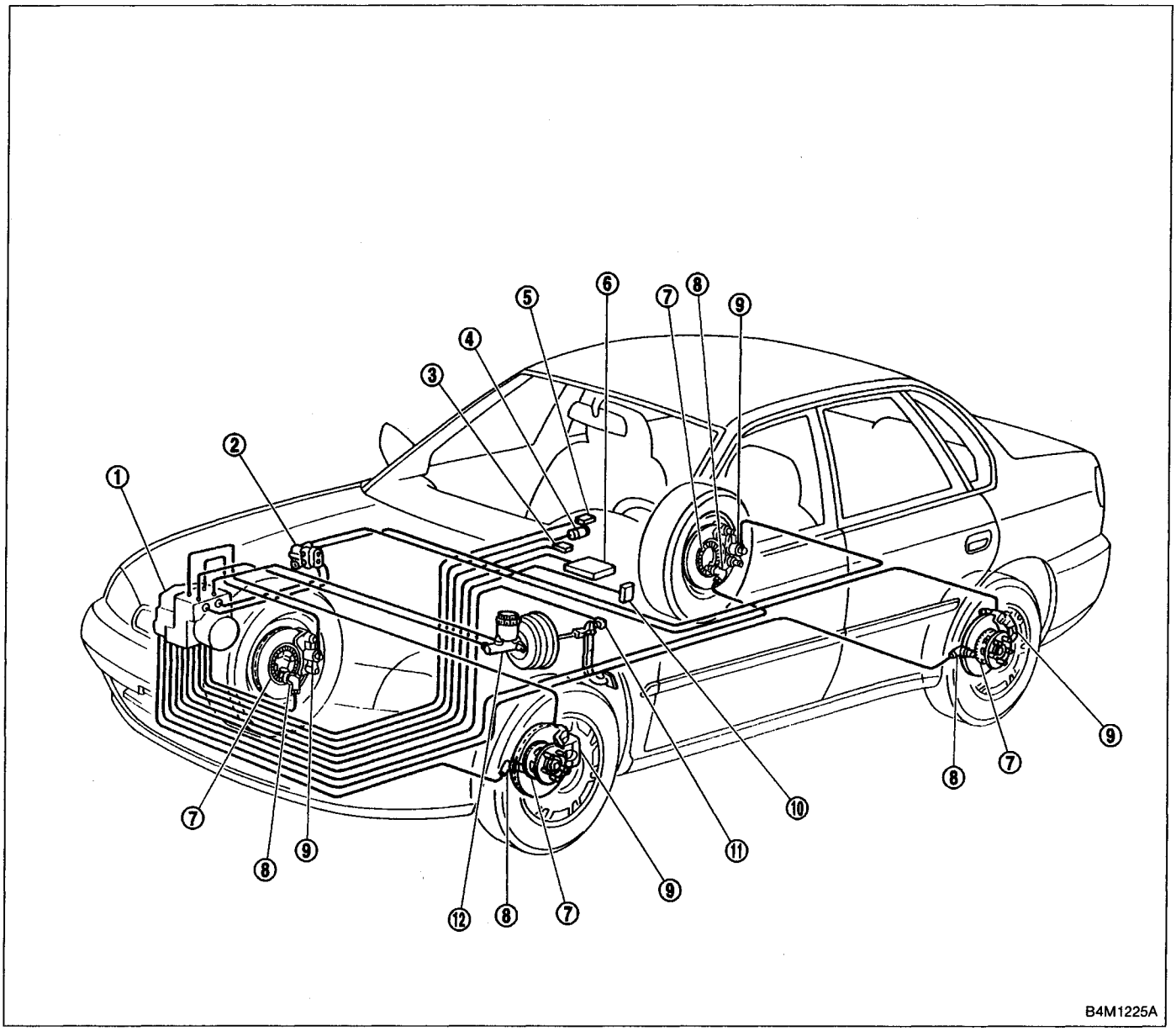
1. WARNING LIGHT ILLUMINATION PATTERN



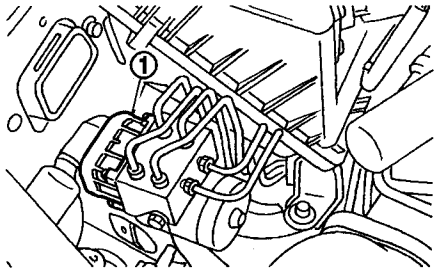
1) When the ABS warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
2) When the ABS warning light remains constantly OFF, repair the ABS warning light circuit or diagnosis circuit. <Ref. to 4-4d [T7A0].☆10>

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 approximately 12 km/h (7 MPH). However, the Anti-lock brakes do not work while the ABS warning light is illuminated.

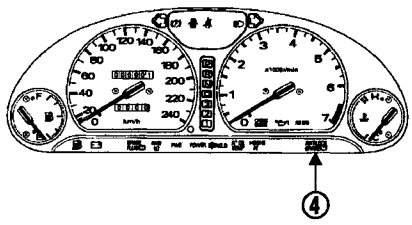
3. Electrical Components Location



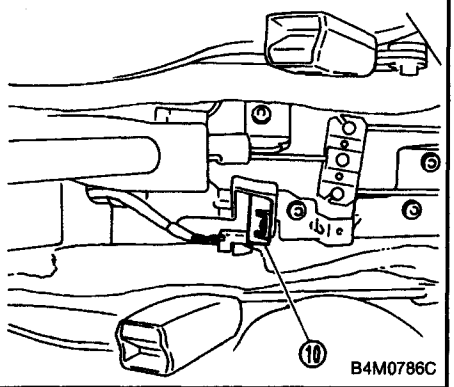
① ABS control module and hydraulic control unit (ABSCM&H/U)
② Proportioning valve
③ Diagnosis connector
④ ABS warning light
⑤ Data link connector (for Subaru select monitor)
⑥ Transmission control module (only AT vehicle)
⑦ Tone wheel
⑧ ABS sensor
⑨ Wheel cylinder
⑩ G sensor (only AWD vehicle)
⑪ Brake switch
⑫ Master cylinder



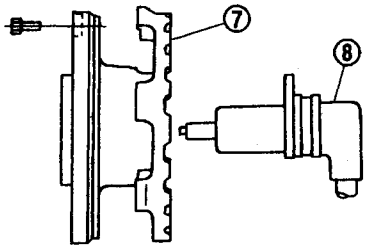
B4M1226A



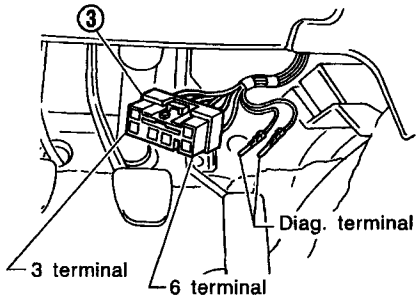
B4M0230D



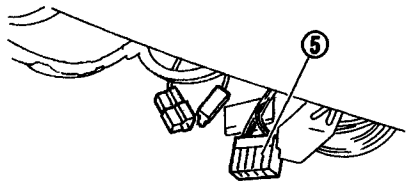
B4M0786C



B4M0646D

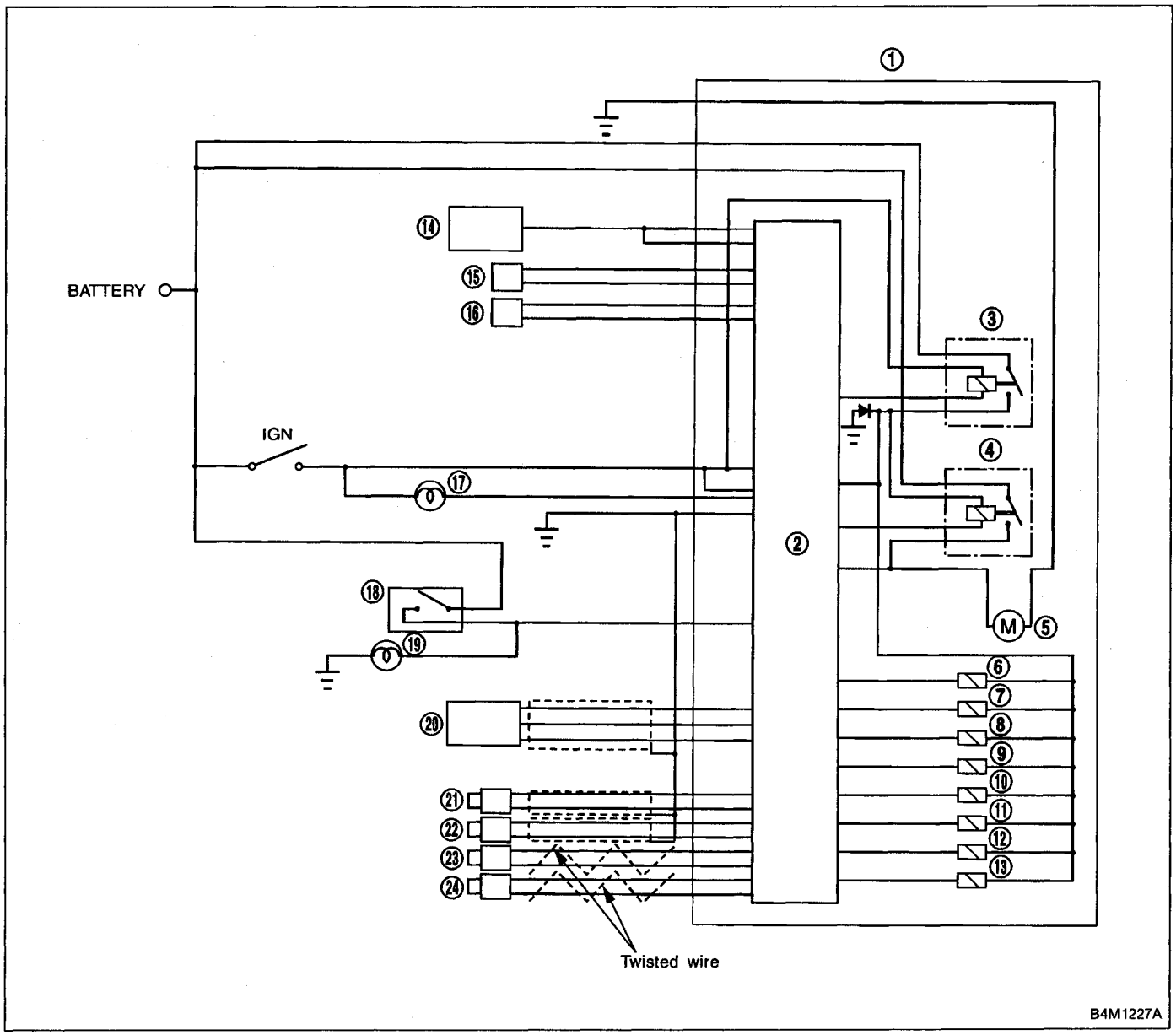


B4M0231D



B4M0645D

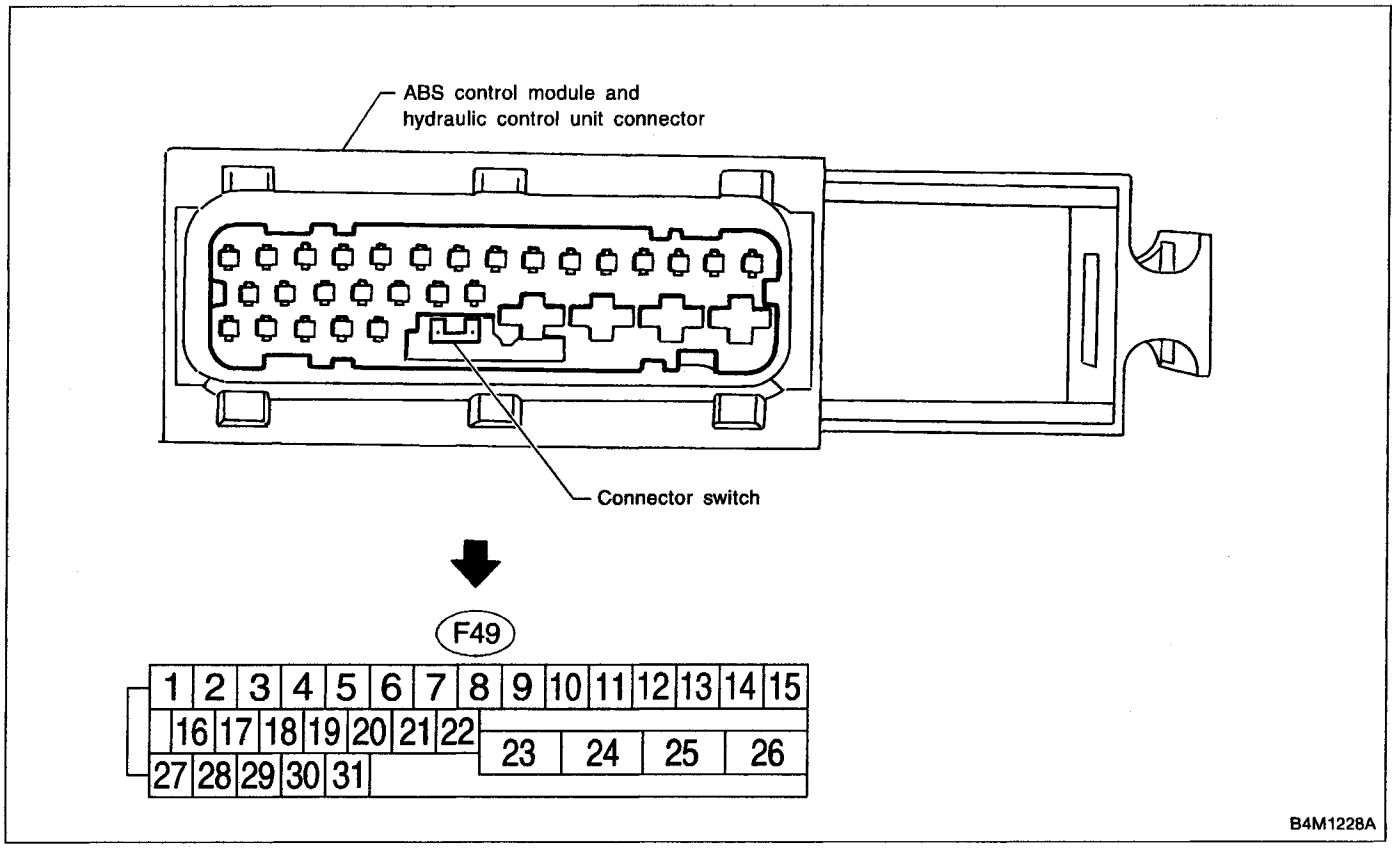
4. Schematic



① ABS control module and hydraulic control unit (ABSCM&H/U)
② ABS control module area
③ Valve relay
④ Motor relay
⑤ Motor
⑥ Front left inlet solenoid valve
⑦ Front left outlet solenoid valve
⑧ Front right inlet solenoid valve
⑨ Front right outlet solenoid valve
⑩ Rear left inlet solenoid valve
⑪ Rear left outlet solenoid valve
⑫ Rear right inlet solenoid valve
⑬ Rear right outlet solenoid valve
⑭ Transmission control module (only AT model)
⑮ Diagnosis connector
⑯ Data link connector
⑰ ABS warning light
⑱ Stop light switch
⑲ Stop light
⑳ G sensor (only AWD model)
㉑ Front left ABS sensor
㉒ Front right ABS sensor
㉓ Rear left ABS sensor
㉔ Rear right ABS sensor

5. Control Module I/O Signal

1. I/O SIGNAL VOLTAGE



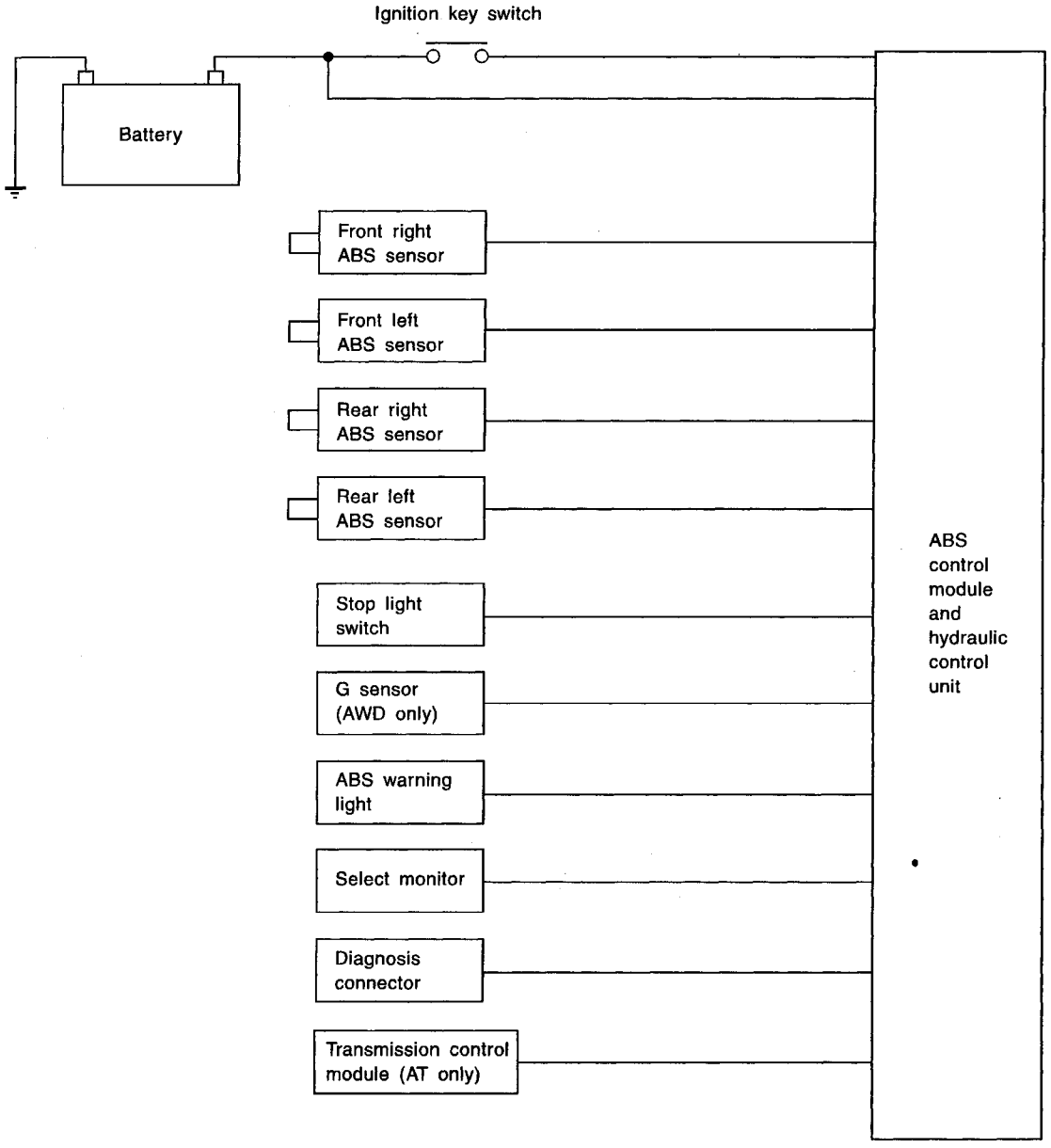
NOTE:

- The terminal numbers in the ABS control module and hydraulic control unit connector are as shown in the figure.
- When the connector is removed from the ABSCM&H/U, the connector switch closes the circuit between terminal No. 21 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		24—23	10 — 15 V when ignition switch is ON.
Motor relay power supply		25—23	10 — 15 V when ignition switch is ON.
G sensor*2 (AWD model only)	power supply	30—28	4.75 — 5.25 V
	ground	28	—
	output	6—28	2.3 ± 0.2 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		21—23	Less than 1.5 V during 1.5 seconds when ignition switch is ON, and 10 — 15 V after 1.5 seconds.
AT ABS signal*2 (AT model only)		31—23	Less than 1.5 V when the ABS control does not operate still and more than 5.5 V when ABS operates.
ABS operation signal monitor*2		3—23	Less than 1.5 V when the ABS control does not operate still and more than 5.5 V when ABS operates.
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*2	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 (F2) or (F1).

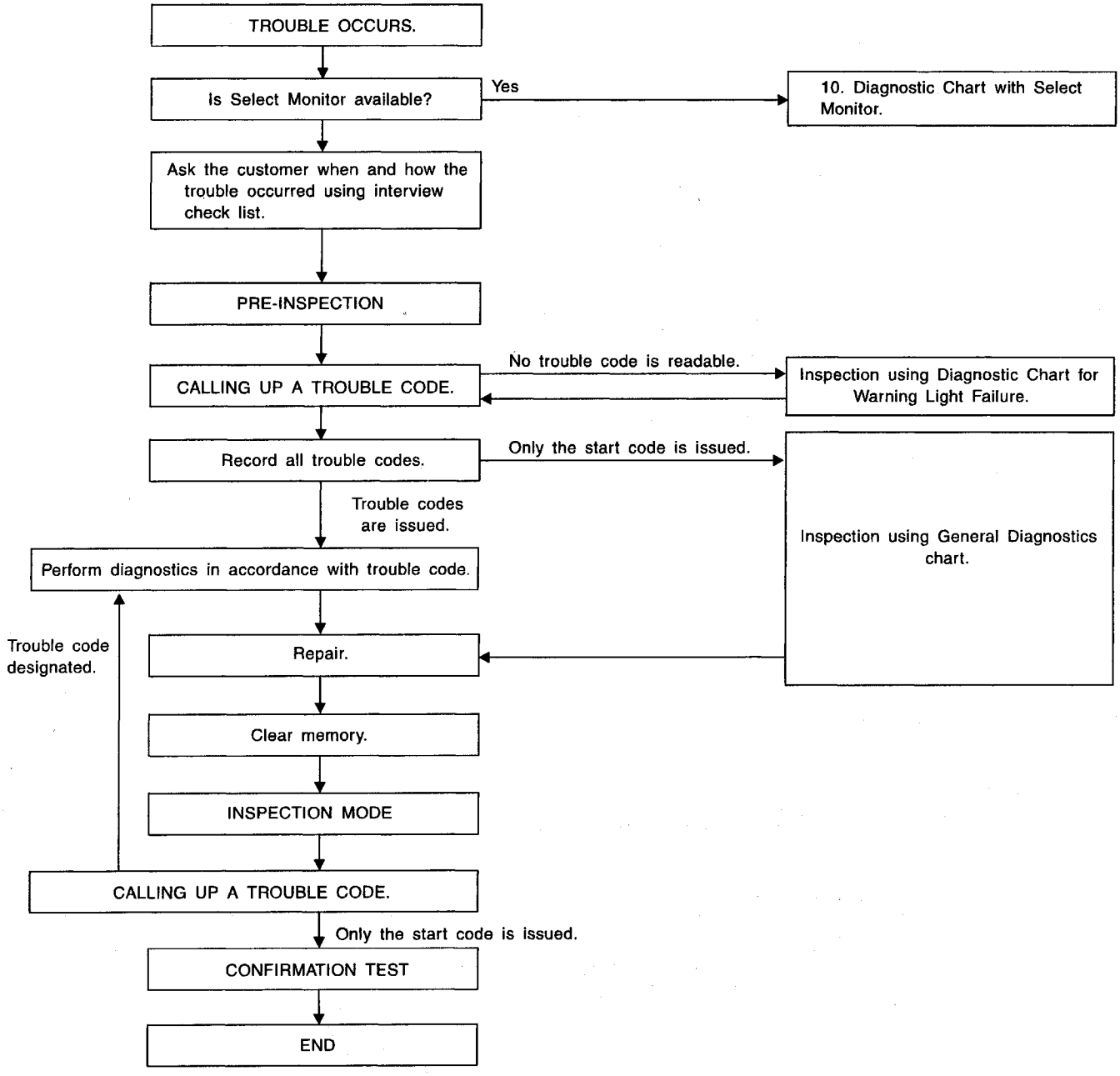
2. I/O SIGNAL DIAGRAM



B4M1229A

6. Diagnostics Chart for On-board Diagnosis System

A: BASIC DIAGNOSTICS PROCEDURE



B4M1051A

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

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

B: CHECK LIST FOR INTERVIEW

Check the following items about the vehicle's state.

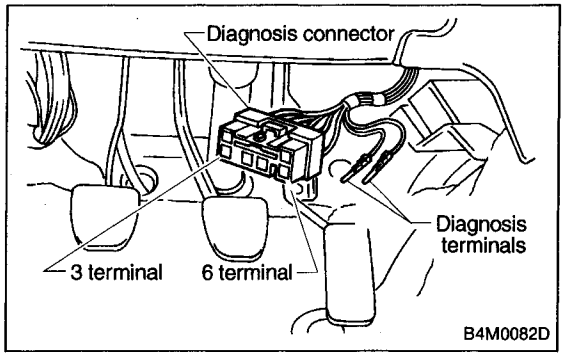
1. THE STATE OF THE ABS WARNING LIGHT			
ABS warning light comes on.	☐ Always ☐ Sometimes ☐ Only once ☐ Does not come on • When /how long does it come on?:		
Ignition key position	☐ LOCK ☐ ACC ☐ ON (before starting engine) ☐ START ☐ On after starting (Engine is running) ☐ On after starting (Engine is 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. 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 :	

Behavior of vehicle	a) Directional stability cannot be obtained or steering arm 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 arm refuses to work when accelerating : ☐ Yes / ☐No	
	• When :	☐ Vehicle turns to right ☐ Vehicle turns to left ☐ Spins ☐ Others :
	c) Brakes are 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 :	
3. 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 :		

C: INSPECTION MODE

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 one minute.



D: TROUBLE CODES

When on-board diagnosis of the ABS control module detects a problem, the information (up to a maximum of three) will be stored in the EEP ROM as a trouble code. When there are more than three, the most recent three will be stored. (Stored codes will stay in memory until they are cleared.)

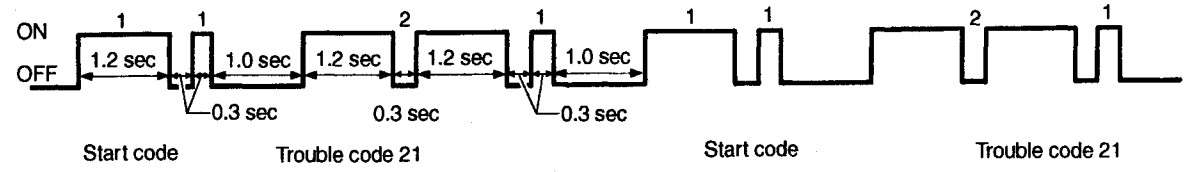
1. CALLING UP A TROUBLE CODE

1) Take out diagnosis connector from side of driver's seat heater unit.
2) Turn ignition switch OFF.
3) Connect diagnosis connector terminal 6 to diagnosis terminal.
4) Turn ignition switch ON.
5) ABS warning light is set in the diagnostic mode and blinks to identify trouble code.
6) After the start code (11) is shown, the trouble codes will be shown in order of the last information first.
These repeat for a maximum of 5 minutes.

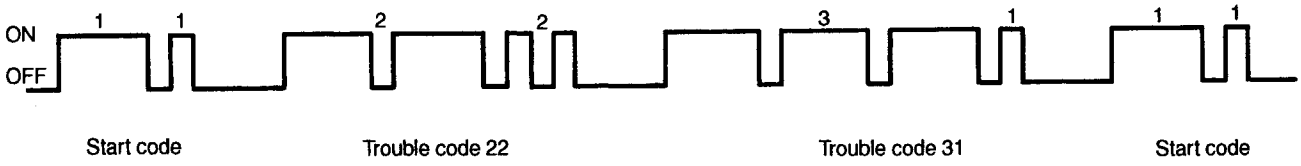
NOTE:
When there are no trouble codes in memory, only the start code (11) is shown.

Example of code indication

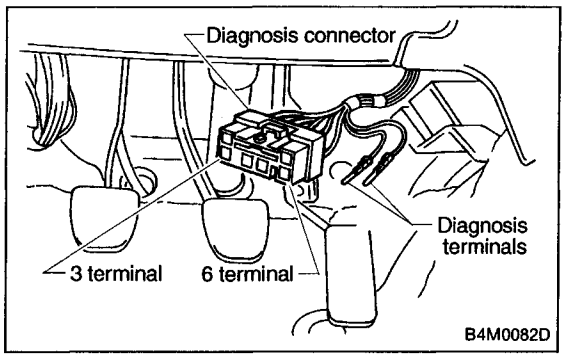
Trouble code: 21



Trouble code: 22, 31

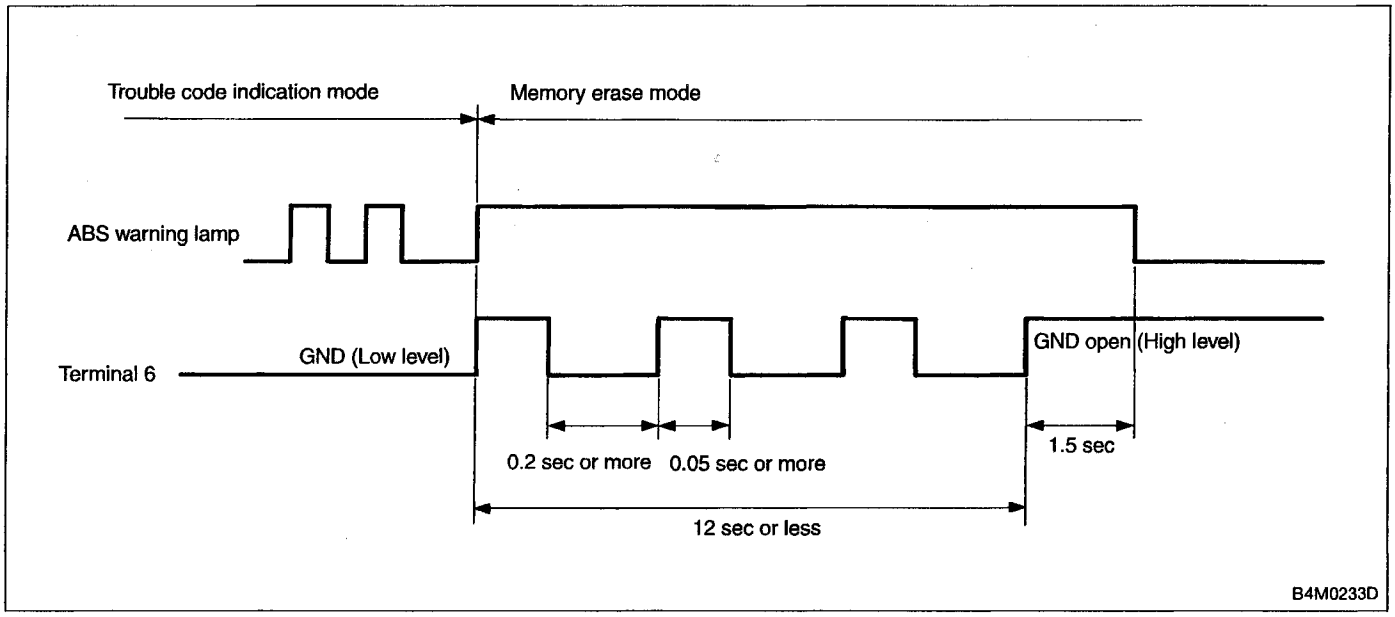


B4M0232A



2. CLEARING MEMORY

1) After calling up a trouble code, disconnect diagnosis connector terminal 6 from diagnosis terminal.
2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal 6 and diagnosis terminal for at least 0.05 seconds each time.



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

7. Diagnostics Chart for ABS Warning Light Circuit and Diagnosis Circuit Failure

A: ABS WARNING LIGHT DOES NOT COME ON.

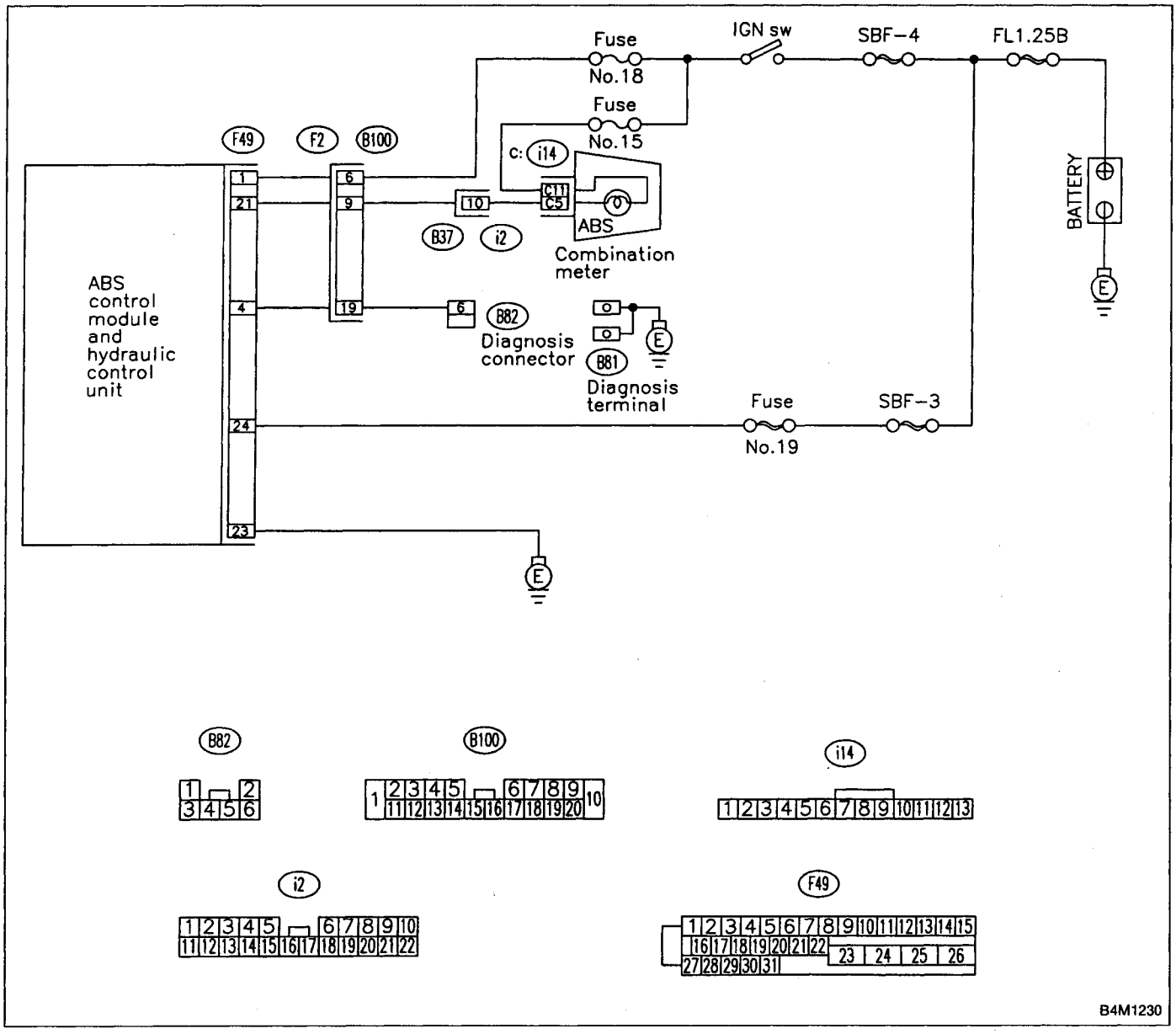
DIAGNOSIS:

- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



7A1	CHECK IF OTHER WARNING LIGHTS TURN ON.

Turn ignition switch to ON (engine OFF).

CHECK : ***Do other warning lights turn on?***

YES : Go to step **7A2.**

NO : Repair combination meter.

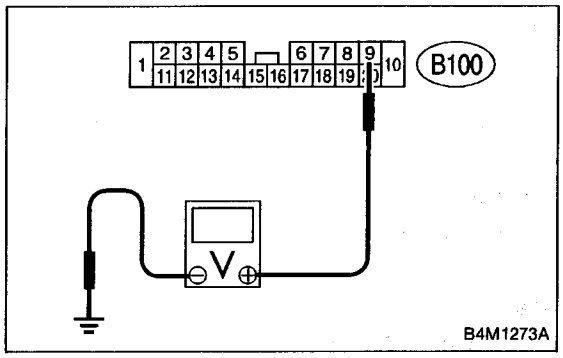
7A2	CHECK ABS WARNING LIGHT BULB.

1) Turn ignition switch to OFF.
2) Remove combination meter.
3) Remove ABS warning light bulb from combination meter.

CHECK : ***Is ABS warning light bulb OK?***

YES : Go to step **7A3.**

NO : Replace ABS warning light bulb.



7A3	CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

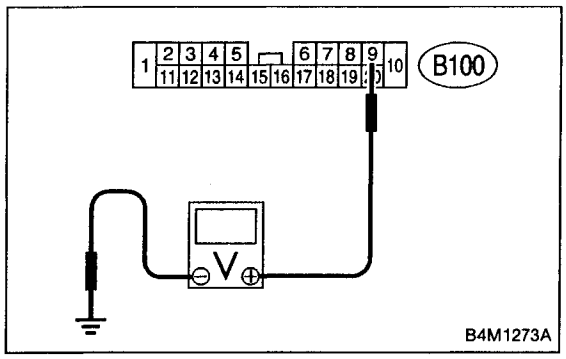
1) Disconnect connector (B100) from connector (F2).
2) Measure voltage between connector (B100) and chassis ground.

Connector & terminal
(B100) No. 9 (+) — Chassis ground (–):

CHECK : ***Is the voltage less than 3 V?***

YES : Go to step **7A4.**

NO : Repair warning light harness.



7A4	CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

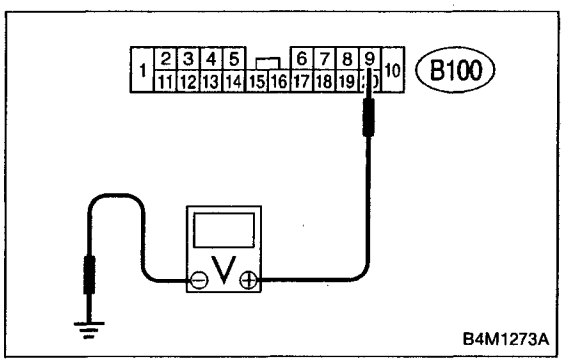
1) Turn ignition switch to ON.
2) Measure voltage between connector (B100) and chassis ground.

Connector & terminal
(B100) No. 9 (+) — Chassis ground (–):

CHECK ***: Is voltage less than 3 V?***

YES : Go to step **7A5**.

NO : Repair warning light harness.



7A5	CHECK WIRING HARNESS.

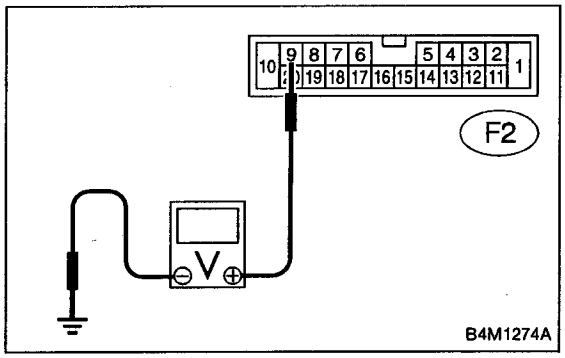
1) Turn ignition switch to OFF.
2) Install ABS warning light bulb from combination meter.
3) Install combination meter.
4) Turn ignition switch to ON.
5) Measure voltage between connector (B100) and chassis ground.

Connector & terminal
(B100) No. 9 (+) — Chassis ground (–):

CHECK ***: Is voltage between 10 V and 15 V?***

YES : Go to step **7A6**.

NO : Repair wiring harness.

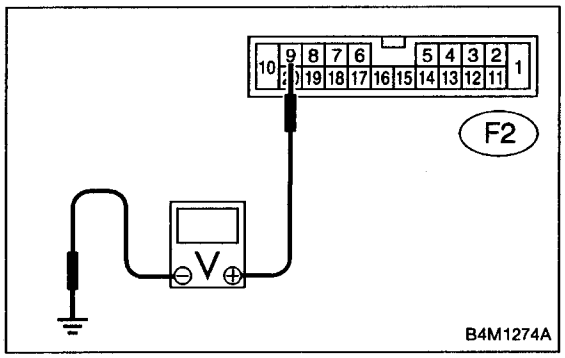


7A6	CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

1) Turn ignition switch to OFF.
2) Measure voltage between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 (+) — Chassis ground (–):

CHECK ***: Is the voltage less than 3 V?***
YES : Go to step **7A7**.
NO : Repair wiring harness.

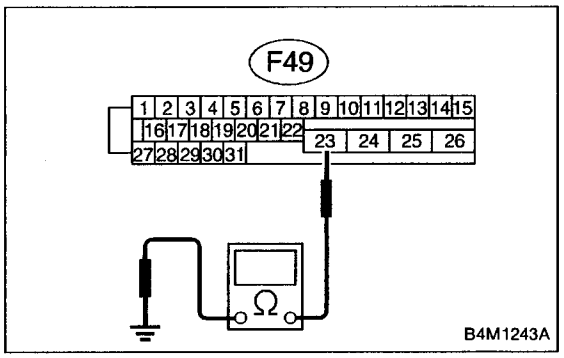


7A7	CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 (+) — Chassis ground (–):

CHECK ***: Is voltage less than 3 V?***
YES : Go to step **7A8**.
NO : Repair wiring harness.

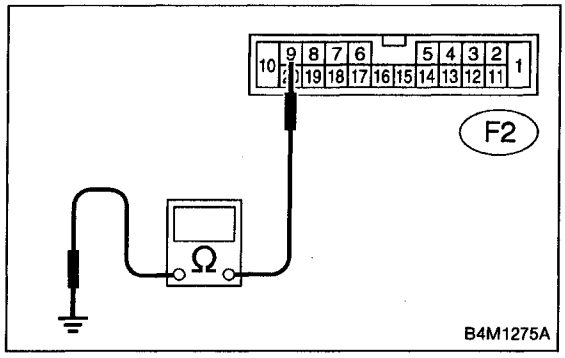


7A8	CHECK GROUND CIRCUIT OF ABSCM&H/U.

Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — GND:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **7A9**.
NO : Repair ABSCM&H/U ground harness.



7A9	CHECK WIRING HARNESS.

Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **7A10.**

NO : Repair harness/connector.

7A10	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connectors between combination meter and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Replace ABSCM&H/U.

B: ABS WARNING LIGHT DOES NOT GO OFF.

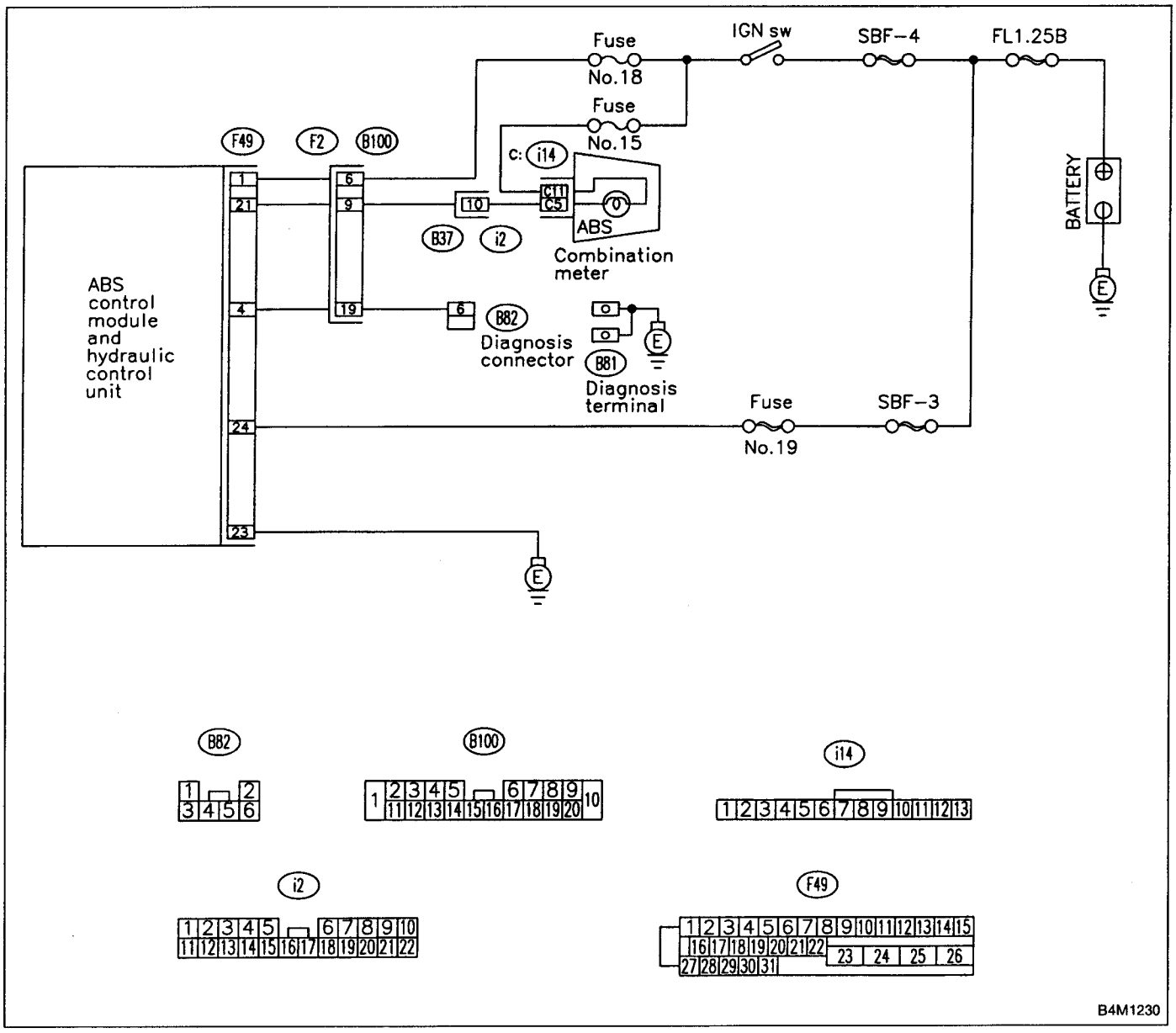
DIAGNOSIS:

- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



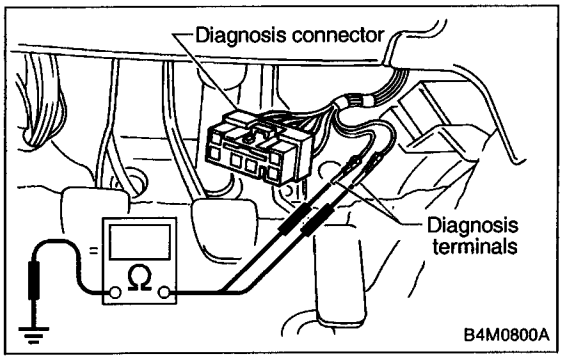
7B1	CHECK INSTALLATION OF ABSCM&H/U CONNECTOR.

Turn ignition switch to OFF.

CHECK : ***Is ABSCM&H/U connector inserted into ABSCM until the clamp locks onto it?***

YES : Go to step **7B2.**

NO : Insert ABSCM&H/U connector into ABSCM&H/U until the clamp locks onto it.



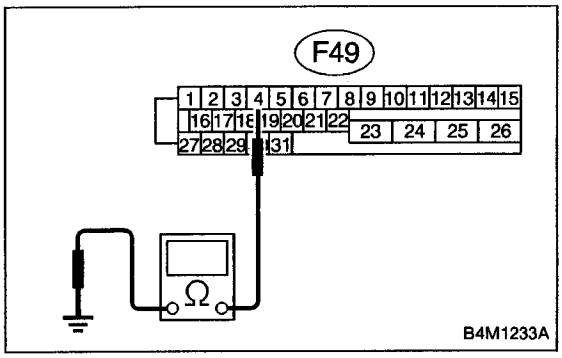
7B2	CHECK DIAGNOSIS TERMINAL.

Measure resistance between diagnosis terminals (B81) and chassis ground.

CHECK : ***Terminals***
Diagnosis terminal (A) — Chassis ground:
Diagnosis terminal (B) — Chassis ground:
Is the resistance less than 0.5 Ω?

YES : Go to step **7B3.**

NO : Repair diagnosis terminal harness.



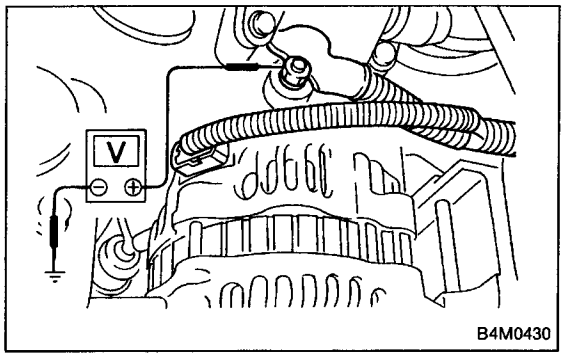
7B3	CHECK DIAGNOSIS LINE.

1) Turn ignition switch to OFF.
2) Connect diagnosis terminal to diagnosis connector (B82) No. 6.
3) Disconnect connector from ABSCM&H/U.
4) Measure resistance between ABSCM&H/U connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 4 — Chassis ground:
Is the resistance less than 0.5 Ω?

YES : Go to step **7B4.**

NO : Repair harness connector between ABSCM&H/U and diagnosis connector.



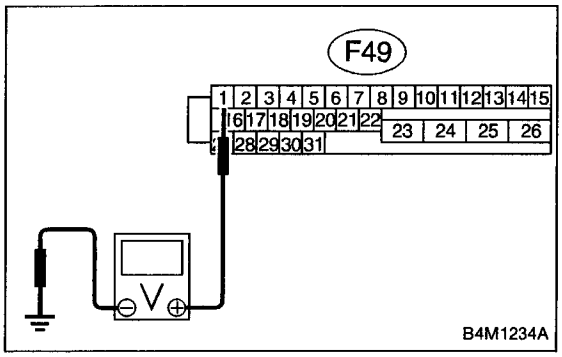
7B4	CHECK GENERATOR.

1) Start the engine.
2) Idle the engine.
3) Measure voltage between generator and chassis ground.

Terminal
Generator B terminal (+) — Chassis ground (–):
CHECK ***: Is the voltage between 10 and 15 V?***
YES : Go to step **7B5**.
NO : Repair generator.

7B5	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.
CHECK ***: Is there poor contact at battery terminal?***
YES : Repair battery terminal.
NO : Go to step **7B6**.



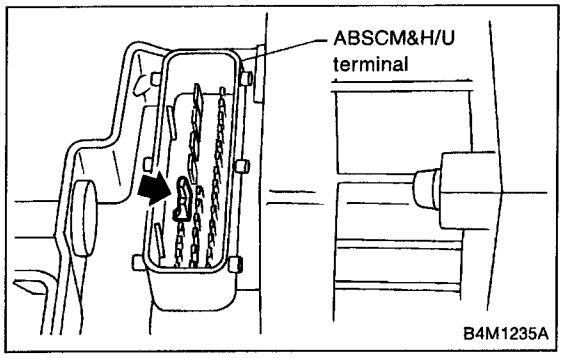
7B6	CHECK POWER SUPPLY OF ABSCM.

1) Disconnect connector from ABSCM&H/U.
2) Start engine.
3) Idle the engine.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):
CHECK ***: Is the voltage between 10 and 15 V?***
YES : Go to step **7B7**.
NO : Repair ABSCM&H/U power supply circuit.

7B7	CHECK WIRING HARNESS.

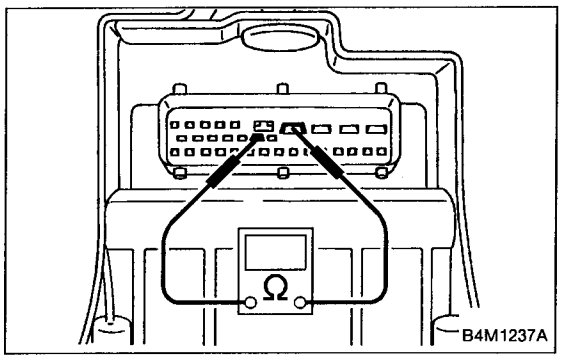
1) Disconnect connector (F2) from connector (B100).
2) Turn ignition switch to ON.
CHECK ***: Does the ABS warning light remain off?***
YES : Go to step **7B8**.
NO : Repair front wiring harness.



7B8	CHECK PROJECTION AT ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Check for broken projection at the ABSCM&H/U terminal.

CHECK : ***Are the projection broken?***
YES : Go to step **7B9**.
NO : Replace ABSCM&H/U.

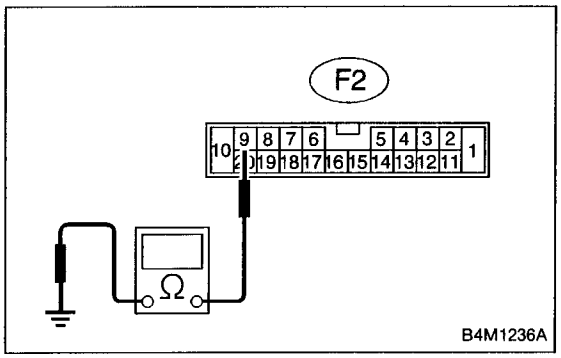


7B9	CHECK ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals
No. 21 — No. 23:

CHECK : ***Is the resistance more than 1 MΩ?***
YES : Go to step **7B10**.
NO : Replace ABSCM&H/U.

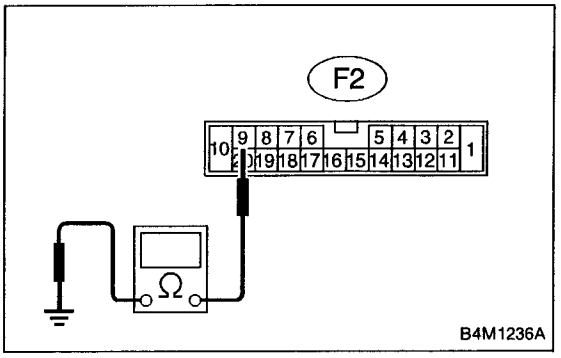


7B10	CHECK WIRING HARNESS.

Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

CHECK : ***Is the resistance less than 0.5 Ω?***
YES : Go to step **7B11**.
NO : Repair harness.



7B11	CHECK WIRING HARNESS.

1) Connect connector to ABSCM&H/U.
2) Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

CHECK : ***Is the resistance more than 1 MΩ?***
YES : Go to step **7B12**.
NO : Repair harness.

7B12	CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.

CHECK : ***Is there poor contact in ABSCM&H/U connector? <Ref. to FOREWORD [T3C1].☆10>***
YES : Repair connector.
NO : Replace ABSCM&H/U.

C: TROUBLE CODE DOES NOT APPEAR.

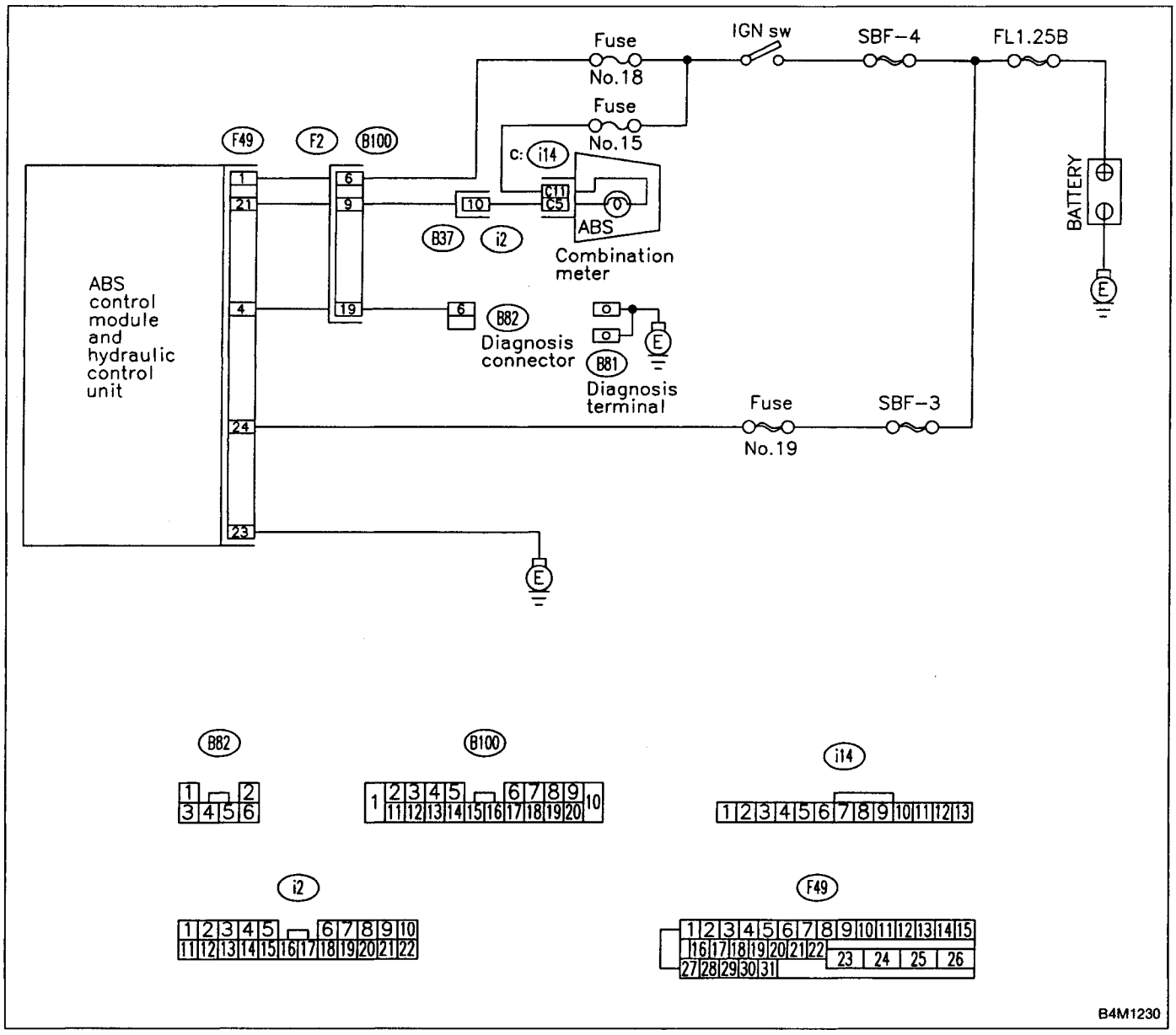
DIAGNOSIS:

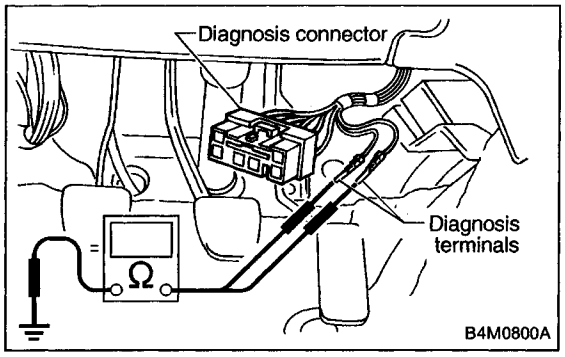
- Diagnosis circuit is open.

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



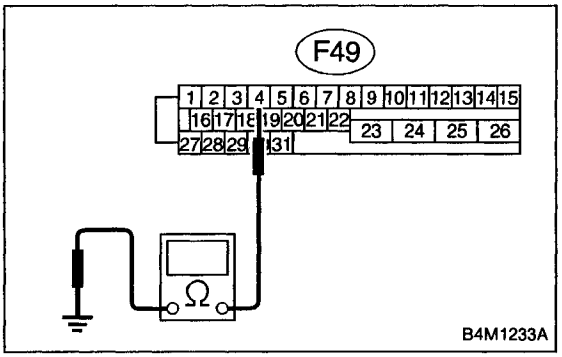


7C1	CHECK DIAGNOSIS TERMINAL.

Measure resistance between diagnosis terminals (B81) and chassis ground.

Terminals
Diagnosis terminal (A) — Chassis ground:
Diagnosis terminal (B) — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **7C2**.
NO : Repair diagnosis terminal harness.



7C2	CHECK DIAGNOSIS LINE.

1) Turn ignition switch to OFF.
2) Connect diagnosis terminal to diagnosis connector (B82) No. 6.
3) Disconnect connector from ABSCM&H/U.
4) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 4 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **7C3**.
NO : Repair harness connector between ABSCM&H/U and diagnosis connector.

7C3	CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.

CHECK ***: Is there poor contact in ABSCM&H/U connector? <Ref. to FOREWORD [T3C1].☆10>***
YES : Repair connector.
NO : Replace ABSCM&H/U.

8. Diagnostics Chart with Trouble Code by ABS Warning Light

A: LIST OF TROUBLE CODE

Trouble code	Contents of diagnosis		Ref. to
11	Start code • Trouble code 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 right ABS sensor	[T8B0]☆10
23		Front left ABS sensor	[T8C0]☆10
25		Rear right ABS sensor	[T8D0]☆10
27		Rear left ABS sensor	[T8E0]☆10
22	Abnormal ABS sensor (Abnormal ABS sensor signal)	Front right ABS sensor	[T8F0]☆10
24		Front left ABS sensor	[T8G0]☆10
26		Rear right ABS sensor	[T8H0]☆10
28		Rear left ABS sensor	[T8I0]☆10
29		Any one of four	[T8J0]☆10
31	Abnormal solenoid valve circuit(s) in ABS control module and hydraulic unit	Front right inlet valve	[T8K0]☆10
32		Front right outlet valve	[T8O0]☆10
33		Front left inlet valve	[T8L0]☆10
34		Front left outlet valve	[T8P0]☆10
35		Rear right inlet valve	[T8M0]☆10
36		Rear right outlet valve	[T8Q0]☆10
37		Rear left inlet valve	[T8N0]☆10
38		Rear left outlet valve	[T8R0]☆10
41	Abnormal ABS control module		[T8S0]☆10
42	Source voltage is abnormal.		[T8T0]☆10
44	A combination of AT control abnormal		[T8U0]☆10
51	Abnormal valve relay		[T8V0]☆10
52	Abnormal motor and/or motor relay		[T8W0]☆10
54	Abnormal stop light switch		[T8X0]☆10
56	Abnormal G sensor output voltage		[T8Y0]☆10

B: TROUBLE CODE 21 (FRONT RH)
C: TROUBLE CODE 23 (FRONT LH)
D: TROUBLE CODE 25 (REAR RH)
E: TROUBLE CODE 27 (REAR LH)
— ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

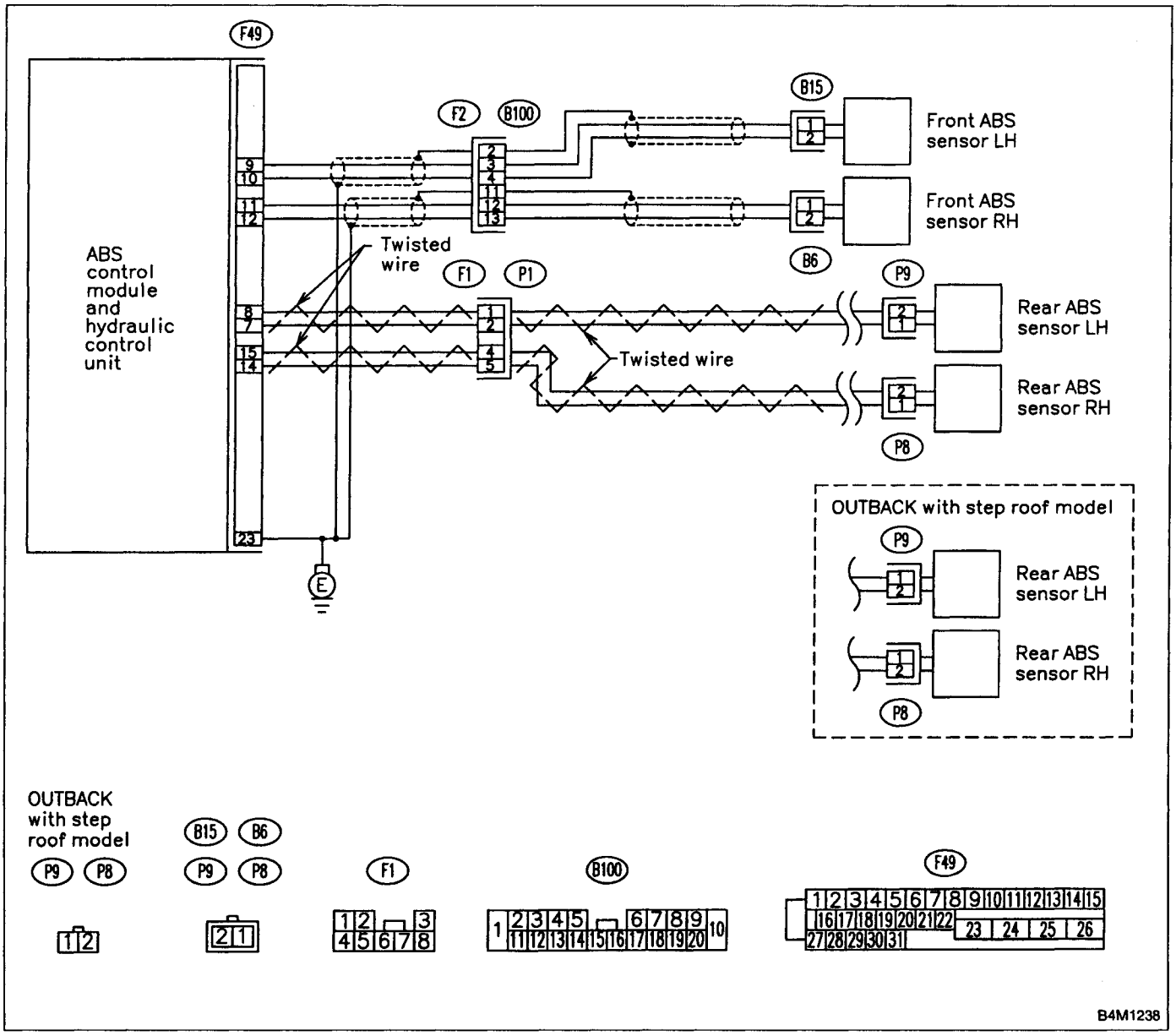
DIAGNOSIS:

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

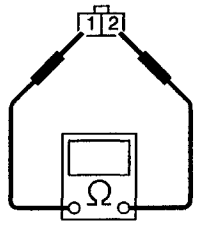
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

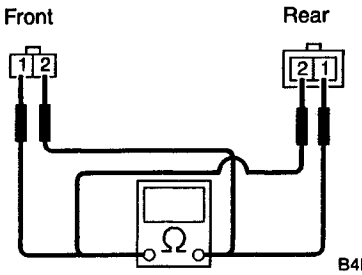


Except OUTBACK model



B4M0806E

OUTBACK model



B4M1036C

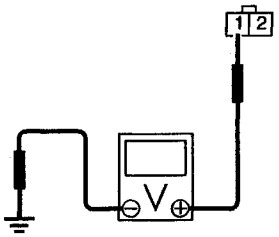
8E1	CHECK ABS SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance of ABS sensor connector terminals.

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:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **8E2**.
NO : Replace ABS sensor.

Except OUTBACK model



B4M0807E

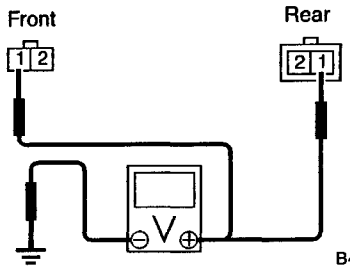
8E2	CHECK BATTERY SHORT OF ABS SENSOR.

1) Disconnect connector from ABSCM&H/U.
2) Measure 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 (–):

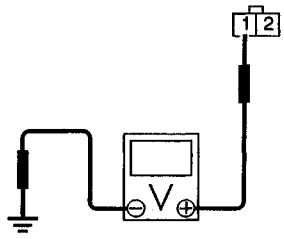
CHECK ***: Is the voltage less than 1 V?***
YES : Go to step **8E3**.
NO : Replace ABS sensor.

OUTBACK model

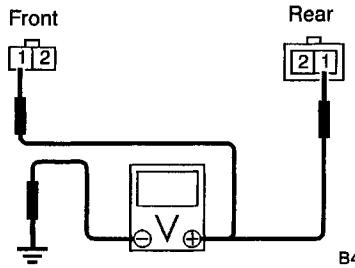


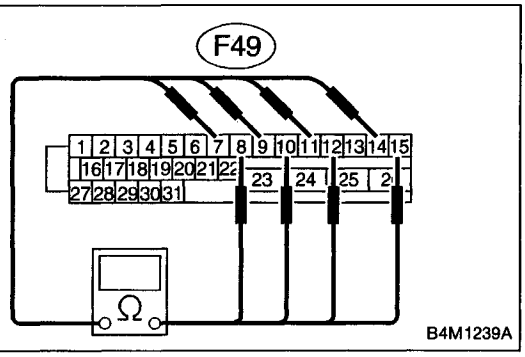
B4M1037C

Except OUTBACK model



OUTBACK model





8E3	CHECK BATTERY SHORT OF ABS SENSOR.

1) Turn ignition switch to ON.
2) Measure 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 (–):

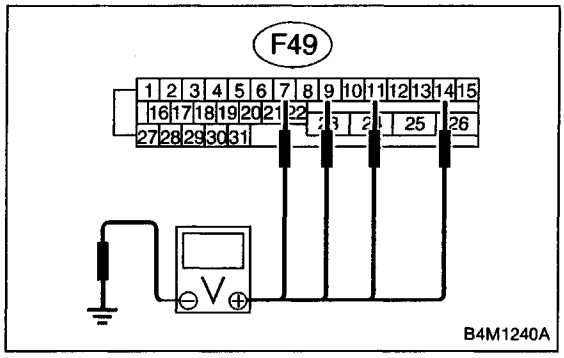
CHECK ***: Is the voltage less than 1 V?***
YES : Go to step **8E4**.
NO : Replace ABS sensor.

8E4	CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

1) Turn ignition switch to OFF.
2) Connect connector to ABS sensor.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
Trouble code 21 / (F49) No. 11 — No. 12:
Trouble code 23 / (F49) No. 9 — No. 10:
Trouble code 25 / (F49) No. 14 — No. 15:
Trouble code 27 / (F49) No. 7 — No. 8:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **8E5**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.



8E5	CHECK BATTERY SHORT OF HARNESS.

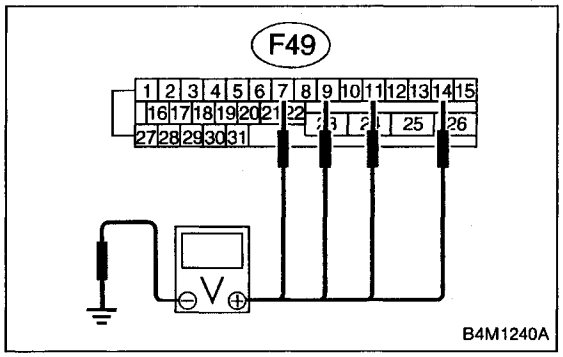
Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 (+) — Chassis ground (–):
Trouble code 23 / (F49) No. 9 (+) — Chassis ground (–):
Trouble code 25 / (F49) No. 14 (+) — Chassis ground (–):
Trouble code 27 / (F49) No. 7 (+) — Chassis ground (–):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8E6**.

NO : Repair harness between ABSCM&H/U and ABS sensor.



8E6	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 (+) — Chassis ground (–):
Trouble code 23 / (F49) No. 9 (+) — Chassis ground (–):
Trouble code 25 / (F49) No. 14 (+) — Chassis ground (–):
Trouble code 27 / (F49) No. 7 (+) — Chassis ground (–):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8E7**.

NO : Repair harness between ABSCM&H/U and ABS sensor.

8E7	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32 ± 10 N·m (3.3 ± 1.0 kg-m, 24 ± 7 ft-lb)

CHECK ***: Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **8E8**.

NO : Tighten ABS sensor installation bolts securely.

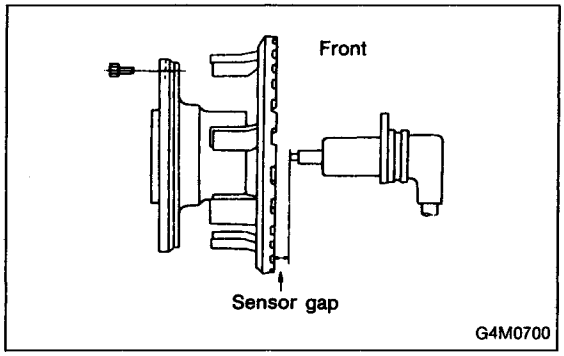
8E8	CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:
13 ± 3 N·m (1.3 ± 0.3 kg-m, 9 ± 2.2 ft-lb)

CHECK : ***Are the tone wheel installation bolts tightened securely?***

YES : Go to step **8E9**.

NO : Tighten tone wheel installation bolts securely.

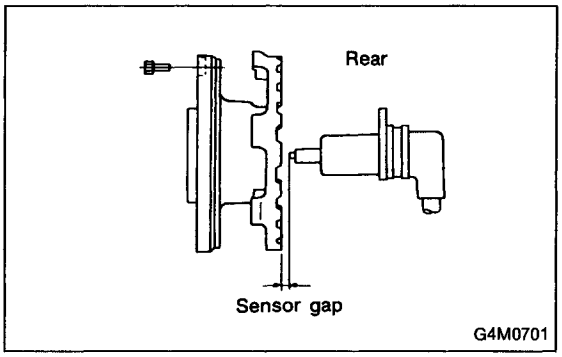


8E9	CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK : ***Is the gap within the specifications shown in the following table?***

Specifications	Front wheel	Rear wheel
	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to step **8E10**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

8E10	CHECK HUB RUNOUT.

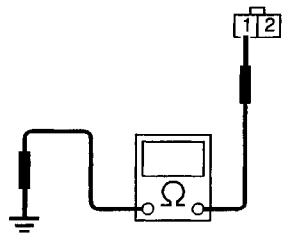
Measure hub runout.

CHECK : ***Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **8E11**.

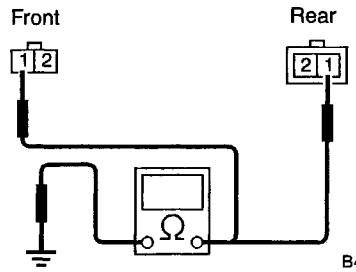
NO : Repair hub.

Except OUTBACK model

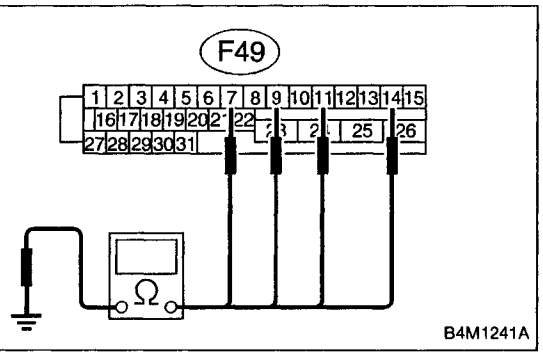


B4M0818E

OUTBACK model



B4M1042C



B4M1241A

8E11	CHECK GROUND SHORT OF ABS SENSOR.

1) Turn ignition switch to ON.
2) Measure 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:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **8E12**.
NO : Replace ABS sensor and ABSCM&H/U.

8E12	CHECK GROUND SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Connect connector to ABS sensor.
3) Measure resistance between ABSCM&H/U connector terminal and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 — Chassis ground:
Trouble code 23 / (F49) No. 9 — Chassis ground:
Trouble code 25 / (F49) No. 14 — Chassis ground:
Trouble code 27 / (F49) No. 7 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **8E13**.
NO : Repair harness between ABSCM&H/U and ABS sensor.
Replace ABSCM&H/U.

8E13	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].☆10>***
YES : Repair connector.
NO : Go to step **8E14**.

8E14	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8E15**.

8E15	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

NOTE:
Check harness and connectors between ABSCM&H/U and ABS sensor.

F: TROUBLE CODE 22 (FRONT RH)
G: TROUBLE CODE 24 (FRONT LH)
H: TROUBLE CODE 26 (REAR RH)
I: TROUBLE CODE 28 (REAR LH)
— ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

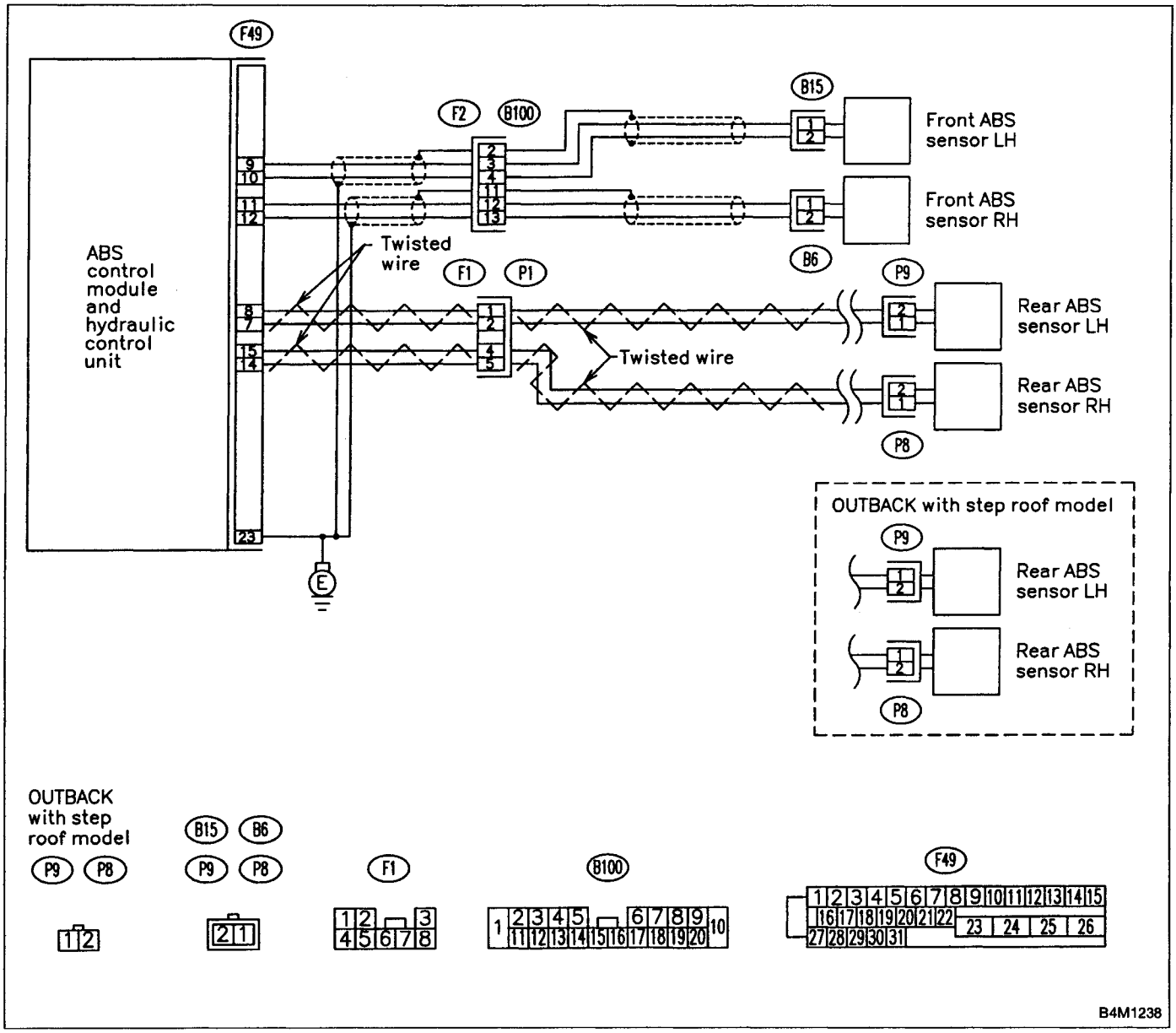
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



8I1	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32 ± 10 N·m (3.3 ± 1.0 kg-m, 24 ± 7 ft-lb)

CHECK : ***Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **8I2**.

NO : Tighten ABS sensor installation bolts securely.

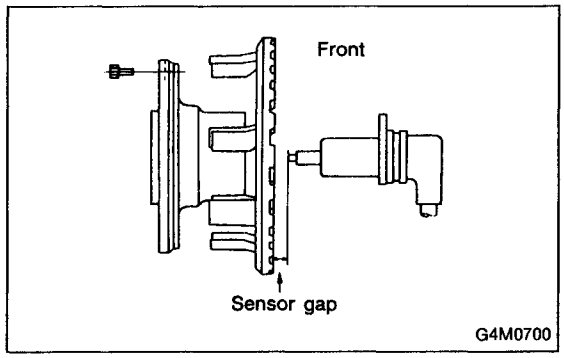
8I2	CHECK INSTALLATION OF TONE WHEEL.

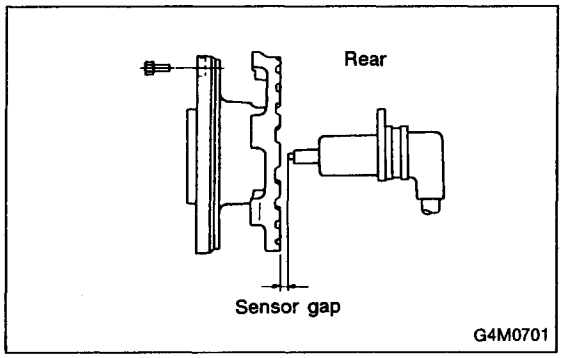
Tightening torque:
13 ± 3 N·m (1.3 ± 0.3 kg-m, 9 ± 2.2 ft-lb)

CHECK : ***Are the tone wheel installation bolts tightened securely?***

YES : Go to step **8I3**.

NO : Tighten tone wheel installation bolts securely.





8I3	CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK : ***Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

YES : Go to step **8I4**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

8I4	CHECK OSCILLOSCOPE.

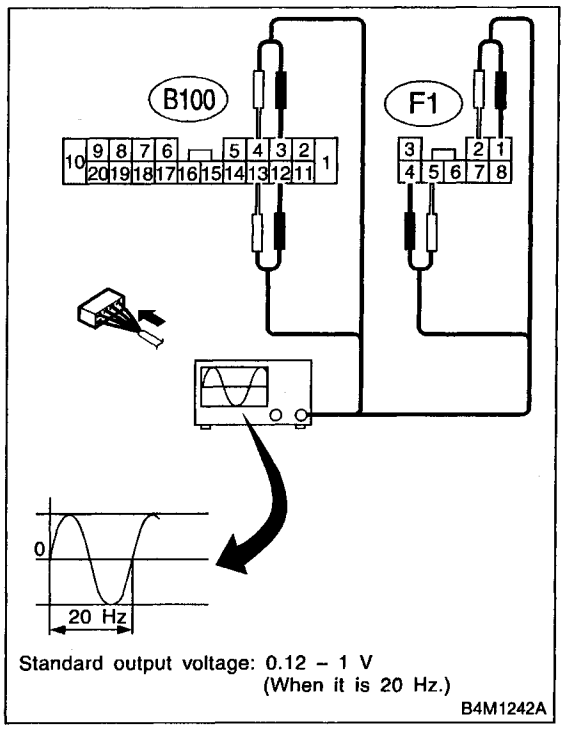
CHECK : ***Is an oscilloscope available?***

YES : Go to step **8I5**.

NO : Go to step **8I6**.

8I5	CHECK ABS SENSOR SIGNAL.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Connect the oscilloscope to the connector (F1) or connector (B100).
4) Turn ignition switch ON.



Standard output voltage: 0.12 – 1 V
(When it is 20 Hz.)
B4M1242A

5) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

Connector & terminal
Trouble code 22 / (B100) No. 12 (+) — No. 13 (–):
Trouble code 24 / (B100) No. 3 (+) — No. 4 (–):
Trouble code 26 / (F1) No. 4 (+) — No. 5 (–):
Trouble code 28 / (F1) No. 1 (+) — No. 2 (–):
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK : ***Is oscilloscope pattern smooth, as shown in figure?***

YES : Go to step **8I9**.
NO : Go to step **8I6**.

8I6	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor or drum from hub in accordance with trouble code.

CHECK : ***Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.
NO : Go to step **8I7**.

8I7	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK : ***Are there broken or damaged in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.
NO : Go to step **8I8**.

8I8	CHECK HUB RUNOUT.

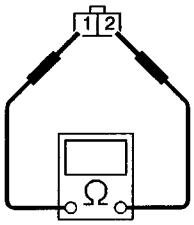
Measure hub runout.

CHECK : ***Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **8I9**.

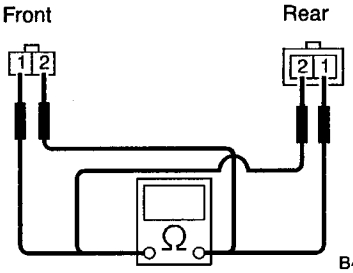
NO : Repair hub.

Except OUTBACK model



B4M0806E

OUTBACK model



B4M1036C

8I9	CHECK RESISTANCE OF ABS SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance between ABS sensor connector terminals.

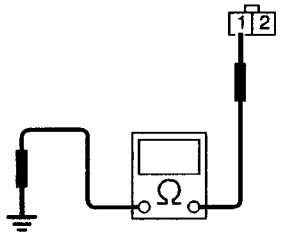
Terminal
Front RH No. 1 — No. 2:
Front LH No. 1 — No. 2:
Rear RH No. 1 — No. 2:
Rear LH No. 1 — No. 2:

CHECK : ***Is the resistance between 0.8 and 1.2 kΩ?***

YES : Go to step **8I10**.

NO : Replace ABS sensor.

Except OUTBACK model



B4M0818E

8I10	CHECK GROUND SHORT OF ABS SENSOR.

Measure resistance between ABS sensor and chassis ground.

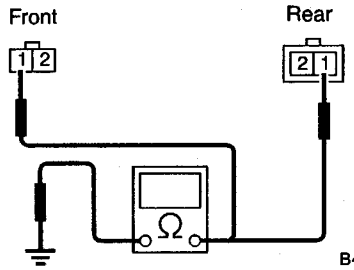
Terminal
Front RH No. 1 — Chassis ground:
Front LH No. 1 — Chassis ground:
Rear RH No. 1 — Chassis ground:
Rear LH No. 1 — Chassis ground:

CHECK : ***Is the resistance more than 1 MΩ?***

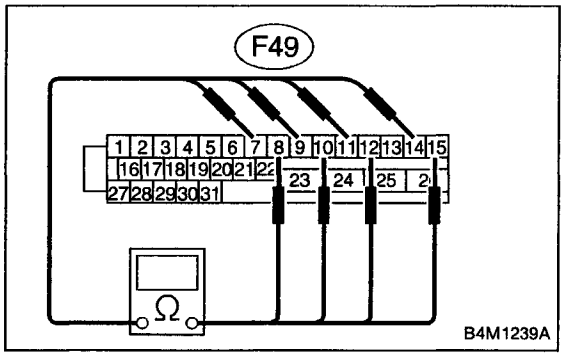
YES : Go to step **8I11**.

NO : Replace ABS sensor.

OUTBACK model



B4M1042C

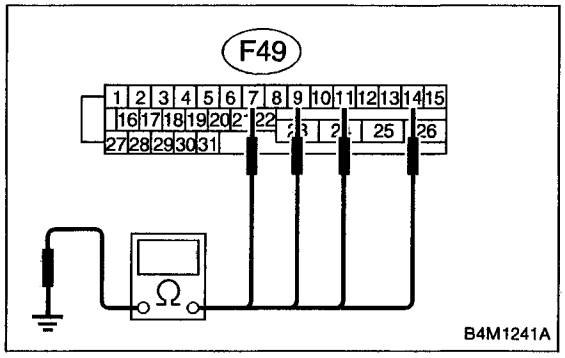


8I11	CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

1) Connect connector to ABS sensor.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance at ABSCM&H/U connector terminals.

Connector & terminal
Trouble code 22 / (F49) No. 11 — No. 12:
Trouble code 24 / (F49) No. 9 — No. 10:
Trouble code 26 / (F49) No. 14 — No. 15:
Trouble code 28 / (F49) No. 7 — No. 8:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **8I12**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

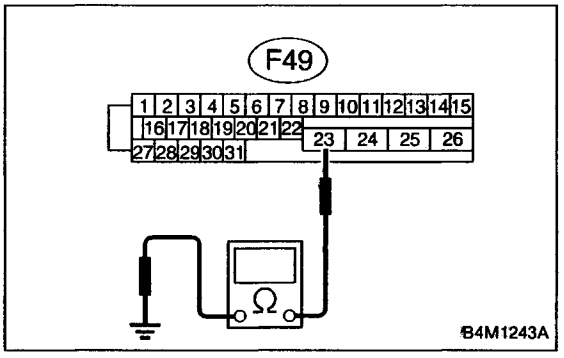


8I12	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 22 / (F49) No. 11 — Chassis ground:
Trouble code 24 / (F49) No. 9 — Chassis ground:
Trouble code 26 / (F49) No. 14 — Chassis ground:
Trouble code 28 / (F49) No. 7 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **8I13**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.



8I13	CHECK GROUND CIRCUIT OF ABSCM&H/U.

Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — GND:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **8I14**.
NO : Repair ABSCM&H/U ground harness.

8I14	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **8I15**.

8I15	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Is the car telephone or the wireless transmitter properly installed?***

YES : Go to step **8I16**.

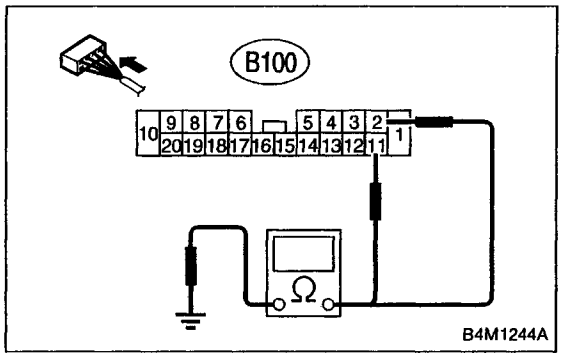
NO : Properly install the car telephone or the wireless transmitter.

8I16	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **8I17**.



8I17	CHECK SHIELD CIRCUIT.

1) Connect all connectors.
2) Measure resistance between shield connector and chassis ground.

Connector & terminal
Trouble code 22 / (B100) No. 11 — Chassis ground:
Trouble code 24 / (B100) No. 2 — Chassis ground:
Trouble code 26 / Go to step 8I18.
Trouble code 28 / Go to step 8I18.

CHECK : ***Is the resistance less than 0.5 Ω?***

YES : Go to step **8I18**.

NO : Repair shield harness.

8I18	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8I19.**

8I19	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary noise interference.

J: TROUBLE CODE 29 — ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —

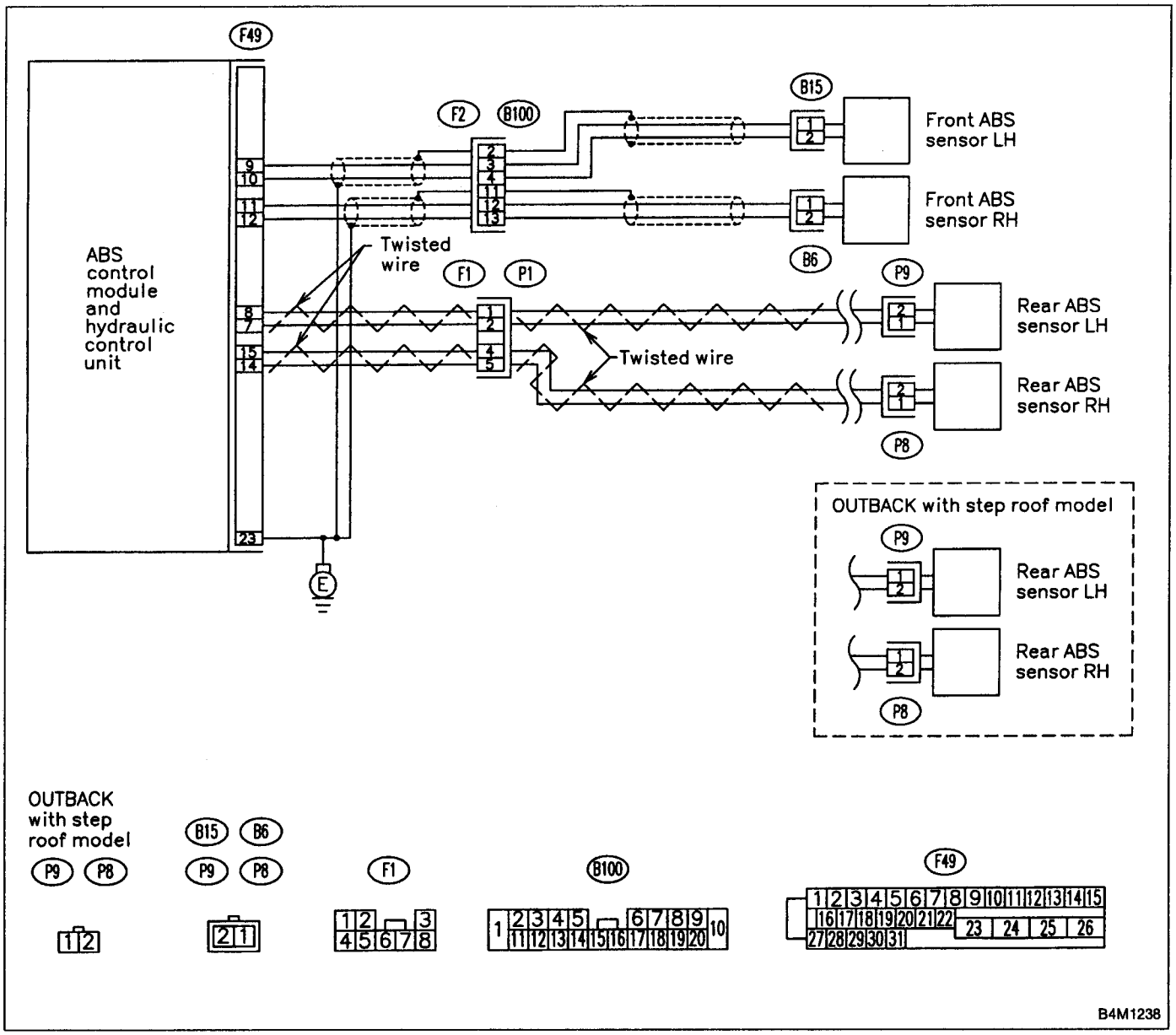
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



8J1	CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.

CHECK : ***Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.***

YES : The ABS is normal. Erase the trouble code.

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 trouble code may sometimes occur.

NO : Go to step **8J2**.

8J2	CHECK TIRE SPECIFICATIONS.

CHECK : ***Are the tire specifications correct?***

YES : Go to step **8J3**.

NO : Replace tire.

8J3	CHECK WEAR OF TIRE.

CHECK : ***Is the tire worn excessively?***

YES : Replace tire.

NO : Go to step **8J4**.

8J4	CHECK TIRE PRESSURE.

CHECK : ***Is the tire pressure correct?***

YES : Go to step **8J5**.

NO : Adjust tire pressure.

8J5	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32 ± 10 N·m (3.3 ± 1.0 kg-m, 24 ± 7 ft-lb)

CHECK : ***Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **8J6**.

NO : Tighten ABS sensor installation bolts securely.

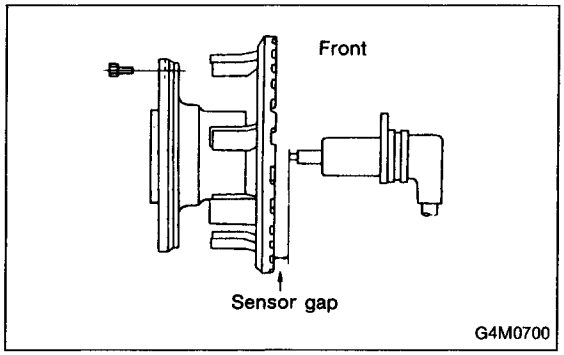
8J6	CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:
13 ± 3 N·m (1.3 ± 0.3 kg-m, 9 ± 2.2 ft-lb)

CHECK : ***Are the tone wheel installation bolts tightened securely?***

YES : Go to step **8J7**.

NO : Tighten tone wheel installation bolts securely.

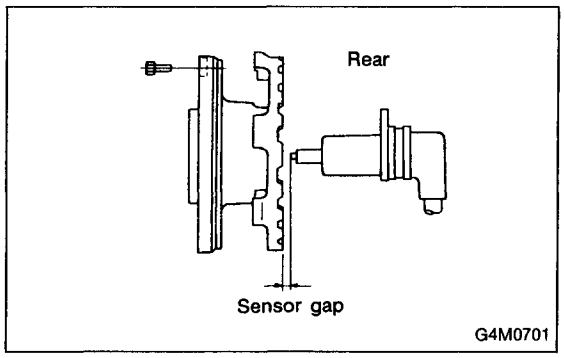


8J7	CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK : ***Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to step **8J8**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

8J8	CHECK OSCILLOSCOPE.

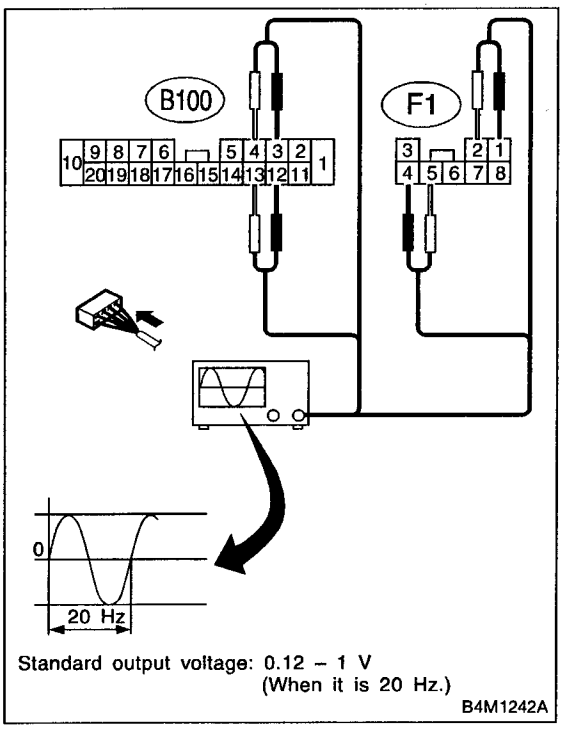
CHECK : ***Is an oscilloscope available?***

YES : Go to step **8J9**.

NO : Go to step **8J10**.

8J9	CHECK ABS SENSOR SIGNAL.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Connect the oscilloscope to the connector (F1) or connector (B100).
4) Turn ignition switch ON.



Standard output voltage: 0.12 – 1 V
(When it is 20 Hz.)

B4M1242A

5) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

Connector & terminal
(B100) No. 12 (+) — No. 13 (–) (Front RH):
(B100) No. 3 (+) — No. 4 (–) (Front LH):
(F1) No. 4 (+) — No. 5 (–) (Rear RH):
(F1) No. 1 (+) — No. 2 (–) (Rear LH):
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK : ***Is oscilloscope pattern smooth, as shown in figure?***

YES : Go to step **8J13**.

NO : Go to step **8J10**.

8J10	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor from hub.

CHECK : ***Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.

NO : Go to step **8J11**.

8J11	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK : ***Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.

NO : Go to step **8J12**.

8J12	CHECK HUB RUNOUT.

Measure hub runout.

CHECK : ***Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **8J13**.

NO : Repair hub.

8J13	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8J14**.

8J14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

K: TROUBLE CODE 31 (FRONT RH)
L: TROUBLE CODE 33 (FRONT LH)
M: TROUBLE CODE 35 (REAR RH)
N: TROUBLE CODE 37 (REAR LH)
— ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U —

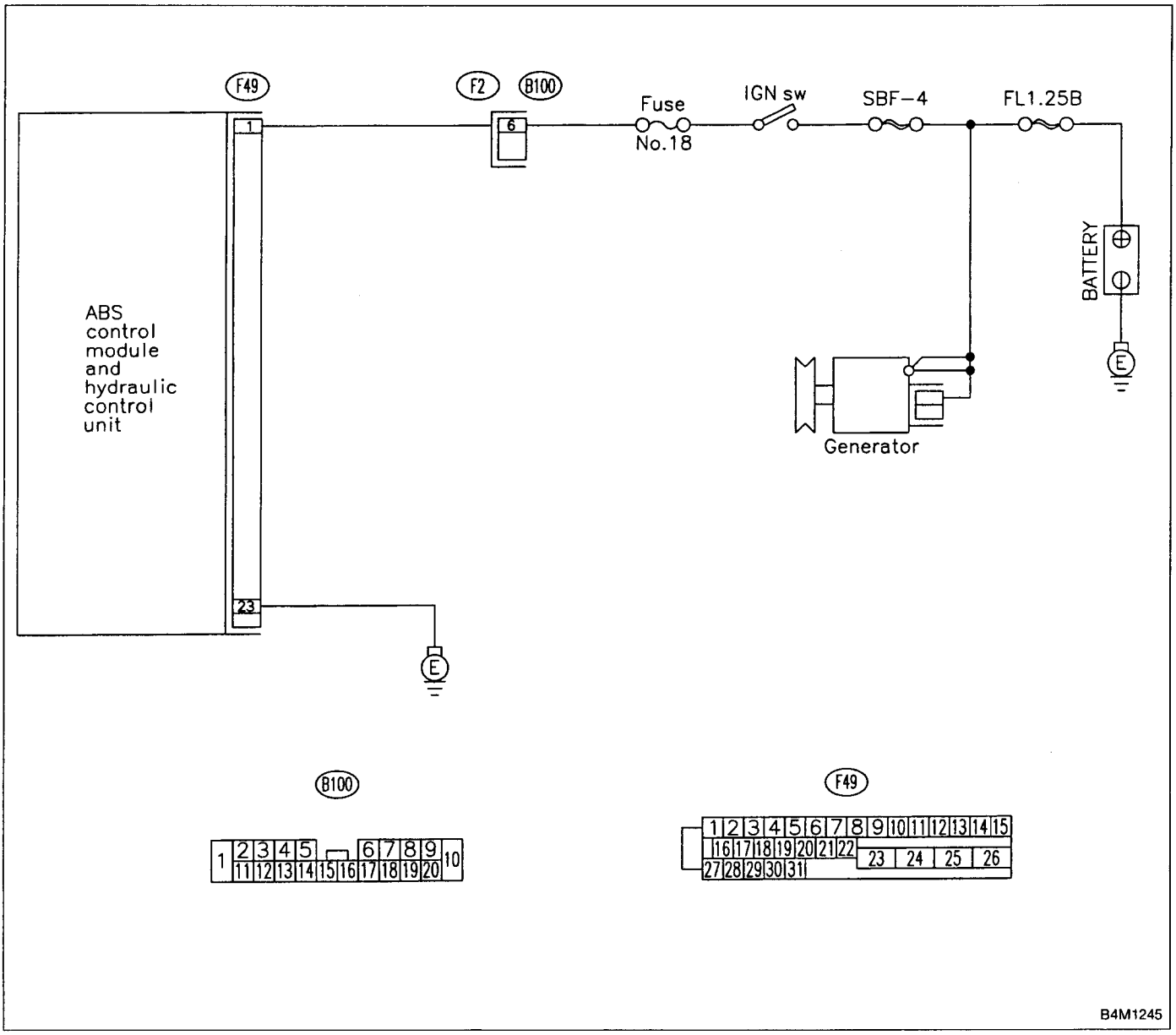
DIAGNOSIS:

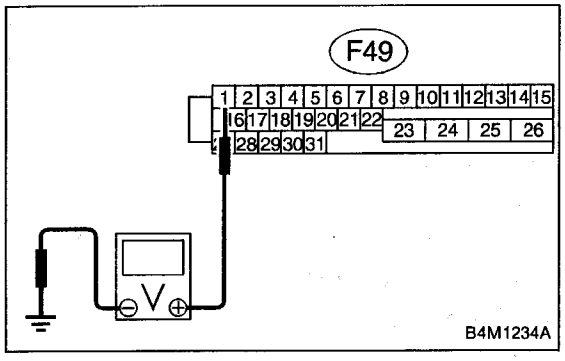
- Faulty harness/connector
- Faulty inlet solenoid valve in ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8N1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

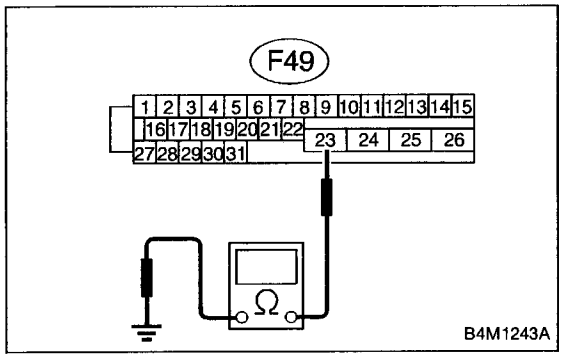
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8N2**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



8N2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **8N3**.

NO : Repair ABSCM&H/U ground harness.

8N3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **8N4**.

8N4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8N5**.

8N5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

O: TROUBLE CODE 32 (FRONT RH)
P: TROUBLE CODE 34 (FRONT LH)
Q: TROUBLE CODE 36 (REAR RH)
R: TROUBLE CODE 38 (REAR LH)
— ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U —

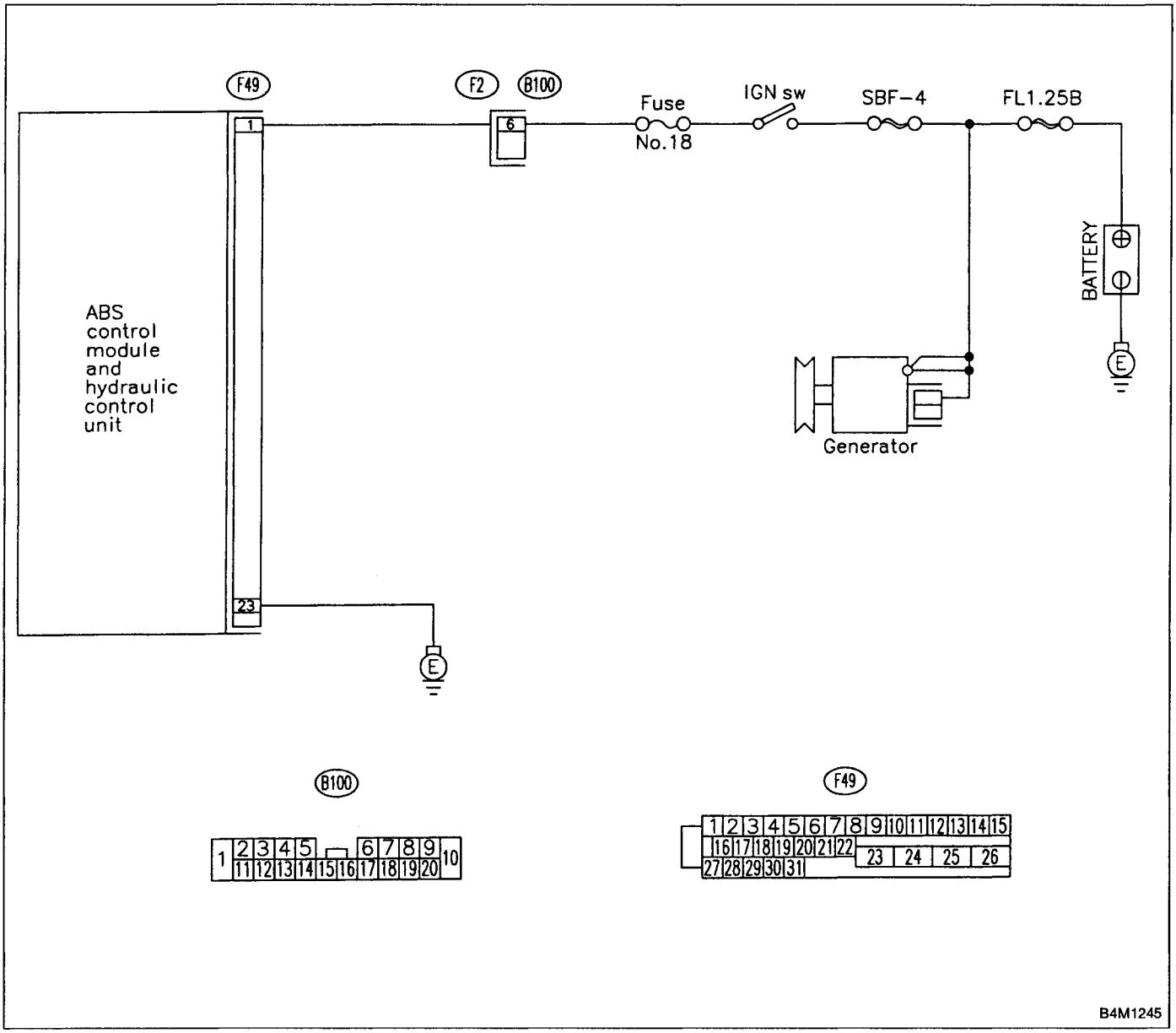
DIAGNOSIS:

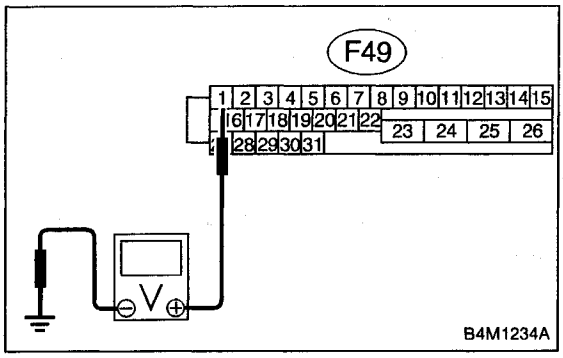
- Faulty harness/connector
- Faulty outlet solenoid valve in ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8R1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

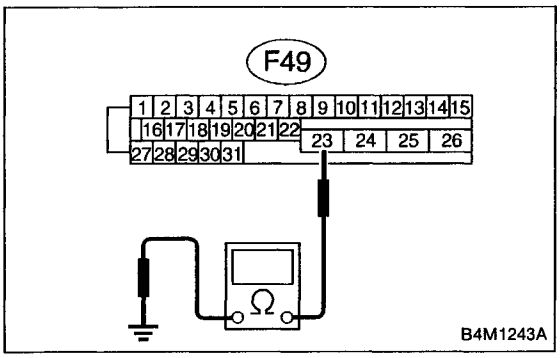
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8R2**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



8R2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **8R3**.

NO : Repair ABSCM&H/U ground harness.

8R3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **8R4**.

8R4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8R5**.

8R5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

S: TROUBLE CODE 41
— ABNORMAL ABS CONTROL MODULE —

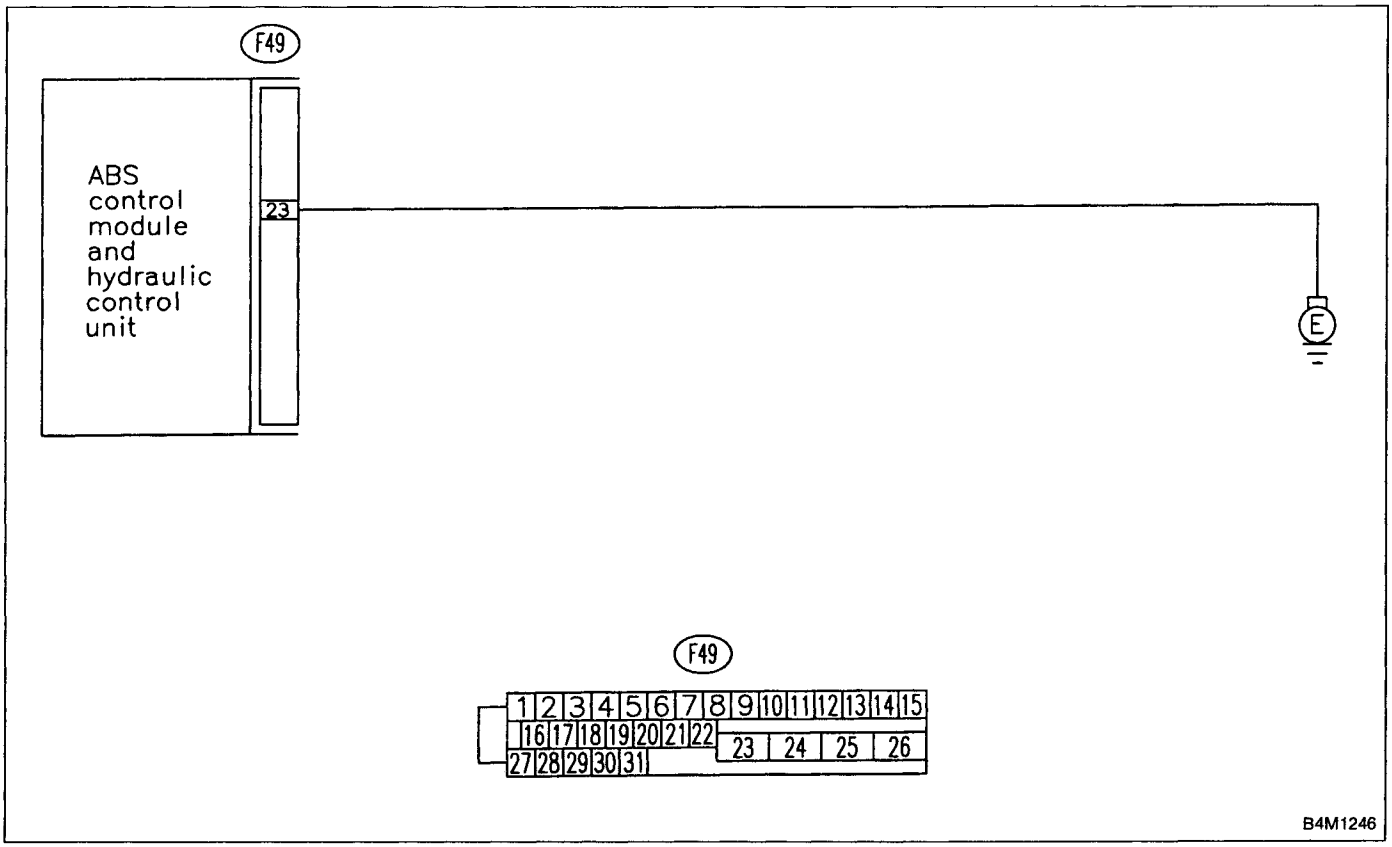
DIAGNOSIS:

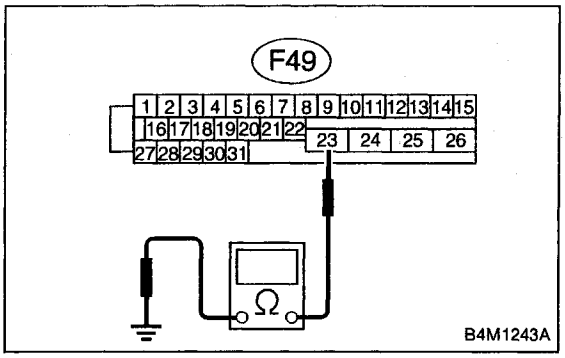
- Faulty ABSCM&H/U.

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8S1	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK : ***Is the resistance less than 0.5 Ω?***
YES : Go to step **8S2**.
NO : Repair ABSCM&H/U ground harness.

8S2	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between battery, ignition switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***
YES : Repair connector.
NO : Go to step **8S3**.

8S3	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Is the car telephone or the wireless transmitter properly installed?***
YES : Go to step **8S4**.
NO : Properly install the car telephone or the wireless transmitter.

8S4	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Are noise sources (such as an antenna) installed near the sensor harness?***
YES : Install the noise sources apart from the sensor harness.
NO : Go to step **8S5**.

8S5	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **8S6**.

8S6	**CHECK ANY OTHER TROUBLE CODES APPEARANCE.**

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

T: TROUBLE CODE 42
— SOURCE VOLTAGE IS ABNORMAL. —

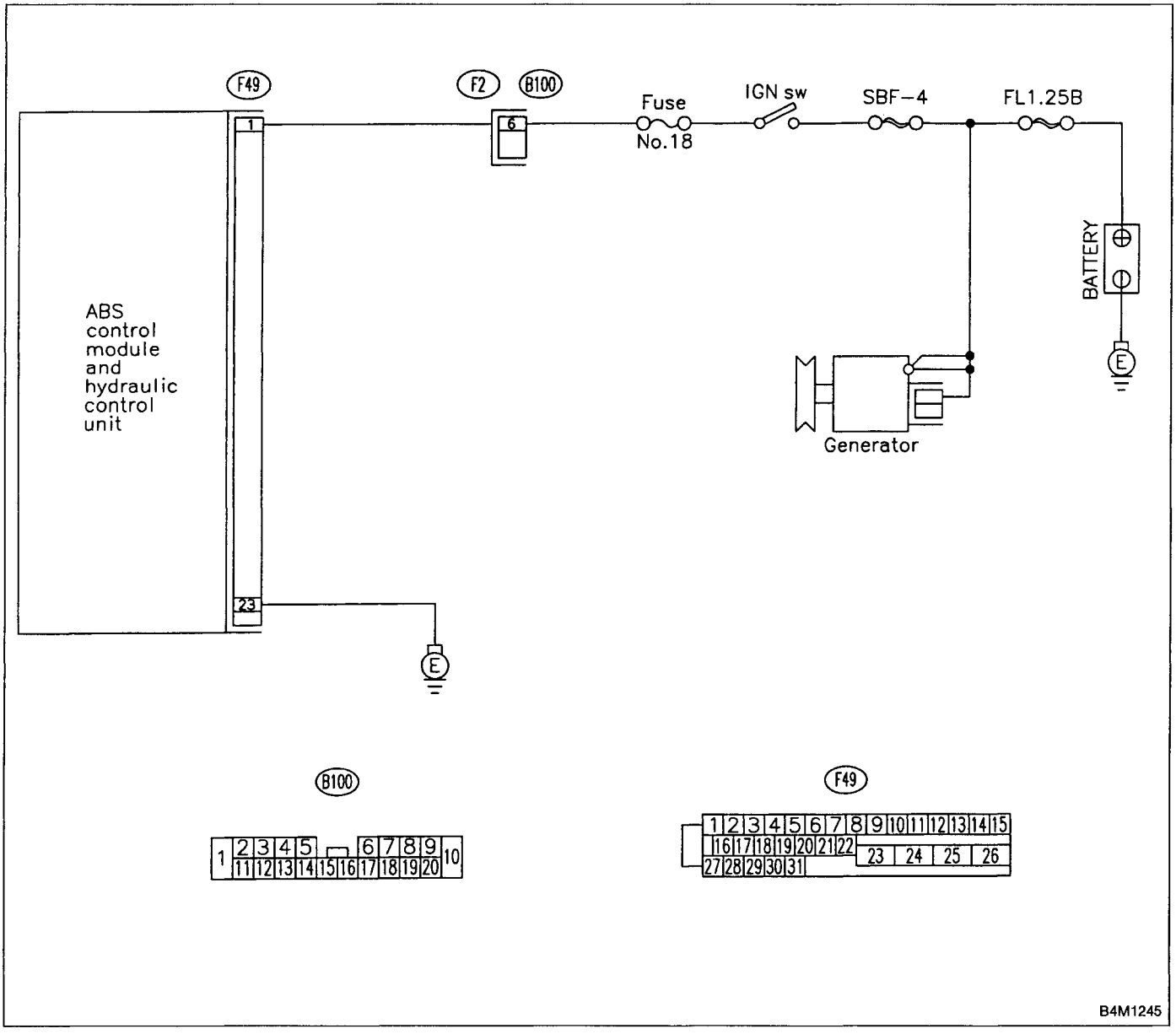
DIAGNOSIS:

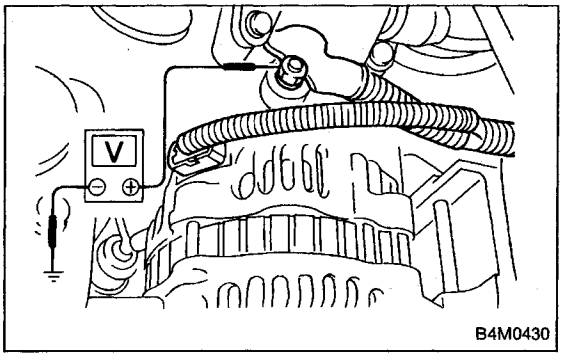
- Power source voltage of the ABSCM&H/U is low or high.

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8T1	CHECK GENERATOR.

1) Start engine.
2) Idling after warm-up.
3) Measure voltage between generator B terminal and chassis ground.

Terminal
Generator B terminal — Chassis ground:

CHECK ***: Is the voltage between 10 V and 17 V?***

YES : Go to step **8T2.**

NO : Repair generator.

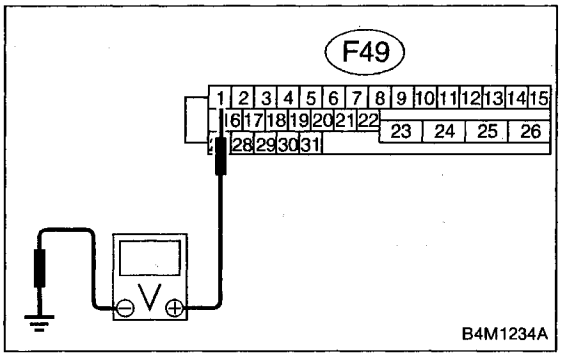
8T2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK ***: Are the positive and negative battery terminals tightly clamped?***

YES : Go to step **8T3.**

NO : Tighten the clamp of terminal.



8T3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

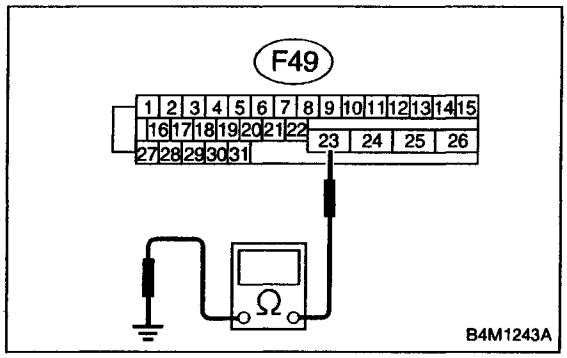
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 17 V?***

YES : Go to step **8T4.**

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



8T4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK : ***Is the resistance less than 0.5 Ω?***
YES : Go to step **8T5**.
NO : Repair ABSCM&H/U ground harness.

8T5	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***
YES : Repair connector.
NO : Go to step **8T6**.

8T6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **8T7**.

8T7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

U: TROUBLE CODE 44 — A COMBINATION OF AT CONTROL ABNORMAL —

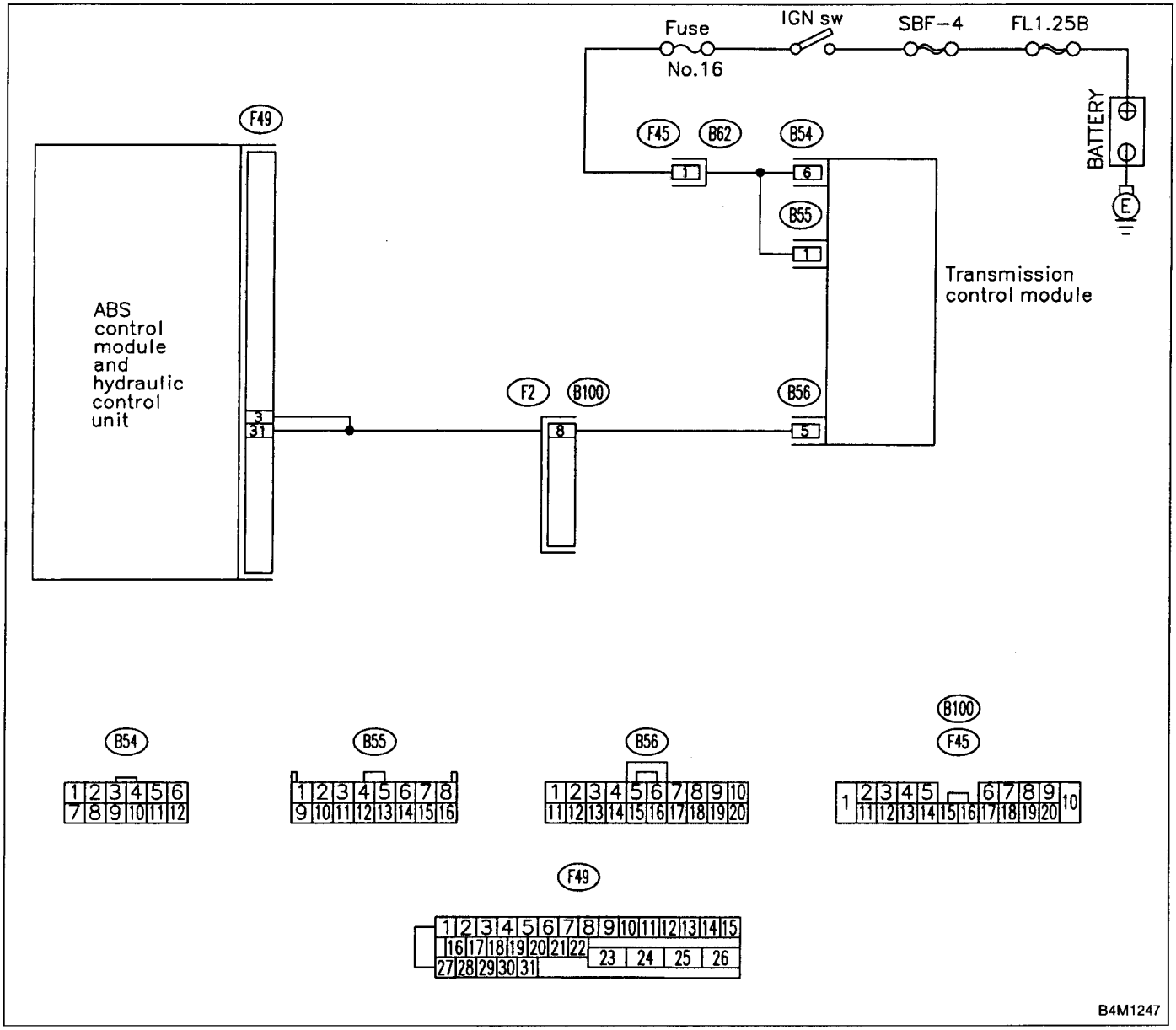
DIAGNOSIS:

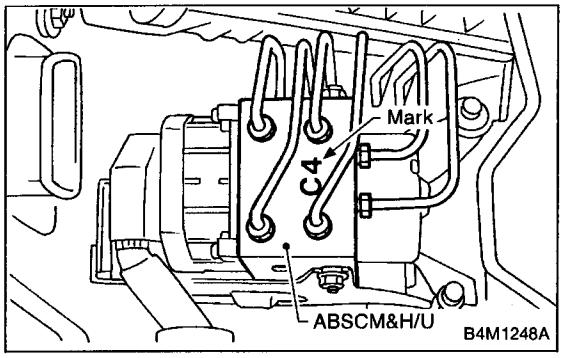
- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8U1	CHECK SPECIFICATIONS OF THE ABSCM.

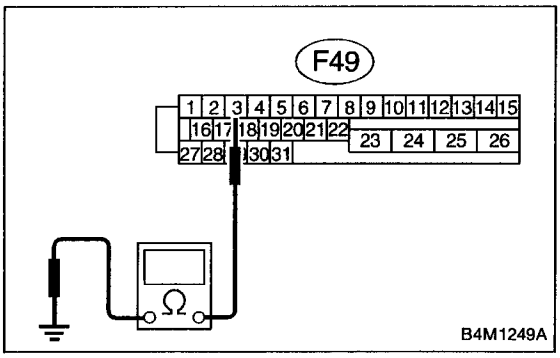
Check specifications of the mark to the ABSCM&H/U.

Mark	Model
C3	AWD AT
C4	AWD MT

CHECK : ***Is an ABSCM&H/U for AT model installed on a MT model?***

YES : Replace ABSCM&H/U.

NO : Go to step **8U2**.



8U2	CHECK GROUND SHORT OF HARNESS.

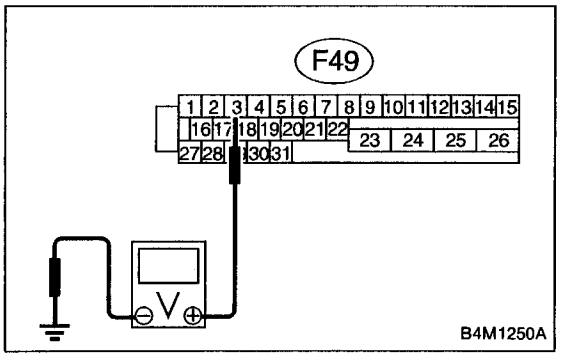
1) Turn ignition switch to OFF.
2) Disconnect two connectors from TCM.
3) Disconnect connector from ABSCM&H/U.
4) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 — Chassis ground:

CHECK : ***Is the resistance more than 1 MΩ?***

YES : Go to step **8U3**.

NO : Repair harness between TCM and ABSCM&H/U.



8U3	CHECK BATTERY SHORT OF HARNESS.

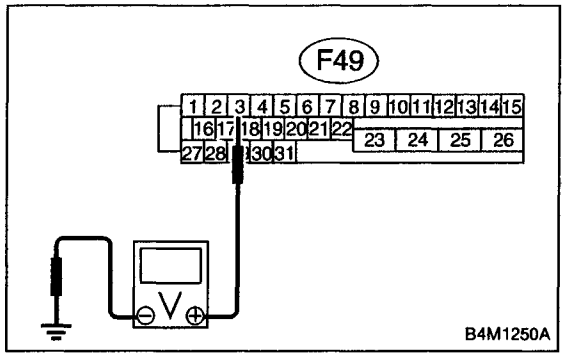
Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (–):

CHECK : ***Is the voltage less than 1 V?***

YES : Go to step **8U4**.

NO : Repair harness between TCM and ABSCM&H/U.



8U4	CHECK BATTERY SHORT OF HARNESS.

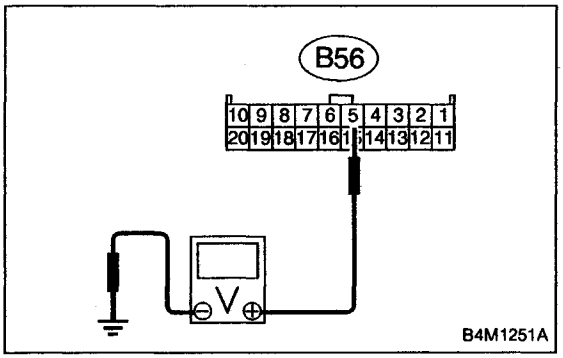
1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (–):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8U5**.

NO : Repair harness between TCM and ABSCM&H/U.



8U5	CHECK TCM.

1) Turn ignition switch to OFF.
2) Connect all connectors to TCM.
3) Turn ignition switch to ON.
4) Measure voltage between TCM connector terminal and chassis ground.

Connector & terminal
(B56) No. 5 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8U7**.

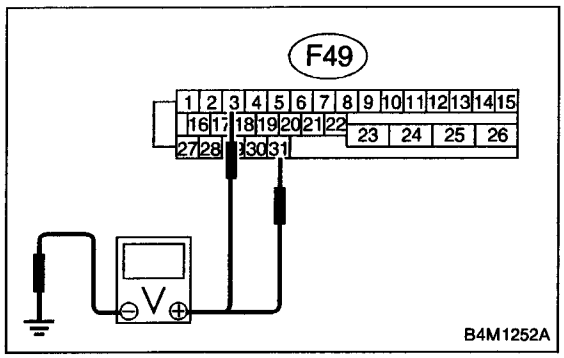
NO : Go to step **8U6**.

8U6	CHECK AT.

CHECK ***: Is the AT functioning normally?***

YES : Replace TCM.

NO : Repair AT.



8U7	CHECK OPEN CIRCUIT OF HARNESS.

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (–):
(F49) No. 31 (+) — Chassis ground (–):

CHECK : ***Is the voltage between 10 V and 15 V?***

YES : Go to step **8U8**.

NO : Repair harness/connector between TCM and ABSCM&H/U.

8U8	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between TCM and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **8U9**.

8U9	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8U10**.

8U10	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

V: TROUBLE CODE 51
— ABNORMAL VALVE RELAY —

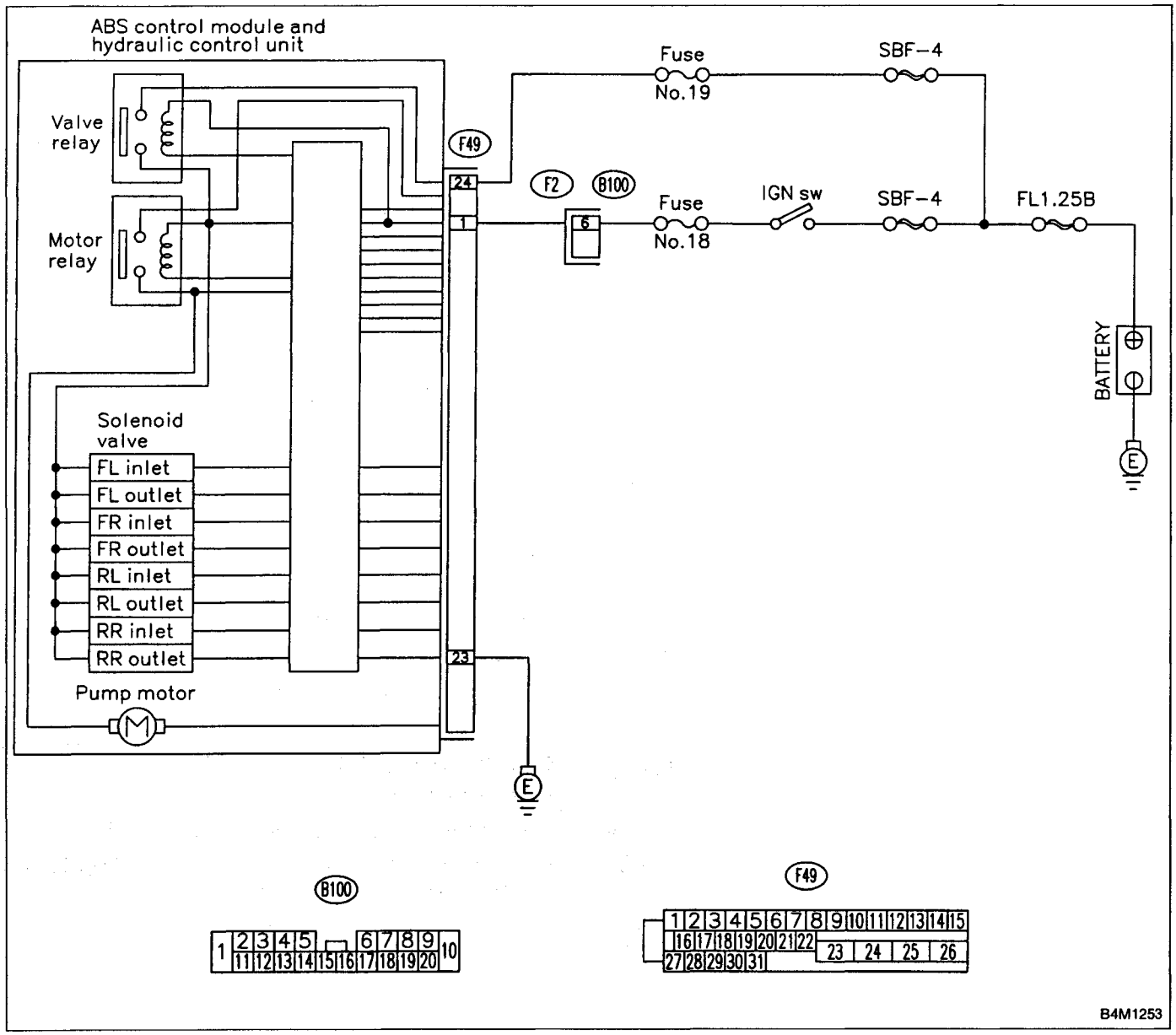
DIAGNOSIS:

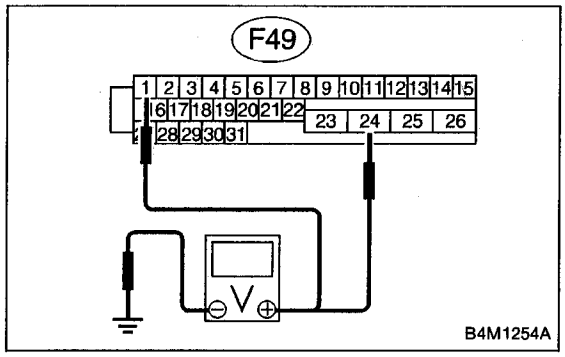
- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8V1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

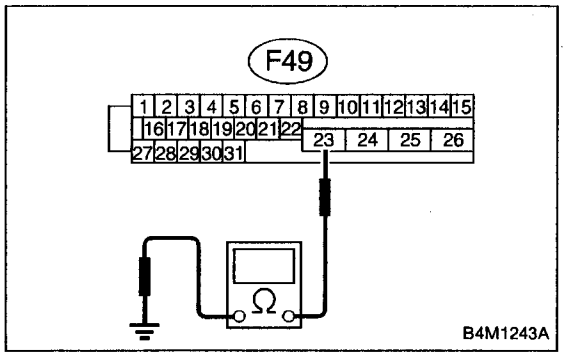
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Run the engine at idle.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):
(F49) No. 24 (+) — Chassis ground (–):

CHECK : ***Is the voltage between 10 V and 15 V?***

YES : Go to step **8V2**.

NO : Repair harness connector between battery and ABSCM&H/U.



8V2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

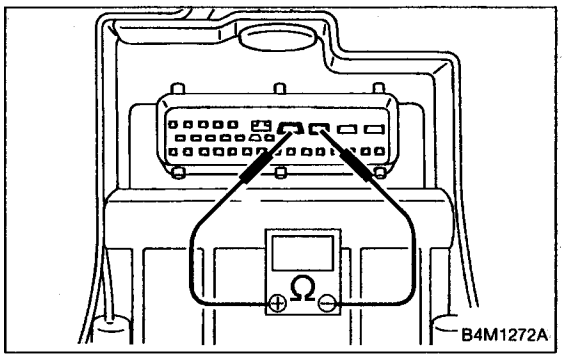
1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK : ***Is the resistance less than 0.5 Ω?***

YES : Go to step **8V3**.

NO : Repair ABSCM&H/U ground harness.



8V3	CHECK VALVE RELAY IN ABSCM&H/U.

Measure resistance between ABSCM&H/U and terminals.

Terminals
No. 23 (+) — No. 24 (–):

CHECK : ***Is the resistance more than 1 MΩ?***

YES : Go to step **8V4**.

NO : Replace ABSCM&H/U.

8V4	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **8V5**.

8V5	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8V6**.

8V6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

W: TROUBLE CODE 52 — ABNORMAL MOTOR AND/OR MOTOR RELAY —

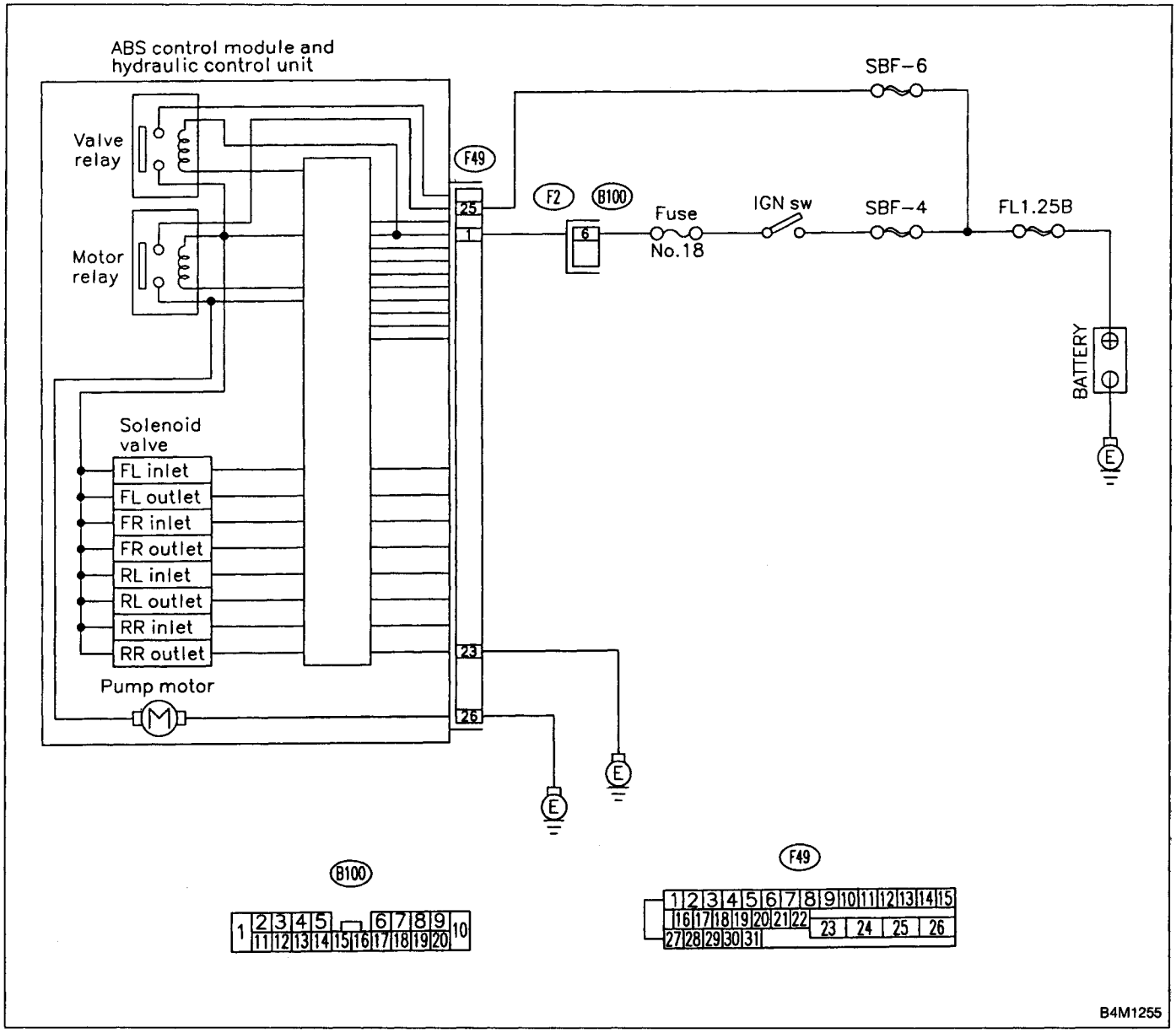
DIAGNOSIS:

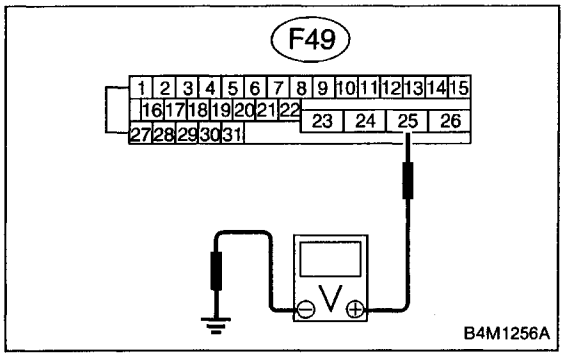
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8W1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

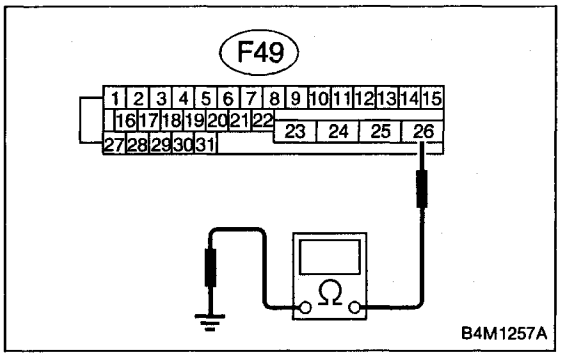
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 25 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8W2**.

NO : Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6.



8W2	CHECK GROUND CIRCUIT OF MOTOR.

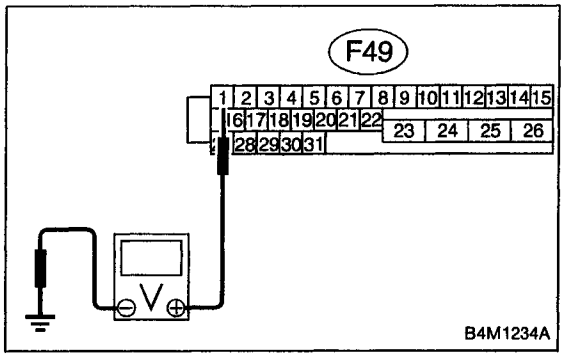
1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 26 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **8W3**.

NO : Repair ABSCM&H/U ground harness.



8W3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

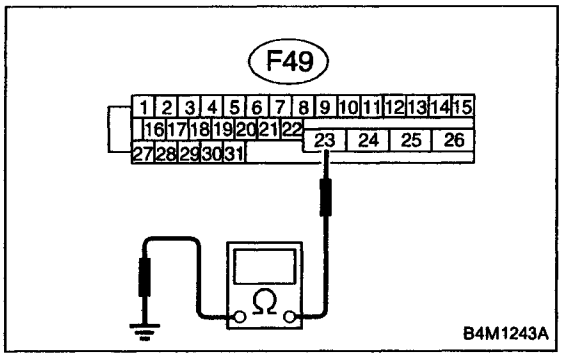
1) Run the engine at idle.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8W4**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



8W4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **8W5**.

NO : Repair ABSCM&H/U ground harness.

8W5	CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W25D1].>

NOTE:
Use the diagnosis connector to operate the sequence control.

CHECK ***: Can motor revolution noise (buzz) be heard when carrying out the sequence control?***

YES : Go to step **8W6**.

NO : Replace ABSCM&H/U.

8W6	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connector between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **8W7**.

8W7	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8W8**.

8W8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

X: TROUBLE CODE 54
— ABNORMAL STOP LIGHT SWITCH —

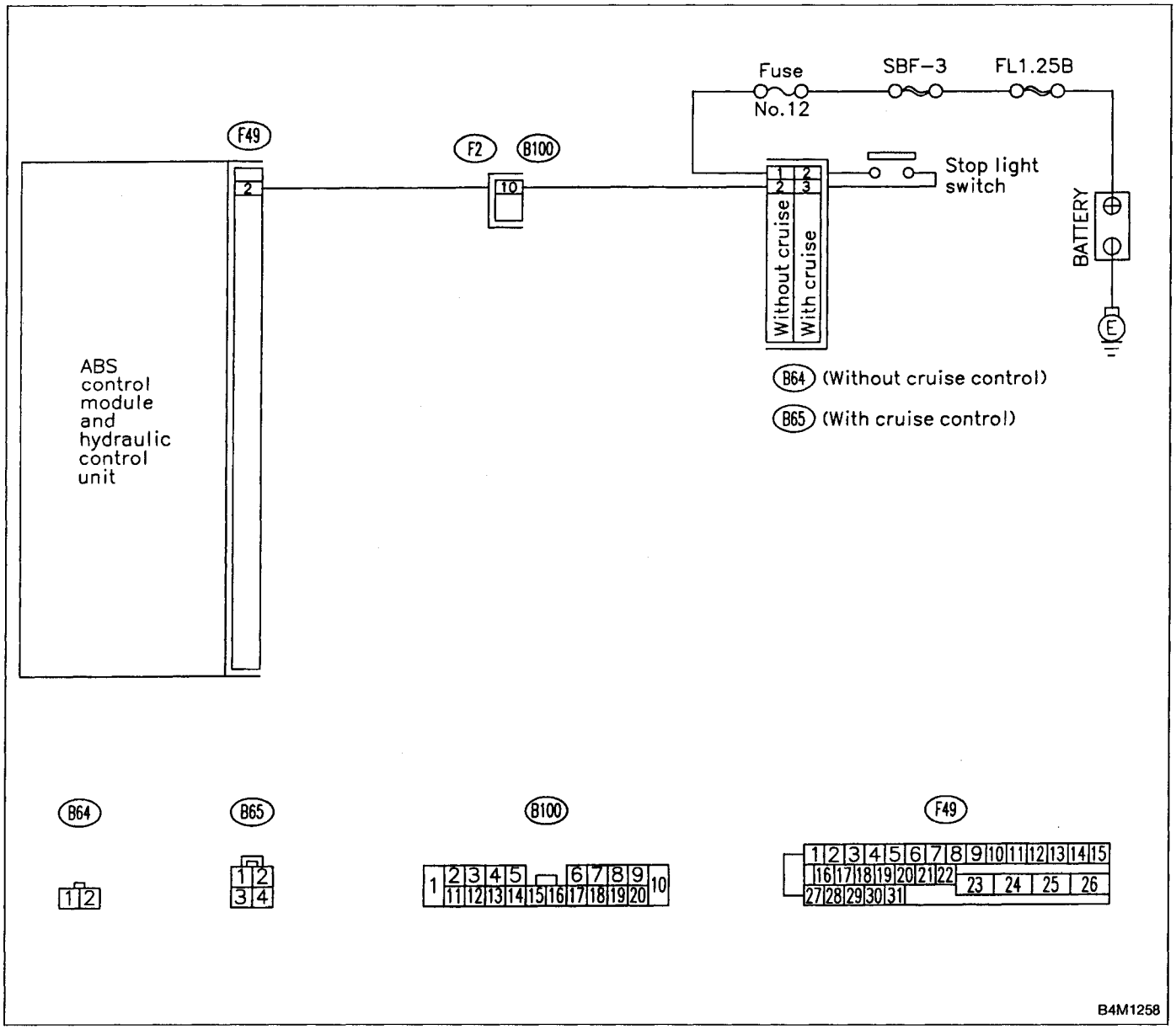
DIAGNOSIS:

- Faulty stop light switch

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



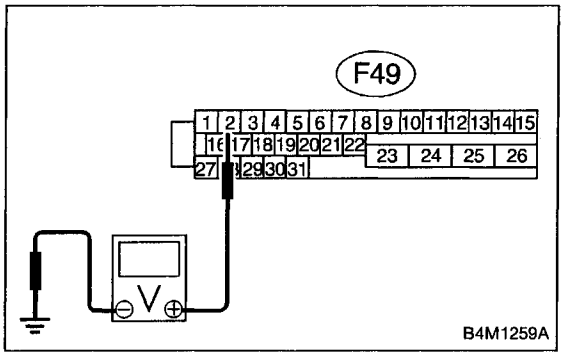
8X1	CHECK STOP LIGHTS COME ON.

Depress the brake pedal.

CHECK : ***Do stop lights come on?***

YES : Go to step **8X2.**

NO : Repair stop lights circuit.



8X2	CHECK OPEN CIRCUIT IN HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Depress brake pedal.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 2 (+) — Chassis ground (–):

CHECK : ***Is the voltage between 10 V and 15 V?***

YES : Go to step **8X3.**

NO : Repair harness between stop light switch and ABSCM&H/U.

8X3	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connector between stop light switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **8X4.**

8X4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8X5.**

8X5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

Y: TROUBLE CODE 56 — ABNORMAL G SENSOR OUTPUT VOLTAGE —

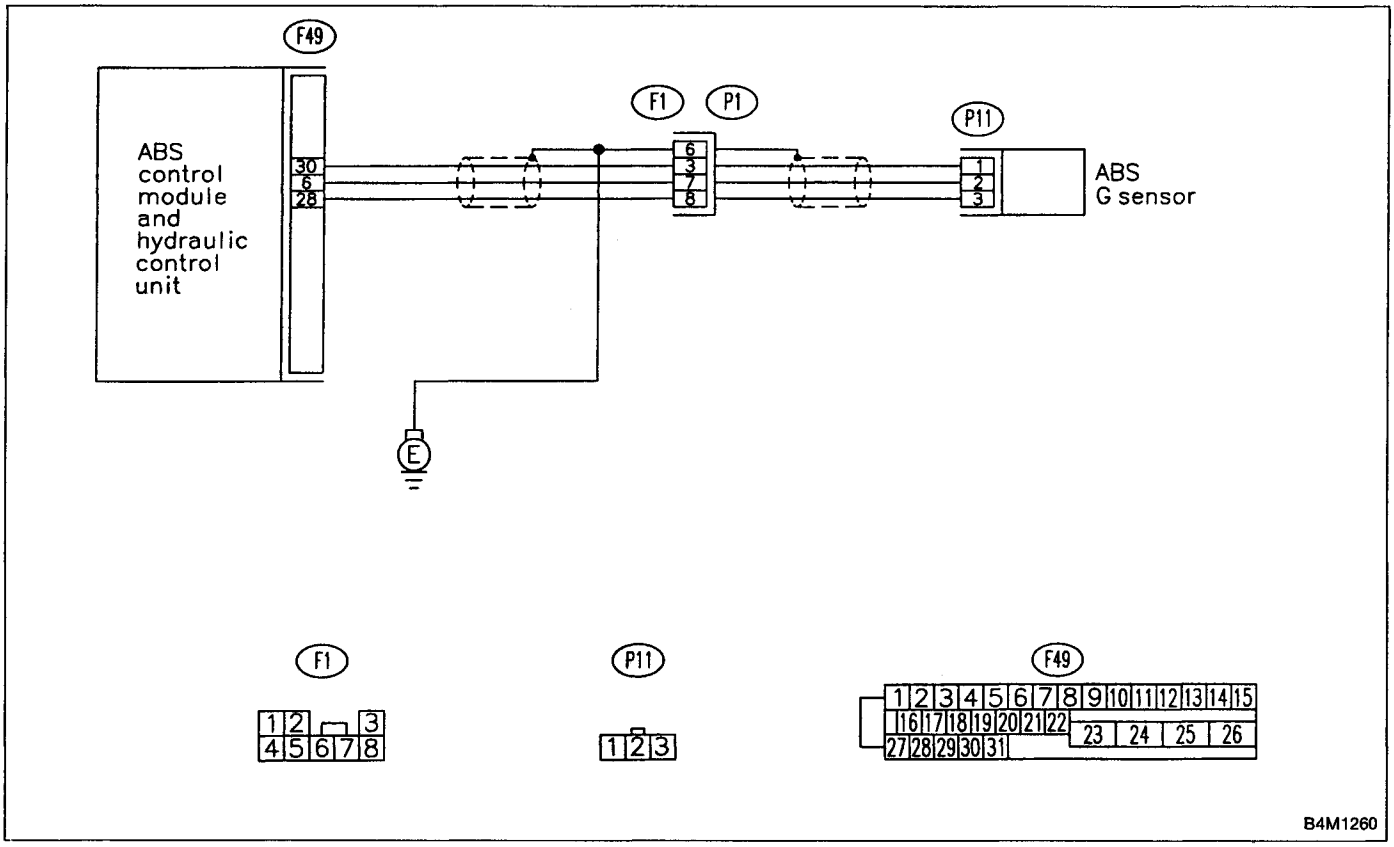
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

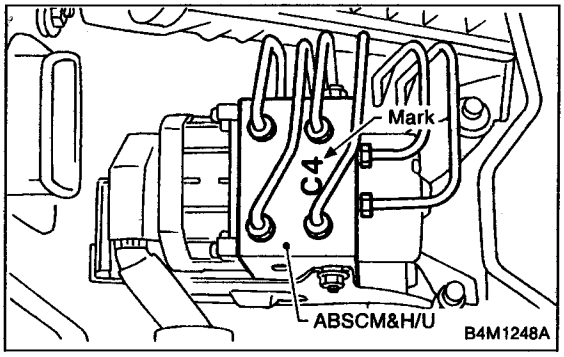


8Y1	CHECK ALL FOUR WHEELS FOR FREE TURNING.

CHECK : ***Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?***

YES : The ABS is normal. Erase the trouble code.

NO : Go to step **8Y2**.



8Y2	CHECK SPECIFICATIONS OF ABSCM&H/U.

Check specifications of the mark to the ABSCM&H/U.

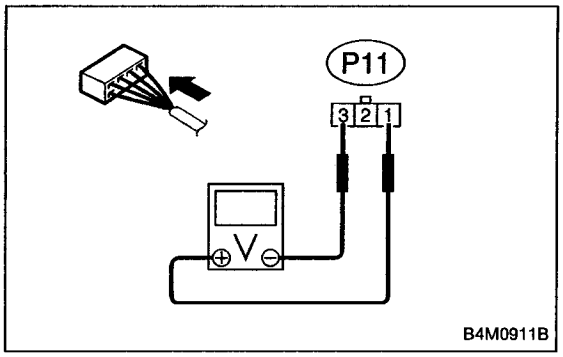
Mark	Model
C3	AWD AT
C4	AWD MT

CHECK : ***Is an ABSCM for AWD model installed on a FWD model?***

CAUTION:
Be sure to turn ignition switch to OFF when removing ABSCM&H/U.

YES : Replace ABSCM&H/U.

NO : Go to step **8Y3**.



8Y3	CHECK INPUT VOLTAGE OF G SENSOR.

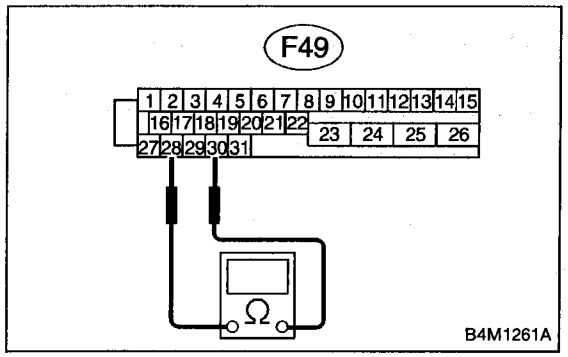
1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect G sensor from body. (Do not disconnect connector.)
4) Turn ignition switch to ON.
5) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 1 (+) — No. 3 (–):

CHECK : ***Is the voltage between 4.75 and 5.25 V?***

YES : Go to step **8Y4**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.



8Y4	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

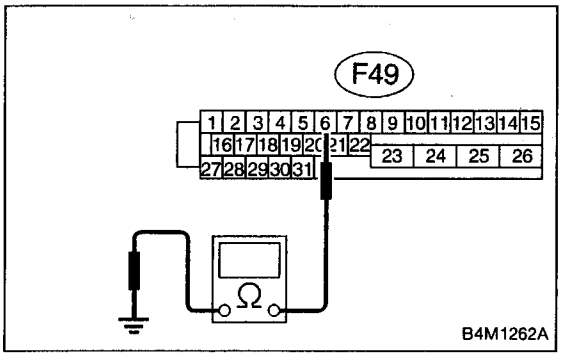
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK ***: Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **8Y5**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.



8Y5	CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

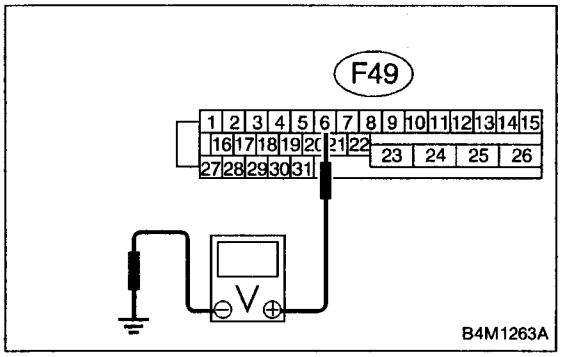
1) Disconnect connector from G sensor.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **8Y6**.

NO : Repair harness between G sensor and ABSCM&H/U.



8Y6	CHECK BATTERY SHORT OF HARNESS.

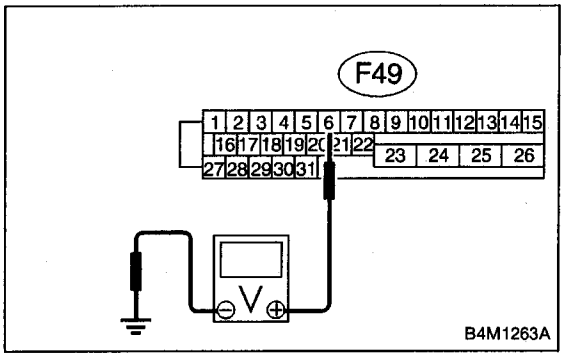
Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (–):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8Y7**.

NO : Repair harness between G sensor and ABSCM&H/U.



8Y7	CHECK BATTERY SHORT OF HARNESS.

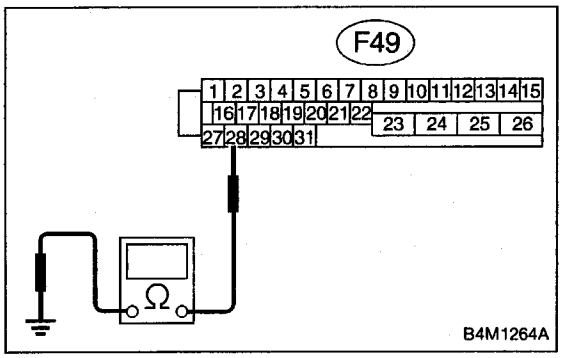
1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (–):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8Y8**.

NO : Repair harness between G sensor and ABSCM&H/U.



8Y8	CHECK GROUND SHORT OF HARNESS.

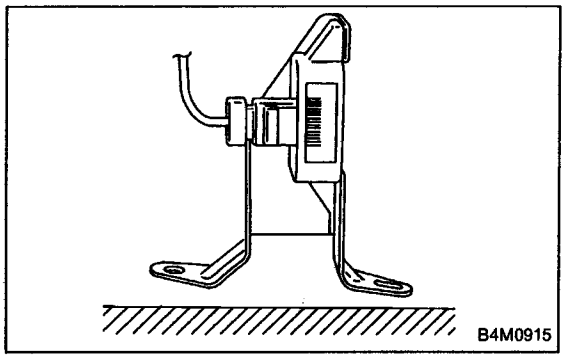
Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 28 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **8Y9**.

NO : Repair harness between G sensor and ABSCM&H/U.
Replace ABSCM&H/U.



8Y9	CHECK G SENSOR.

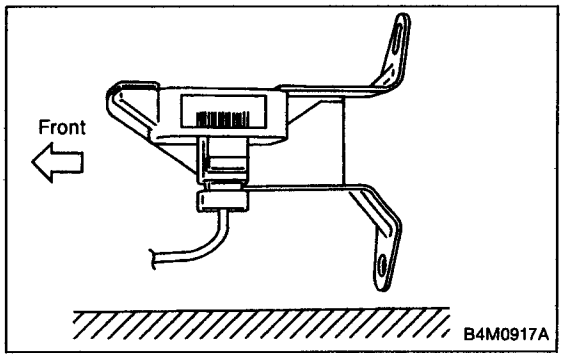
1) Turn ignition switch to OFF.
2) Remove G sensor from vehicle.
3) Connect connector to G sensor.
4) Connect connector to ABSCM&H/U.
5) Turn ignition switch to ON.
6) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK : ***Is the voltage between 2.1 and 2.4 V when G sensor is horizontal?***

YES : Go to step **8Y10**.

NO : Replace G sensor.



8Y10	CHECK G SENSOR.

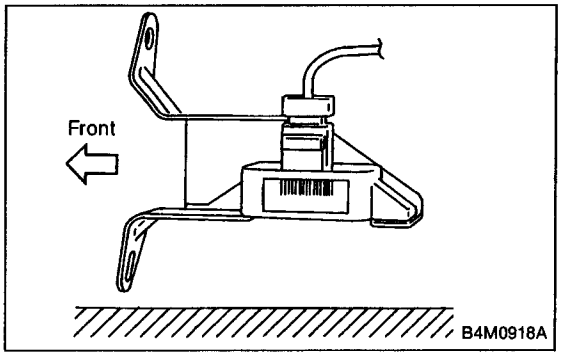
Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK : ***Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **8Y11**.

NO : Replace G sensor.



8Y11	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK : ***Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **8Y12**.

NO : Replace G sensor.

8Y12	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **8Z12**.

8Y13	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

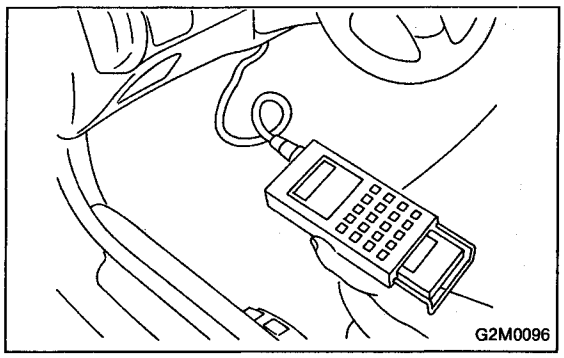
NO : Go to step **8Y14**.

8Y14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



9. Select Monitor Function Mode

Applicable cartridge of select monitor: No. 498346300

A: LIST OF FUNCTION MODE

1. F MODE (ROM ID, ANALOG DATA ARE DISPLAYED.)

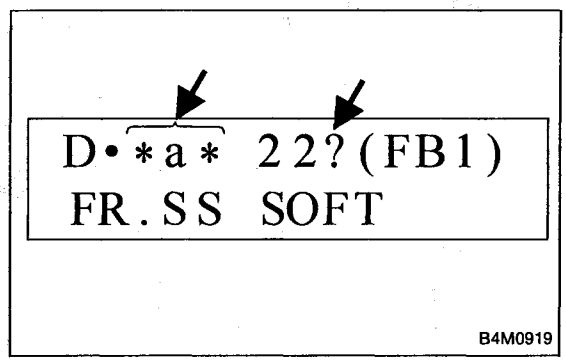
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
F00	ROM ID	ECM identification	ROM ID number of ECM is read and enabled communication state is displayed.	Possible	[T9B0]☆10
F01	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	[T9C0]☆10
F02	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	[T9D0]☆10
F03	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	[T9E0]☆10
F04	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	[T9F0]☆10
F05	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	[T9C0]☆10
F06	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	[T9D0]☆10
F07	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	[T9E0]☆10
F08	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	[T9F0]☆10
F09	BLS	Stop light switch monitor	Stop light switch monitor voltage is displayed.	Possible	[T9G0]☆10
F10	G-SENS	G sensor output voltage (V)	Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.	Possible	[T9H0]☆10

2. FA MODE (ON/OFF DATA ARE DISPLAYED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FA0	B1	Stop light switch	LED 1 comes on with the switch on (with the brake pedal down).	Possible	[T9I0]☆10
	VR	Valve relay signal	LED 2 comes on with the valve relay off.		
	MR	Motor relay signal	LED 3 comes on with the motor on.		
	AT	AT ABS signal	LED 4 comes on when ABS control is on.		
	AW	ABS warning light	LED 6 comes on when the warning light is on.		
	VM	Valve relay monitor	LED 1 comes on with the valve relay off.		
	MM	Motor relay monitor	LED 8 comes on when the motor relay is on.		
	CM	CCM signal	LED 9 comes on when ABS control is on.		

3. FB MODE (TROUBLE CODES ARE DISPLAYED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FB1	D-ALL	History of trouble codes is displayed.	A maximum of 3 trouble codes are displayed in order of occurrence.	Possible	[T10B0]☆10
	D-NEW		The most recent trouble code appears on the select monitor display.		
	D-MID		The second most recent trouble code appears on the select monitor display.		
	D-OLD		The third most recent trouble code appears on the select monitor display.		
	D-REF		A specified period of time proceeding trouble code appears on the select monitor display.		



NOTE:
- If a particular trouble code is not properly stored in memory (due to a drop in ABSCM&H/U power supply, etc.) when a problem occurs, the trouble code, followed by a question mark "?", appears on the select monitor display. This shows it may be an unreliable reading.
- *a* refers to the troubles in order of occurrence (NEW. MID, OLD and REF).

4. FC MODE (TROUBLE CODES ARE ERASED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FC0	D-CLR	History of trouble codes is erased.	Function of clearing trouble code.	Possible	[T9J0]☆10

5. FD MODE (ABS SEQUENCE CONTROL MODE)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FD1	A-CHK	ABS sequence control	Perform ABS sequence control by operating valve and pump motor sequentially.	Impossible	4-4 [W25D2]☆10

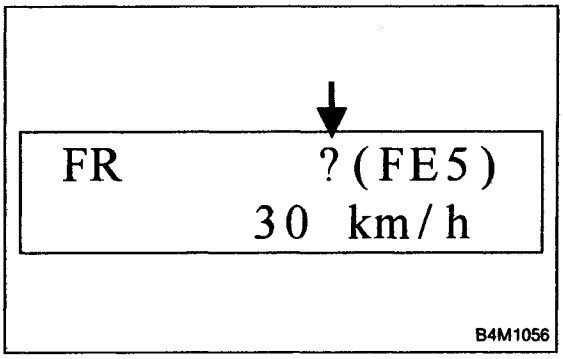
6. FE MODE (FREEZE FRAME DATA)

NOTE:

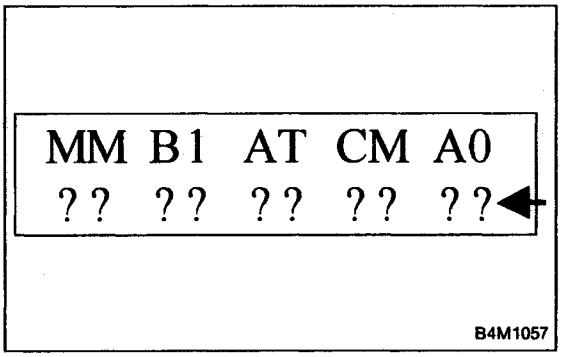
- Data stored at the time of trouble occurrence is shown on display.
- Each time trouble occurs, the latest information is stored in the freeze frame data in memory.

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FE1	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	[T9K0]☆10
FE2	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	[T9L0]☆10
FE3	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	[T9M0]☆10
FE4	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	[T9N0]☆10
FE5	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	[T9K0]☆10
FE6	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	[T9L0]☆10
FE7	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	[T9M0]☆10
FE8	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	[T9N0]☆10
FE13	POWER	ABSCM&H/U power supply voltage (V)	Power (in volts) supplied to ABSCM&H/U appears on the select monitor display.	Possible	[T9O0]☆10
FE14	G-SENS	G sensor output voltage (V)	Refers to vehicle acceleration detected by the analog G sensor. It appears on the select monitor display in volts.	Possible	[T9P0]☆10
FE15	MM	Motor relay monitor	LED 1 comes on when motor relay is on.	Possible	[T9Q0]☆10
	B1	Stop light switch	LED 2 comes on with the stop light switch on (with the brake pedal depressed).		
	AT	AT ABS signal	LED 3 comes on when ABS control is on.		
	CM	CCM signal	LED 4 comes on when ABS control is on.		
	A0	ABS control	LED 5 comes on when ABS control is on.		
FE16	CODE	Trouble code	The most recent trouble code appears on select monitor display.	Possible	[T9R0]☆10

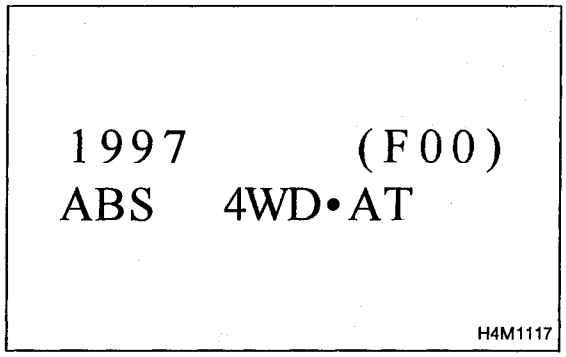
1) When a trouble code is not stored in memory, activating the FE mode causes the initial value to appear on the select monitor display.
- FE1 — 4: 159 mile/h
- FE5 — 8: 255 km/h
- FE13: 18.05 V
- FE14: 5.00 V
- FE15: The MM, B1 and A0 LEDs are on. The AT and CM LEDs are out.
- FE16: NO HISTORY OF OCCURRED



2) If freeze frame data is not properly stored in memory (due to a drop in ABSCM power supply, etc.), a trouble code, preceded by a question mark "?", appears on the select monitor display. This shows it may be an unreliable reading.



3) When a trouble code is detected in the FE mode, a question mark "?" appears continuously on the select monitor display until the freeze frame data is stored in memory.



B: MODE F00 — ROM ID NUMBER (ROM) —

CONDITION:

Ignition switch ON

SPECIFIED DATA:

Presentation display

9B1	CHECK MESSAGE OF DISPLAY.

CHECK : ***Does display indicate message "Error 1"?***

YES : Repair loose or disconnect connector, or discontinued circuit in data link circuit.

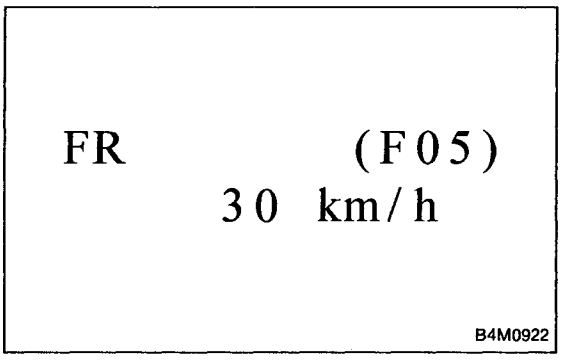
NO : Go to step **9B2**.

9B2	CHECK MESSAGE OF DISPLAY.

CHECK : ***Does display indicate message "Error 2"?***

YES : Repair poor contact of select monitor cartridge, or installation of different type select monitor cartridge.

NO : Data link system is normal.

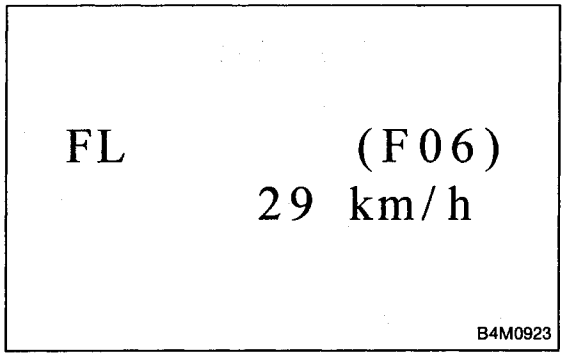


C: MODE F01 AND F05 — FRONT RIGHT WHEEL SPEED SIGNAL (FR) —

- Compare speedometer with monitor indications.
- F01: FR wheel speed is indicated in mile per hour (mile/h).
- F05: FR wheel speed is indicated in kilometer per hour (km/h).

NOTE:

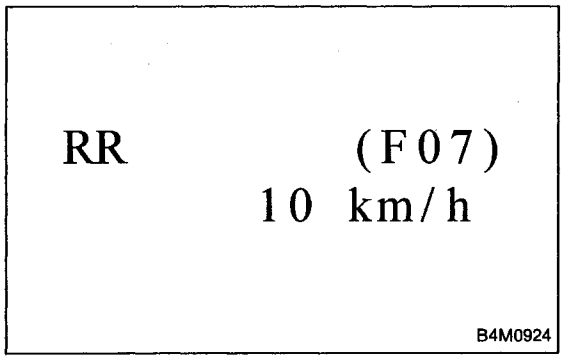
The monitor as shown, indicates that FR wheel speed is 30 km/h.



D: MODE F02 AND F06 — FRONT LEFT WHEEL SPEED SIGNAL (FL) —

- Compare speedometer with monitor indications.
- F02: FL wheel speed is indicated in mile per hour (mile/h).
- F06: FL wheel speed is indicated in kilometer per hour (km/h).

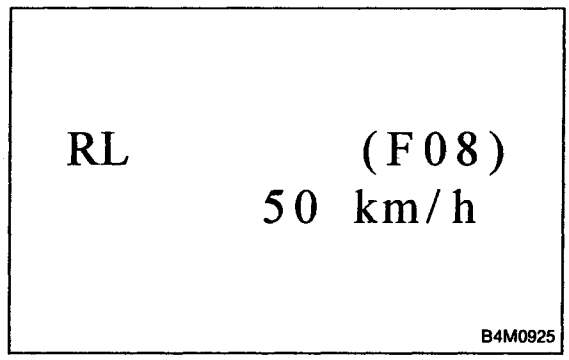
NOTE:
The monitor as shown, indicates that FL wheel speed is 29 km/h.



E: MODE F03 AND F07 — REAR RIGHT WHEEL SPEED SIGNAL (RR) —

- Compare speedometer with monitor indications.
- F03: RR wheel speed is indicated in mile per hour (mile/h).
- F07: RR wheel speed is indicated in kilometer per hour (km/h).

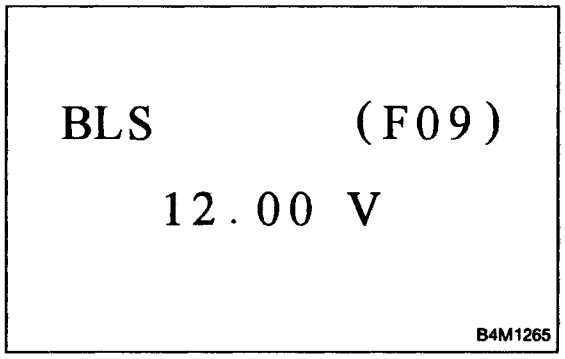
NOTE:
The monitor as shown, indicates that RR wheel speed is 10 km/h.



F: MODE F04 AND F08
— REAR LEFT WHEEL SPEED SIGNAL (RL) —

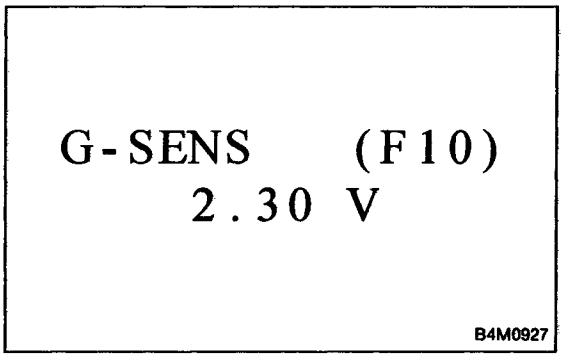
- Compare speedometer with monitor indications.
- F04: RL wheel speed is indicated in mile per hour (mile/h).
- F08: RL wheel speed is indicated in kilometer per hour (km/h).

NOTE:
The monitor as shown, indicates that RL wheel speed is 50 km/h.



G: MODE F09
— STOP LIGHT SWITCH MONITOR (BLS) —

- Stop light switch monitor voltage is displayed.

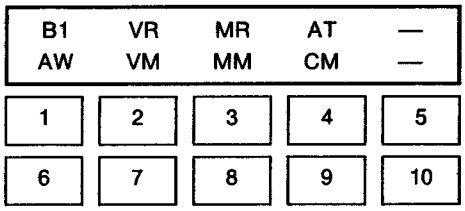


H: MODE F10
— G SENSOR OUTPUT VOLTAGE (G-SENS) —

- Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.

NOTE:
Only AWD model

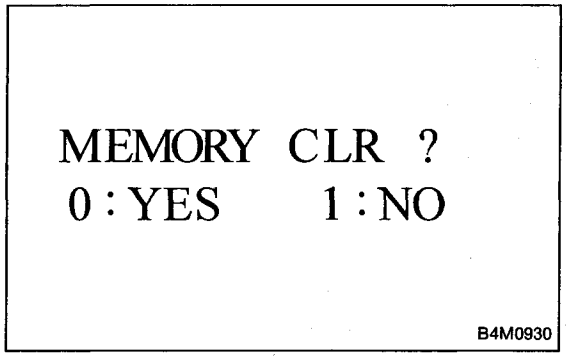
LED No.	Signal name	Display
1	Stop light switch	B1
2	Valve relay signal	VR
3	Motor relay signal	MR
4	AT ABS signal	AT
5	—	—
6	ABS warning light	AW
7	Valve relay monitor	VM
8	Motor relay monitor	MM
9	CCM signal	CM
10	—	—



I: MODE FA0
— ON ↔ OFF SIGNAL —

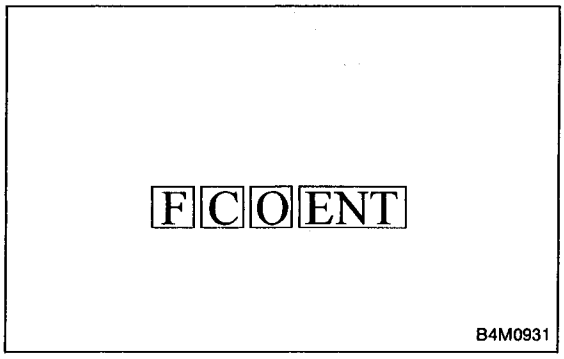
Requirement for LED "ON"

LED No. 1 Stop light switch is turned ON. (With brake pedal depressed.)
LED No. 2 Valve relay is turned OFF.
LED No. 3 Motor relay is turned ON.
LED No. 4 ABS control operates.
LED No. 6 ABS warning light is ON.
LED No. 7 Valve relay is turned OFF.
LED No. 8 Motor relay is turned ON.
LED No. 9 ABS control operates.

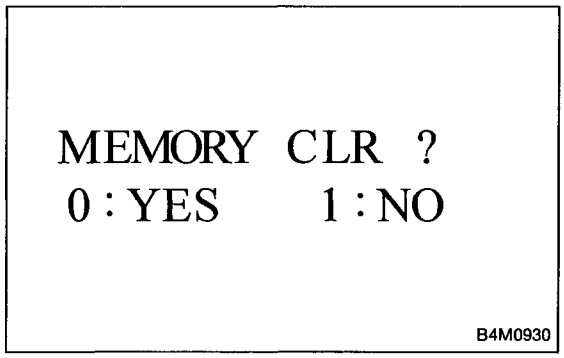


J: MODE FC0
— HISTORY OF TROUBLE CODES IS ERASED (D·CLR) —

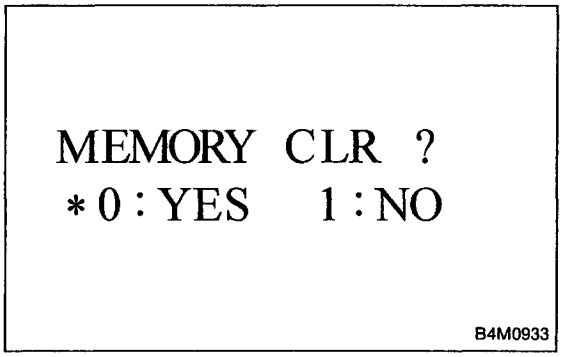
- Deletes the recorded trouble codes in ABS control module.



1) Press the function key [F] [C] [O] [ENT] in that order.

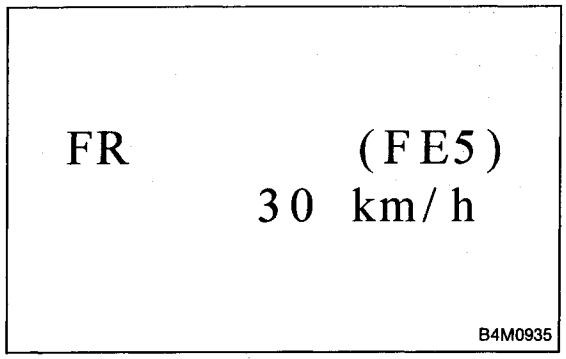


2) System indicates as shown.



3) Press the function key [0], to clear memories. The indication of * is added to screen.

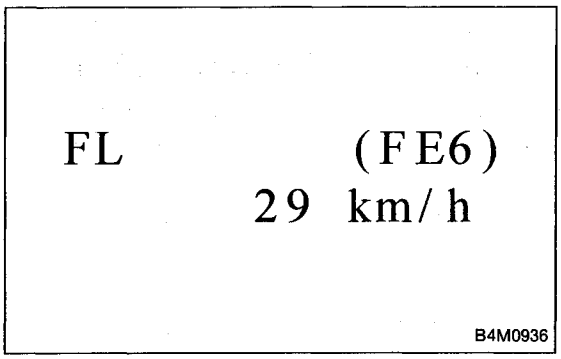
4) Press the function key [ENT]. System indicates as shown.
5) Turn ignition switch to OFF.



K: MODE FE1 AND FE5 — FRONT RIGHT WHEEL SPEED SIGNAL (FR) —

- The wheel speed is indicated at the time of malfunction.
- FE1: FR wheel speed is indicated in mile per hour (mile/h).
- FE5: FR wheel speed is indicated in kilometer per hour (km/h).

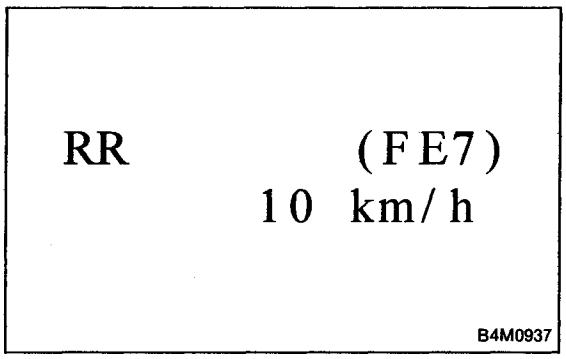
NOTE:
The monitor as shown, indicates that FR wheel speed is 30 km/h.



L: MODE FE2 AND FE6 — FRONT LEFT WHEEL SPEED SIGNAL (FL) —

- The wheel speed is indicated at the time of malfunction.
- FE2: FL wheel speed is indicated in mile per hour (mile/h).
- FE6: FL wheel speed is indicated in kilometer per hour (km/h).

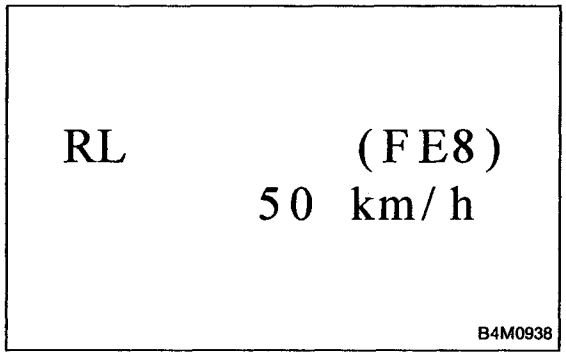
NOTE:
The monitor as shown, indicates that FL wheel speed is 29 km/h.



M: MODE FE3 AND FE7 — REAR RIGHT WHEEL SPEED SIGNAL (RR) —

- The wheel speed is indicated at the time of malfunction.
- FE3: RR wheel speed is indicated in mile per hour (mile/h).
- FE7: RR wheel speed is indicated in kilometer per hour (km/h).

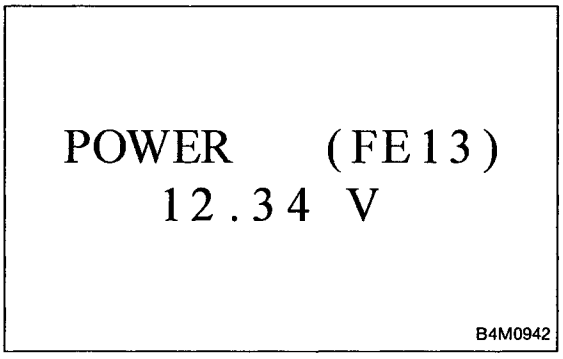
NOTE:
The monitor as shown, indicates that RR wheel speed is 10 km/h.



N: MODE FE4 AND FE8 — REAR LEFT WHEEL SPEED SIGNAL (RL) —

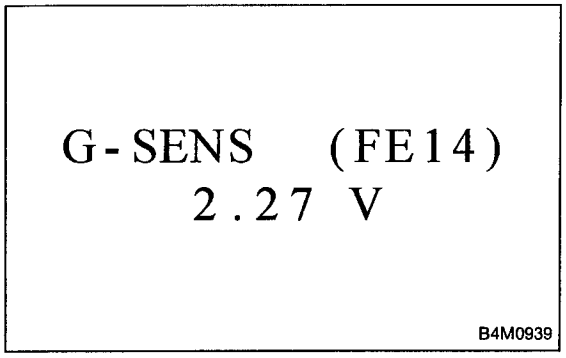
- The wheel speed is indicated at the time of malfunction.
- FE4: RL wheel speed is indicated in mile per hour (mile/h).
- FE8: RL wheel speed is indicated in kilometer per hour (km/h).

NOTE:
The monitor as shown, indicates that RL wheel speed is 50 km/h.



O: MODE FE13 — ABSCM&H/U POWER SUPPLY VOLTAGE (POWER) —

- ABSCM&H/U power supply voltage is indicated at the time of malfunction.

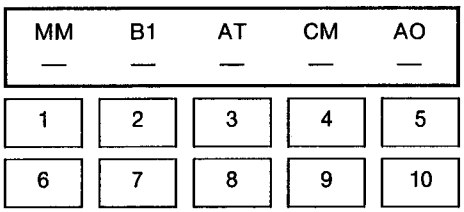


P: MODE FE14
— G SENSOR OUTPUT VOLTAGE (G-SENS) —

● Refers to vehicle acceleration detected by the analog G sensor at the time of malfunction. It appears on the select monitor display in volts.

NOTE:
Only AWD model

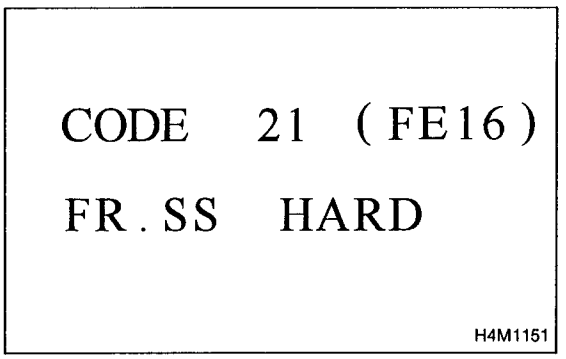
LED No.	Signal name	Display
1	Motor relay monitor	MM
2	Stop light switch	B1
3	AT ABS signal	AT
4	CCM signal	CM
5	ABS signal	AO
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—



Q: MODE FE15
— ON ↔ OFF SIGNAL —

● ON or OFF is indicated at the time of malfunction.
● Requirement for LED "ON"

LED No. 1 Motor relay is turned ON.
LED No. 2 Stop light switch is turned ON. (With brake pedal depressed.)
LED No. 3 ABS control operates.
LED No. 4 ABS control operates.
LED No. 5 ABS control operates.



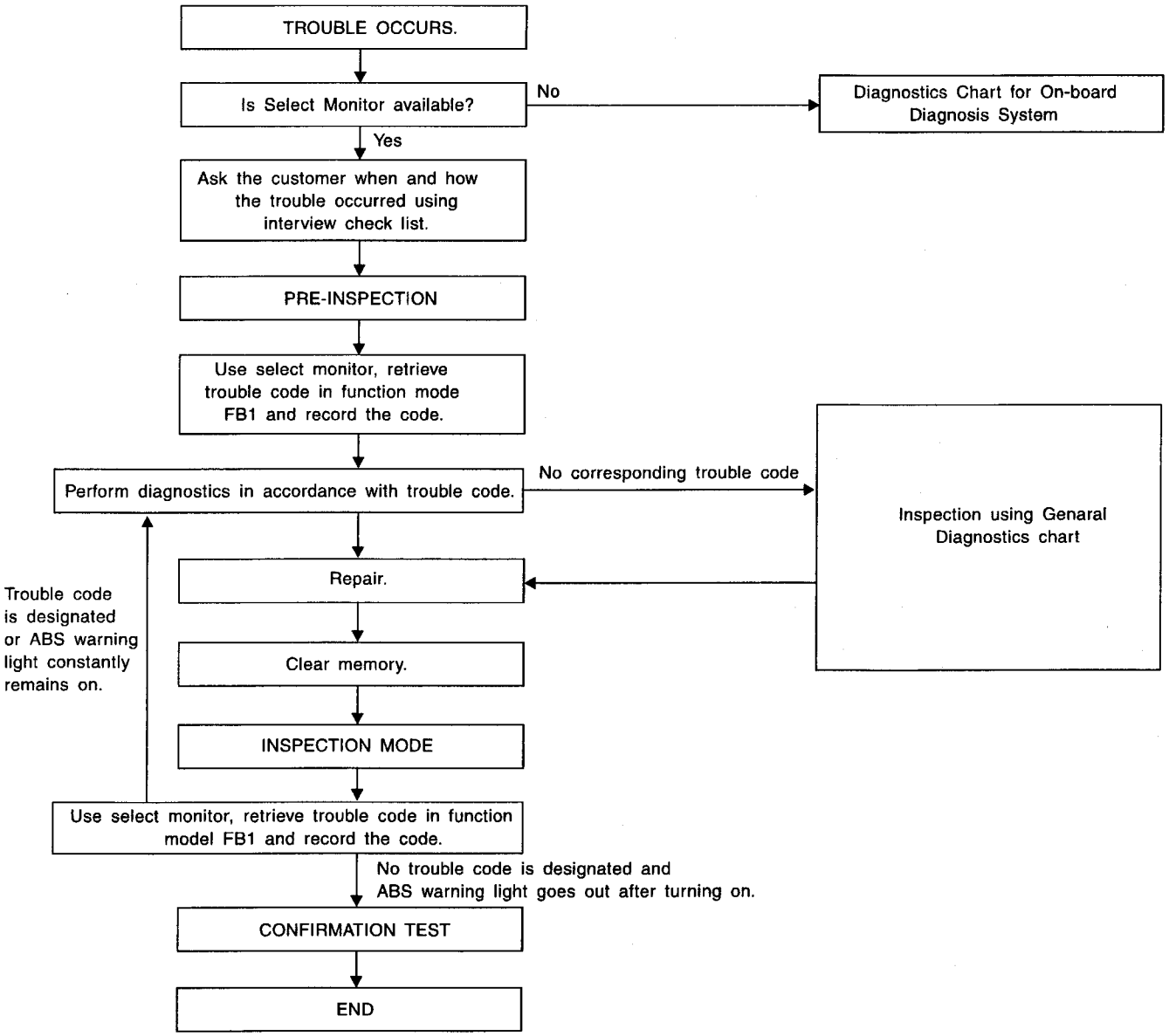
R: MODE FE16
— TROUBLE CODE (CODE) —

● When freeze frame data is stored in memory, trouble code appears on monitor.

NOTE:
The monitor as shown, indicates trouble code 21.

10. Diagnostics Chart with Select Monitor

A: BASIC DIAGNOSTIC CHART



B4M1076A

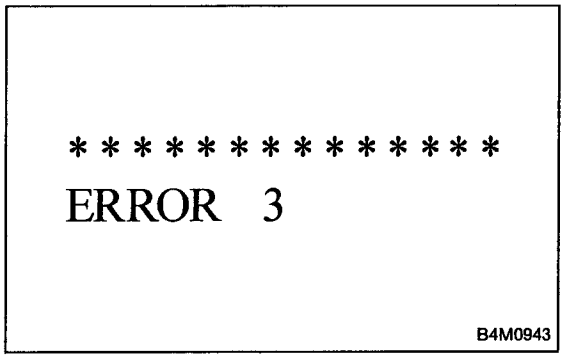
CAUTION:
Remove foreign matter (dust, water, etc.) from the ABSCM&H/U connector during removal and installation.

NOTE:
To check harness for broken wires or short circuits, shake it while holding it or the connector.

B: LIST OF TROUBLE CODE

Code	Display screen (FB1)	Contents of diagnosis	Ref. to
—	ERROR 3 (1)	Select monitor communication failure	[T10C0]☆10
11	NO TROUBLE	Although no trouble appears on the select monitor display, the ABS warning light remains on.	[T10D0]☆10
21	FR. SS HARD	Open circuit or input voltage too high of FR sensor	[T10E0]☆10
22	FR. SS SOFT	Abnormal ABS sensor signal of FR sensor	[T10I0]☆10
23	FL. SS HARD	Open circuit or input voltage too high of FL sensor	[T10F0]☆10
24	FL. SS SOFT	Abnormal ABS sensor signal of FL sensor	[T10J0]☆10
25	RR. SS HARD	Open circuit or input voltage too high of RR sensor	[T10G0]☆10
26	RR. SS SOFT	Abnormal ABS sensor signal of RR sensor	[T10K0]☆10
27	RL. SS HARD	Open circuit or input voltage too high of RL sensor	[T10H0]☆10
28	RL. SS SOFT	Abnormal ABS sensor signal of RL sensor	[T10L0]☆10
29	EITHER. SS SOFT	Abnormal ABS sensor signal (any one of four)	[T10M0]☆10
31	FR. EV VALVE	Abnormal FR inlet valve	[T10N0]☆10
32	FR. AV VALVE	Abnormal FR outlet valve	[T10R0]☆10
33	FL. EV VALVE	Abnormal FL inlet valve	[T10O0]☆10
34	FL. AV VALVE	Abnormal FL outlet valve	[T10S0]☆10
35	RR. EV VALVE	Abnormal RR inlet valve	[T10P0]☆10
36	RR. AV VALVE	Abnormal RR outlet valve	[T10T0]☆10
37	RL. EV VALVE	Abnormal RL inlet valve	[T10Q0]☆10
38	RL. AV VALVE	Abnormal RL outlet valve	[T10U0]☆10
41	ECU	Abnormal ABSCM&H/U	[T10V0]☆10
42	LOW VOLTAGE	Source voltage is low.	[T10W0]☆10
	HIGH VOLTAGE	Source voltage is high.	[T10X0]☆10
44	CCM LINE	A combination of AT control abnormals (ABS not in control)	[T10Y0]☆10
	CCM OPEN	A combination of AT control abnormals (ABS in control)	[T10Z0]☆10
51	V. RELAY	Abnormal valve relay	[T10AA0]☆10
	V. RELAY ON	Valve relay ON failure	[T10AB0]☆10
52	M. RELAY OPEN	Open circuit of motor relay	[T10AC0]☆10
	M. RELAY ON	Motor relay ON failure	[T10AD0]☆10
	MOTOR	Abnormal motor	[T10AE0]☆10
54	BLS	Abnormal stop light switch	[T10AF0]☆10
56	G SENSOR LINE	Open or short circuit of G sensor	[T10AG0]☆10
	G SENSOR +B	Battery short of G sensor	[T10AH0]☆10
	G SENSOR H μ	Abnormal G sensor high μ output	[T10AI0]☆10
	G SENSOR STICK	G sensor output is stuck.	[T10AJ0]☆10

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



C: ERROR 3 (1) — SELECT MONITOR COMMUNICATION FAILURE —

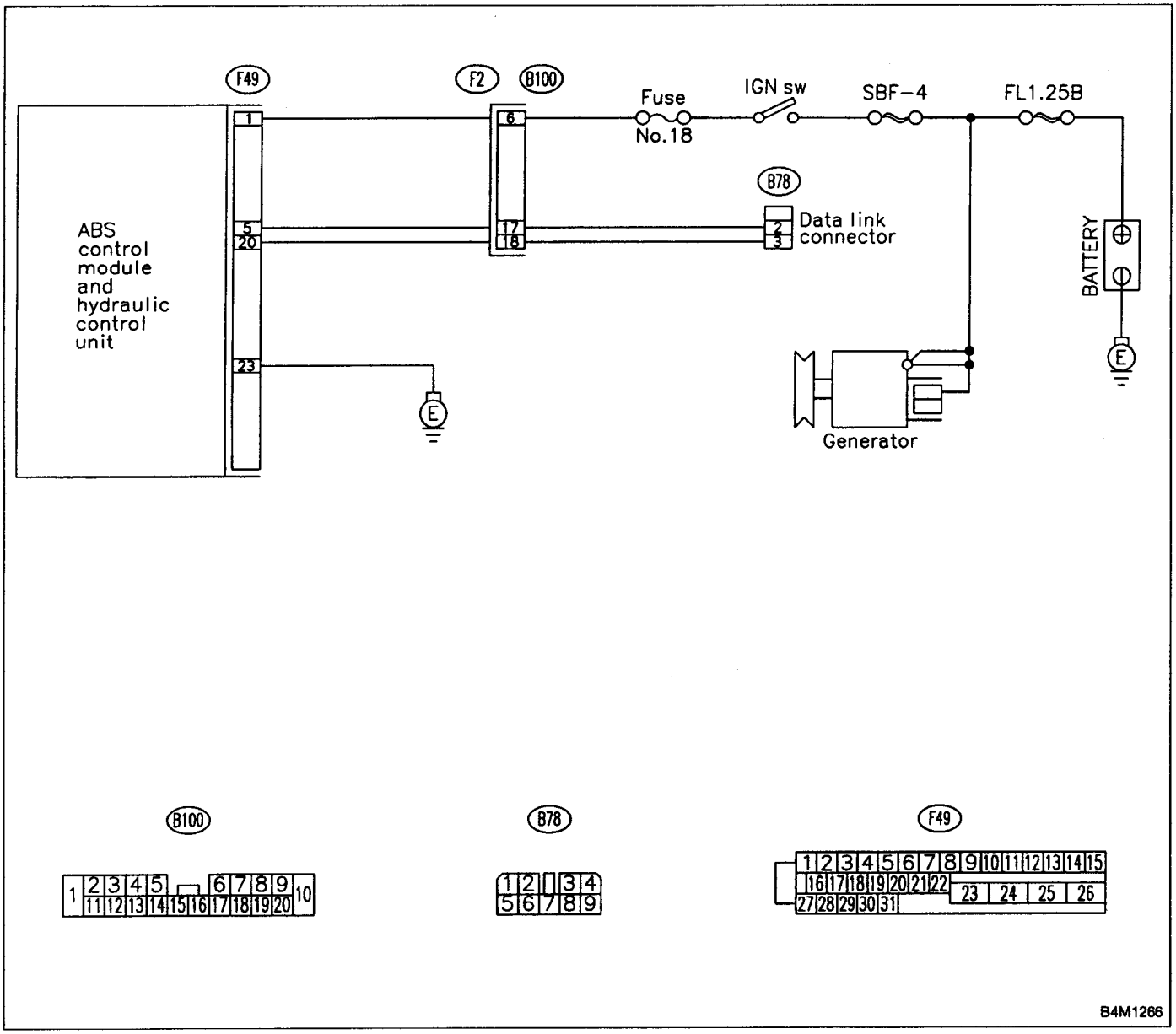
DIAGNOSIS:

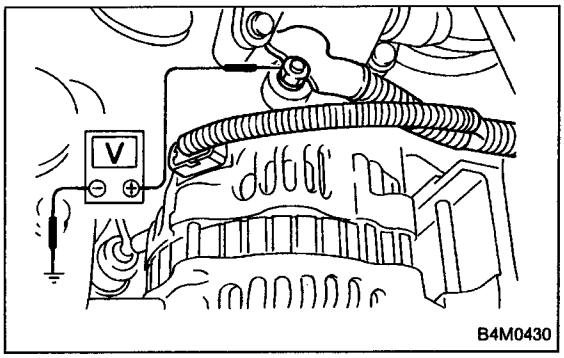
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS warning light remains on.
- ERROR 3 or 1 appears on the select monitor display.

WIRING DIAGRAM:





10C1	CHECK GENERATOR.

1) Start the engine.
2) Idle the engine.
3) Measure voltage between generator and chassis ground.

Terminal
Generator B terminal (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 and 15 V?***
YES : Go to step **10C2**.
NO : Repair generator.

10C2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact at battery terminal?***
YES : Repair battery terminal.
NO : Go to step **10C3**.

10C3	CHECK COMMUNICATION OF SELECT MONITOR.

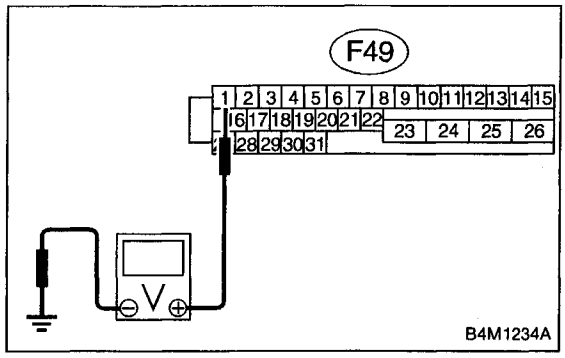
Using the select monitor, check whether communication to other system (such as engine, AT, etc.) can be executed normally.

CHECK ***: Are the name and year of the system displayed on the select monitor?***
YES : Go to step **10C4**.
NO : Repair select monitor communication cable and connector.

10C4	CHECK INSTALLATION OF ABSCM&H/U CONNECTOR.

Turn ignition switch to OFF.

CHECK ***: Is ABSCM&H/U connector inserted into ABSCM&H/U until the clamp locks onto it?***
YES : Go to step **10C5**.
NO : Insert ABSCM&H/U connector into ABSCM&H/U until the clamp locks onto it.



10C5	CHECK POWER SUPPLY OF ABSCM&H/U.

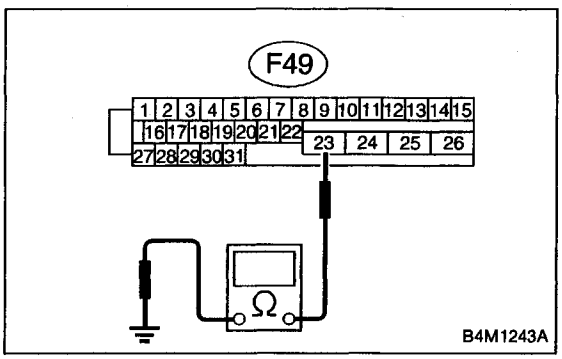
1) Disconnect connector from ABSCM&H/U.
2) Start engine.
3) Idle the engine.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 and 15 V?***

YES : Go to step **10C6**.

NO : Repair ABSCM&H/U power supply circuit.



10C6	CHECK GROUND CIRCUIT OF ABSCM&H/U.

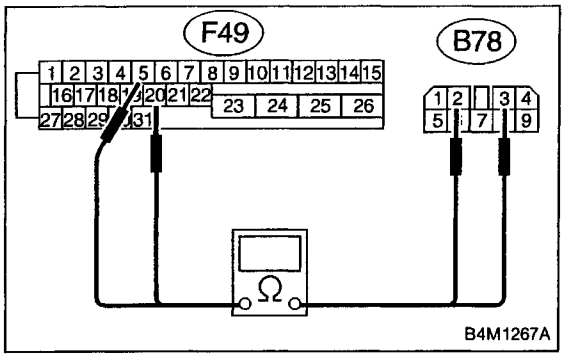
1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Repair harness/connector between ABSCM&H/U and select monitor.

NO : Go to step **10C7**.



10C7	CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND DATA LINK CONNECTOR.

1) Turn ignition switch OFF.
2) Measure resistance between ABSCM&H/U connector and data link connector.

Connector & terminal
(F49) No. 20 — (B78) No. 3:
(F49) No. 5 — (B78) No. 2:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Repair harness and connector between ABSCM&H/U and data link connector.

NO : Go to step **10C8**.

10C8	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between ABSCM&H/U and data link connector? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Replace ABSCM&H/U.

D•ALL 11 (FB1)
NO TROUBLE

B4M0944

D: NO TROUBLE — ALTHOUGH NO TROUBLE APPEARS ON THE SELECT MONITOR DISPLAY, THE ABS WARNING LIGHT REMAINS ON —

DIAGNOSIS:

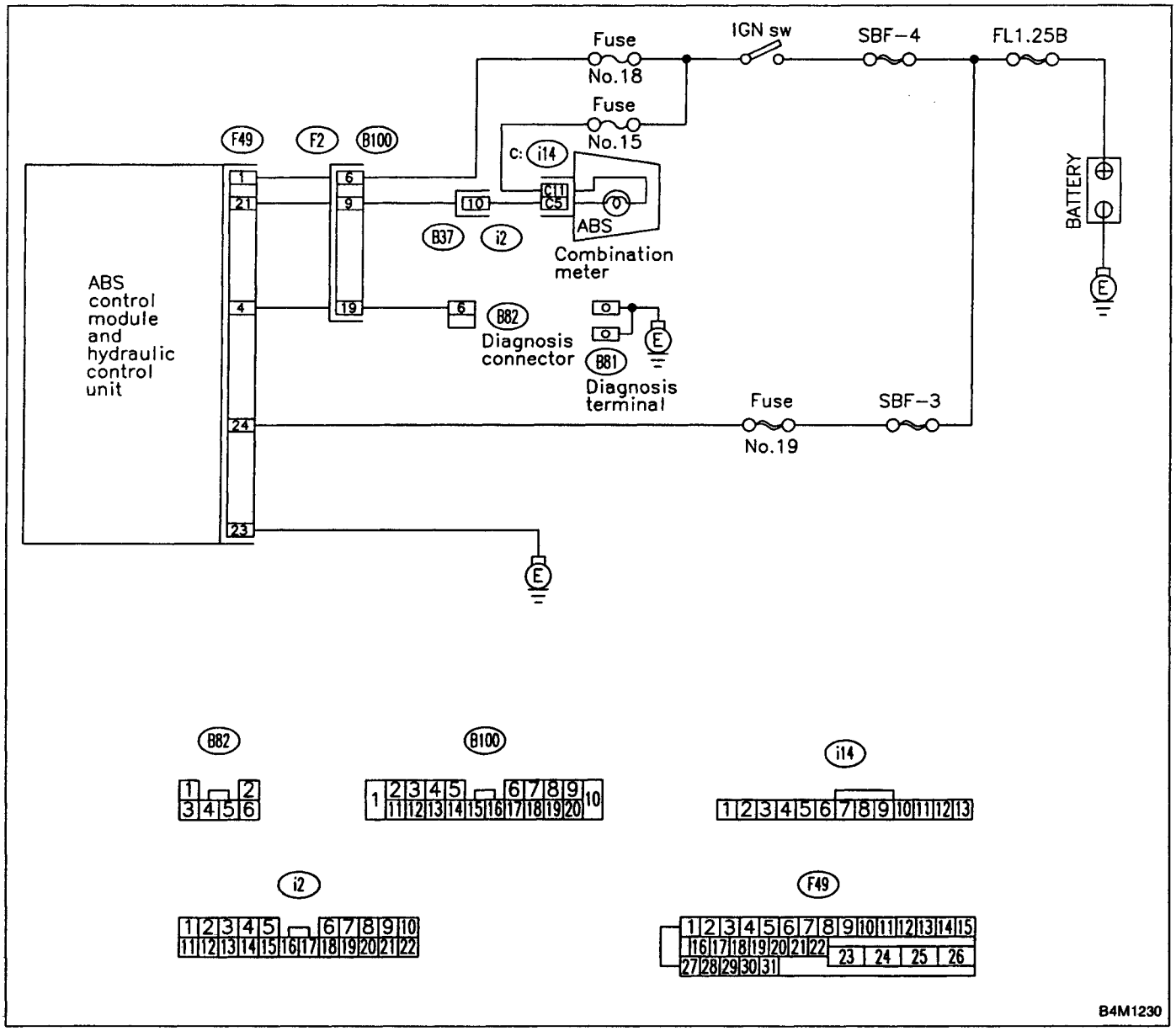
- ABS warning light circuit is shorted.

TROUBLE SYMPTOM:

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

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

WIRING DIAGRAM:

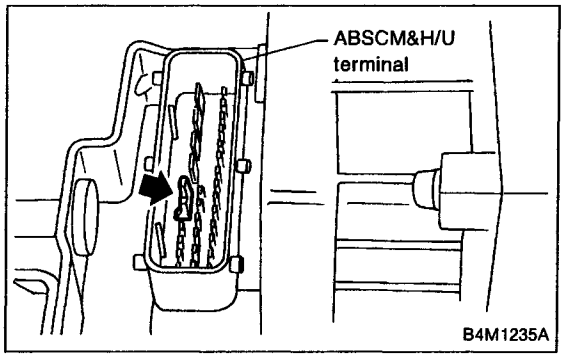


B4M1230

10D1	CHECK WIRING HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector (F2) from connector (B100).
3) Turn ignition switch to ON.

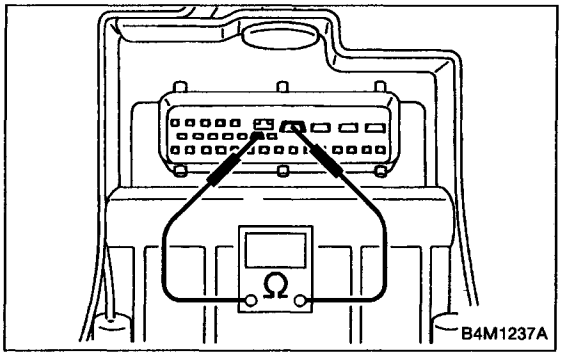
CHECK : ***Does the ABS warning light remain off?***
YES : Go to step **10D2**.
NO : Repair front wiring harness.



10D2	CHECK PROJECTION AT ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Check for broken projection at the ABSCM&H/U terminal.

CHECK : ***Are the projection broken?***
YES : Go to step **10D3**.
NO : Replace ABSCM&H/U.

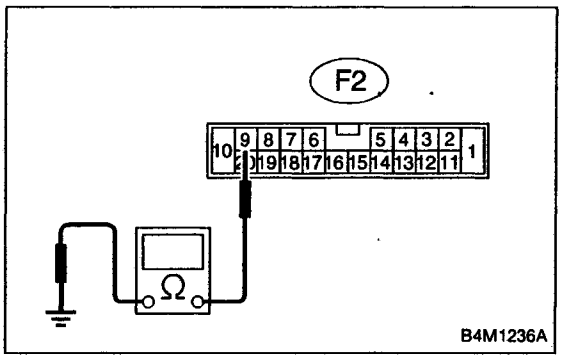


10D3	CHECK ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals
No. 21 — No. 23:

CHECK : ***Is the resistance more than 1 MΩ?***
YES : Go to step **10D4**.
NO : Replace valve relay.

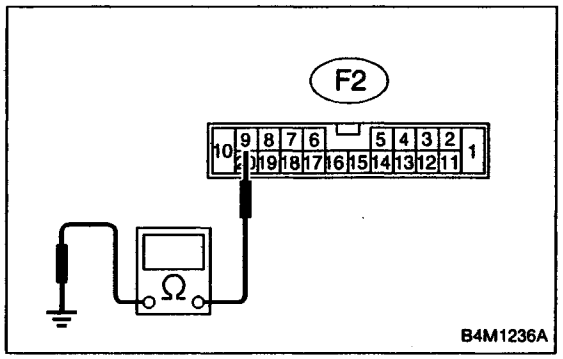


10D4	CHECK WIRING HARNESS.

Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

CHECK : ***Is the resistance less than 0.5 Ω?***
YES : Go to step **10D5**.
NO : Repair harness.



10D5	CHECK WIRING HARNESS.

1) Connect connector to ABSCM&H/U.
2) Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

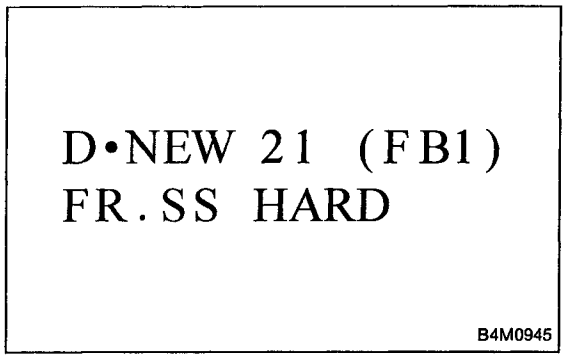
CHECK : ***Is the resistance more than 1 MΩ?***
YES : Go to step **10D6**.
NO : Repair harness.

10D6	CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.

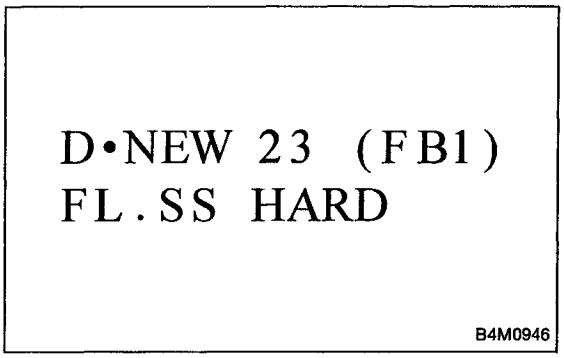
CHECK : ***Is there poor contact in ABSCM&H/U connector? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

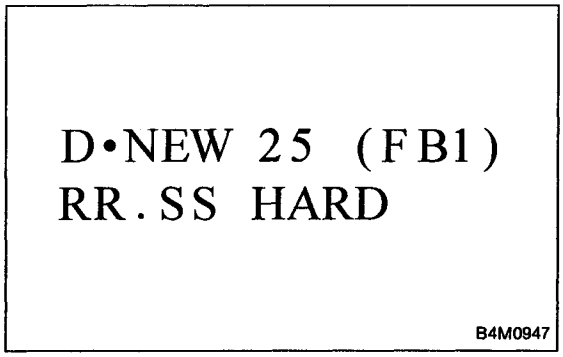
NO : Replace ABSCM&H/U.



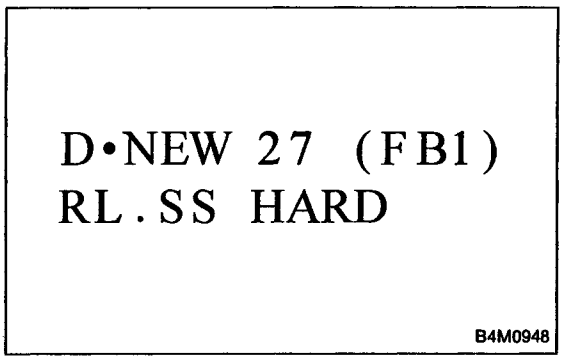
E: TROUBLE CODE 21 FR. SS HARD — ABNORMAL FRONT RH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —



F: TROUBLE CODE 23 FL. SS HARD — ABNORMAL FRONT LH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —



G: TROUBLE CODE 25 RR. SS HARD — ABNORMAL REAR RH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —



H: TROUBLE CODE 27 RL. SS HARD — ABNORMAL REAR LH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

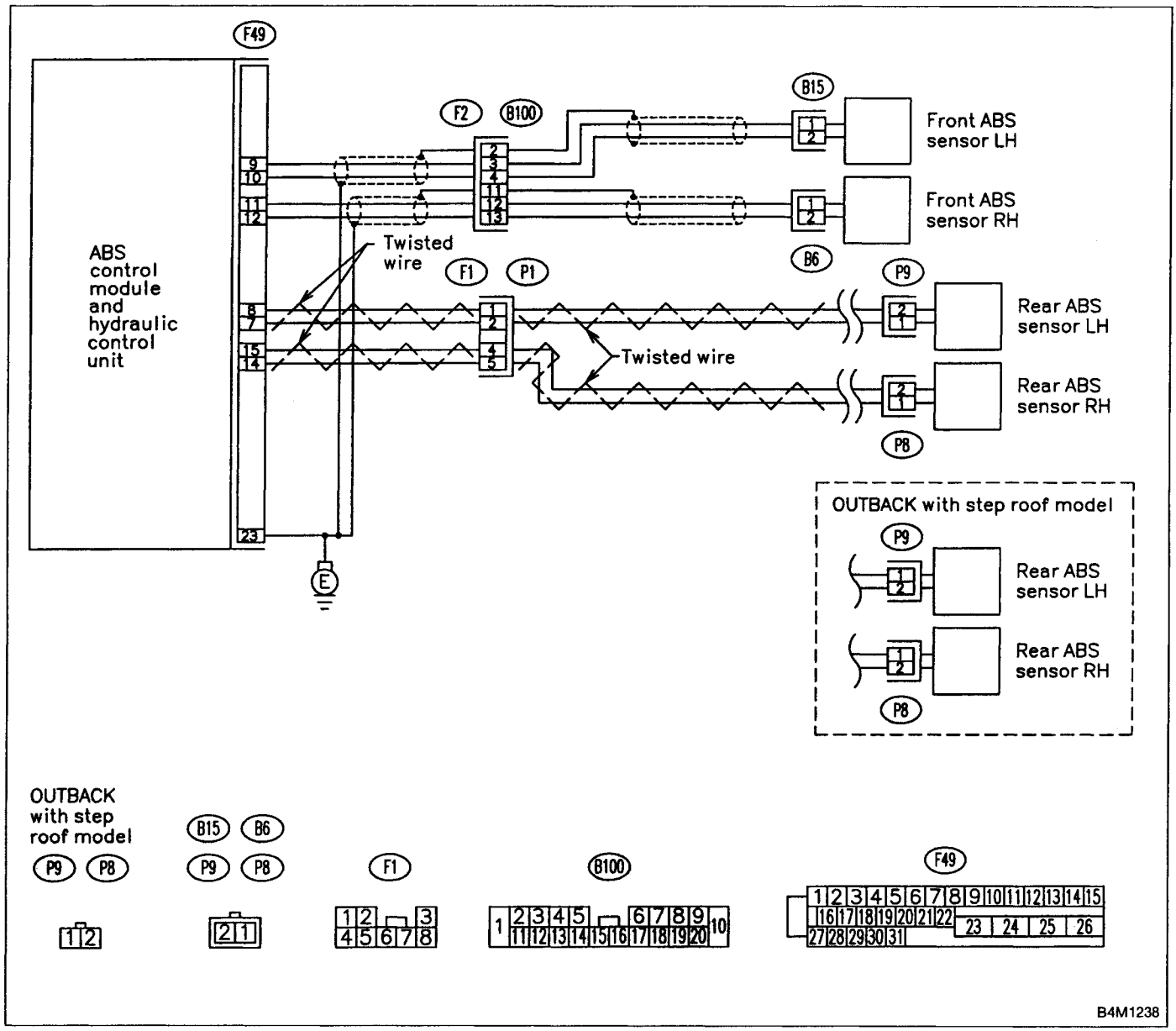
DIAGNOSIS:

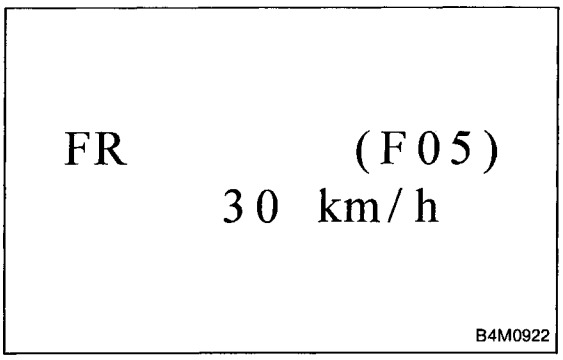
- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10H1	CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.

Read the ABS sensor output corresponding to the faulty system in the select monitor function mode.

NOTE:
The select monitor display shows that the front right wheel is rotating at 30 km/h.

CHECK : ***Does the speed indicated on the display change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position?***

YES : Go to step **10H2**.

NO : Go to step **10H9**.

10H2	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32 ± 10 N·m (3.3 ± 1.0 kg-m, 24 ± 7 ft-lb)

CHECK : ***Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **10H3**.

NO : Tighten ABS sensor installation bolts securely.

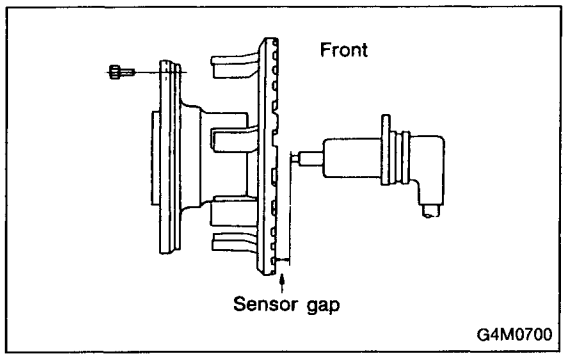
10H3	CHECK INSTALLATION OF TONE WHEEL.

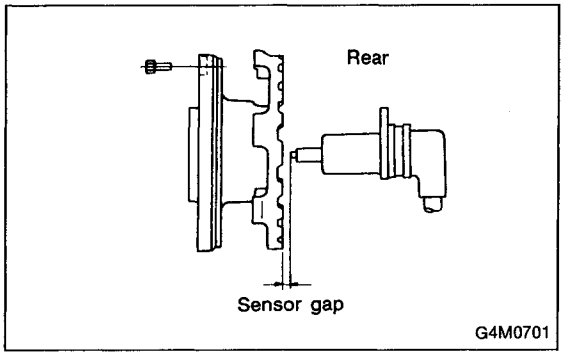
Tightening torque:
13 ± 3 N·m (1.3 ± 0.3 kg-m, 9 ± 2.2 ft-lb)

CHECK : ***Are the tone wheel installation bolts tightened securely?***

YES : Go to step **10H4**.

NO : Tighten tone wheel installation bolts securely.





10H4	CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK : ***Is the gap within the specifications shown in the following table?***

Specifications	Front wheel	Rear wheel
	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

YES : Go to step **10H5**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10H5	CHECK HUB RUNOUT.

Measure hub runout.

CHECK : ***Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **10H6**.

NO : Repair hub.

10H6	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10H7**.

10H7	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10H8**.

10H8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

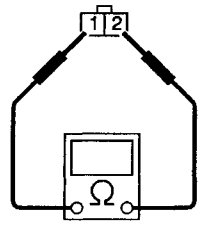
CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

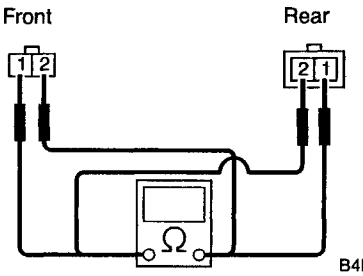
NOTE:
Check harness and connectors between ABSCM&H/U and ABS sensor.

Except OUTBACK model



B4M0806E

OUTBACK model



B4M1036C

10H9	CHECK ABS SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance of ABS sensor connector terminals.

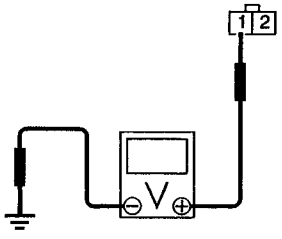
Terminal
Front RH No. 1 — No. 2:
Front LH No. 1 — No. 2:
Rear RH No. 1 — No. 2:
Rear LH No. 1 — No. 2:

CHECK : ***Is the resistance between 0.8 and 1.2 kΩ?***

YES : Go to step **10H10**.

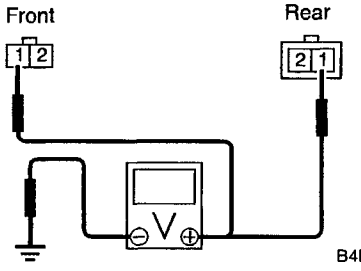
NO : Replace ABS sensor.

Except OUTBACK model



B4M0807E

OUTBACK model



B4M1037C

10H10	CHECK BATTERY SHORT OF ABS SENSOR.

1) Disconnect connector from ABSCM&H/U.
2) Measure voltage between ABS sensor and chassis ground.

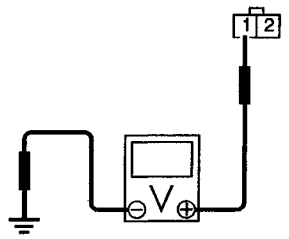
Terminal
Front RH No. 1 (+) — Chassis ground (–):
Front LH No. 1 (+) — Chassis ground (–):
Rear RH No. 1 (+) — Chassis ground (–):
Rear LH No. 1 (+) — Chassis ground (–):

CHECK : ***Is the voltage less than 1 V?***

YES : Go to step **10H11**.

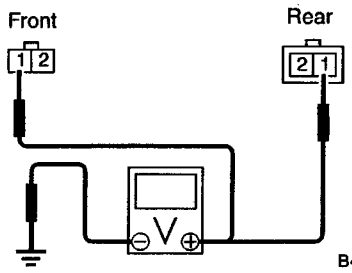
NO : Replace ABS sensor.

Except OUTBACK model

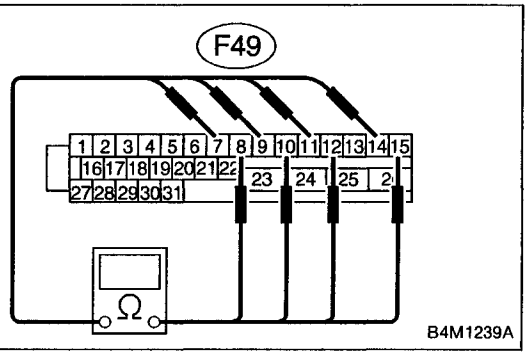


B4M0807E

OUTBACK model



B4M1037C



B4M1239A

10H11	CHECK BATTERY SHORT OF ABS SENSOR.

1) Turn ignition switch to ON.
2) Measure 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 (–):

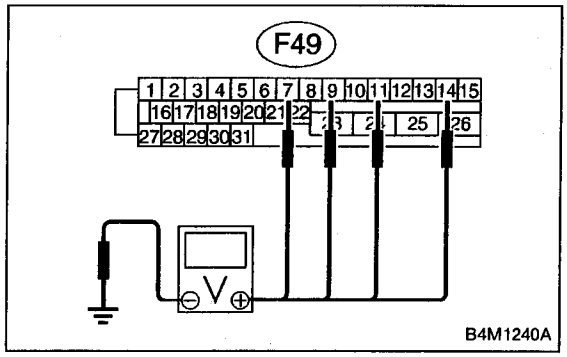
CHECK ***: Is the voltage less than 1 V?***
YES : Go to step **10H12**.
NO : Replace ABS sensor.

10H12	CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

1) Turn ignition switch to OFF.
2) Connect connector to ABS sensor.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
Trouble code 21 / (F49) No. 11 — No. 12:
Trouble code 23 / (F49) No. 9 — No. 10:
Trouble code 25 / (F49) No. 14 — No. 15:
Trouble code 27 / (F49) No. 7 — No. 8:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **10H13**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.



10H13	CHECK BATTERY SHORT OF HARNESS.

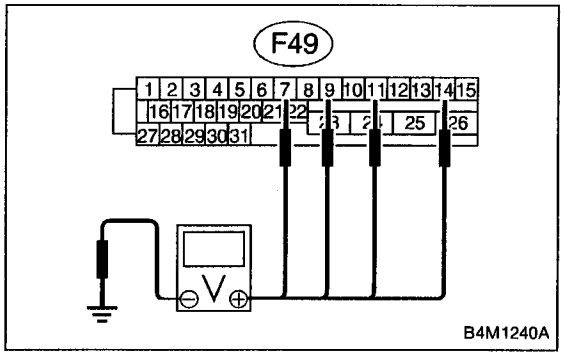
Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 (+) — Chassis ground (–):
Trouble code 23 / (F49) No. 9 (+) — Chassis ground (–):
Trouble code 25 / (F49) No. 14 (+) — Chassis ground (–):
Trouble code 27 / (F49) No. 7 (+) — Chassis ground (–):

CHECK : ***Is the voltage less than 1 V?***

YES : Go to step **10H14**.

NO : Repair harness between ABSCM&H/U and ABS sensor.



10H14	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 (+) — Chassis ground (–):
Trouble code 23 / (F49) No. 9 (+) — Chassis ground (–):
Trouble code 25 / (F49) No. 14 (+) — Chassis ground (–):
Trouble code 27 / (F49) No. 7 (+) — Chassis ground (–):

CHECK : ***Is the voltage less than 1 V?***

YES : Go to step **10H15**.

NO : Repair harness between ABSCM&H/U and ABS sensor.

10H15	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32 ± 10 N·m (3.3 ± 1.0 kg-m, 24 ± 7 ft-lb)

CHECK : ***Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **10H16**.

NO : Tighten ABS sensor installation bolts securely.

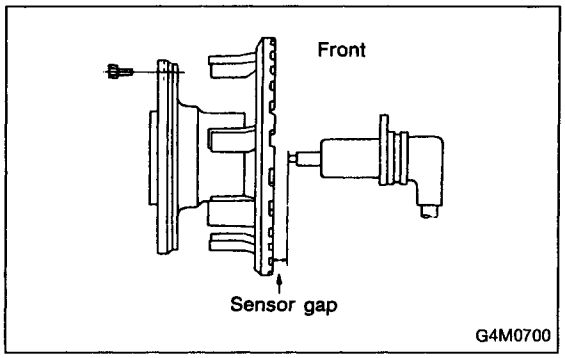
10H16	CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:
13 ± 3 N·m (1.3 ± 0.3 kg-m, 9 ± 2.2 ft-lb)

CHECK ***: Are the tone wheel installation bolts tightened securely?***

YES : Go to step **10H17**.

NO : Tighten tone wheel installation bolts securely.

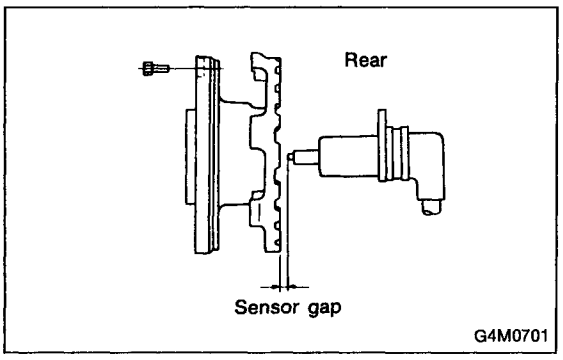


10H17	CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to step **10H18**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10H18	CHECK HUB RUNOUT.

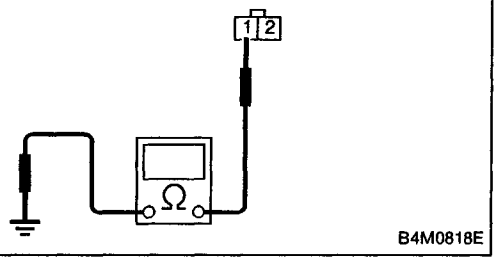
Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

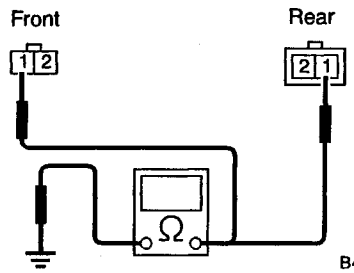
YES : Go to step **10H19**.

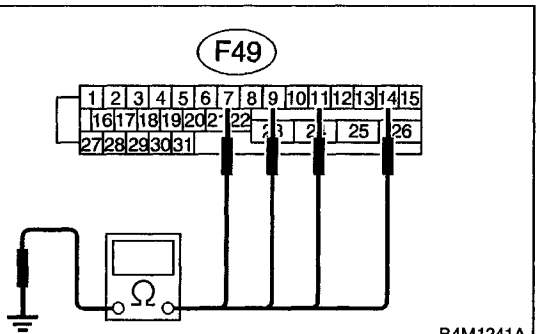
NO : Repair hub.

Except OUTBACK model



OUTBACK model





10H19	CHECK GROUND SHORT OF ABS SENSOR.

1) Turn ignition switch to ON.
2) Measure 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:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **10H20**.
NO : Replace ABS sensor and ABSCM&H/U.

10H20	CHECK GROUND SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Connect connector to ABS sensor.
3) Measure resistance between ABSCM&H/U connector terminal and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 — Chassis ground:
Trouble code 23 / (F49) No. 9 — Chassis ground:
Trouble code 25 / (F49) No. 14 — Chassis ground:
Trouble code 27 / (F49) No. 7 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **10H21**.
NO : Repair harness between ABSCM&H/U and ABS sensor.
And replace ABSCM&H/U.

10H21	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].☆10>***
YES : Repair connector.
NO : Go to step **10H22**.

10H22	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10H23**.

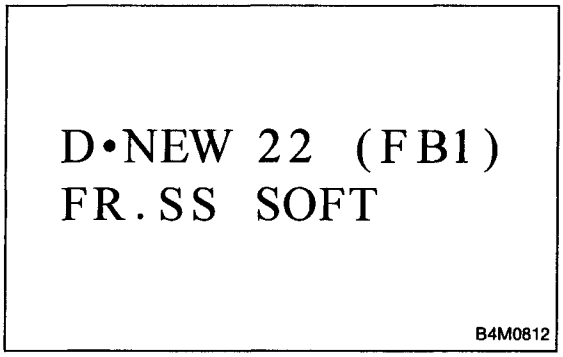
10H23	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

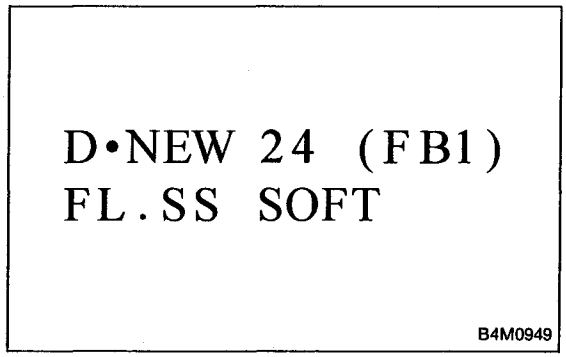
YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

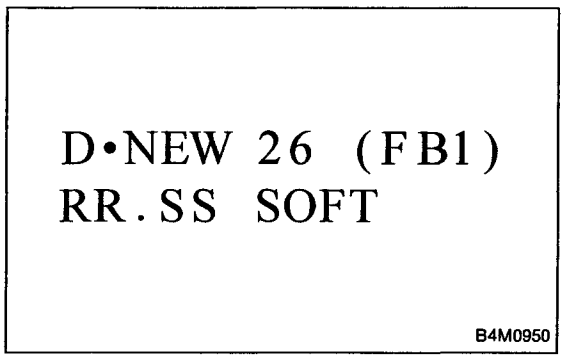
NOTE:
Check harness and connectors between ABSCM&H/U and ABS sensor.



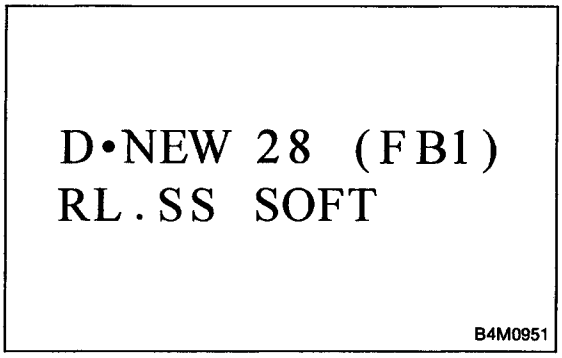
I: TROUBLE CODE 22 FR. SS SOFT — ABNORMAL FRONT RH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —



J: TROUBLE CODE 24 FL. SS SOFT — ABNORMAL FRONT LH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —



K: TROUBLE CODE 26 RR. SS SOFT — ABNORMAL REAR RH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —



L: TROUBLE CODE 28 RL. SS SOFT — ABNORMAL REAR LH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

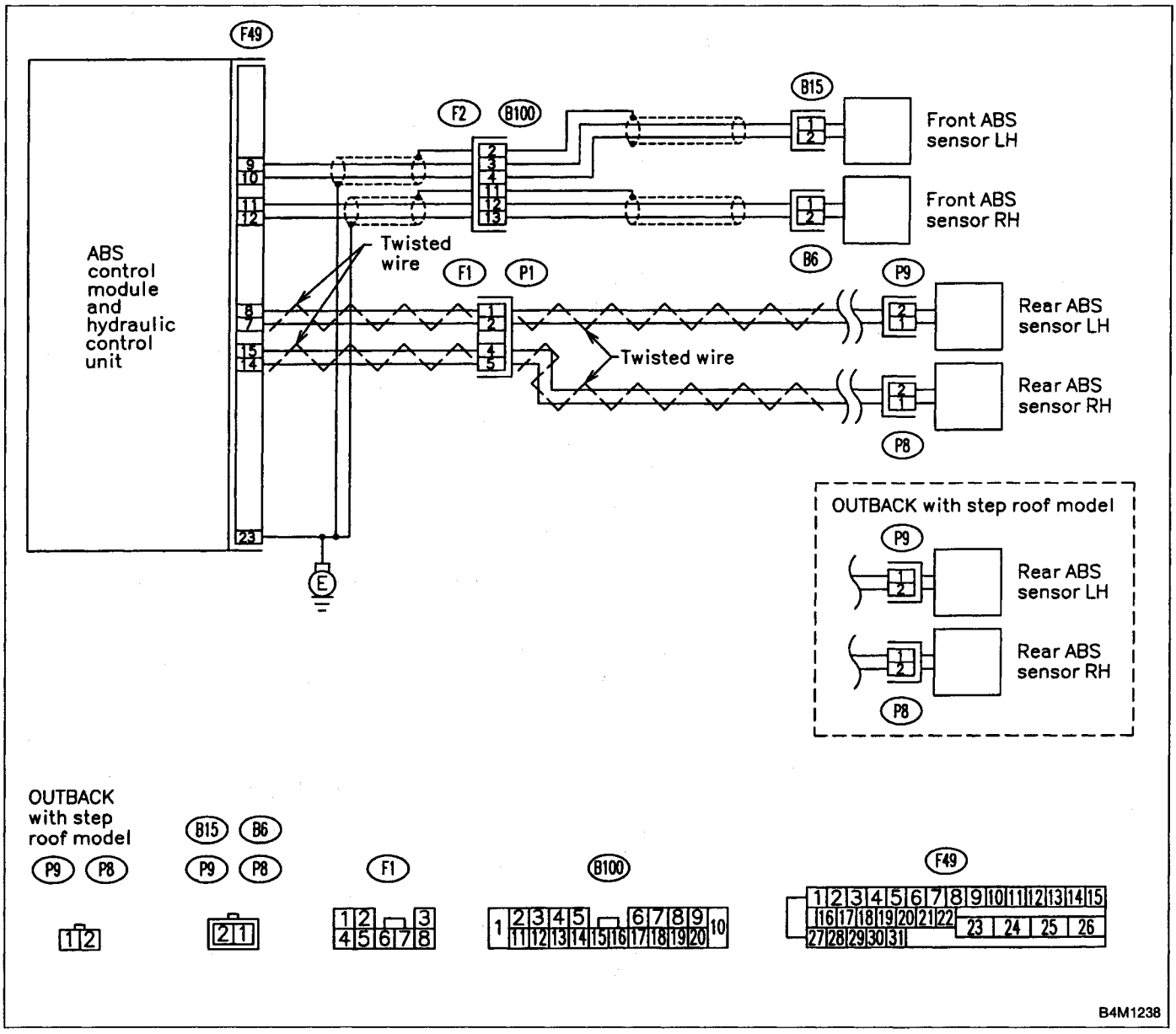
DIAGNOSIS:

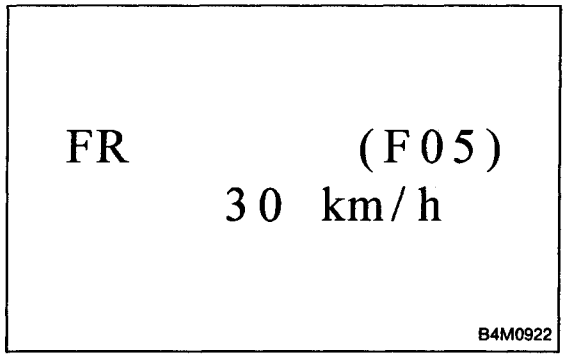
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10L1	CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.

Read the ABS sensor output corresponding to the faulty system in the select monitor function mode.

NOTE:
The select monitor display shows that the front right wheel is rotating at 30 km/h.

CHECK : ***Does the speed indicated on the display change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position?***

YES : Go to step **10L2**.

NO : Go to step **10L8**.

10L2	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connectors between ABSCM&HIU and ABS sensor?***

YES : Repair connector.

NO : Go to step **10L3**.

10L3	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Is the car telephone or the wireless transmitter properly installed?***

YES : Go to step **10L4**.

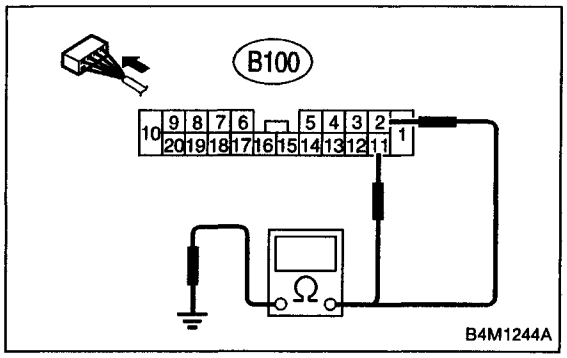
NO : Properly install the car telephone or the wireless transmitter.

10L4	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **10L5**.



10L5	CHECK SHIELD CIRCUIT.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Measure resistance between shield connector and chassis ground.

Connector & terminal
Trouble code 22 / (B100) No. 11 — Chassis ground:
Trouble code 24 / (B100) No. 2 — Chassis ground:
Trouble code 26 / Go to step 10L6.
Trouble code 28 / Go to step 10L6.

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **10L6**.
NO : Repair shield harness.

10L6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **10L7**.

10L7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary noise interference.

10L8	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32 ± 10 N·m (3.3 ± 1.0 kg-m, 24 ± 7 ft-lb)

CHECK ***: Are the ABS sensor installation bolts tightened securely?***
YES : Go to step **10L9**.
NO : Tighten ABS sensor installation bolts securely.

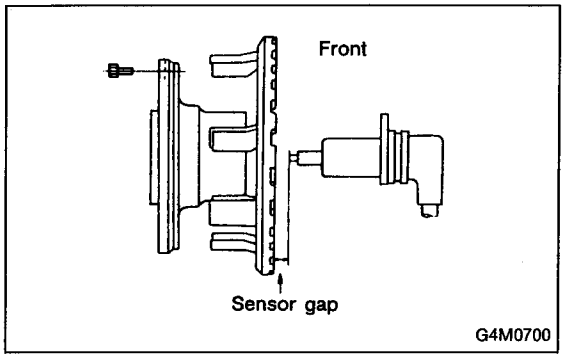
10L9	CHECK INSTALLATION OF TONE WHEEL.

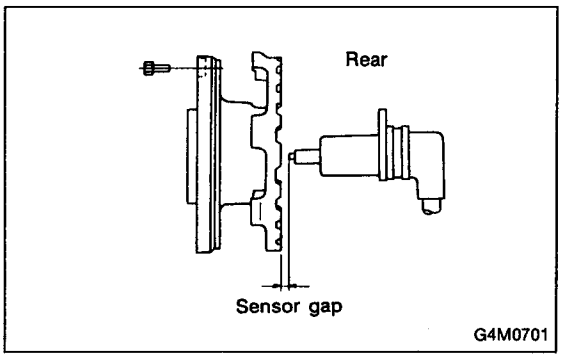
Tightening torque:
13 ± 3 N·m (1.3 ± 0.3 kg-m, 9 ± 2.2 ft-lb)

CHECK : ***Are the tone wheel installation bolts tightened securely?***

YES : Go to step **10L10**.

NO : Tighten tone wheel installation bolts securely.





10L10	CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK : ***Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

YES : Go to step **10L11**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10L11	CHECK OSCILLOSCOPE.

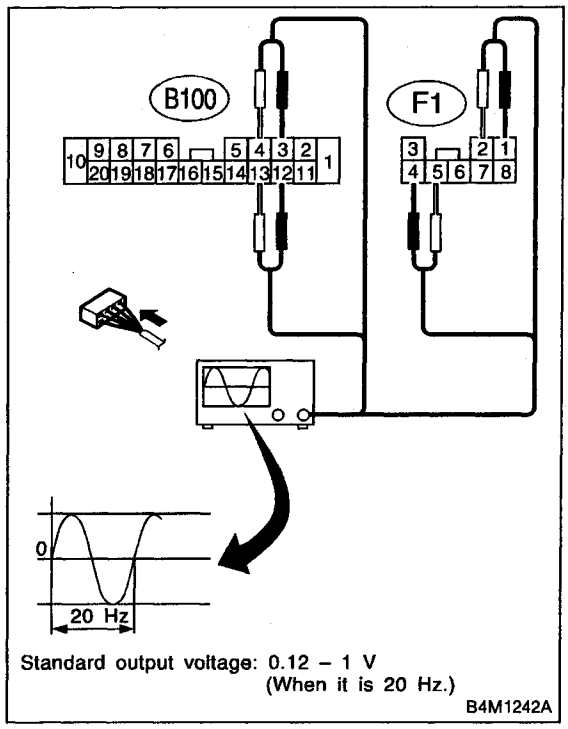
CHECK : ***Is an oscilloscope available?***

YES : Go to step **10L12**.

NO : Go to step **10L13**.

10L12	CHECK ABS SENSOR SIGNAL.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Connect the oscilloscope to the connector (F1) or connector (B100) in accordance with trouble code.
4) Turn ignition switch ON.



Standard output voltage: 0.12 – 1 V
(When it is 20 Hz.)
B4M1242A

5) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABSCM&H/U sometimes stores the trouble code 29.

Connector & terminal
Trouble code 22 / (B100) No. 12 (+) — No. 13 (–):
Trouble code 24 / (B100) No. 3 (+) — No. 4 (–):
Trouble code 26 / (F1) No. 4 (+) — No. 5 (–):
Trouble code 28 / (F1) No. 1 (+) — No. 2 (–):
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK : ***Is oscilloscope pattern smooth, as shown in figure?***

YES : Go to step **10L16**.

NO : Go to step **10L13**.

10L13	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor or drum from hub in accordance with trouble code.

CHECK : ***Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.

NO : Go to step **10L14**.

10L14	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK : ***Are there broken or damaged in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.

NO : Go to step **10L15**.

10L15	CHECK HUB RUNOUT.

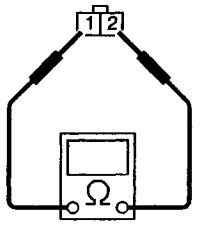
Measure hub runout.

CHECK : ***Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **10L16**.

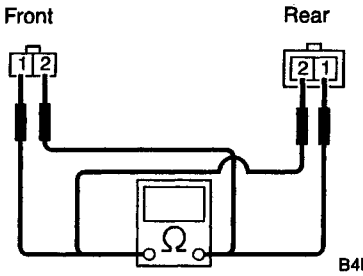
NO : Repair hub.

Except OUTBACK model



B4M0806E

OUTBACK model



B4M1036C

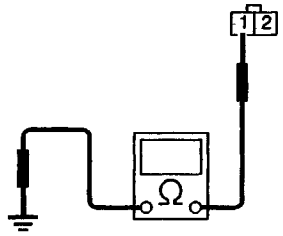
10L16	CHECK RESISTANCE OF ABS SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance between ABS sensor connector terminals.

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:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **10L17**.
NO : Replace ABS sensor.

Except OUTBACK model



B4M0818E

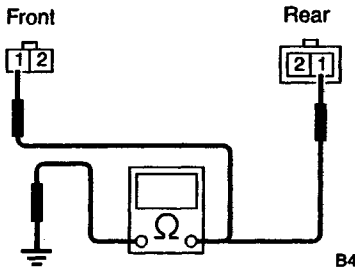
10L17	CHECK GROUND SHORT OF ABS SENSOR.

Measure resistance between ABS sensor and chassis ground.

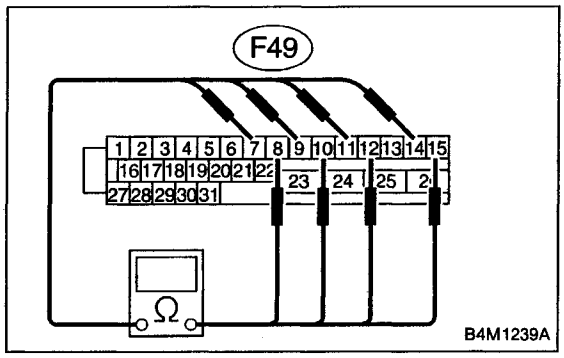
Terminal
Front RH No. 1 — Chassis ground:
Front LH No. 1 — Chassis ground:
Rear RH No. 1 — Chassis ground:
Rear LH No. 1 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **10L18**.
NO : Replace ABS sensor.

OUTBACK model



B4M1042C

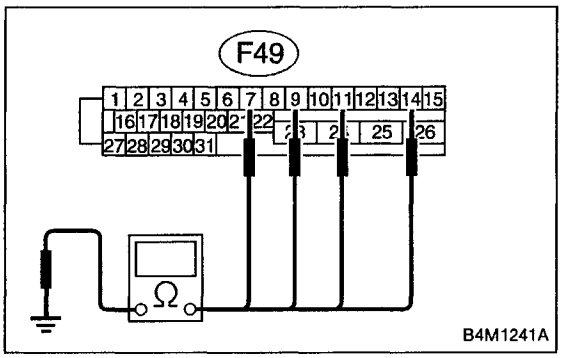


10L18	CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

1) Connect connector to ABS sensor.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance at ABSCM&H/U connector terminals.

Connector & terminal
Trouble code 22 / (F49) No. 11 — No. 12:
Trouble code 24 / (F49) No. 9 — No. 10:
Trouble code 26 / (F49) No. 14 — No. 15:
Trouble code 28 / (F49) No. 7 — No. 8:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **10L19**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

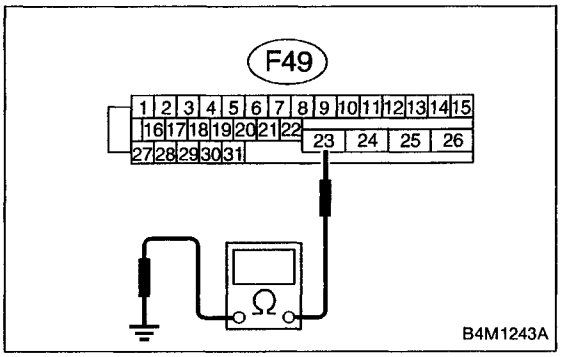


10L19	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 22 / (F49) No. 11 — Chassis ground:
Trouble code 24 / (F49) No. 9 — Chassis ground:
Trouble code 26 / (F49) No. 14 — Chassis ground:
Trouble code 28 / (F49) No. 7 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **10L20**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.



10L20	CHECK GROUND CIRCUIT OF ABSCM&H/U.

Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — GND:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **10L21**.
NO : Repair ABSCM&H/U ground harness.

10L21	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between ABSCM&HIU and ABS sensor? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10L22**.

10L22	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Is the car telephone or the wireless transmitter properly installed?***

YES : Go to step **10L23**.

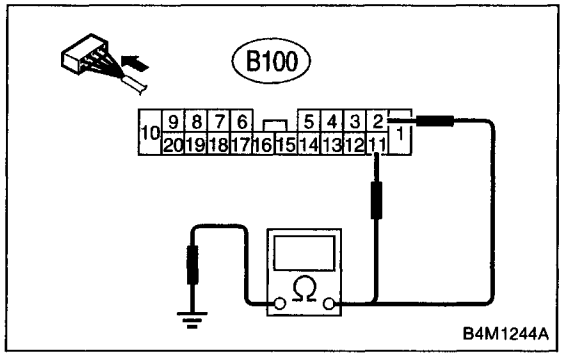
NO : Properly install the car telephone or the wireless transmitter.

10L23	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **10L24**.



10L24	CHECK SHIELD CIRCUIT.

1) Connect all connectors.
2) Measure resistance between shield connector and chassis ground.

Connector & terminal
Trouble code 22 / (B100) No. 11 — Chassis ground:
Trouble code 24 / (B100) No. 2 — Chassis ground:
Trouble code 26 / Go to step 10L25.
Trouble code 28 / Go to step 10L25.

CHECK : ***Is the resistance less than 0.5 Ω?***

YES : Go to step **10L25**.

NO : Repair shield harness.

10L25	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10L26**.

10L26	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary noise interference.

D•NEW 29 (FB1)
EITHER. SS SOFT

B4M0952

M: TROUBLE CODE 29 EITHER. SS SOFT — ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —

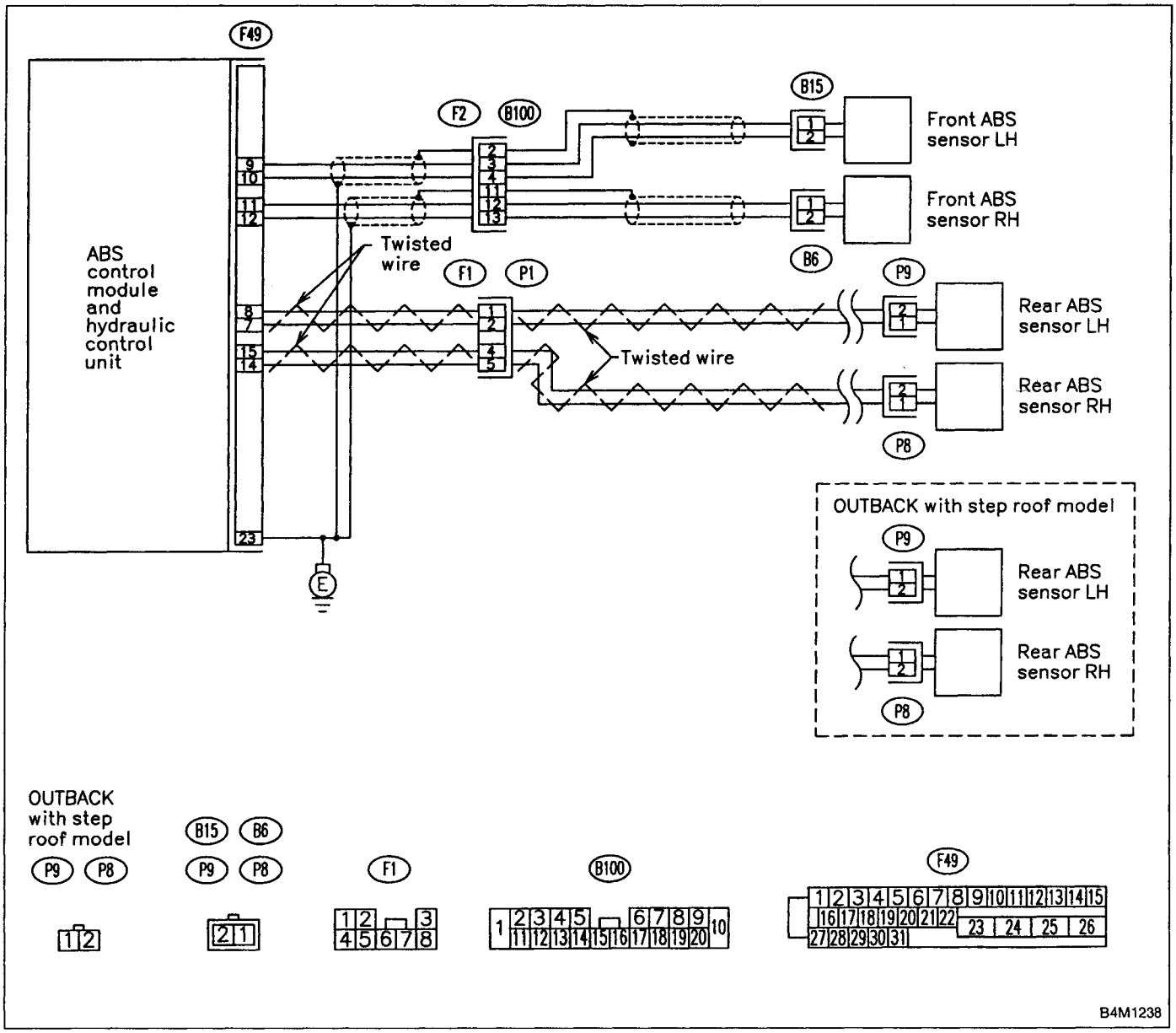
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1238

10M1	CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.

CHECK : ***Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.***

YES : The ABS is normal. Erase the trouble code.

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 trouble code may sometimes occur.

NO : Go to step **10M2**.

10M2	CHECK TIRE SPECIFICATIONS.

Turn ignition switch to OFF.

CHECK : ***Are the tire specifications correct?***

YES : Go to step **10M3**.

NO : Replace tire.

10M3	CHECK WEAR OF TIRE.

CHECK : ***Is the tire worn excessively?***

YES : Replace tire.

NO : Go to step **10M4**.

10M4	CHECK TIRE PRESSURE.

CHECK : ***Is the tire pressure correct?***

YES : Go to step **10M5**.

NO : Adjust tire pressure.

10M5	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32 ± 10 N·m (3.3 ± 1.0 kg-m, 24 ± 7 ft-lb)

CHECK : ***Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **10M6**.

NO : Tighten ABS sensor installation bolts securely.

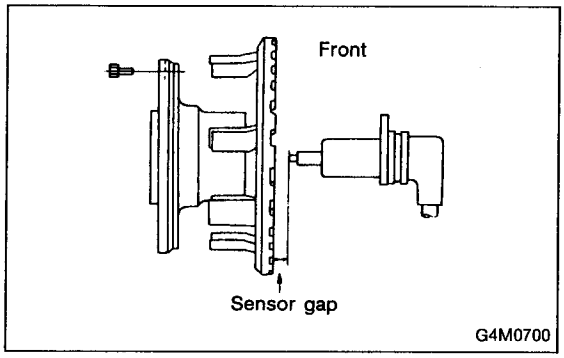
10M6	CHECK INSTALLATION OF TONE WHEEL.

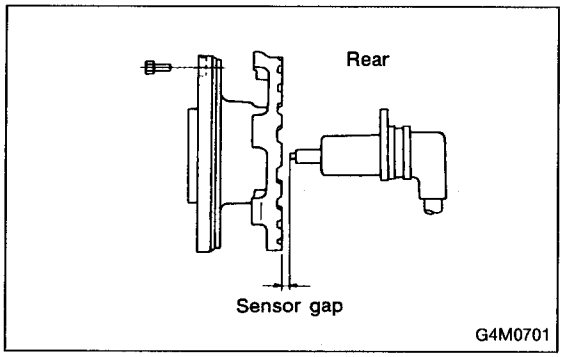
Tightening torque:
13 ± 3 N·m (1.3 ± 0.3 kg-m, 9 ± 2.2 ft-lb)

CHECK ***: Are the tone wheel installation bolts tightened securely?***

YES : Go to step **10M7**.

NO : Tighten tone wheel installation bolts securely.





10M7	CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

YES : Go to step **10M8**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10M8	CHECK OSCILLOSCOPE.

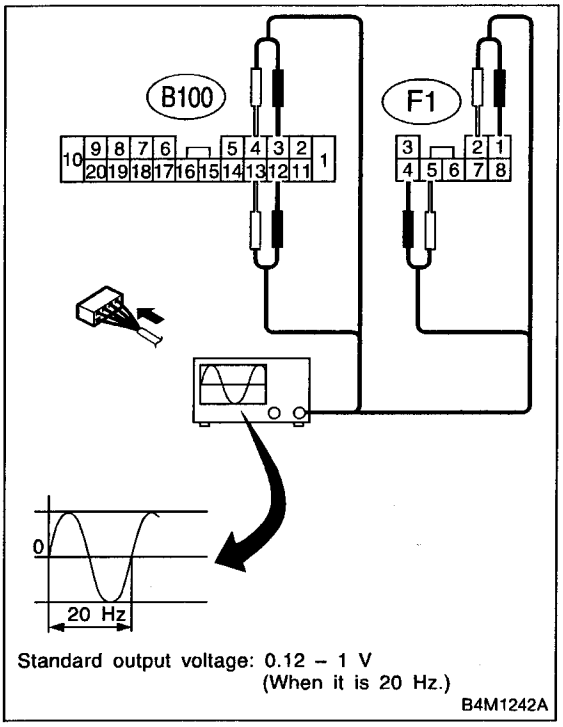
CHECK ***: Is an oscilloscope available?***

YES : Go to step **10M9**.

NO : Go to step **10M10**.

10M9	CHECK ABS SENSOR SIGNAL.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Connect the oscilloscope to the connector (F1) or connector (B100) in accordance with trouble code.
4) Turn ignition switch ON.



Standard output voltage: 0.12 – 1 V
(When it is 20 Hz.)
B4M1242A

5) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABSCM&H/U sometimes stores the trouble code 29.

Connector & terminal
(B100) No. 12 (+) — No. 13 (–) (Front RH):
(B100) No. 3 (+) — No. 4 (–) (Front LH):
(F1) No. 4 (+) — No. 5 (–) (Rear RH):
(F1) No. 1 (+) — No. 2 (–) (Rear LH):
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK : ***Is oscilloscope pattern smooth, as shown in figure?***

YES : Go to step **8M13**.

NO : Go to step **8M10**.

10M10	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor from hub.

CHECK : ***Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.

NO : Go to step **10M11**.

10M11	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK : ***Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.

NO : Go to step **10M12**.

10M12	CHECK HUB RUNOUT.

Measure hub runout.

CHECK : ***Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **10M13**.

NO : Repair hub.

10M13	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

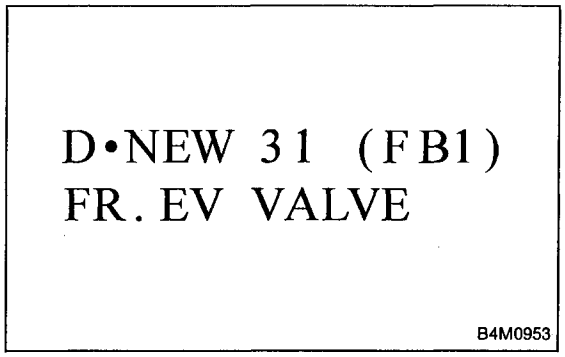
NO : Go to step **10M14.**

10M14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

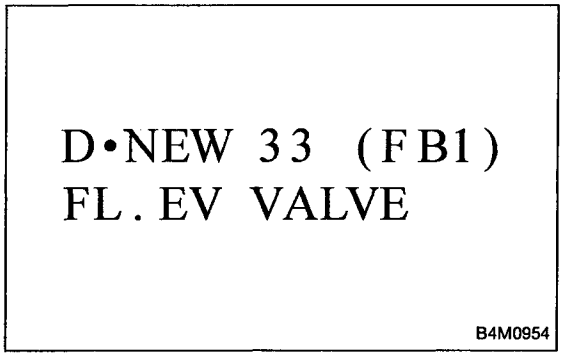
CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

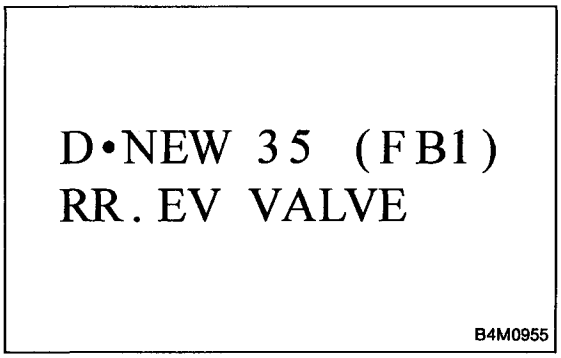
NO : A temporary poor contact.



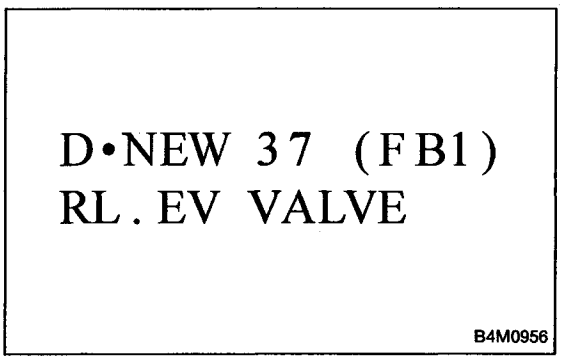
N: TROUBLE CODE 31 FR. EV VALVE — ABNORMAL FRONT RH INLET SOLENOID VALVE —



O: TROUBLE CODE 33 FL. EV VALVE — ABNORMAL FRONT LH INLET SOLENOID VALVE —



P: TROUBLE CODE 35 RR. EV VALVE — ABNORMAL REAR RH INLET SOLENOID VALVE —



Q: TROUBLE CODE 37 RL. EV VALVE — ABNORMAL REAR LH INLET SOLENOID VALVE —

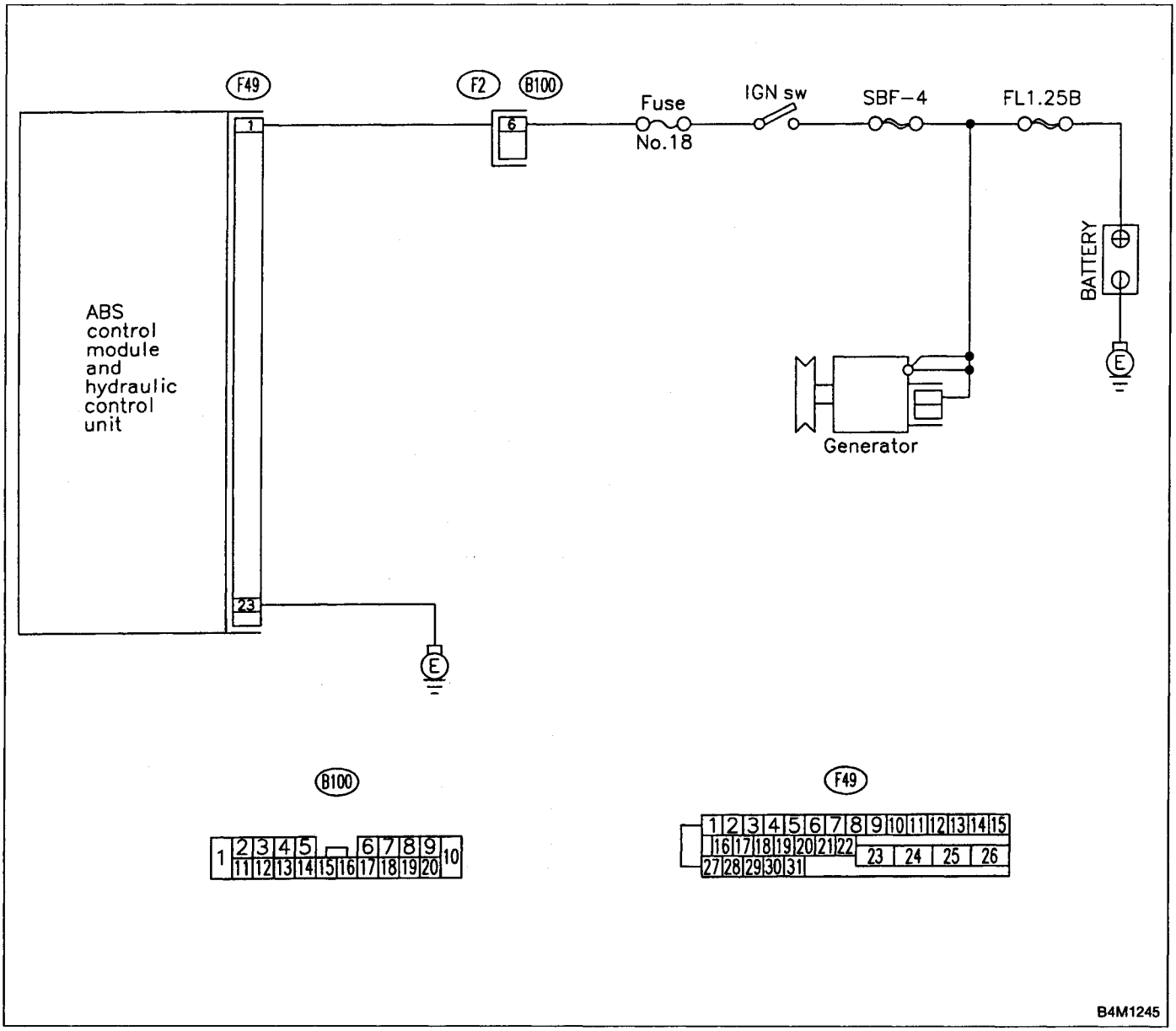
DIAGNOSIS:

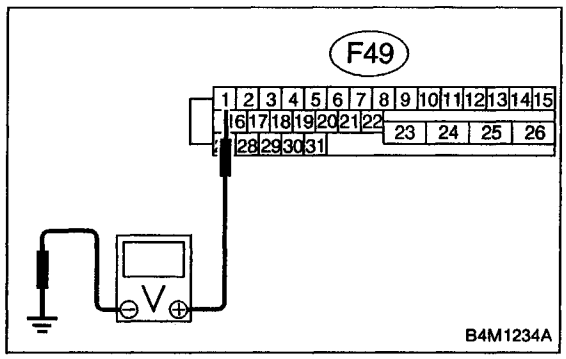
- Faulty harness/connector
- Faulty inlet solenoid valve

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10Q1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

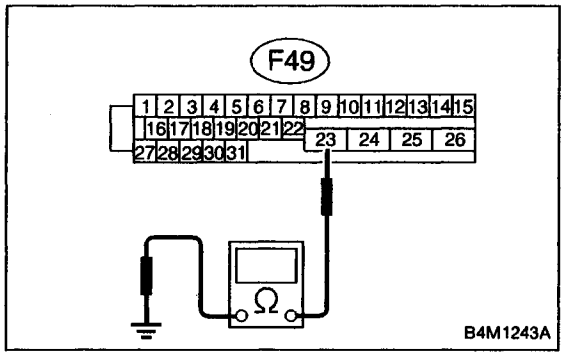
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Run the engine at idle.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10Q2.**

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10Q2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10Q3.**

NO : Repair ABSCM&H/U ground harness.

10Q3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10Q4.**

10Q4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

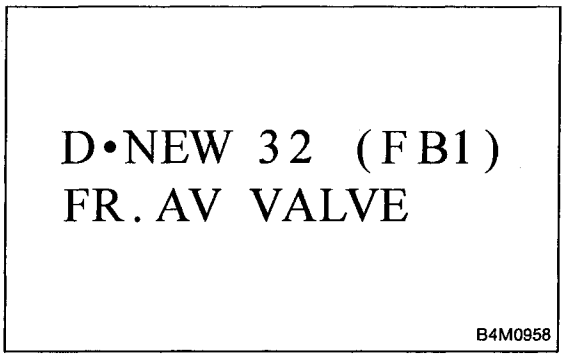
NO : Go to step **10Q5.**

10Q5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

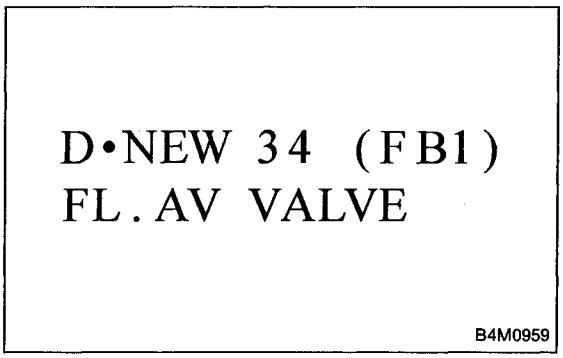
CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

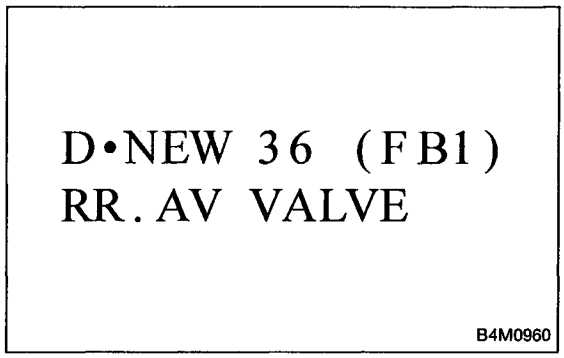
NO : A temporary poor contact.



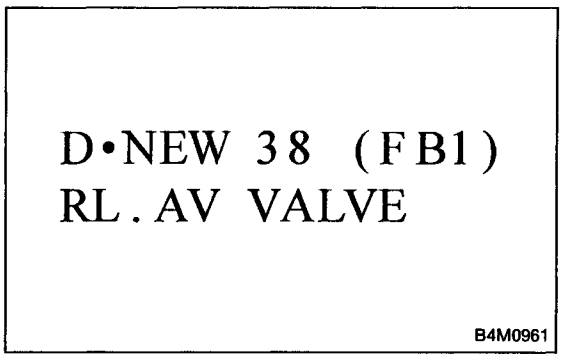
R: TROUBLE CODE 32 FR. AV VALVE — ABNORMAL FRONT RH OUTLET SOLENOID VALVE —



S: TROUBLE CODE 34 FL. AV VALVE — ABNORMAL FRONT LH OUTLET SOLENOID VALVE —



T: TROUBLE CODE 36 RR. AV VALVE — ABNORMAL REAR RH OUTLET SOLENOID VALVE —



U: TROUBLE CODE 38 RL. AV VALVE — ABNORMAL REAR LH OUTLET SOLENOID VALVE —

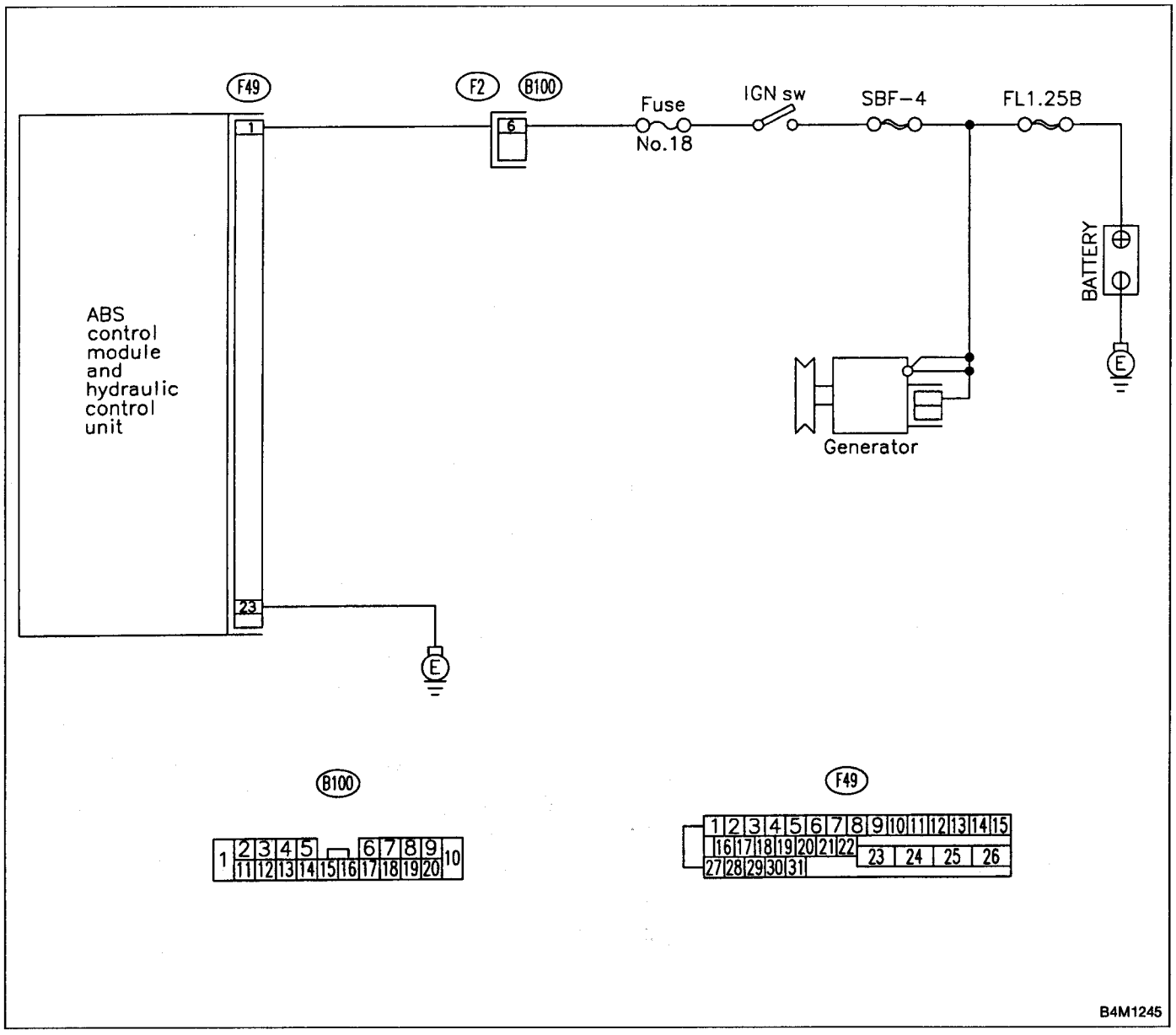
DIAGNOSIS:

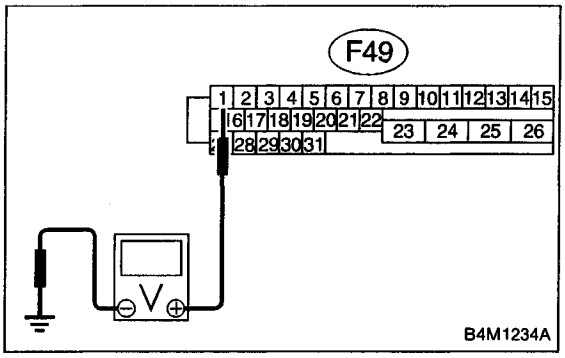
- Faulty harness/connector
- Faulty outlet solenoid valve

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10U1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

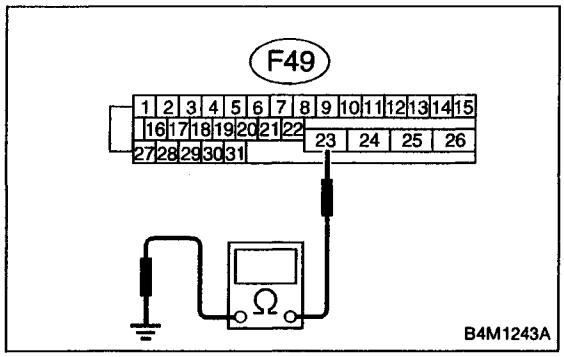
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Run the engine at idle.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10U2**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10U2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10U3**.

NO : Repair ABSCM&H/U ground harness.

10U3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10U4**.

10U4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10U5**.

10U5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 41 (FB1)
ECU

B4M0962

V: TROUBLE CODE 41 ECU — ABNORMAL ABS CONTROL MODULE —

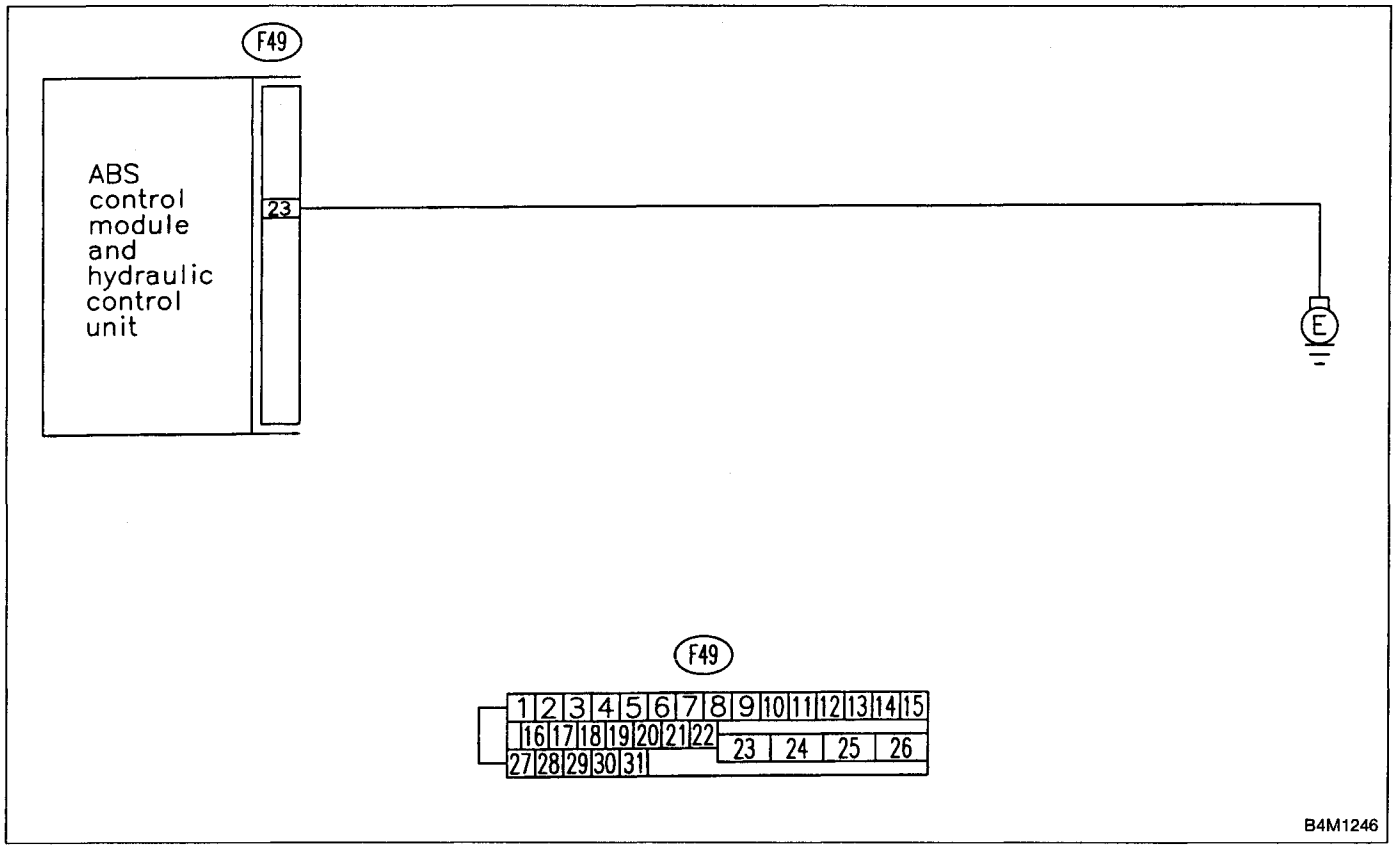
DIAGNOSIS:

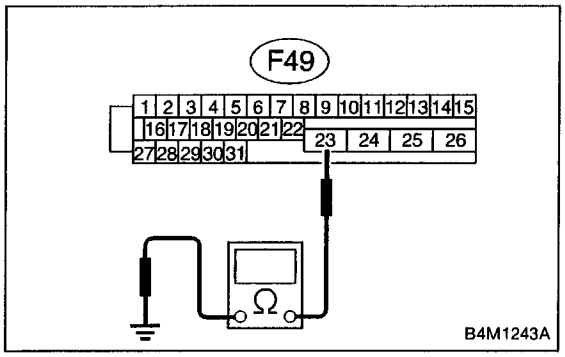
- Faulty ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10V1	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10V2**.

NO : Repair ABSCM&H/U ground harness.

10V2	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between battery, ignition switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10V3**.

10V3	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Is the car telephone or the wireless transmitter properly installed?***

YES : Go to step **10V4**.

NO : Properly install the car telephone or the wireless transmitter.

10V4	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **10V5**.

10V5	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10V6**.

10V6	**CHECK ANY OTHER TROUBLE CODES APPEARANCE.**

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 42 (FB1)
LOW VOLTAGE

B4M0963

W: TROUBLE CODE 42 LOW VOLTAGE — SOURCE VOLTAGE IS LOW —

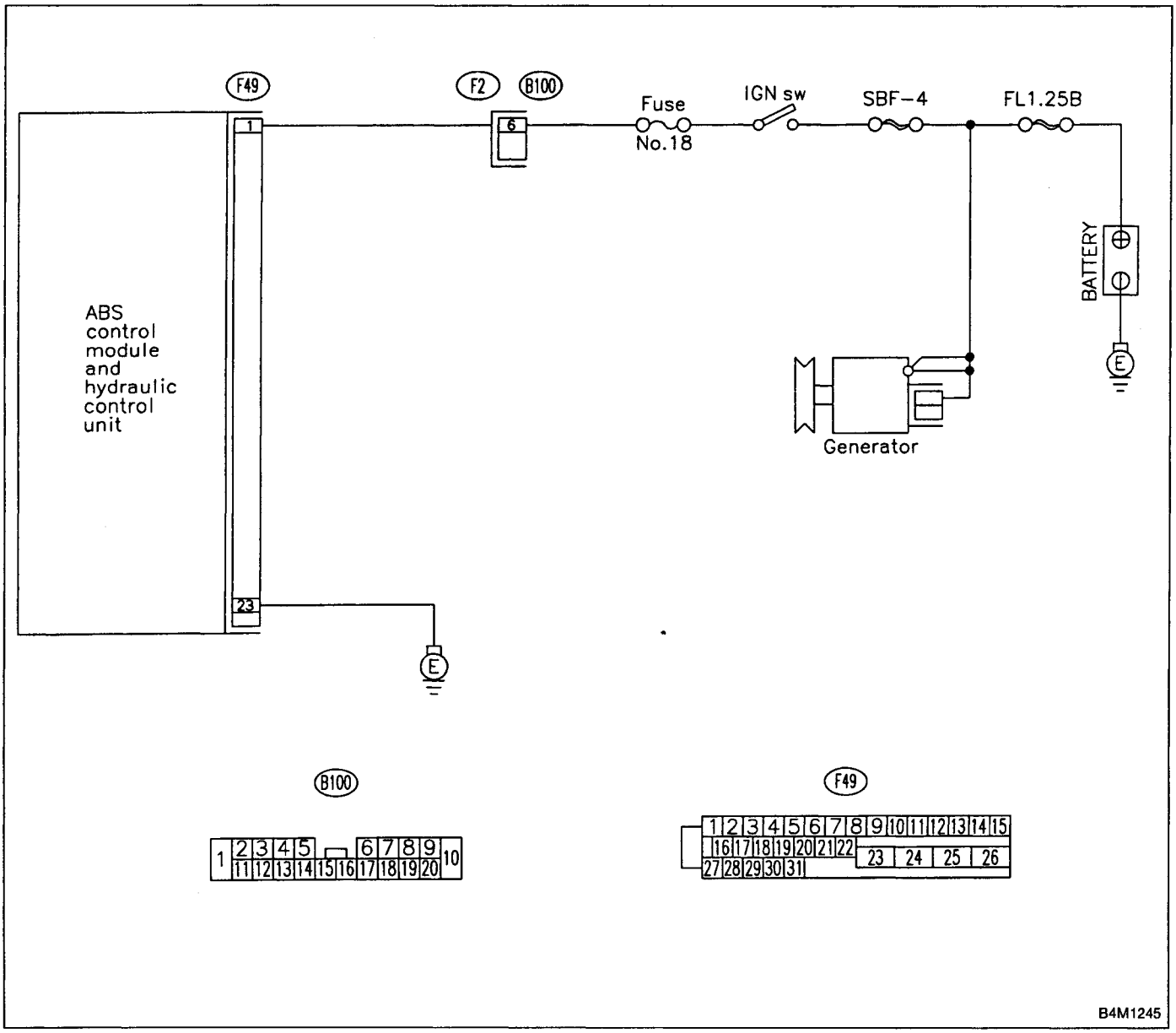
DIAGNOSIS:

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

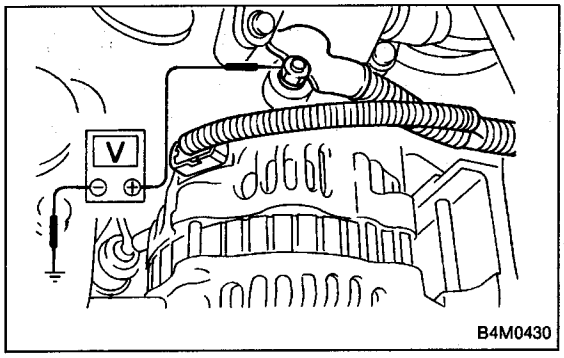
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1245



10W1	CHECK GENERATOR.

1) Start engine.
2) Idling after warm-up.
3) Measure voltage between generator B terminal and chassis ground.

Terminal
Generator B terminal — Chassis ground:

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10W2**.

NO : Repair generator.

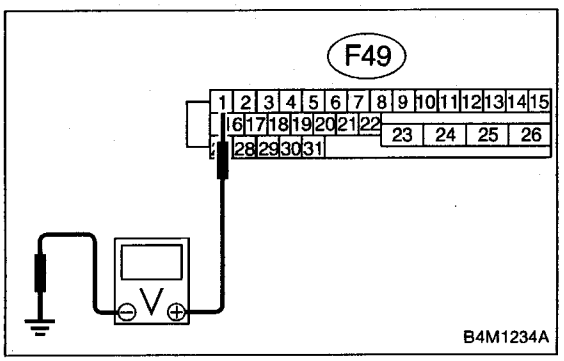
10W2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK ***: Are the positive and negative battery terminals tightly clamped?***

YES : Go to step **10W3**.

NO : Tighten the clamp of terminal.



10W3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

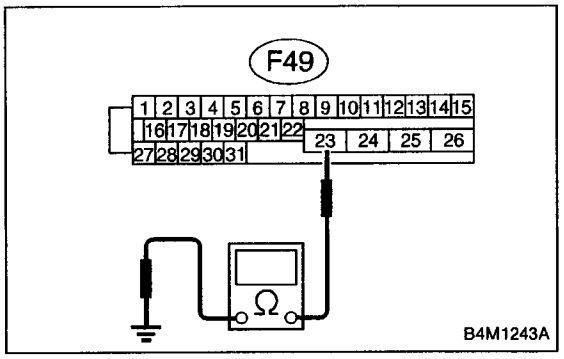
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10W4**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10W4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10W5**.

NO : Repair ABSCM&H/U ground harness.

10W5	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10W6**.

10W6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10W7**.

10W7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 42 (FB1)

HIGH VOLTAGE

B4M1268

X: TROUBLE CODE 42 LOW VOLTAGE — SOURCE VOLTAGE IS HIGH —

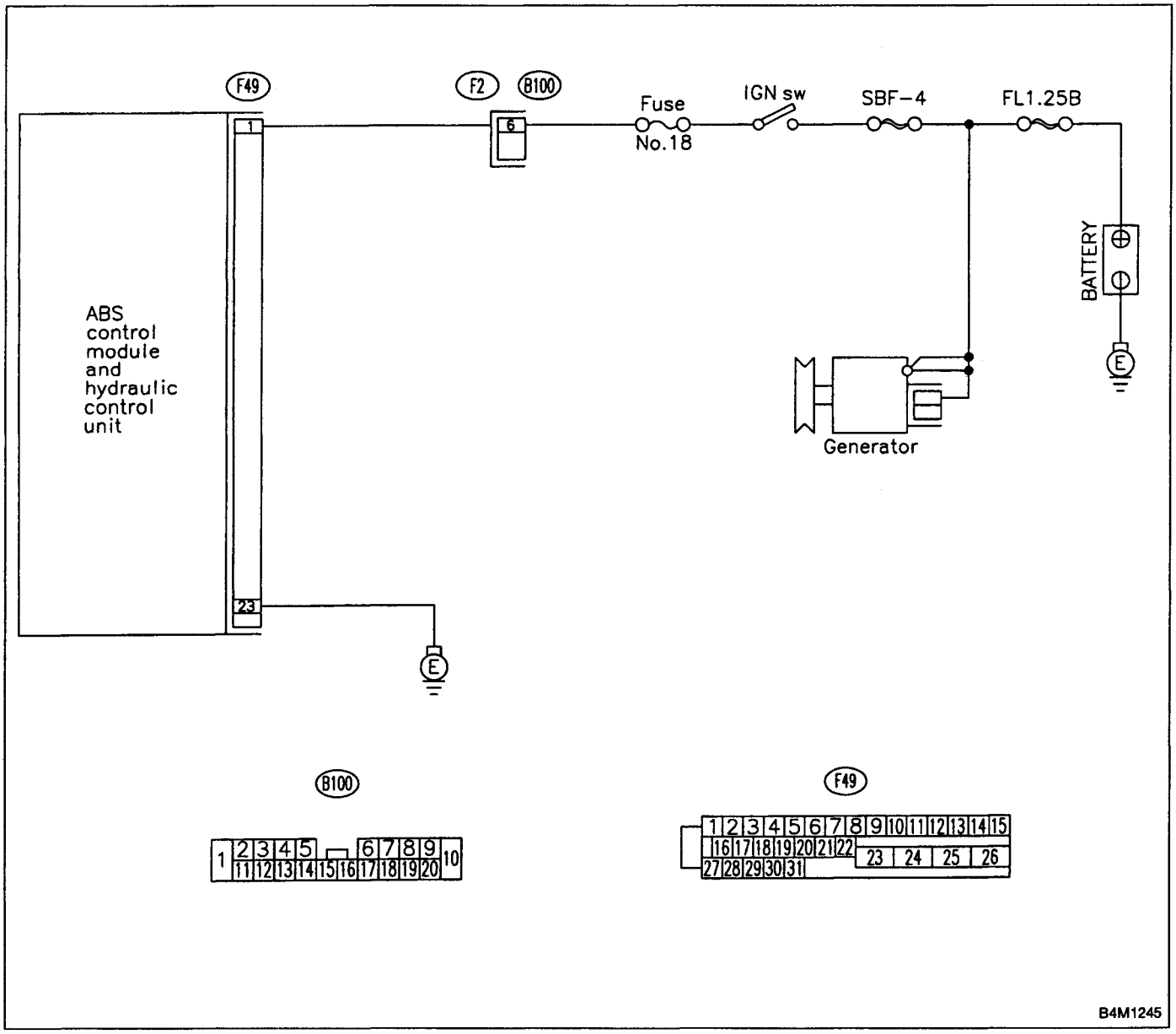
DIAGNOSIS:

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

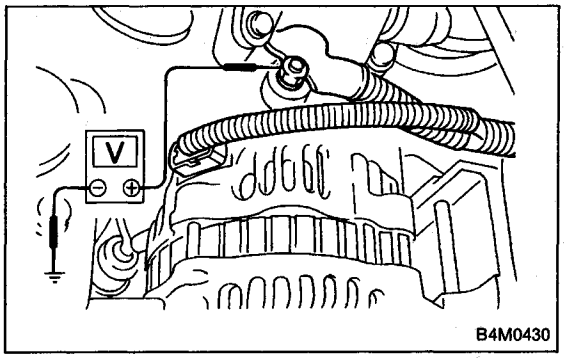
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1245



10X1	CHECK GENERATOR.

1) Start engine.
2) Idling after warm-up.
3) Measure voltage between generator B terminal and chassis ground.

Terminal
Generator B terminal — Chassis ground:

CHECK ***: Is the voltage between 10 V and 17 V?***

YES : Go to step **10X2**.

NO : Repair generator.

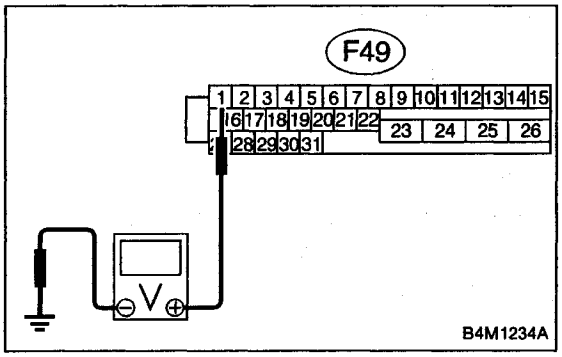
10X2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK ***: Are the positive and negative battery terminals tightly clamped?***

YES : Go to step **10X3**.

NO : Tighten the clamp of terminal.



10X3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

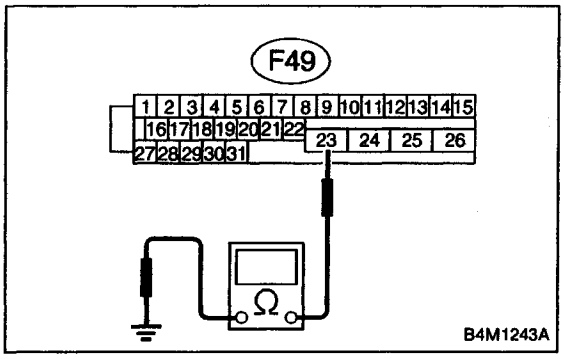
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 17 V?***

YES : Go to step **10X4**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10X4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK : ***Is the resistance less than 0.5 Ω?***
YES : Go to step **10X5**.
NO : Repair ABSCM&H/U ground harness.

10X5	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***
YES : Repair connector.
NO : Go to step **10X6**.

10X6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **10X7**.

10X7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

D•NEW 44 (FB1)
CCM LINE

B4M0964

Y: TROUBLE CODE 44 CCM LINE — A COMBINATION OF AT CONTROL ABNORMALS —

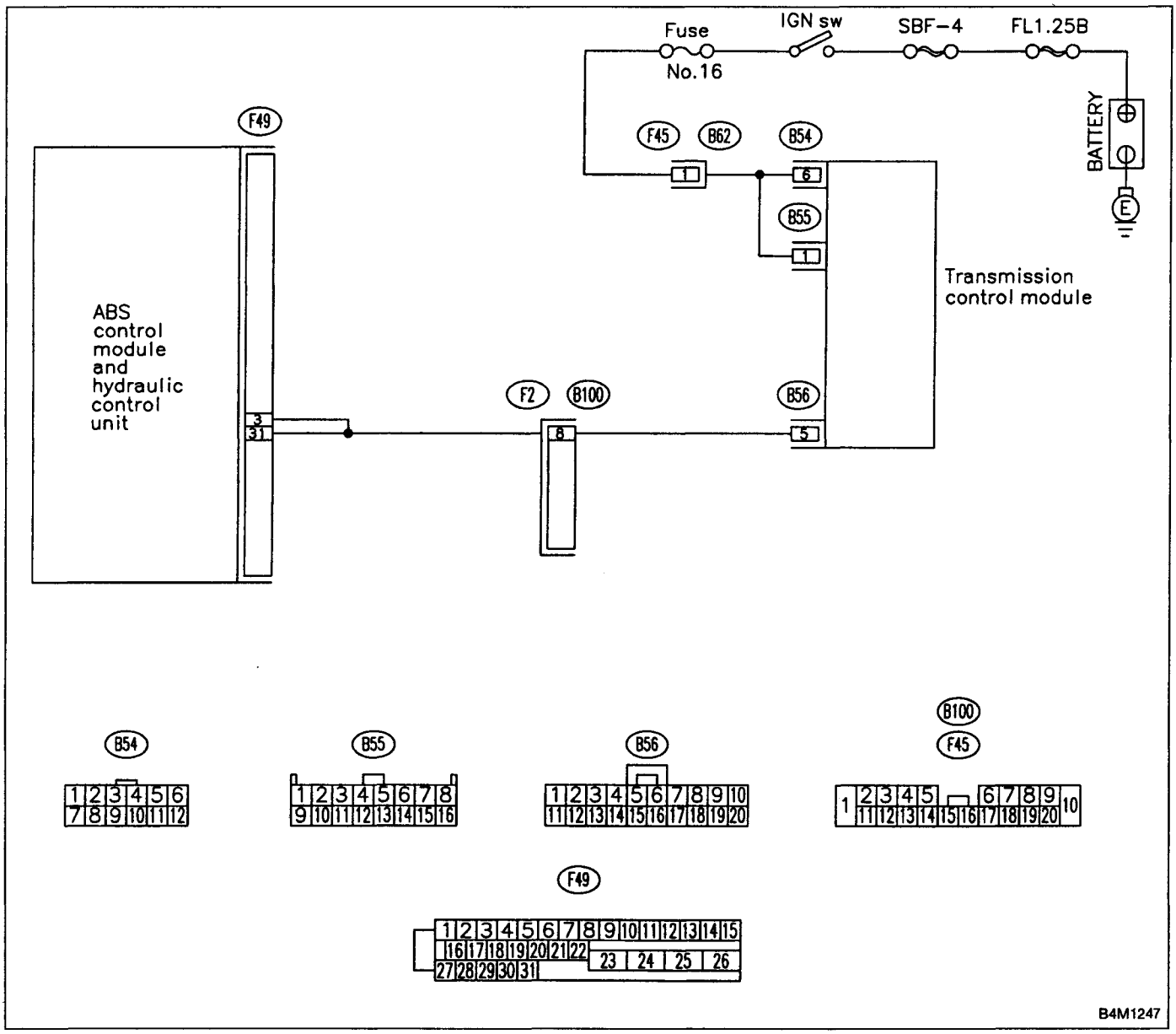
DIAGNOSIS:

- Combination of AT control faults

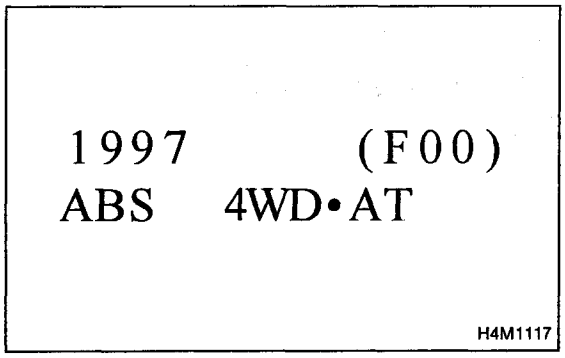
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1247



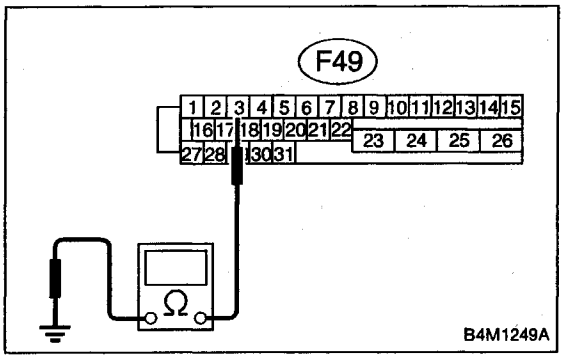
10Y1	CHECK SPECIFICATIONS OF ABSCM&H/U USING SELECT MONITOR.

1) Press [F], [0] and [0] on the select monitor.
2) Read the select monitor display.

CHECK : ***Is an ABSCM&H/U for AT model installed on a MT model?***

YES : Replace ABSCM&H/U.

NO : Go to step **10Y2**.



10Y2	CHECK GROUND SHORT OF HARNESS.

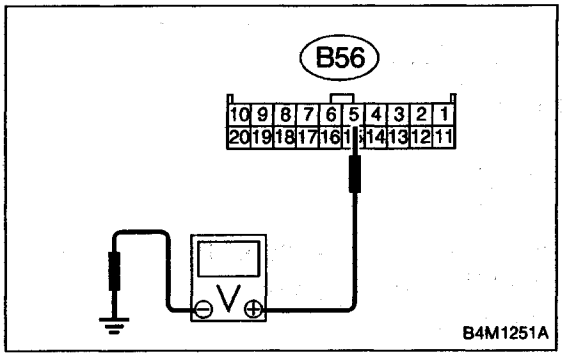
1) Turn ignition switch to OFF.
2) Disconnect two connectors from TCM.
3) Disconnect connector from ABSCM&H/U.
4) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 — Chassis ground:

CHECK : ***Is the resistance more than 1 MΩ?***

YES : Go to step **10Y3**.

NO : Repair harness between TCM and ABSCM&H/U.



10Y3	CHECK TCM.

1) Connect all connectors to TCM.
2) Turn ignition switch to ON.
3) Measure voltage between TCM connector terminal and chassis ground.

Connector & terminal
(B55) No. 5 (+) — Chassis ground (–):

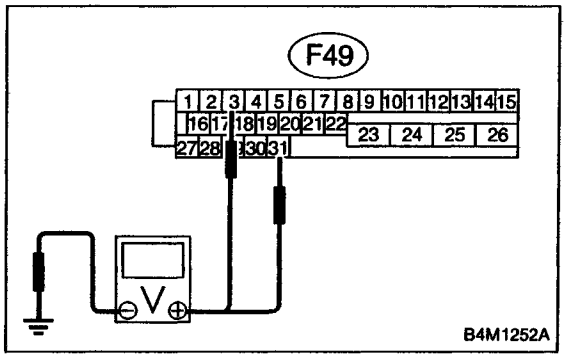
CHECK : ***Is the voltage between 10 V and 15 V?***

YES : Go to step **10Y5**.

NO : Go to step **10Y4**.

10Y4	CHECK AT.

CHECK : ***Is the AT functioning normally?***
YES : Replace TCM.
NO : Repair AT.



10Y5	CHECK OPEN CIRCUIT OF HARNESS.

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (–):
(F49) No. 31 (+) — Chassis ground (–):

CHECK : ***Is the voltage more than 10 V?***
YES : Go to step **10Y6**.
NO : Repair harness/connector between AT control module and ABSCM&H/U.

10Y6	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between AT control module and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***
YES : Repair connector.
NO : Go to step **10Y7**.

10Y7	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **10Y8**.

10Y8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

D•NEW 44 (FB1)
CCM OPEN

B4M0965

Z: TROUBLE CODE 44 CCM OPEN — A COMBINATION OF AT CONTROL ABNORMALS —

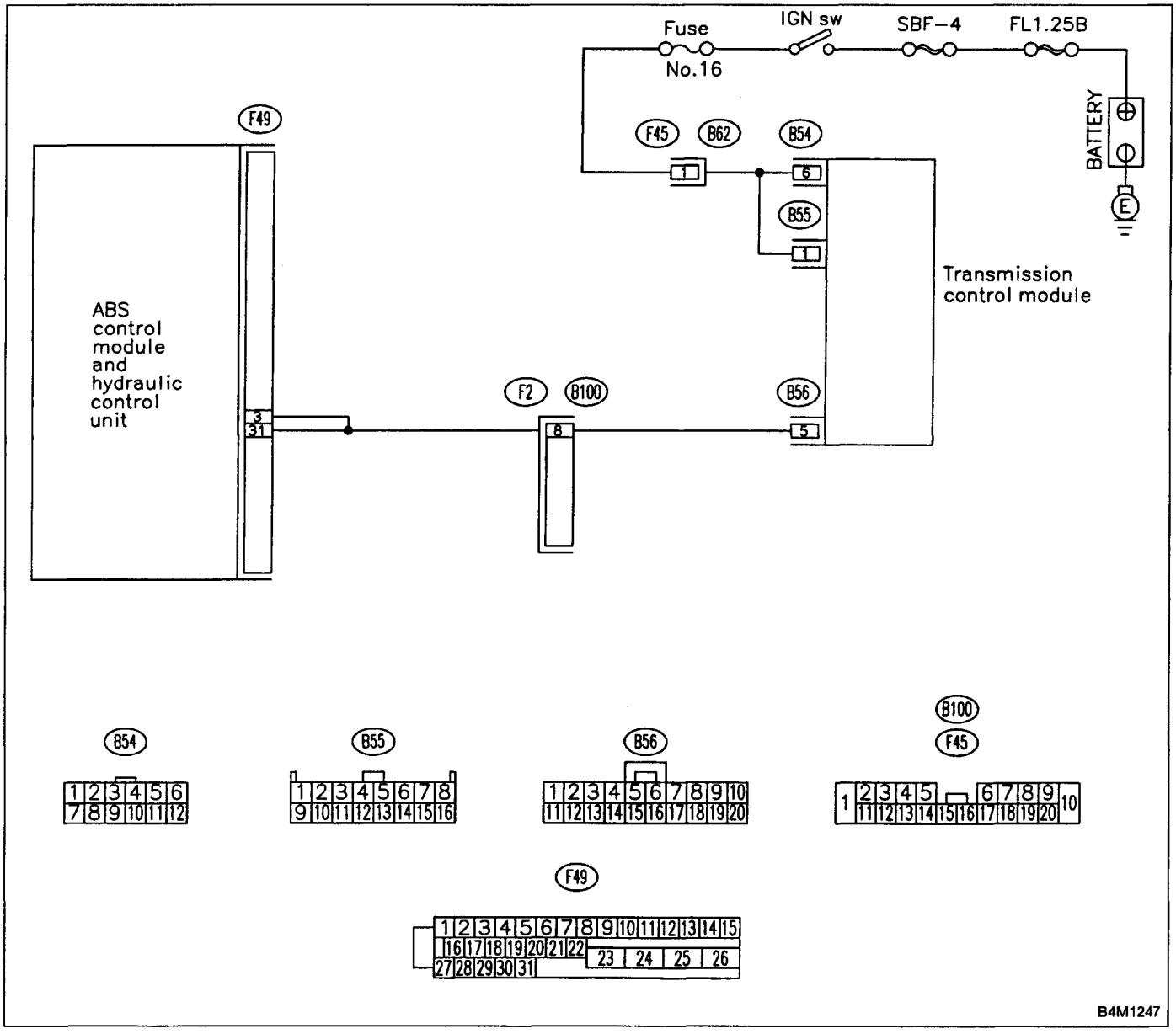
DIAGNOSIS:

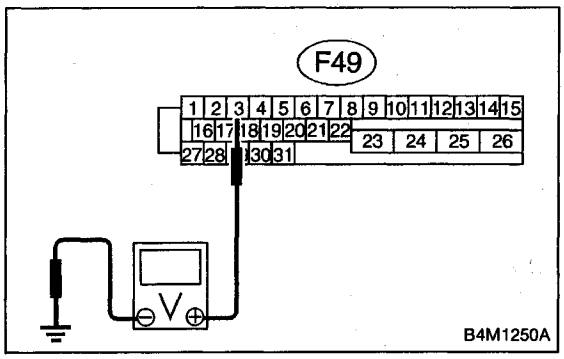
- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10Z1	CHECK BATTERY SHORT OF HARNESS.

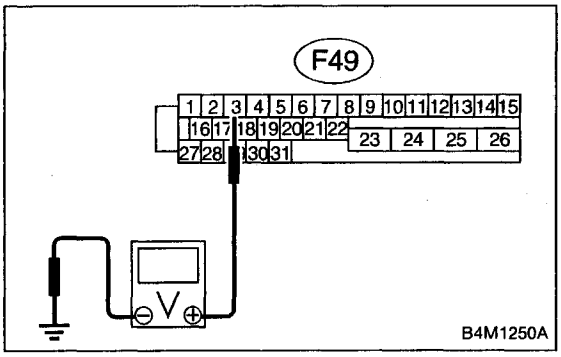
1) Turn ignition switch to OFF.
2) Disconnect two connectors from AT control module.
3) Disconnect connector from ABSCM&H/U.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (–):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **10Z2**.

NO : Repair harness between AT control module and ABSCM&H/U.



10Z2	CHECK BATTERY SHORT OF HARNESS.

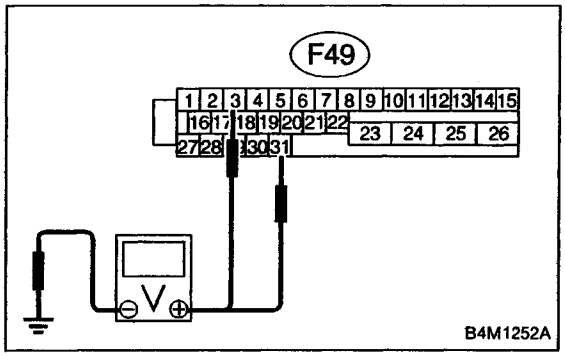
1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (–):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **10Z3**.

NO : Repair harness between AT control module and ABSCM&H/U.



10Z3	CHECK OPEN CIRCUIT OF HARNESS.

1) Turn ignition switch to OFF.
2) Connect all connectors to TCM.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (–):
(F49) No. 31 (+) — Chassis ground (–):

CHECK : ***Is the voltage between 10 V and 13 V?***
YES : Go to step **10Z4**.
NO : Repair harness/connector between TCM and ABSCM&H/U.

10Z4	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connectors between AT control module and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***
YES : Repair connector.
NO : Go to step **10Z5**.

10Z5	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **10Z6**.

10Z6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

D•NEW 51 (FB1)
V.RELAY

B4M0968

AA: TROUBLE CODE 51 V. RELAY — ABNORMAL VALVE RELAY —

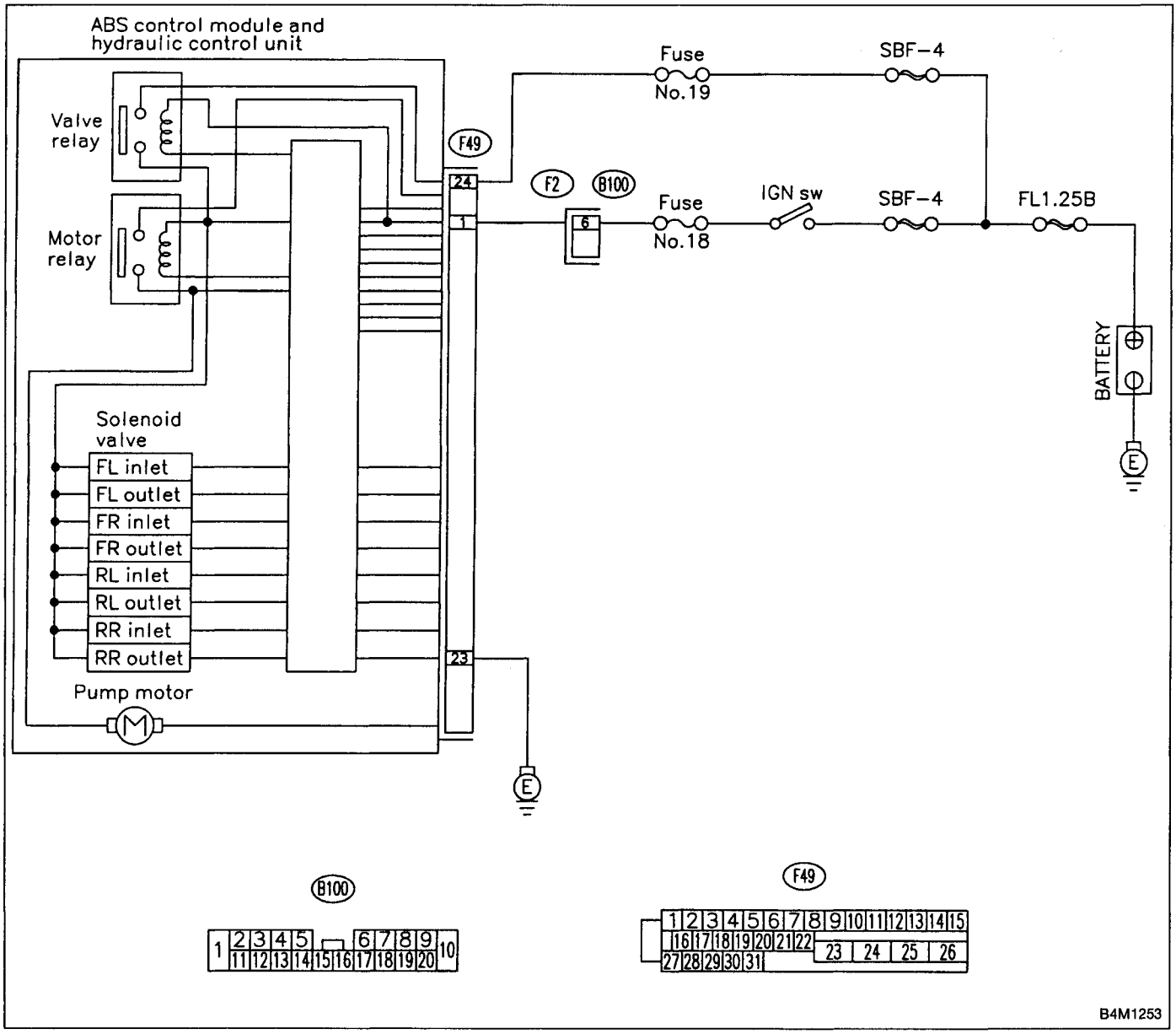
DIAGNOSIS:

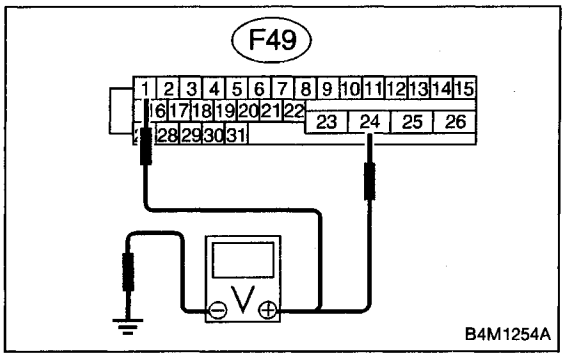
- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AA1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

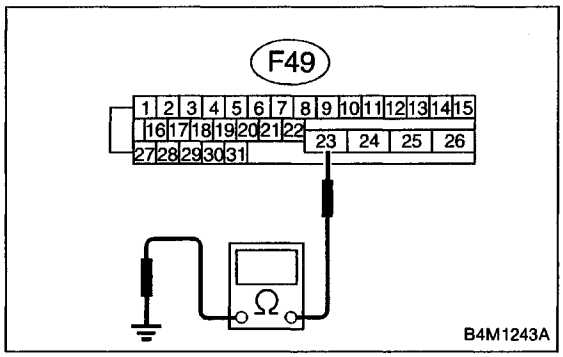
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Run the engine at idle.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):
(F49) No. 24 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10AA2**.

NO : Repair harness connector between battery and ABSCM&H/U.



10AA2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10AA3**.

NO : Repair ABSCM&H/U ground harness.

10AA3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AA4**.

10AA4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AA5**.

10AA5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 51 (FB1)
V.RELAY ON

B4M0802

AB: TROUBLE CODE 51 V. RELAY ON — VALVE RELAY ON FAILURE —

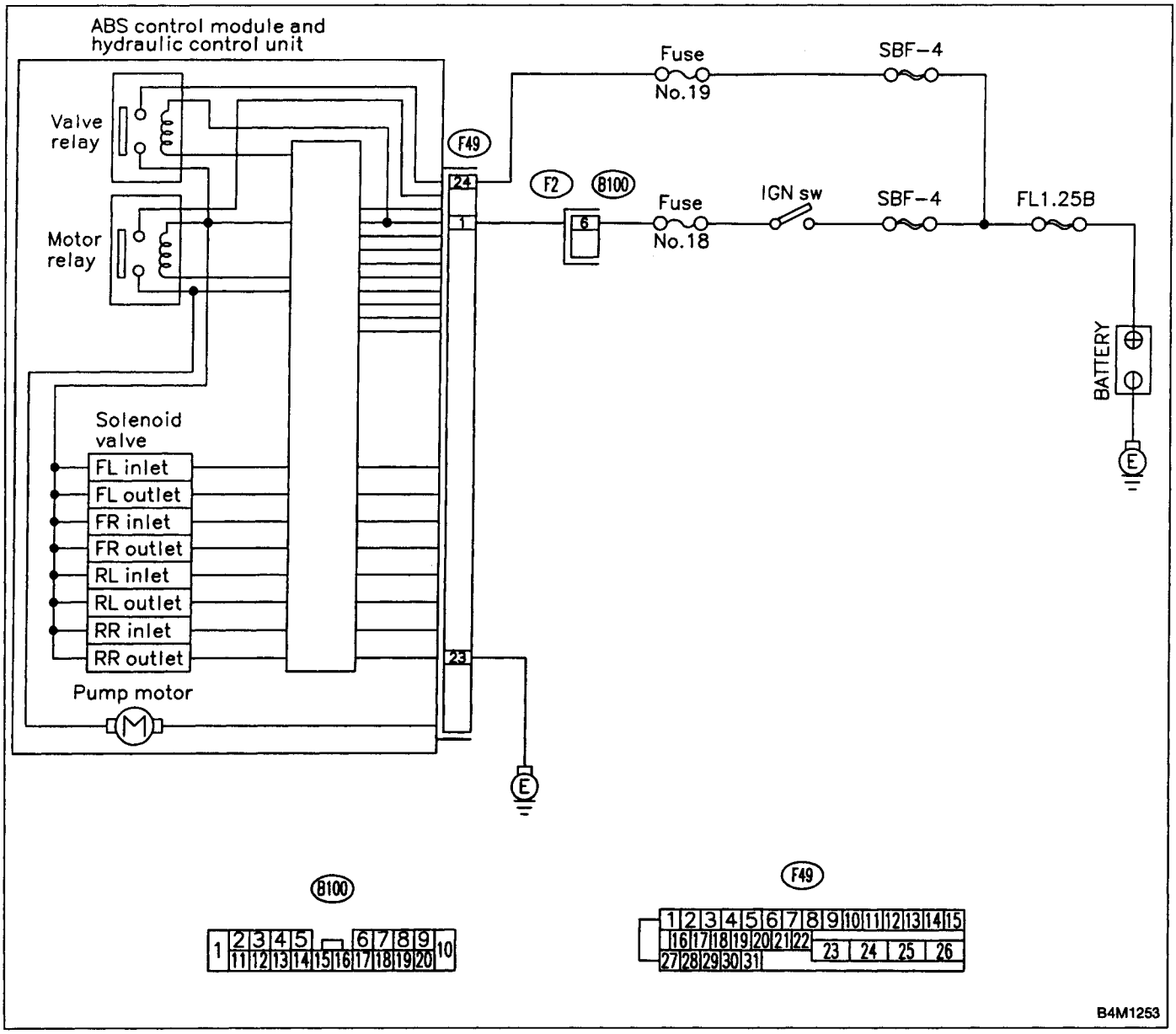
DIAGNOSIS:

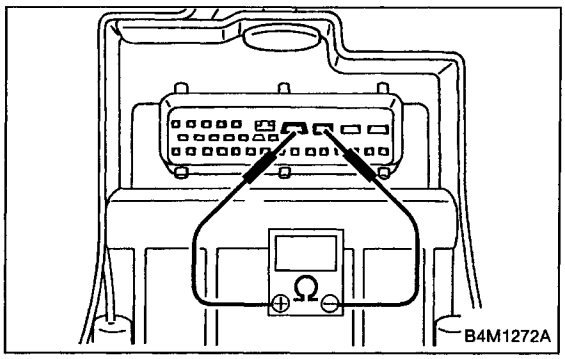
- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AB1	CHECK VALVE RELAY IN ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals
No. 23 (+) — No. 24 (–):

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10AB2**.

NO : Replace ABSCM&H/U.

10AB2	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AB3**.

10AB3	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AB4**.

10AB4	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 52 (FB1)
M. RELAY OPEN

B4M0969

AC: TROUBLE CODE 52 M. RELAY OPEN — OPEN CIRCUIT OF MOTOR RELAY —

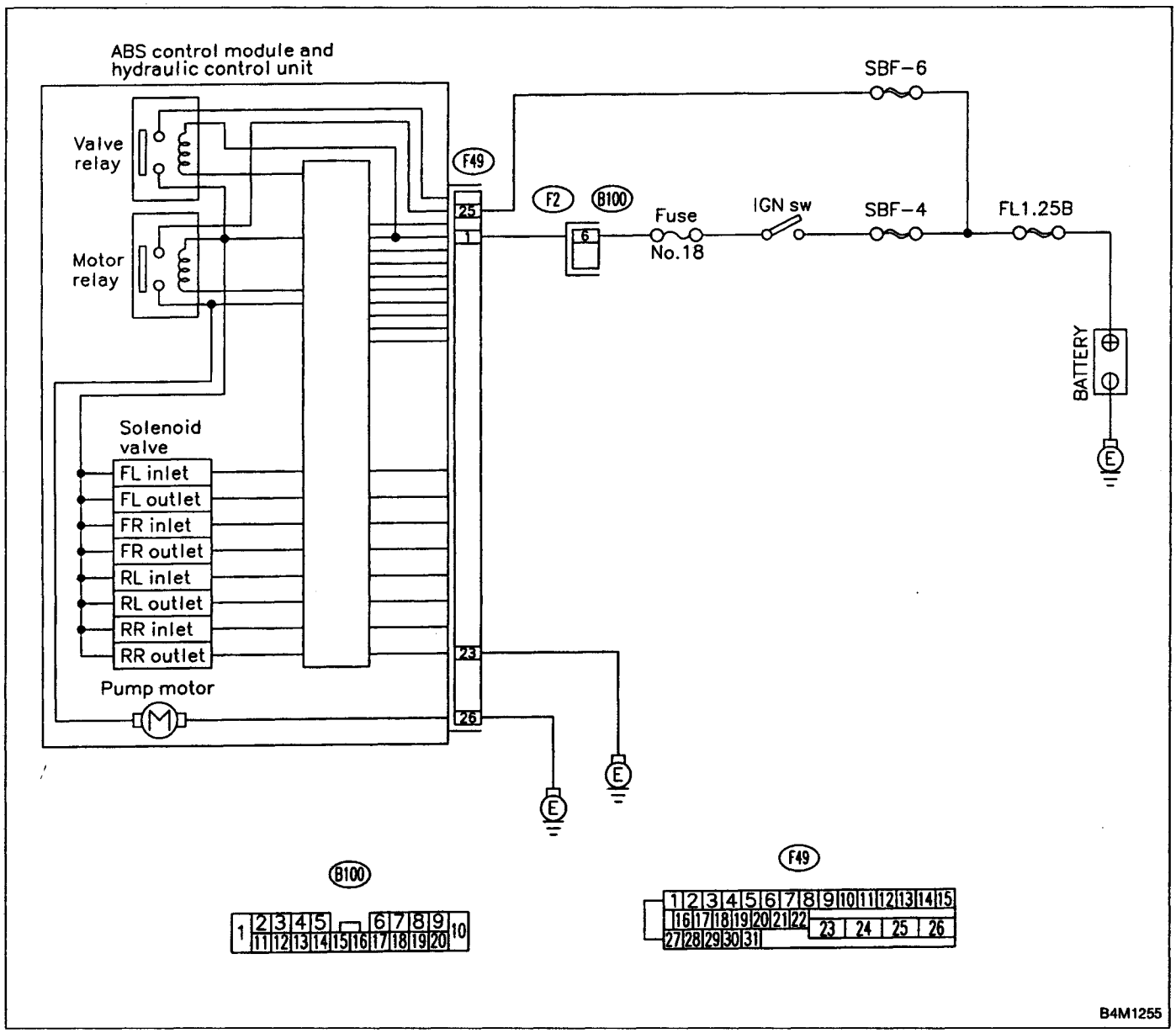
DIAGNOSIS:

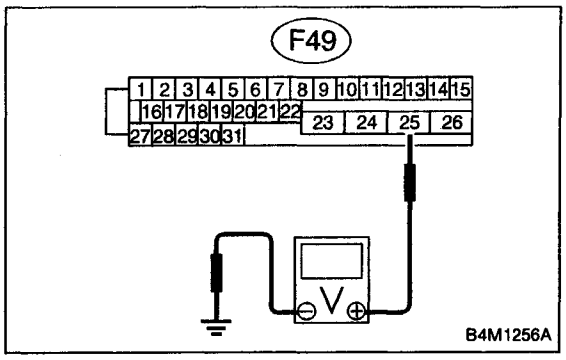
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AC1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

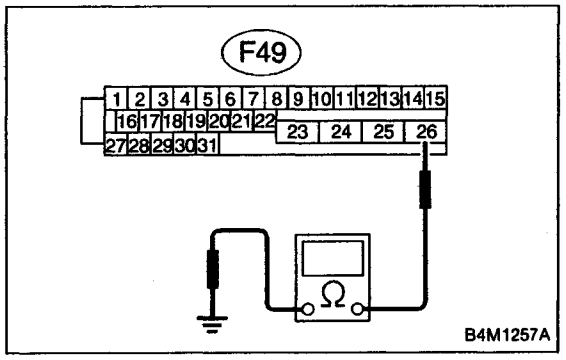
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 25 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 13 V?***

YES : Go to step **10AC2**.

NO : Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6.



10AC2	CHECK GROUND CIRCUIT OF MOTOR.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 26 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10AC3**.

NO : Repair ABSCM&H/U ground harness.

10AC3	CHECK MOTOR OPERATION.

Operate the check sequence. <Ref. to 4-4 [W25D1].>

NOTE:
Use the diagnosis connector to operate the sequence control.

CHECK ***: Can motor revolution noise (buzz) be heard when carrying out the check sequence?***

YES : Go to step **10AC4**.

NO : Replace ABSCM&H/U.

10AC4	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connector between hydraclic unit, relay box and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AC5**.

10AC5	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AC6**.

10AC6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 52 (FB1)
M. RELAY ON

B4M0970

AD: TROUBLE CODE 52 M. RELAY ON — MOTOR RELAY ON FAILURE —

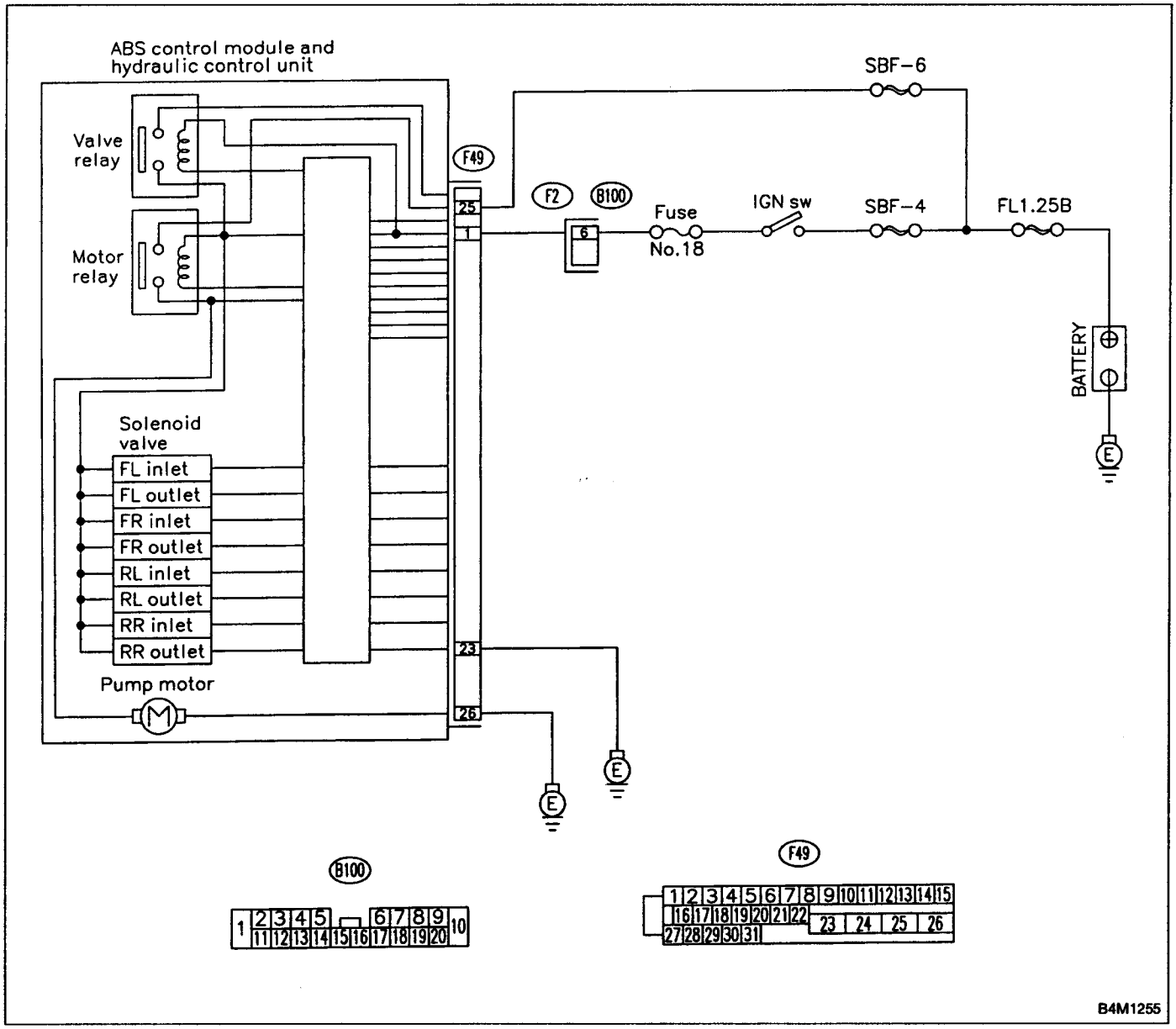
DIAGNOSIS:

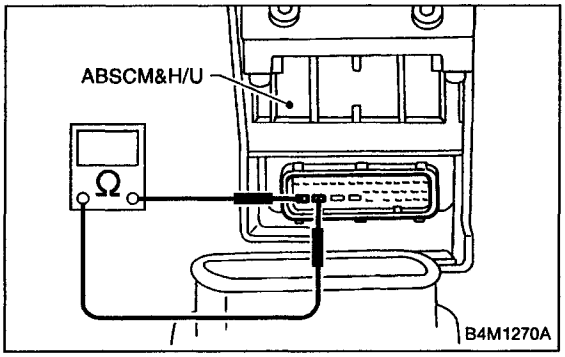
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AD1	CHECK MOTOR RELAY IN ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals
No. 25 — No. 26:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10AD2**.

NO : Replace ABSCM&H/U.

10AD2	CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W25D1].>

CHECK ***: Can motor revolution noise (buzz) be heard when carrying out the sequence control?***

YES : Go to step **10AD3**.

NO : Replace ABSCM&H/U.

10AD3	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connector between hydraulic unit, relay box and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AD4**.

10AD4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AD5**.

10AD5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 52 (FB1)
MOTOR

B4M0971

AE: TROUBLE CODE 52 MOTOR — ABNORMAL MOTOR —

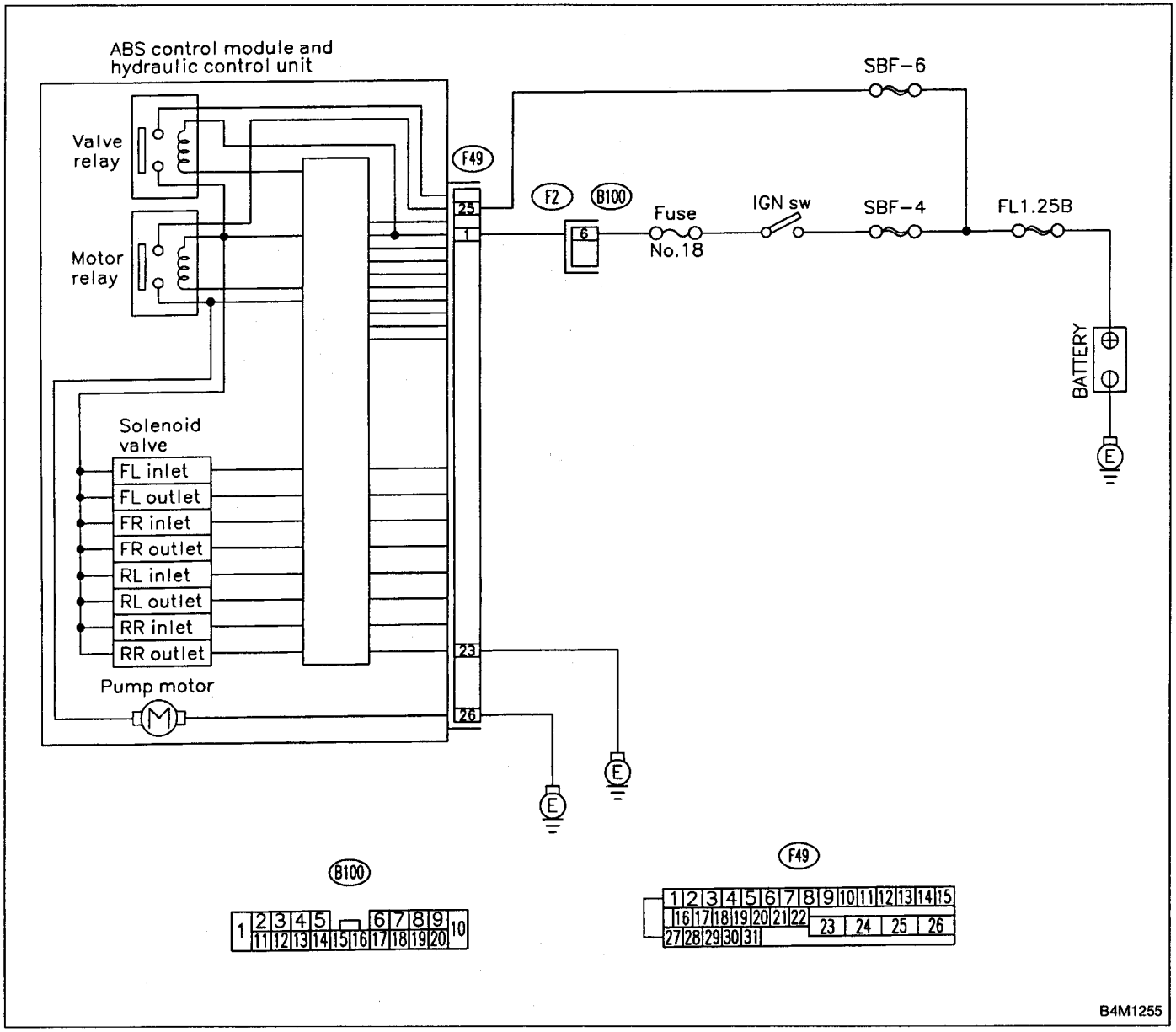
DIAGNOSIS:

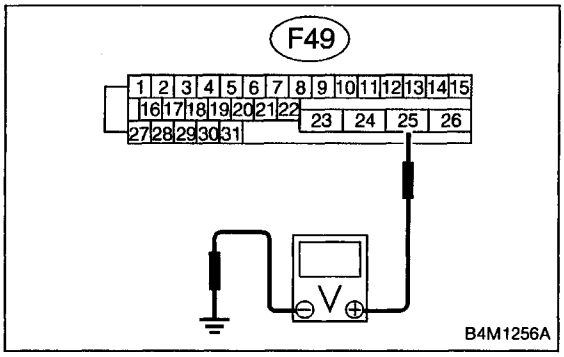
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AE1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

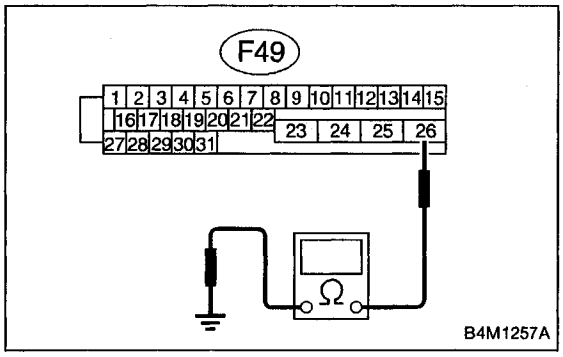
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 25 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 13 V?***

YES : Go to step **10AE2.**

NO : Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6.



10AE2	CHECK GROUND CIRCUIT OF MOTOR.

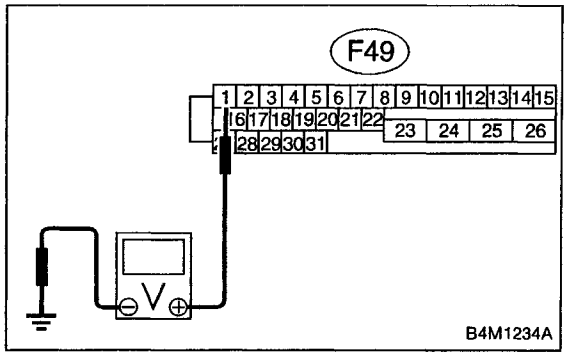
1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 26 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10AE3.**

NO : Repair ABSCM&H/U ground harness.



10AE3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

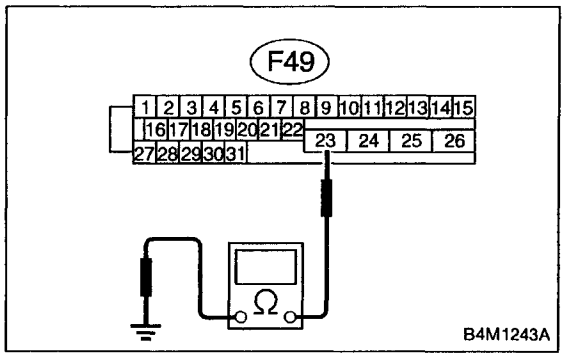
1) Run the engine at idle.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (–):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10AE4**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10AE4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10AE5**.

NO : Repair ABSCM&H/U ground harness.

10AE5	CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W25D1].>

NOTE:
Use the diagnosis connector to operate the sequence control.

CHECK ***: Can motor revolution noise (buzz) be heard when carrying out the sequence control?***

YES : Go to step **10AE6**.

NO : Replace hydraulic unit.

10AE6	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connector between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AE7**.

10AE7	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AE8**.

10AE8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 54 (FB1)
BLS

B4M0972

AF: TROUBLE CODE 54 BLS — ABNORMAL STOP LIGHT SWITCH —

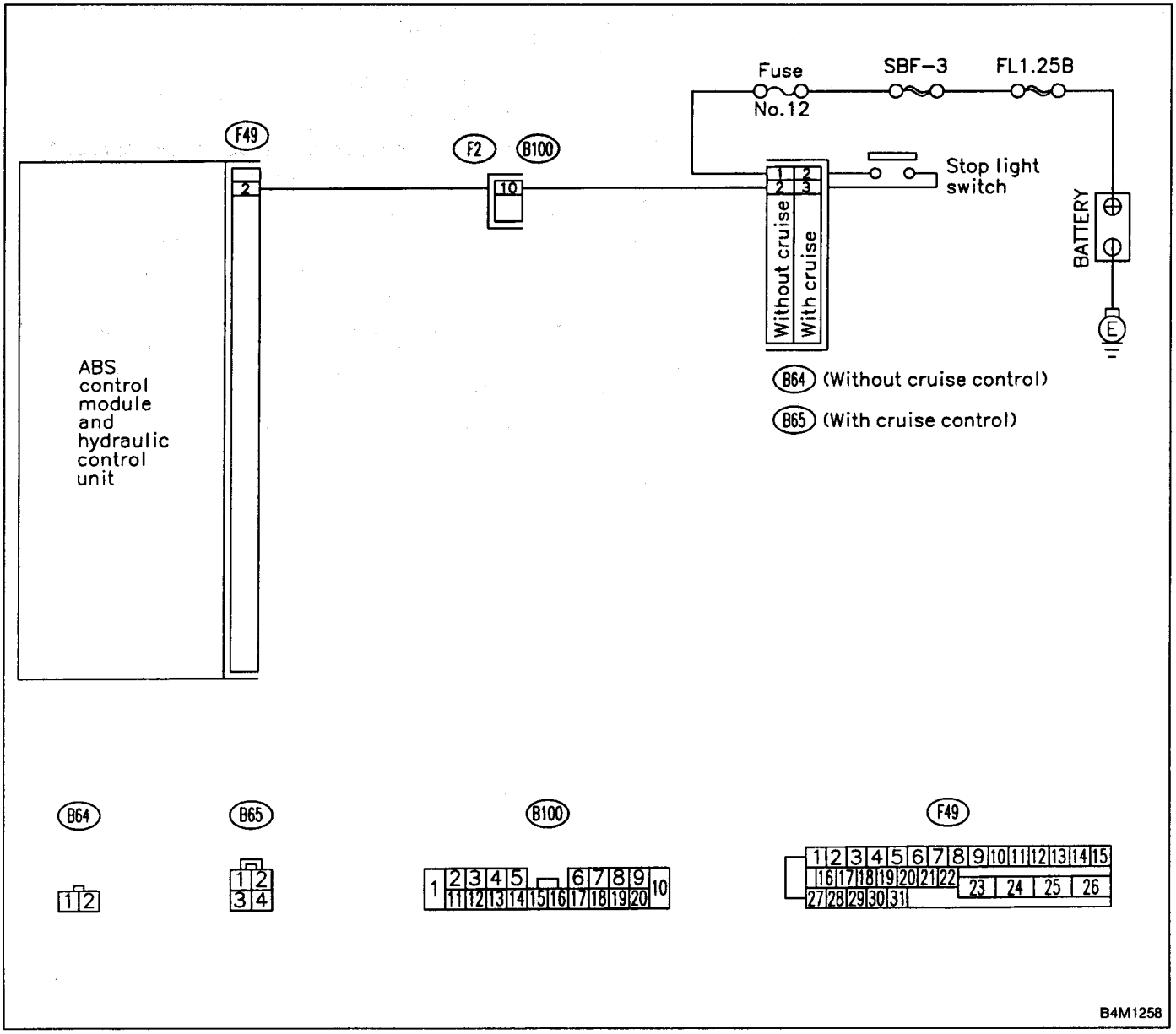
DIAGNOSIS:

- Faulty stop light switch

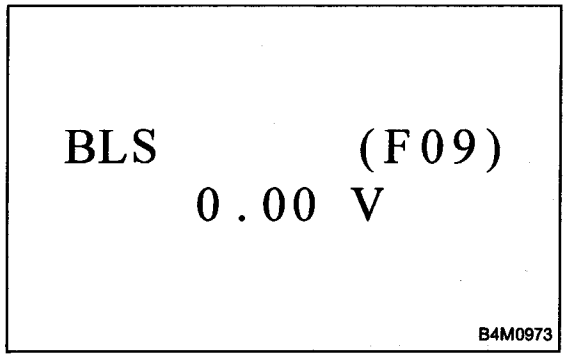
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1258



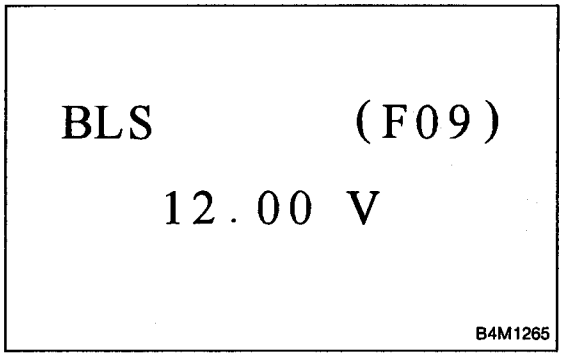
10AF1	CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.

1) Press [F], [0] and [9] on the select monitor.
2) Depress the brake pedal.
3) Read the stop light switch output on the select monitor display.

CHECK : ***Is the reading indicated on monitor display less than 1.5 V?***

YES : Go to step **10AF2**.

NO : Go to step **10AF3**.



10AF2	CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.

1) Release the brake pedal.
2) Read the stop light switch output on the select monitor display.

CHECK : ***Is the reading indicated on monitor display between 10 V and 15 V?***

YES : Go to step **10AF5**.

NO : Go to step **10AF3**.

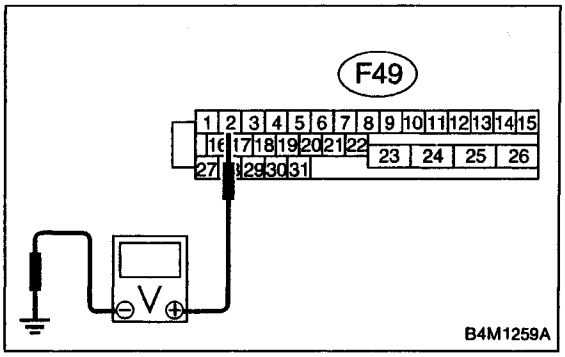
10AF3	CHECK IF STOP LIGHTS COME ON.

Depress the brake pedal.

CHECK : ***Do stop lights turn on?***

YES : Go to step **10AF4**.

NO : Repair stop lights circuit.



10AF4	CHECK OPEN CIRCUIT IN HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Depress brake pedal.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 2 — Chassis ground:

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10AF5**.

NO : Repair harness between stop light switch and ABSCM&H/U connector.

10AF5	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connector between stop light switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AF6**.

10AF6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AF7**.

10AF7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 56 (FB1)
G SENSOR LINE

B4M0974

AG: TROUBLE CODE 56 G SENSOR LINE — OPEN OR SHORT CIRCUIT OF G SENSOR —

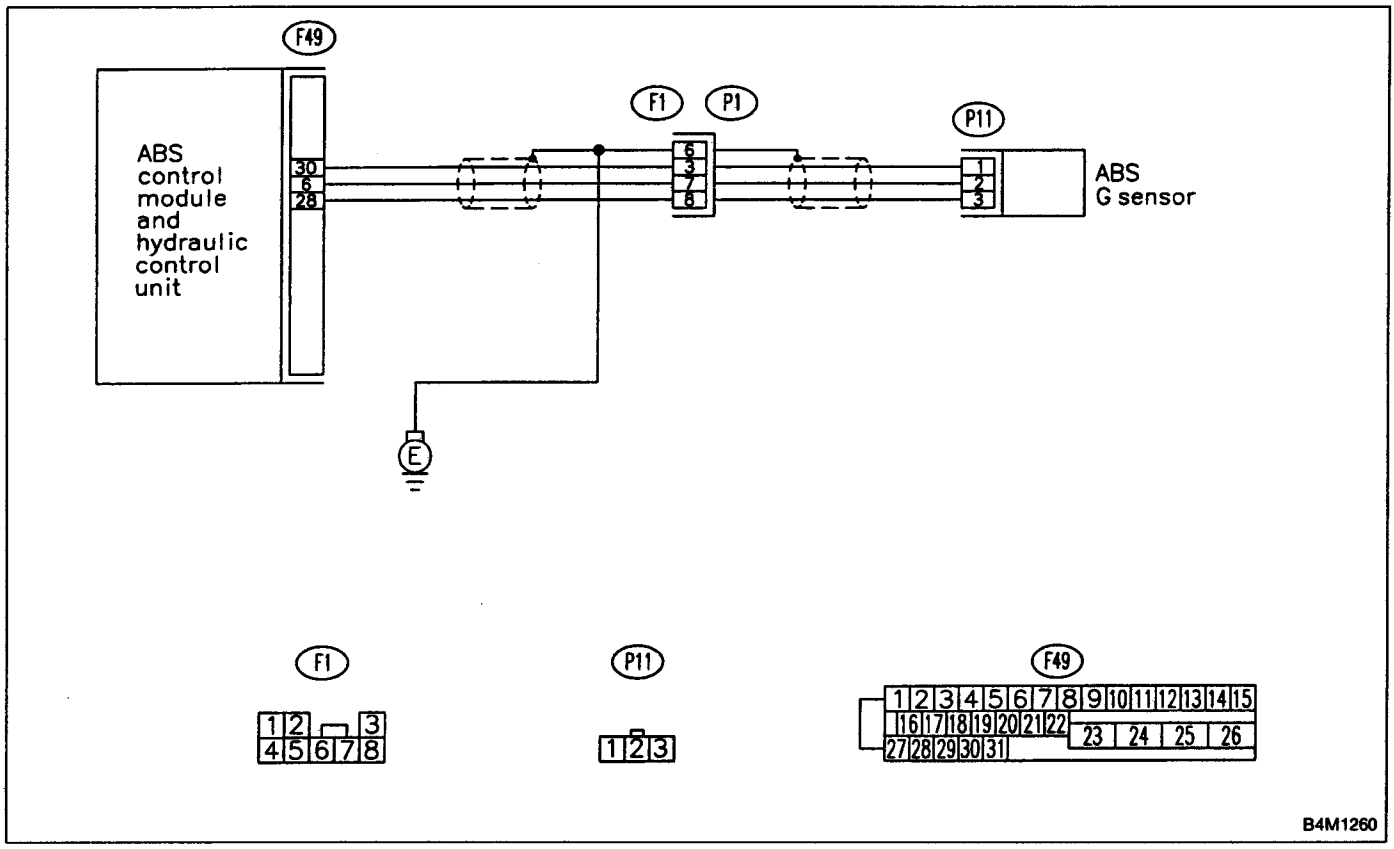
DIAGNOSIS:

- Faulty G sensor output voltage

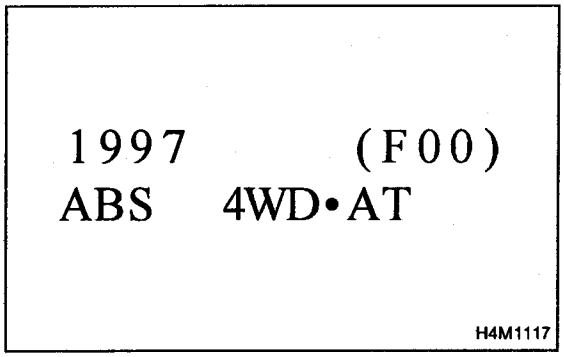
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1260



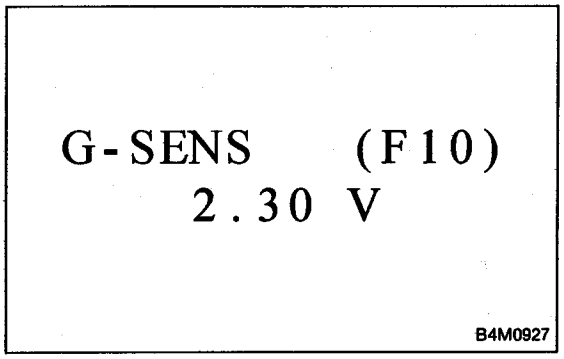
10AG1	CHECK SPECIFICATIONS OF ABSCM&H/U USING SELECT MONITOR.

1) Press [F], [0] and [0] on the select monitor.
2) Read the select monitor display.

CHECK : ***Is an ABSCM&H/U for 4WD model installed on a FWD model?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AG2**.



10AG2	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press [F], [1] and [0] on the select monitor.
2) Read the select monitor display.

CHECK : ***Is the indicated reading between 2.1 and 2.5 V when the G sensor is in horizontal position?***

YES : Go to step **10AG3**.

NO : Go to step **10AG6**.

10AG3	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AG4**.

10AG4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

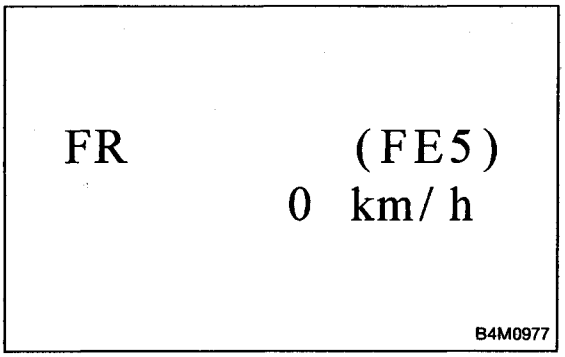
NO : Go to step **10AG5**.

10AG5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



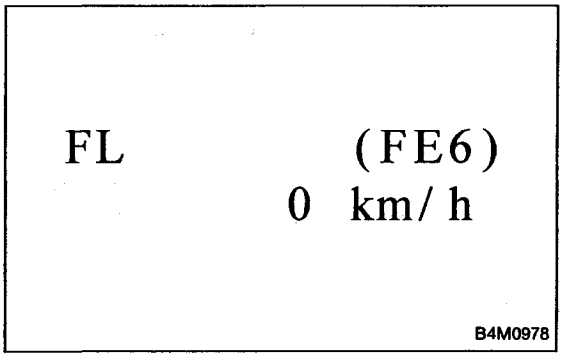
10AG6	CHECK FREEZE FRAME DATA.

1) Press [F], [E] and [5] on the select monitor.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to step **10AG7**.

NO : Go to step **10AG15**.



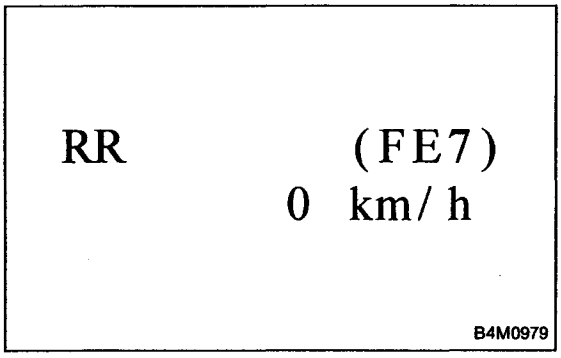
10AG7	CHECK FREEZE FRAME DATA.

1) Press the scroll key so that FE6 appears on the monitor display.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to step **10AG8**.

NO : Go to step **10AG15**.



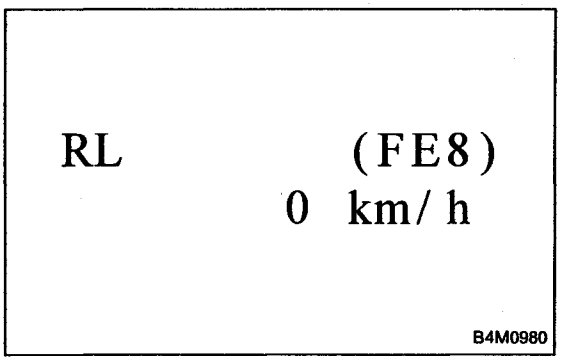
10AG8	CHECK FREEZE FRAME DATA.

1) Press the scroll key so that FE7 appears on the monitor display.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to step **10AG9**.

NO : Go to step **10AG15**.



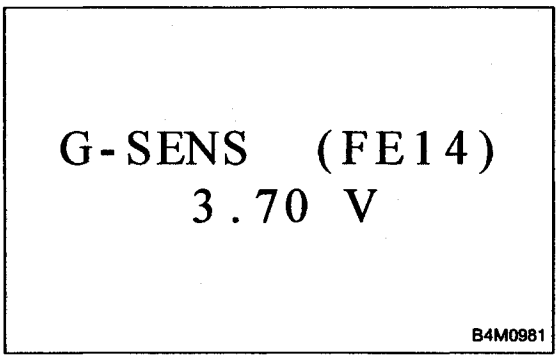
10AG9	CHECK FREEZE FRAME DATA.

1) Press the scroll key so that FE8 appears on the monitor display.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to step **10AG10**.

NO : Go to step **10AG15**.



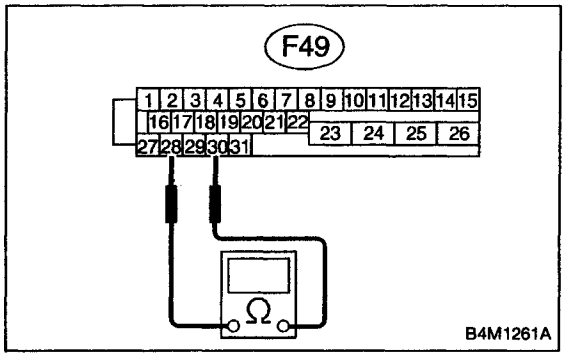
10AG10	CHECK FREEZE FRAME DATA.

1) Press the scroll key so that FE14 appears on the monitor display.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display more than 3.65 V?***

YES : Go to step **10AG11**.

NO : Go to step **10AG15**.



10AG11	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK ***: Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **10AG12.**

NO : Repair harness/connector between G sensor and ABSCM&H/U.

10AG12	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AG13.**

10AG13	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

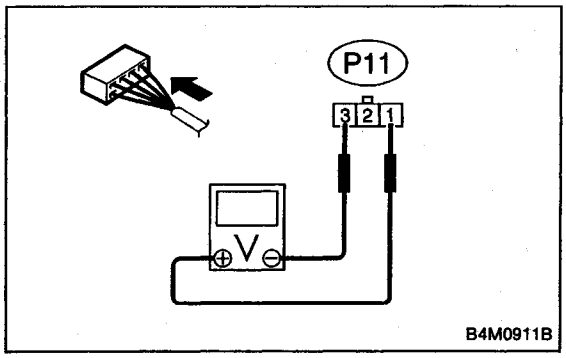
NO : Go to step **10AG14.**

10AG14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



10AG15	CHECK INPUT VOLTAGE OF G SENSOR.

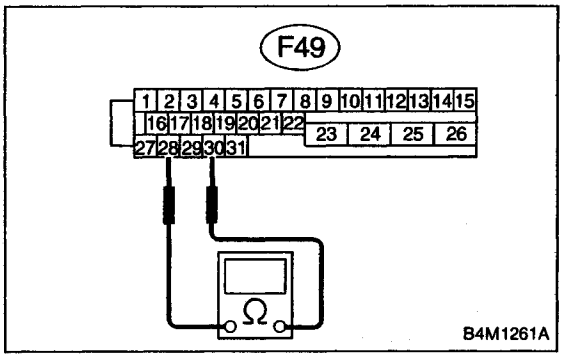
1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect G sensor from body. (Do not disconnect connector.)
4) Turn ignition switch to ON.
5) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 1 (+) — No. 3 (–):

CHECK ***: Is the voltage between 4.75 and 5.25 V?***

YES : Go to step **10AG16.**

NO : Repair harness/connector between G sensor and ABSCM&H/U.



10AG16	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

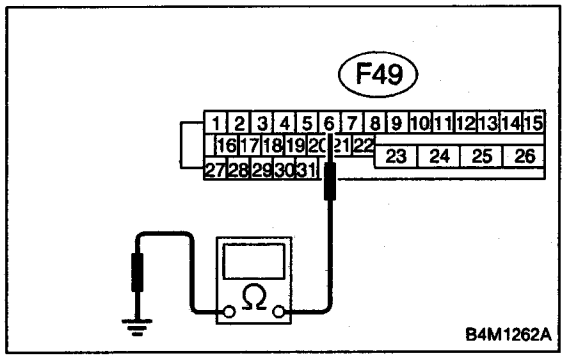
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK ***: Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **10AG17.**

NO : Repair harness/connector between G sensor and ABSCM&H/U.



10AG17	CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

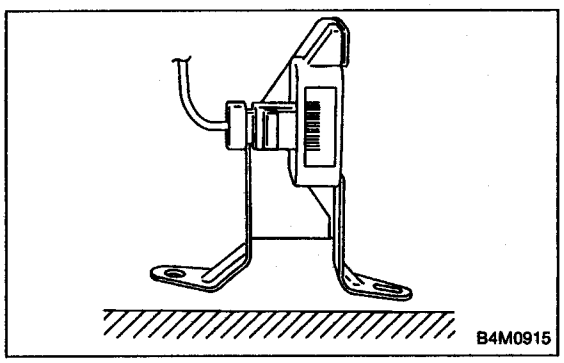
1) Disconnect connector from G sensor.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10AG18.**

NO : Repair harness between G sensor and ABSCM&H/U.



10AG18	CHECK G SENSOR.

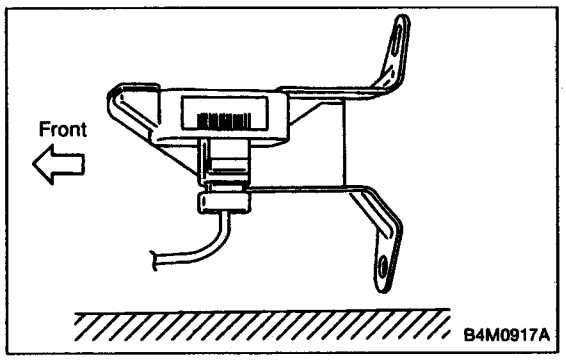
1) Connect connector to G sensor.
2) Connect connector to ABSCM&H/U.
3) Turn ignition switch to ON.
4) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK ***: Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?***

YES : Go to step **10AG19.**

NO : Replace G sensor.



10AG19	CHECK G SENSOR.

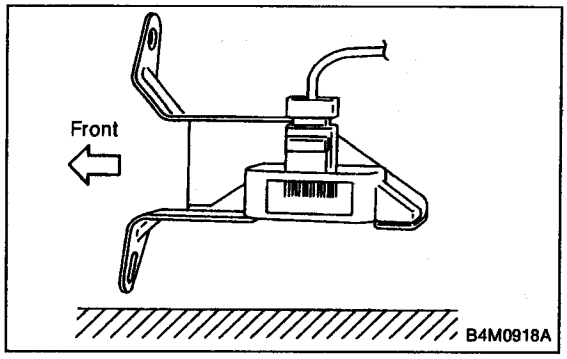
Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK ***: Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **10AG20.**

NO : Replace G sensor.



10AG20	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK : ***Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AG21**.

NO : Replace G sensor.

10AG21	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AG22**.

10AG22	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AG23**.

10AG23	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 56 (FB1)
G SENSOR +B

B4M0982

AH: TROUBLE CODE 56 G SENSOR +B — BATTERY SHORT OF G SENSOR —

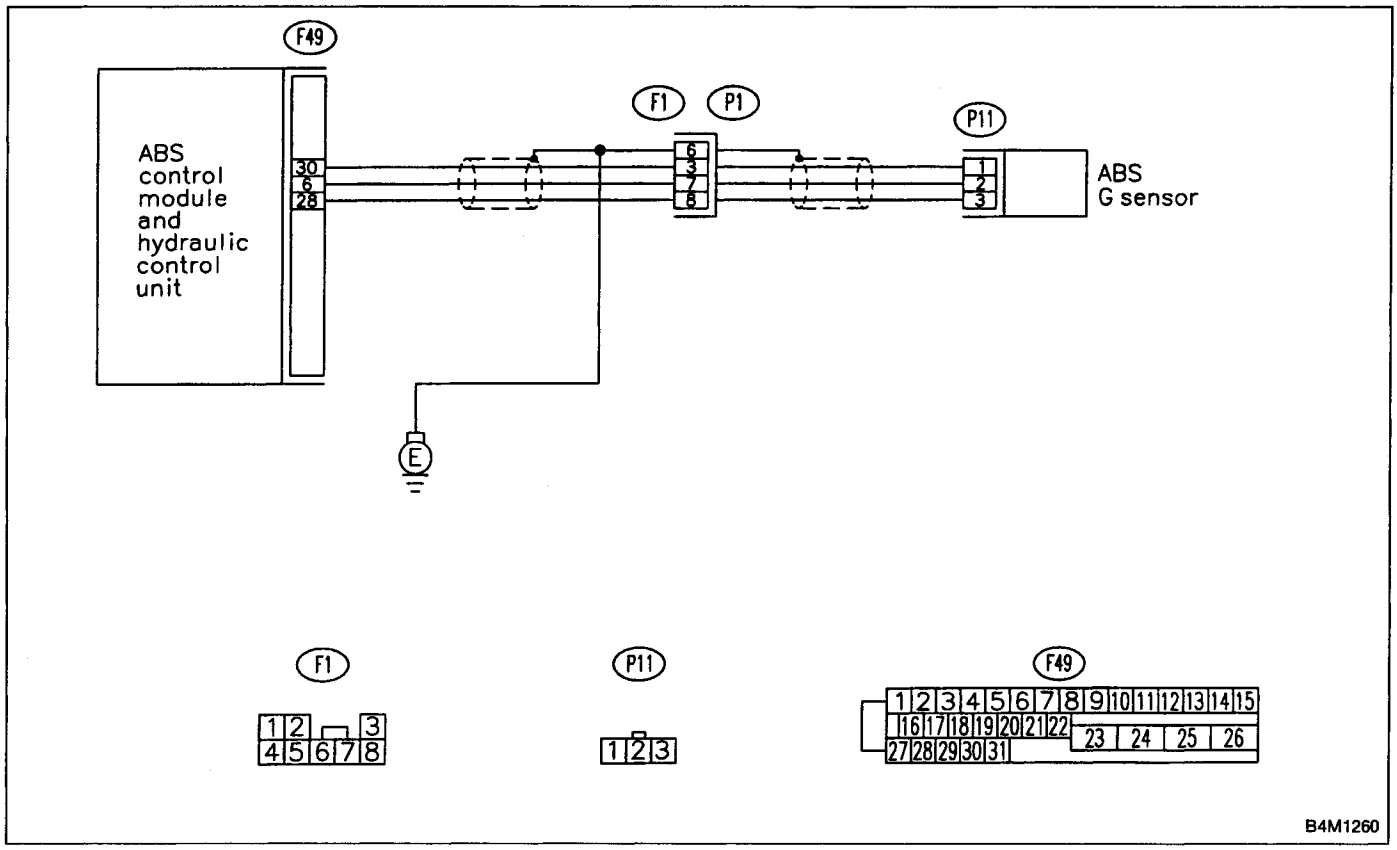
DIAGNOSIS:

- Faulty G sensor output voltage

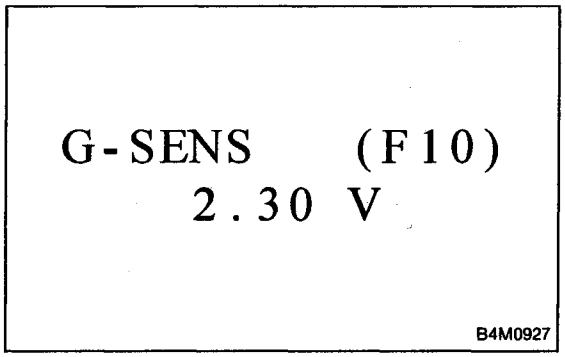
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1260



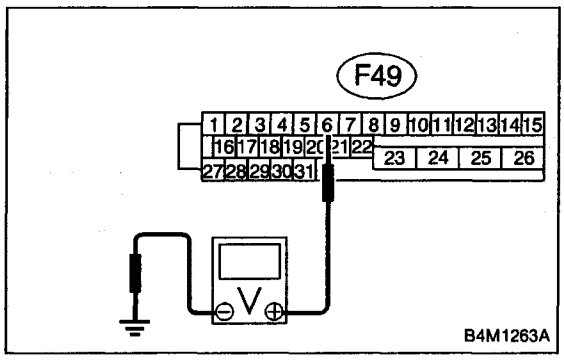
10AH1	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press [F], [1] and [0] on the select monitor.
2) Read the select monitor display.

CHECK : ***Is the indicated reading between 2.1 and 2.5 V when the G sensor is in horizontal position?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AH2.**



10AH2	CHECK BATTERY SHORT OF HARNESS.

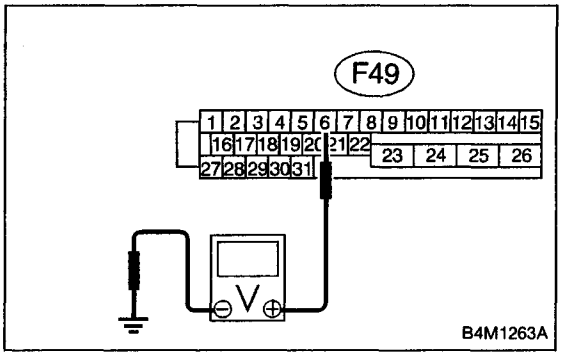
1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect connector from G sensor.
4) Disconnect connector from ABSCM&H/U.
5) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (–):

CHECK : ***Is the voltage less than 1 V?***

YES : Go to step **10AH3.**

NO : Repair harness between G sensor and ABSCM&H/U.



10AH3	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (–):

CHECK : ***Is the voltage less than 1 V?***

YES : Go to step **10AH4.**

NO : Repair harness between G sensor and ABSCM&H/U.

10AH4	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AH5.**

10AH5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 56 (FB1)
G SENSOR Hμ

B4M0984

AI: TROUBLE CODE 56 G SENSOR Hμ — ABNORMAL G SENSOR HIGH μ OUTPUT —

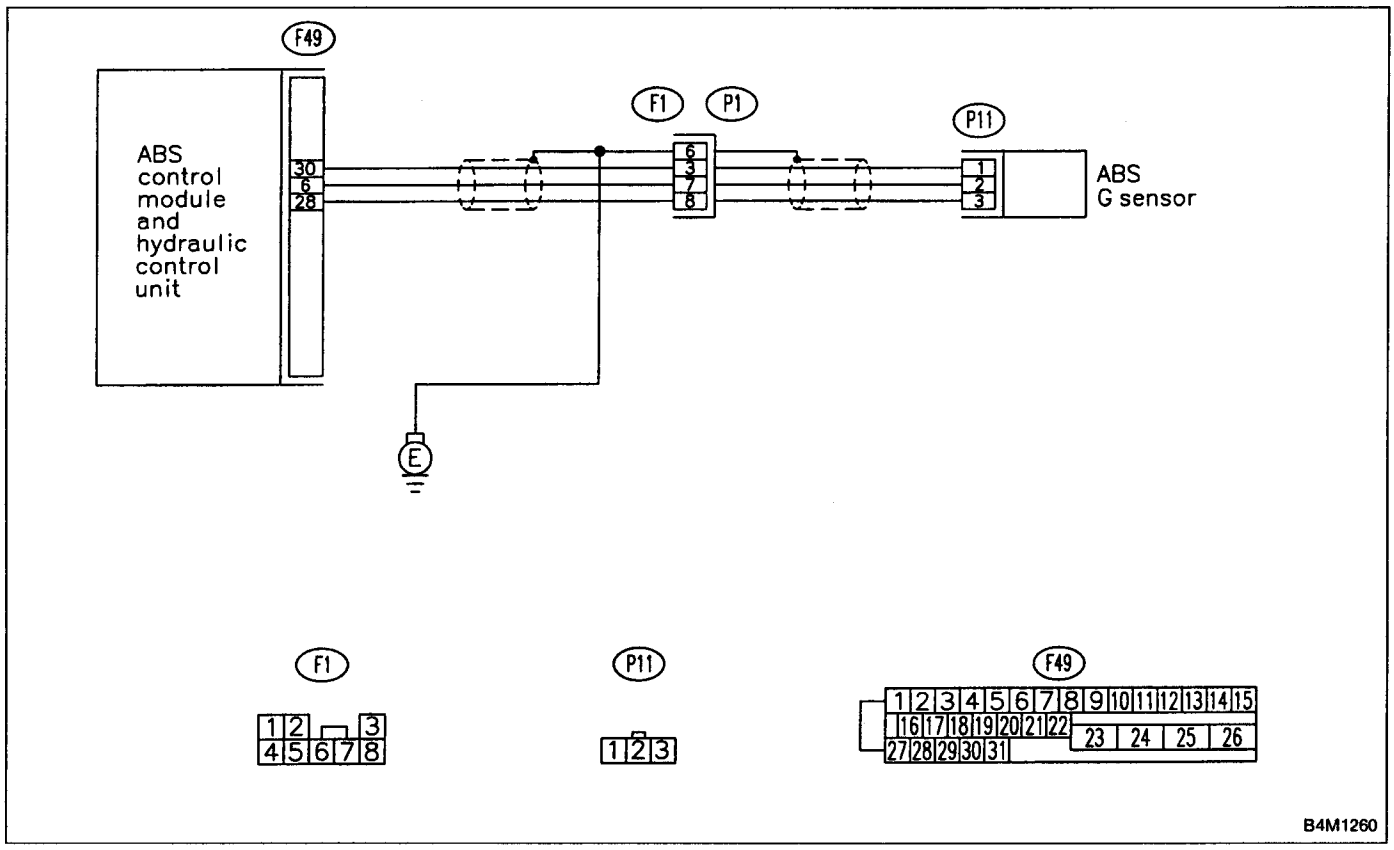
DIAGNOSIS:

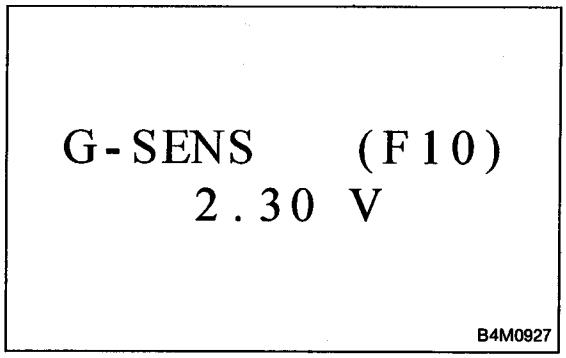
- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AI1	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press [F], [1] and [0] on the select monitor.
2) Read the select monitor display.

CHECK : ***Is the indicated reading 2.3±0.2 V when the G sensor is in horizontal position?***

YES : Go to step **10AI2**.

NO : Go to step **10AI6**.

10AI2	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AI3**.

10AI3	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

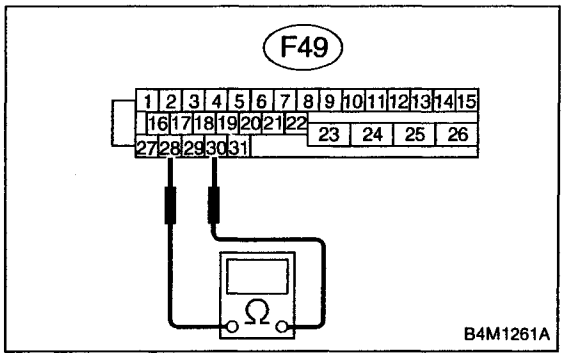
NO : Go to step **10AI4**.

10AI4	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



10AI5	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

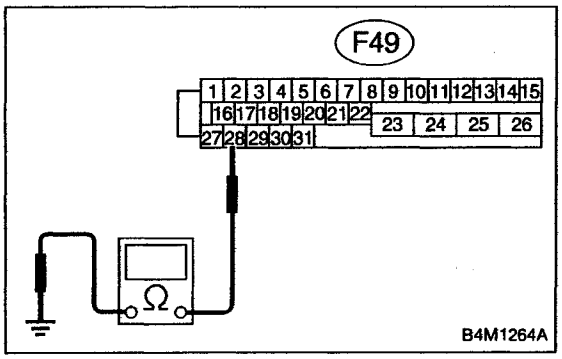
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK ***: Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **10AI6.**

NO : Repair harness/connector between G sensor and ABSCM&H/U.



10AI6	CHECK GROUND SHORT OF HARNESS.

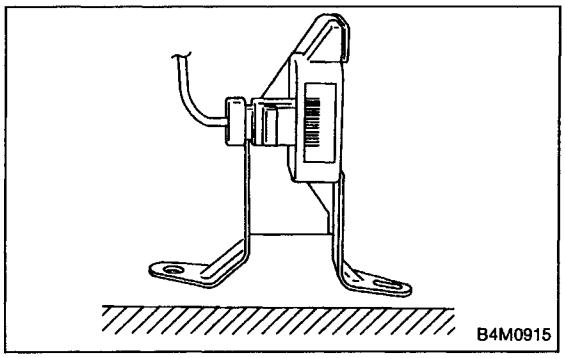
Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 28 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10AI7.**

NO : Repair harness between G sensor and ABSCM&H/U.
Replace ABSCM&H/U.



10AI7	CHECK G SENSOR.

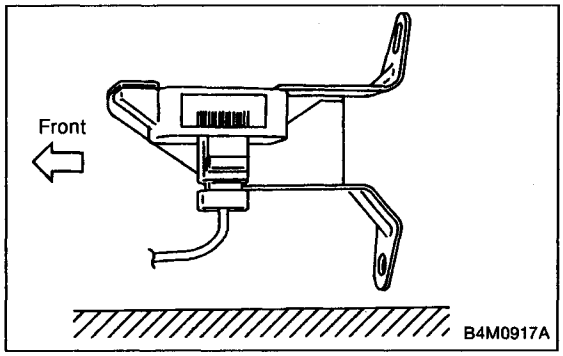
1) Remove console box.
2) Remove G sensor from vehicle.
3) Connect connector to G sensor.
4) Connect connector to ABSCM&H/U.
5) Turn ignition switch to ON.
6) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK ***: Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?***

YES : Go to step **10AI8**.

NO : Replace G sensor.



10AI8	CHECK G SENSOR.

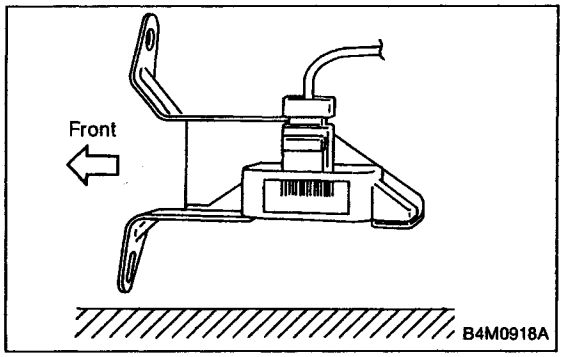
Measure voltage between G sensor connector terminals.

Connector & terminal
(R70) No. 2 (+) — No. 1 (–):

CHECK ***: Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **10AI9**.

NO : Replace G sensor.



10AI9	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal
(R70) No. 2 (+) — No. 1 (–):

CHECK ***: Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AI10**.

NO : Replace G sensor.

10AI10	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AI11**.

10AI11	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 56 (FB1)
G SENSOR STICK

B4M0813

AJ: TROUBLE CODE 56 G SENSOR STICK — G SENSOR OUTPUT IS STUCK —

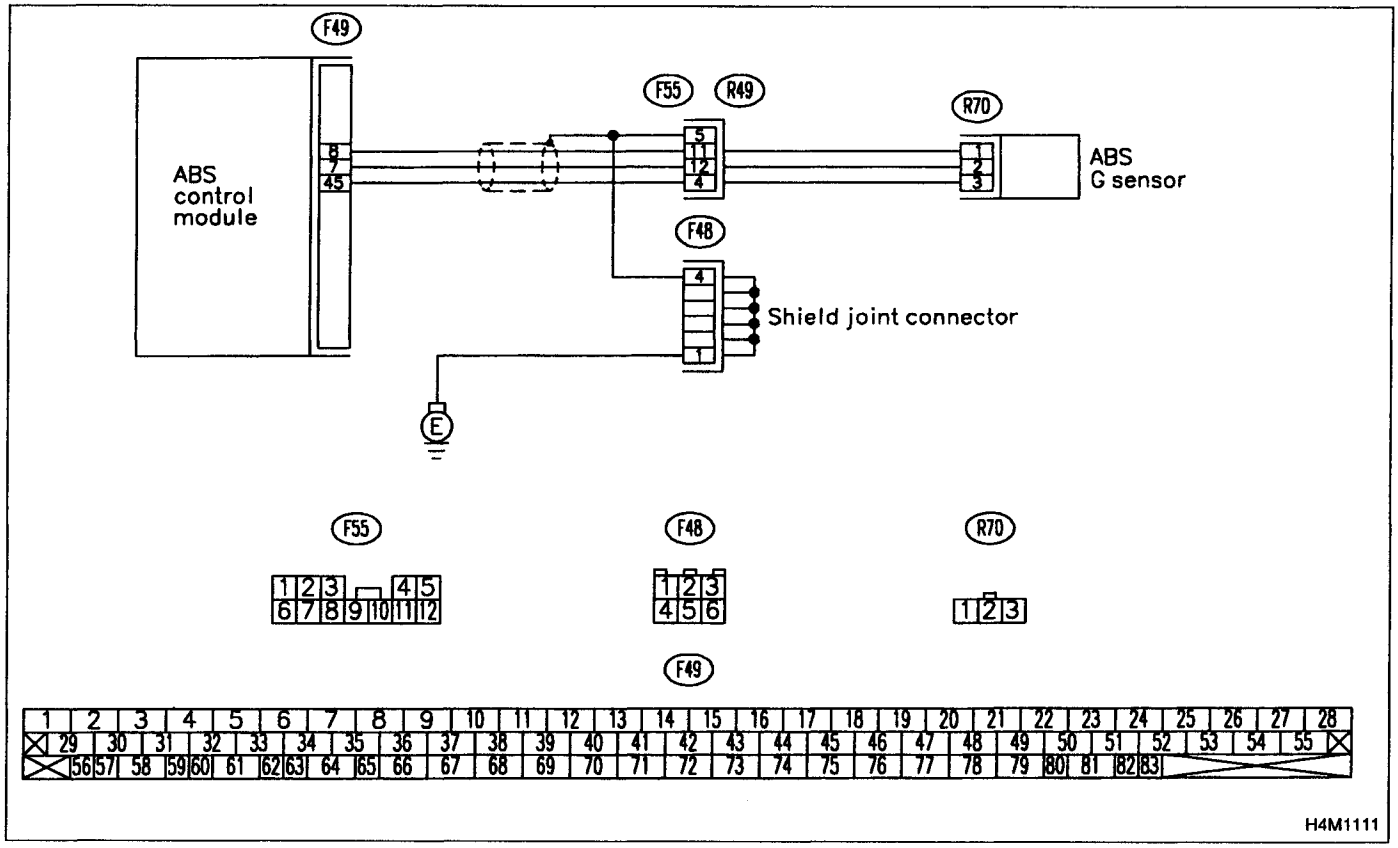
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



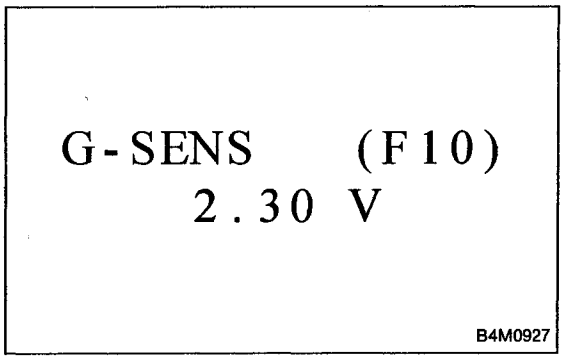
H4M1111

10AJ1	CHECK ALL FOUR WHEELS FOR FREE TURNING.

CHECK : ***Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?***

YES : The ABS is normal. Erase the trouble code.

NO : Go to step **10AJ2**.



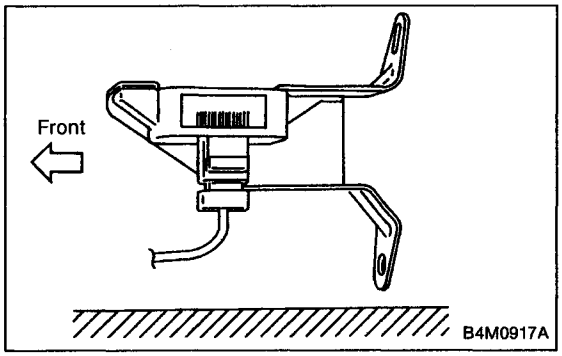
10AJ2	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press [F], [1] and [0] on the select monitor.
2) Read the select monitor display.

CHECK : ***Is the indicated reading between 2.1 and 2.5 V when the vehicle is in horizontal position?***

YES : Go to step **10AJ3**.

NO : Go to step **10AJ8**.



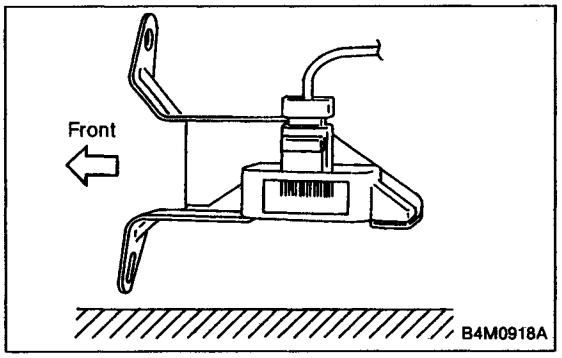
10AJ3	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Turn ignition switch to OFF.
2) Remove console box.
3) Remove G sensor from vehicle. (Do not disconnect connector.)
4) Turn ignition switch to ON.
5) Press [F], [1] and [0] on the select monitor.
6) Read the select monitor display.

CHECK : ***Is the indicated reading between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **10AJ4**.

NO : Replace G sensor.



10AJ4	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

Read the select monitor display.

CHECK : ***Is the indicated reading between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AJ5**.

NO : Replace G sensor.

10AJ5	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].☆10>***

YES : Repair connector.

NO : Go to step **10AJ6**.

10AJ6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

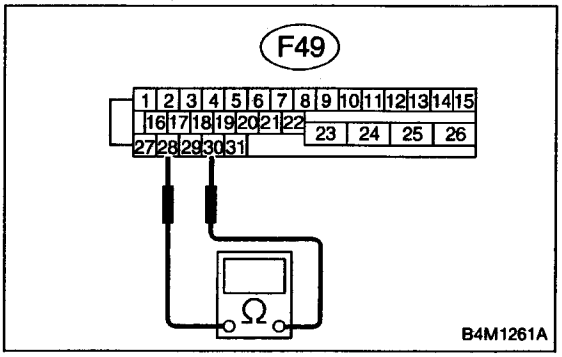
NO : Go to step **10AJ7**.

10AJ7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



10AJ8	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

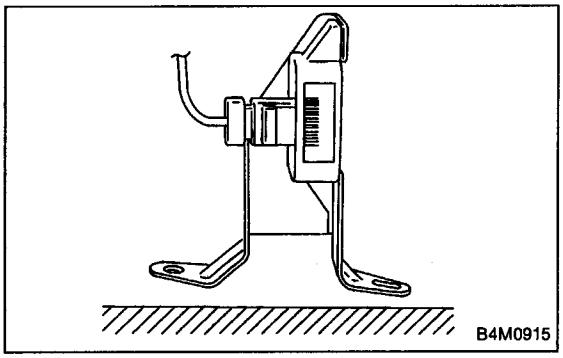
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK : ***Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **10AJ9**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.



10AJ9	CHECK G SENSOR.

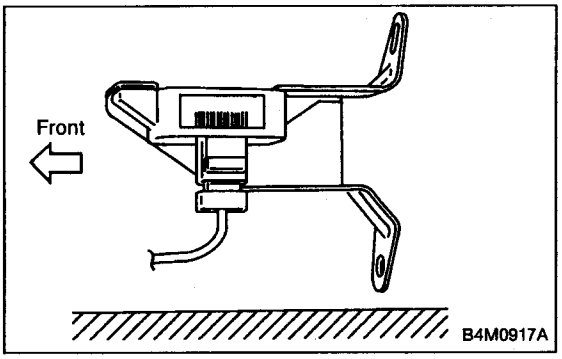
1) Remove console box.
2) Remove G sensor from vehicle.
3) Connect connector to G sensor.
4) Connect connector to ABSCM&H/U.
5) Turn ignition switch to ON.
6) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK ***: Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?***

YES : Go to step **10AJ10**.

NO : Replace G sensor.



10AJ10	CHECK G SENSOR.

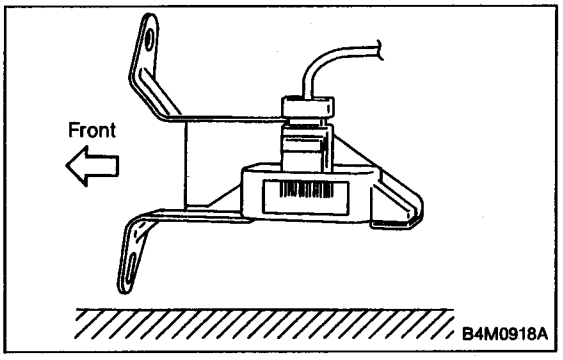
Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK ***: Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **10AJ11**.

NO : Replace G sensor.



10AJ11	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (–):

CHECK ***: Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AJ12**.

NO : Replace G sensor.

10AJ12	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AJ13**.

10AJ13	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

11. General Diagnostics Table

A: SYMPTOMS AND PROBABLE CAUSES

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

B: CHECKING THE HYDRAULIC UNIT OPERATION

11B1	PREPARING THE BRAKE TESTER.

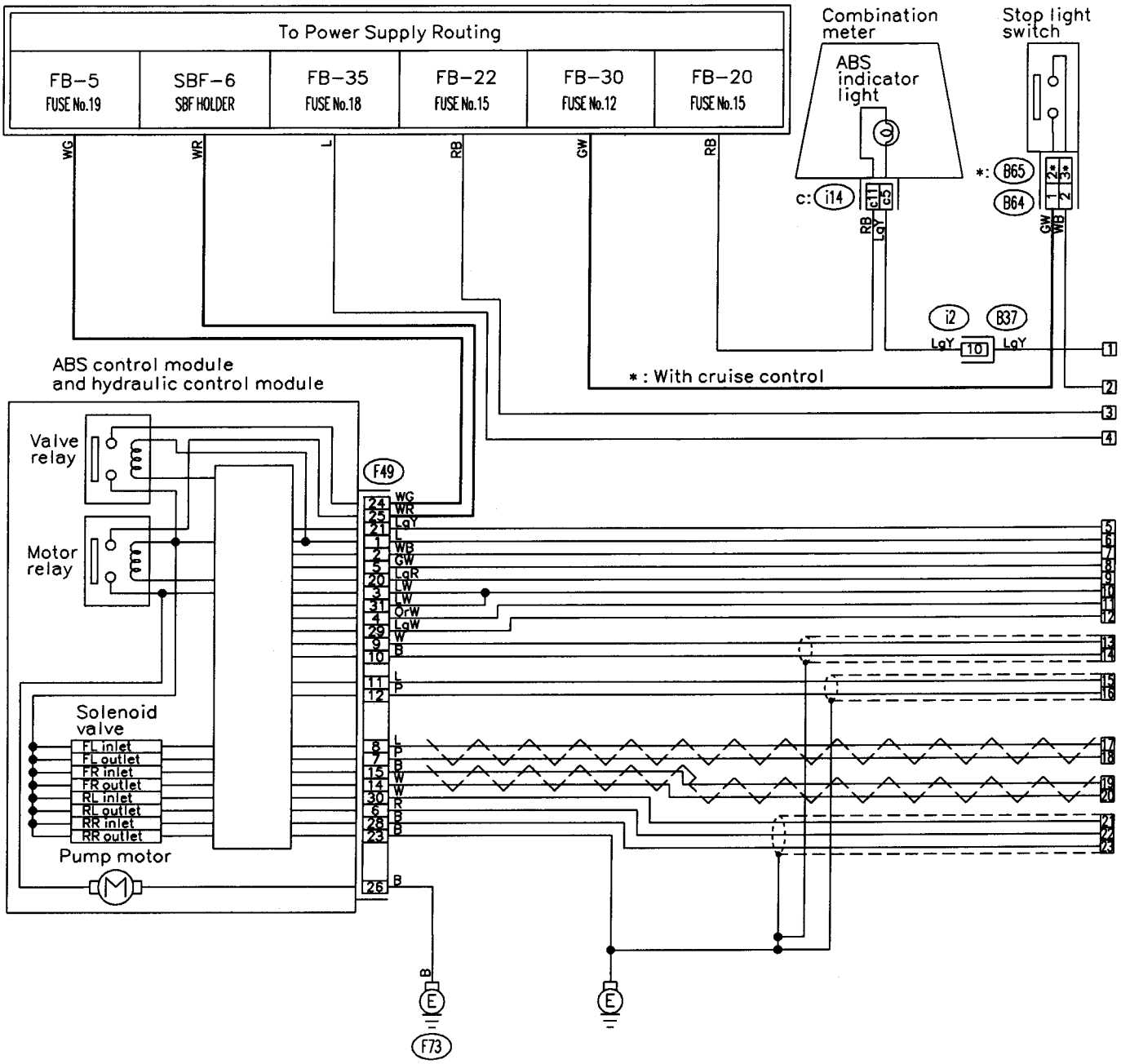
CHECK : ***Is the brake tester available?***

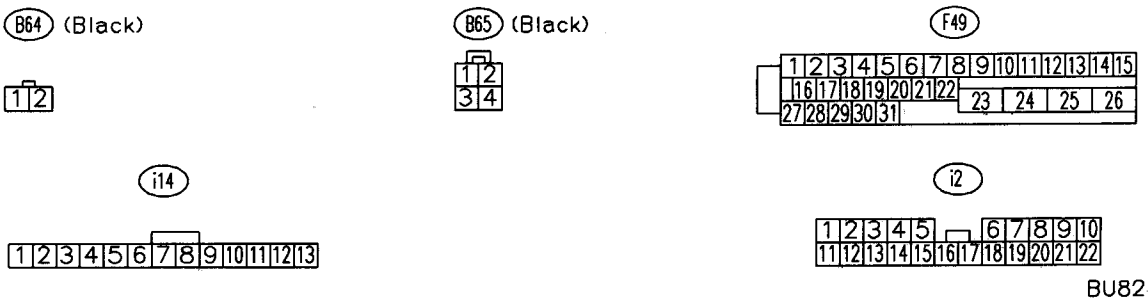
YES : CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH BRAKE TESTER <Ref. to 4-4 [W25C2].☆10>

NO : CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE <Ref. to 4-4 [W25C1].☆10>

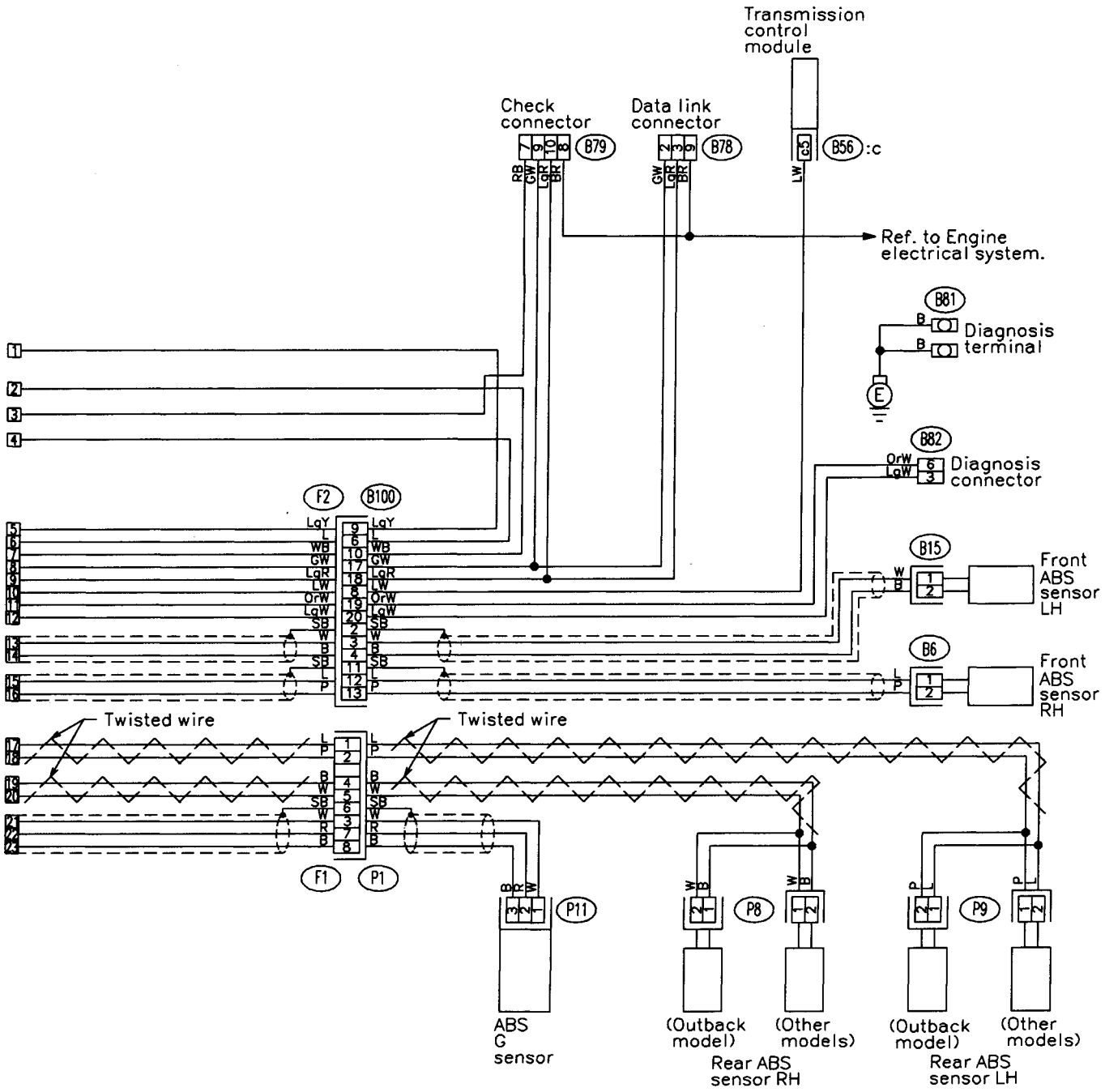
6. Wiring Diagram

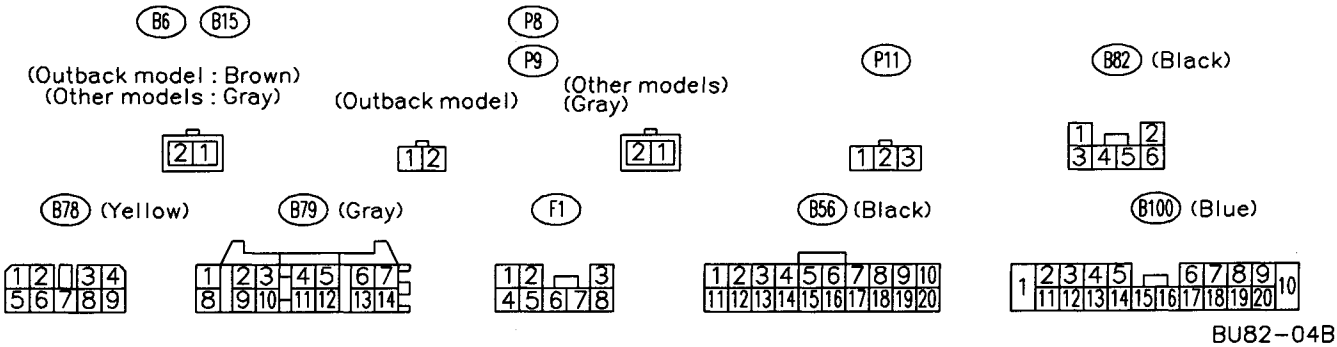
4. ANTI-LOCK BRAKE SYSTEM





BU82-04A


Transmission control module
Check connector
B79
Data link connector
B78
B56 :c
Ref. to Engine electrical system.
B81
Diagnosis terminal
B82
Diagnosis connector
F2
B100
B15
Front ABS sensor LH
B6
Front ABS sensor RH
Twisted wire
Twisted wire
F1
P1
P11
P8
P9
ABS G sensor
(Outback model)
(Other models)
Rear ABS sensor RH
(Outback model)
(Other models)
Rear ABS sensor LH


B6 B15
(Outback model : Brown)
(Other models : Gray)
P8
P9
(Outback model)
(Other models)
(Gray)
P11
B82 (Black)
B78 (Yellow)
B79 (Gray)
F1
B56 (Black)
B100 (Blue)

BU82-04B