

2. ABS Control Module and Hydraulic Control Unit (ABSCM&H/U) S401543

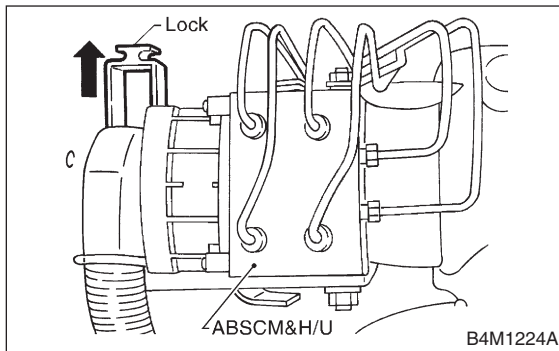
A: REMOVAL S401543A18

- 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.

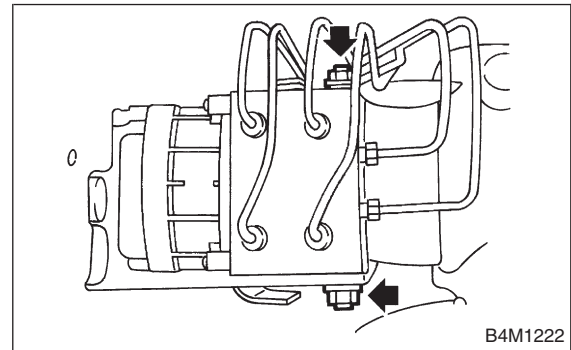
CAUTION:

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: INSTALLATION

S401543A11

- 1) Install ABSCM&H/U.

CAUTION:

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

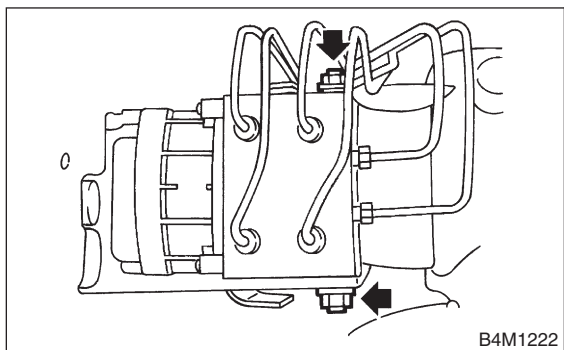
Tightening torque:

18 N·m (1.8 kgf-m, 13.0 ft-lb)

- 2) Connect brake pipes to their correct ABSCM&H/U connections.

Brake pipe tightening torque:

15 N·m (1.5 kgf-m, 10.8 ft-lb)



- 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 connector is securely locked.

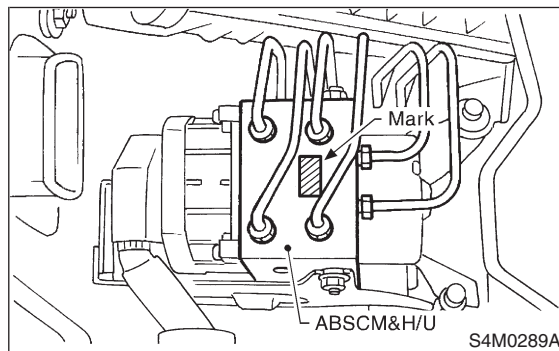
- 5) Install air intake duct.
- 6) Connect ground cable to battery.
- 7) Bleed air from the brake system.

C: INSPECTION

S401543A10

- 1) Check connected and fixed condition of connector.
- 2) Check specifications of the mark with ABSCM&H/U.

Mark	Model
C5	AWD AT
C6	AWD MT



1. CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE

S401543A1001

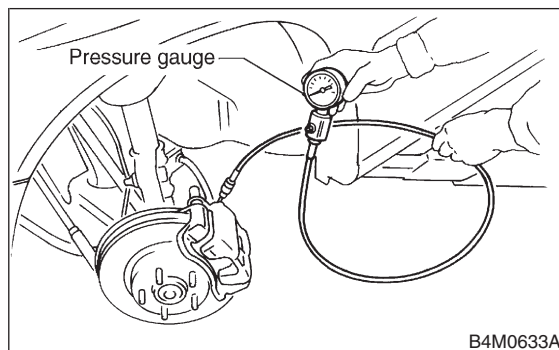
- 1) Lift-up vehicle and remove wheels.
- 2) Disconnect the air bleeder screws from the FL and FR caliper bodies.
- 3) Connect two pressure gauges to the FL and FR caliper bodies.

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 ABS-10 OPERATION, ABS Sequence Control.>

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

ABS

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.

	Front wheel	Rear wheel
Initial value	3,432 kPa (35 kg/cm ² , 498 psi)	3,432 kPa (35 kg/cm ² , 498 psi)
When decompressed	490 kPa (5 kg/cm ² , 71 psi) or less	490 kPa (5 kg/cm ² , 71 psi) or less
When compressed	3,432 kPa (35 kg/cm ² , 498 psi) or more	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 ABS-10 OPERATION, ABS Sequence Control.>

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.

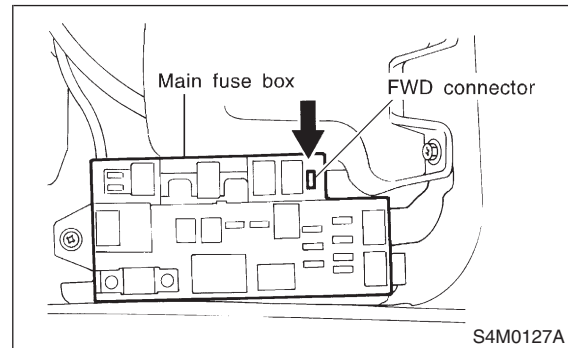
17) Connect the air bleeder screws to RL and RR caliper bodies.

18) Bleed air from brake line.

2. CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH BRAKE TESTER

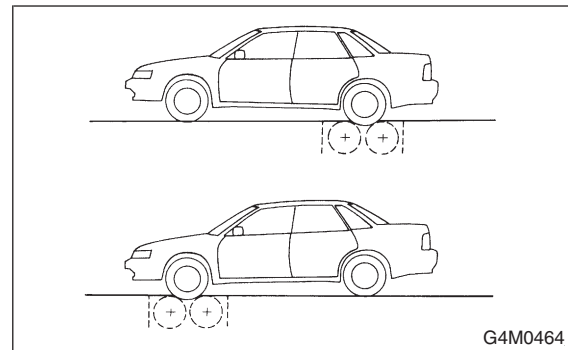
S401543A1002

1) In the case of AWD AT vehicles, install a spare fuse with the FWD connector in the main fuse box to simulate FWD vehicles.



2) Prepare for operating ABS sequence control. <Ref. to ABS-10 OPERATION, ABS Sequence Control.>

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 ABS-10 OPERATION, ABS Sequence Control.>

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.

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

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

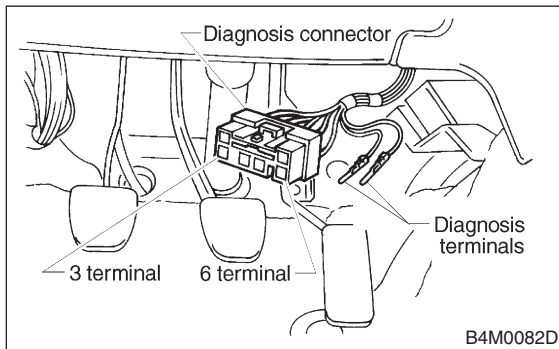
3. ABS Sequence Control S401187

A: OPERATION S401187A16

- 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. ABS SEQUENCE CONTROL WITH DIAGNOSIS CONNECTOR S401187A1601

- 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. ABS SEQUENCE CONTROL WITH SELECT MONITOR S401187A1602

NOTE:

- In the event of any trouble, the sequence control may not be operative. In such a case, activate the sequence control, referring to "1. ABS SEQUENCE CONTROL WITH DIAGNOSIS CONNECTOR".

- When the diagnosis terminal is connected to the diagnosis connector, the sequence control will not operate.

- 1) Connect select monitor to data link connector beside driver's seat instrument panel lower cover.
- 2) Turn ignition switch ON.
- 3) Turn select monitor switch ON.
- 4) Put select monitor to {ABS/TCS} mode.
- 5) When {Function check sequence} is selected, 'ABS sequence control' will start.
- 6) The message 'Press Brake Pedal Firmly' is displayed as follows:
 - (1) When using the brake tester, depress brake pedal with braking force of 981 N (100 kgf, 221 lb).
 - (2) When using the pressure gauge, depress brake pedal so as to make the pressure gauge indicate 3,432 kPa (35 kg/cm², 498 psi).

CAUTION:

Do not depress the clutch pedal.

- 7) When the message "Press YES" is displayed, press YES key.
- 8) Operation points will be displayed on select monitor.

S401187A1603



- 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.

B: SPECIFICATION S401187A22

1. CONDITIONS FOR COMPLETION OF ABS SEQUENCE CONTROL S401187A2201

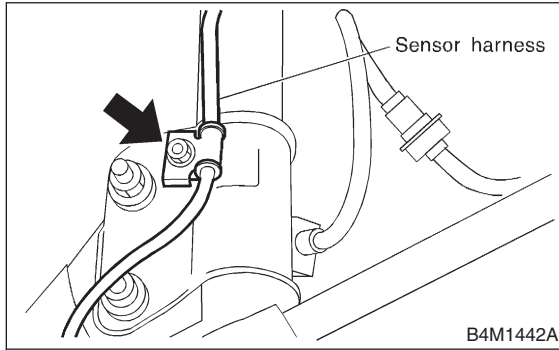
When the following conditions develop, the ABS sequence control stops and ABS operation is returned to the normal control mode.

- 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.)

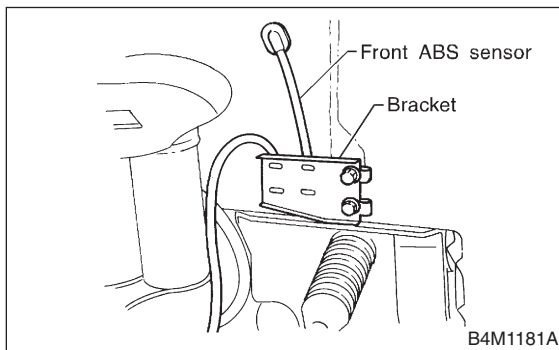
4. Front ABS Sensor S401190

A: REMOVAL S401190A18

- 1) Disconnect front ABS sensor connector located in engine compartment.
- 2) Remove bolts which secure sensor harness to strut.



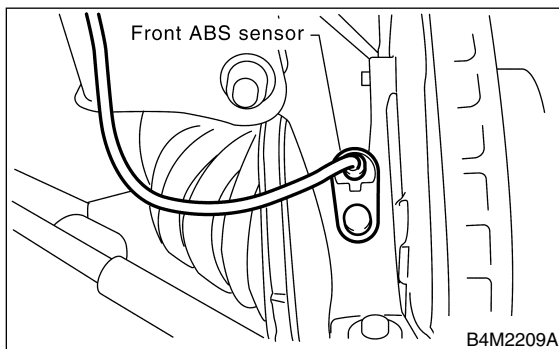
- 3) Remove bolts which secure sensor harness to body.



- 4) Remove bolts which secure front ABS sensor to housing, and remove front ABS sensor.

CAUTION:

- Be careful not to damage pole piece located at tip of the sensor and teeth faces during removal.
- Do not pull sensor harness during removal.



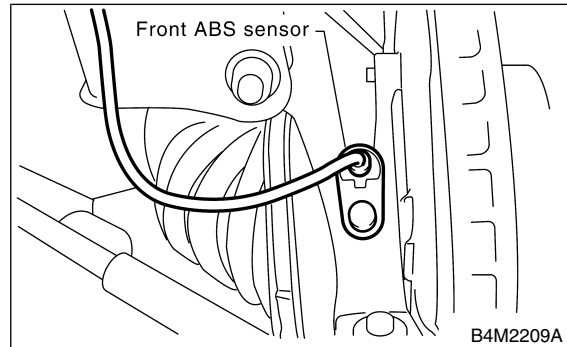
- 5) Remove front disc brake caliper and disc rotor from housing after removing front tire.

B: INSTALLATION S401190A11

- 1) Temporarily install front ABS sensor on housing.

CAUTION:

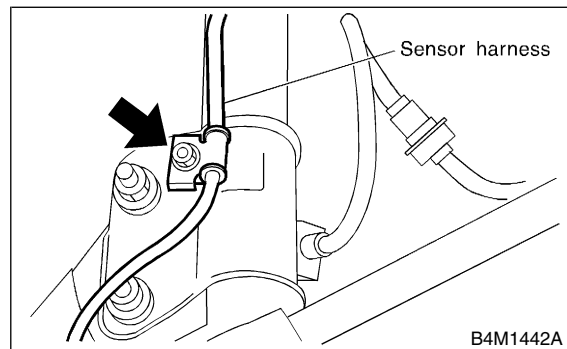
Be careful not to strike ABS sensor's pole piece and tone wheel's teeth against adjacent metal parts during installation.



- 2) Install front ABS sensor on strut and wheel apron bracket.

Tightening torque:

32 N·m (3.3 kgf·m, 24 ft·lb)



- 3) Place a thickness gauge between ABS sensor's pole piece and tone wheel's tooth face. After standard clearance is obtained over the entire perimeter, tighten ABS sensor on housing to specified torque.

ABS sensor standard clearance:

0.3 — 0.8 mm (0.012 — 0.031 in)

Tightening torque:

32 N·m (3.3 kgf·m, 24 ft·lb)

CAUTION:

Check the marks on the harness to make sure that no distortion exists. (RH: white, LH: yellow)

NOTE:

If the clearance is outside specifications, readjust.

C: INSPECTION

S401190A10

1. ABS SENSOR

S401190A1001

- 1) Check pole piece of ABS sensor for foreign particles or damage. If necessary, clean pole piece or replace ABS sensor.
- 2) Measure ABS sensor resistance.

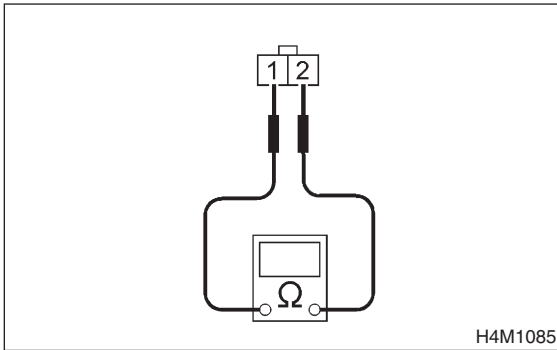
CAUTION:

If resistance is outside the standard value, replace ABS sensor with new one.

NOTE:

Check ABS sensor cable for discontinuity. If necessary, replace with a new one.

ABS sensor	Terminal No.	Standard
Front - LH	1 and 2	1.0±1.5 kΩ
Front - RH	1 and 2	
Rear - LH	1 and 2	1.0±0.2 kΩ
Rear - RH	1 and 2	



2. SENSOR GAP

S401190A1002

- 1) Check tone wheel's teeth (44 pieces) for cracks or dents. If necessary, replace tone wheel with a new one.
- 2) Clearances (sensor gaps) should be measured one by one to ensure tone wheel and speed sensor are installed correctly.

NOTE:

- If clearance is narrow, adjust by using spacer (Part No. 26755AA000).
- If clearance is wide, check the outputted voltage then replace ABS sensor or tone wheel if the outputted voltage is outside the specification.

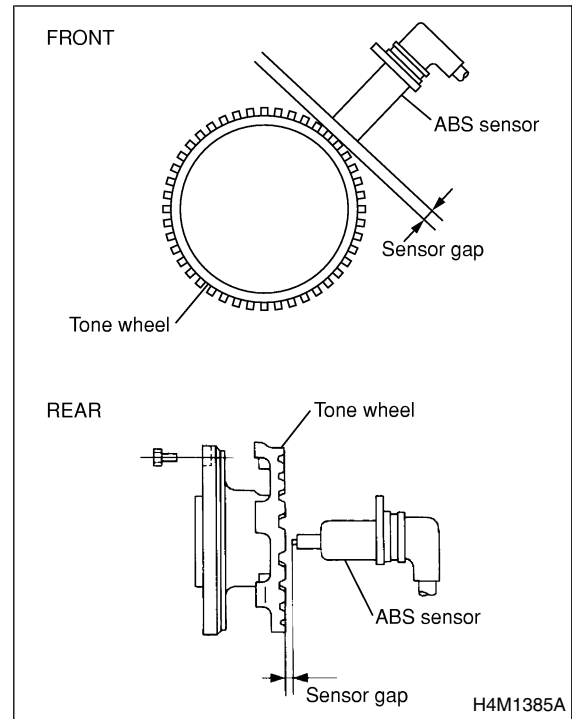
ABS sensor clearance:

Front

0.3 — 0.8 mm (0.012 — 0.031 in)

Rear

0.7 — 1.2 mm (0.028 — 0.047 in)



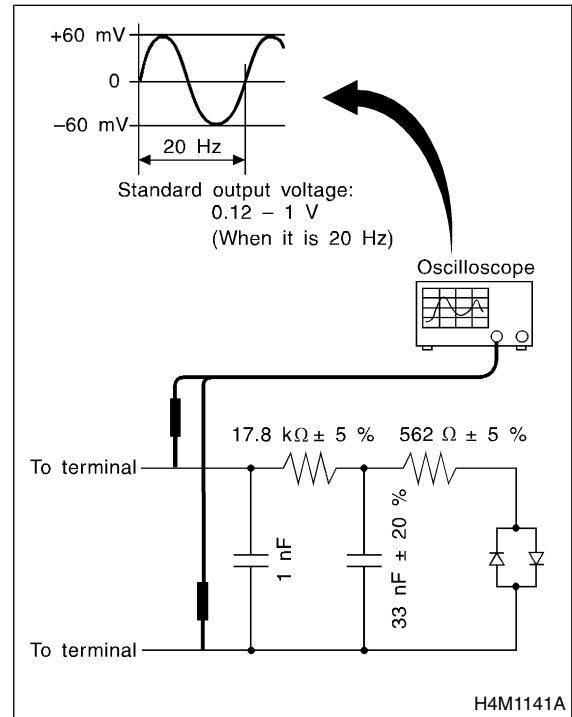
3. OUTPUT VOLTAGE

S401190A1003

Output voltage can be checked by the following method. Install resistor and condenser, then rotate wheel about 2.75 km/h (2 MPH) or equivalent.

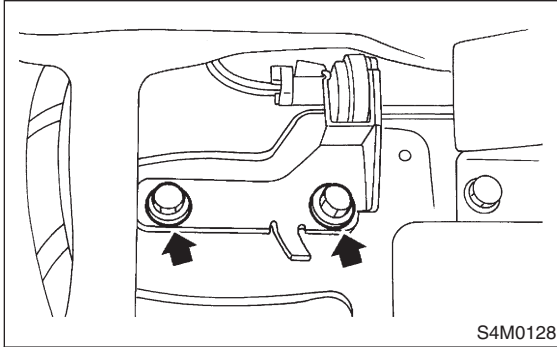
NOTE:

Regarding terminal No., please refer to item 1. ABS SENSOR.



6. G Sensor S401183**A: REMOVAL** S401183A18

- 1) Turn ignition switch to OFF.
- 2) Remove console cover. <Ref. to EI-24 REMOVAL, Console Box.>
- 3) Disconnect connector from G sensor.
- 4) Remove G sensor from body.

**B: INSTALLATION** S401183A11

Install in the reverse order of removal.

CAUTION:

Do not drop or bump G sensor.

C: INSPECTION

S401183A10

No.	Step	Check	Yes	No
1	CHECK SUBARU SELECT MONITOR.	Do you have SUBARU SELECT MONITOR?	Go to step 5.	Go to step 2.
2	CHECK G SENSOR. 1) Turn ignition switch to OFF. 2) Remove G sensor from vehicle. 3) Connect connector to G sensor. 4) Turn ignition switch to ON. 5) Measure voltage between G sensor connector terminals. Connector & terminal: (R70) No. 2 (+) — No. 3 (-)	Is the voltage 2.3 ± 0.2 V when G sensor is horizontal?	Go to step 3.	Replace G sensor.
3	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal: (R70) No. 2 (+) — No. 3 (-)	Is the voltage 3.9 ± 0.2 V when G sensor is inclined forwards to 90° ?	Go to step 4.	Replace G sensor.
4	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal: (R70) No. 2 (+) — No. 3 (-)	Is the voltage 0.7 ± 0.2 V when G sensor is inclined backwards to 90° ?	G sensor is normal.	Replace G sensor.
5	CHECK G SENSOR. 1) Turn ignition switch to OFF. 2) Connect select monitor connector to data link connector. 3) Turn select monitor into {BRAKE CONTROL} mode. 4) Set the display in the {Current Data Display & Save} mode. 5) Read the G sensor output voltage.	Is the indicated reading 2.3 ± 0.2 V when the vehicle is in horizontal position?	Go to step 6.	Replace G sensor.
6	CHECK G SENSOR. 1) Remove console box. 2) Remove G sensor from vehicle. (Do not disconnect connector.) 3) Read the select monitor display.	Is the indicated reading 3.9 ± 0.2 V when G sensor is inclined forwards to 90° ?	Go to step 7.	Replace G sensor.
7	CHECK G SENSOR. Read the select monitor display.	Is the indicated reading 0.7 ± 0.2 V when G sensor is inclined backwards to 90° ?	G sensor is normal.	Replace G sensor.

G SENSOR

ABS

MEMO:

1. General Description

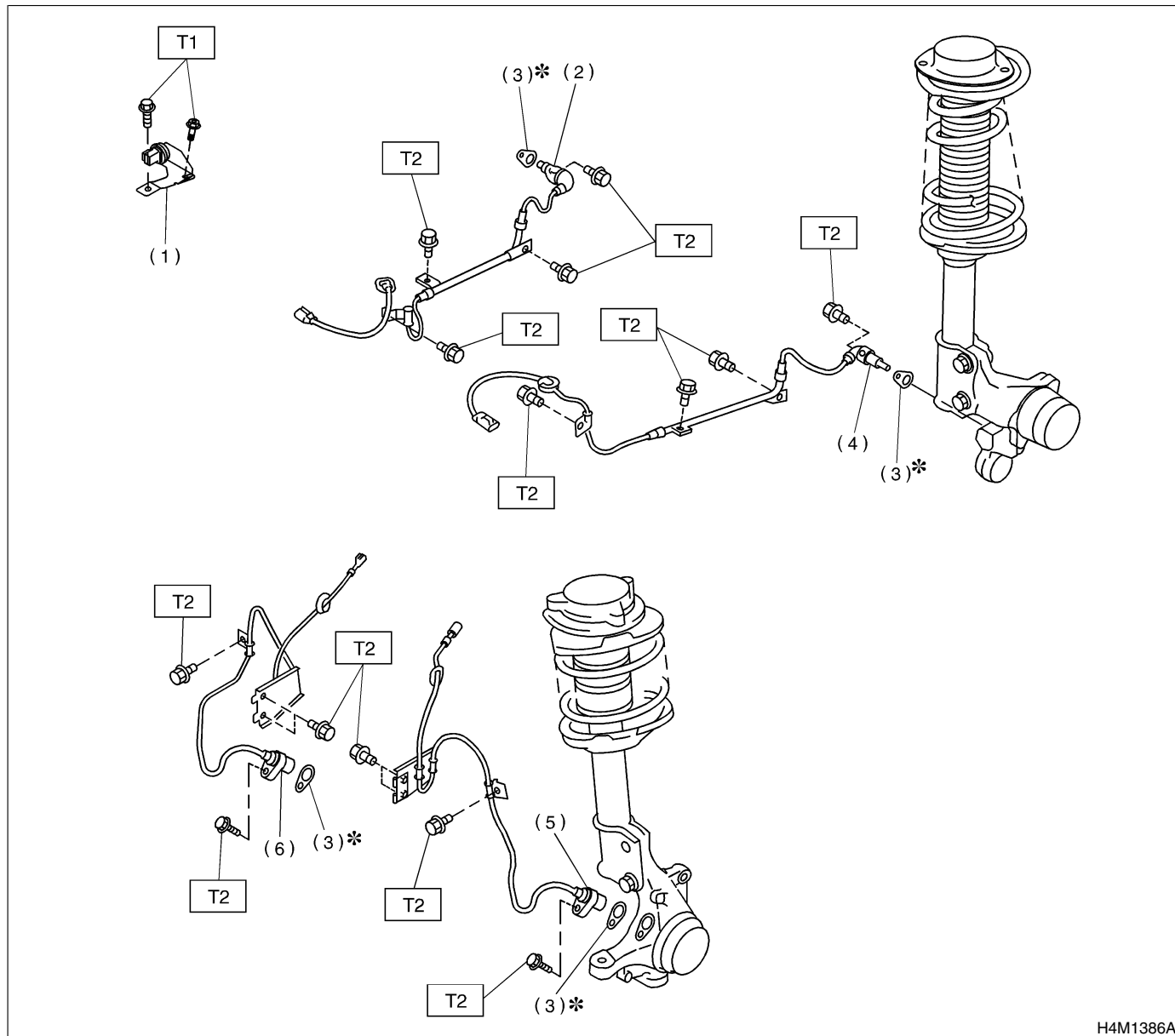
S401001

A: COMPONENT

S401001A05

1. SENSOR

S401001A0501



H4M1386A

- (1) G sensor
- (2) Rear ABS sensor RH
- (3) ABS spacer
- (4) Rear ABS sensor LH

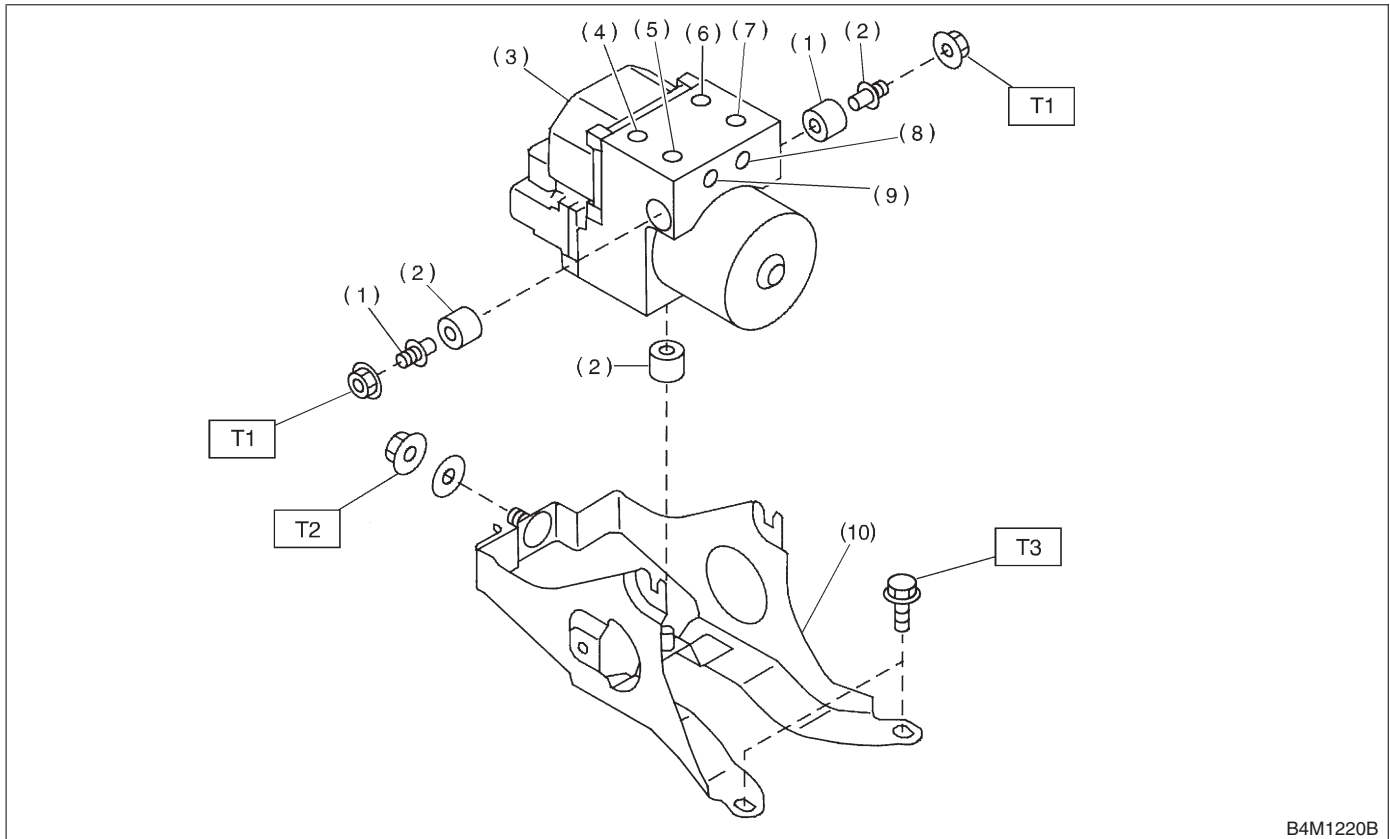
- (5) Front ABS sensor LH
- (6) Front ABS sensor RH

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.4 (0.75, 5.4)

T2: 32 (3.3, 24)

2. ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT (ABSCM&H/U) S401001A0502



- (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 (kgf-m, ft-lb)

T1: 18 (1.8, 13.0)

T2: 29 (3.0, 21.7)

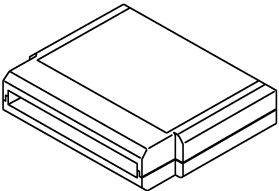
T3: 32 (3.3, 24)

B: CAUTION S401001A03

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part in the vehicle is hot after running.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Before disconnecting electrical connectors of sensors or units, be sure to disconnect negative terminal from battery.

C: PREPARATION TOOL S401001A17

1. SPECIAL TOOL S401001A1703

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B2M3876	24082AA150	CARTRIDGE	Troubleshooting for electrical systems.
 B2M3877	22771AA030	SELECT MONITOR KIT	Troubleshooting for electrical systems. - English: 22771AA030 (Without printer) - German: 22771AA070 (Without printer) - French: 22771AA080 (Without printer) - Spanish: 22771AA090 (Without printer)

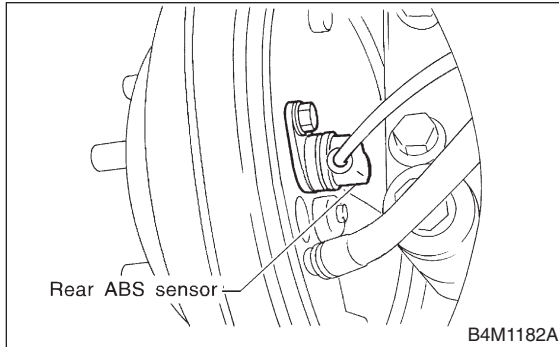
2. GENERAL TOOL S401001A1704

TOOL NAME	REMARKS
Circuit Tester	Used for measuring resistance, voltage and ampere.
Pressure Gauge	Used for measuring oil pressure.
Oscilloscope	Used for measuring sensor.

5. Rear ABS Sensor S401185

A: REMOVAL S401185A18

- 1) Remove rear seat and disconnect rear ABS sensor connector.
- 2) Remove rear sensor harness bracket from rear trailing link and bracket.
- 3) Remove rear ABS sensor from rear back plate.



- 4) Remove rear tone wheel while removing hub from housing and hub assembly. <Ref. to DS-22 REMOVAL, Rear Axle.>

CAUTION:

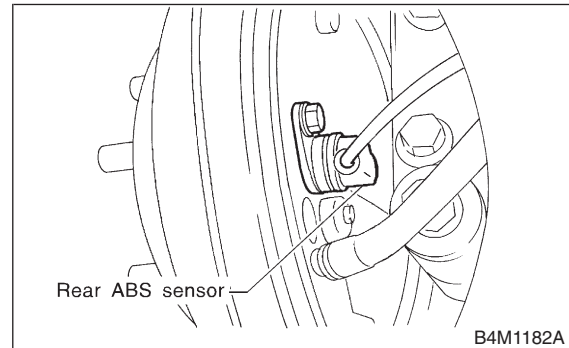
- Be careful not to damage pole piece located at tip of the sensor and teeth faces during removal.
- Do not pull sensor harness during removal.

B: INSTALLATION S401185A11

- 1) Install rear tone wheel on hub, then rear housing on hub. <Ref. to DS-28 ASSEMBLY, Rear Axle.>
- 2) Temporarily install rear ABS sensor on back plate.

CAUTION:

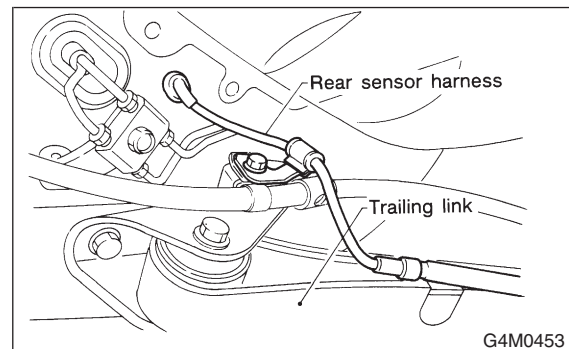
Be careful not to strike ABS sensor's pole piece and tone wheel's teeth against adjacent metal parts during installation.



- 3) Install rear drive shaft to rear housing and rear differential spindle. <Ref. to DS-25 INSTALLATION, Rear Axle.>
- 4) Install rear sensor harness on rear trailing link.

Tightening torque:

32 N·m (3.3 kgf-m, 24 ft-lb)



- 5) Place a thickness gauge between ABS sensor's pole piece and tone wheel's tooth face. After standard clearance is obtained over the entire perimeter, tighten ABS sensor on back plate to specified torque.

ABS sensor standard clearance:

0.7 — 1.2 mm (0.028 — 0.047 in)

Tightening torque:

32 N·m (3.3 kgf-m, 24 ft-lb)

CAUTION:

Check the marks on the harness to make sure that no distortion exists. (RH: white, LH: yellow)

NOTE:
If the clearance is outside specifications, readjust.

C: INSPECTION S401185A10

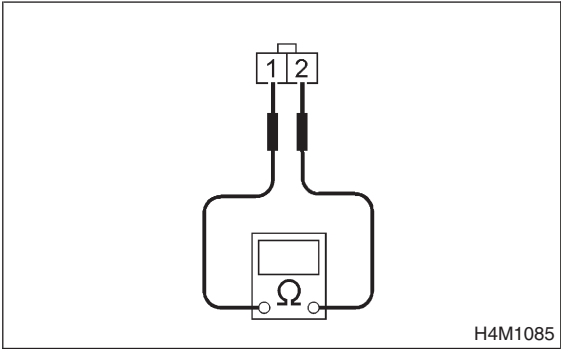
1. ABS SENSOR S401185A1001

- 1) Check pole piece of ABS sensor for foreign particles or damage. If necessary, clean pole piece or replace ABS sensor.
- 2) Measure ABS sensor resistance.

CAUTION:
If resistance is outside the standard value, replace ABS sensor with new one.

NOTE:
Check ABS sensor cable for discontinuity. If necessary, replace with a new one.

ABS sensor	Terminal No.	Standard
Front - LH	1 and 2	1.0±1.5 kΩ
Front - RH	1 and 2	
Rear - LH	1 and 2	1.0±0.2 kΩ
Rear - RH	1 and 2	



2. SENSOR GAP S401185A1002

1) Check tone wheel's teeth (44 pieces) for cracks or dents. If necessary, replace tone wheel with a new one.

2) Clearances (sensor gaps) should be measured one by one to ensure tone wheel and speed sensor are installed correctly.

NOTE:

- If clearance is narrow, adjust by using spacer (Part No. 26755AA000).
- If clearance is wide, check the outputted voltage then replace ABS sensor or tone wheel if the outputted voltage is outside the specification.

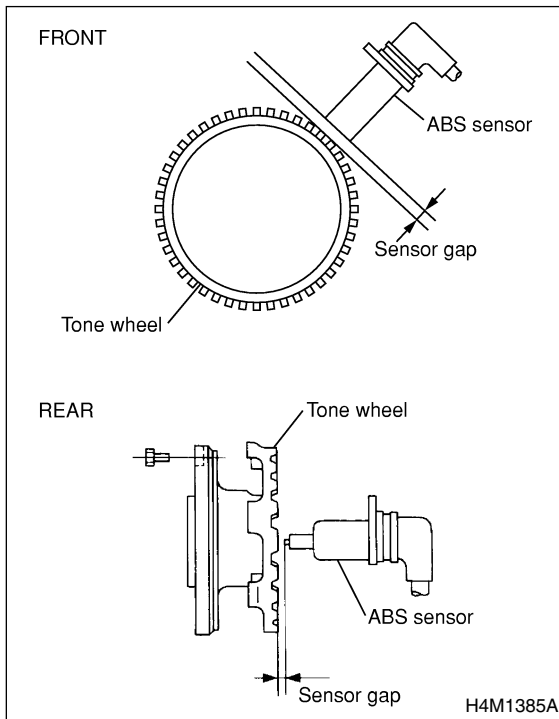
ABS sensor clearance:

Front

0.3 — 0.8 mm (0.012 — 0.031 in)

Rear

0.7 — 1.2 mm (0.028 — 0.047 in)

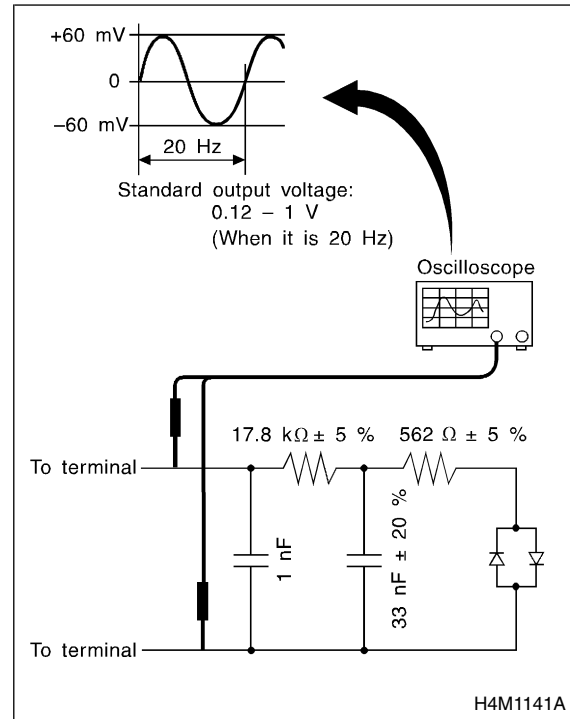


3. OUTPUT VOLTAGE S401185A1003

Output voltage can be checked by the following method. Install resistor and condenser, then rotate wheel about 2.75 km/h (2 MPH) or equivalent.

NOTE:

Regarding terminal No., please refer to item 1. ABS SENSOR.



1. Basic Diagnostic Procedure

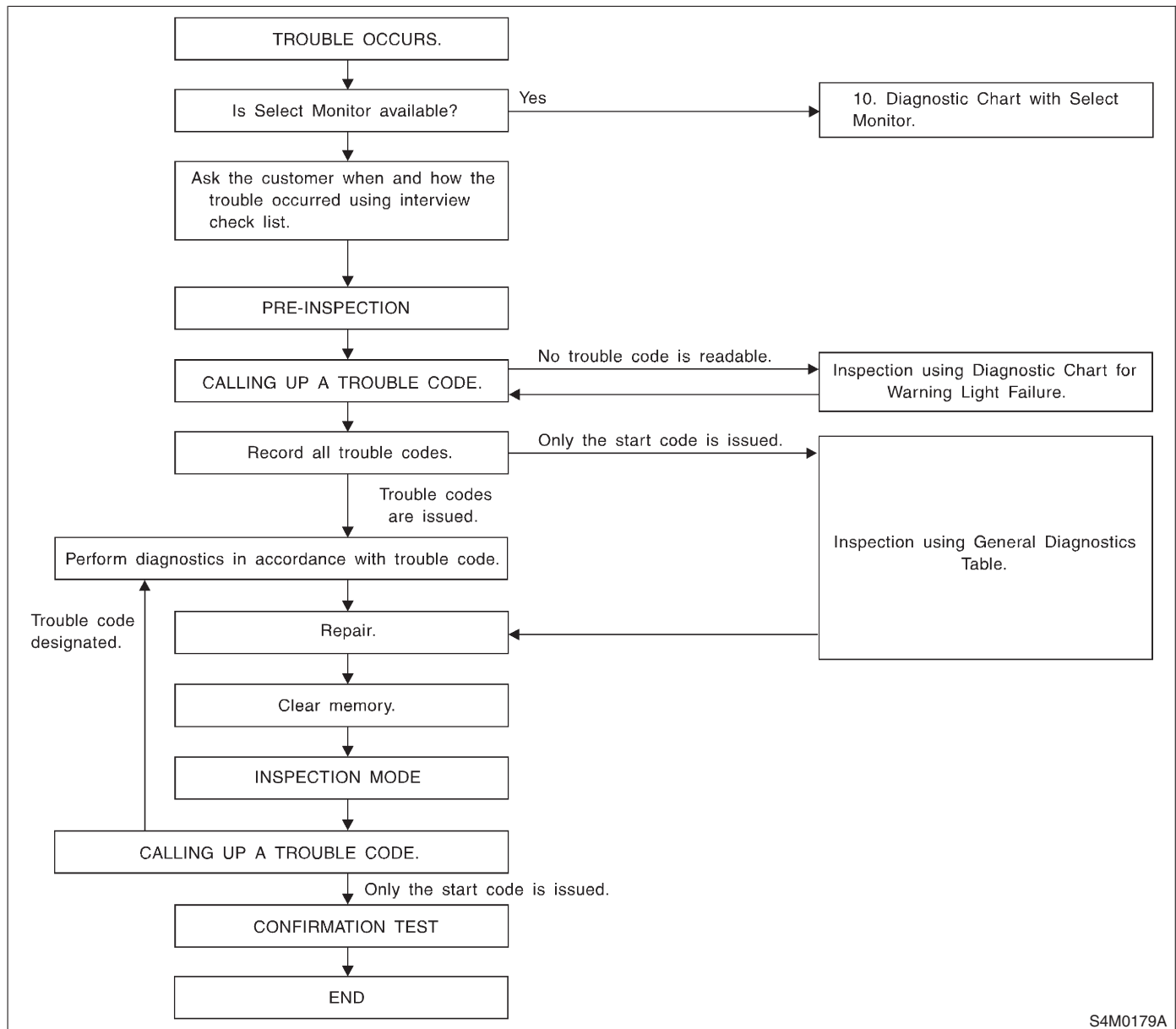
S006501

A: PROCEDURE

S006501E45

1. WITHOUT SUBARU SELECT MONITOR

S006501E4501



S4M0179A

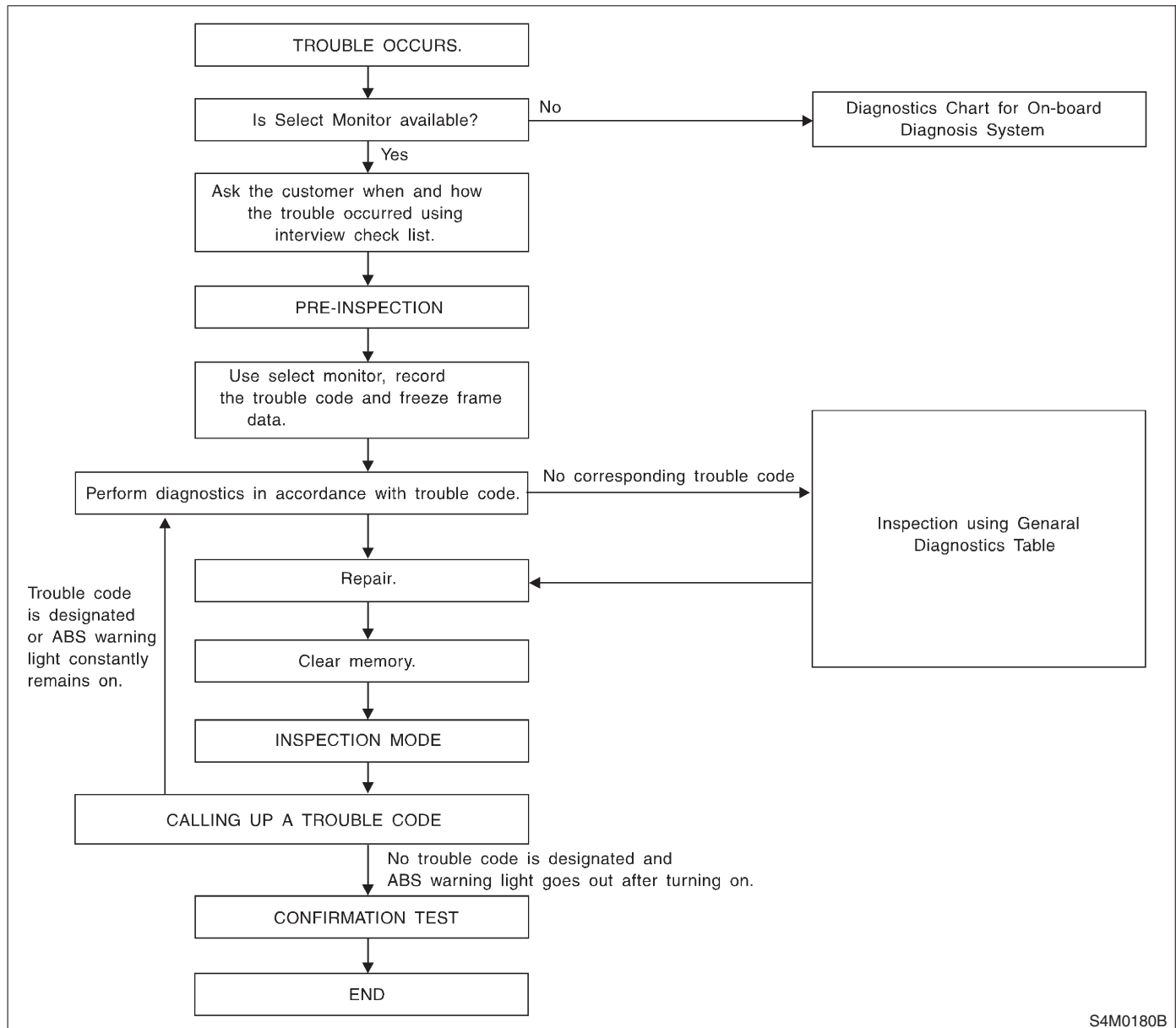
CAUTION:

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.

2. WITH SUBARU SELECT MONITOR S006501E4502



S4M0180B

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.
- Check list for interview. <Ref. to ABS-4 CHECK, Check List for Interview.>

CHECK LIST FOR INTERVIEW

ABS

2. Check List for Interview S006502

A: CHECK S006502A04

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 :	

CHECK LIST FOR INTERVIEW

ABS

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 :

CHECK LIST FOR INTERVIEW

ABS

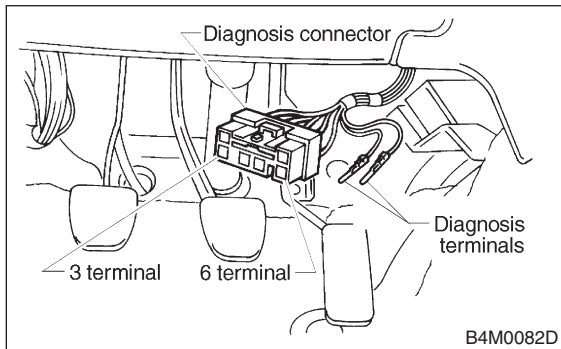
Condition	a) Brakes	Deceleration : g	
		☐ Continuous / ☐ Intermittent	
	b) Accelerator	Acceleration : g	
		☐ Continuous / ☐ Intermittent	
	c) Vehicle speed	km/h	MPH
		☐ Advancing ☐ Accelerating ☐ Reducing speed ☐ Low speed ☐ Turning ☐ Others :	
	d) Tire inflation pressure	Front RH tire : kPa	
		Front 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 :			

10. Clear Memory Mode S006513

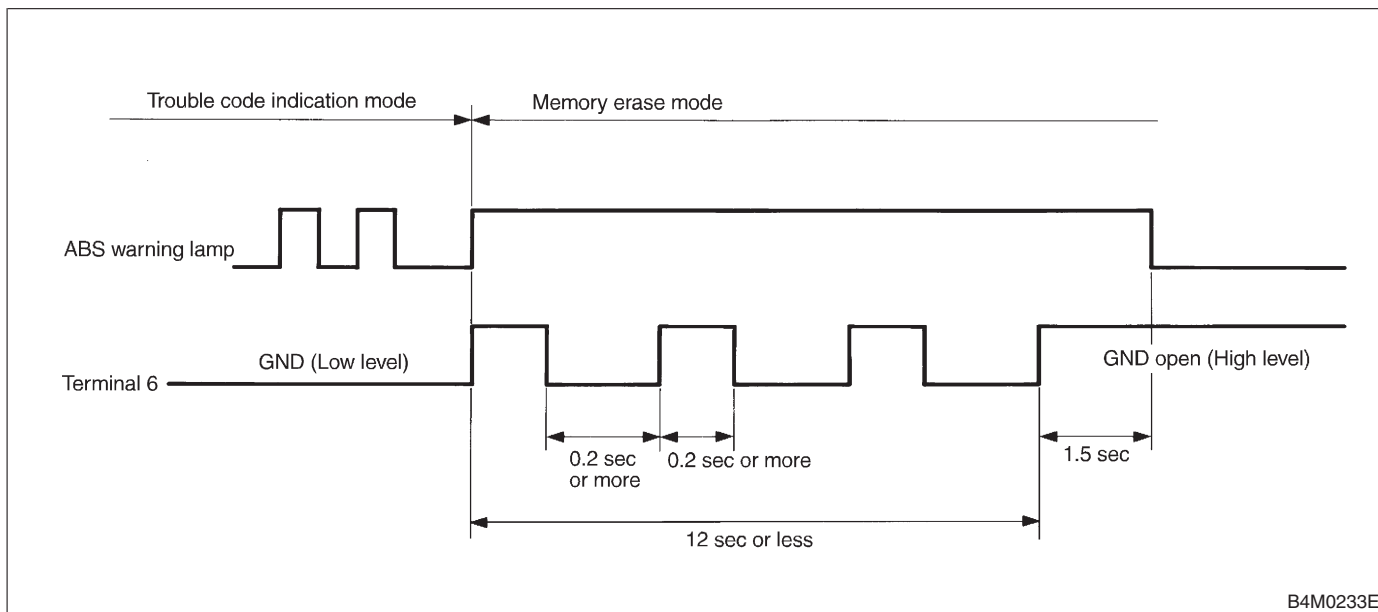
A: OPERATION S006513A16

1. WITHOUT SUBARU SELECT MONITOR S006513A1602

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 0.2 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.

2. WITH SUBARU SELECT MONITOR S006513A1601

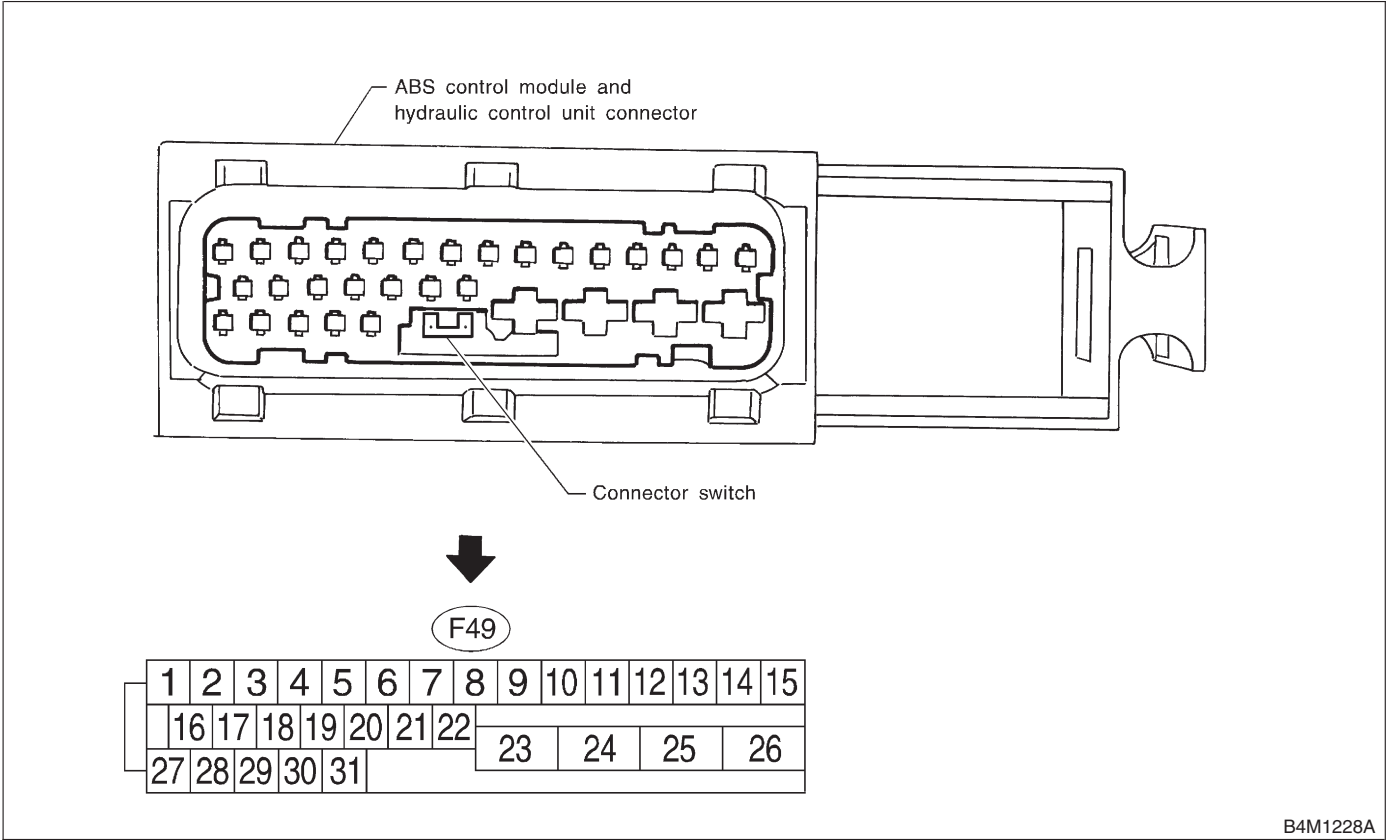
Refer to SUBARU SELECT MONITOR for information about how to clear trouble codes. <Ref. to ABS-14 OPERATION, Subaru Select Monitor.>

5. Control Module I/O Signal

S006524

A: ELECTRICAL SPECIFICATION

S006524A08



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.

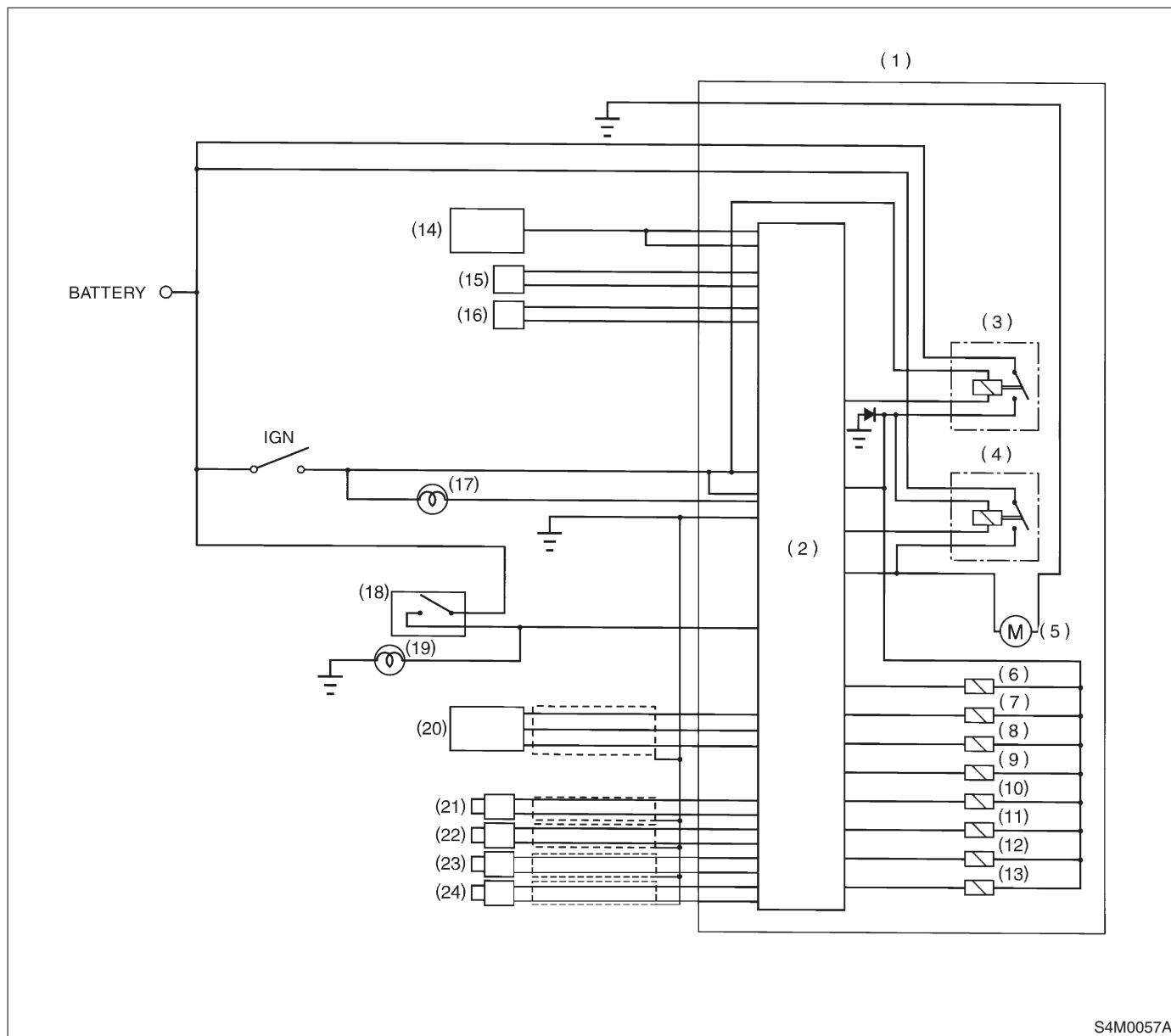
Contents		Terminal No. (+)(-)	Input/Output signal
			Measured value and measuring conditions
ABS sensor*2 (Wheel speed sensor)	Front left wheel	9—10	0.12 — 1 V (When it is 20 Hz.)
	Front right wheel	11—12	
	Rear left wheel	7—8	
	Rear right wheel	14—15	
Valve relay power supply*1		24—23	10 — 15 V when ignition switch is ON.
Motor relay power supply*1		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)		3—23	Less than 1.5 V when the ABS control does not oper- ate still and more than 5.5 V when ABS operates.
ABS operation signal monitor*2 (AT model only)		31—23	Less than 1.5 V when the ABS control does not oper- ate 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 (F55).

B: SCHEMATIC

S006524A21



- (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) Automatic transmission control module
- (15) Diagnosis connector
- (16) Data link connector

- (17) ABS warning light
- (18) Stop light switch
- (19) Stop light
- (20) G sensor
- (21) Front left ABS sensor
- (22) Front right ABS sensor
- (23) Rear left ABS sensor
- (24) Rear right ABS sensor

6. Data Link Connector S006505

A: NOTE S006505A15

Refer to “EN section” for information about the differential connector. <Ref. to EN-47 NOTE, Data Link Connector.>

13. Diagnostics Chart with Diagnosis Connector

S006522

A: ABS WARNING LIGHT DOES NOT COME ON.

S006522E24

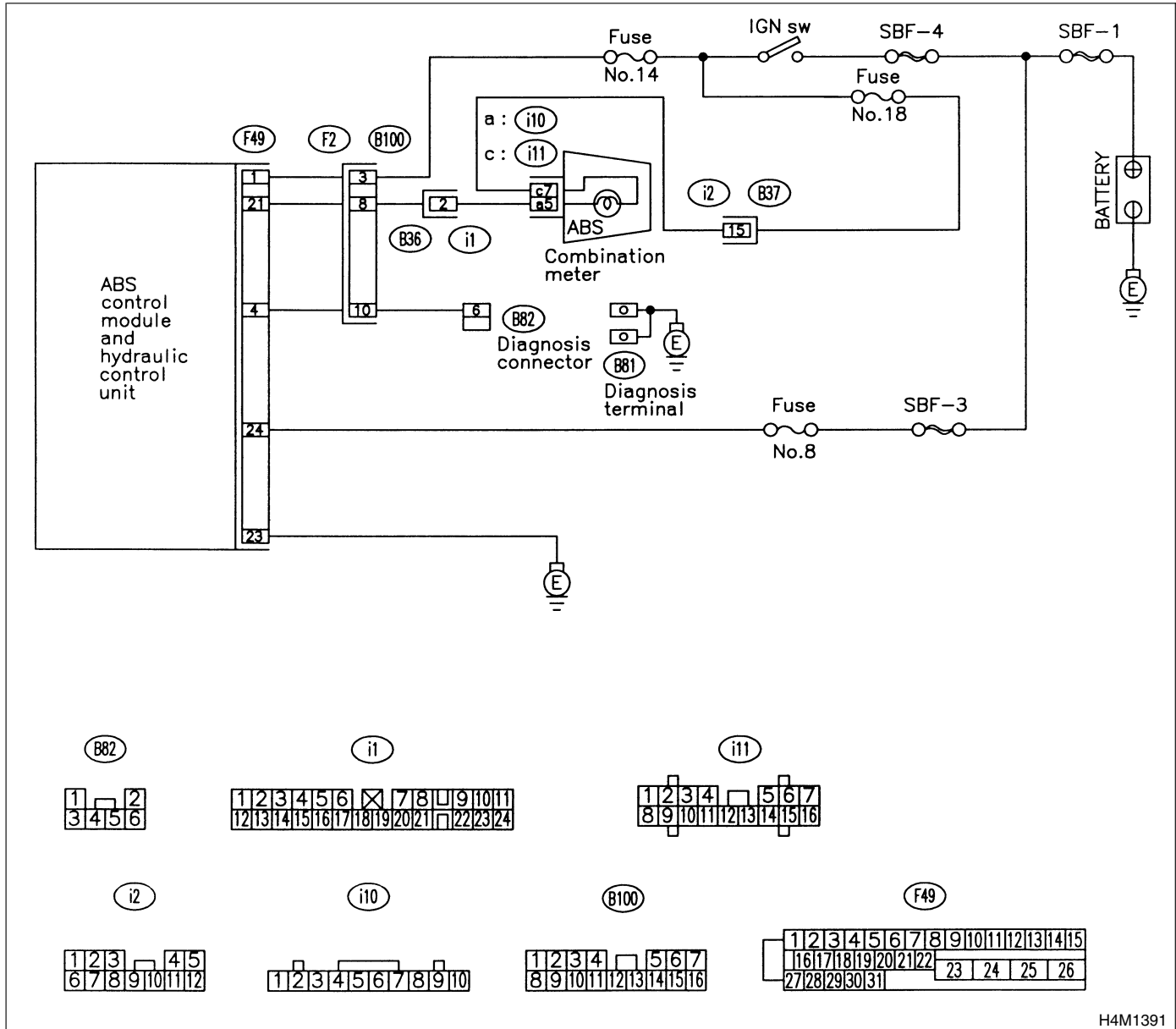
DIAGNOSIS:

- 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:



H4M1391

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	CHECK IF OTHER WARNING LIGHTS TURN ON. Turn ignition switch to ON (engine OFF).	Do other warning lights turn on?	Go to step 2.	Repair combination meter.
2	CHECK ABS WARNING LIGHT BULB. 1) Turn ignition switch to OFF. 2) Remove combination meter. 3) Remove ABS warning light bulb from combination meter.	Is ABS warning light bulb OK?	Go to step 3.	Replace ABS warning light bulb.
3	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. 8 (+) — Chassis ground (-):	Is the voltage less than 3 V?	Go to step 4.	Repair warning light harness.
4	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. 8 (+) — Chassis ground (-):	Is voltage less than 3 V?	Go to step 5.	Repair warning light harness.
5	CHECK WIRING HARNESS. 1) Turn ignition switch to OFF. 2) Install ABS warning light bulb to 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. 8 (+) — Chassis ground (-):	Is voltage between 10 V and 15 V?	Go to step 6.	Repair wiring harness.
6	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. 8 (+) — Chassis ground (-):	Is the voltage less than 3 V?	Go to step 7.	Repair wiring harness.
7	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. 8 (+) — Chassis ground (-):	Is voltage less than 3 V?	Go to step 8.	Repair wiring harness.
8	CHECK GROUND CIRCUIT OF ABSCM&H/U. Measure resistance between ABSCM&H/U and chassis ground. Connector & terminal (F49) No. 23 — Chassis ground:	Is the resistance less than 0.5 Ω?	Go to step 9.	Repair ABSCM&H/U ground harness.
9	CHECK WIRING HARNESS. Measure resistance between connector (F2) and chassis ground. Connector & terminal (F2) No. 8 — Chassis ground:	Is the resistance less than 0.5 Ω?	Go to step 10.	Repair harness/connector.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
10	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connectors between combination meter and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Replace ABSCM&H/U.

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

B: ABS WARNING LIGHT DOES NOT GO OFF. S006522E25

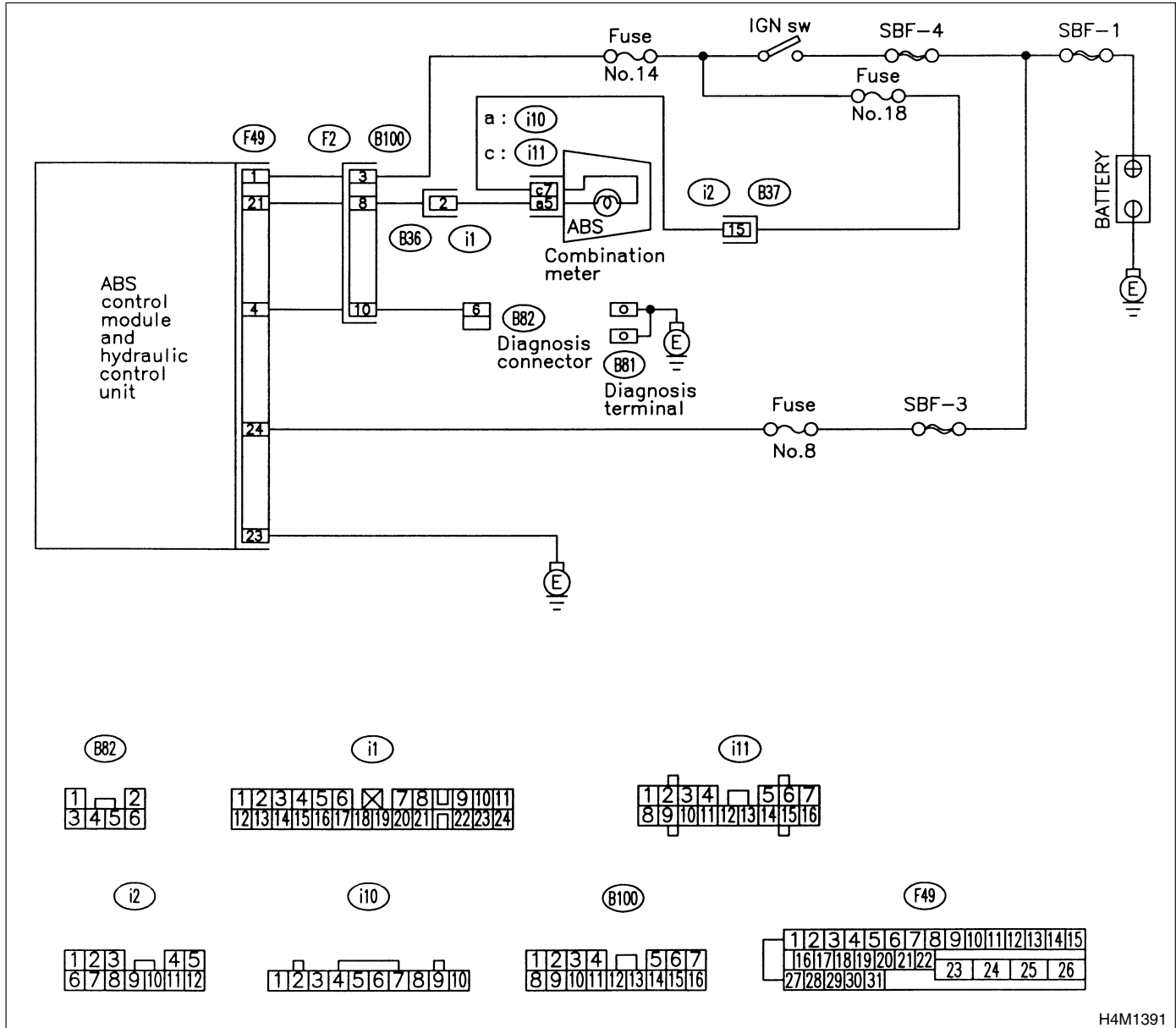
DIAGNOSIS:

- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



H4M1391

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	CHECK INSTALLATION OF ABSCM&H/U CONNECTOR. Turn ignition switch to OFF.	Is ABSCM&H/U connector inserted into ABSCM until the clamp locks onto it?	Go to step 2.	Insert ABSCM&H/U connector into ABSCM&H/U until the clamp locks onto it.
2	CHECK DIAGNOSIS TERMINAL. Measure resistance between diagnosis terminals (B81) and chassis ground. Terminals Diagnosis terminal (A) — Chassis ground: Diagnosis terminal (B) — Chassis ground:	Is the resistance less than 0.5 Ω ?	Go to step 3.	Repair diagnosis terminal harness.
3	CHECK DIAGNOSIS LINE. 1) Turn ignition switch to OFF. 2) Connect diagnosis terminal (B81) 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:	Is the resistance less than 0.5 Ω ?	Go to step 4.	Repair harness connector between ABSCM&H/U and diagnosis connector.
4	CHECK GENERATOR. 1) Start the engine. 2) Idle the engine. 3) Measure voltage between generator and chassis ground. Terminal Generator B terminal (+) — Chassis ground (-):	Is the voltage between 10 and 15 V?	Go to step 5.	Repair generator.
5	CHECK BATTERY TERMINAL. Turn ignition switch to OFF.	Is there poor contact at battery terminal?	Repair battery terminal.	Go to step 6.
6	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 (-):	Is the voltage between 10 and 15 V?	Go to step 7.	Repair ABSCM&H/U power supply circuit.
7	CHECK WIRING HARNESS. 1) Disconnect connector (F2) from connector (B100). 2) Turn ignition switch to ON.	Does the ABS warning light remain off?	Go to step 8.	Repair front wiring harness.
8	CHECK PROJECTION AT ABSCM&H/U. 1) Turn ignition switch to OFF. 2) Check for broken projection at the ABSCM&H/U terminal.	Are the projection broken?	Replace ABSCM&H/U.	Go to step 9.
9	CHECK ABSCM&H/U. Measure resistance between ABSCM&H/U terminals. Terminal No. 21 — No. 23:	Is the resistance more than 1 M Ω ?	Go to step 10.	Replace ABSCM&H/U.
10	CHECK WIRING HARNESS. Measure resistance between connector (F2) and chassis ground. Connector & terminal (F2) No. 8 — Chassis ground:	Is the resistance less than 0.5 Ω ?	Go to step 11.	Repair harness.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
11	CHECK WIRING HARNESS. 1) Connect connector to ABSCM&H/U. 2) Measure resistance between connector (F2) and chassis ground. Connector & terminal (F2) No. 8 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 12.	Repair harness.
12	CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.	Is there poor contact in ABSCM&H/U connector? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Replace ABSCM&H/U.

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

C: TROUBLE CODE DOES NOT APPEAR. S006522E50

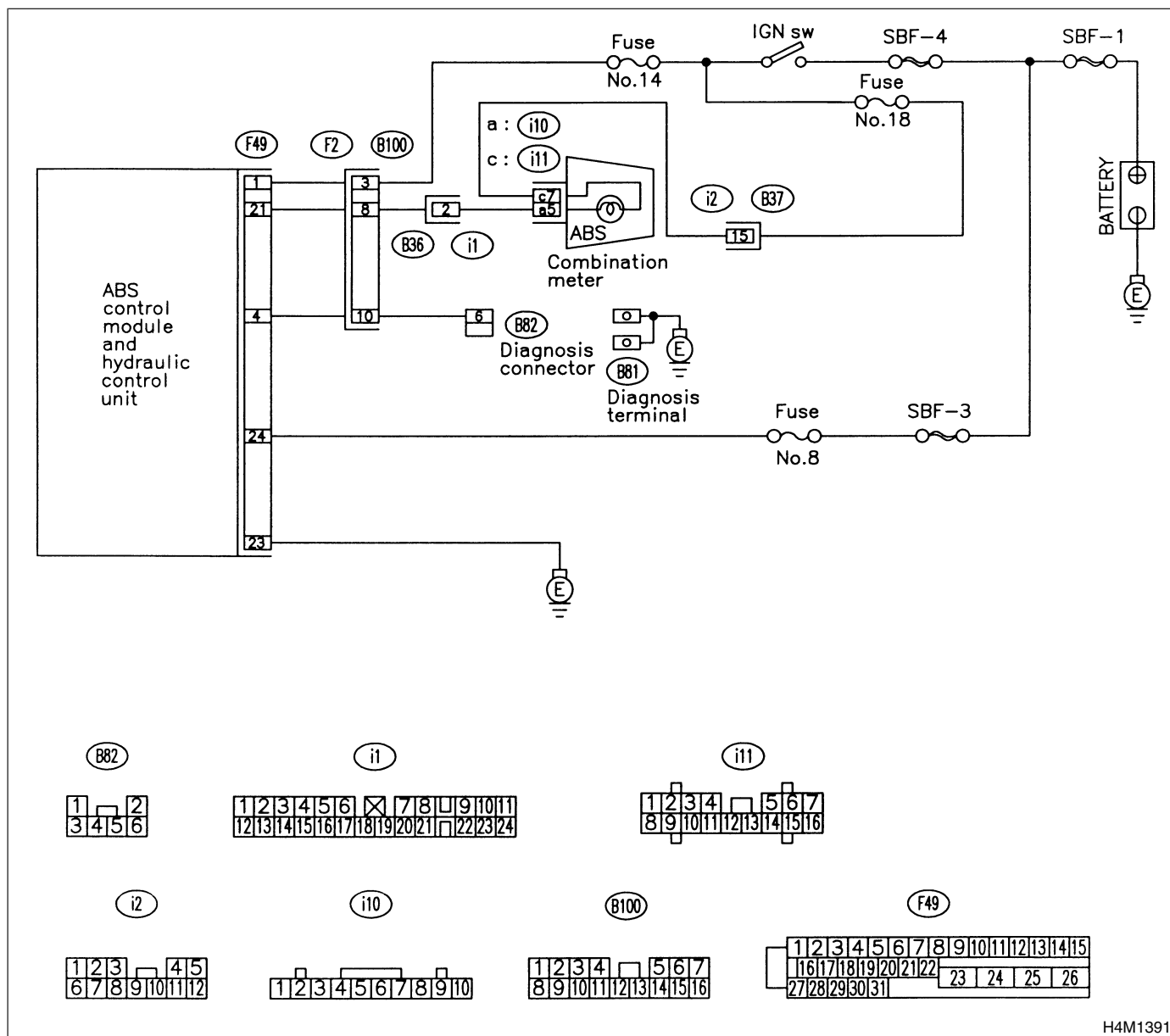
DIAGNOSIS:

- 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:



H4M1391

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	CHECK DIAGNOSIS TERMINAL. Measure resistance between diagnosis terminals (B81) and chassis ground. Terminals <i>Diagnosis terminal (A) — Chassis ground:</i> <i>Diagnosis terminal (B) — Chassis ground:</i>	Is the resistance less than 0.5 Ω ?	Go to step 2.	Repair diagnosis terminal harness.
2	CHECK DIAGNOSIS LINE. 1) Turn ignition switch to OFF. 2) Connect diagnosis terminal (B81) 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 <i>(F49) No. 4 — Chassis ground:</i>	Is the resistance less than 0.5 Ω ?	Go to step 3.	Repair harness connector between ABSCM&H/U and diagnosis connector.
3	CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.	Is there poor contact in ABSCM&H/U connector? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Replace ABSCM&H/U.

D: TROUBLE CODE 21

— ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (FRONT RH) — S006522E60

E: TROUBLE CODE 23

— ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (FRONT LH) — S006522E61

F: TROUBLE CODE 25

— ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR RH) — S006522E62

G: TROUBLE CODE 27

— ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) — S006522E63

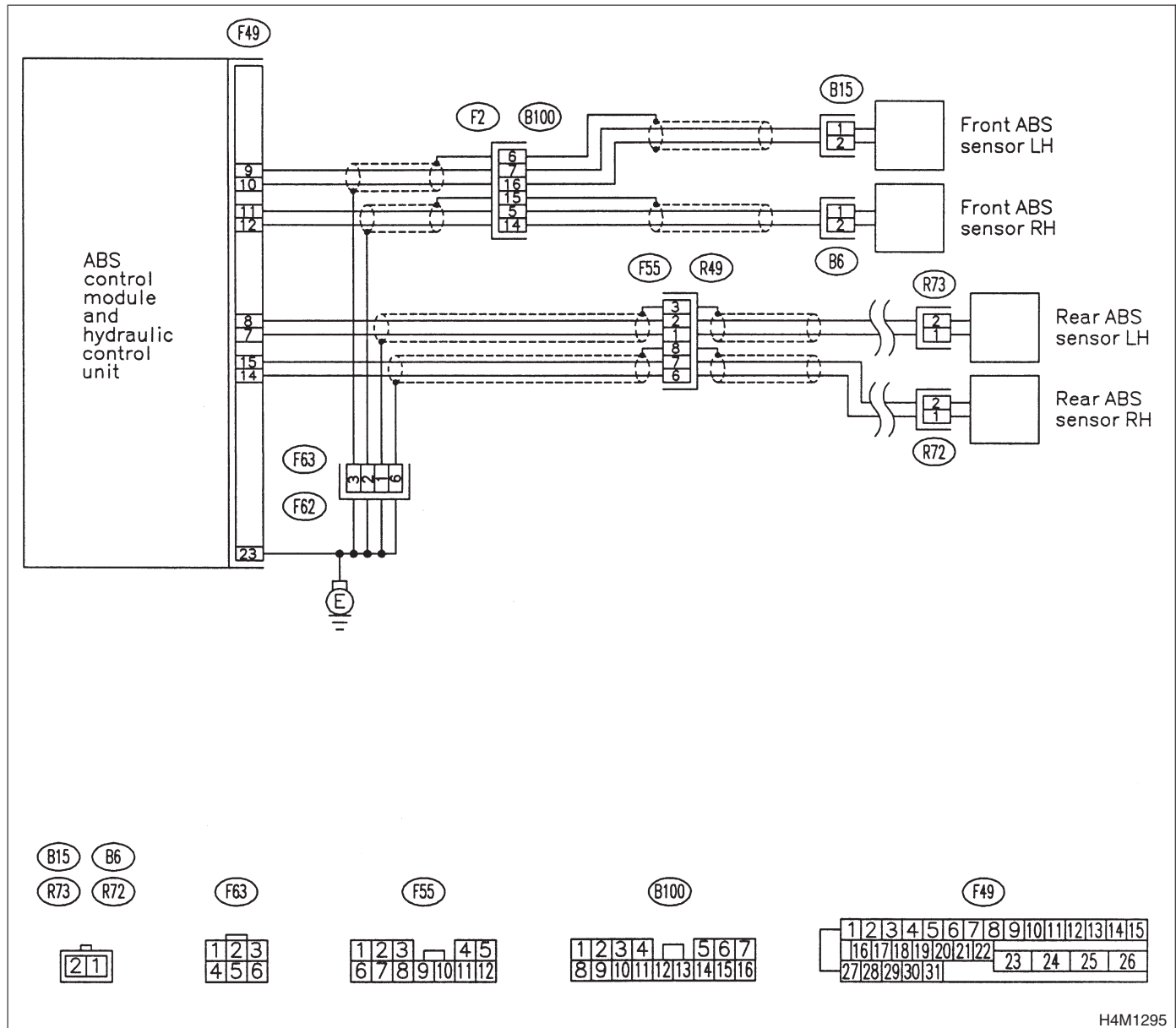
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1295

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	CHECK FRONT ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from front ABS sensor. 3) Measure resistance of front ABS sensor connector terminals. Terminal RH No. 1 — No. 2: LH No. 1 — No. 2:	Is the resistance between 1.0 and 1.5 kΩ?	Go to step 2.	Replace front ABS sensor.
2	CHECK REAR ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from rear ABS sensor. 3) Measure resistance of rear ABS sensor connector terminals. Terminal RH No. 1 — No. 2: LH No. 1 — No. 2:	Is the resistance between 0.8 and 1.2 kΩ?	Go to step 3.	Replace rear ABS sensor.
3	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 (-):	Is the voltage less than 1 V?	Go to step 4.	Replace ABS sensor.
4	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 (-):	Is the voltage less than 1 V?	Go to step 5.	Replace ABS sensor.
5	CHECK TROUBLE CODE.	Is the trouble code 21 and/or 23?	Go to step 6.	Go to step 7.
6	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:	Is the resistance between 1.0 and 1.5 kΩ?	Go to step 8.	Repair harness/connector between ABSCM&H/U and ABS sensor.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
7	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 25 / (F49) No. 14 — No. 15: Trouble code 27 / (F49) No. 7 — No. 8:	Is the resistance between 0.8 and 1.2 kΩ?	Go to step 8.	Repair harness/connector between ABSCM&H/U and ABS sensor.
8	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 (-):	Is the voltage less than 1 V?	Go to step 9.	Repair harness between ABSCM&H/U and ABS sensor.
9	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 (-):	Is the voltage less than 1 V?	Go to step 10.	Repair harness between ABSCM&H/U and ABS sensor.
10	CHECK INSTALLATION OF ABS SENSOR. Tightening torque: 32 N·m (3.3 kgf-m, 24 ft-lb)	Are the ABS sensor installation bolts tightened securely?	Go to step 11.	Tighten ABS sensor installation bolts securely.
11	CHECK TROUBLE CODE.	Is the trouble code 25 and/or 27?	Go to step 12.	Go to step 13.
12	CHECK INSTALLATION OF REAR TONE WHEEL. Tightening torque: 13 N·m (1.3 kgf-m, 9.4 ft-lb)	Are the rear tone wheel installation bolts tightened securely?	Go to step 13.	Tighten rear tone wheel installation bolts securely.
13	CHECK ABS SENSOR GAP. Measure tone wheel-to-pole piece gap over entire perimeter of the wheel. Specifications Front wheel 0.3 — 0.8 mm (0.012 — 0.031 in) Rear wheel 0.7 — 1.2 mm (0.028 — 0.047 in)	Is the gap within the specifications?	Go to step 14.	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.
14	CHECK HUB RUNOUT. Measure hub runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 15.	Repair hub.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
15	CHECK GROUND SHORT OF ABS SENSOR. 1) Turn ignition switch to OFF. 2) Measure resistance between ABS sensor and chassis ground. Terminal <i>Front RH No. 1 — Chassis ground:</i> <i>Front LH No. 1 — Chassis ground:</i> <i>Rear RH No. 1 — Chassis ground:</i> <i>Rear LH No. 1 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Go to step 16.	Replace ABS sensor and ABSCM&H/U.
16	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 <i>Trouble code 21 / (F49) No. 11 — Chassis ground:</i> <i>Trouble code 23 / (F49) No. 9 — Chassis ground:</i> <i>Trouble code 25 / (F49) No. 14 — Chassis ground:</i> <i>Trouble code 27 / (F49) No. 7 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Go to step 17.	Repair harness between ABSCM&H/U and ABS sensor. Replace ABSCM&H/U.
17	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 18.
18	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 19.
19	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact. NOTE: Check harness and connectors between ABSCM&H/U and ABS sensor.

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

H: TROUBLE CODE 22

— ABNORMAL ABS SENSOR (FRONT RH) — S006522E64

I: TROUBLE CODE 24

— ABNORMAL ABS SENSOR (FRONT LH) — S006522E65

J: TROUBLE CODE 26

— ABNORMAL ABS SENSOR (REAR RH) — S006522E66

K: TROUBLE CODE 28

— ABNORMAL ABS SENSOR (REAR LH) — S006522E67

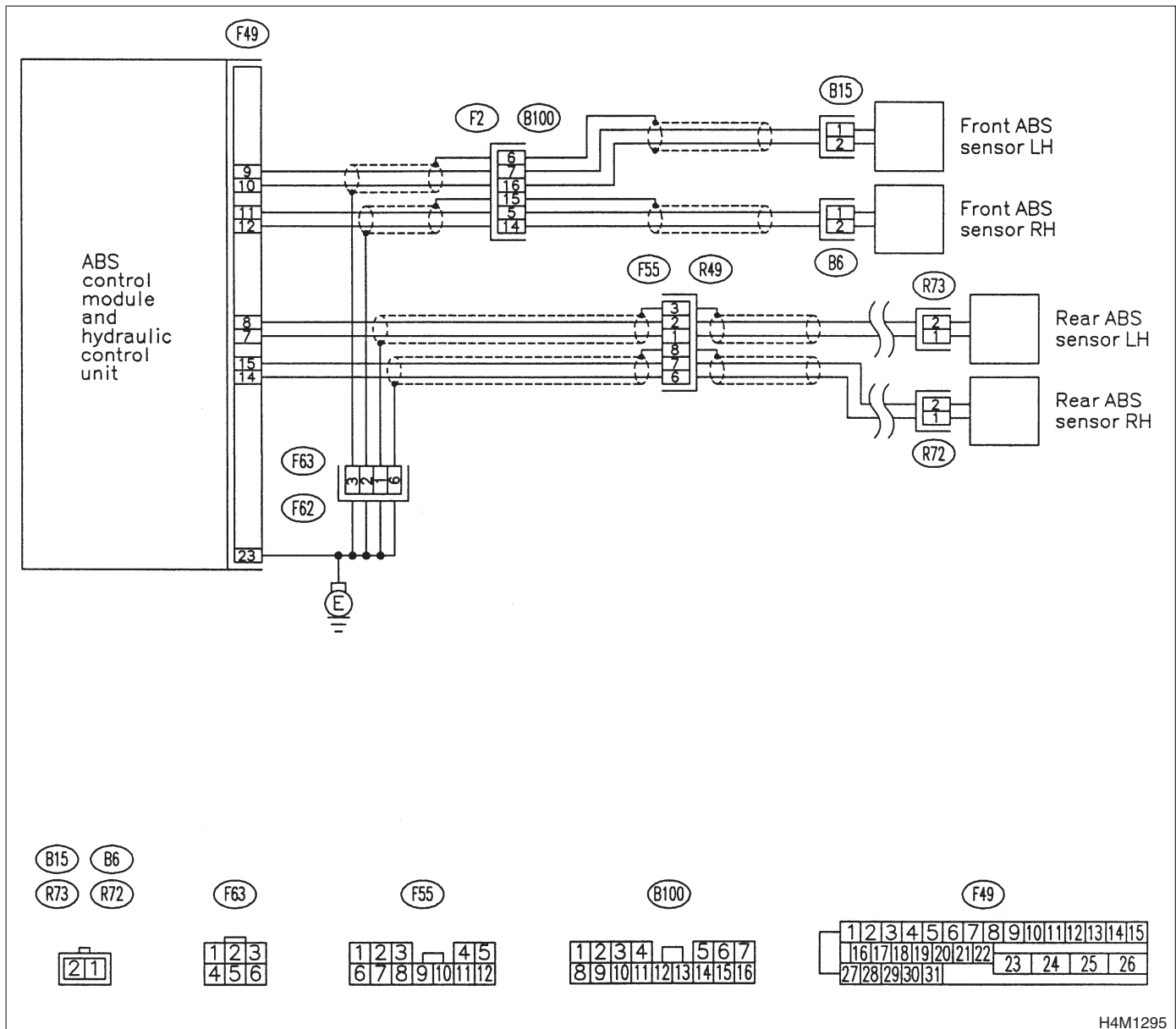
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1295

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	CHECK INSTALLATION OF ABS SENSOR. <i>Tightening torque:</i> 32 N·m (3.3 kgf-m, 24 ft-lb)	Are the ABS sensor installation bolts tightened securely?	Go to step 2.	Tighten ABS sensor installation bolts securely.
2	CHECK TROUBLE CODE.	Is the trouble code 26 and/or 28?	Go to step 3.	Go to step 4.
3	CHECK INSTALLATION OF REAR TONE WHEEL. <i>Tightening torque:</i> 13 N·m (1.3 kgf-m, 9.4 ft-lb)	Are the rear tone wheel installation bolts tightened securely?	Go to step 4.	Tighten rear tone wheel installation bolts securely.
4	CHECK ABS SENSOR GAP. Measure tone wheel to pole piece gap over entire perimeter of the wheel. <i>Specifications</i> <i>Front wheel</i> 0.3 — 0.8 mm (0.012 — 0.031 in) <i>Rear wheel</i> 0.7 — 1.2 mm (0.028 — 0.047 in)	Is the gap within the specifications?	Go to step 5.	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.
5	PREPARE OSCILLOSCOPE.	Is an oscilloscope available?	Go to step 6.	Go to step 7.
6	CHECK ABS SENSOR SIGNAL. 1) Raise all four wheels of ground. 2) Turn ignition switch OFF. 3) Connect the oscilloscope to the connector. 4) Turn ignition switch ON. 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. <i>Connector & terminal</i> <i>Trouble code 22 / (B100) No. 5 (+) — No. 14 (-):</i> <i>Trouble code 24 / (B100) No. 7 (+) — No. 16 (-):</i> <i>Trouble code 26 / (F55) No. 6 (+) — No. 7 (-):</i> <i>Trouble code 28 / (F55) No. 1 (+) — No. 2 (-):</i>	Is oscilloscope pattern smooth, as shown in figure?	Go to step 10.	Go to step 7.
7	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL. Remove disc rotor or drum from hub in accordance with trouble code.	Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?	Thoroughly remove dirt or other foreign matter.	Go to step 8.
8	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.	Are there broken or damaged in the ABS sensor pole piece or the tone wheel?	Replace ABS sensor or tone wheel.	Go to step 9.
9	CHECK HUB RUNOUT. Measure hub runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 10.	Repair hub.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
10	CHECK RESISTANCE OF FRONT ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from front ABS sensor. 3) Measure resistance between front ABS sensor connector terminals. Terminal RH No. 1 — No. 2: LH No. 1 — No. 2:	Is the resistance between 1.0 and 1.5 kΩ?	Go to step 11.	Replace front ABS sensor.
11	CHECK RESISTANCE OF REAR ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from rear ABS sensor. 3) Measure resistance between rear ABS sensor connector terminals. Terminal RH No. 1 — No. 2: LH No. 1 — No. 2:	Is the resistance between 0.8 and 1.2 kΩ?	Go to step 12.	Replace rear ABS sensor.
12	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:	Is the resistance more than 1 MΩ?	Go to step 13.	Replace ABS sensor.
13	CHECK TROUBLE CODE.	Is the trouble code 22 and/or 24?	Go to step 14.	Go to step 15.
14	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:	Is the resistance between 1.0 and 1.5 kΩ?	Go to step 16.	Repair harness/connector between ABSCM&H/U and ABS sensor.
15	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 26 / (F49) No. 14 — No. 15: Trouble code 28 / (F49) No. 7 — No. 8:	Is the resistance between 0.8 and 1.2 kΩ?	Go to step 16.	Repair harness/connector between ABSCM&H/U and ABS sensor.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
16	CHECK GROUND SHORT OF HARNESS. Measure resistance between ABSCM&H/U connector and chassis ground. Connector & terminal <i>Trouble code 22 / (F49) No. 11 — Chassis ground:</i> <i>Trouble code 24 / (F49) No. 9 — Chassis ground:</i> <i>Trouble code 26 / (F49) No. 14 — Chassis ground:</i> <i>Trouble code 28 / (F49) No. 7 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Go to step 17.	Repair harness/connector between ABSCM&H/U and ABS sensor.
17	CHECK GROUND CIRCUIT OF ABSCM&H/U. Measure resistance between ABSCM&H/U and chassis ground. Connector & terminal <i>(F49) No. 23 — Chassis ground:</i>	Is the resistance less than 0.5 Ω?	Go to step 18.	Repair ABSCM&H/U ground harness.
18	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 19.
19	CHECK SOURCES OF SIGNAL NOISE.	Is the car telephone or the wireless transmitter properly installed?	Go to step 20.	Properly install the car telephone or the wireless transmitter.
20	CHECK SOURCES OF SIGNAL NOISE.	Are noise sources (such as an antenna) installed near the sensor harness?	Install the noise sources apart from the sensor harness.	Go to step 21.
21	CHECK SHIELD CIRCUIT. 1) Connect all connectors. 2) Measure resistance between shield connector and chassis ground. Connector & terminal <i>Trouble code 22 / (B100) No. 15 — Chassis ground:</i> <i>Trouble code 24 / (B100) No. 6 — Chassis ground:</i> <i>Trouble code 26 / (F55) No. 8 — Chassis ground:</i> <i>Trouble code 28 / (F55) No. 3 — Chassis ground:</i>	Is the resistance less than 0.5 Ω?	Go to step 22.	Repair shield harness.
22	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 23.
23	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary noise interference.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

L: TROUBLE CODE 29

— ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —

S006522E68

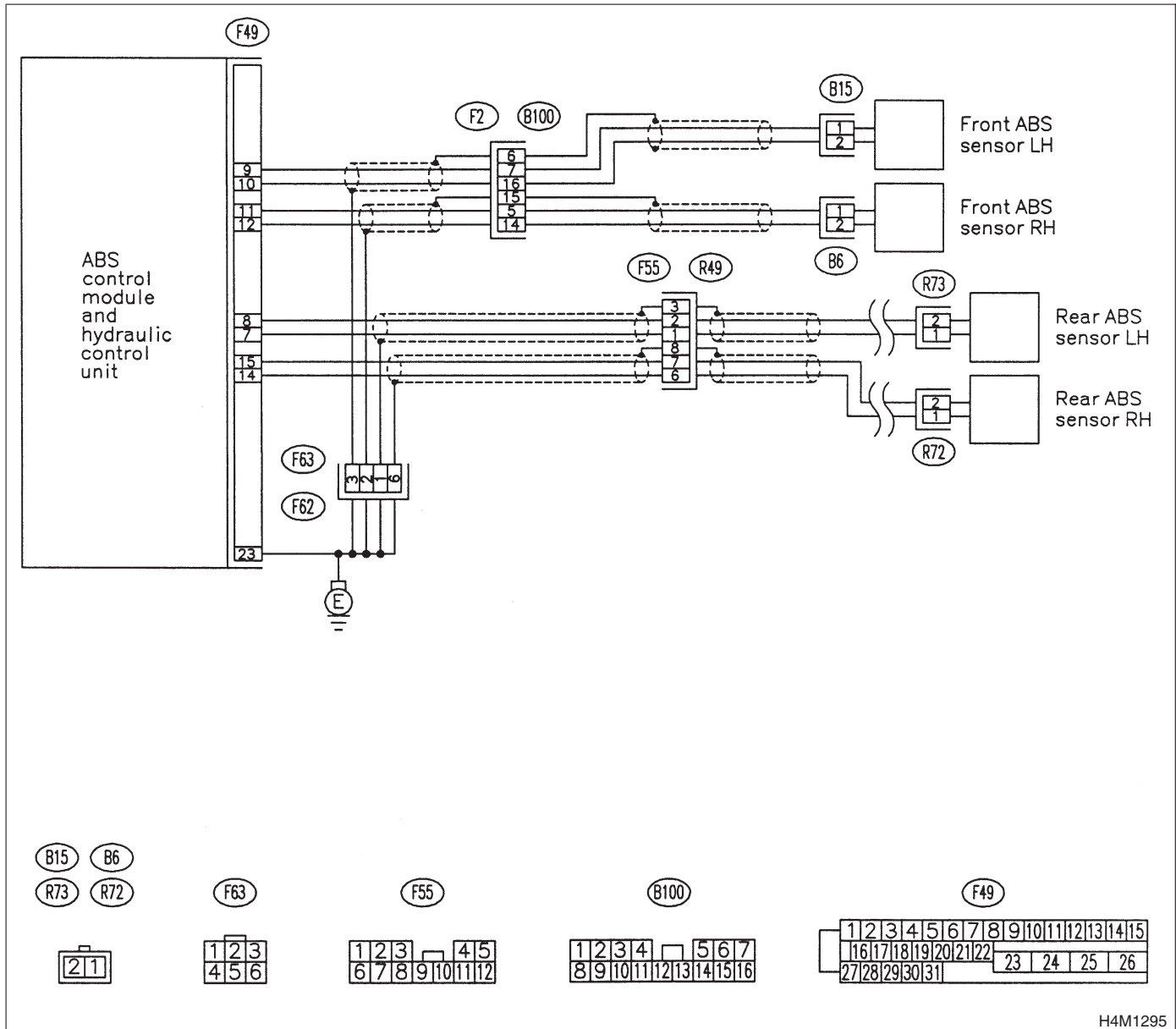
DIAGNOSIS:

- 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:



H4M1295

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.	Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.	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.	Go to step 2.
2	CHECK TIRE SPECIFICATIONS.	Are the tire specifications correct?	Go to step 3.	Replace tire.
3	CHECK WEAR OF TIRE.	Is the tire worn excessively?	Replace tire.	Go to step 4.
4	CHECK TIRE PRESSURE.	Is the tire pressure correct?	Go to step 5.	Adjust tire pressure.
5	CHECK INSTALLATION OF ABS SENSOR. <i>Tightening torque:</i> 32 N·m (3.3 kgf-m, 24 ft-lb)	Are the ABS sensor installation bolts tightened securely?	Go to step 6.	Tighten ABS sensor installation bolts securely.
6	CHECK INSTALLATION OF REAR TONE WHEEL. <i>Tightening torque:</i> 13 N·m (1.3 kgf-m, 9.4 ft-lb)	Are the rear tone wheel installation bolts tightened securely?	Go to step 7.	Tighten rear tone wheel installation bolts securely.
7	CHECK ABS SENSOR GAP. Measure tone wheel to pole piece gap over entire perimeter of the wheel. Specifications Front wheel 0.3 — 0.8 mm (0.012 — 0.031 in) Rear wheel 0.7 — 1.2 mm (0.028 — 0.047 in)	Is the gap within the specifications?	Go to step 8.	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.
8	PREPARE OSCILLOSCOPE.	Is an oscilloscope available?	Go to step 9.	Go to step 10.
9	CHECK ABS SENSOR SIGNAL. 1) Raise all four wheels of ground. 2) Turn ignition switch OFF. 3) Connect the oscilloscope to the connector. 4) Turn ignition switch ON. 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. 5 (+) — No. 14 (-) (Front RH): (B100) No. 7 (+) — No. 16 (-) (Front LH): (F55) No. 6 (+) — No. 7 (-) (Rear RH): (F55) No. 1 (+) — No. 2 (-) (Rear LH):	Is oscilloscope pattern smooth, as shown in figure?	Go to step 13.	Go to step 10.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
10	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL. Remove disc rotor from hub.	Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?	Thoroughly remove dirt or other foreign matter.	Go to step 11.
11	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.	Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?	Replace ABS sensor or tone wheel.	Go to step 12.
12	CHECK HUB RUNOUT. Measure hub runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 13.	Repair hub.
13	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.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 14.
14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

MEMO:

M: TROUBLE CODE 31

— **ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT RH)** — S006522E69

N: TROUBLE CODE 33

— **ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT LH)** — S006522E70

O: TROUBLE CODE 35

— **ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR RH)** — S006522E71

P: TROUBLE CODE 37

— **ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH)** — S006522E72

DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

ABS

Wiring diagram for the ABS control module and hydraulic control unit. The diagram shows the ABS control module connected to a battery and a generator. The battery is connected to the module via a fuse (F2) and a relay (B100). The generator is connected to the module via a fuse (F49) and a relay (B100). The module is also connected to a ground point (E).

Legend:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26				
27	28	29	30	31										

1	2	3	4		5	6	7
8	9	10	11	12	13	14	15
16							

H4M1305

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair harness connector between battery, ignition switch and ABSCM&H/U.
2	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:	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair ABSCM&H/U ground harness.
3	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 4.
4	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 5.
5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

MEMO:

Q: TROUBLE CODE 32

— ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U
(FRONT RH) — S006522E73

R: TROUBLE CODE 34

— ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U
(FRONT LH) — S006522E74

S: TROUBLE CODE 36

— ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U
(REAR RH) — S006522E75

T: TROUBLE CODE 38

— ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U
(REAR LH) — S006522E76

DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

ABS

Wiring diagram for the ABS control module and hydraulic control unit. The diagram shows the ABS control module connected to a battery and a generator. The battery is connected to the module via a fuse (F2) and a switch (B100). The generator is connected to the module via a fuse (F49) and a switch (B100). The module is labeled "ABS control module and hydraulic control unit". The battery is labeled "BATTERY" and the generator is labeled "Generator". The diagram includes a legend for the module's pins: F49 (1-15) and B100 (1-16).

Legend:

F49	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	16	17	18	19	20	21	22	23	24	25	26				
	27	28	29	30	31										

B100	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16					

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

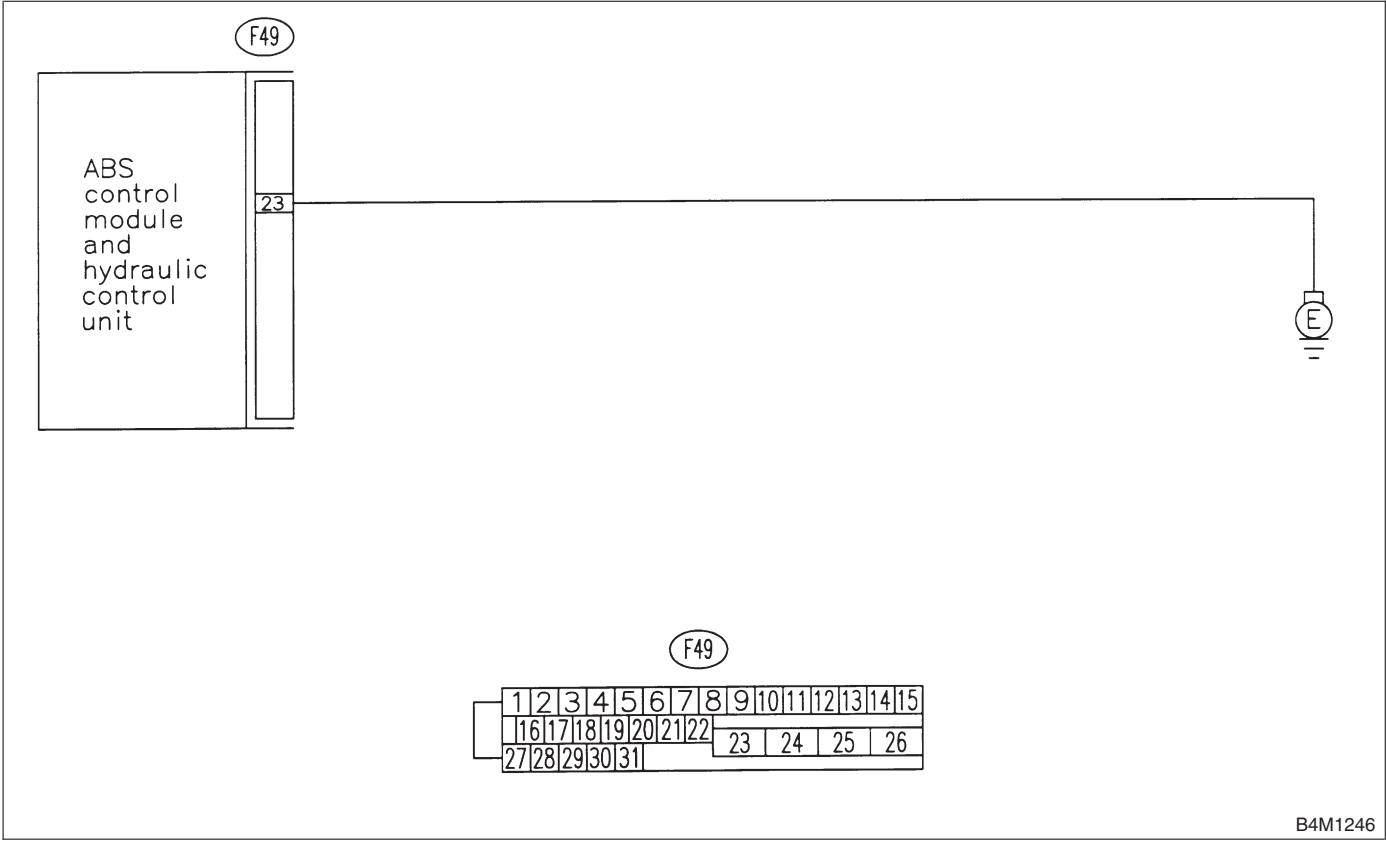
ABS

No.	Step	Check	Yes	No
1	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair harness connector between battery, ignition switch and ABSCM&H/U.
2	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:	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair ABSCM&H/U ground harness.
3	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 4.
4	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 5.
5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

MEMO:

U: TROUBLE CODE 41
— ABNORMAL ABS CONTROL MODULE — S006522D29

- DIAGNOSIS:
- Faulty ABSCM&H/U
- TROUBLE SYMPTOM:
- ABS does not operate.
- WIRING DIAGRAM:



B4M1246

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	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:	Is the resistance less than 0.5 Ω ?	Go to step 2.	Repair ABSCM&H/U ground harness.
2	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between battery, ignition switch and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 3.
3	CHECK SOURCES OF SIGNAL NOISE.	Is the car telephone or the wireless transmitter properly installed?	Go to step 4.	Properly install the car telephone or the wireless transmitter.
4	CHECK SOURCES OF SIGNAL NOISE.	Are noise sources (such as an antenna) installed near the sensor harness?	Install the noise sources apart from the sensor harness.	Go to step 5.
5	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 6.
6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

V: TROUBLE CODE 42

— SOURCE VOLTAGE IS ABNORMAL. — S006522D37

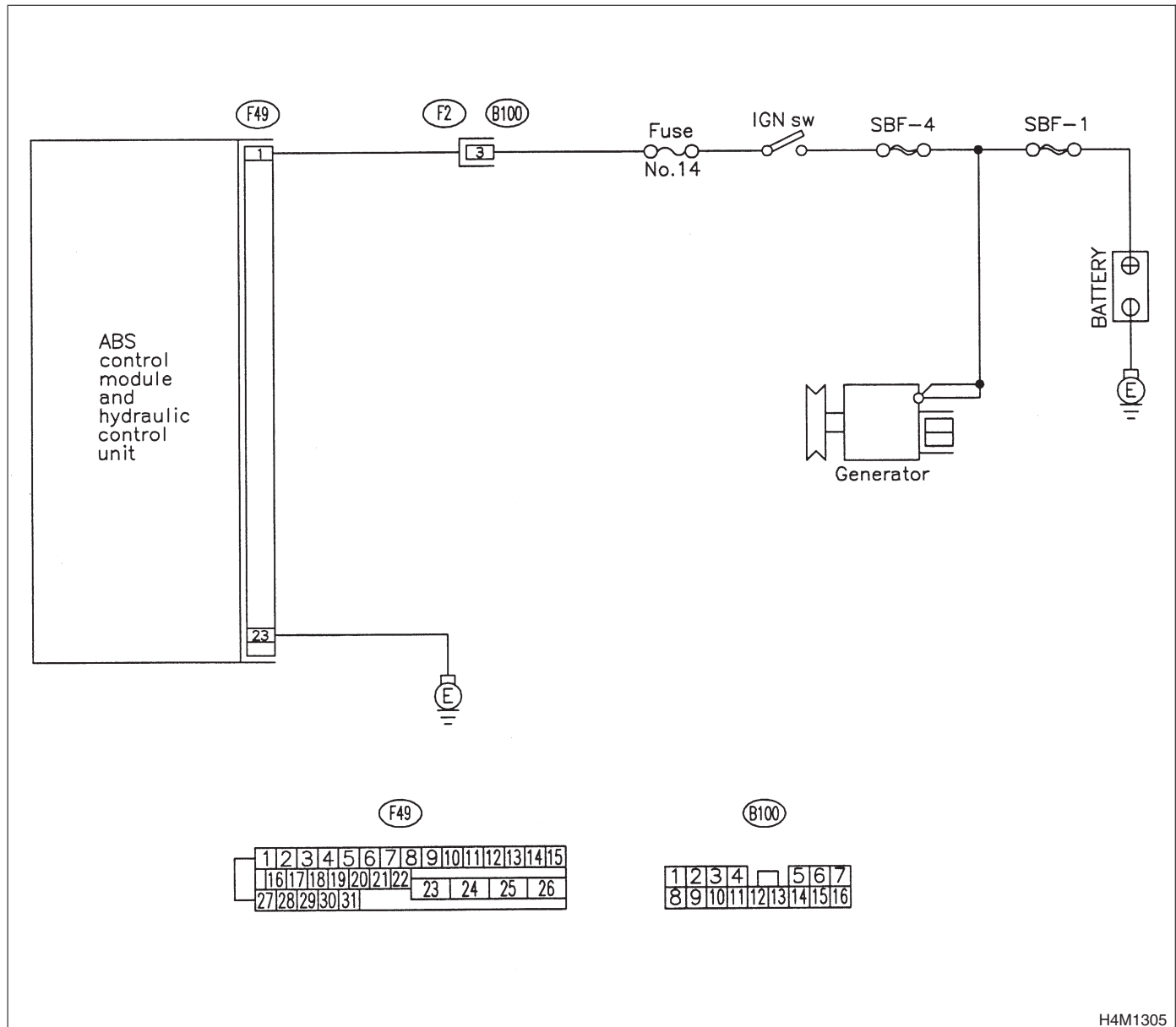
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1305

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	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:	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair generator.
2	CHECK BATTERY TERMINAL. Turn ignition switch to OFF.	Are the positive and negative battery terminals tightly clamped?	Go to step 3.	Tighten the clamp of terminal.
3	CHECK INPUT VOLTAGE OF ABSCM&H/U. 1) Disconnect 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 (-):	Is the voltage between 10 V and 15 V?	Go to step 4.	Repair harness connector between battery, ignition switch and ABSCM&H/U.
4	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:	Is the resistance less than 0.5 Ω ?	Go to step 5.	Repair ABSCM&H/U ground harness.
5	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 6.
6	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 7.
7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

W: TROUBLE CODE 44

— A COMBINATION OF AT CONTROL ABNORMAL —

S006522D42

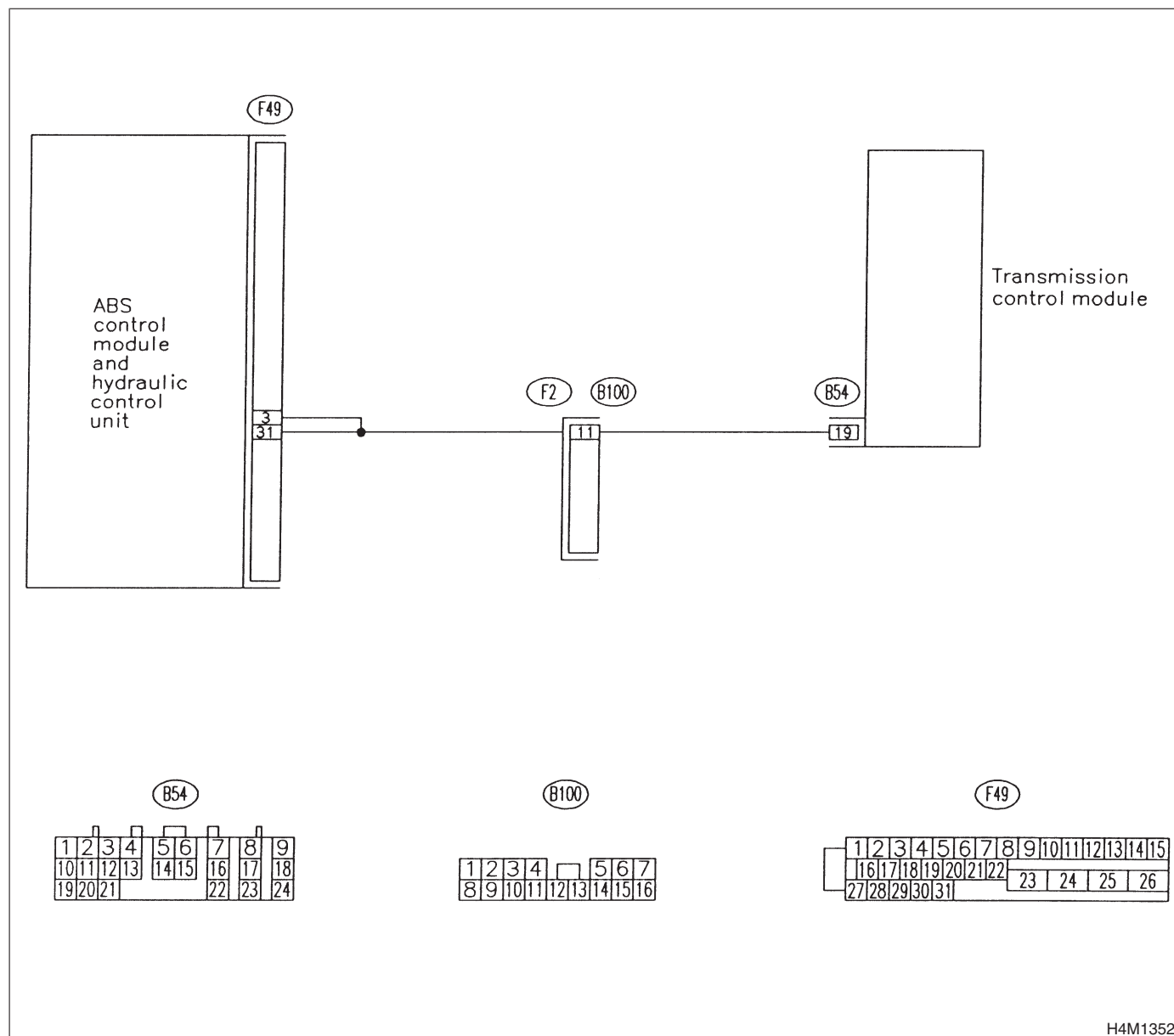
DIAGNOSIS:

- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	CHECK SPECIFICATIONS OF THE ABSCM&H/U. Check specifications of the mark to the ABSCM&H/U. <i>Mark: C5</i> <i>Model</i> <i>AWD AT</i> <i>Mark: C6</i> <i>Model</i> <i>AWD MT</i>	Is an ABSCM&H/U for AT model installed on a MT model?	Replace ABSCM&H/U.	Go to step 2.
2	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. <i>Connector & terminal</i> <i>(F49) No. 3 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Go to step 3.	Repair harness between TCM and ABSCM&H/U.
3	CHECK BATTERY SHORT OF HARNESS. Measure voltage between ABSCM&H/U connector and chassis ground. <i>Connector & terminal</i> <i>(F49) No. 3 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 4.	Repair harness between TCM and ABSCM&H/U.
4	CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between ABSCM&H/U connector and chassis ground. <i>Connector & terminal</i> <i>(F49) No. 3 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 5.	Repair harness between TCM and ABSCM&H/U.
5	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. <i>Connector & terminal</i> <i>(B54) No. 19 (+) — Chassis ground (-):</i>	Is the voltage between 10 V and 15 V?	Go to step 7.	Go to step 6.
6	CHECK AT.	Is the AT functioning normally?	Replace TCM.	Repair AT.
7	CHECK OPEN CIRCUIT OF HARNESS. Measure voltage between ABSCM&H/U connector and chassis ground. <i>Connector & terminal</i> <i>(F49) No. 3 (+) — Chassis ground (-):</i> <i>(F49) No. 31 (+) — Chassis ground (-):</i>	Is the voltage between 10 V and 15 V?	Go to step 8.	Repair harness/connector between TCM and ABSCM&H/U.
8	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between TCM and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 9.
9	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.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 10.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

No.	Step	Check	Yes	No
10	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

X: TROUBLE CODE 51

— ABNORMAL VALVE RELAY —

S006522D61

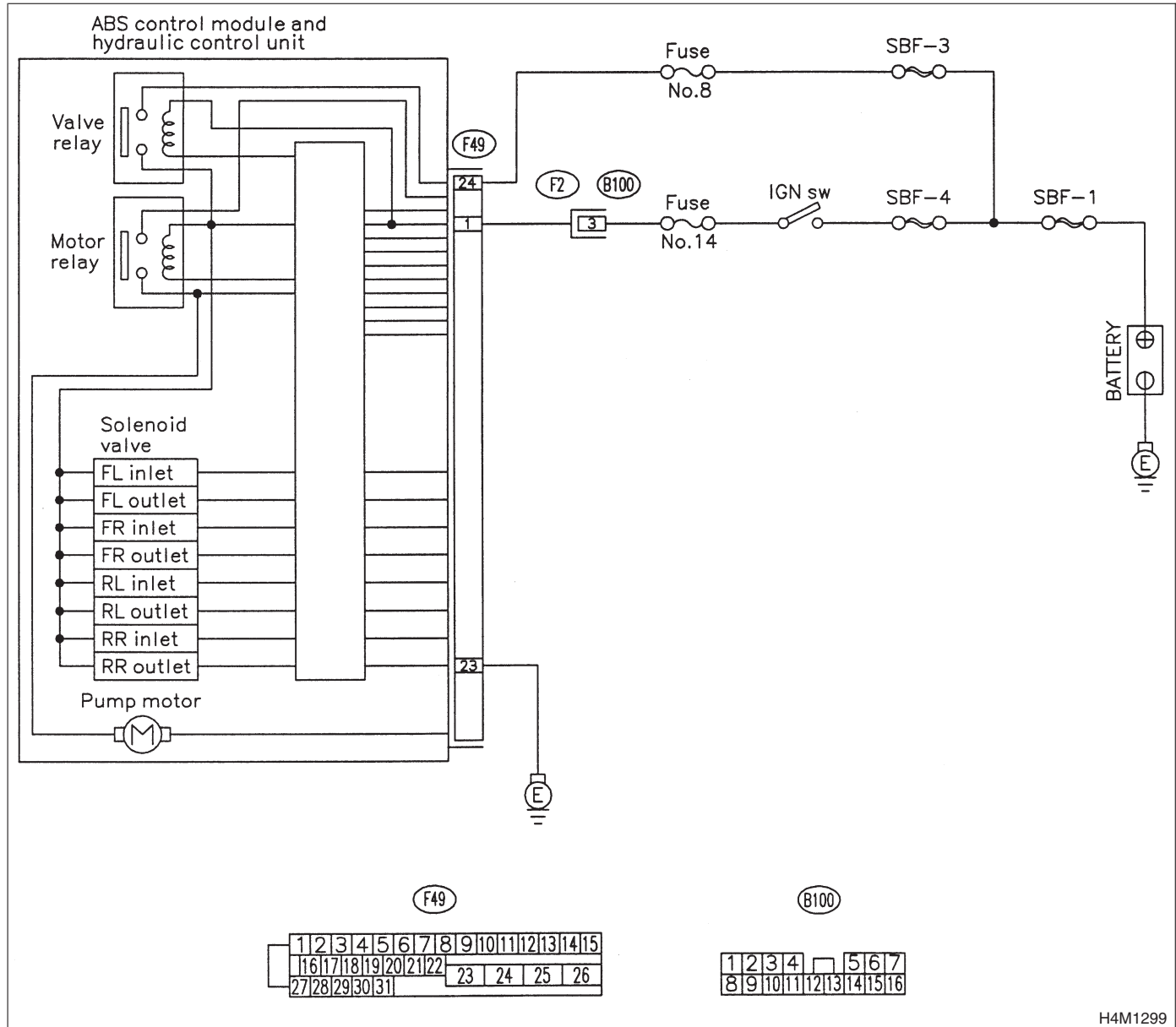
DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1299

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair harness connector between battery and ABSCM&H/U.
2	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:	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair ABSCM&H/U ground harness.
3	CHECK VALVE RELAY IN ABSCM&H/U. Measure resistance between ABSCM&H/U and terminals. Terminals No. 23 (+) — No. 24 (-):	Is the resistance more than 1 MΩ?	Go to step 4.	Replace ABSCM&H/U.
4	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 5.
5	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 6.
6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

Y: TROUBLE CODE 52

— ABNORMAL MOTOR AND/OR MOTOR RELAY —

S006522D65

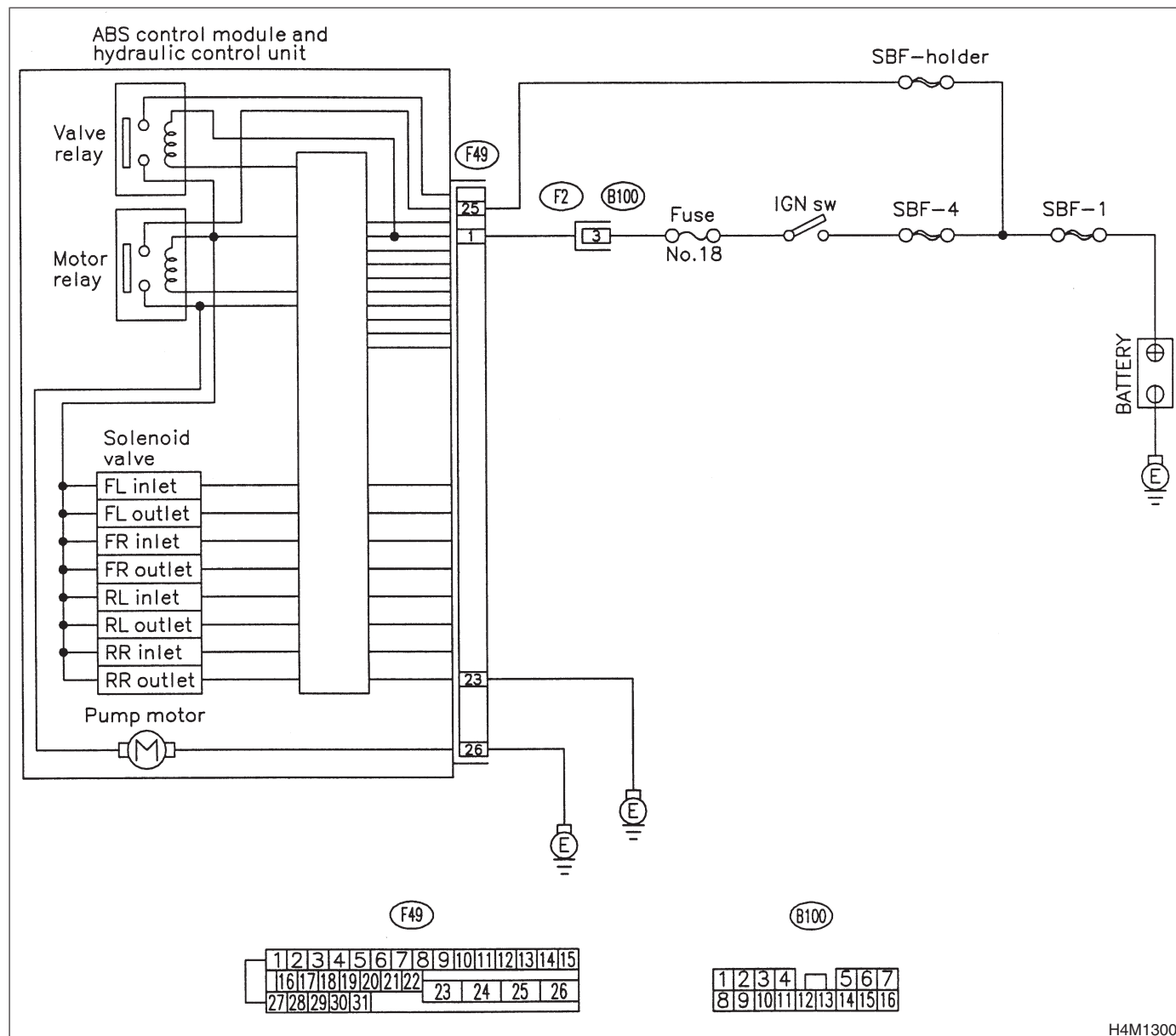
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1300

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair harness/connector between battery and ABSCM&H/U and check fuse SBF-holder.
2	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:	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair ABSCM&H/U ground harness.
3	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 4.	Repair harness connector between battery, ignition switch and ABSCM&H/U.
4	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:	Is the resistance less than 0.5 Ω?	Go to step 5.	Repair ABSCM&H/U ground harness.
5	CHECK MOTOR OPERATION. Operate the sequence control. <Ref. to ABS-10 OPERATION, ABS Sequence Control.> NOTE: Use the diagnosis connector to operate the sequence control.	Can motor revolution noise (buzz) be heard when carrying out the sequence control?	Go to step 6.	Replace ABSCM&H/U.
6	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connector between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 7.
7	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 8.
8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

Z: TROUBLE CODE 54

— ABNORMAL STOP LIGHT SWITCH —

S006522D72

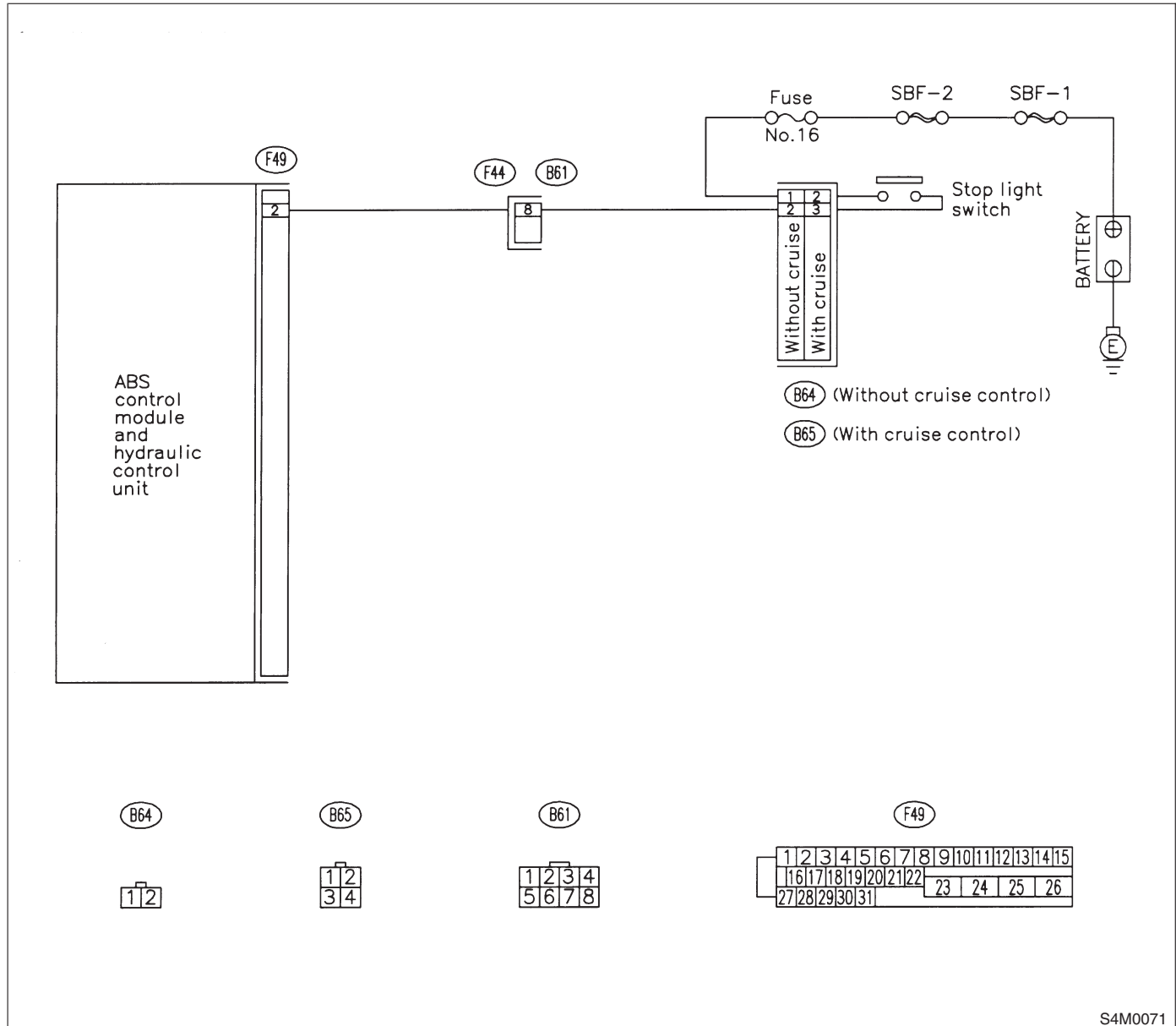
DIAGNOSIS:

- Faulty stop light switch

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0071

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	CHECK STOP LIGHTS COME ON. Depress the brake pedal.	Do stop lights come on?	Go to step 2.	Repair stop lights circuit.
2	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 3.	Repair harness between stop light switch and ABSCM&H/U.
3	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connector between stop light switch and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 4.
4	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 5.
5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

AA: TROUBLE CODE 56

— ABNORMAL G SENSOR OUTPUT VOLTAGE — S006522E77

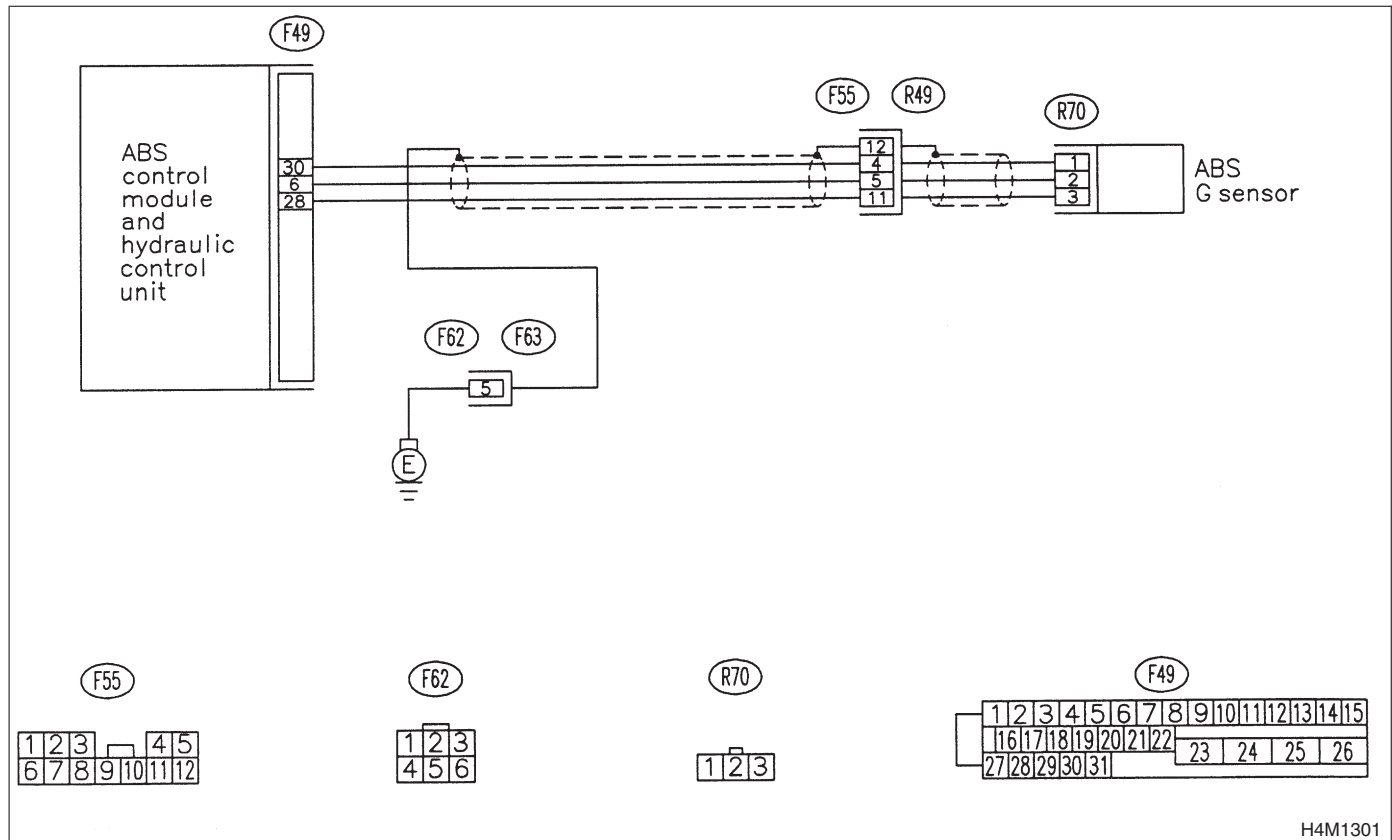
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1301

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
1	CHECK ALL FOUR WHEELS FOR FREE TURNING.	Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?	The ABS is normal. Erase the trouble code.	Go to step 2.
2	CHECK SPECIFICATIONS OF ABSCM&H/U. Check specifications of the mark to the ABSCM&H/U. Mark: C5 Model AWD AT Mark: C6 Model AWD MT	Does the vehicle specification and the ABSCM&H/U specification match?	Replace ABSCM&H/U. CAUTION: Be sure to turn ignition switch to OFF when removing ABSCM&H/U.	Go to step 3.
3	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 (R70) No. 1 (+) — No. 3 (-):	Is the voltage between 4.75 and 5.25 V?	Go to step 4.	Repair harness/connector between G sensor and ABSCM&H/U.
4	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. 6 — No. 28:	Is the resistance between 4.3 and 4.9 kΩ?	Go to step 5.	Repair harness/connector between G sensor and ABSCM&H/U.
5	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:	Is the resistance more than 1 MΩ?	Go to step 6.	Repair harness between G sensor and ABSCM&H/U.
6	CHECK BATTERY SHORT OF HARNESS. Measure voltage between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Go to step 7.	Repair harness between G sensor and ABSCM&H/U.
7	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 (-):	Is the voltage less than 1 V?	Go to step 8.	Repair harness between G sensor and ABSCM&H/U.
8	CHECK GROUND SHORT OF HARNESS. Measure resistance between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 28 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 9.	Repair harness between G sensor and ABSCM&H/U. Replace ABSCM&H/U.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS

No.	Step	Check	Yes	No
9	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 (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?	Go to step 10.	Replace G sensor.
10	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?	Go to step 11.	Replace G sensor.
11	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?	Go to step 12.	Replace G sensor.
12	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 13.
13	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 14.
14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

AB: SELECT MONITOR S006522E48

Applicable cartridge of select monitor: No. 24082AA130

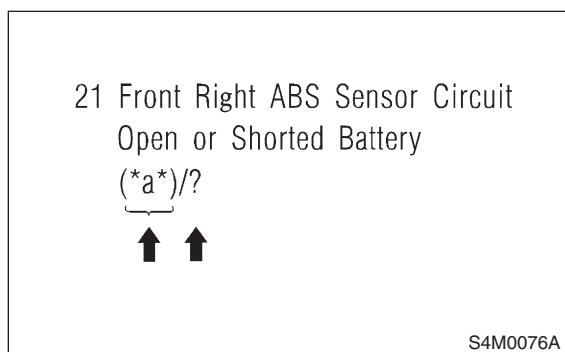
NOTE:

For basic handling of the select monitor, refer to its Operation Manual.

AC: TROUBLE CODES ARE DISPLAYED. S006522E51

A maximum of 3 trouble codes are displayed in order of occurrence.

- 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 (Latest, Old, Older and Reference).

Display screen	Contents to be monitored
Latest	The most recent trouble code appears on the select monitor display.
Old	The second most recent trouble code appears on the select monitor display.
Older	The third most recent trouble code appears on the select monitor display.
Reference	A specified period of time proceeding trouble code appears on the select monitor display.

AD: CLEAR MEMORY S006522E33

Display screen	Contents to be monitored
Clear memory?	Function of clearing trouble code and freeze frame data.

AE: ANALOG DATA ARE DISPLAYED. S006522E29

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

AF: ON/OFF DATA ARE DISPLAYED. S006522E43

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

AG: ABS SEQUENCE CONTROLS006522E23

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

AH: FREEZE FRAME DATA S006522E39

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.
- If freeze frame data is not properly stored in memory (due to a drop in ABSCM power supply, etc.), a freeze frame data, preceded by a question mark "?", appears on the select monitor display. This shows it may be an unreliable reading. The value of the freeze frame data will be written over, and the memory cannot be cleared.

Display screen	Contents to be monitored
FR wheel speed	Wheel speed detected by the Front Right ABS sensor is displayed in km/h or mile/h.
FL wheel speed	Wheel speed detected by the Front Left ABS sensor is displayed in km/h or mile/h.
RR wheel speed	Wheel speed detected by the Rear Right ABS sensor is displayed in km/h or mile/h.
RL wheel speed	Wheel speed detected by the Rear Left ABS sensor is displayed in km/h or mile/h.
ABSCM power voltage	Power (in volts) supplied to ABSCM&H/U appears on the select monitor display.
G sensor output voltage	Refers to vehicle acceleration detected by the analog G sensor. It appears on the select monitor display in volts.
Motor relay monitor	Motor relay operation monitor signal
Stop light switch	Stop light switch signal
ABS signal to TCM	ABS operation signal from ABS control module to TCM (Output signal)
ABS-AT control	ABS operation signal from ABS control module to TCM (ABS operation signal monitor)
ABS operation signal	ABS operation signal

MEMO:

14. Diagnostics Chart with Subaru Select Monitor S006583

A: COMMUNICATION FOR INITIALIZING IMPOSSIBLE S006583E34

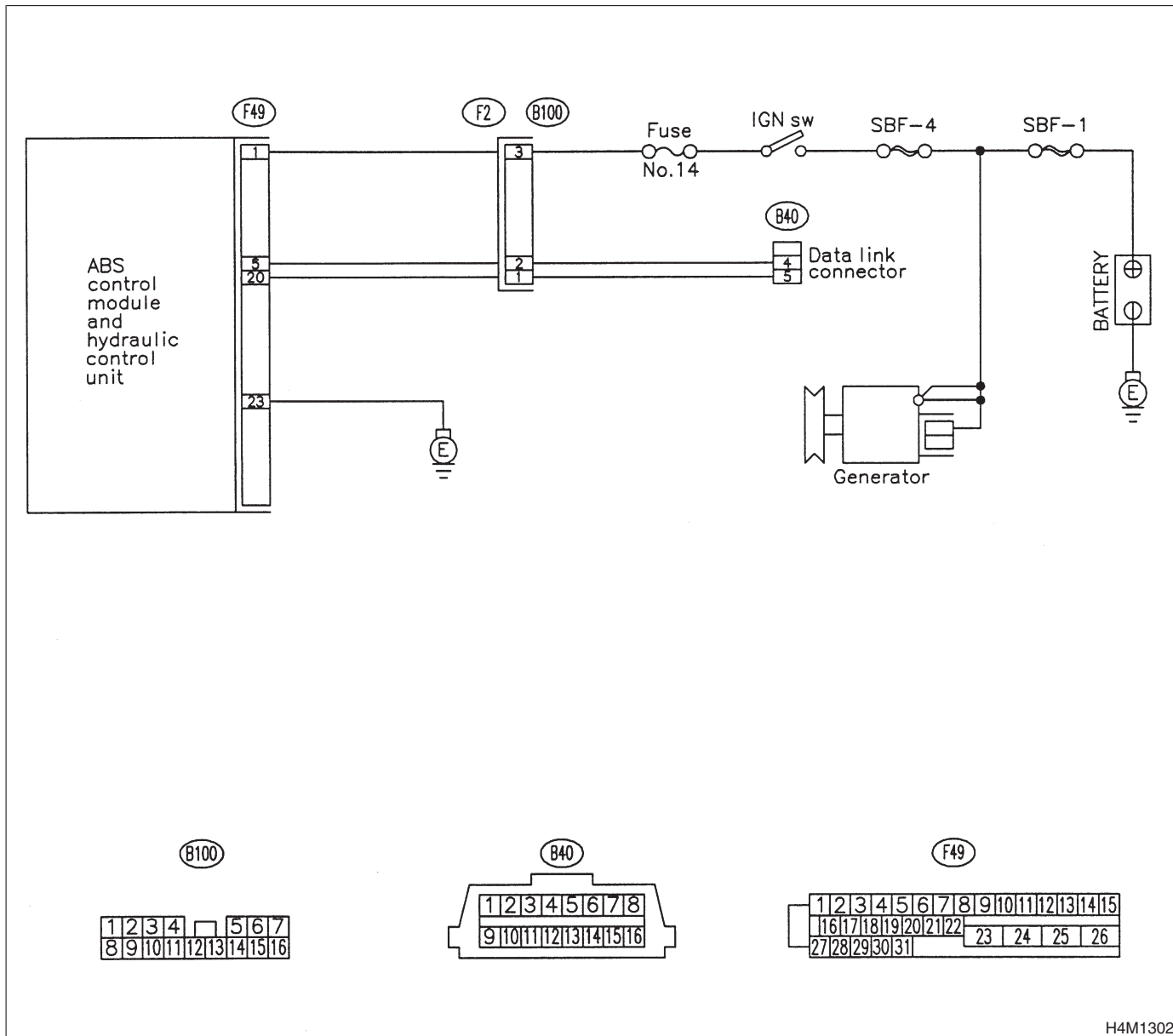
DIAGNOSIS:

- Faulty harness connector

TROUBLE SYMPTOM:

- ABS warning light remains on.

WIRING DIAGRAM:



H4M1302

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK IGNITION SWITCH.	Is ignition switch ON?	Go to step 2.	Turn ignition switch ON, and select brake control mode using the select monitor.
2	CHECK GENERATOR. 1) Start the engine. 2) Idle the engine. 3) Measure voltage between generator and chassis ground. Terminal Generator B terminal (+) — Chassis ground (-):	Is the voltage between 10 and 15 V?	Go to step 3.	Repair generator.
3	CHECK BATTERY TERMINAL. Turn ignition switch to OFF.	Is there poor contact at battery terminal?	Repair battery terminal.	Go to step 4.
4	CHECK COMMUNICATION OF SELECT MONITOR. Using the select monitor, check whether communication to other system (such as engine, AT, etc.) can be executed normally.	Are the name and year of the system displayed on the select monitor?	Go to step 5.	Repair select monitor communication cable and connector.
5	CHECK INSTALLATION OF ABSCM&H/U CONNECTOR. Turn ignition switch to OFF.	Is ABSCM&H/U connector inserted into ABSCM&H/U until the clamp locks onto it?	Go to step 6.	Insert ABSCM&H/U connector into ABSCM&H/U until the clamp locks onto it.
6	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 (-):	Is the voltage between 10 and 15 V?	Go to step 7.	Repair ABSCM&H/U power supply circuit.
7	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:	Is the resistance less than 0.5 Ω ?	Repair harness/connector between ABSCM&H/U and select monitor.	Go to step 8.
8	CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND DATA LINK CONNECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance between ABSCM&H/U connector and data link connector. Connector & terminal (F49) No. 20 — (B40) No. 5: (F49) No. 5 — (B40) No. 4:	Is the resistance less than 0.5 Ω ?	Repair harness and connector between ABSCM&H/U and data link connector.	Go to step 9.
9	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between ABSCM&H/U and data link connector? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Replace ABSCM&H/U.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

B: NO TROUBLE CODE

S006583E41

DIAGNOSIS:

- ABS warning light circuit is shorted.

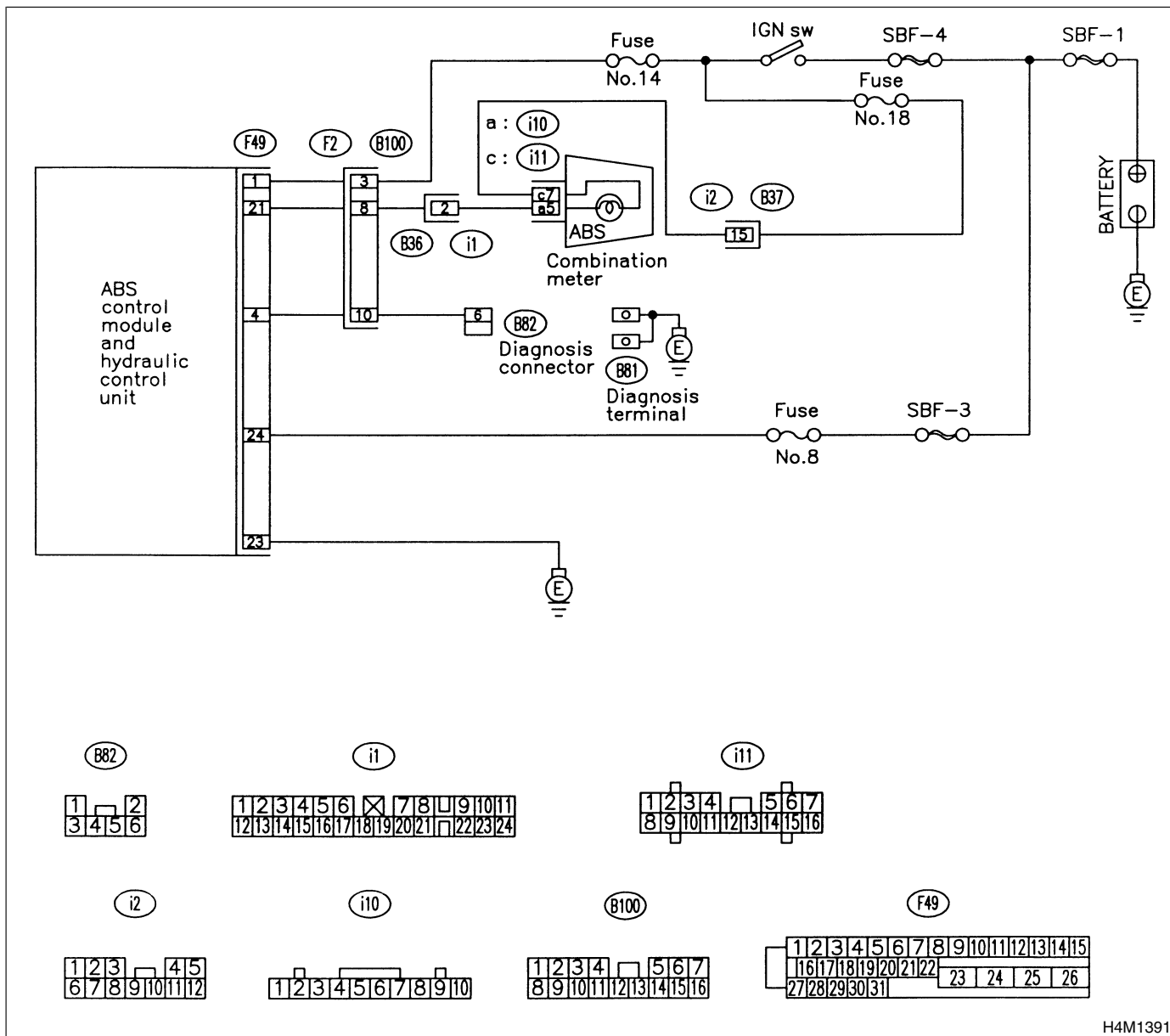
TROUBLE SYMPTOM:

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

NOTE:

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

WIRING DIAGRAM:



H4M1391

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK WIRING HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector (F2) from connector (B100). 3) Turn ignition switch to ON.	Does the ABS warning light remain off?	Go to step 2.	Repair front wiring harness.
2	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.	Are the projection broken?	Replace ABSCM&H/U.	Go to step 3.
3	CHECK ABSCM&H/U. Measure resistance between ABSCM&H/U terminals. Terminals No. 21 — No. 23:	Is the resistance more than 1 MΩ?	Go to step 4.	Replace ABSCM&H/U.
4	CHECK WIRING HARNESS. Measure resistance between connector (F2) and chassis ground. Connector & terminal (F2) No. 8 — Chassis ground:	Is the resistance less than 0.5 Ω?	Go to step 5.	Repair harness.
5	CHECK WIRING HARNESS. 1) Connect connector to ABSCM&H/U. 2) Measure resistance between connector (F2) and chassis ground. Connector & terminal (F2) No. 8 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 6.	Repair harness.
6	CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.	Is there poor contact in ABSCM&H/U connector? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Replace ABSCM&H/U.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

C: TROUBLE CODE 21

— OPEN OR SHORT CIRCUIT IN FRONT RIGHT ABS SENSOR CIRCUIT —

S006583C50

D: TROUBLE CODE 23

— OPEN OR SHORT CIRCUIT IN FRONT LEFT ABS SENSOR CIRCUIT —

S006583C60

E: TROUBLE CODE 25

— OPEN OR SHORT CIRCUIT IN REAR RIGHT ABS SENSOR CIRCUIT —

S006583C69

F: TROUBLE CODE 27

— OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —

S006583C78

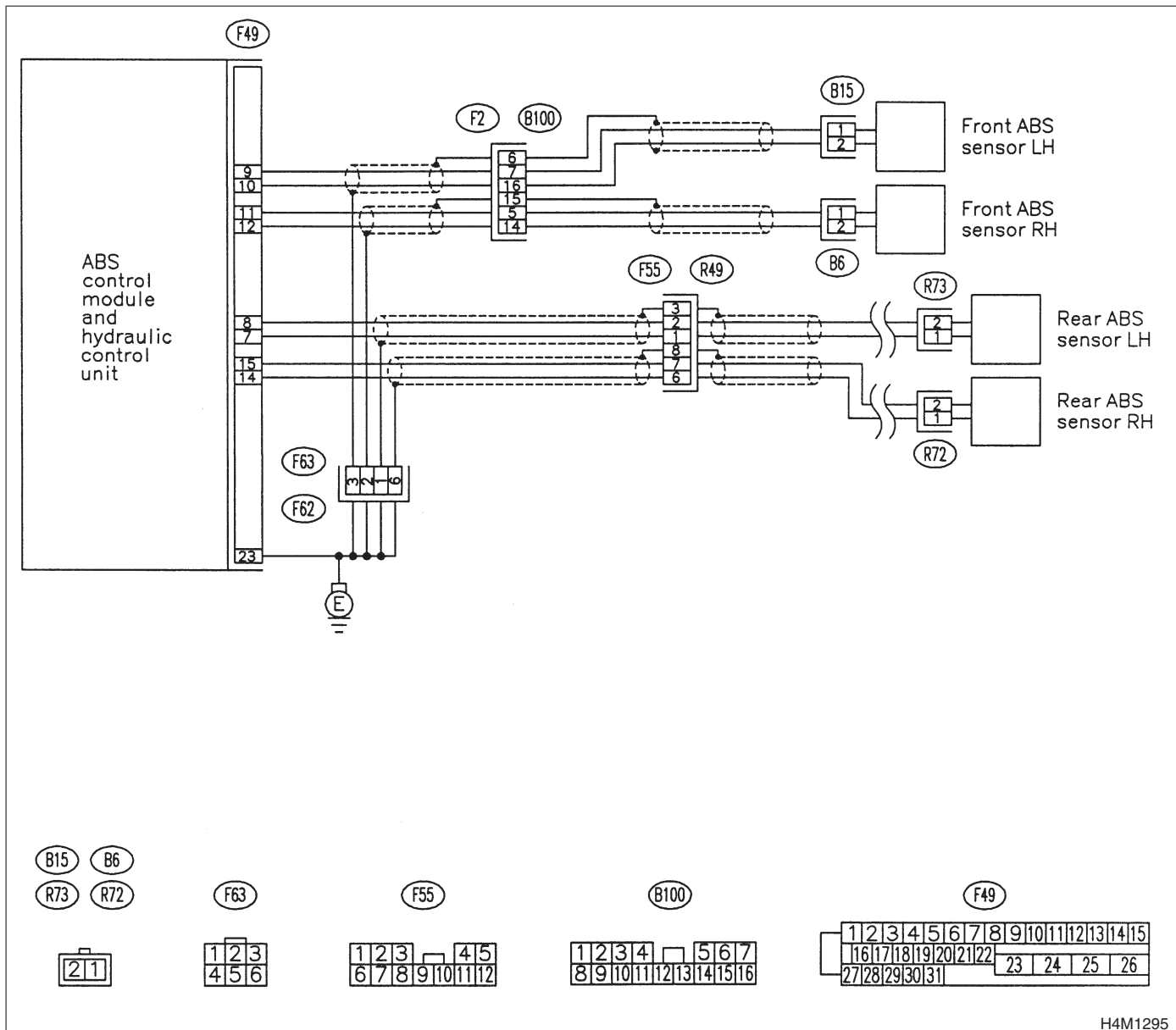
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1295

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR. 1) Select "Current data display & Save" on the select monitor. 2) Read the ABS sensor output corresponding to the faulty system in the select monitor data display mode.	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?	Go to step 2.	Go to step 10.
2	CHECK INSTALLATION OF ABS SENSOR. <i>Tightening torque:</i> 32 N·m (3.3 kgf-m, 24 ft-lb)	Are the ABS sensor installation bolts tightened securely?	Go to step 3.	Tighten ABS sensor installation bolts securely.
3	CHECK TROUBLE CODE.	Is the trouble code 21 and/or 23?	Go to step 5.	Go to step 4.
4	CHECK INSTALLATION OF REAR TONE WHEEL. <i>Tightening torque:</i> 13 N·m (1.3 kgf-m, 9.4 ft-lb)	Are the rear tone wheel installation bolts tightened securely?	Go to step 5.	Tighten rear tone wheel installation bolts securely.
5	CHECK ABS SENSOR GAP. Measure tone wheel-to-pole piece gap over entire perimeter of the wheel. <i>Specifications</i> <i>Front wheel</i> 0.3 — 0.8 mm (0.012 — 0.031 in) <i>Rear wheel</i> 0.7 — 1.2 mm (0.028 — 0.047 in)	Is the gap within the specifications?	Go to step 6.	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.
6	CHECK HUB RUNOUT. Measure hub runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 7.	Repair hub.
7	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 8.
8	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 9.
9	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact. NOTE: Check harness and connectors between ABSCM&H/U and ABS sensor.
10	CHECK FRONT ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from front ABS sensor. 3) Measure resistance of front ABS sensor connector terminals. <i>Terminal</i> RH No. 1 — No. 2: LH No. 1 — No. 2:	Is the resistance between 1.0 and 1.5 kΩ?	Go to step 11.	Replace front ABS sensor.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
11	CHECK REAR ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from rear ABS sensor. 3) Measure resistance of rear ABS sensor connector terminals. Terminal <i>RH No. 1 — No. 2:</i> <i>LH No. 1 — No. 2:</i>	Is the resistance between 0.8 and 1.2 kΩ?	Go to step 12.	Replace rear ABS sensor.
12	CHECK BATTERY SHORT OF ABS SENSOR. 1) Disconnect connector from ABSCM&H/U. 2) Measure voltage between ABS sensor and chassis ground. Terminal <i>Front RH No. 1 (+) — Chassis ground (-):</i> <i>Front LH No. 1 (+) — Chassis ground (-):</i> <i>Rear RH No. 1 (+) — Chassis ground (-):</i> <i>Rear LH No. 1 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 13.	Replace ABS sensor.
13	CHECK BATTERY SHORT OF ABS SENSOR. 1) Turn ignition switch to ON. 2) Measure voltage between ABS sensor and chassis ground. Terminal <i>Front RH No. 1 (+) — Chassis ground (-):</i> <i>Front LH No. 1 (+) — Chassis ground (-):</i> <i>Rear RH No. 1 (+) — Chassis ground (-):</i> <i>Rear LH No. 1 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 14.	Replace ABS sensor.
14	CHECK TROUBLE CODE.	Is the trouble code 21 and/or 23?	Go to step 15.	Go to step 16.
15	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 <i>Trouble code 21 / (F49) No. 11 — No. 12:</i> <i>Trouble code 23 / (F49) No. 9 — No. 10:</i>	Is the resistance between 1.0 and 1.5 kΩ?	Go to step 17.	Repair harness/connector between ABSCM&H/U and ABS sensor.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
16	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 25 / (F49) No. 14 — No. 15: Trouble code 27 / (F49) No. 7 — No. 8:	Is the resistance between 0.8 and 1.2 kΩ?	Go to step 17.	Repair harness/connector between ABSCM&H/U and ABS sensor.
17	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 (-):	Is the voltage less than 1 V?	Go to step 18.	Repair harness between ABSCM&H/U and ABS sensor.
18	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 (-):	Is the voltage less than 1 V?	Go to step 19.	Repair harness between ABSCM&H/U and ABS sensor.
19	CHECK INSTALLATION OF ABS SENSOR. Tightening torque: 32 N·m (3.3 kgf-m, 24 ft-lb)	Are the ABS sensor installation bolts tightened securely?	Go to step 20.	Tighten ABS sensor installation bolts securely.
20	CHECK TROUBLE CODE.	Is the trouble code 21 and/or 23?	Go to step 22.	Go to step 21.
21	CHECK INSTALLATION OF REAR TONE WHEEL. Tightening torque: 13 N·m (1.3 kgf-m, 9.4 ft-lb)	Are the rear tone wheel installation bolts tightened securely?	Go to step 22.	Tighten rear tone wheel installation bolts securely.
22	CHECK ABS SENSOR GAP. Measure tone wheel-to-pole piece gap over entire perimeter of the wheel. Specifications Front wheel 0.3 — 0.8 mm (0.012 — 0.031 in) Rear wheel 0.7 — 1.2 mm (0.028 — 0.047 in)	Is the gap within the specifications?	Go to step 23.	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.
23	CHECK HUB RUNOUT. Measure hub runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 24.	Repair hub.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
24	CHECK GROUND SHORT OF ABS SENSOR. 1) Turn ignition switch to OFF. 2) Measure resistance between ABS sensor and chassis ground. Terminal <i>Front RH No. 1 — Chassis ground:</i> <i>Front LH No. 1 — Chassis ground:</i> <i>Rear RH No. 1 — Chassis ground:</i> <i>Rear LH No. 1 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Go to step 25.	Replace ABS sensor and ABSCM&H/U.
25	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 <i>Trouble code 21 / (F49) No. 11 — Chassis ground:</i> <i>Trouble code 23 / (F49) No. 9 — Chassis ground:</i> <i>Trouble code 25 / (F49) No. 14 — Chassis ground:</i> <i>Trouble code 27 / (F49) No. 7 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Go to step 26.	Repair harness between ABSCM&H/U and ABS sensor. And replace ABSCM&H/U.
26	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 27.
27	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 28.
28	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact. NOTE: Check harness and connectors between ABSCM&H/U and ABS sensor.

MEMO:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

G: TROUBLE CODE 22

— FRONT RIGHT ABNORMAL ABS SENSOR SIGNAL — S006583C54

H: TROUBLE CODE 24

— FRONT LEFT ABNORMAL ABS SENSOR SIGNAL — S006583C64

I: TROUBLE CODE 26

— REAR RIGHT ABNORMAL ABS SENSOR SIGNAL — S006583C73

J: TROUBLE CODE 28

— REAR LEFT ABNORMAL ABS SENSOR SIGNAL — S006583C82

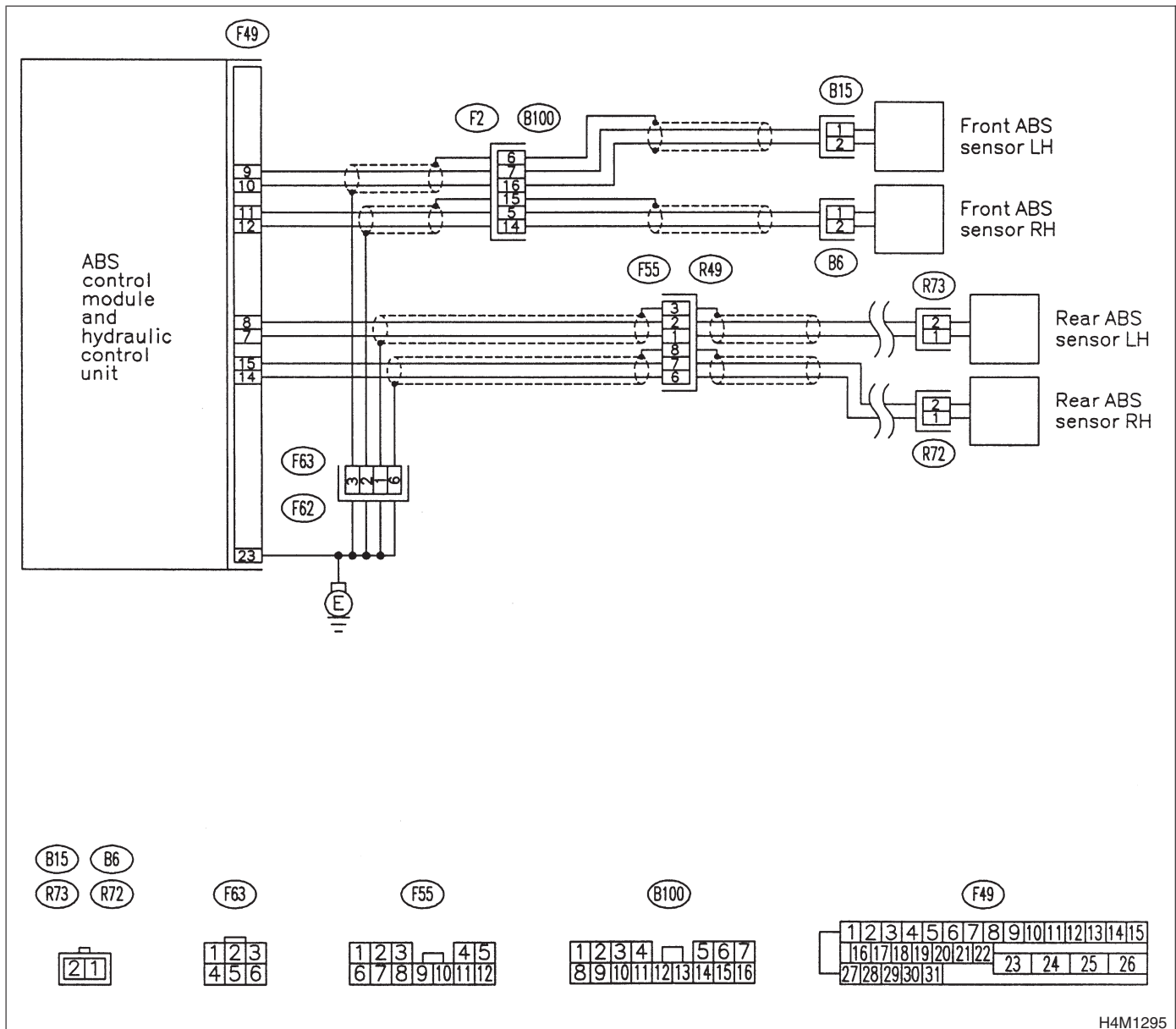
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1295

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR. 1) Select "Current data display & Save" on the select monitor. 2) Read the ABS sensor output corresponding to the faulty system in the select monitor data display mode.	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?	Go to step 2.	Go to step 8.
2	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 3.
3	CHECK SOURCES OF SIGNAL NOISE.	Is the car telephone or the wireless transmitter properly installed?	Go to step 4.	Properly install the car telephone or the wireless transmitter.
4	CHECK SOURCES OF SIGNAL NOISE.	Are noise sources (such as an antenna) installed near the sensor harness?	Install the noise sources apart from the sensor harness.	Go to step 5.
5	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. 15 — Chassis ground: Trouble code 24 / (B100) No. 6 — Chassis ground: Trouble code 26 / (F55) No. 8 — Chassis ground: Trouble code 28 / (F55) No. 3 — Chassis ground:	Is the resistance less than 0.5 Ω?	Go to step 6.	Repair shield harness.
6	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 7.
7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary noise interference.
8	CHECK INSTALLATION OF ABS SENSOR. Tightening torque: 32 N·m (3.3 kgf-m, 24 ft-lb)	Are the ABS sensor installation bolts tightened securely?	Go to step 9.	Tighten ABS sensor installation bolts securely.
9	CHECK TROUBLE CODE.	Is the trouble code 22 and/or 24?	Go to step 11.	Go to step 10.
10	CHECK INSTALLATION OF REAR TONE WHEEL. Tightening torque: 13 N·m (1.3 kgf-m, 9.4 ft-lb)	Are the rear tone wheel installation bolts tightened securely?	Go to step 11.	Tighten rear tone wheel installation bolts securely.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
11	CHECK ABS SENSOR GAP. Measure tone wheel to pole piece gap over entire perimeter of the wheel. Specifications <i>Front wheel</i> 0.3 — 0.8 mm (0.012 — 0.031 in) <i>Rear wheel</i> 0.7 — 1.2 mm (0.028 — 0.047 in)	Is the gap within the specifications?	Go to step 12.	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.
12	PREPARE OSCILLOSCOPE.	Is an oscilloscope available?	Go to step 13.	Go to step 14.
13	CHECK ABS SENSOR SIGNAL. 1) Raise all four wheels of ground. 2) Turn ignition switch OFF. 3) Connect the oscilloscope to the connector. 4) Turn ignition switch ON. 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 <i>Trouble code 22 / (B100) No. 5 (+) — No. 14 (-):</i> <i>Trouble code 24 / (B100) No. 7 (+) — No. 16 (-):</i> <i>Trouble code 26 / (F55) No. 6 (+) — No. 7 (-):</i> <i>Trouble code 28 / (F55) No. 1 (+) — No. 2 (-):</i>	Is oscilloscope pattern smooth, as shown in figure?	Go to step 17.	Go to step 14.
14	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL. Remove disc rotor or drum from hub in accordance with trouble code.	Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?	Thoroughly remove dirt or other foreign matter.	Go to step 15.
15	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.	Are there broken or damaged in the ABS sensor pole piece or the tone wheel?	Replace ABS sensor or tone wheel.	Go to step 16.
16	CHECK HUB RUNOUT. Measure hub runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 17.	Repair hub.
17	CHECK RESISTANCE OF FRONT ABS SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from front ABS sensor. 3) Measure resistance between front ABS sensor connector terminals. Terminal <i>RH No. 1 — No. 2:</i> <i>LH No. 1 — No. 2:</i>	Is the resistance between 1.0 and 1.5 kΩ?	Go to step 18.	Replace front ABS sensor.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
18	CHECK RESISTANCE OF REAR ABS SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from rear ABS sensor. 3) Measure resistance between rear ABS sensor connector terminals. Terminal RH No. 1 — No. 2: LH No. 1 — No. 2:	Is the resistance between 0.8 and 1.2 kΩ?	Go to step 19.	Replace rear ABS sensor.
19	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:	Is the resistance more than 1 MΩ?	Go to step 20.	Replace ABS sensor.
20	CHECK TROUBLE CODE.	Is the trouble code 22 and/or 24?	Go to step 21.	Go to step 22.
21	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:	Is the resistance between 1.0 and 1.5 kΩ?	Go to step 23.	Repair harness/connector between ABSCM&H/U and ABS sensor.
22	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 26 / (F49) No. 14 — No. 15: Trouble code 28 / (F49) No. 7 — No. 8:	Is the resistance between 0.8 and 1.2 kΩ?	Go to step 23.	Repair harness/connector between ABSCM&H/U and ABS sensor.
23	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:	Is the resistance more than 1 MΩ?	Go to step 24.	Repair harness/connector between ABSCM&H/U and ABS sensor.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
24	CHECK GROUND CIRCUIT OF ABSCM&H/U. Measure resistance between ABSCM&H/U and chassis ground. Connector & terminal (F49) No. 23 — Chassis ground:	Is the resistance less than 0.5 Ω?	Go to step 25.	Repair ABSCM&H/U ground harness.
25	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 26.
26	CHECK SOURCES OF SIGNAL NOISE.	Is the car telephone or the wireless transmitter properly installed?	Go to step 27.	Properly install the car telephone or the wireless transmitter.
27	CHECK SOURCES OF SIGNAL NOISE.	Are noise sources (such as an antenna) installed near the sensor harness?	Install the noise sources apart from the sensor harness.	Go to step 28.
28	CHECK SHIELD CIRCUIT. 1) Connect all connectors. 2) Measure resistance between shield connector and chassis ground. Connector & terminal Trouble code 22 / (B100) No. 15 — Chassis ground: Trouble code 24 / (B100) No. 6 — Chassis ground: Trouble code 26 / (F55) No. 8 — Chassis ground: Trouble code 28 / (F55) No. 3 — Chassis ground:	Is the resistance less than 0.5 Ω?	Go to step 29.	Repair shield harness.
29	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 30.
30	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary noise interference.

MEMO:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

K: TROUBLE CODE 29

— ABNORMAL ABS SENSOR SIGNAL ON ANY ONE OF FOUR SENSOR —

S006583E78

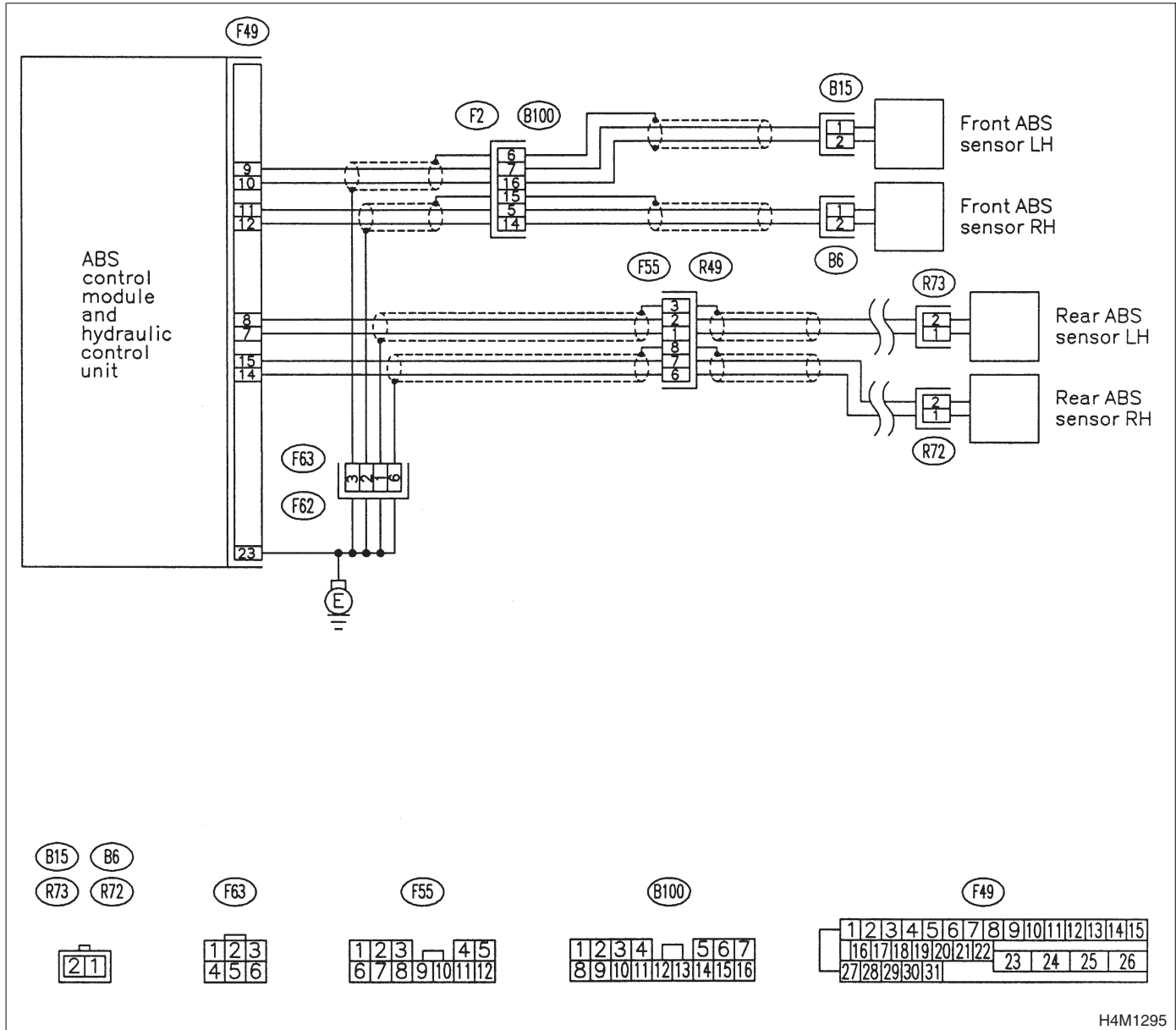
DIAGNOSIS:

- 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:



H4M1295

No.	Step	Check	Yes	No
1	CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.	Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.	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.	Go to step 2.
2	CHECK TIRE SPECIFICATIONS. Turn ignition switch to OFF.	Are the tire specifications correct?	Go to step 3.	Replace tire.
3	CHECK WEAR OF TIRE.	Is the tire worn excessively?	Replace tire.	Go to step 4.
4	CHECK TIRE PRESSURE.	Is the tire pressure correct?	Go to step 5.	Adjust tire pressure.
5	CHECK INSTALLATION OF ABS SENSOR. <i>Tightening torque:</i> 32 N·m (3.3 kgf-m, 24 ft-lb)	Are the ABS sensor installation bolts tightened securely?	Go to step 6.	Tighten ABS sensor installation bolts securely.
6	CHECK INSTALLATION OF REAR TONE WHEEL. <i>Tightening torque:</i> 13 N·m (1.3 kgf-m, 9.4 ft-lb)	Are the rear tone wheel installation bolts tightened securely?	Go to step 7.	Tighten rear tone wheel installation bolts securely.
7	CHECK ABS SENSOR GAP. Measure tone wheel to pole piece gap over entire perimeter of the wheel. <i>Specifications</i> <i>Front wheel</i> 0.3 — 0.8 mm (0.012 — 0.031 in) <i>Rear wheel</i> 0.7 — 1.2 mm (0.028 — 0.047 in)	Is the gap within the specifications?	Go to step 8.	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.
8	PREPARE OSCILLOSCOPE.	Is an oscilloscope available?	Go to step 9.	Go to step 10.
9	CHECK ABS SENSOR SIGNAL. 1) Raise all four wheels of ground. 2) Turn ignition switch to OFF. 3) Connect the oscilloscope to the connector. 4) Turn ignition switch to ON. 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. <i>Connector & terminal</i> <i>(B100) No. 5 (+) — No. 14 (-) (Front RH):</i> <i>(B100) No. 7 (+) — No. 16 (-) (Front LH):</i> <i>(F55) No. 6 (+) — No. 7 (-) (Rear RH):</i> <i>(F55) No. 1 (+) — No. 2 (-) (Rear LH):</i>	Is oscilloscope pattern smooth, as shown in figure?	Go to step 13.	Go to step 10.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
10	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL. Remove disc rotor from hub.	Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?	Thoroughly remove dirt or other foreign matter.	Go to step 11.
11	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.	Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?	Replace ABS sensor or tone wheel.	Go to step 12.
12	CHECK HUB RUNOUT. Measure hub runout.	Is the runout less than 0.05 mm (0.0020 in)?	Go to step 13.	Repair hub.
13	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.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 14.
14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

MEMO:

— FRONT RIGHT INLET VALVE MALFUNCTION — S006583C93

— FRONT LEFT INLET VALVE MALFUNCTION —

— REAR RIGHT INLET VALVE MALFUNCTION —

— REAR LEFT INLET VALVE MALFUNCTION —

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	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 (–):	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair harness connector between battery, ignition switch and ABSCM&H/U.
2	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:	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair ABSCM&H/U ground harness.
3	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 4.
4	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 5.
5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

— FRONT RIGHT OUTLET VALVE MALFUNCTION — S006583C99

— FRONT LEFT OUTLET VALVE MALFUNCTION — S006583D08

— REAR RIGHT OUTLET VALVE MALFUNCTION —

— REAR LEFT OUTLET VALVE MALFUNCTION —

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	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 (–):	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair harness connector between battery, ignition switch and ABSCM&H/U.
2	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:	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair ABSCM&H/U ground harness.
3	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 4.
4	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 5.
5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

T: TROUBLE CODE 41 — ABS CONTROL MODULE MALFUNCTION —

S006583D31

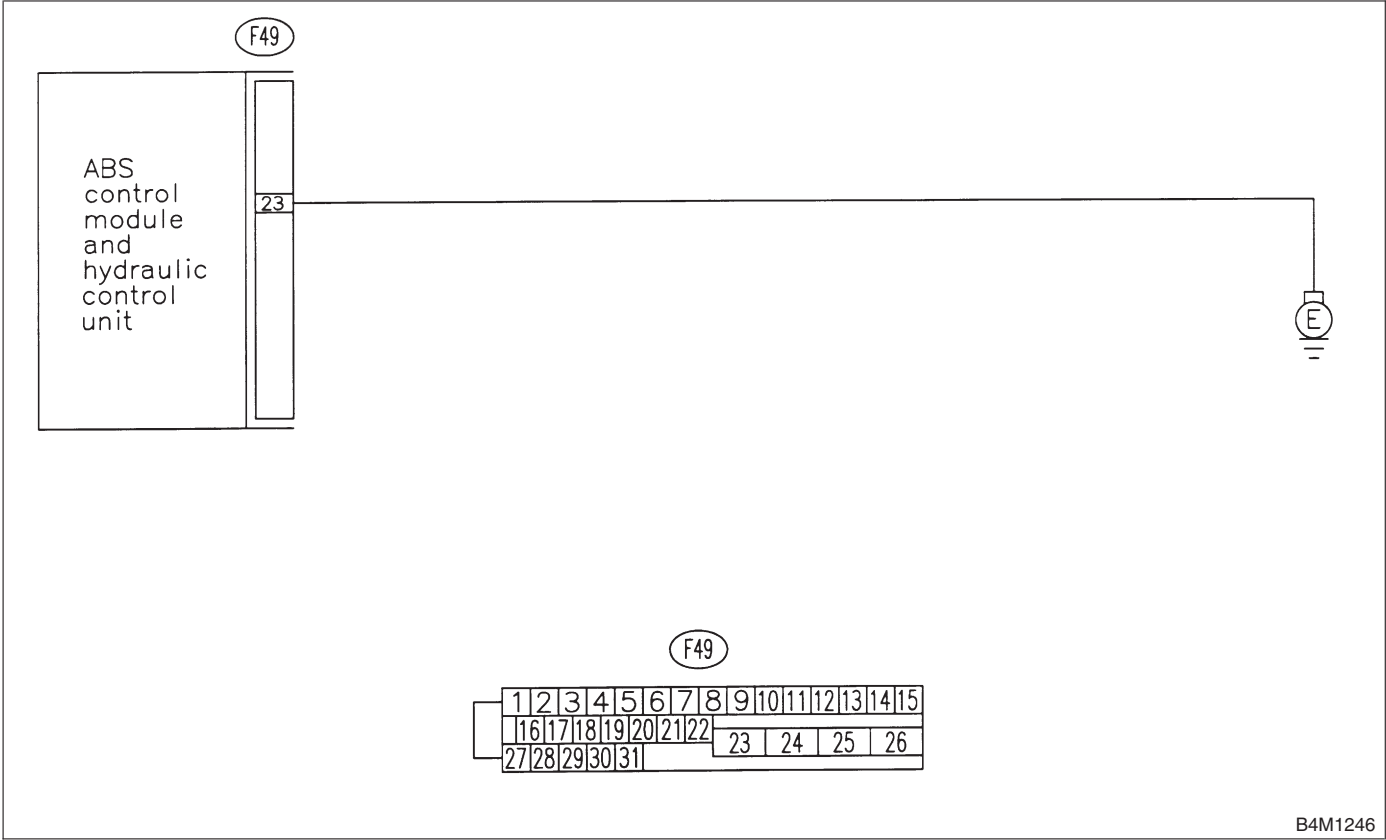
DIAGNOSIS:

- Faulty ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1246

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	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:	Is the resistance less than 0.5 Ω ?	Go to step 2.	Repair ABSCM&H/U ground harness.
2	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between battery, ignition switch and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 3.
3	CHECK SOURCES OF SIGNAL NOISE.	Is the car telephone or the wireless transmitter properly installed?	Go to step 4.	Properly install the car telephone or the wireless transmitter.
4	CHECK SOURCES OF SIGNAL NOISE.	Are noise sources (such as an antenna) installed near the sensor harness?	Install the noise sources apart from the sensor harness.	Go to step 5.
5	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.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 6.
6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

U: TROUBLE CODE 42
— POWER SUPPLY VOLTAGE TOO LOW —

S006583D36

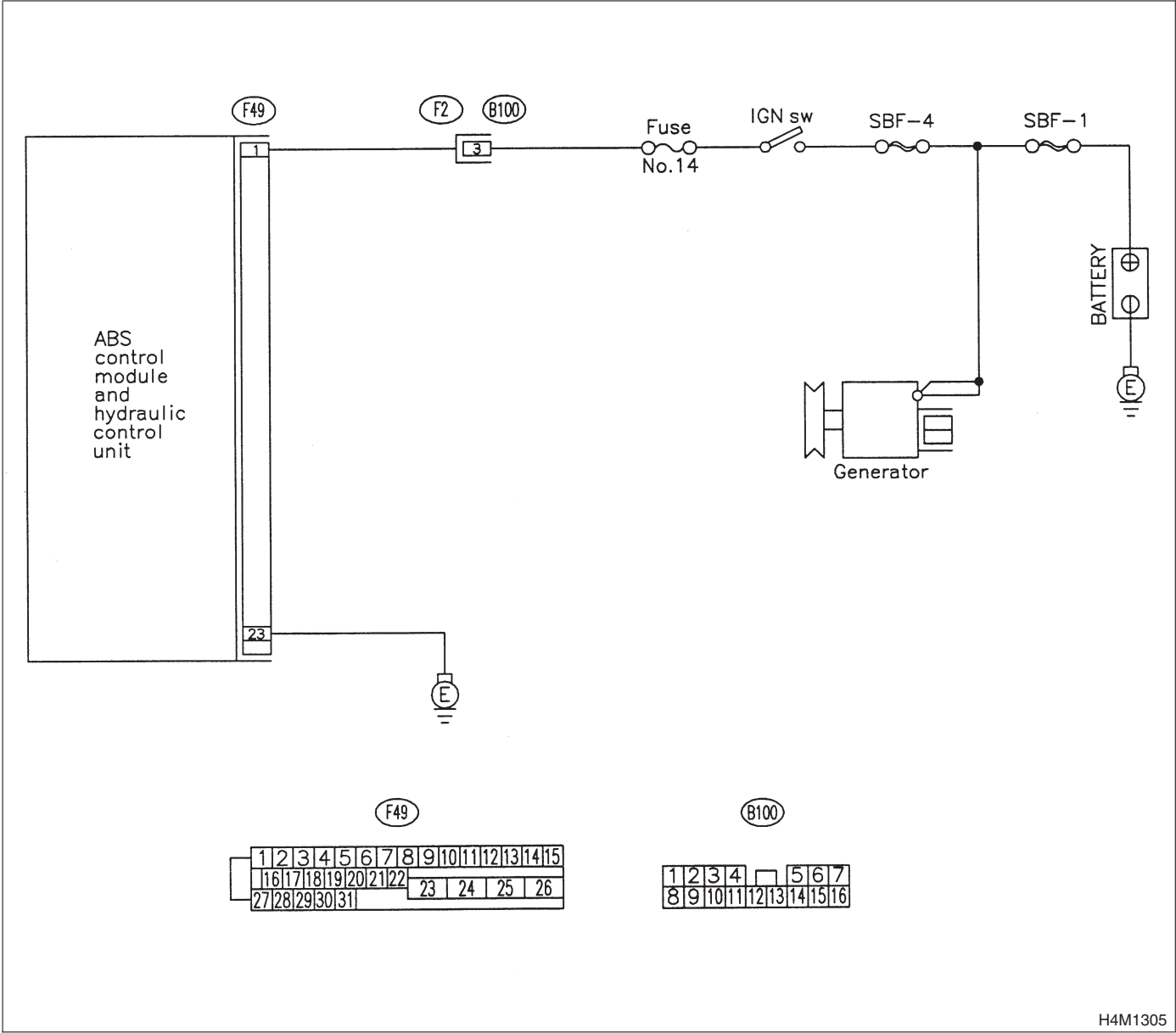
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1305

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK GENERATOR. 1) Start engine. 2) Idling after warm-up. 3) Measure voltage between generator B terminal and chassis ground. <i>Terminal</i> Generator B terminal — Chassis ground:	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair generator.
2	CHECK BATTERY TERMINAL. Turn ignition switch to OFF.	Are the positive and negative battery terminals tightly clamped?	Go to step 3.	Tighten the clamp of terminal.
3	CHECK INPUT VOLTAGE OF ABSCM&H/U. 1) Disconnect connector from ABSCM&H/U. 2) Run the engine at idle. 3) Measure voltage between ABSCM&H/U connector and chassis ground. <i>Connector & terminal</i> (F49) No. 1 (+) — Chassis ground (-):	Is the voltage between 10 V and 15 V?	Go to step 4.	Repair harness connector between battery, ignition switch and ABSCM&H/U.
4	CHECK GROUND CIRCUIT OF ABSCM&H/U. 1) Turn ignition switch to OFF. 2) Measure resistance between ABSCM&H/U connector and chassis ground. <i>Connector & terminal</i> (F49) No. 23 — Chassis ground:	Is the resistance less than 0.5 Ω ?	Go to step 5.	Repair ABSCM&H/U ground harness.
5	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 6.
6	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 7.
7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

V: TROUBLE CODE 42
— POWER SUPPLY VOLTAGE TOO HIGH —

S006583D35

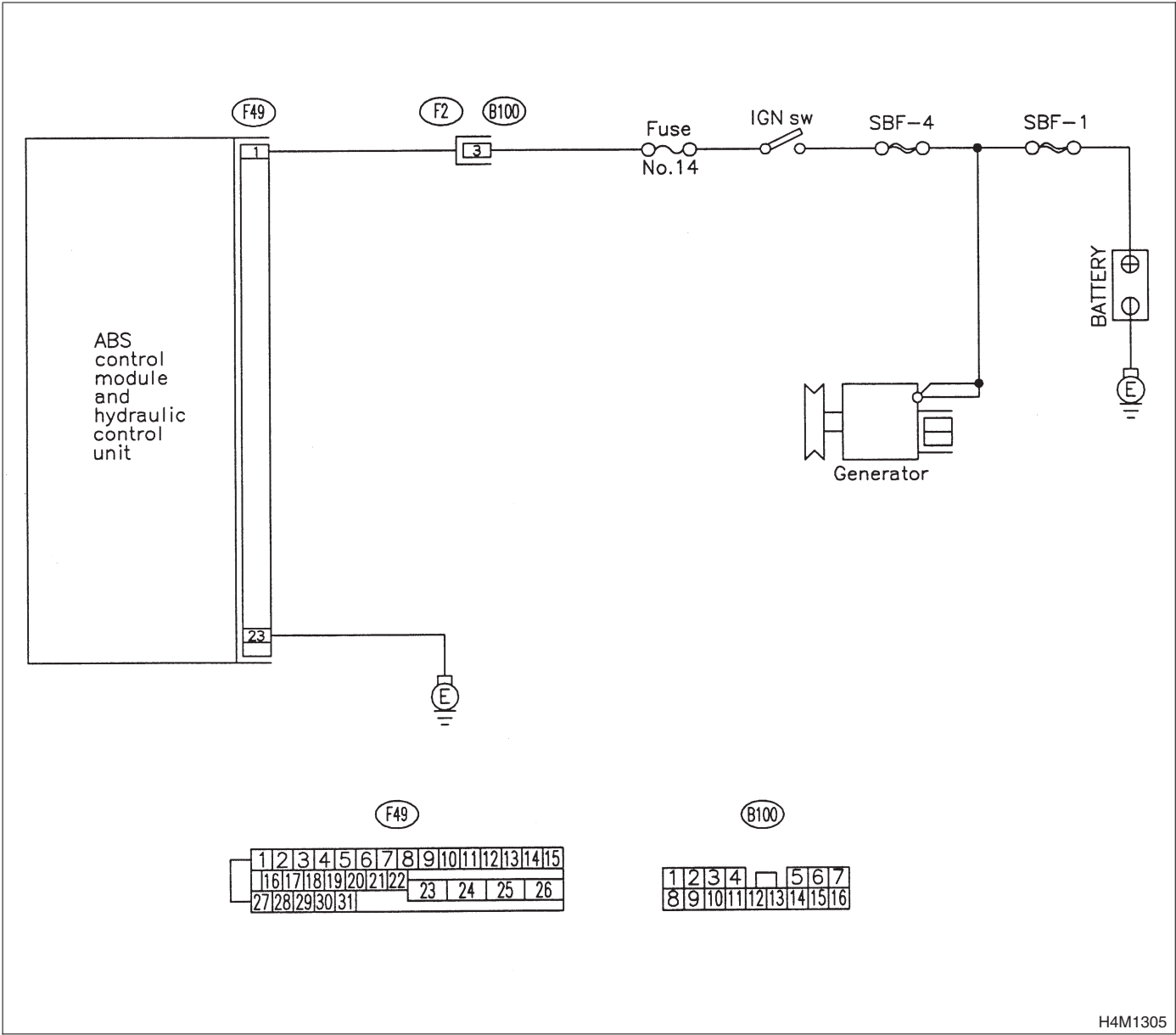
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1305

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK GENERATOR. 1) Start engine. 2) Idling after warm-up. 3) Measure voltage between generator B terminal and chassis ground. <i>Terminal</i> Generator B terminal — Chassis ground:	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair generator.
2	CHECK BATTERY TERMINAL. Turn ignition switch to OFF.	Are the positive and negative battery terminals tightly clamped?	Go to step 3.	Tighten the clamp of terminal.
3	CHECK INPUT VOLTAGE OF ABSCM&H/U. 1) Disconnect connector from ABSCM&H/U. 2) Run the engine at idle. 3) Measure voltage between ABSCM&H/U connector and chassis ground. <i>Connector & terminal</i> (F49) No. 1 (+) — Chassis ground (-):	Is the voltage between 10 V and 15 V?	Go to step 4.	Repair harness connector between battery, ignition switch and ABSCM&H/U.
4	CHECK GROUND CIRCUIT OF ABSCM&H/U. 1) Turn ignition switch to OFF. 2) Measure resistance between ABSCM&H/U connector and chassis ground. <i>Connector & terminal</i> (F49) No. 23 — Chassis ground:	Is the resistance less than 0.5 Ω ?	Go to step 5.	Repair ABSCM&H/U ground harness.
5	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 6.
6	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 7.
7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

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

S006583E79

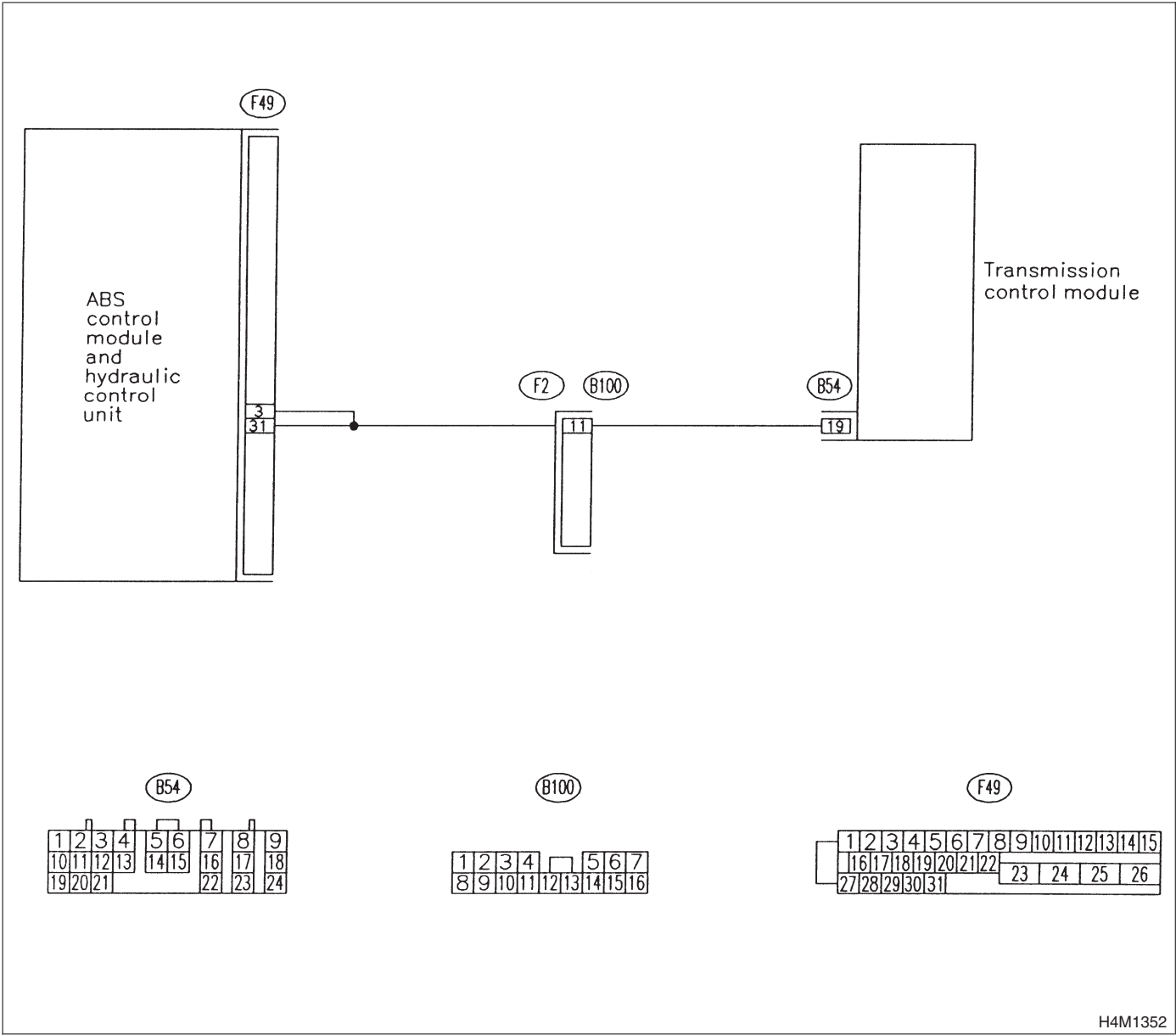
DIAGNOSIS:

- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

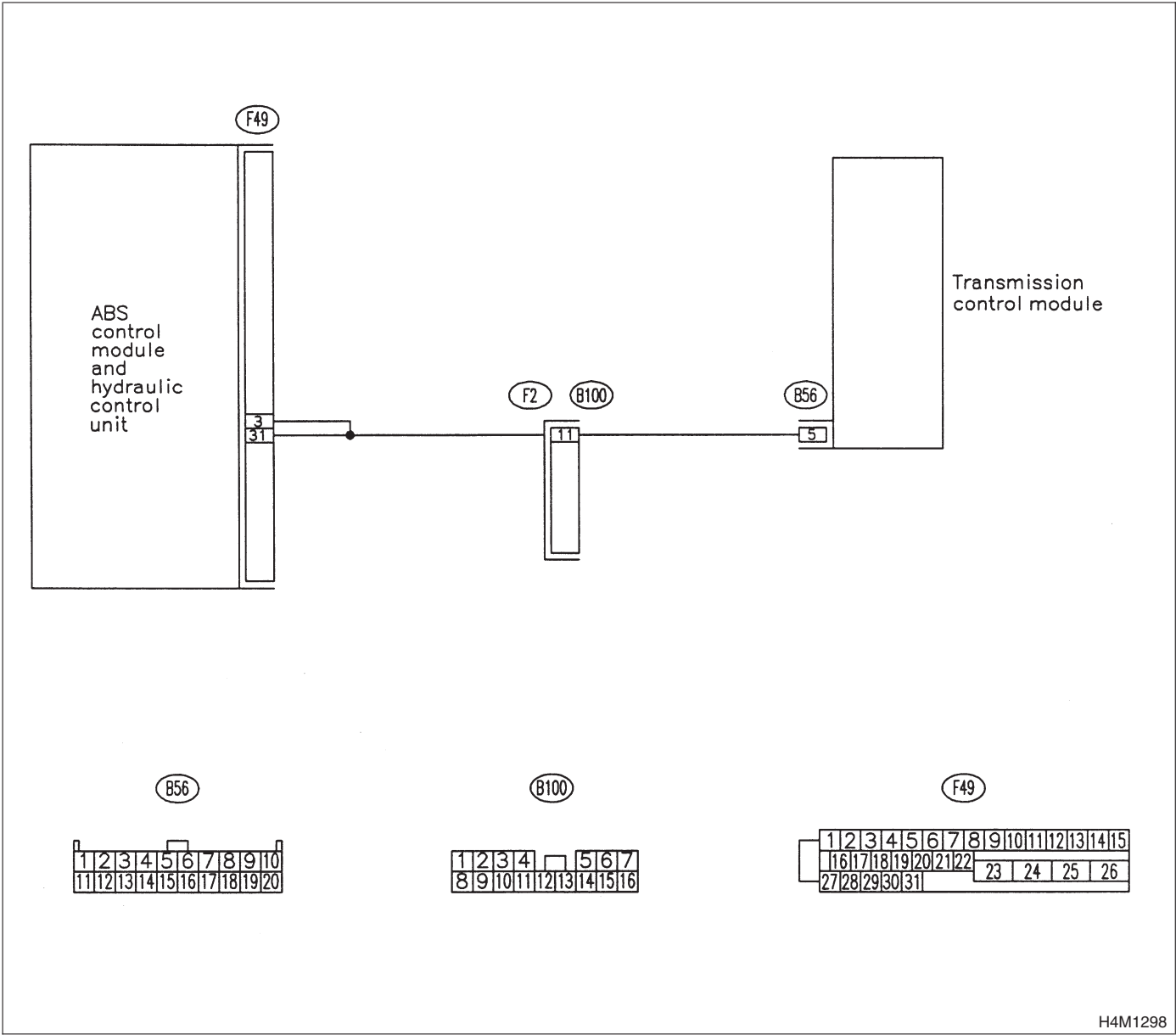
ABS

No.	Step	Check	Yes	No
1	CHECK SPECIFICATIONS OF THE ABSCM&H/U. Check specifications of the mark to the ABSCM&H/U. <i>Mark: C5</i> <i>Model</i> <i>AWD AT</i> <i>Mark: C6</i> <i>Model</i> <i>AWD MT</i>	Is an ABSCM&H/U for AT model installed on a MT model?	Replace ABSCM&H/U.	Go to step 2.
2	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. <i>Connector & terminal</i> <i>(F49) No. 3 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Go to step 3.	Repair harness between TCM and ABSCM&H/U.
3	CHECK TCM. 1) Connect all connectors to TCM. 2) Turn ignition switch to ON. 3) Measure voltage between TCM connector terminal and chassis ground. <i>Connector & terminal</i> <i>(B54) No. 19 (+) — Chassis ground (-):</i>	Is the voltage between 10 V and 15 V?	Go to step 5.	Go to step 4.
4	CHECK AT.	Is the AT functioning normally?	Replace TCM.	Repair AT.
5	CHECK OPEN CIRCUIT OF HARNESS. Measure voltage between ABSCM&H/U connector and chassis ground. <i>Connector & terminal</i> <i>(F49) No. 3 (+) — Chassis ground (-):</i> <i>(F49) No. 31 (+) — Chassis ground (-):</i>	Is the voltage between 5.5 V and 15 V?	Go to step 6.	Repair harness/connector between TCM and ABSCM&H/U.
6	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between TCM and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 7.
7	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 8.
8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

X: TROUBLE CODE 44
— ABS-AT CONTROL (CONTROLLED) — S006583E80

- DIAGNOSIS:**
- Combination of AT control faults
- TROUBLE SYMPTOM:**
- ABS does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect two connectors from TCM. 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 (-):	Is the voltage less than 1 V?	Go to step 2.	Repair harness between TCM and ABSCM&H/U.
2	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 (-):	Is the voltage less than 1 V?	Go to step 3.	Repair harness between TCM and ABSCM&H/U.
3	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 (-):	Is the voltage between 5.5 V and 15 V?	Go to step 4.	Repair harness/connector between TCM and ABSCM&H/U.
4	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connectors between TCM and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 5.
5	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 6.
6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

Y: TROUBLE CODE 51

— VALVE RELAY MALFUNCTION —

S006583E81

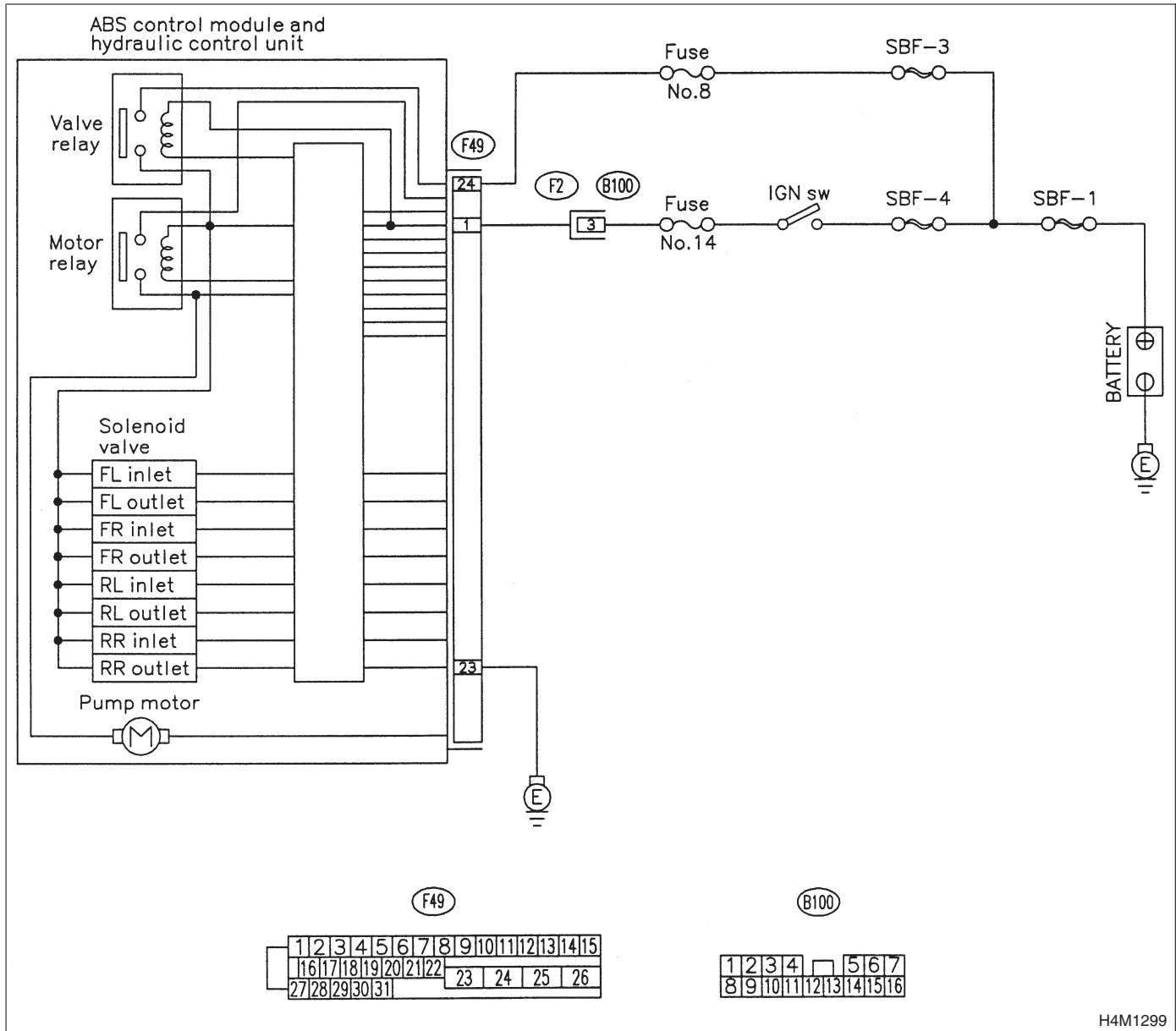
DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1299

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair harness connector between battery and ABSCM&H/U.
2	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:	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair ABSCM&H/U ground harness.
3	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 4.
4	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 5.
5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

Z: TROUBLE CODE 51

— VALVE RELAY ON FAILURE —

S006583D63

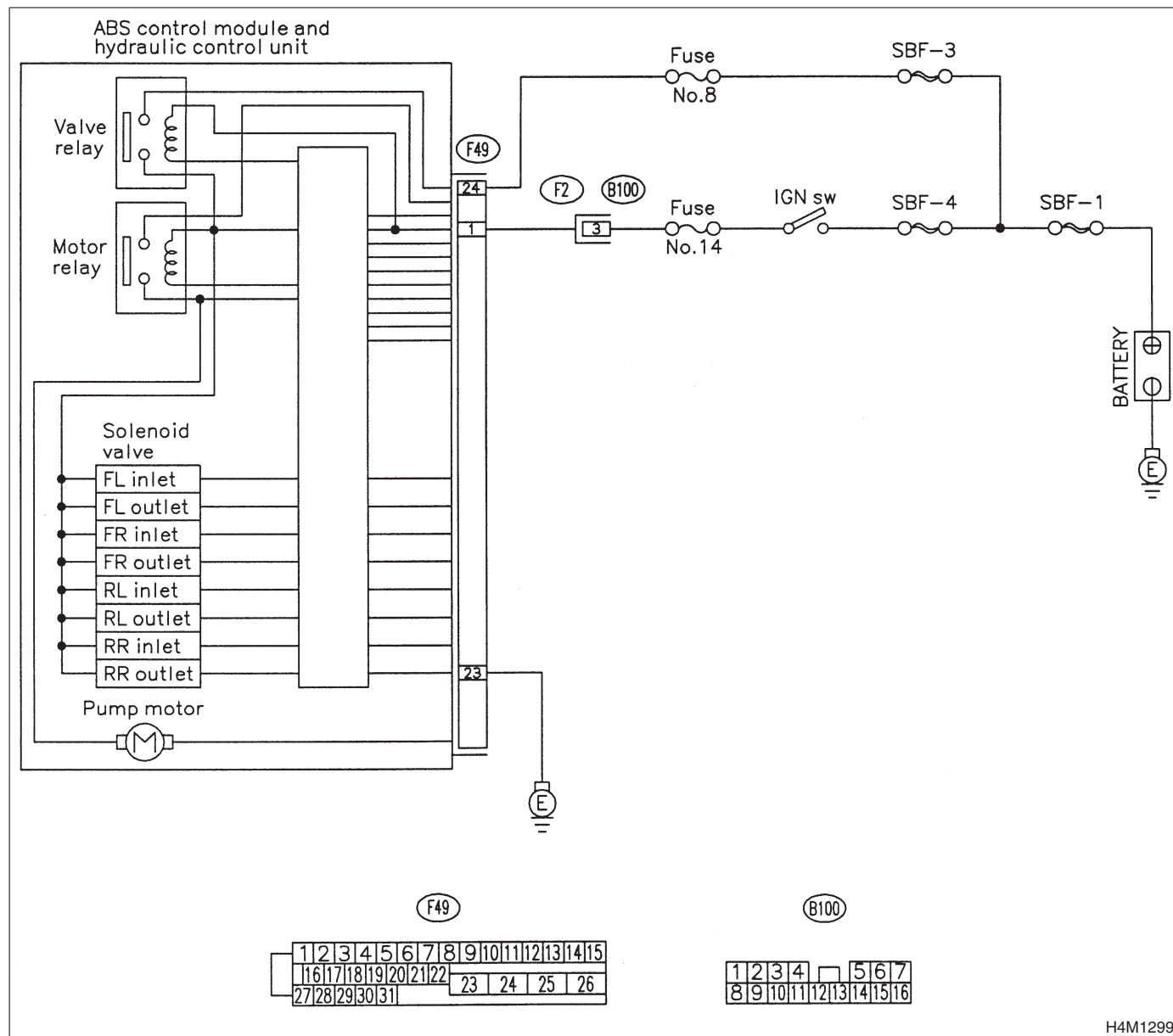
DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1299

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK VALVE RELAY IN ABSCM&H/U. Measure resistance between ABSCM&H/U terminals. Terminals No. 23 (+) — No. 24 (–):	Is the resistance more than 1 MΩ?	Go to step 2.	Replace ABSCM&H/U.
2	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 3.
3	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 4.
4	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

AA: TROUBLE CODE 52

— OPEN CIRCUIT IN MOTOR RELAY CIRCUIT —

S006583E82

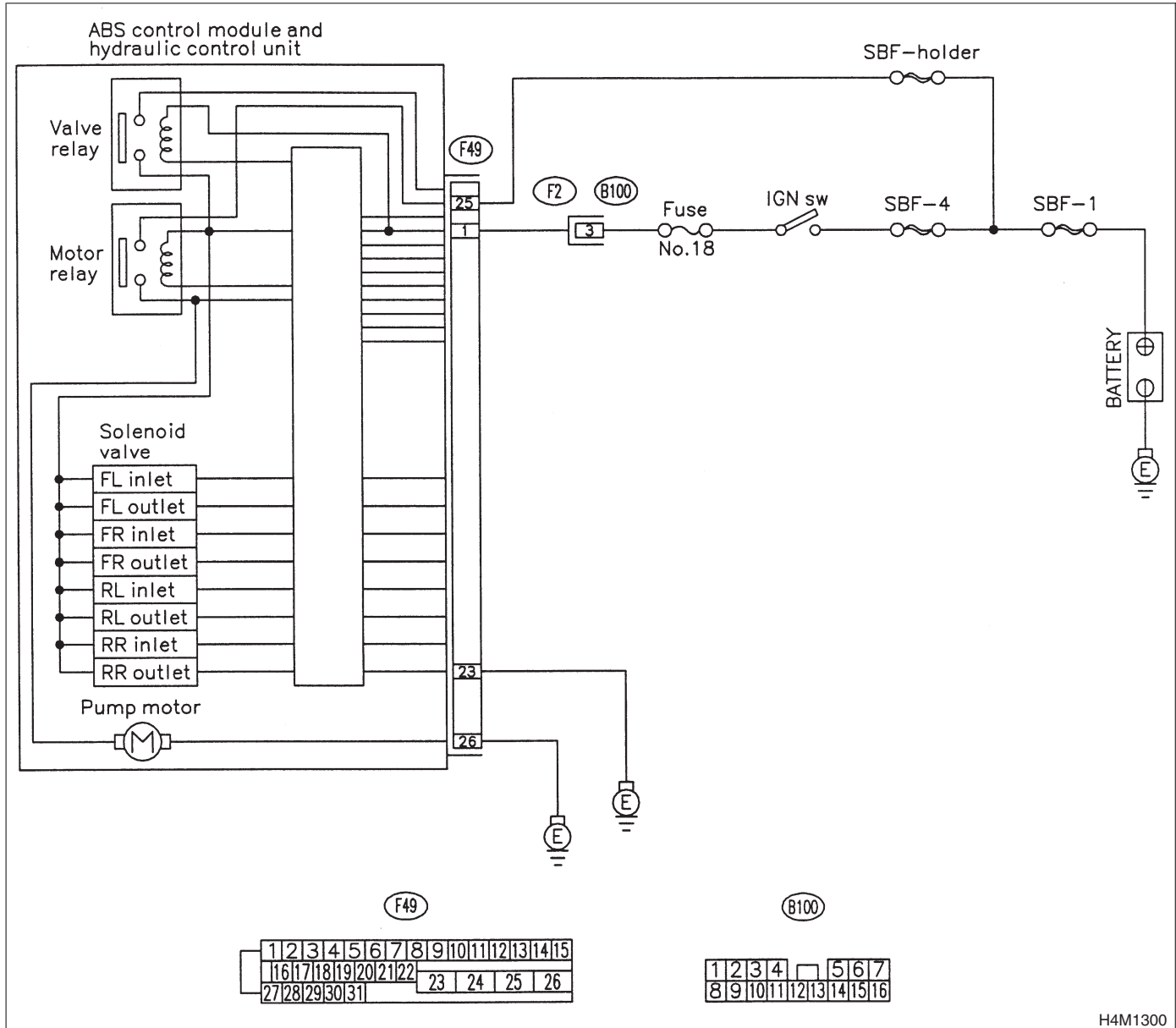
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1300

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair harness/connector between battery and ABSCM&H/U and check fuse SBF-holder.
2	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:	Is the resistance less than 0.5 Ω ?	Go to step 3.	Repair ABSCM&H/U ground harness.
3	CHECK MOTOR OPERATION. Operate the sequence control. <Ref. to ABS-10 OPERATION, ABS Sequence Control.> NOTE: Use the diagnosis connector to operate the sequence control.	Can motor revolution noise (buzz) be heard when carrying out the check sequence?	Go to step 4.	Replace ABSCM&H/U.
4	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connector between hydraulic unit, relay box and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 5.
5	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 6.
6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

AB: TROUBLE CODE 52

— MOTOR RELAY ON FAILURE —

S006583E83

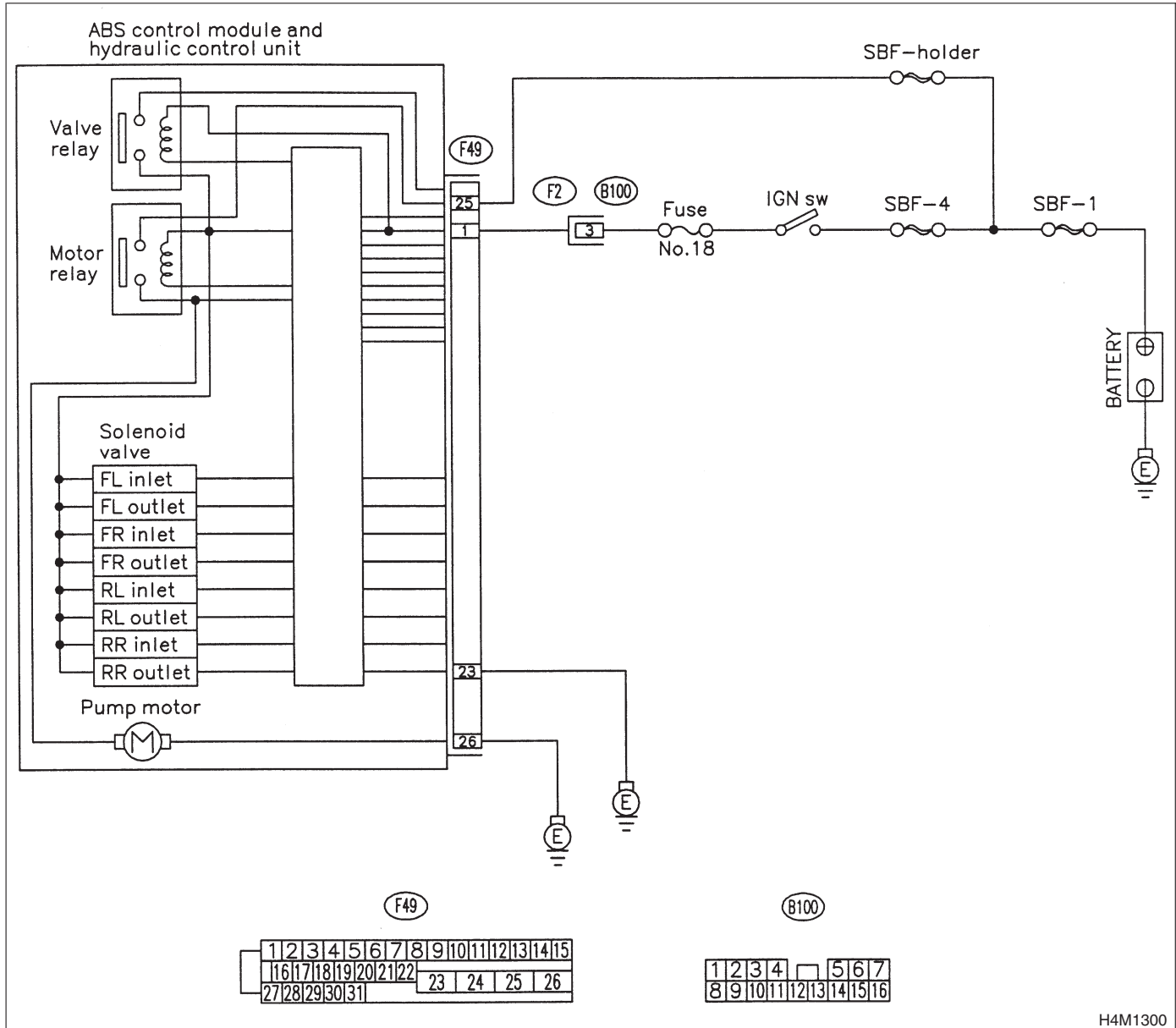
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK MOTOR RELAY IN ABSCM&H/U. Measure resistance between ABSCM&H/U terminals. Terminals No. 25 — No. 26:	Is the resistance more than 1 MΩ?	Go to step 2.	Replace ABSCM&H/U.
2	CHECK MOTOR OPERATION. Operate the sequence control. <Ref. to ABS-10 OPERATION, ABS Sequence Control.> NOTE: Use the diagnosis connector to operate the sequence control.	Can motor revolution noise (buzz) be heard when carrying out the sequence control?	Go to step 3.	Replace ABSCM&H/U.
3	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connector between hydraulic unit, relay box and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 4.
4	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 5.
5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

AC: TROUBLE CODE 52 — MOTOR MALFUNCTION —

S006583D68

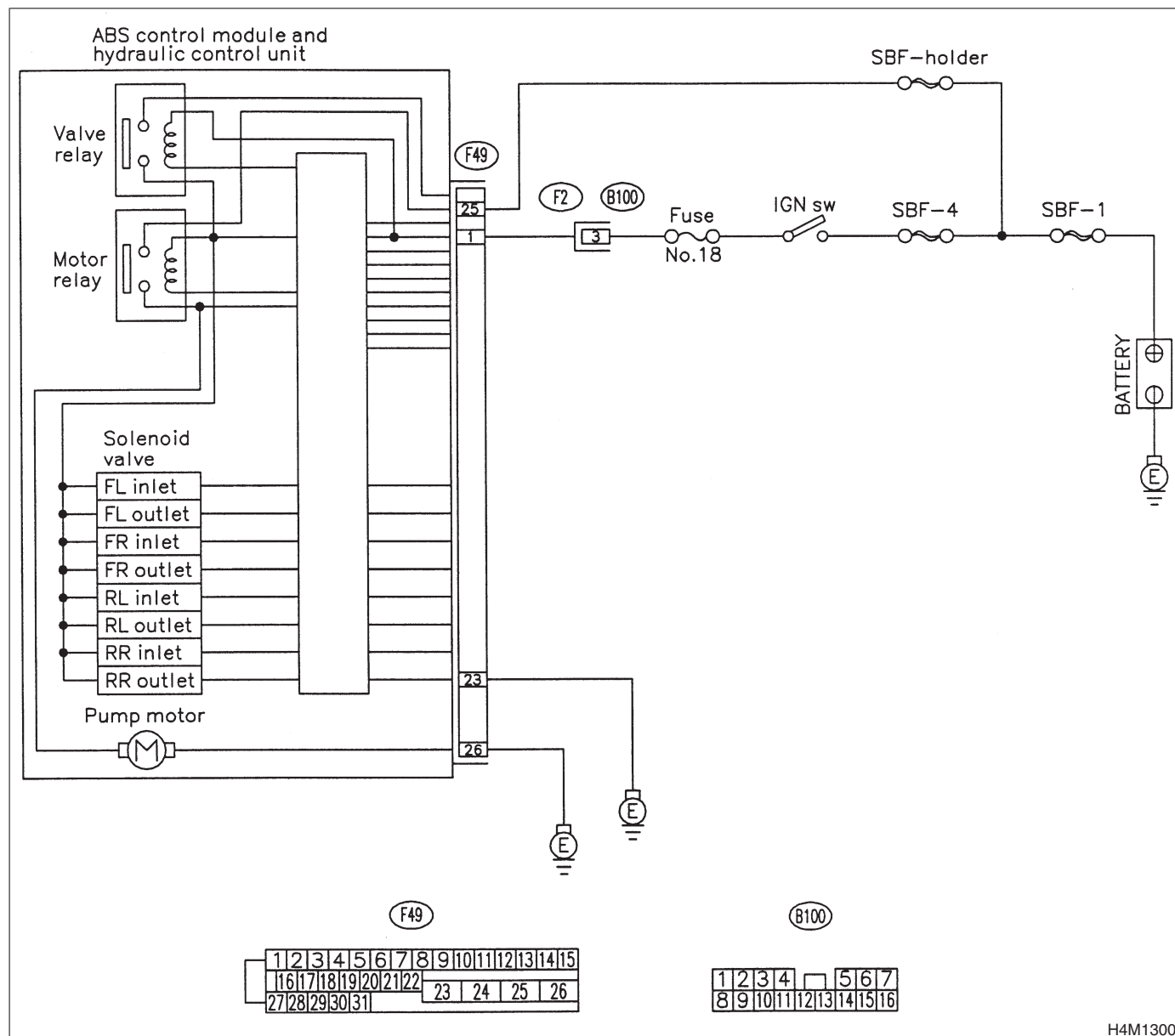
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 2.	Repair harness/connector between battery and ABSCM&H/U and check fuse SBF-holder.
2	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:	Is the resistance less than 0.5 Ω?	Go to step 3.	Repair ABSCM&H/U ground harness.
3	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 (-):	Is the voltage between 10 V and 15 V?	Go to step 4.	Repair harness connector between battery, ignition switch and ABSCM&H/U.
4	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:	Is the resistance less than 0.5 Ω?	Go to step 5.	Repair ABSCM&H/U ground harness.
5	CHECK MOTOR OPERATION. Operate the sequence control. <Ref. to ABS-10 OPERATION, ABS Sequence Control.> NOTE: Use the diagnosis connector to operate the sequence control.	Can motor revolution noise (buzz) be heard when carrying out the sequence control?	Go to step 6.	Replace hydraulic unit.
6	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connector between generator, battery and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 7.
7	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 8.
8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

AD: TROUBLE CODE 54 — STOP LIGHT SWITCH SIGNAL CIRCUIT MALFUNCTION —

S006583E84

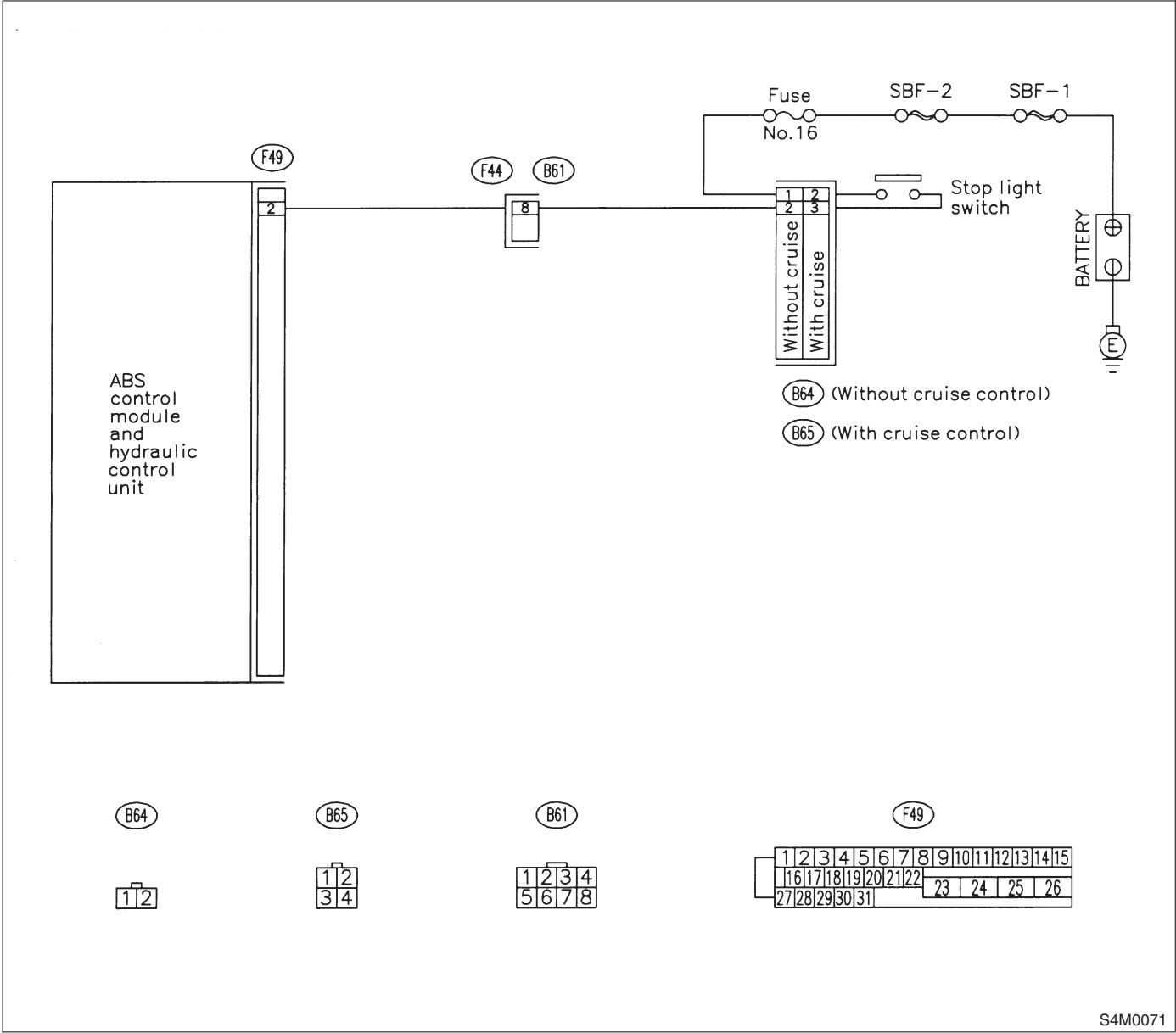
DIAGNOSIS:

- Faulty stop light switch

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR. 1) Select "Current data display & Save" on the select monitor. 2) Release the brake pedal. 3) Read the stop light switch output in the select monitor data display.	Is the reading indicated on monitor display less than 1.5 V?	Go to step 2.	Go to step 3.
2	CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR. 1) Depress the brake pedal. 2) Read the stop light switch output in the select monitor data display.	Is the reading indicated on monitor display between 10 V and 15 V?	Go to step 5.	Go to step 3.
3	CHECK IF STOP LIGHTS COME ON. Depress the brake pedal.	Do stop lights turn on?	Go to step 4.	Repair stop lights circuit.
4	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:	Is the voltage between 10 V and 15 V?	Go to step 5.	Repair harness between stop light switch and ABSCM&H/U connector.
5	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connector between stop light switch and ABSCM&H/U? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 6.
6	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 7.
7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

AE: TROUBLE CODE 56 — OPEN OR SHORT CIRCUIT IN G SENSOR CIRCUIT —

S006583E85

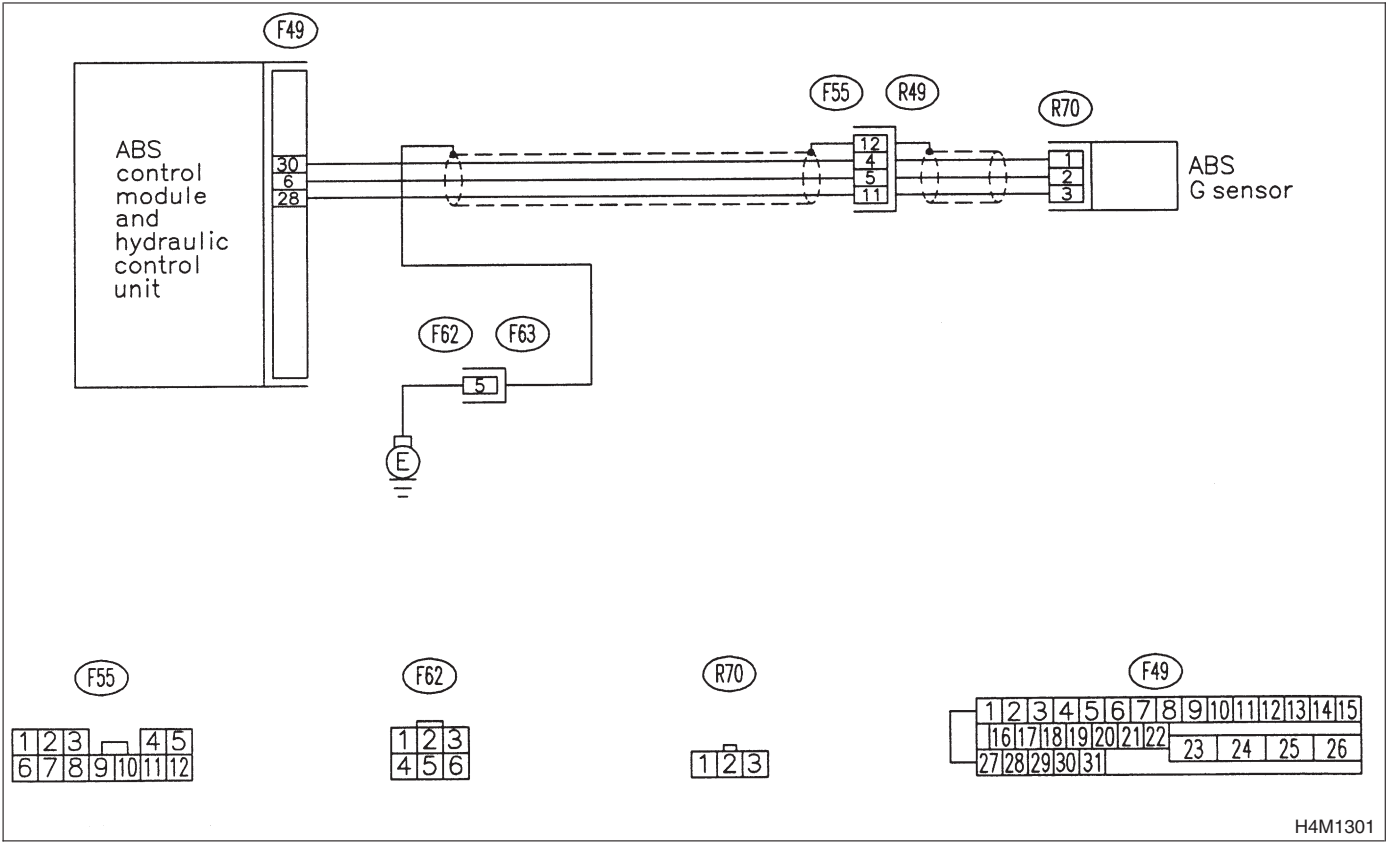
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1301

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR. 1) Select "Current data display & Save" on the select monitor. 2) Read the G sensor output in select monitor data display.	Is the G sensor output on the monitor display between 2.1 and 2.5 V when the G sensor is in horizontal position?	Go to step 2.	Go to step 5.
2	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 3.
3	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 4.
4	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.
5	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 (R70) No. 1 (+) — No. 3 (-):	Is the voltage between 4.75 and 5.25 V?	Go to step 6.	Repair harness/connector between G sensor and ABSCM&H/U.
6	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. 6 — No. 28:	Is the resistance between 4.3 and 4.9 kΩ?	Go to step 7.	Repair harness/connector between G sensor and ABSCM&H/U.
7	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:	Is the resistance more than 1 MΩ?	Go to step 8.	Repair harness between G sensor and ABSCM&H/U.
8	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 (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?	Go to step 9.	Replace G sensor.
9	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?	Go to step 10.	Replace G sensor.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
10	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?	Go to step 11.	Replace G sensor.
11	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 12.
12	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 13.
13	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

MEMO:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

AF: TROUBLE CODE 56 — BATTERY SHORT IN G SENSOR CIRCUIT —

S006583E86

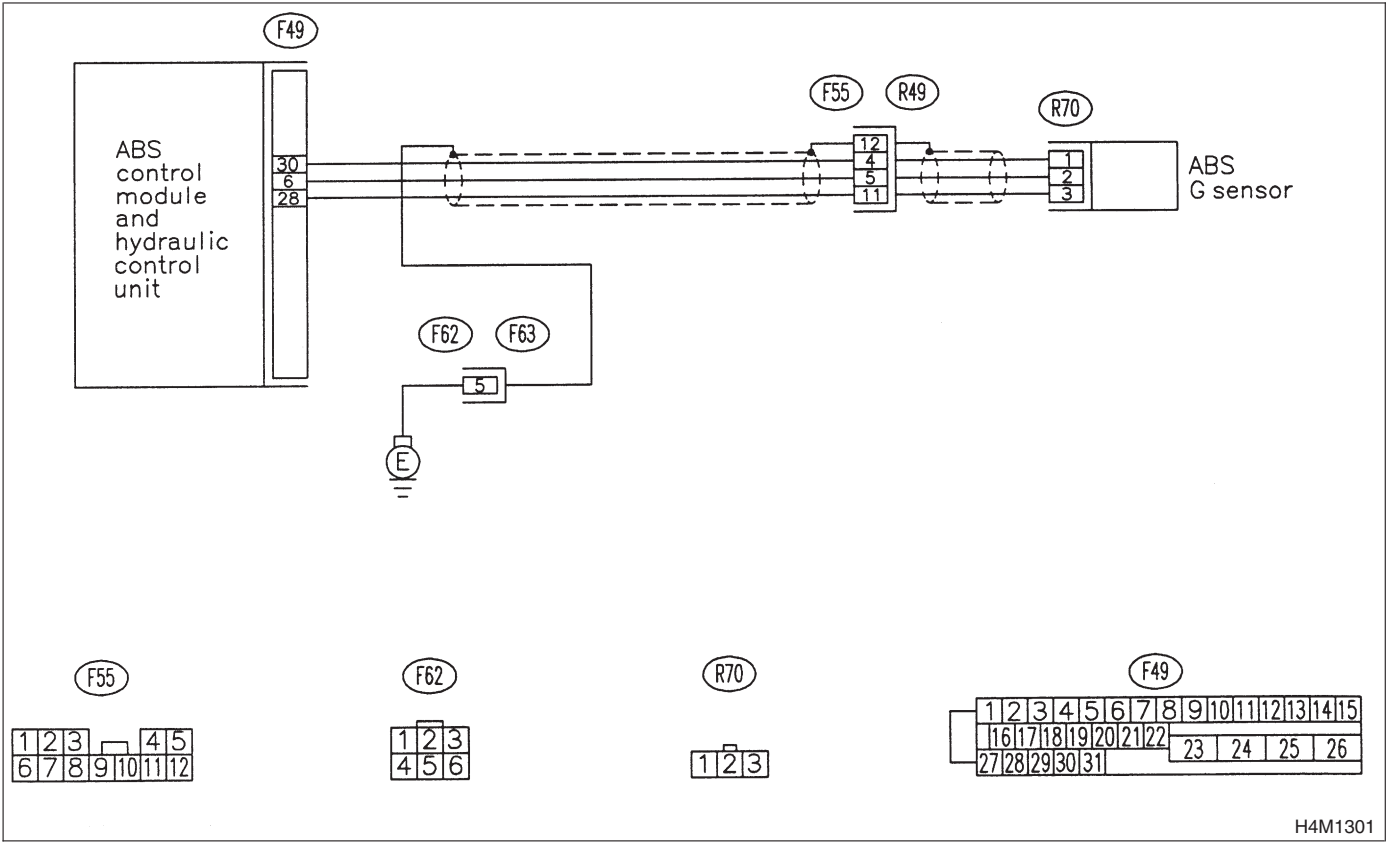
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1301

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR. 1) Select "Current data display & Save" on the select monitor. 2) Read the G sensor output in select monitor data display.	Is the G sensor output on the monitor display between 2.1 and 2.5 V when the G sensor is in horizontal position?	Go to step 2.	Go to step 5.
2	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 3.
3	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 4.
4	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.
5	CHECK FREEZE FRAME DATA. 1) Select "Freeze frame data" on the select monitor. 2) Read front right wheel speed on the select monitor display.	Is the front right wheel speed on monitor display 0 km?	Go to step 6.	Go to step 14.
6	CHECK FREEZE FRAME DATA. Read front left wheel speed on the select monitor display.	Is the front left wheel speed on monitor display 0 km?	Go to step 7.	Go to step 14.
7	CHECK FREEZE FRAME DATA. Read rear right wheel speed on the select monitor display.	Is the rear right wheel speed on monitor display 0 km?	Go to step 8.	Go to step 15.
8	CHECK FREEZE FRAME DATA. Read rear left wheel speed on the select monitor display.	Is the rear left wheel speed on monitor display 0 km?	Go to step 9.	Go to step 14.
9	CHECK FREEZE FRAME DATA. Read G sensor output on the select monitor display.	Is the G sensor output on monitor display more than 3.65 V?	Go to step 10.	Go to step 14.
10	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. 6 — No. 28:	Is the resistance between 4.3 and 4.9 kΩ?	Go to step 11.	Repair harness/connector between G sensor and ABSCM&H/U.
11	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 12.
12	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 13.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
13	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.
14	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 (R70) No. 1 (+) — No. 3 (-):	Is the voltage between 4.75 and 5.25 V?	Go to step 15.	Repair harness/connector between G sensor and ABSCM&H/U.
15	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. 6 — No. 28:	Is the resistance between 4.3 and 4.9 kΩ?	Go to step 16.	Repair harness/connector between G sensor and ABSCM&H/U.
16	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 (-):	Is the voltage less than 1 V?	Go to step 17.	Repair harness between G sensor and ABSCM&H/U.
17	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 (-):	Is the voltage less than 1 V?	Go to step 18.	Repair harness between G sensor and ABSCM&H/U.
18	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 (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?	Go to step 19.	Replace G sensor.
19	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?	Go to step 20.	Replace G sensor.
20	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?	Go to step 21.	Replace G sensor.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
21	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 22.
22	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 23.
23	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

AG: TROUBLE CODE 56

— ABNORMAL G SENSOR HIGH μ OUTPUT — S006583E87

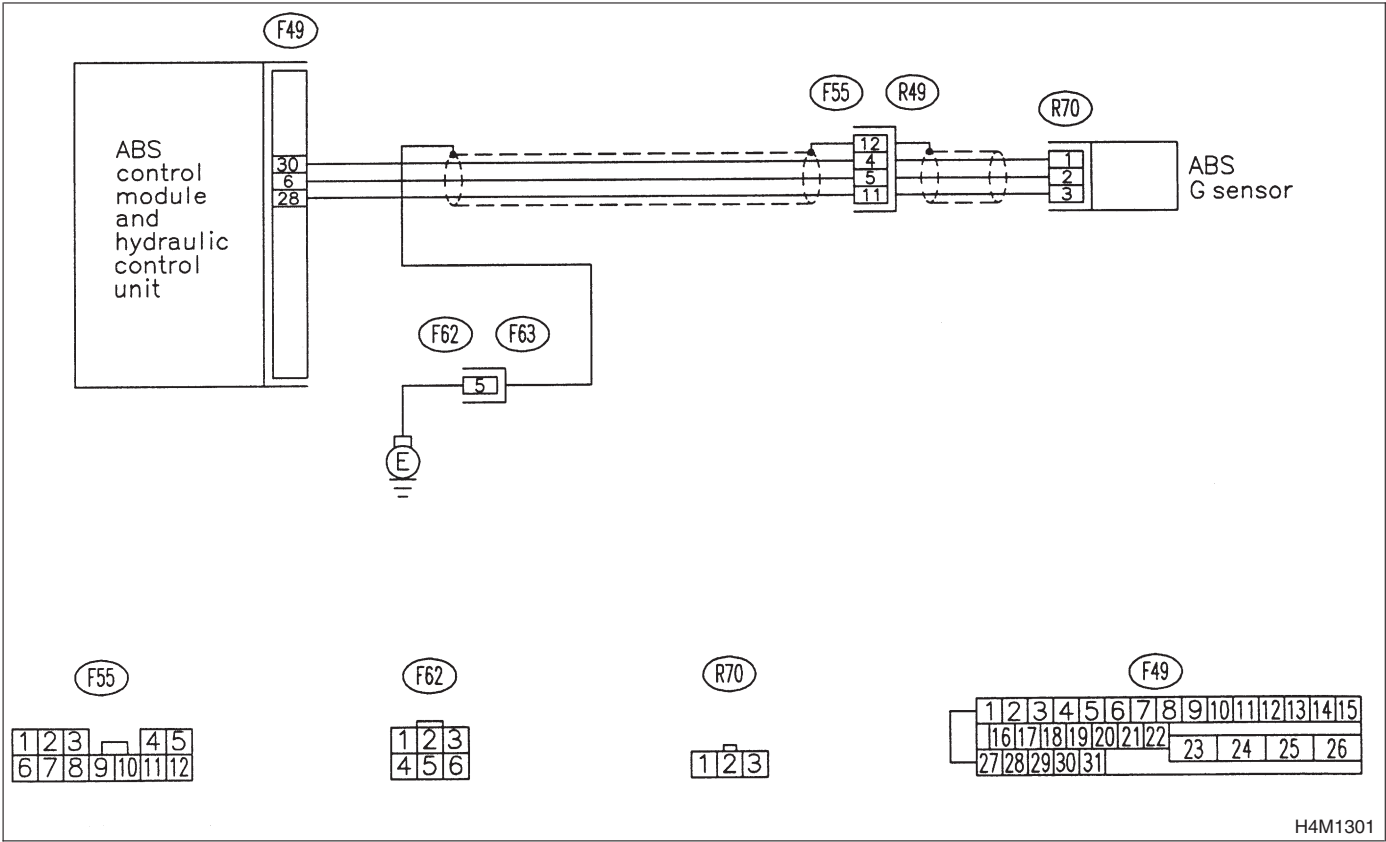
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1301

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR. 1) Select "Current data display & Save" on the select monitor. 2) Read G sensor output on the select monitor display.	Is the G sensor output on monitor display 2.1 and 2.5 V when the G sensor is in horizontal position?	Go to step 2.	Go to step 5.
2	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 3.
3	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 4.
4	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.
5	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. 6 — No. 28:	Is the resistance between 4.3 and 4.9 kΩ?	Go to step 6.	Repair harness/connector between G sensor and ABSCM&H/U.
6	CHECK GROUND SHORT OF HARNESS. Measure resistance between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 28 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 7.	Repair harness between G sensor and ABSCM&H/U.
7	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 (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?	Go to step 8.	Replace G sensor.
8	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?	Go to step 9.	Replace G sensor.
9	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 3 (-):	Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?	Go to step 10.	Replace G sensor.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
10	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.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 11.
11	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

MEMO:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

AH: TROUBLE CODE 56 — DETECTION OF G SENSOR STICK —

S006583E88

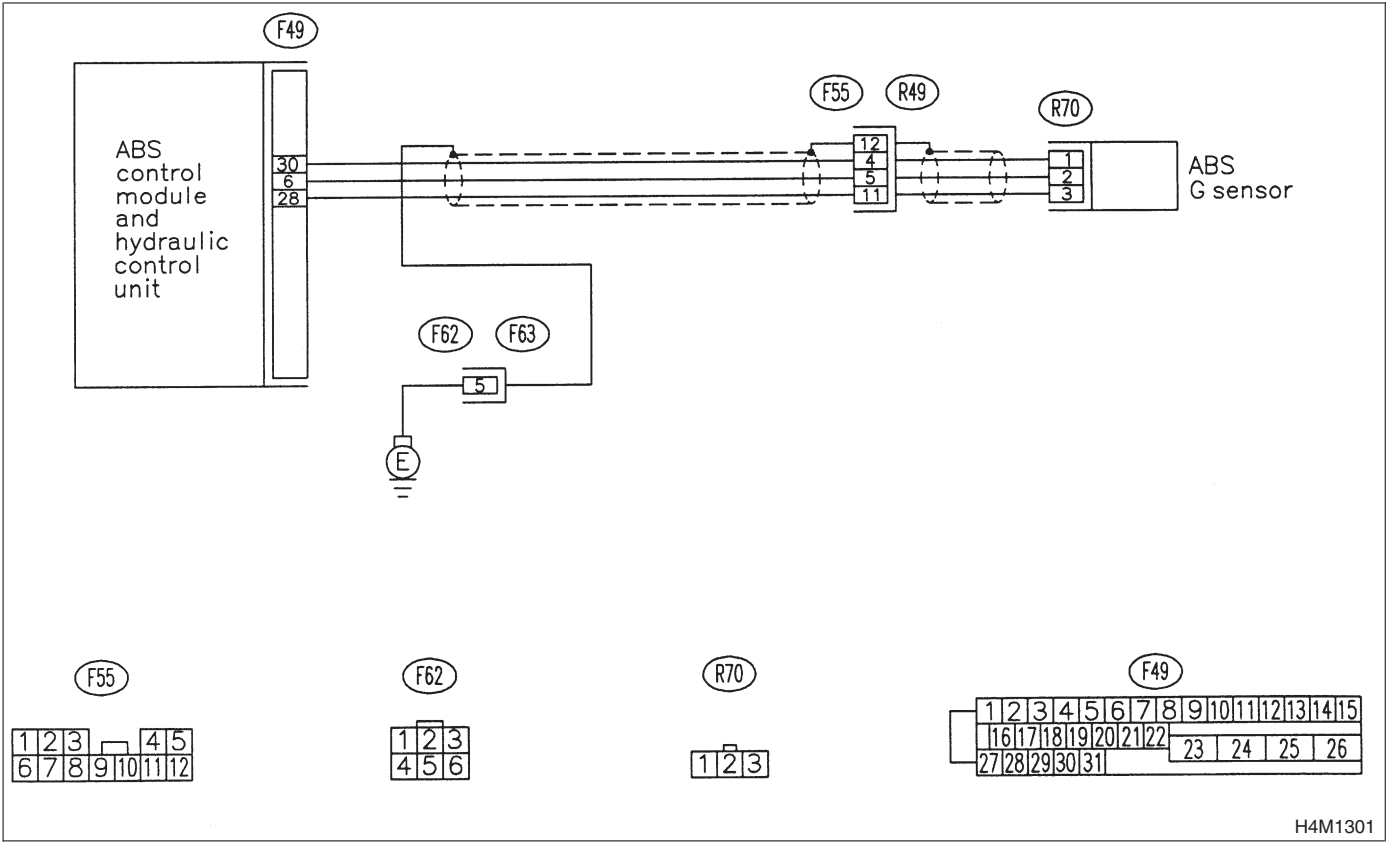
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1301

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
1	CHECK ALL FOUR WHEELS FOR FREE TURNING.	Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?	The ABS is normal. Erase the trouble code.	Go to step 2.
2	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR. 1) Select "Current data display & Save" on the select monitor. 2) Read the select monitor display.	Is the G sensor output on the monitor display between 2.1 and 2.5 V when the vehicle is in horizontal position?	Go to step 3.	Go to step 8.
3	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) Select "Current data display & Save" on the select monitor. 6) Read the select monitor display.	Is the G sensor output on the monitor display between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?	Go to step 4.	Replace G sensor.
4	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR. Read the select monitor display.	Is the G sensor output on the monitor display between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?	Go to step 5.	Replace G sensor.
5	CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF.	Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to EN-6 CAUTION, General Description.>	Repair connector.	Go to step 6.
6	CHECK ABSCM&H/U. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 7.
7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.
8	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. 6 — No. 28:	Is the resistance between 4.3 and 4.9 kΩ?	Go to step 9.	Repair harness/connector between G sensor and ABSCM&H/U.
9	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 (R70) No. 2 (+) — No. 1 (-):	Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?	Go to step 10.	Replace G sensor.

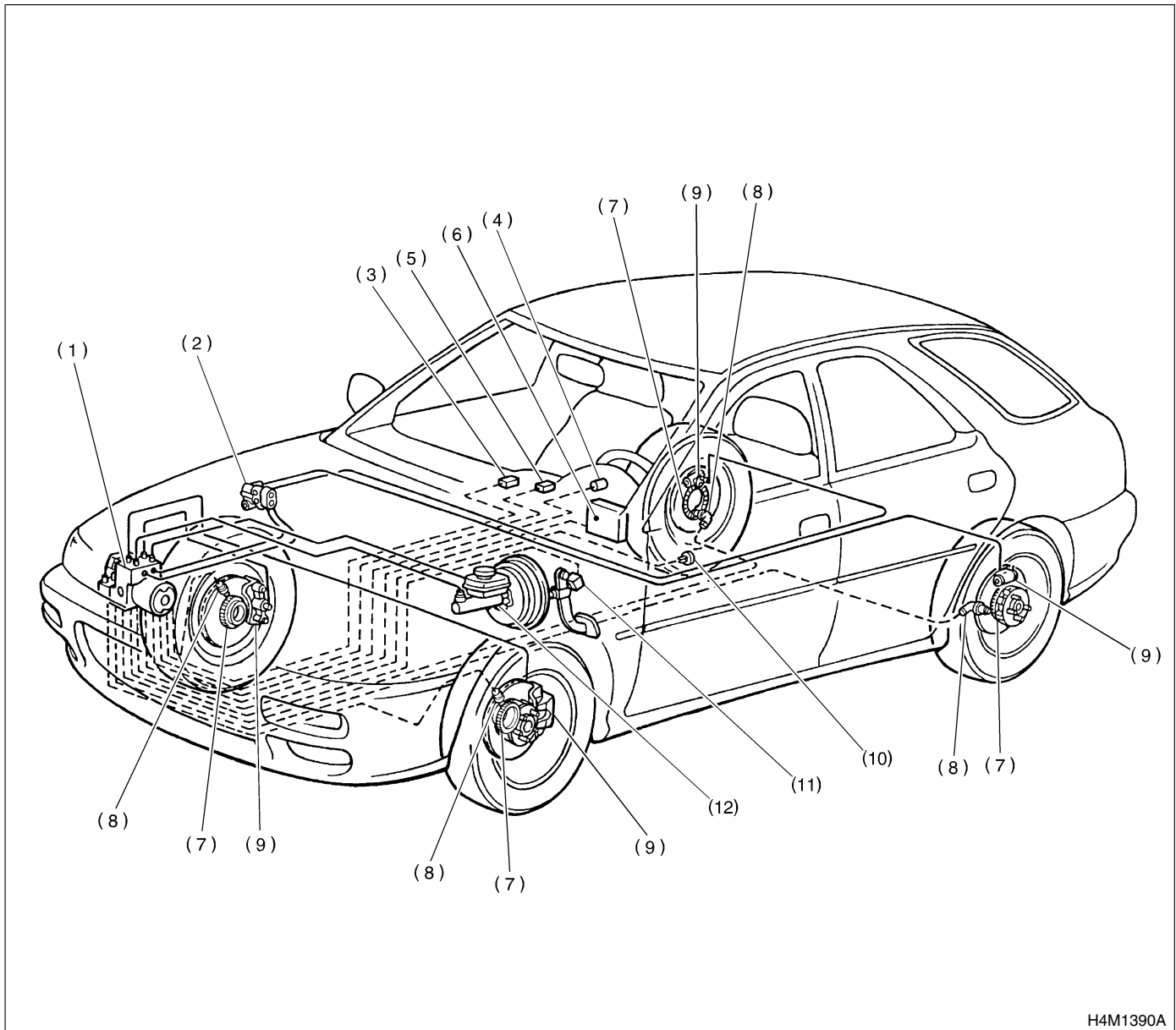
DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS

No.	Step	Check	Yes	No
10	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 1 (-):	Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?	Go to step 11.	Replace G sensor.
11	CHECK G SENSOR. Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 2 (+) — No. 1 (-):	Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?	Go to step 12.	Replace G sensor.
12	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.	Is the same trouble code as in the current diagnosis still being output?	Replace ABSCM&H/U.	Go to step 13.
13	CHECK ANY OTHER TROUBLE CODES APPEARANCE.	Are other trouble codes being output?	Proceed with the diagnosis corresponding to the trouble code.	A temporary poor contact.

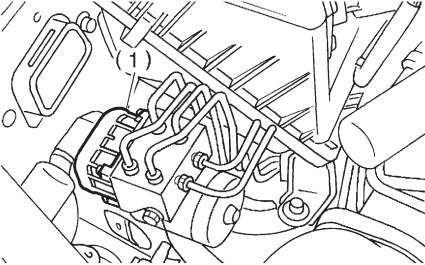
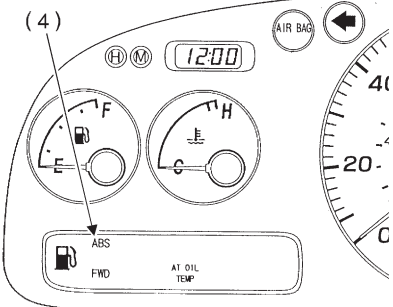
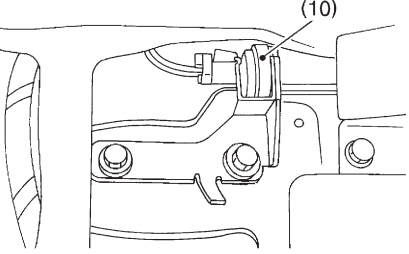
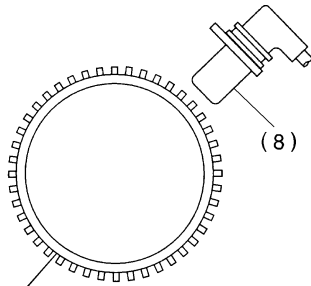
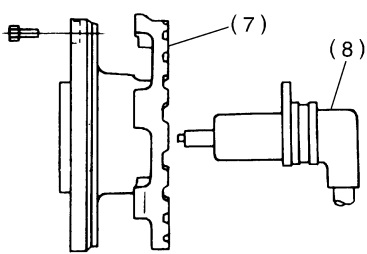
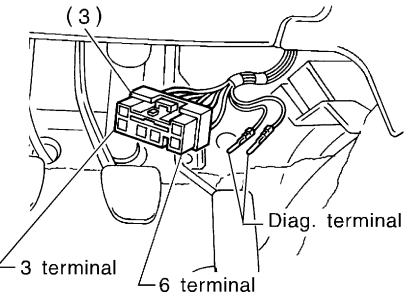
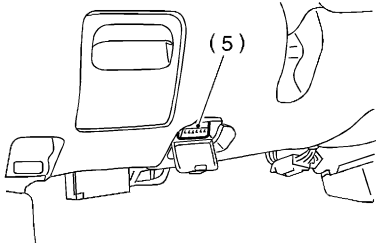
4. Electrical Components Location S006507

A: LOCATION S006507A13



H4M1390A

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

 B4M1226B	 H4M1304A	 S4M0055A
FRONT  B4M2201C	REAR  B4M0646G	 B4M0231E
 S4M0056A	SUBARU.	SUBARU.

3. General Description S006001

A: CAUTION S006001A03

1. SUPPLEMENTAL RESTRAINT SYSTEM

“AIRBAG” S006001A0301

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.

B: INSPECTION S006001A10

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

1. BATTERY S006001A1001

Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more

Specific gravity: Above 1.260

2. BRAKE FLUID S006001A1002

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

3. HYDRAULIC UNIT S006001A1006

Check the hydraulic unit.

- With brake tester <Ref. to ABS-7 INSPECTION, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>
- Without brake tester <Ref. to ABS-7 INSPECTION, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).>

4. BRAKE DRAG S006001A1003

Check brake drag. <Ref. to BR-44 INSPECTION, Brake Booster.>

5. BRAKE PAD AND ROTOR S006001A1004

Check brake pad <Ref. to BR-18 INSPECTION, Front Brake Pad.> and rotor. <Ref. to BR-20 INSPECTION, Front Disc Rotor.>

6. TIRE S006001A1005

Check tire specifications, tire wear <Ref. to WT-4 INSPECTION, Tire.> and air pressure. <Ref. to WT-2 SPECIFICATIONS, General Description.>

15. General Diagnostic Table S006257

A: INSPECTION S006257A10

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

GENERAL DIAGNOSTIC TABLE

ABS

MEMO:

9. Inspection Mode S006510

A: OPERATION S006510A16

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.

LIST OF DIAGNOSTIC TROUBLE CODE

ABS

12. List of Diagnostic Trouble Code S006511

A: LIST S006511A12

1. WITHOUT SUBARU SELECT MONITOR S006511A1201

Trouble code	Contents of diagnosis		Index No.
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	<Ref. to ABS-34 TROUBLE CODE 21 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (FRONT RH) —, Diagnostics Chart with Diagnosis Connector.>
23		Front left ABS sensor	<Ref. to ABS-34 TROUBLE CODE 23 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (FRONT LH) —, Diagnostics Chart with Diagnosis Connector.>
25		Rear right ABS sensor	<Ref. to ABS-34 TROUBLE CODE 25 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR RH) —, Diagnostics Chart with Diagnosis Connector.>
27		Rear left ABS sensor	<Ref. to ABS-34 TROUBLE CODE 27 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>
22	Abnormal ABS sensor (Abnormal ABS sensor signal)	Front right ABS sensor	<Ref. to ABS-40 TROUBLE CODE 22 — ABNORMAL ABS SENSOR (FRONT RH) —, Diagnostics Chart with Diagnosis Connector.>
24		Front left ABS sensor	<Ref. to ABS-40 TROUBLE CODE 24 — ABNORMAL ABS SENSOR (FRONT LH) —, Diagnostics Chart with Diagnosis Connector.>
26		Rear right ABS sensor	<Ref. to ABS-40 TROUBLE CODE 26 — ABNORMAL ABS SENSOR (REAR RH) —, Diagnostics Chart with Diagnosis Connector.>
28		Rear left ABS sensor	<Ref. to ABS-40 TROUBLE CODE 28 — ABNORMAL ABS SENSOR (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>
29		Any one of four	<Ref. to ABS-44 TROUBLE CODE 29 — ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —, Diagnostics Chart with Diagnosis Connector.>

LIST OF DIAGNOSTIC TROUBLE CODE

ABS

Trouble code	Contents of diagnosis		Index No.
31	Abnormal solenoid valve circuit(s) in ABS control module and hydraulic unit	Front right inlet valve	<Ref. to ABS-48 TROUBLE CODE 31 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT RH) —, Diagnostics Chart with Diagnosis Connector.>
32		Front right outlet valve	<Ref. to ABS-52 TROUBLE CODE 32 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT RH) —, Diagnostics Chart with Diagnosis Connector.>
33		Front left inlet valve	<Ref. to ABS-48 TROUBLE CODE 33 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT LH) —, Diagnostics Chart with Diagnosis Connector.>
34		Front left outlet valve	<Ref. to ABS-52 TROUBLE CODE 34 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (FRONT LH) —, Diagnostics Chart with Diagnosis Connector.>
35		Rear right inlet valve	<Ref. to ABS-48 TROUBLE CODE 35 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR RH) —, Diagnostics Chart with Diagnosis Connector.>
36		Rear right outlet valve	<Ref. to ABS-52 TROUBLE CODE 36 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR RH) —, Diagnostics Chart with Diagnosis Connector.>
37		Rear left inlet valve	<Ref. to ABS-48 TROUBLE CODE 37 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>
38		Rear left outlet valve	<Ref. to ABS-52 TROUBLE CODE 38 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>
41	Abnormal ABS control module		<Ref. to ABS-56 TROUBLE CODE 41 — ABNORMAL ABS CONTROL MODULE —, Diagnostics Chart with Diagnosis Connector.>
42	Source voltage is abnormal.		<Ref. to ABS-58 TROUBLE CODE 42 — SOURCE VOLTAGE IS ABNORMAL. —, Diagnostics Chart with Diagnosis Connector.>
44	A combination of AT control abnormal		<Ref. to ABS-60 TROUBLE CODE 44 — A COMBINATION OF AT CONTROL ABNORMAL —, Diagnostics Chart with Diagnosis Connector.>
51	Abnormal valve relay		<Ref. to ABS-64 TROUBLE CODE 51 — ABNORMAL VALVE RELAY —, Diagnostics Chart with Diagnosis Connector.>
52	Abnormal motor and/or motor relay		<Ref. to ABS-66 TROUBLE CODE 52 — ABNORMAL MOTOR AND/OR MOTOR RELAY —, Diagnostics Chart with Diagnosis Connector.>
54	Abnormal stop light switch		<Ref. to ABS-68 TROUBLE CODE 54 — ABNORMAL STOP LIGHT SWITCH —, Diagnostics Chart with Diagnosis Connector.>
56	Abnormal G sensor output voltage		<Ref. to ABS-70 TROUBLE CODE 56 — ABNORMAL G SENSOR OUTPUT VOLTAGE —, Diagnostics Chart with Diagnosis Connector.>

LIST OF DIAGNOSTIC TROUBLE CODE

ABS

2. WITH SUBARU SELECT MONITOR S006511A1202

Code	Display screen	Contents of diagnosis	Index No.
—	Communication for initializing impossible	Select monitor communication failure	<Ref. to ABS-76 COMMUNICATION FOR INITIALIZING IMPOSSIBLE, Diagnostics Chart with Subaru Select Monitor.>
—	No trouble code	Although no trouble code appears on the select monitor display, the ABS warning light remains on.	<Ref. to ABS-78 NO TROUBLE CODE, Diagnostics Chart with Subaru Select Monitor.>
21	Open or short circuit in front right ABS sensor circuit	Open or short circuit in front right ABS sensor circuit	<Ref. to ABS-80 TROUBLE CODE 21 — OPEN OR SHORT CIRCUIT IN FRONT RIGHT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
22	Front right ABS sensor abnormal signal	Front right ABS sensor abnormal signal	<Ref. to ABS-86 TROUBLE CODE 22 — FRONT RIGHT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>
23	Open or short circuit in front left ABS sensor circuit	Open or short circuit in front left ABS sensor circuit	<Ref. to ABS-80 TROUBLE CODE 23 — OPEN OR SHORT CIRCUIT IN FRONT LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
24	Front left ABS sensor abnormal signal	Front left ABS sensor abnormal signal	<Ref. to ABS-86 TROUBLE CODE 24 — FRONT LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>
25	Open or short circuit in rear right ABS sensor circuit	Open or short circuit in rear right ABS sensor circuit	<Ref. to ABS-80 TROUBLE CODE 25 — OPEN OR SHORT CIRCUIT IN REAR RIGHT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
26	Rear right ABS sensor abnormal signal	Rear right ABS sensor abnormal signal	<Ref. to ABS-86 TROUBLE CODE 26 — REAR RIGHT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>
27	Open or short circuit in rear left ABS sensor circuit	Open or short circuit in rear left ABS sensor circuit	<Ref. to ABS-80 TROUBLE CODE 27 — OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
28	Rear left ABS sensor abnormal signal	Rear left ABS sensor abnormal signal	<Ref. to ABS-86 TROUBLE CODE 28 — REAR LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>
29	Abnormal ABS sensor signal on any one of four sensor	Abnormal ABS sensor signal on any one of four	<Ref. to ABS-92 TROUBLE CODE 29 — ABNORMAL ABS SENSOR SIGNAL ON ANY ONE OF FOUR SENSOR —, Diagnostics Chart with Subaru Select Monitor.>
31	Front right inlet valve malfunction	Front right inlet valve malfunction	<Ref. to ABS-96 TROUBLE CODE 31 — FRONT RIGHT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
32	Front right outlet valve malfunction	Front right outlet valve malfunction	<Ref. to ABS-98 TROUBLE CODE 32 — FRONT RIGHT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
33	Front left inlet valve malfunction	Front left inlet valve malfunction	<Ref. to ABS-96 TROUBLE CODE 33 — FRONT LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
34	Front left outlet valve malfunction	Front left outlet valve malfunction	<Ref. to ABS-98 TROUBLE CODE 34 — FRONT LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
35	Rear right inlet valve malfunction	Rear right inlet valve malfunction	<Ref. to ABS-96 TROUBLE CODE 35 — REAR RIGHT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
36	Rear right outlet valve malfunction	Rear right outlet valve malfunction	<Ref. to ABS-98 TROUBLE CODE 36 — REAR RIGHT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
37	Rear left inlet valve malfunction	Rear left inlet valve malfunction	<Ref. to ABS-96 TROUBLE CODE 37 — REAR LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

LIST OF DIAGNOSTIC TROUBLE CODE

ABS

Code	Display screen	Contents of diagnosis	Index No.
38	Rear left outlet valve malfunction	Rear left outlet valve malfunction	<Ref. to ABS-98 TROUBLE CODE 38 — REAR LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
41	ABS control module malfunction	ABS control module and hydraulic control unit malfunction	<Ref. to ABS-100 TROUBLE CODE 41 — ABS CONTROL MODULE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
42	Power supply voltage too low	Power supply voltage too low	<Ref. to ABS-102 TROUBLE CODE 42 — POWER SUPPLY VOLTAGE TOO LOW —, Diagnostics Chart with Subaru Select Monitor.>
42	Power supply voltage too high	Power supply voltage too high	<Ref. to ABS-104 TROUBLE CODE 42 — POWER SUPPLY VOLTAGE TOO HIGH —, Diagnostics Chart with Subaru Select Monitor.>
44	ABS-AT control (Non Controlled)	ABS-AT control (Non Controlled)	<Ref. to ABS-106 TROUBLE CODE 44 — ABS-AT CONTROL (NON CONTROLLED), Diagnostics Chart with Subaru Select Monitor.>
44	ABS-AT control (Controlled)	ABS-AT control (Controlled)	<Ref. to ABS-108 TROUBLE CODE 44 — ABS-AT CONTROL (CONTROLLED), Diagnostics Chart with Subaru Select Monitor.>
51	Valve relay malfunction	Valve relay malfunction	<Ref. to ABS-110 TROUBLE CODE 51 — VALVE RELAY MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
51	Valve relay ON failure	Valve relay ON failure	<Ref. to ABS-112 TROUBLE CODE 51 — VALVE RELAY ON FAILURE —, Diagnostics Chart with Subaru Select Monitor.>
52	Open circuit in motor relay circuit	Open circuit in motor relay circuit	<Ref. to ABS-114 TROUBLE CODE 52 - OPEN CIRCUIT IN MOTOR RELAY CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
52	Motor relay ON failure	Motor relay ON failure	<Ref. to ABS-116 TROUBLE CODE 52 — MOTOR RELAY ON FAILURE —, Diagnostics Chart with Subaru Select Monitor.>
52	Motor malfunction	Motor malfunction	<Ref. to ABS-118 TROUBLE CODE 52 — MOTOR MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
54	Stop light switch signal circuit malfunction	Stop light switch signal circuit malfunction	<Ref. to ABS-120 TROUBLE CODE 54 — STOP LIGHT SWITCH SIGNAL CIRCUIT MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>
56	Open or short circuit in G sensor circuit	Open or short circuit in G sensor circuit	<Ref. to ABS-122 TROUBLE CODE 56 — OPEN OR SHORT CIRCUIT IN G SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
56	Battery short in G sensor circuit	Battery short in G sensor circuit	<Ref. to ABS-126 TROUBLE CODE 56 — BATTERY SHORT IN G SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>
56	Abnormal G sensor high μ output	Abnormal G sensor high μ output	<Ref. to ABS-130 TROUBLE CODE 56 — ABNORMAL G SENSOR HIGH μ OUTPUT —, Diagnostics Chart with Subaru Select Monitor.>
56	Detection of G sensor stick	Detection of G sensor stick	<Ref. to ABS-134 TROUBLE CODE 56 — DETECTION OF G SENSOR STICK —, Diagnostics Chart with Subaru Select Monitor.>

NOTE:

High μ means high friction coefficient against road surface.

8. Read Diagnostic Trouble Code

S006508

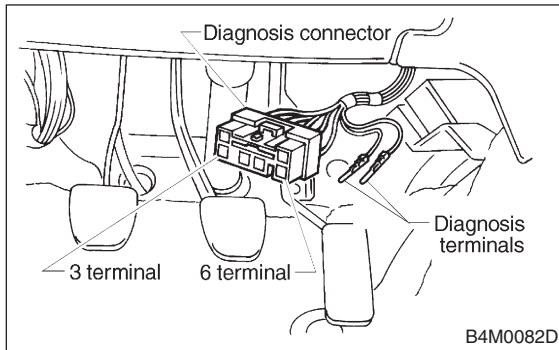
A: OPERATION

S006508A16

1. WITHOUT SUBARU SELECT MONITOR

S006508A1602

- 1) Take out diagnosis connector from side of driver's seat heater unit.

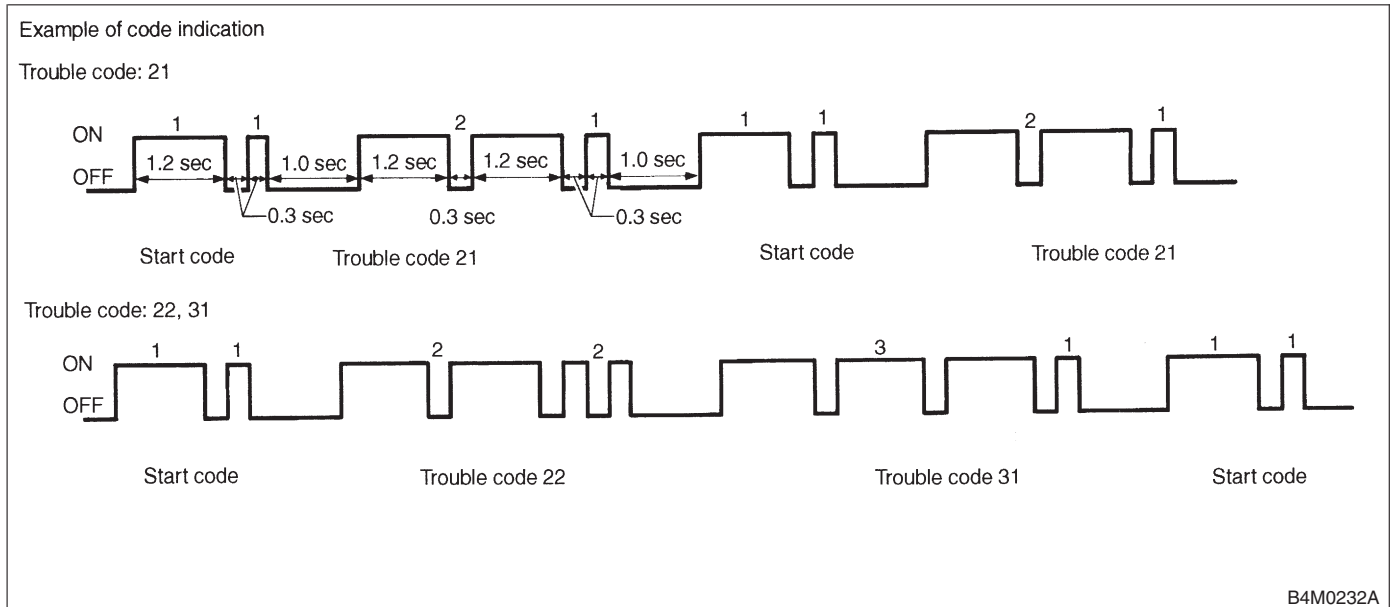


- 2) Turn ignition switch OFF.
- 3) Connect diagnosis connector terminal 6 to diagnosis terminal.
- 4) Turn ignition switch ON.
- 5) ABS warning light is set in the diagnostic mode and blinks to identify trouble code.

- 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 3 minutes.

NOTE:

- When there are no trouble codes in memory, only the start code (11) is shown.
- When on-board diagnosis of the ABS control module detects a problem, the information (up to a maximum of three) will be stored in the EEPROM 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.)



2. WITH SUBARU SELECT MONITOR

S006508A1601

Refer to SUBARU SELECT MONITOR for information about how to obtain and understand trouble codes.
<Ref. to ABS-14 OPERATION, Subaru Select Monitor.>

7. Subaru Select Monitor

S006503

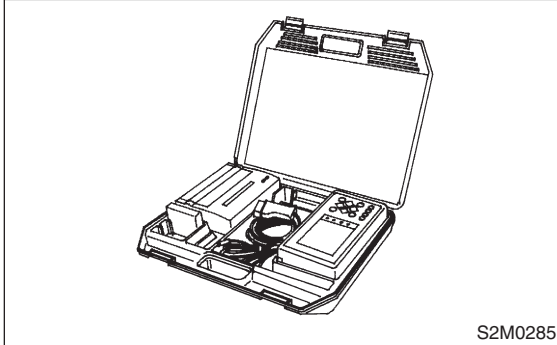
A: OPERATION

S006503A16

1. READ DIAGNOSTIC TROUBLE CODE

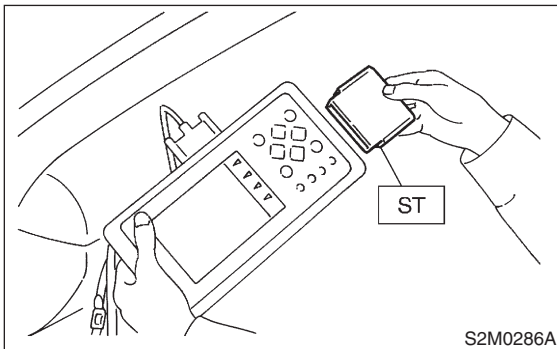
S006503A1601

- 1) Prepare Subaru Select Monitor kit.



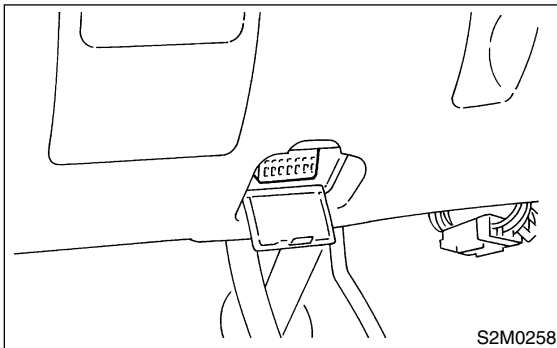
- 2) Connect diagnosis cable to Subaru Select Monitor.

- 3) Insert cartridge into Subaru Select Monitor.



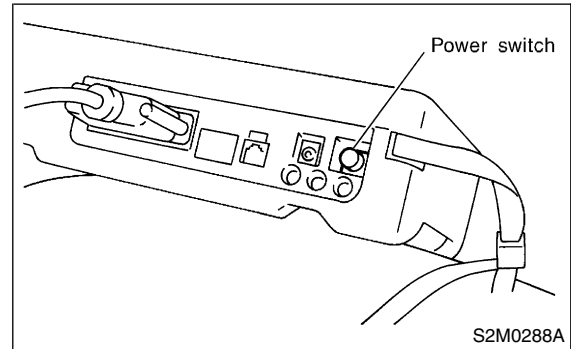
- 4) Connect Subaru Select Monitor to data link connector.

- (1) Data link connector located in the lower portion of the instrument panel (on the driver's side).



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

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



- 6) On the 「Main Menu」 display screen, select the {Each System Check} and press the [YES] key.

- 7) On the 「System Selection Menu」 display screen, select the {Brake Control System} and press the [YES] key.

- 8) Press the [YES] key after displayed the information of engine type.

- 9) On the 「ABS Diagnosis」 display screen, select the {Diagnostic Code(s) Display} and press the [YES] key.

- 10) On the 「Diagnostic Code(s) Display」 display screen, select the {Current Diagnostic Code(s)} or {History Diagnostic Code(s)} and press the [YES] key.

NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

- For detailed concerning diagnostic trouble codes, refer to the "List of Diagnostic Trouble Code". <Ref. to ABS-20 LIST, List of Diagnostic Trouble Code.>

2. READ CURRENT DATA S006503A1602

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

Display screen	Contents to be monitored	Unit of measure
FR Wheel Speed	Wheel speed detected by the Front Right ABS sensor is displayed	km/h or MPH
FL Wheel Speed	Wheel speed detected by the Front Left ABS sensor is displayed	km/h or MPH
RR Wheel Speed	Wheel speed detected by the Rear Right ABS sensor is displayed	km/h or MPH
RL Wheel Speed	Wheel speed detected by the Rear Left ABS sensor is displayed	km/h or MPH
Stop Light Switch	Stop light switch signal	ON or OFF
Stop Light Switch	Stop light switch monitor voltage is displayed.	V
G sensor output Signal	Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.	V
Valve Relay Signal	Valve Relay Signal	ON or OFF
Motor Relay Signal	Motor Relay Signal	ON or OFF
ABS Signal to TCM	ABS operation signal from ABS control module to TCM	ON or OFF
ABS Warning Lamp	ON operation of the ABS warning light is displayed.	ON or OFF
Motor Relay Monitor	Operating condition of the motor relay is displayed.	High or Low
Valve Relay Monitor	Operating condition of the valve relay is displayed.	ON or OFF
CCM Signal	ABS operation signal from ABS control module to TCM	ON or OFF

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

3. CLEAR MEMORY MODE S006503A1603

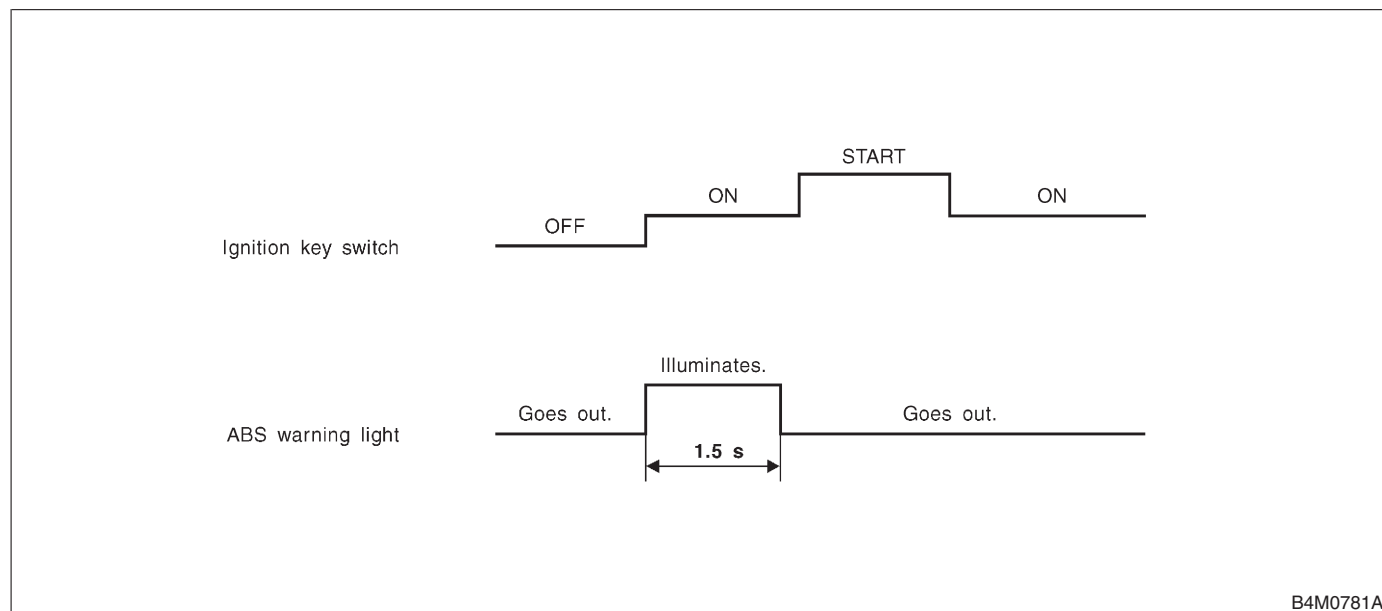
- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the 「YES」 key.
- 2) On the 「System Select Menu」 display screen, select {Brake System} and press the 「YES」 key.
- 3) Press the 「YES」 key after displayed the information of engine type.
- 4) On the 「Brake Control Diagnosis」 display screen, select the {Clear Memory} and press the 「YES」 key.
- 5) When the “Done” and “turn ignition switch OFF” are shown on the display screen, turn the Subaru Select Monitor and ignition switch to OFF.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

11. Warning Light Illumination Pattern S006531

A: INSPECTION S006531A10



1) When the ABS warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.

2) When the ABS warning light remains constantly OFF, repair the ABS warning light circuit or diagnosis circuit. <Ref. to ABS-24 ABS WARNING LIGHT DOES NOT COME ON., Diagnostics Chart with Diagnosis Connector.>

NOTE:

Even though the ABS warning light does not go out 1.5 seconds after it illuminates, the ABS system operates normally when the warning light goes out while driving at approximately 12 km/h (7 MPH). However, the Anti-lock brakes do not work while the ABS warning light is illuminated.

14. Air Bleeding S405163

A: PROCEDURE S405163E45

CAUTION:

- The FMVSS No. 116, fresh DOT3 or 4 brake fluid must be used.
- Cover bleeder with waste cloth, when loosening it, to prevent brake fluid from being splashed over surrounding parts.
- Avoid mixing different brands of brake fluid to prevent degrading the quality of the fluid.
- Be careful not to allow dirt or dust to get into the reservoir tank.

NOTE:

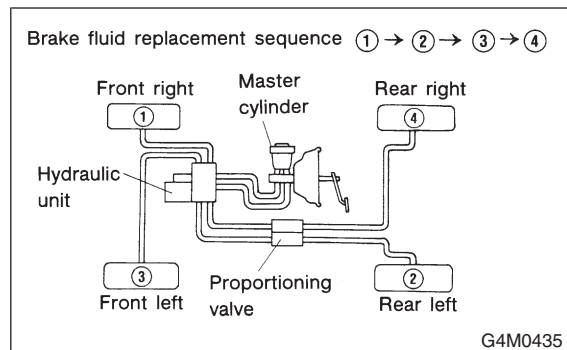
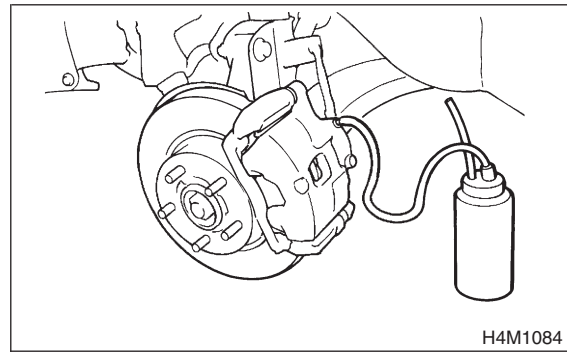
- Start with the brakes (wheels) connecting to the secondary chamber of the master cylinder.
- The time interval between two brake pedal operations (from the time when the pedal is released to the time when it is depressed another time) shall be approximately 3 seconds.
- The air bleeder on each brake shall be released for 1 to 2 seconds.

1. BRAKE LINE S405163E4502

NOTE:

- During bleeding operation, keep the brake reserve tank filled with brake fluid to eliminate entry of air.
 - Brake pedal operating must be very slow.
 - For convenience and safety, it is advisable to have two men working.
- 1) Make sure that there is no leak from joints and connections of the brake system.

- 2) Fit one end of vinyl tube into the air bleeder and put the other end into a brake fluid container.



- 3) Slowly depress the brake pedal and keep it depressed. Then, open the air bleeder to discharge air together with the fluid. Release air bleeder for 1 to 2 seconds. Next, with the bleeder closed, slowly release the brake pedal. Repeat these steps until there are no more air bubbles in the vinyl tube. Allow 3 to 4 seconds between two brake pedal operations.

CAUTION:

Cover bleeder with waste cloth, when loosening it, to prevent brake fluid from being splashed over surrounding parts.

NOTE:

Brake pedal operating must be very slow.

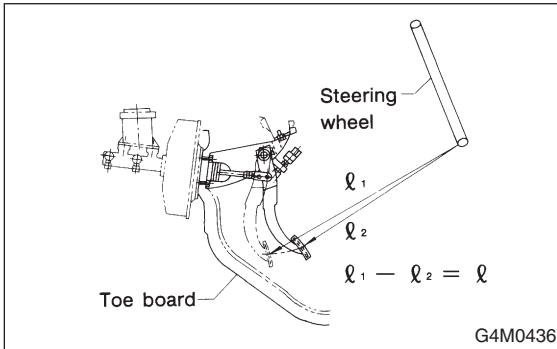
- 4) Tighten air bleeder securely when no air bubbles are visible.

Air bleeder tightening torque:
8 N·m (0.8 kgf-m, 5.8 ft-lb)

- 5) Perform these steps for the brakes connecting to the secondary chamber of master cylinder, first, and then for the ones connecting to primary chamber. With all procedures completed, fully depress the brake pedal and keep it in that position for approximately 20 seconds to make sure that there is no leak evident in the entire system.
- 6) Perform sequence control. (With ABS model)

7) Check the pedal stroke.

While the engine is idling, depress the brake pedal with a 490 N (50 kg, 110 lb) load and measure the distance between the brake pedal and steering wheel. With the brake pedal released, measure the distance between the pedal and steering wheel again. The difference between the two measurements must be more than specified.



Specified pedal stroke:

Without ABS

90 mm (3.54 in)

With ABS

95 mm (3.74 in)

When depressing brake pedal with a 490 N (50 kg, 110 lb) load.

(1) Models without ABS

If the distance is more than specifications, there is a possibility that air is in the brake line. Bleed air from the brake line.

(2) Models with ABS

If the distance is more than specifications, there is a possibility air is in the inside of the hydraulic unit. Therefore, air must be bled from the inside of the hydraulic unit to the brake pipes in accordance with the bleeding sequence control.

8) Add brake fluid to the required level (MAX. level) of reserve tank.

9) As a final step, test run the vehicle at low speed and apply brakes relatively hard 2 to 3 times to ensure that brakes provide normal braking action on all four wheels without dragging and uneven braking.

11. Brake Booster S405166

A: REMOVAL S405166A18

1) Remove the following parts at engine compartment.

- (1) Disconnect connector for brake fluid level indicator.
- (2) Remove brake pipes from master cylinder.
- (3) Remove master cylinder installing nuts.
- (4) Disconnect vacuum hose from brake booster.

2) Remove the following parts from the pedal bracket.

- (1) Snap pin and clevis pin.
- (2) Four brake booster installing nuts.

3) Remove brake booster while shunning brake pipes.

- Be careful not to drop brake booster. Brake booster should be discarded if it has been dropped.

- Use special care when handling operating rod. If excessive force is applied to operating rod, sufficient to cause a change in the angle in excess of $\pm 3^\circ$, it may result in damage to the power piston cylinder.

- Use care when placing brake booster on the floor.

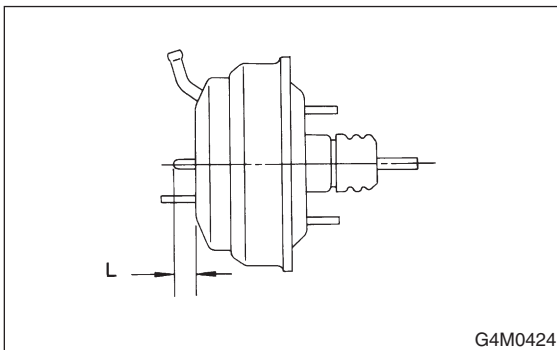
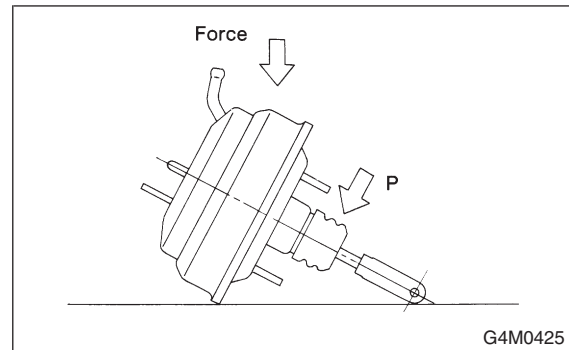
- Do not change the push rod length. If it has been changed, reset the projected length "L" to the standard length.

Standard:

L = 10 mm (0.39 in)

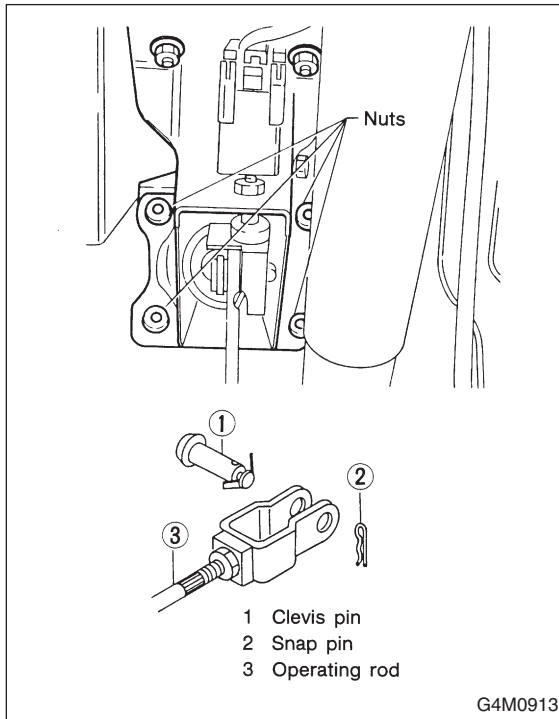
CAUTION:

If external force is applied from above when brake booster is placed in this position, the resin portion as indicated by "P", may be damaged.

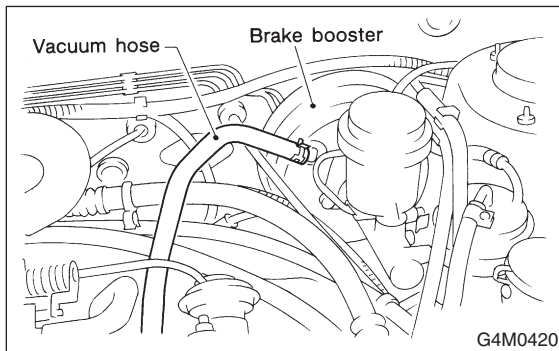


B: INSTALLATION S405166A11

- 1) Mount brake booster in position.
- 2) Connect operating rod to brake pedal with clevis pin and snap pin.



- 3) Connect vacuum hose to brake booster.

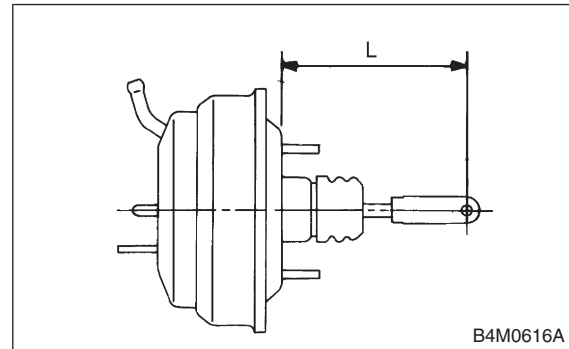


- 4) Mount master cylinder onto brake booster.
- 5) Connect brake pipes to master cylinder.
- 6) Connect electric connector for brake fluid level indicator.

- 7) Adjust operating rod of brake booster.

Standard: L
145.3 mm (5.72 in)

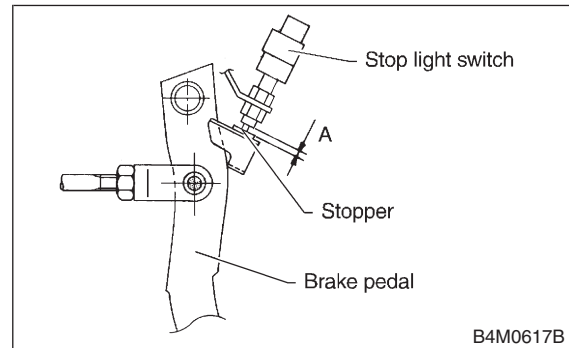
If it is not in specified value, adjust it by adjusting brake booster operating rod.



- 8) Measure the clearance between threaded end of stop light switch and stopper.
- If it is not in specified value, adjust it by adjusting position of stop light switch.

CAUTION:
Be careful not to rotate stop light switch.

Stop light switch clearance: A
0.3 mm (0.012 in)



- 9) Apply grease to operating rod connecting pin to prevent it from wearing.
- 10) Bleed air from brake system.

Tightening torque (Air bleeder screw):
8 N·m (0.8 kgf-m, 5.8 ft-lb)

- 11) Conduct road tests to ensure brakes do not drag.

C: INSPECTION S405166A10

1. OPERATION CHECK (WITHOUT USING GAUGES) S405166A1001

CAUTION:

When checking operation, be sure to securely apply the hand brake.

● Checking without gauges

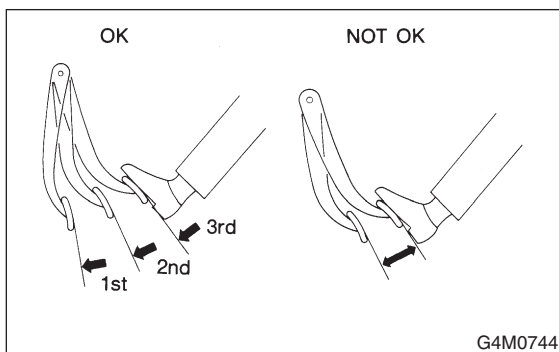
This method cannot determine the exact portion which has failed, but it can provide a rough understanding of the nature of the failure if checking is conducted in accordance with the following procedures.

● Air tightness check

Start engine, and run it for 1 to 2 minutes, then turn it off. Depress brake pedal several times applying the same pedal force as that used in ordinary braking operations. The pedal stroke should be greatest on the 1st depression, and it should become smaller with each successive depression. If no change occurs in the pedal height while in a depressed state, brake booster is faulty.

NOTE:

- In the event of defective operation, inspect the condition of the check valve and vacuum hose.
- Replace them if faulty and conduct the test again.
- If no improvement is observed, check precisely with gauges.

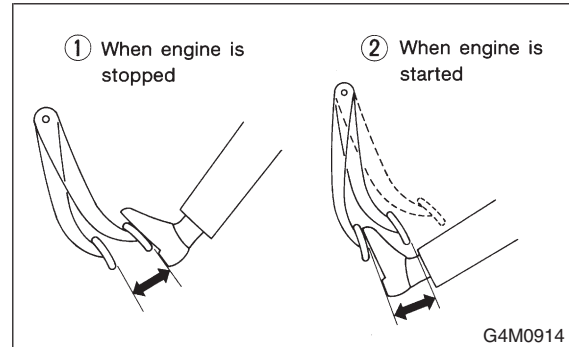


● Operation check

- 1) With engine off, depress brake pedal several times applying the same pedal force and make sure that the pedal height does not vary with each depression of the pedal.
- 2) With brake pedal depressed, start engine.
- 3) As engine starts, brake pedal should move slightly toward the floor. If no change occurs in the pedal height, brake booster is faulty.

NOTE:

If faulty, check precisely with gauges.



● Loaded air tightness check

Depress brake pedal while engine is running, and turn off engine while the pedal is still depressed. Keep the pedal depressed for 30 seconds; if no change occurs in the pedal height, brake booster is functioning normally; if the pedal height increases, it is faulty.

NOTE:

If faulty, check precisely with gauges.

2. OPERATION CHECK (WITH GAUGES)

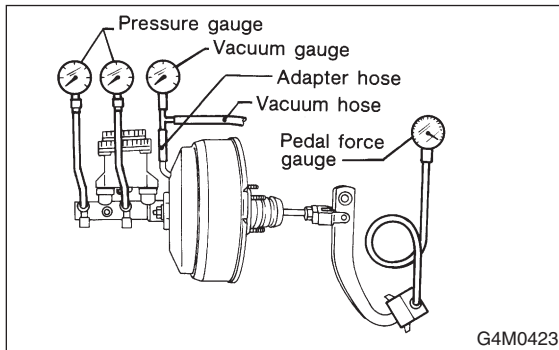
S405166A1002

CAUTION:

When checking operation, be sure to securely apply the hand brake.

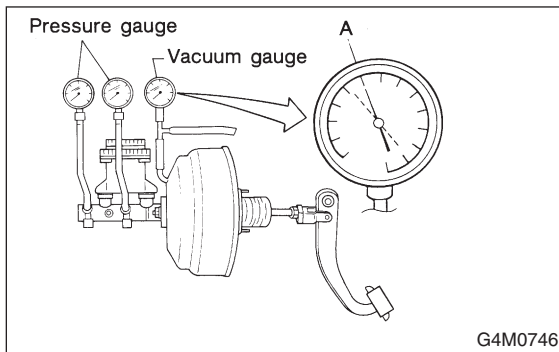
● Checking with gauges

Connect gauges as shown in Figure. After bleeding air from pressure gauges, proceed to each check.



● Air tightness check

1) Start engine and keep it running until a vacuum of 66.7 kPa (500 mmHg, 19.69 inHg) = point A is indicated on vacuum gauge. Do not depress brake pedal.

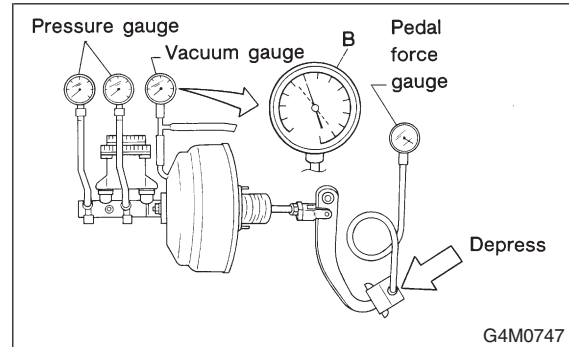


2) Stop engine and watch the gauge. If the vacuum drop range is less than 3.3 kPa (25 mmHg, 0.98 inHg) within 15 seconds after stopping engine, brake booster is functioning properly. If defective, the cause may be one of those listed below.

- Check valve malfunction
- Leak from vacuum hose
- Leak from the shell jointed portion or stud bolt welded portion
- Damaged diaphragm
- Leak from valve body seal and bearing portion
- Leak from plate and seal assembly portion
- Leak from poppet valve assembly portion

● Loaded air tightness check

1) Start engine and depress brake pedal with pedal force of 196 N (20 kgf, 44 lb). Keep engine running until a vacuum of 66.7 kPa (500 mmHg, 19.69 inHg) = point B is indicated on vacuum gauge while the pedal is still depressed.



2) Stop engine and watch vacuum gauge. If the vacuum drop range is less than 3.3 kPa (25 mmHg, 0.98 inHg) within 15 seconds after stopping engine, brake booster is functioning properly. If defective, refer to "Air tightness check". <Ref. to BR-44 INSPECTION, Brake Booster.>

● Lack of boosting action check

Turn off engine, and set the vacuum gauge reading at "0". Then, check the fluid pressure when brake pedal is depressed. The pressure must be greater than the standard value listed below.

Brake pedal force	147 N (15 kgf, 33 lb)	294 N (30 kgf, 66 lb)
Models without ABS	785 kPa (8 kg/cm ² , 114 psi)	2,158 kPa (22 kg/cm ² , 313 psi)
Models with ABS	588 kPa (6 kg/cm ² , 85 psi)	1,863 kPa (19 kg/cm ² , 270 psi)

● Boosting action check

Set the vacuum gauge reading at 66.7 kPa (500 mmHg, 19.69 inHg) by running engine. Then, check the fluid pressure when brake pedal is depressed. The pressure must be greater than the standard value listed below.

Brake pedal force	147 N (15 kgf, 33 lb)	294 N (30 kgf, 66 lb)
Models without ABS	5,492 kPa (56 kg/cm ² , 796 psi)	8,434 kPa (86 kg/cm ² , 1,223 psi)
Models with ABS	5,394 kPa (55 kg/cm ² , 782 psi)	9,219 kPa (94 kg/cm ² , 1,337 psi)

13. Brake Fluid S405162

A: REPLACEMENT S405162A20

CAUTION:

- To always maintain the brake fluid characteristics, replace the brake fluid according to maintenance schedule or earlier than that when used in severe condition.
- The FMVSS No. 116, fresh DOT3 or 4 brake fluid must be used.
- Cover bleeder with waste cloth, when loosening it, to prevent brake fluid from being splashed over surrounding parts.
- Avoid mixing different brands of brake fluid to prevent degrading the quality of the fluid.
- Be careful not to allow dirt or dust to get into the reservoir tank.

NOTE:

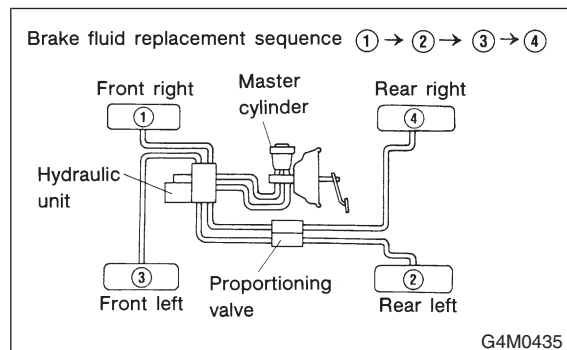
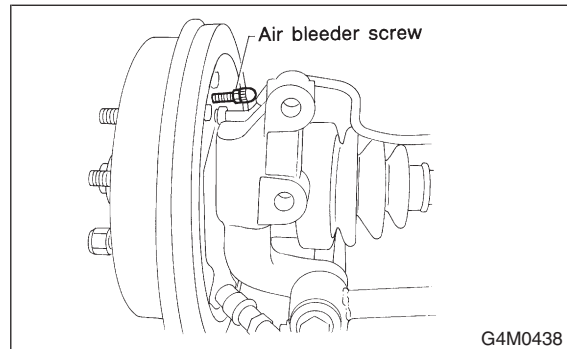
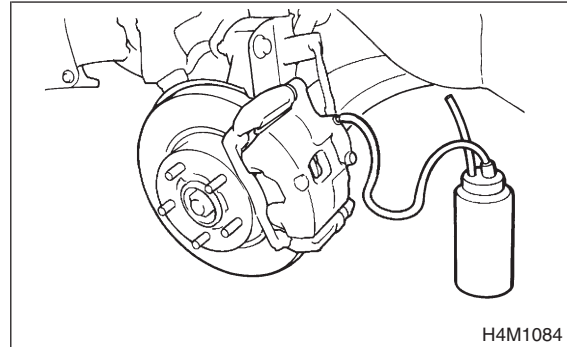
- During bleeding operation, keep the brake reserve tank filled with brake fluid to eliminate entry of air.
- Brake pedal operating must be very slow.
- For convenience and safety, it is advisable to have two men working.
- The amount of brake fluid required is approximately 500 ml (16.9 US fl oz, 17.6 Imp fl oz) for total brake system.

- 1) Either jack-up vehicle and place a safety stand under it, or lift-up vehicle.
- 2) Remove both front and rear wheels.
- 3) Draw out the brake fluid from master cylinder with syringe.
- 4) Refill reservoir tank with recommended brake fluid.

Recommended brake fluid:

FMVSS No. 116, fresh DOT3 or 4 brake fluid

- 5) Install one end of a vinyl tube onto the air bleeder and insert the other end of the tube into a container to collect the brake fluid.



- 6) Instruct your co-worker to depress the brake pedal slowly two or three times and then hold it depressed.
- 7) Loosen bleeder screw approximately 1/4 turn until a small amount of brake fluid drains into container, and then quickly tighten screw.
- 8) Repeat again from the two former procedures above until there are no air bubbles in drained brake fluid and new fluid flows through vinyl tube.

NOTE:

Add brake fluid as necessary while performing the air bleed operation, in order to prevent the tank from running short of brake fluid.

9) After completing the bleeding operation, hold brake pedal depressed and tighten screw and install bleeder cap.

Tightening torque (Bleeder screw):

8 N·m (0.8 kgf-m, 5.8 ft-lb)

10) Bleed air from each wheel cylinder using the same procedures as described in steps 6) through 7) above.

11) Depress brake pedal with a force of approximately 294 N (30 kgf, 66 lb) and hold it there for approximately 20 seconds. At this time check pedal to see if it shows any unusual movement.

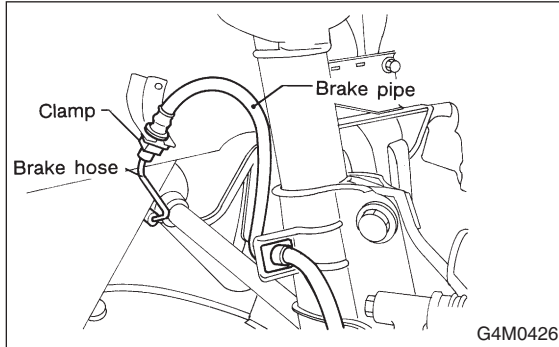
Visually inspect bleeder screws and brake pipe joints to make sure that there is no fluid leakage.

12) Install wheels, and drive car for a short distance between 2 to 3 km (1 to 2 miles) to make sure that brakes are operating properly.

15. Brake Hose S405164

A: REMOVAL S405164A18

- 1) Separate brake pipe from brake hose.
(Always use flare nut wrench and be careful not to deform flare nut.)



- 2) Pull out clamp to remove brake hose.
- 3) Remove clamp at strut and union bolt.

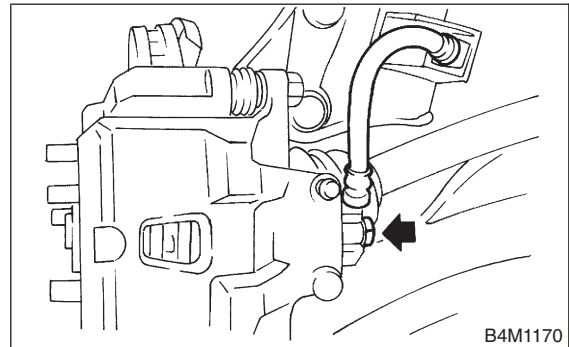
B: INSTALLATION S405164A11

1. FRONT BRAKE HOSE S405164A1101

- 1) Route end of brake hose (on caliper side) through hole in brake hose bracket at strut location.
- 2) Tighten end of brake hose at caliper using a union bolt.

Torque (Union bolt):

18 N·m (1.8 kgf-m, 13.0 ft-lb)



- 3) Secure middle fitting of brake hose to bracket at strut location using a clamp.
- 4) Position disc in straight-forward direction and route brake hose through hole in bracket on wheel apron side.

CAUTION:

Be sure brake hose is not twisted.

- 5) Temporarily tighten flare nut to connect brake pipe and hose.
- 6) Fix brake hose with clamp at wheel apron bracket.
- 7) While holding hexagonal part of brake hose fitting with a wrench, tighten flare nut to the specified torque.

Torque (Brake pipe flare nut):

14.7 N·m (1.5 kgf-m, 10.8 ft-lb)

- 8) Bleed air from the brake system.

2. REAR BRAKE HOSE S405164A1102

- 1) Pass brake hose through the hole of bracket, and lightly tighten flare nut to connect brake pipe.
- 2) Insert clamp upward to fix brake hose.
- 3) Perform the same procedures as before mentioned in steps 7) and 8).

C: INSPECTION S405164A10

Ensure there are no cracks, breakage, or damage on hoses. Check joints for fluid leakage. If any cracks, breakage, damage or leakage is found, repair or replace hose.

16. Brake Pedal S405541

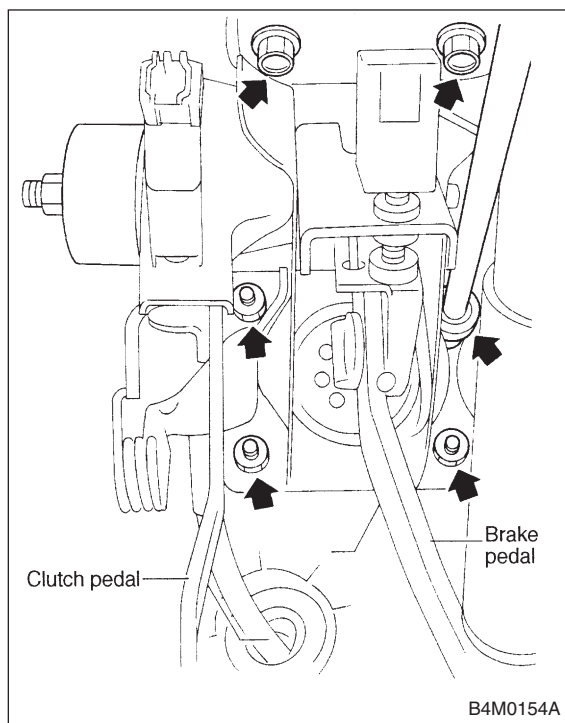
A: REMOVAL S405541A18

1. 2200 cc MT MODEL S405541A1803

- 1) Disconnect ground cable from battery.
- 2) Disconnect clutch cable from release lever.
- 3) Remove instrument panel lower cover from instrument panel.
- 4) Disconnect the following parts from pedal bracket.
 - (1) Operating rod of brake booster
 - (2) Electrical connectors (for stop light switch, etc.)
- 5) Remove clevis pin which secures pedal to push rod.
- 6) Remove bolts and nuts which secure brake and clutch pedals, and remove pedal bracket and clutch cable as a unit.

CAUTION:

Before removing clutch cable from toe board, remove grommet. Slowly remove clutch cable, being careful not to scratch it.



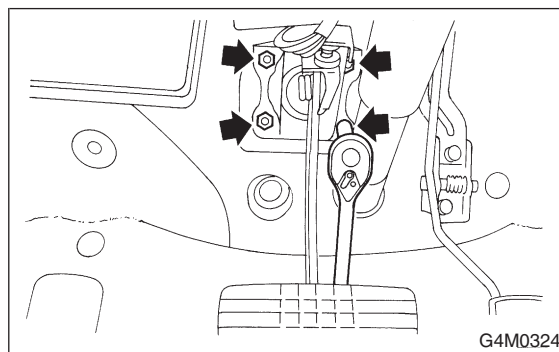
- 7) Depress clutch pedal, disconnect clutch cable from clutch pedal.

2. 2500 cc MT MODEL S405541A1804

- 1) Remove steering bolts.
- 2) Raise vehicle on hoist and remove the two bolts which secure steering unit to underside of body.
- 3) Lower vehicle to floor.
- 4) Remove instrument panel lower cover from instrument panel.
- 5) Disconnect the following parts from pedal bracket.
 - Operating rod of brake booster
 - Electrical connectors (for stop light switch, etc.)
- 6) Remove clevis pin which secures lever to push rod.
- 7) Remove nut which secures clutch master cylinder.
- 8) Remove steering assembly.
- 9) Remove bolts and nuts which secure brake and clutch pedals, and remove pedal assembly.

3. AT MODEL S405541A1802

- 1) Disconnect ground cable from battery.
- 2) Remove instrument panel lower cover from instrument panel.
- 3) Remove clevis pin which secures brake pedal to brake booster operating rod. Also disconnect stop lamp switch connector.
- 4) Remove two bolts and four nuts which secure brake pedal to pedal.



B: INSTALLATION S405541A11

1) Install in the reverse order of removal.

CAUTION:

- If cable clamp is damaged, replace it with a new one.
- Never fail to cover outer cable end with boot.
- Be careful not to kink accelerator cable.
- Always use new clevis pins.

2) Adjustment of clutch pedal <Ref. to CL-24 ADJUSTMENT, Clutch Pedal.>

3) Adjustment after pedal installation <Ref. to BR-56 INSPECTION, Brake Pedal.>

C: ASSEMBLY S405541A02

1) Attach stop light switch, etc. to pedal bracket temporarily.

2) Clean inside of bores of clutch pedal and brake pedal, apply grease, and set bushings into bores.

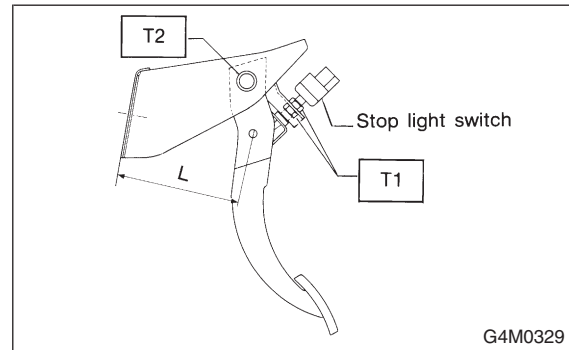
3) Align bores of pedal bracket, clutch pedal and brake pedal, attach brake pedal return spring and clutch pedal effort reducing spring, and then install pedal bolt.

NOTE:

Clean up inside of bushings and apply grease before installing spacer.

Tightening torque:

T2: 29 N·m (3.0 kgf-m, 21.7 ft-lb)



4) Set brake pedal position by adjusting position of stop light switch.

Pedal position: L

125.9 mm (4.96 in)

Tightening torque:

T1: 8 N·m (0.8 kgf-m, 5.8 ft-lb)

D: INSPECTION S405541A10

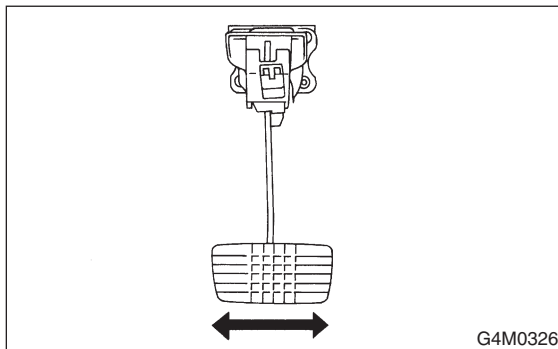
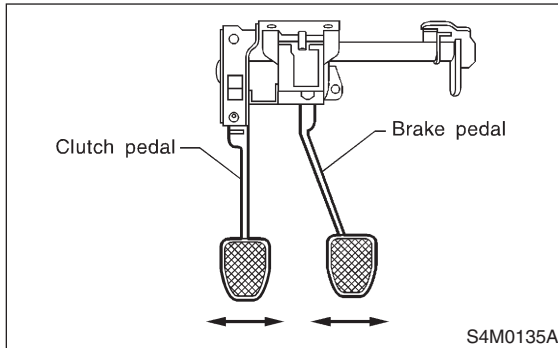
1) Move brake and clutch pedal pads in the lateral direction with a force of approximately 10 N (1 kgf, 2 lb) to ensure pedal deflection is in specified range.

CAUTION:

If excessive deflection is noted, replace bushings with new ones.

Deflection of brake and clutch pedal:**Service limit**

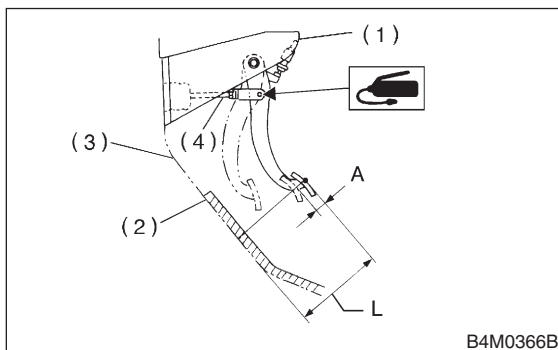
5.0 mm (0.197 in) or less



2) Check position of pedal pad.

Pedal height: L

148 mm (5.83 in)



- (1) Stop light switch
- (2) Mat
- (3) Toe board
- (4) Brake booster operating rod

3) If it is not in specified value, adjust it by adjusting brake booster operating rod length.

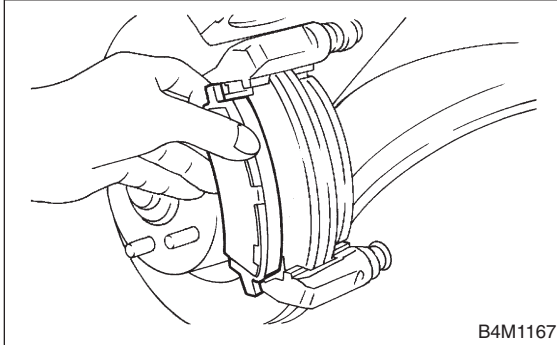
2. Front Brake Pad

S405178

A: REMOVAL

S405178A18

- 1) Remove lock pin.
- 2) Raise caliper body.
- 3) Remove pad.

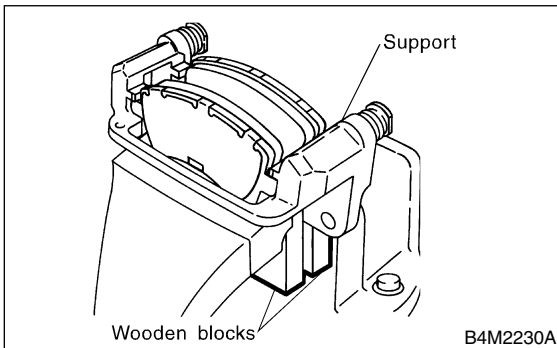


B4M1167

NOTE:

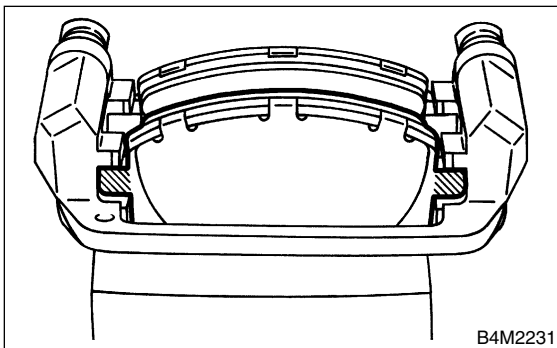
If brake pad is difficult to remove, proceed as follows:

- (1) Remove caliper body and fasten it provisionally to coil spring.
- (2) Remove support.
- (3) Place a support in a vise between wooden blocks.



B4M2230A

- (4) Attach a rod of less than 12 mm (0.47 in) dia. to the shaded area of brake pad, and strike the rod with a hammer to drive brake pad out of place.

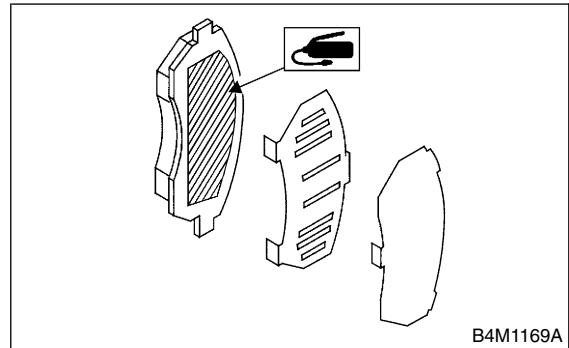


B4M2231

B: INSTALLATION

S405178A11

- 1) Apply thin coat of Molykote AS880N (Part No. 26298AC000) to the frictional portion between pad and pad clip.
- 2) Apply thin coat of Molykote AS880N (Part No. 26298AC000) to the frictional portion between pad and pad inner shim.



B4M1169A

- 3) Install pads on support.
- 4) Install caliper body on support.

Tightening torque:

39 N·m (4.0 kgf-m, 28.9 ft-lb)

NOTE:

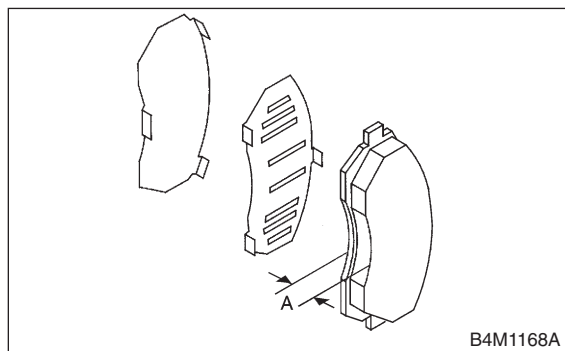
If it is difficult to push piston during pad replacement, loosen air bleeder to facilitate work.

FRONT BRAKE PAD

Brake

C: INSPECTION S405178A10

Check pad thickness A.



Pad thickness (including back metal)	Standard value	17 mm (0.67 in)
	Wear limit	7.5 mm (0.295 in)

CAUTION:

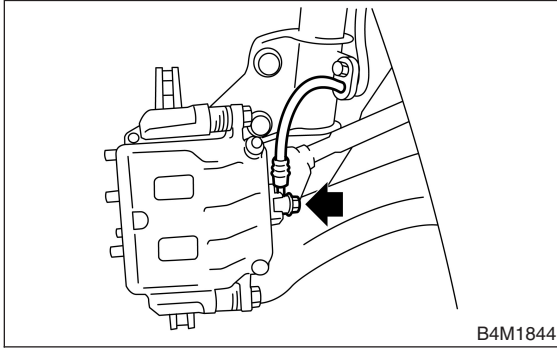
- Always replace the pads for both the left and right wheels at the same time. Also replace pad clips if they are twisted or worn.
- A wear indicator is provided on the inner disc brake pad. If the pad wears down to such an extent that the end of the wear indicator contacts the disc rotor, a squeaking sound is produced as the wheel rotates. If this sound is heard, replace the pad.
- Replace pad if there is oil or grease on it.

4. Front Disc Brake Assembly

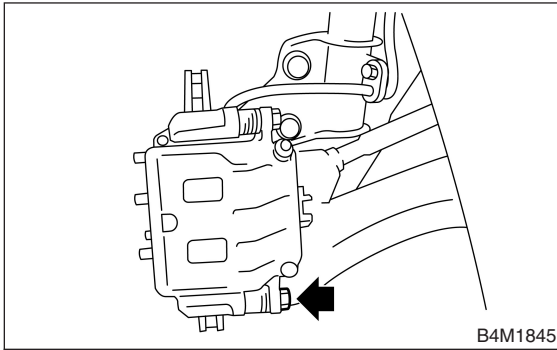
S405176

A: REMOVAL S405176A18

- 1) Remove union bolt and disconnect brake hose from caliper body assembly.



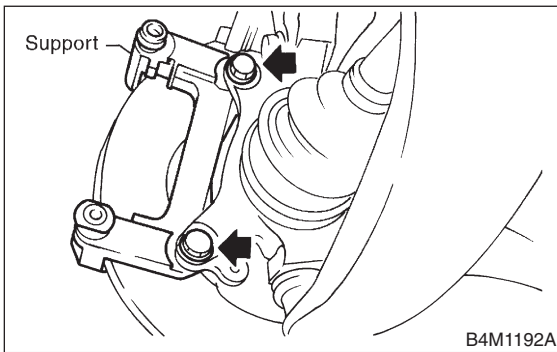
- 2) Remove bolt securing lock pin to caliper body.



- 3) Raise caliper body and move it toward vehicle center to separate it from support.
- 4) Remove support from housing.

NOTE:

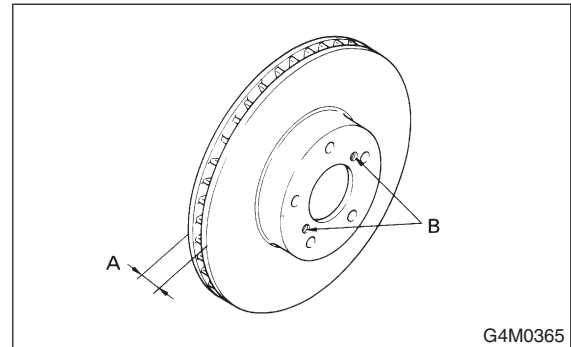
Remove support only when replacing it or the rotor. It need not be removed when servicing caliper body assembly.



- 5) Remove disc rotor from hub.

NOTE:

If disc rotor seizes up within hub, drive disc rotor out by installing an 8-mm bolt in holes B on the rotor.



- 6) Clean mud and foreign particles from caliper body assembly and support.

FRONT DISC BRAKE ASSEMBLY

Brake

B: INSTALLATION S405176A11

- 1) Install disc rotor on hub.
- 2) Install support on housing.

Tightening torque:

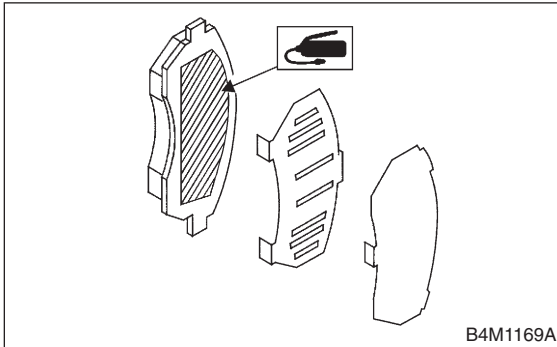
78 N·m (8 kgf-m, 58 ft-lb)

CAUTION:

- Always replace the pads for both the left and right wheels at the same time. Also replace pad clips if they are twisted or worn.
- A wear indicator is provided on the inner disc brake pad. If the pad wears down to such an extent that the end of the wear indicator contacts the disc rotor, a squeaking sound is produced as the wheel rotates. If this sound is heard, replace the pad.
- When replacing the pads, replace pads of the right and left wheels at the same time.

3) Apply thin coat of Molykote AS880N (Part No. 26298AC000) to the frictional portion between pad and pad clip.

4) Apply thin coat of Molykote AS880N (Part No. 26298AC000) to the frictional portion between pad and inner shim.



- 5) Install pads on support.
- 6) Install caliper body on support.

Tightening torque:

39 N·m (4.0 kgf-m, 28.9 ft-lb)

- 7) Connect brake hose.

Tightening torque:

18 N·m (1.8 kgf-m, 13.0 ft-lb)

CAUTION:

Replace brake hose gaskets with new ones.

- 8) Bleed air from brake system.

C: DISASSEMBLY S405176A06

1. 14 inch TYPE S405176A0602

- 1) Clean mud and foreign particles from caliper body assembly and support.

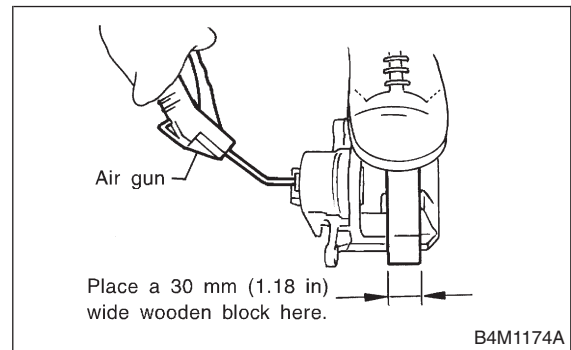
CAUTION:

Be careful not to allow foreign particles to enter inlet (at brake hose connector).

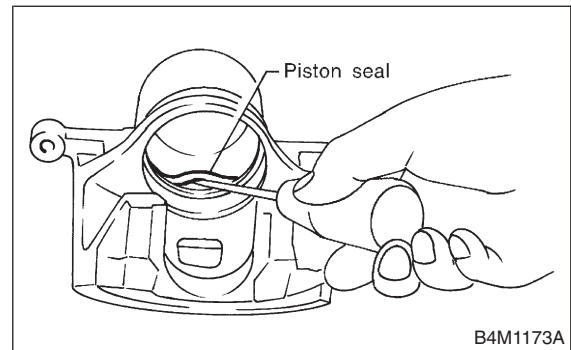
- 2) Gradually supply compressed air via caliper body brake hose to force piston out.

CAUTION:

- Place a wooden block as shown in Figure to prevent damage to piston.
- Do not apply excessively high-pressure.



- 3) Remove piston boot.
- 4) Remove piston seal from caliper body cylinder.



- 5) Remove guide pin and boot from caliper body.

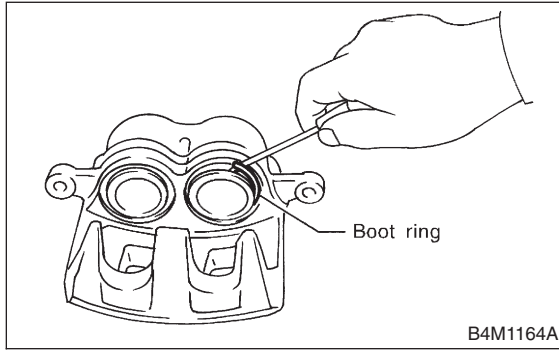
2. 15 inch AND 16 inch TYPE S405176S0603

1) Clean mud and foreign particles from caliper body assembly and support.

CAUTION:

Be careful not to allow foreign particles to enter inlet (at brake hose connector).

2) Using a standard screwdriver, remove boot ring from piston.

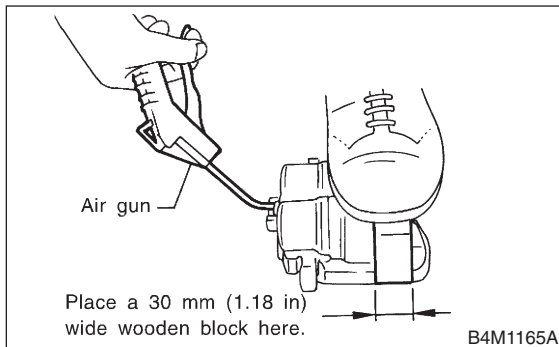


3) Remove boot from piston end.

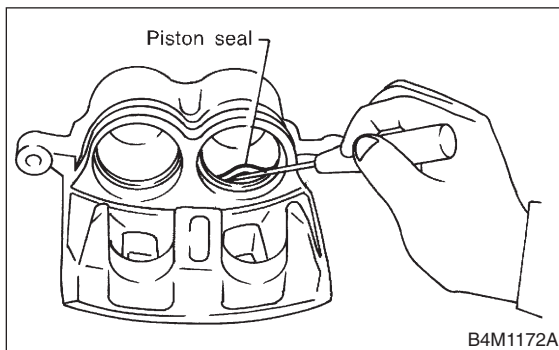
4) Gradually supply compressed air via caliper body brake hose to force piston out.

CAUTION:

Place a wooden block as shown in Figure to prevent damage to piston.



5) Remove piston seal from caliper body cylinder.



6) Remove lock pin boot and guide pin boot.

D: ASSEMBLY S405176A02

1. 14 inch TYPE S405176A0202

- 1) Clean caliper body interior using brake fluid.
- 2) Apply a coat of brake fluid to piston seal and fit piston seal in groove on caliper body.
- 3) Apply a coat of brake fluid to the entire inner surface of cylinder and outer surface of piston.
- 4) Apply a coat of specified grease to boot and fit in groove on ends of cylinder and install piston boot onto cylinder.

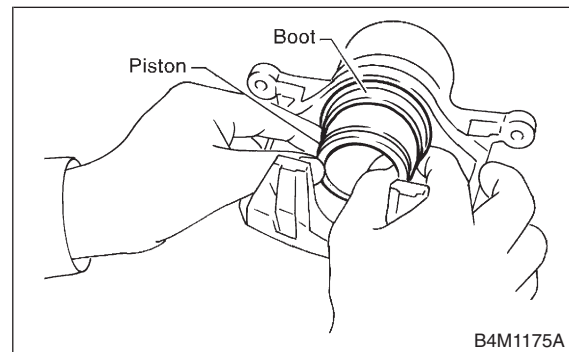
Grease:

NIGLUBE RX-2 (Part No. 003606000)

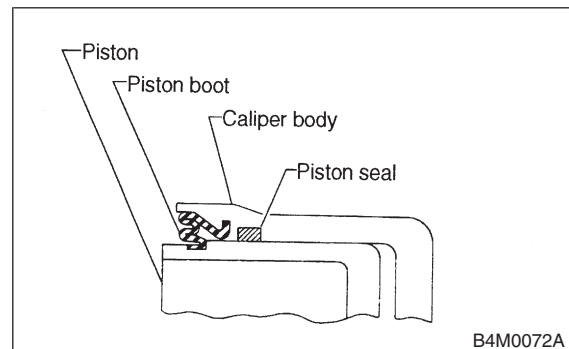
5) Insert piston into cylinder.

CAUTION:

Do not force piston into cylinder.



6) Position boot in grooves on cylinder and piston.



FRONT DISC BRAKE ASSEMBLY

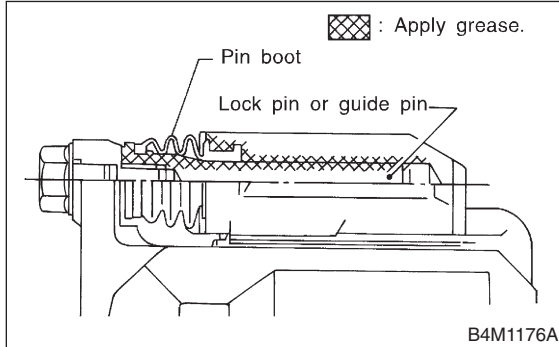
Brake

7) Apply a coat of specified grease to lock pin and guide pin outer surface, cylinder inner surface, and boot grooves.

Grease:

NIGLUBE RX-2 (Part No. 003606000)

8) Install lock and guide pin boot on support.

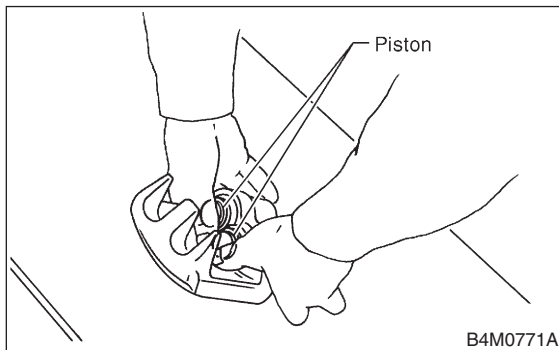


2. 15 inch AND 16 inch TYPE S405176S0203

- 1) Clean caliper body interior using brake fluid.
- 2) Apply a coat of brake fluid to piston seal and fit piston seal in groove on caliper body.
- 3) Apply a coat of brake fluid to the entire inner surface of cylinder and outer surface of piston.
- 4) Insert piston into cylinder.

CAUTION:

Do not force piston into cylinder.

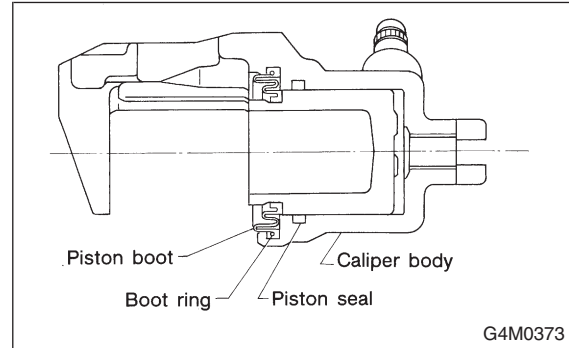


5) Apply a coat of specified grease to boot and fit in groove on ends of cylinder and piston.

Grease:

NIGLUBE RX-2 (Part No. 003606000)

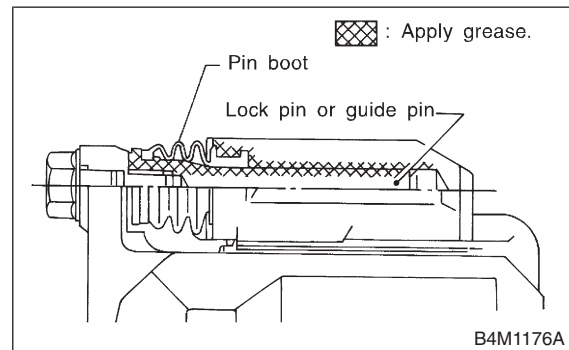
To facilitate installation, fit boot starting with piston end.



- 6) Position boot in grooves on cylinder and piston.
- 7) Install boot ring. Be careful not scratch boot.
- 8) Apply a coat of specified grease to lock pin and guide pin, outer surface, cylinder inner surface, and boot grooves.

Grease:

NIGLUBE RX-2 (Part No. 003606000)



9) Install lock pin boot and guide pin boot on support.

E: INSPECTION S405176A10

- 1) Repair or replace faulty parts.
- 2) Check caliper body and piston for uneven wear, damage or rust.
- 3) Check rubber parts for damage or deterioration.

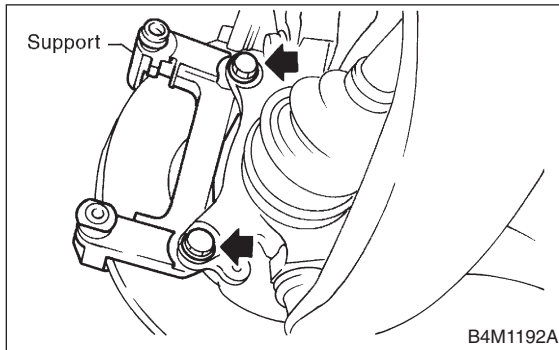
3. Front Disc Rotor S405173

A: REMOVAL S405173A18

- 1) Remove the brake pad. <Ref. to BR-17 REMOVAL, Front Brake Pad.>
- 2) Remove the support.

NOTE:

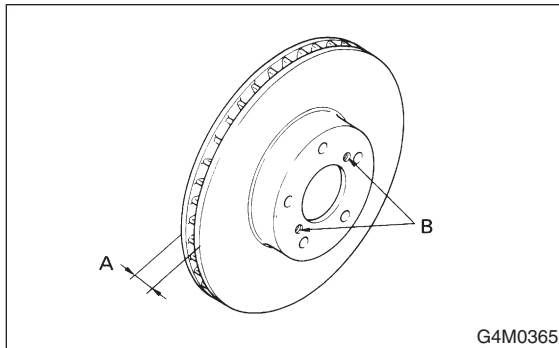
Remove support only when replacing it or the rotor. If need not be removed when servicing caliper body assembly.



- 3) Remove the disc rotor.

NOTE:

If disc rotor seizes up within the hub, drive disc rotor out by installing an 8-mm bolt in holes B on the rotor.



- 4) Clean mud and foreign particles from caliper body assembly and support.

B: INSTALLATION S405173A11

- 1) Install the disc rotor.
- 2) Install the support.

Tightening torque:

78 N·m (8 kgf-m, 58 ft-lb)

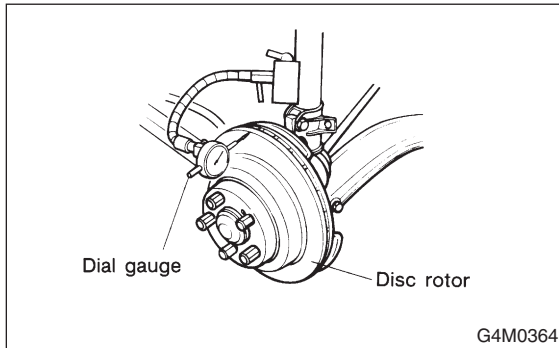
CAUTION:

- Always replace the pads for both the left and right wheels at the same time. Also replace pad clips if they are twisted or worn.
- A wear indicator is provided on the inner disc brake pad. If the pad wears down to such an extent that the end of the wear indicator contacts the disc rotor, a squeaking sound is produced as the wheel rotates. If this sound is heard, replace the pad.
- When replacing the pad, replace pads of the left and right wheels at the same time.

- 3) Install the pads and the caliper body. <Ref. to BR-17 INSTALLATION, Front Brake Pad.>

C: INSPECTION S405173A10

- 1) Install disc rotor by tightening the five wheel nuts.
- 2) Set a dial gauge on the disc rotor. Turn disc rotor to check runout.

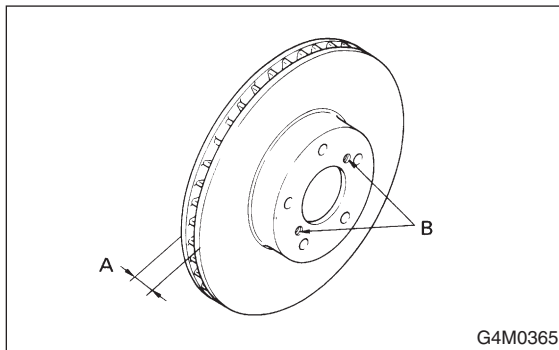


NOTE:

Make sure that dial gauge is set 10 mm (0.39 in) inward of rotor outer perimeter. If the runout of disc rotor exceeds the limit, check for abnormal free play at hub bearing and runout in the thrust direction. If the hub bearing is okay, resurface the disc rotor. After resurfacing, check disc rotor thickness as in step 3.

Disc rotor runout limit:
0.075 mm (0.0030 in)

- 3) Measure disc rotor thickness. If the thickness of disc rotor is below service limit, replace the disc rotor.



NOTE:

Make sure that micrometer is set 10 mm (0.39 in) inward of rotor outer perimeter.

	Standard value	Service limit
Disc rotor thickness A	24.0 mm (0.945 in)	22.0 mm (0.866 in)

GENERAL DESCRIPTION

Brake

1. General Description S405001

A: SPECIFICATIONS S405001E49

	Engine (cc)	2200	
	Driving system	AWD	
		Without ABS	With ABS
Front brake	Type	Disc (Floating type, ventilated)	
	Effective disc diameter	210 mm (8.27 in)	
	Disc thickness × outer diameter	24 × 260 mm (0.94 × 10.24 in)	
	Effective cylinder diameter	57.15 mm (2.2500 in)	
	Pad dimensions (length × width × thickness)	112.4 × 44.3 × 11.0 mm (4.43 × 1.744 × 0.433 in)	
	Clearance adjustment	Automatic adjustment	
Rear brake	Type	Drum (Leading-trailing type)	
	Effective drum diameter	228.6 mm (9 in)	
	Effective cylinder diameter	19.05 mm (0.7500 in)	
	Lining dimensions (length × width × thickness)	218.8 × 35.0 × 4.1 mm (8.61 × 1.378 × 0.161 in)	
	Clearance adjustment	Automatic adjustment	
Master cylinder	Type	Tandem	
	Effective diameter	23.81 mm (0.9374 in)	25.40 mm (1 in)
	Reservoir type	Sealed type	
	Brake fluid reservoir capacity	205 cm ³ (12.51 cu in)	
Brake booster	Type	Vacuum suspended	
	Effective diameter	230 mm (9.06 in)	180 + 205 mm (7.09 + 8.07 in)
Proportioning valve	Split point	2,942 kPa (30.0 kg/cm ² , 427 psi)	
	Reducing ratio	0.4	
Brake line		Dual circuit system	
Brake fluid CAUTION: ● Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. ● When brake fluid is supplemented, be careful not to allow any dust into the reservoir. ● Use fresh DOT3 or 4 brake fluid when replacing or refilling the fluid.		FMVSS No. 116, DOT3 or DOT4	

NOTE:

Refer to “PB” section for parking brake SPECIFICATIONS.

GENERAL DESCRIPTION

Brake

	Engine (cc)	2500
	Driving system	AWD
		With ABS
Front brake	Type	Disc (Floating type, ventilated)
	Effective disc diameter	228 mm (8.98 in)
	Disc thickness × Outer diameter	24 × 277 mm (0.94 × 10.91 in)
	Effective cylinder diameter	42.8 mm (1.685 in) × 2
	Pad dimensions (length × width × thickness)	112.3 × 50.0 × 11.0 mm (4.42 × 1.969 × 0.433 in)
	Clearance adjustment	Automatic adjustment
Rear brake	Type	Disc (Floating type)
	Effective disc diameter	230 mm (9.06 in)
	Disc thickness × Outer diameter	10 × 266 mm (0.39 × 10.47 in)
	Effective cylinder diameter	38.1 mm (1.500 in)
	Pad dimensions (length × width × thickness)	92.4 × 33.7 × 10.0 mm (3.638 × 1.327 × 0.394 in)
	Clearance adjustment	Automatic adjustment
Master cylinder	Type	Tandem
	Effective diameter	25.40 mm (1 in)
	Reservoir type	Sealed type
	Brake fluid reservoir capacity	205 cm ³ (12.51 cu in)
Brake booster	Type	Vacuum suspended
	Effective diameter	180 + 205 mm (7.09 + 8.07 in)
Proportioning valve	Split point	2,942 kPa (30.0 kg/cm ² , 427 psi)
	Reducing ratio	0.4
Brake line		Dual circuit system
Brake fluid CAUTION: ● Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. ● When brake fluid is supplemented, be careful not to allow any dust into the reservoir. ● Use fresh DOT3 or 4 brake fluid when replacing or refilling the fluid.		FMVSS No. 116, DOT3 or DOT4

NOTE:

Refer to “PB” section for parking brake SPECIFICATIONS.

GENERAL DESCRIPTION

Brake

ITEM		STANDARD	SERVICE LIMIT
Front brake	Pad thickness (including back metal)	17 mm (0.67 in)	7.5 mm (0.295 in)
	Disc thickness	24 mm (0.94 in)	22 mm (0.87 in)
	Disc runout	—	0.075 mm (0.0030 in)
Rear brake (Disc type)	Pad thickness (including back metal)	15 mm (0.59 in)	6.5 mm (0.256 in)
	Disc thickness	10 mm (0.39 in)	8.5 mm (0.335 in)
	Disc runout	—	0.1 mm (0.004 in)
Rear brake (Drum type)	Inside diameter	228.6 mm (9 in)	230.6 mm (9.08 in)
	Lining thickness	4.1 mm (0.161 in)	1.5 mm (0.059 in)
Rear brake (Disc type parking)	Inside diameter	170 mm (6.69 in)	171 mm (6.73 in)
	Lining thickness	3.2 mm (0.126 in)	1.5 mm (0.059 in)

			Without ABS	With ABS
Brake booster	Brake fluid pressure without engine running	Brake pedal force	Fluid pressure	
		147 N (15 kgf, 33 lb)	785 kPa (8 kg/cm ² , 114 psi)	588 kPa (6 kg/cm ² , 85 psi)
	Brake fluid pressure with engine running and vacuum at 66.7 kPa (500 mmHg, 19.69 inHg)	294 N (30 kgf, 66 lb)	2,158 kPa (22 kg/cm ² , 313 psi)	1,863 kPa (19 kg/cm ² , 270 psi)
		147 N (15 kgf, 33 lb)	5,492 kPa (56 kg/cm ² , 796 psi)	5,394 kPa (55 kg/cm ² , 782 psi)
		294 N (30 kgf, 66 lb)	8,434 kPa (86 kg/cm ² , 1,223 psi)	9,219 kPa (94 kg/cm ² , 1,337 psi)

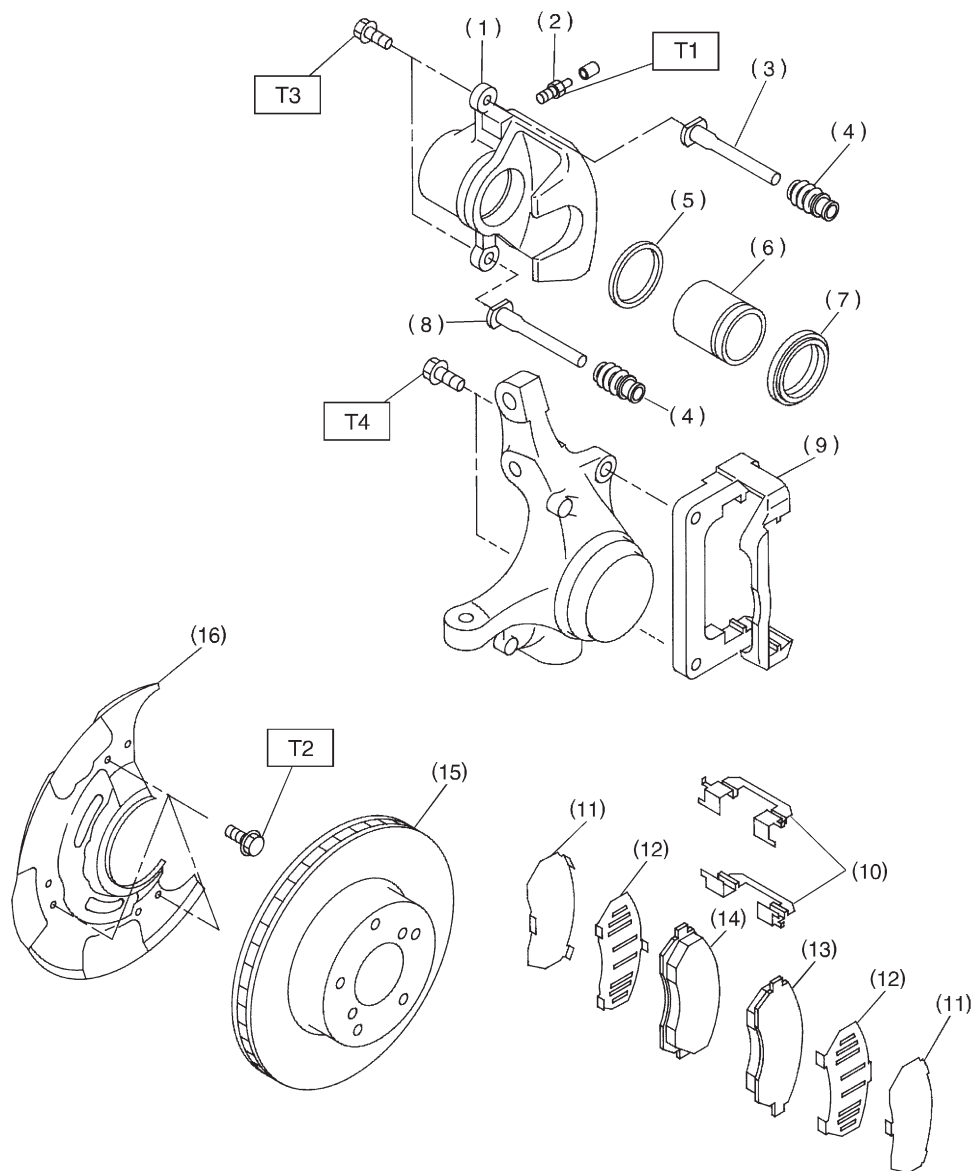
Brake pedal	Free play	1 — 3 mm (0.04 — 0.12 in) [Depress brake pedal pad with a force of less than 10 N (1 kgf, 2 lb).]
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B: COMPONENT

S405001A05

1. 14 inch TYPE

S405001A0501



B4M1208C

- | | |
|-----------------------|--------------------|
| (1) Caliper body | (9) Support |
| (2) Air bleeder screw | (10) Pad clip |
| (3) Guide pin (Green) | (11) Outer shim |
| (4) Pin boot | (12) Inner shim |
| (5) Piston seal | (13) Pad (Outside) |
| (6) Piston | (14) Pad (Inside) |
| (7) Piston boot | (15) Disc rotor |
| (8) Lock pin (Yellow) | (16) Disc cover |

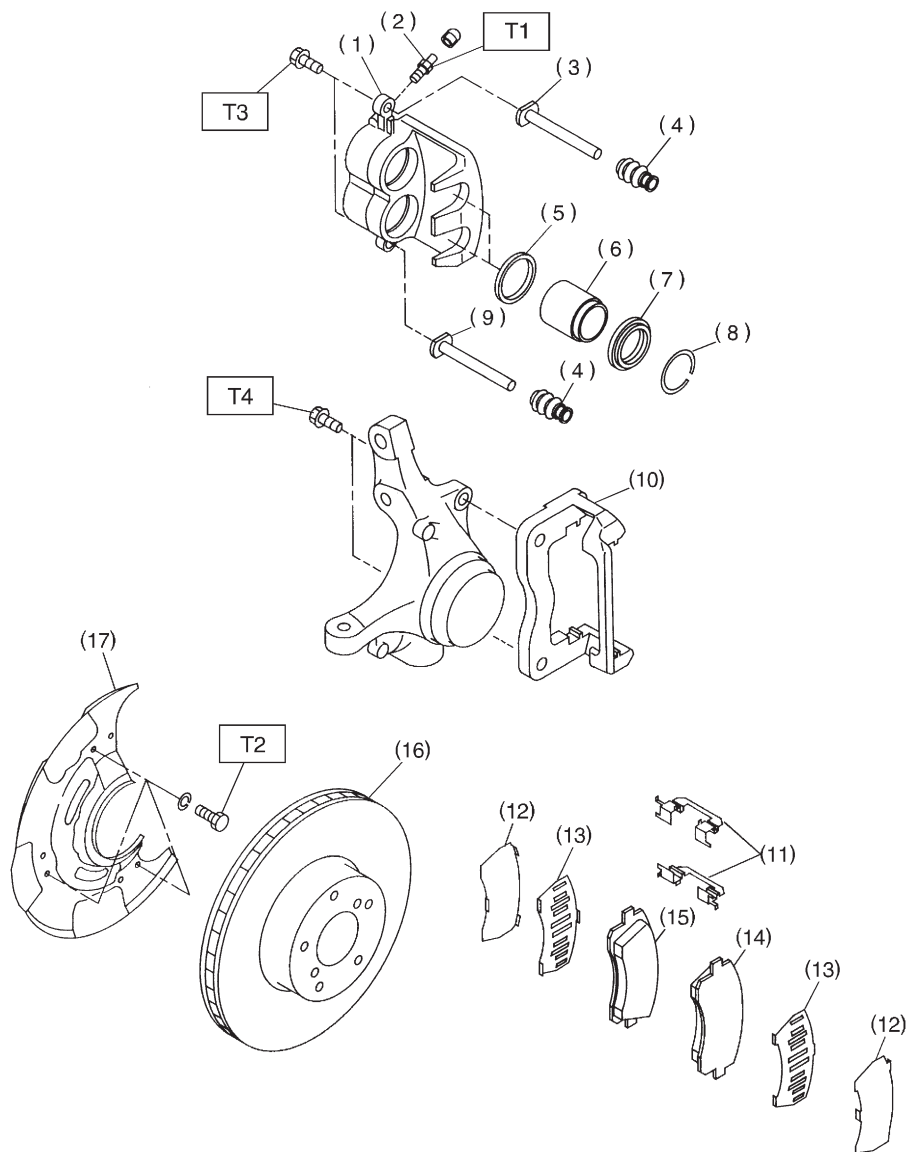
Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.8)

T2: 18 (1.8, 13.0)

T3: 37 (3.8, 27.5)

T4: 78 (8.0, 58)

2. 15 inch AND 16 inch TYPE S405001A0502

B4M1151C

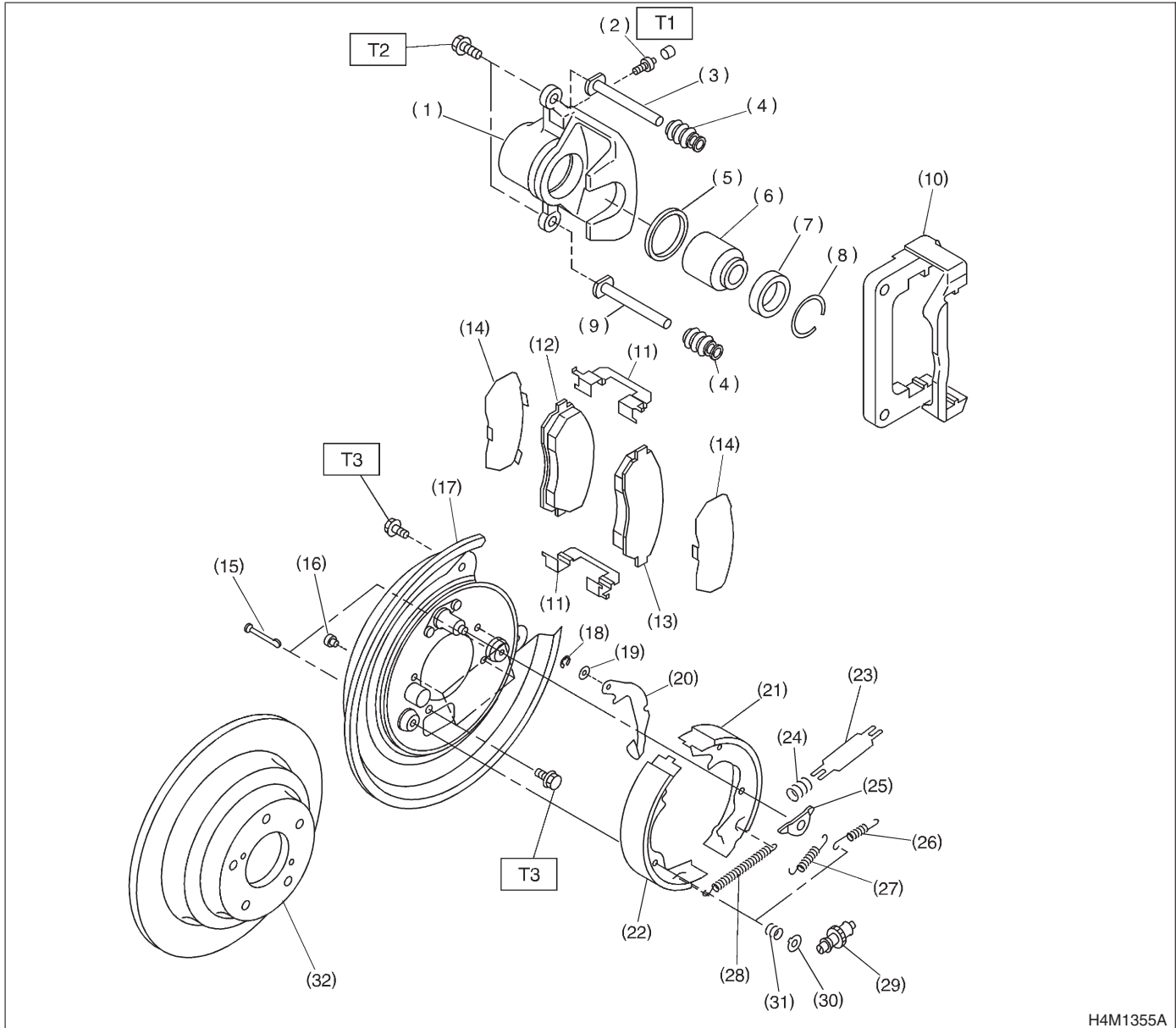
- (1) Caliper body
- (2) Air bleeder screw
- (3) Guide pin (Green)
- (4) Pin boot
- (5) Piston seal
- (6) Piston
- (7) Piston boot
- (8) Boot ring

- (9) Lock pin (Yellow)
- (10) Support
- (11) Pad clip
- (12) Outer shim
- (13) Inner shim
- (14) Pad (Outside)
- (15) Pad (Inside)
- (16) Disc rotor

- (17) Disc cover

Tightening torque: N·m (kgf-m, ft-lb)
T1: 8 (0.8, 5.8)**T2: 18 (1.8, 13.0)****T3: 37 (3.8, 27.5)****T4: 78 (8.0, 58)**

3. REAR DISC BRAKE S405001A0503



H4M1355A

- | | | |
|-----------------------|-------------------------------------|---------------------------------|
| (1) Caliper body | (14) Shim | (27) Primary shoe return spring |
| (2) Air bleeder screw | (15) Shoe hold-down pin | (28) Adjusting spring |
| (3) Guide pin (Green) | (16) Cover | (29) Adjuster |
| (4) Pin boot | (17) Back plate | (30) Shoe hold-down cup |
| (5) Piston seal | (18) Retainer | (31) Shoe hold-down spring |
| (6) Piston | (19) Spring washer | (32) Disc rotor |
| (7) Piston boot | (20) Parking brake lever | |
| (8) Boot ring | (21) Parking brake shoe (Secondary) | |
| (9) Lock pin (Yellow) | (22) Parking brake shoe (Primary) | |
| (10) Support | (23) Strut | |
| (11) Pad clip | (24) Strut shoe spring | |
| (12) Inner pad | (25) Shoe guide plate | |
| (13) Outer pad | (26) Secondary shoe return spring | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.8)

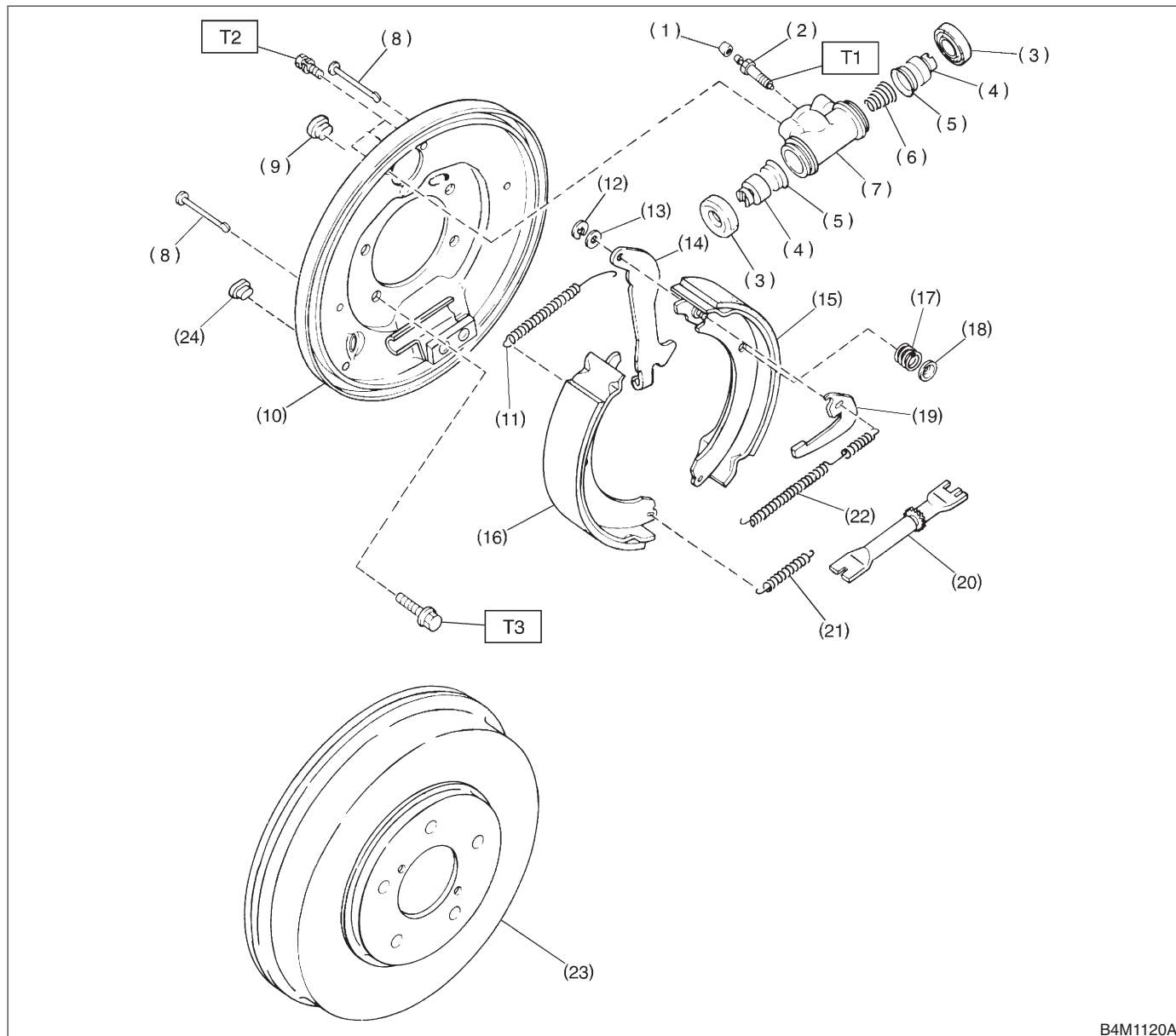
T2: 39 (4.0, 28.9)

T3: 52 (5.3, 38.3)

GENERAL DESCRIPTION

Brake

4. REAR DRUM BRAKE S405001A0504



B4M1120A

- | | | |
|-------------------------|-------------------------------|-------------------------------|
| (1) Air bleeder cap | (11) Upper shoe return spring | (21) Lower shoe return spring |
| (2) Air bleeder screw | (12) Retainer | (22) Adjusting spring |
| (3) Boot | (13) Washer | (23) Drum |
| (4) Piston | (14) Parking brake lever | (24) Plug |
| (5) Cup | (15) Brake shoe (Trailing) | |
| (6) Spring | (16) Brake shoe (Leading) | |
| (7) Wheel cylinder body | (17) Shoe hold-down spring | |
| (8) Pin | (18) Cup | |
| (9) Plug | (19) Adjusting lever | |
| (10) Back plate | (20) Adjuster | |

Tightening torque: N·m (kgf-m, ft-lb)

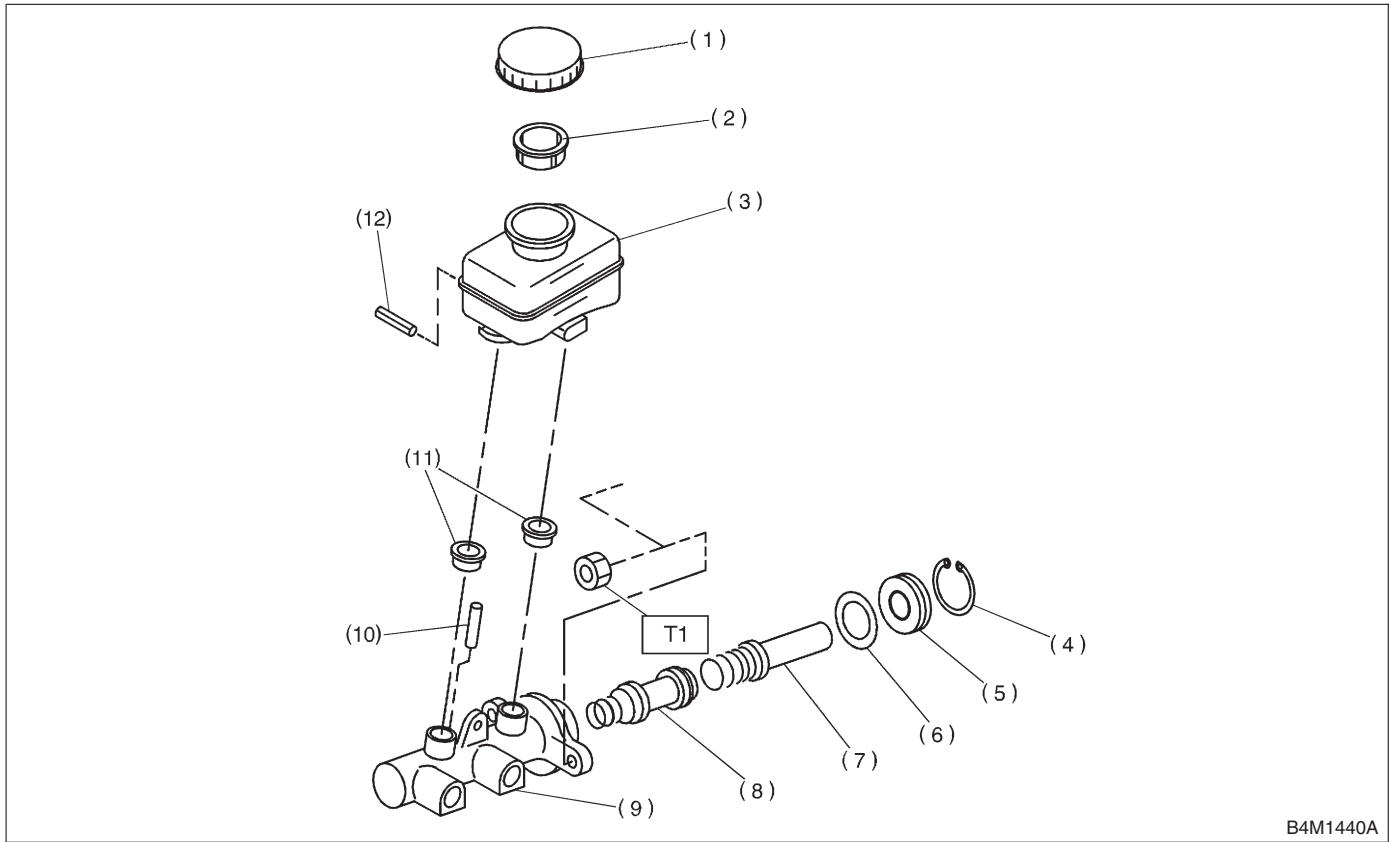
T1: 8 (0.8, 5.8)

T2: 10 (1.0, 7.2)

T3: 52 (5.3, 38.3)

5. MASTER CYLINDER S405001A0505

● With ABS vehicles



B4M1440A

- | | | |
|--------------------|----------------------|-----------|
| (1) Cap | (6) Plate | (11) Seal |
| (2) Filter | (7) Primary piston | (12) Pin |
| (3) Reservoir tank | (8) Secondary piston | |
| (4) C-ring | (9) Cylinder body | |
| (5) Guide ASSY | (10) Cylinder pin | |

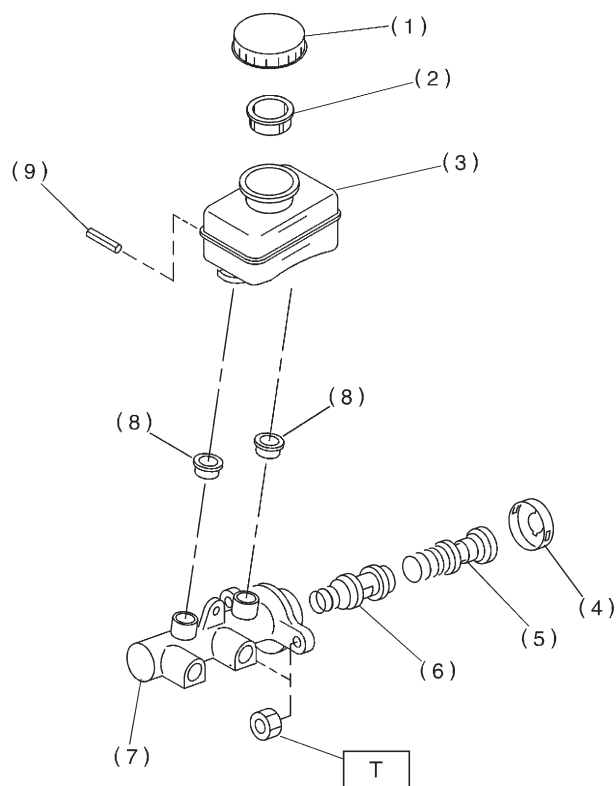
Tightening torque: N·m (kgf-m, ft-lb)

T1: 14 (1.4, 10.1)

GENERAL DESCRIPTION

Brake

● Without ABS vehicles



- (1) Cap
- (2) Filter
- (3) Reservoir tank
- (4) Piston retainer

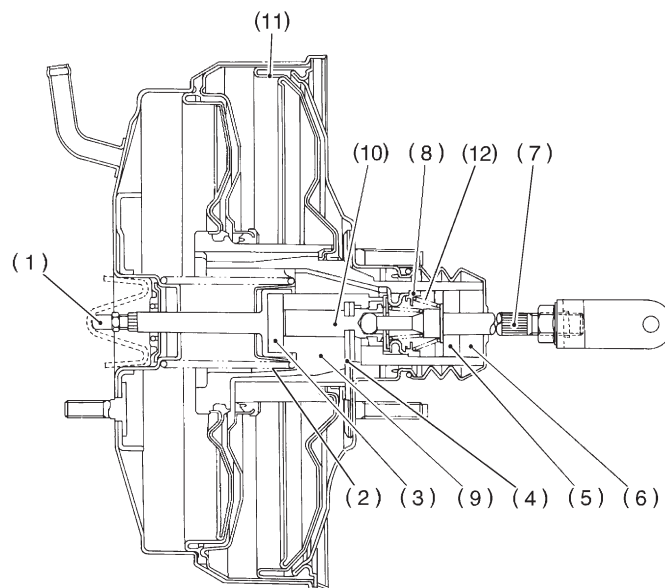
- (5) Primary piston
- (6) Secondary piston
- (7) Cylinder body
- (8) Seal

- (9) Pin

Tightening torque: N·m (kgf-m, ft-lb)
T1: 14 (1.4, 10.1)

6. BRAKE BOOSTER S405001A0507

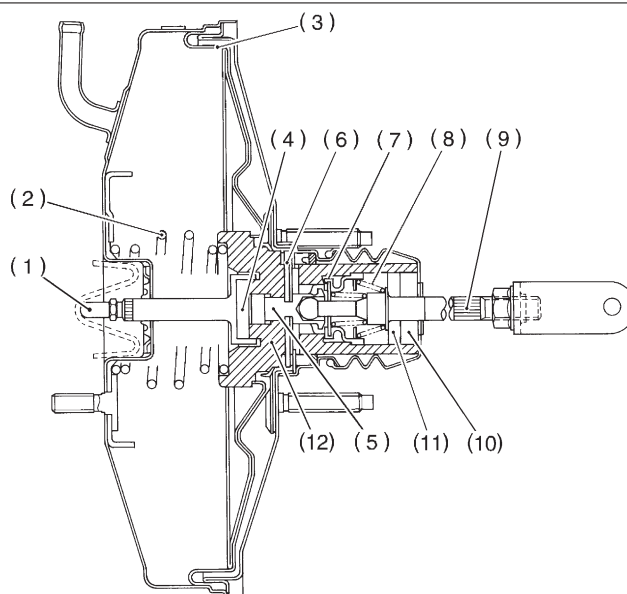
● Models with ABS



B4M1121A

- | | | |
|-------------------|-------------------|--------------------------|
| (1) Push rod | (5) Filter | (9) Valve body |
| (2) Return spring | (6) Silencer | (10) Plunger valve |
| (3) Reaction disc | (7) Operating rod | (11) Diaphragm plate |
| (4) Key | (8) Poppet valve | (12) Valve return spring |

● Models without ABS



B4M1122A

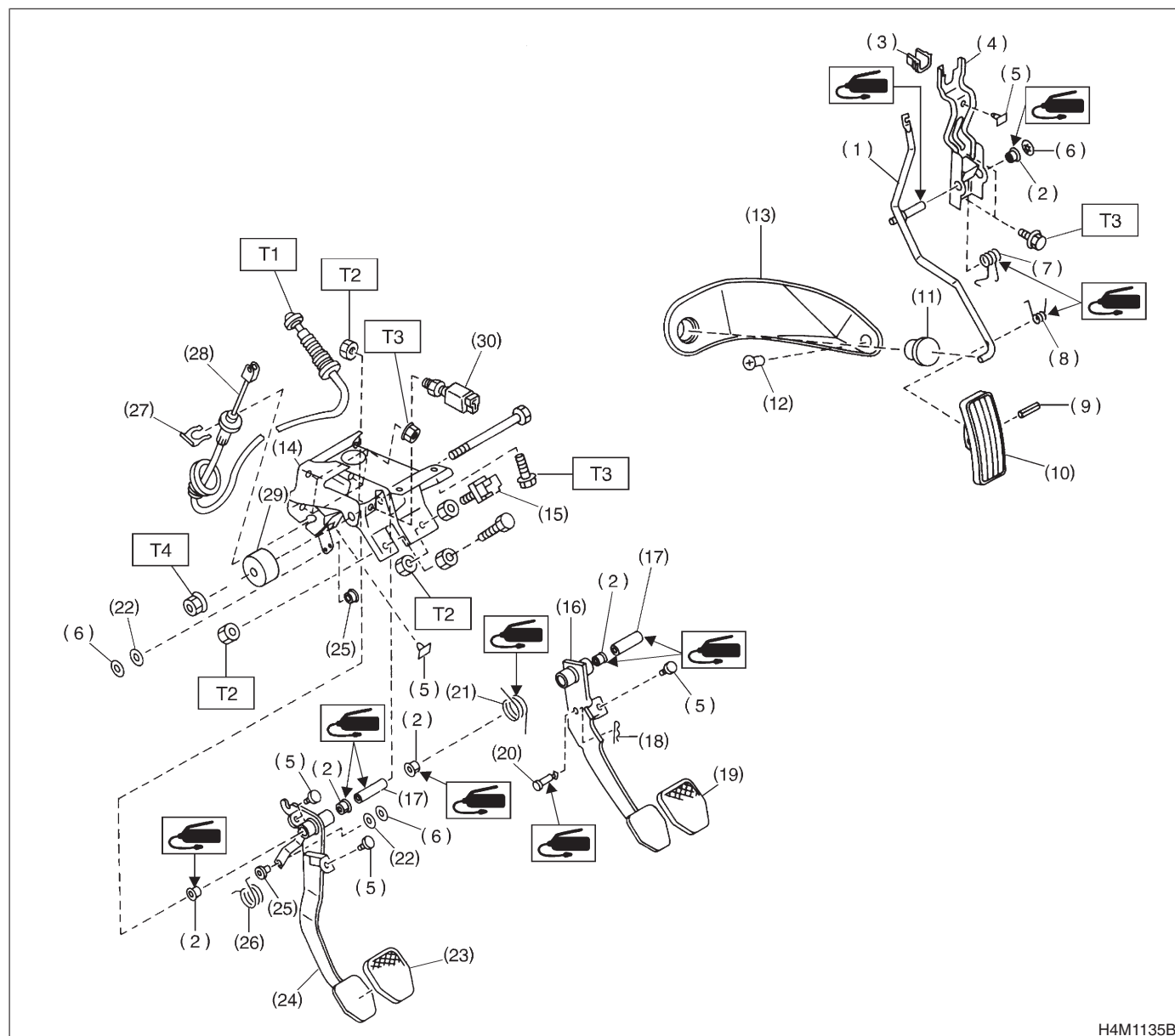
- | | | |
|---------------------|-------------------------|-------------------|
| (1) Push rod | (5) Plunger valve | (9) Operating rod |
| (2) Return spring | (6) Key | (10) Silencer |
| (3) Diaphragm plate | (7) Poppet valve | (11) Filter |
| (4) Reaction disc | (8) Valve return spring | (12) Valve body |

GENERAL DESCRIPTION

Brake

7. BRAKE PEDAL FOR MT MODEL S405001A0508

● 2200 cc Model



H4M1135B

- | | | |
|------------------------------|-------------------------|--|
| (1) Accelerator pedal | (14) Pedal bracket | (27) Clutch cable clamp |
| (2) Bushing | (15) Stop light switch | (28) Clutch cable |
| (3) Holder | (16) Brake pedal | (29) Mass damper |
| (4) Accelerator bracket | (17) Spacer | (30) Clutch switch (Starter interlock) |
| (5) Stopper | (18) Snap pin | |
| (6) Clip | (19) Brake pedal pad | |
| (7) Accelerator spring | (20) Clevis pin | |
| (8) Accelerator pedal spring | (21) Brake pedal spring | |
| (9) Spring pin | (22) Washer | |
| (10) Accelerator pedal pad | (23) Clutch pedal pad | |
| (11) Accelerator stopper | (24) Clutch pedal | |
| (12) Clip | (25) Bushing assist | |
| (13) Accelerator plate | (26) Spring assist | |

Tightening torque: N·m (kgf-m, ft-lb)

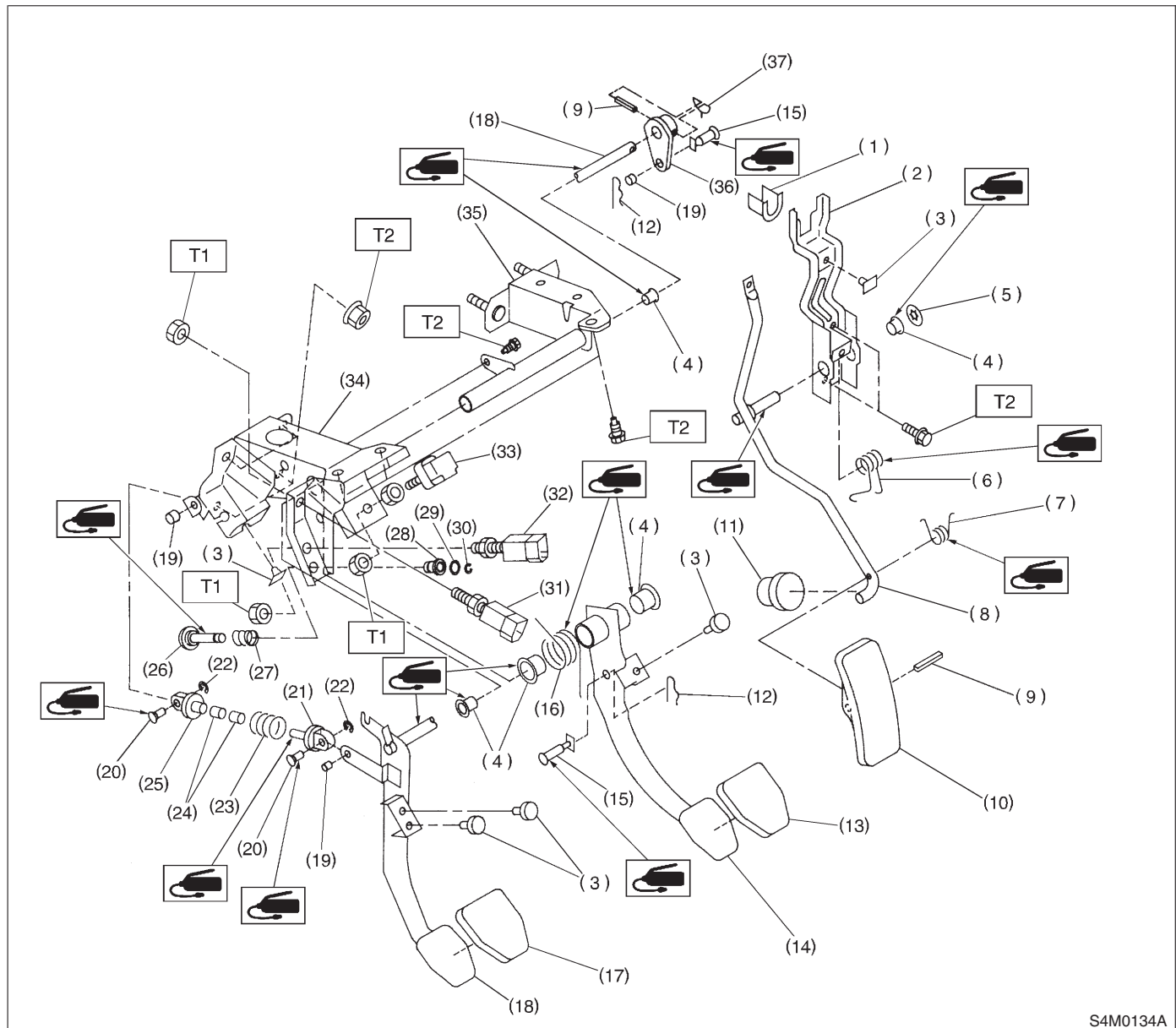
T1: 5.9 (0.60, 4.3)

T2: 8 (0.8, 5.8)

T3: 18 (1.8, 13.0)

T4: 29 (3.0, 21.7)

● 2500 cc Model



S4M0134A

- | | | |
|------------------------------|-------------------------|--|
| (1) Holder | (16) Brake pedal spring | (31) Clutch switch (Starter interlock) |
| (2) Accelerator bracket | (17) Clutch pedal pad | (32) Clutch switch (With cruise control) |
| (3) Stopper | (18) Clutch pedal | (33) Stop light switch |
| (4) Bushing | (19) Bushing C | (34) Pedal bracket |
| (5) Clip | (20) Clutch clevis pin | (35) Clutch master cylinder bracket |
| (6) Accelerator spring | (21) Assist rod A | (36) Lever |
| (7) Accelerator pedal spring | (22) Clip | (37) Lock wire |
| (8) Accelerator pedal | (23) Assist spring | |
| (9) Spring pin | (24) Assist bushing | |
| (10) Accelerator pedal pad | (25) Assist rod B | |
| (11) Accelerator stopper | (26) Rod S | |
| (12) Snap pin | (27) Spring S | |
| (13) Brake pedal pad | (28) Bushing S | |
| (14) Brake pedal | (29) O-ring | |
| (15) Clevis pin | (30) Clip | |

Tightening torque: N·m (kgf-m, ft-lb)

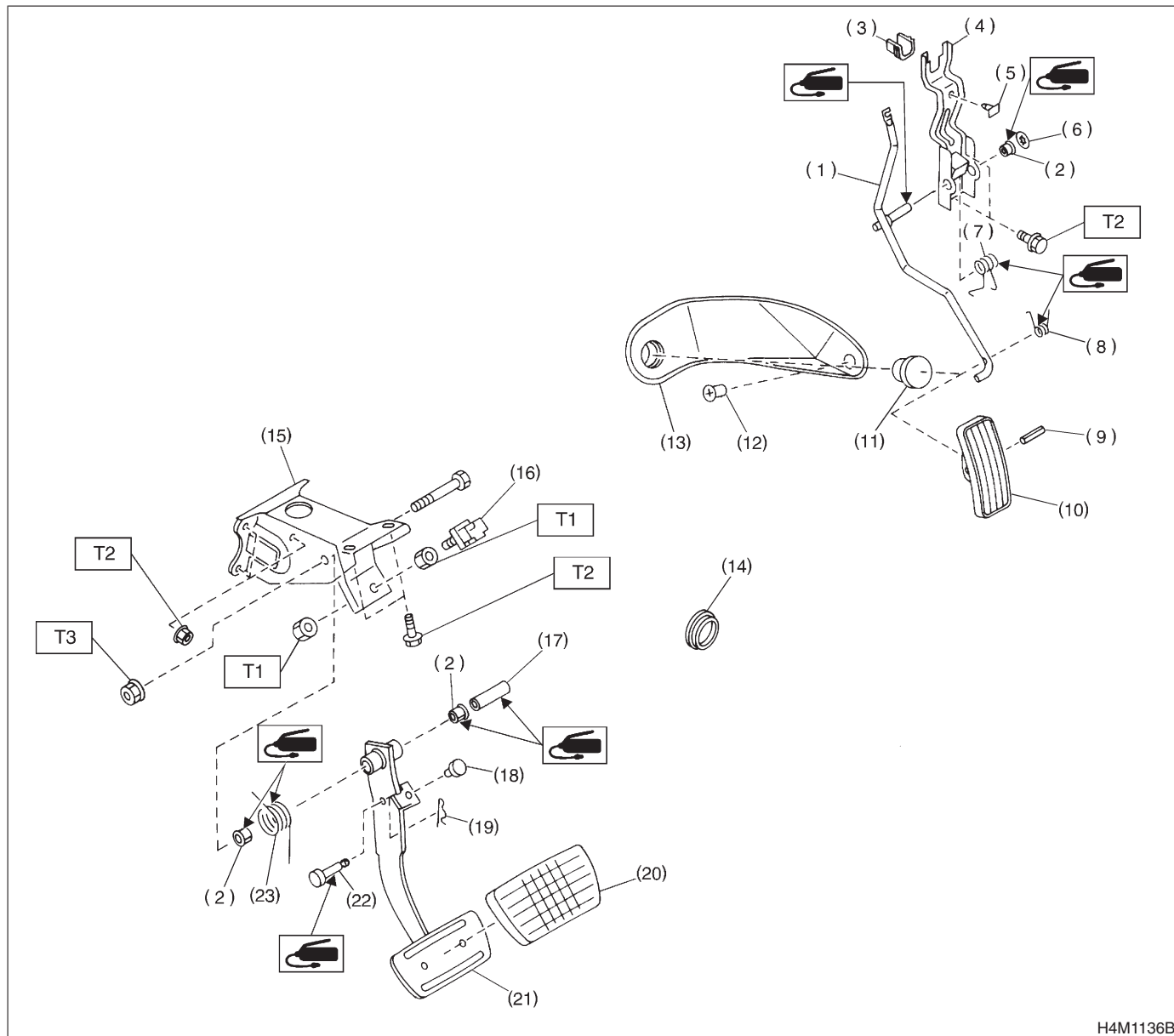
T1: 8 (0.8, 5.8)

T2: 18 (1.8, 13.0)

GENERAL DESCRIPTION

Brake

8. BRAKE PEDAL FOR AT MODEL S405001A0509



H4M1136B

- (1) Accelerator pedal
- (2) Bushing
- (3) Holder
- (4) Accelerator bracket
- (5) Stopper
- (6) Clip
- (7) Accelerator spring
- (8) Accelerator pedal spring
- (9) Spring pin
- (10) Accelerator pedal

- (11) Accelerator stopper
- (12) Clip
- (13) Accelerator plate
- (14) Plug
- (15) Pedal bracket
- (16) Stop light switch
- (17) Spacer
- (18) Stopper
- (19) Snap pin
- (20) Brake pedal pad

- (21) Brake pedal
- (22) Clevis pin
- (23) Brake pedal spring

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.8)

T2: 18 (1.8, 13.0)

T3: 29 (3.0, 21.7)

C: CAUTION S405001A03

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part in the vehicle is hot after running.
- Use SUBARU genuine grease etc. or the equivalent. Do not mix grease etc. with that of another grade or from other manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Apply grease onto sliding or revolution surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of grease to avoid damage and deformation
- Before securing a part on a vice, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vice.
- Do not put fluid on body. If the body is tainted, wash away with water.

1. SPECIAL TOOL *S405001A1703*

2. GENERAL TOOL S405001A1704

BR-16

10. Master Cylinder S405168

A: REMOVAL S405168A18

- 1) Thoroughly drain brake fluid from reservoir tank.
- 2) Disconnect fluid level indicator harness connector.
- 3) Remove brake pipes from master cylinder.
- 4) Remove master cylinder mounting nuts, and take out master cylinder from brake booster.

CAUTION:

Be extremely careful not to spill brake fluid. Brake fluid spilt on the vehicle body will harm the painted surface; wipe it off quickly if spilt.

B: INSTALLATION S405168A11

To install the master cylinder to the body, reverse the sequence of removal procedure.

Tightening torque:

Master cylinder mounting nut
14 N·m (1.4 kgf-m, 10.1 ft-lb)

Piping flare nut
15 N·m (1.5 kgf-m, 10.8 ft-lb)

CAUTION:

Be sure to use recommended brake fluid.

C: DISASSEMBLY S405168A06

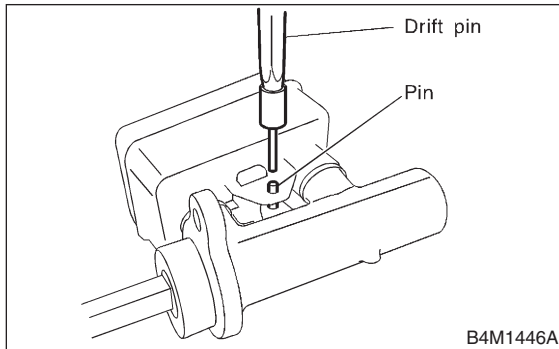
1. PRECAUTIONS FOR DISASSEMBLING

S405168A0602

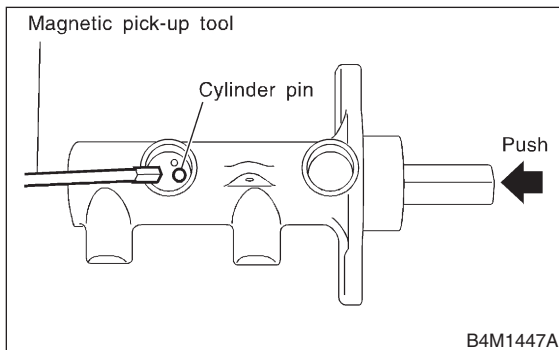
- 1) Remove mud and dirt from the surface of brake master cylinder.
- 2) Prepare tools necessary for disassembly operation, and arrange them neatly on work bench.
- 3) Clean work bench.

2. DISASSEMBLING PROCEDURE S405168A0603

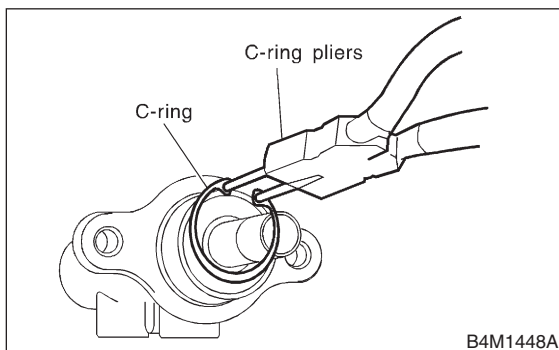
- 1) Remove pin with drift pin which secures reserve tank to master cylinder.



- 2) Remove cylinder pin with magnetic pick-up tool while pushing in primary piston.



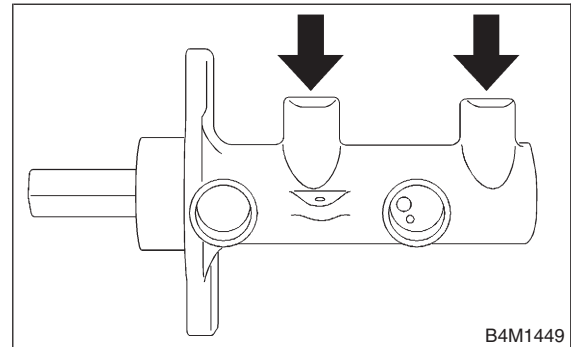
- 3) Remove C-ring with C-ring pliers.



- 4) Gradually supply compressed air via inlet of master cylinder to force piston out.

CAUTION:

- Piston may jump out from master cylinder.
- Do not apply excessively high-pressure.



CAUTION:

- Do not disassemble the piston assembly; otherwise, the spring set value may be changed.
- Use brake fluid or methanol to wash inside wall of cylinder, pistons and piston cups. Be careful not to damage parts when washing. If methanol is used for washing, do not dip rubber parts, such as piston cups, in it for more than 30 seconds; otherwise, they may become swelled.

D: ASSEMBLY S405168A02

1. PRECAUTIONS FOR ASSEMBLING S405168A0201

- 1) When assembling, be sure to use recommended brake fluid.
- 2) Ensure that the inside wall of cylinder, pistons, and piston cups are free from dirt when assembling.
- 3) Be extremely careful not to damage, scratch, or dent cylinder inside wall, pistons, and piston cups.
- 4) Do not drop parts. Never attempt to use any part that has been dropped accidentally.

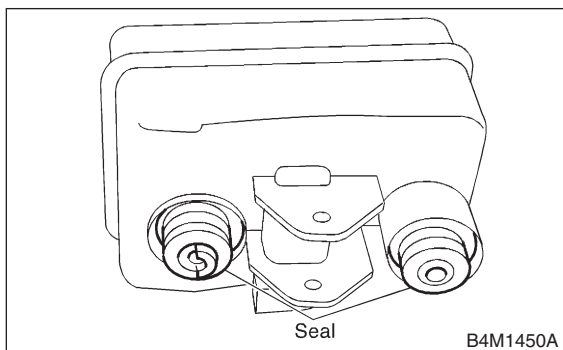
2. ASSEMBLING PROCEDURE S405168A0202

- 1) Assembling piston assembly:
Apply recommended brake fluid to inside wall of cylinder, and to outer surface of piston assembly, and install piston assemblies carefully into cylinder.
- 2) Assemble cylinder pin by pushing in primary piston.
- 3) Assemble plate and guide assembly.
- 4) Assemble C-ring.

CAUTION:

After assembling, ensure that the C-ring is fitted securely in the ring groove.

- 5) Install seal to reservoir tank.



- 6) Install pin with drift pins which secures reservoir tank to master cylinder.

E: INSPECTION S405168A10

If any damage, deformation, wear, swelling, rust, and other faults are found on the primary piston assembly, secondary piston assembly, supply valve stopper, or gasket, replace the faulty part.

CAUTION:

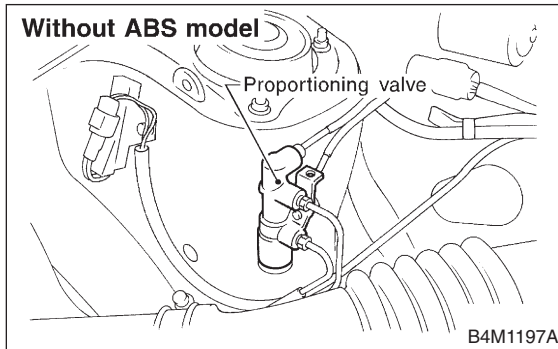
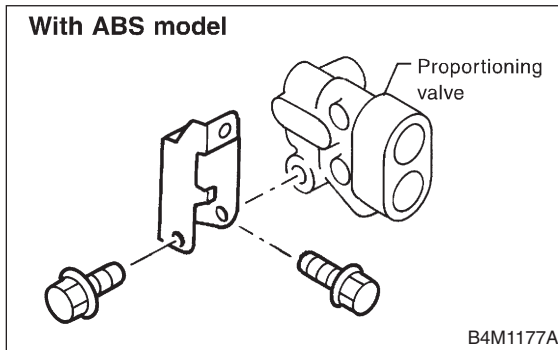
- The primary and secondary pistons must be replaced as complete assemblies.
- The service limit of the clearance between each piston and the master cylinder inner dia. is 0.11 mm (0.0043 in).
- When handling parts, be extremely careful not to damage or scratch the parts, or let any foreign matter get on them.

12. Proportioning Valve

S405167

A: REMOVAL

S405167A18



- 1) Remove brake pipe from proportioning valve at four places.
- 2) Remove proportioning valve from its bracket.

CAUTION:

Do not disassemble or adjust the proportioning valve. (The proportioning valve must be replaced as an assembly.)

B: INSTALLATION

S405167A11

- 1) Install proportioning valve to bracket.
- 2) Connect brake pipes correctly to proportioning valve.
- 3) Bleed air, then check each joint of brake pipe for oil leaks.

Tightening torque:

Proportioning valve to brake pipe flare nut:

15 N·m (1.5 kgf-m, 10.8 ft-lb)

Proportioning valve to bracket (Normal brake vehicle):

22 N·m (2.25 kgf-m, 16.3 ft-lb)

Proportioning valve to bracket (ABS equipped vehicle):

18 N·m (1.8 kgf-m, 13.0 ft-lb)

C: INSPECTION

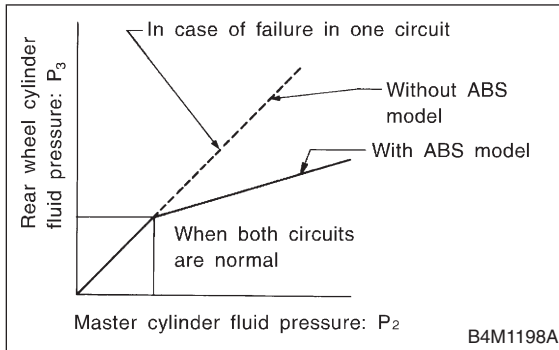
S405167A10

1) Install the oil pressure gauges to measure the master cylinder fluid pressure (front wheel brake fluid pressure) and rear wheel cylinder fluid pressure.

2) Bleed air from the oil pressure gauges.

3) Check the master cylinder fluid pressure and rear wheel cylinder fluid pressure.

The standard values are shown in Figure.

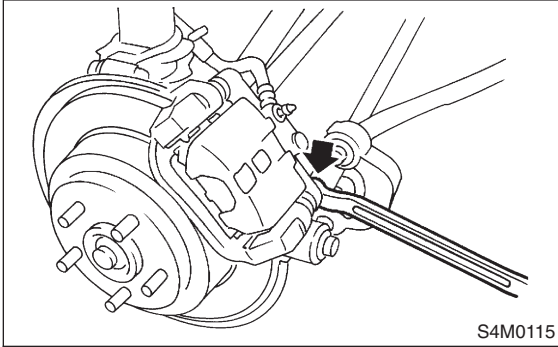


4) For the oil pressure in case of split point, <Ref. to BR-2 SPECIFICATIONS, General Description.>

5. Rear Brake Pad S405175

A: REMOVAL S405175A18

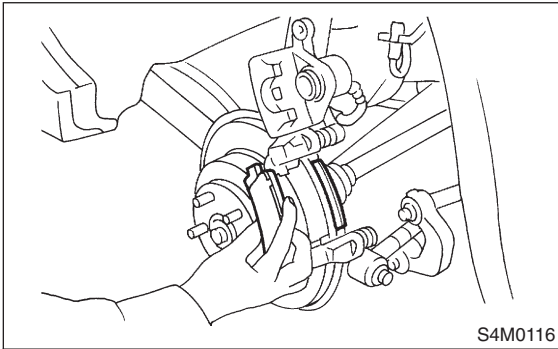
- 1) Remove lock pin.



- 2) Raise caliper body.
- 3) Remove pad from support.

NOTE:

If brake pad is difficult to remove, use the same procedure as for front disc brake pad. <Ref. to BR-17 REMOVAL, Front Brake Pad.>



B: INSTALLATION S405175A11

- 1) Apply thin coat of Molykote AS880N (Part No. 26298AC000) to the frictional portion between pad and pad clip.
- 2) Install pad on support.
- 3) Install caliper body on support.

Tightening torque:

20 N·m (2.0 kgf-m, 14.5 ft-lb)

NOTE:

If it is difficult to push piston during pad replacement, loosen air bleeder to facilitate work.

C: INSPECTION S405175A10

Check pad thickness (including back metal).

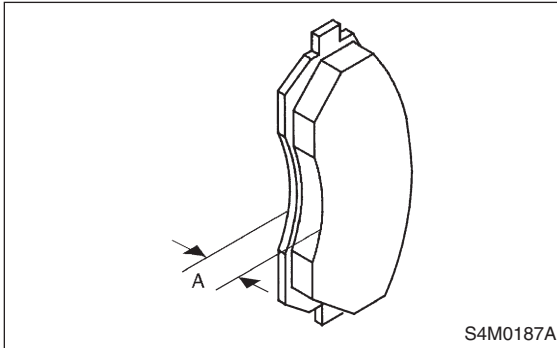
Pad thickness: A

Standard value

15.0 mm (0.591 in)

Wear limit

6.5 mm (0.256 in)



CAUTION:

- Always replace the pads for both the left and right wheels at the same time. Also replace pad clips if they are twisted or worn.
- A wear indicator is provided on the inner disc brake pad. If the pad wears down to such an extent that the end of the wear indicator contacts the disc rotor, a squeaking sound is produced as the wheel rotates. If this sound is heard, replace the pad.
- Replace pad if there is oil or grease on it.

7. Rear Disc Brake Assembly

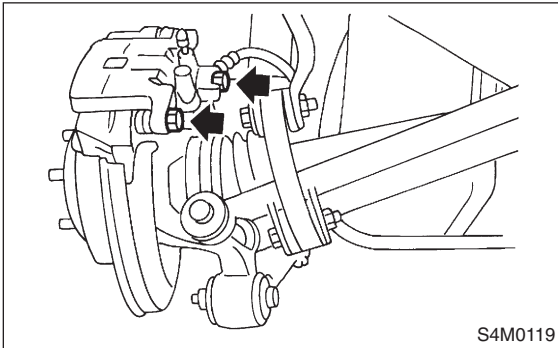
S405172

A: REMOVAL S405172A18

- 1) Lift-up vehicle and remove wheels.
- 2) Disconnect brake hose from caliper body assembly.

CAUTION:

Do not allow brake fluid to come in contact with vehicle body; wipe off completely if spilled.



- 3) Remove lock pin.
- 4) Raise caliper body and move it toward vehicle center to separate it from support.
- 5) Remove support from back plate.

NOTE:

Remove support only when replacing it or the rotor. It need not be removed when servicing caliper body assembly.

- 6) Clean mud and foreign particles from caliper body assembly and support.

CAUTION:

Be careful not to allow foreign particles to enter inlet (at brake hose connector).

B: INSTALLATION S405172A11

- 1) Install disc rotor on hub.
- 2) Install support on back plate.

Tightening torque:

52 N·m (5.3 kgf-m, 38.3 ft-lb)

CAUTION:

- Always replace the pads for both the left and right wheels at the same time. Also replace pad clips if they are twisted or worn.
- A wear indicator is provided on the inner disc brake pad. If the pad wears down to such an extent that the end of the wear indicator contacts the disc rotor, a squeaking sound is produced as the wheel rotates. If this sound is heard, replace the pad.
- Replace pads if there is oil or grease on them.

- 3) Apply thin coat of Molykote AS880N (Part No. 26298AC000) to the frictional portion between pad and pad clip.

- 4) Install pads on support.
- 5) Install caliper body on support.

Tightening torque:

20 N·m (2.0 kgf-m, 14.5 ft-lb)

- 6) Connect brake hose.

Tightening torque:

18 N·m (1.8 kgf-m, 13.0 ft-lb)

CAUTION:

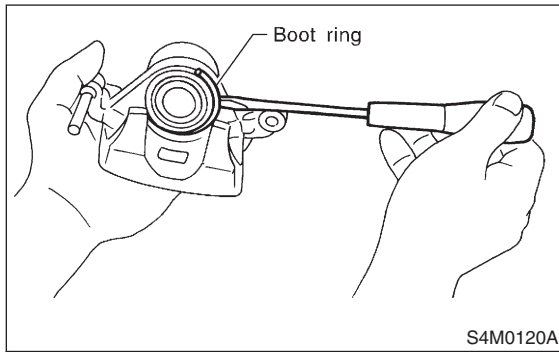
- The brake hose must be connected without any twist.
- Replace brake hose gaskets with new ones.

- 7) Bleed air from brake system.

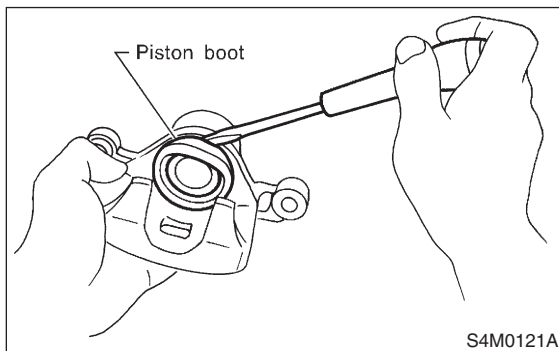
C: DISASSEMBLY

S405172A06

1) Remove the boot ring.



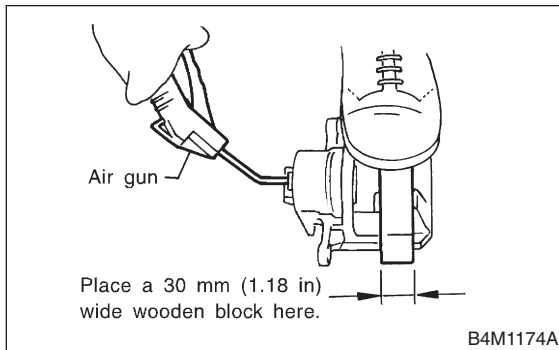
2) Remove the piston boot.



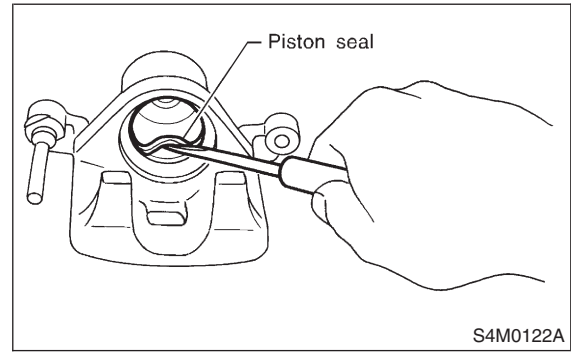
3) Gradually supply compressed air via inlet of caliper body to force piston out.

CAUTION:

- Place a wooden block as shown in Figure to prevent damage to piston.
- Do not apply excessively high-pressure.



4) Remove piston seal from caliper body cylinder.



5) Remove lock pin sleeve and boot from caliper body.

6) Remove guide pin boot.

REAR DISC BRAKE ASSEMBLY

Brake

D: ASSEMBLY S405172A02

- 1) Clean caliper body interior using brake fluid.
- 2) Apply a coat of brake fluid to piston seal and fit piston seal in groove on caliper body.
- 3) Apply a coat of brake fluid to the entire inner surface of cylinder and outer surface of piston.
- 4) Insert piston into cylinder.

CAUTION:

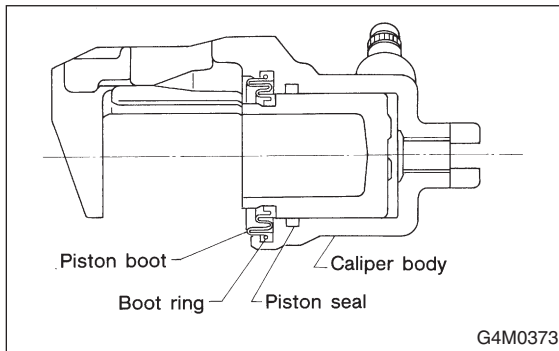
Do not force piston into cylinder.

- 5) Apply a coat of specified grease to boot and fit in groove on ends of cylinder and piston.

Grease

NIGLUBE RX-2 (Part No. 003606000)

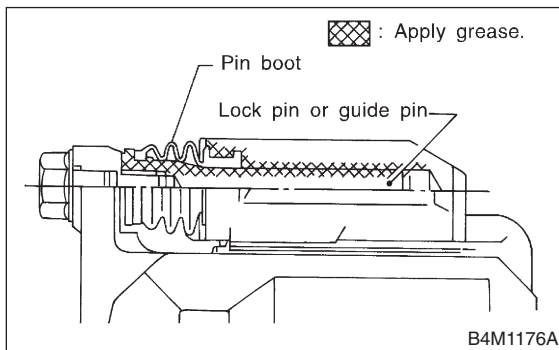
- 6) Install the piston boot to the caliper body, and attach boot ring.



- 7) Apply a coat of specified grease to guide pin, outer surface, sleeve outer surface, cylinder inner surface, and boot grooves.

Grease

NIGLUBE RX-2 (Part No. 003606000)



- 8) Install guide pin boot on caliper body.
- 9) Install lock pin boot on caliper body and insert lock pin sleeve into place.

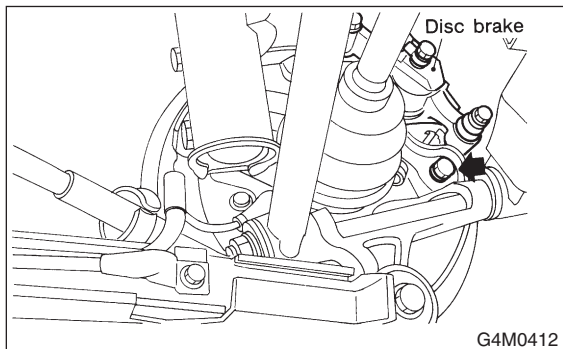
E: INSPECTION S405172A10

- 1) Repair or replace faulty parts.
- 2) Check caliper body and piston for uneven wear, damage or rust.
- 3) Check rubber parts for damage or deterioration.

6. Rear Disc Rotor S405177

A: REMOVAL S405177A18

- 1) Lift-up the vehicle and remove wheels.
- 2) Remove the two mounting bolts and remove the disc brake assembly.

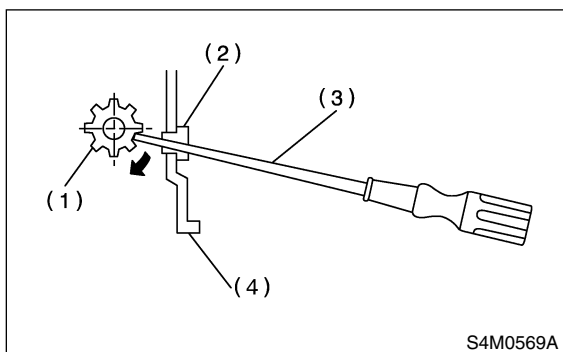


- 3) Suspend the disc brake assembly so that the hose is not stretched.
- 4) Pull down and release the parking brake.
- 5) Remove the disc rotor.

NOTE:

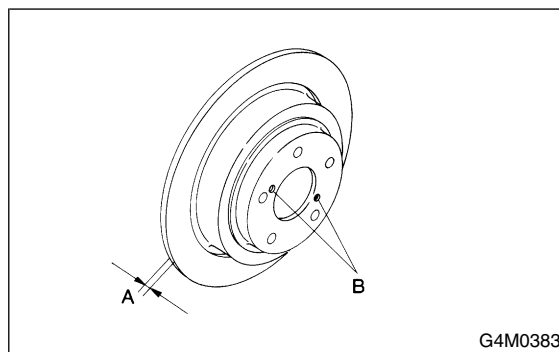
If the disc rotor is difficult to remove, try the following two methods in order.

- (1) Turn the adjusting screw using a slot-type screwdriver until the brake shoe gets away enough from the disc rotor.



- (1) Adjusting screw
- (2) Cover
- (3) Slot-type screwdriver
- (4) Back plate

- (2) If the disc rotor seizes up within hub, drive the disc rotor out by installing an 8-mm bolt in holes B on the rotor.



B: INSTALLATION S405177A11

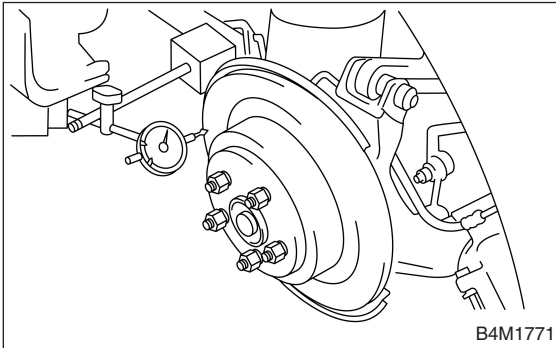
- 1) Install in the reverse order of removal.
- 2) Adjust the parking brake. <Ref. to PB-10, ADJUSTMENT, Parking Brake Assembly (Rear Disc Brake).>

C: INSPECTION S405177A10

1) Set a dial gauge on the disc rotor. Turn the disc rotor to check runout.

CAUTION:

Securely adjust the disc rotor to hub.

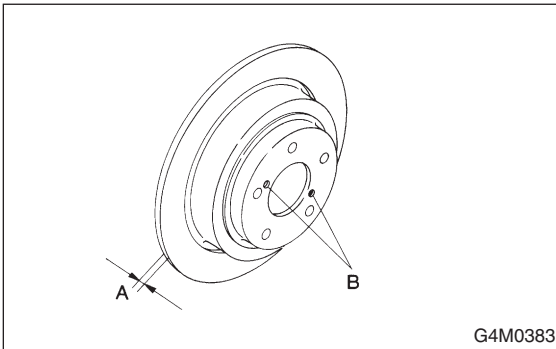


NOTE:

- Make sure the dial gauge is set 10 mm (0.39 in) inward of rotor outer perimeter.
- If the runout of disc rotor exceeds the limit, check for abnormal free play at hub bearing and runout in the thrust direction. <Ref. to DS-29, INSPECTION, Rear Axle.>
If the hub bearing is okay, resurface the disc rotor. After resurfacing, check disc rotor thickness as in step 2.

Disc rotor runout limit:
0.1 mm (0.0040 in)

2) Measure the disc rotor thickness.
If the thickness of disc rotor is below service limit, replace the disc rotor.



NOTE:

Make sure the micrometer is set 10 mm (0.39 in) inward of rotor outer perimeter.

Standard value
10 mm (0.39 in)

Service limit
8.5 mm (0.335 in)

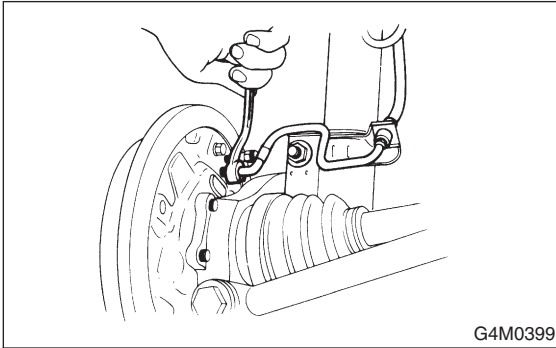
9. Rear Drum Brake Assembly

S405179

A: REMOVAL

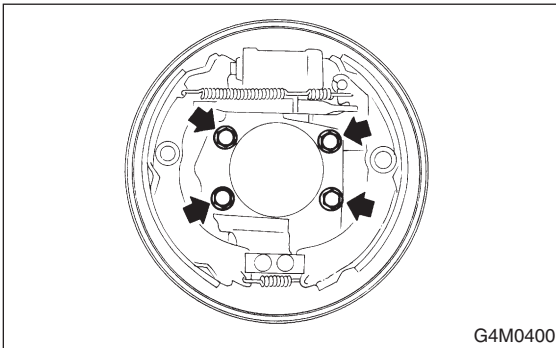
S405179A18

- 1) Remove wheel.
- 2) Remove axle nut.
- 3) Remove brake drum
- 4) Unscrew the brake pipe flare nut and disconnect brake pipe.



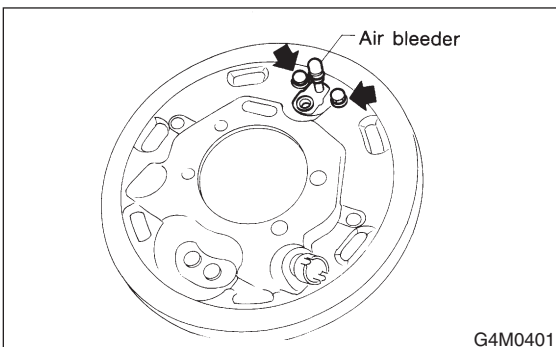
G4M0399

- 5) Remove hub. <Ref. to DS-22 REMOVAL, Rear Axle.>
- 6) Remove the bolts installing back plate, and then, remove brake assembly.



G4M0400

- 7) Remove the bolts installing wheel cylinder on back plate, and remove it.



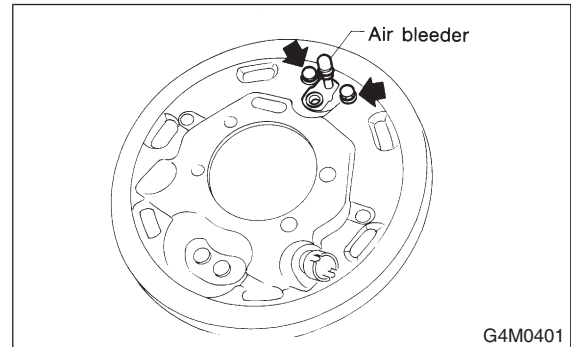
G4M0401

B: INSTALLATION

S405179A11

- 1) Install wheel cylinder on back plate, and tighten bolts.

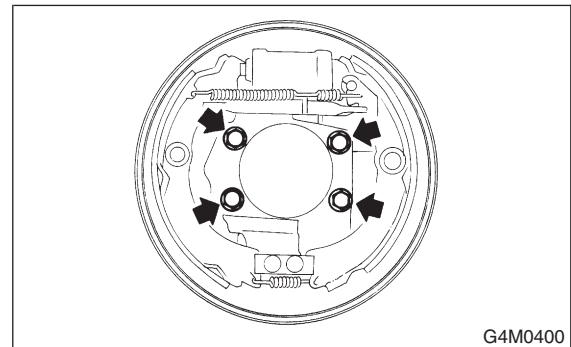
Tightening torque:
10 N·m (1.0 kgf-m, 7.2 ft-lb)



G4M0401

- 2) Install brake assembly on housing, and tighten bolts to install back plate.

Tightening torque:
52 N·m (5.3 kgf-m, 38.3 ft-lb)



G4M0400

- 3) Install hub. <Ref. to DS-25 INSTALLATION, Rear Axle.>
- 4) Connect brake pipe, and tighten brake pipe flange nut.

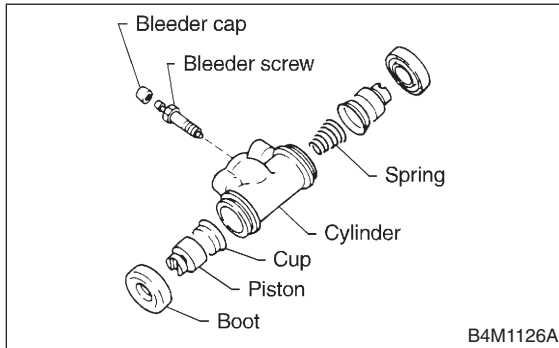
Tightening torque:
14.7 N·m (1.5 kgf-m, 10.8 ft-lb)

- 5) Set the outside diameter of brake shoes less than 0.5 — 0.8 mm (0.020 — 0.031 in) in comparison with the inside diameter of brake drum.
- 6) Install brake drum.
- 7) After installing brake assembly, bleed air from brake line.

C: DISASSEMBLY

S405179A06

- 1) Remove right and left dust boots from wheel cylinder.
- 2) Remove piston, cup, spring and air bleeder screw and cap.



D: ASSEMBLY

S405179A02

- 1) Clean all parts in brake fluid. Check and replace faulty parts.
 - Cup and boot for damage or fatigue
 - Cylinder, piston and spring or damage or rust formation
- 2) Assembly is the reverse order of disassembly.
 - (1) When installing the cup, use ST, apply brake fluid to the frictional surface for smooth installation and pay attention to cup direction.
 - (2) STs are available in different sizes.

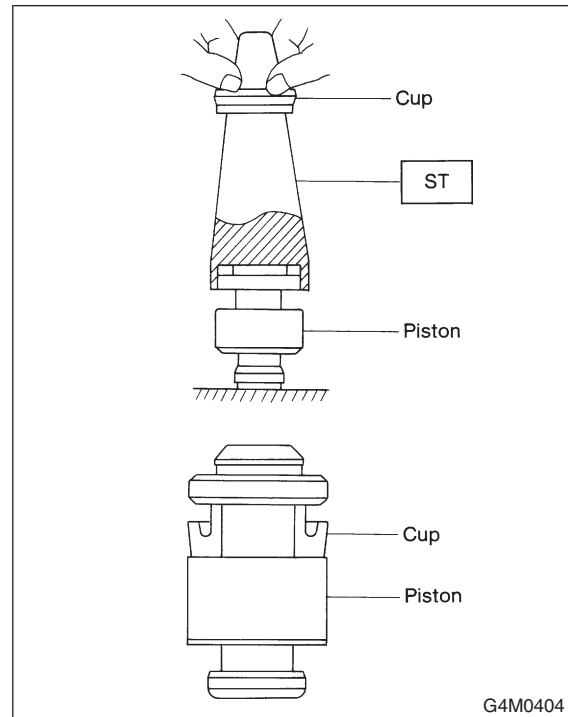
CAUTION:

- When replacing the repair kit, make sure that the sizes of cylinder and cup are the same as those which were replaced.
- Use only the tool of the correct size.

ST: ADAPTER	
Applicable size	Part No.
19.05 mm (3/4 in)	926460000

CAUTION:

While assembling, be careful to prevent any metal chip, dust or dirt from entering the wheel cylinder.



REAR DRUM BRAKE ASSEMBLY

Brake

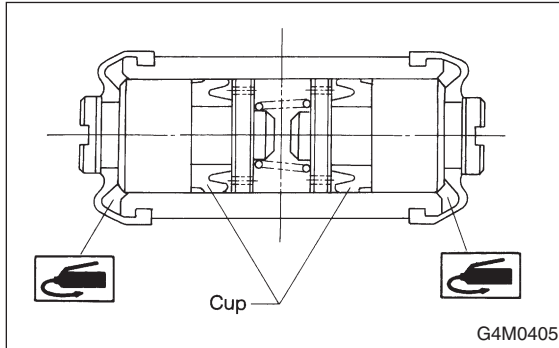
3) Apply rubber grease to the boot inside as shown in Figure.

Grease:

NIGLUBE RX-2 (Part No. 003606000)

CAUTION:

Never use brake grease.



E: INSPECTION

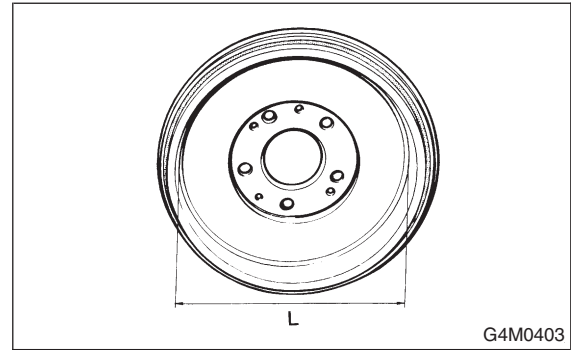
S405179A10

- 1) If the inside surface of brake drum is streaked, correct the surface. And, if it is unevenly worn, taperingly streaked, or the outside surface of brake drum is damaged, correct or replace it.
- 2) Measure the drum inner diameter.

Drum inner diameter: "L"

Standard: 228.6 mm (9 in)

Service limit: 230.6 mm (9.08 in)



- 3) Measure the lining thickness.

Lining thickness:

Standard: 4.1 mm (0.161 in)

Service limit: 1.5 mm (0.059 in)

- 4) If the deformation or wear of back plate, shoe, etc. are notable, replace them.
- 5) When the shoe return spring tension is excessively weakened, replace it, taking care to identify upper and lower springs.

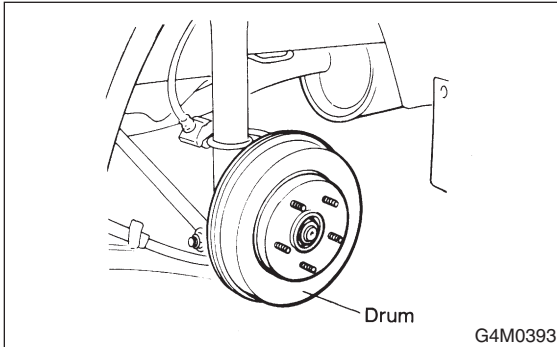
8. Rear Drum Brake Shoe and Drum

S405584

A: REMOVAL

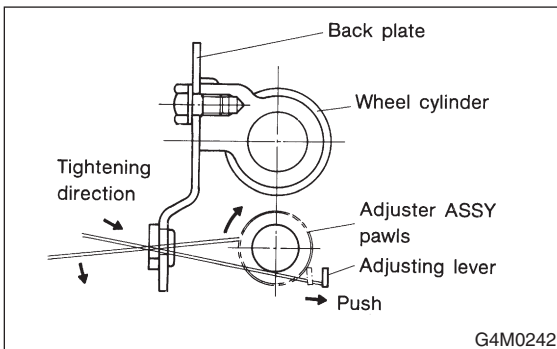
S405584A18

- 1) Loosen wheel nuts, jack-up vehicle, support it with rigid racks, and remove wheel.
- 2) Release parking brake.
- 3) Remove brake drum from brake assembly.

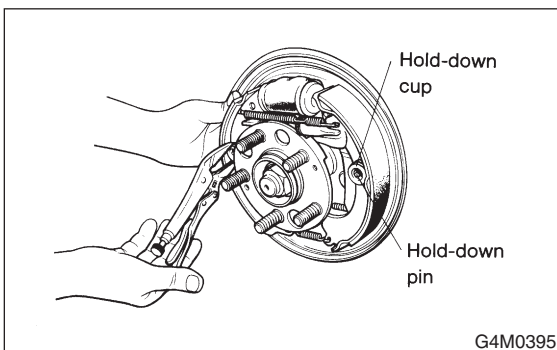


NOTE:

If it is difficult to remove brake drum, remove adjusting hole cover from back plate, and then, turn adjusting screw using a slot-type screwdriver until brake shoe separates from the drum.

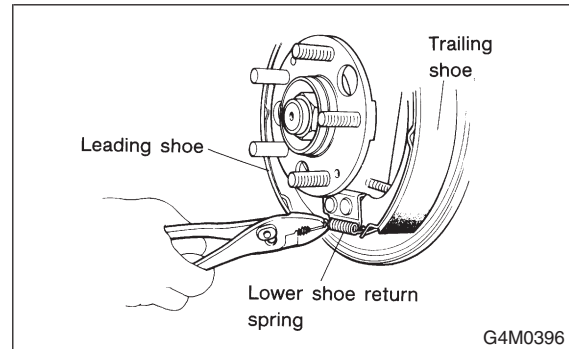


- 4) Hold hold-down pin by securing rear of back plate with your hand.



- 5) Disconnect hold-down cup from hold-down pin by rotating hold-down cup.

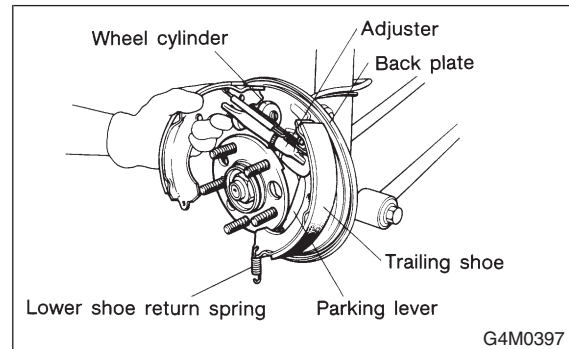
- 6) Disconnect lower shoe return spring from shoes.



- 7) Remove shoes one by one from back plate with adjuster.

CAUTION:

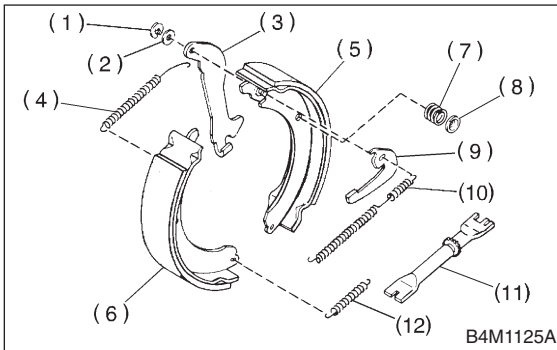
Be careful not to bend parking brake cable excessively when removing brake shoes.



REAR DRUM BRAKE SHOE AND DRUM

Brake

- 8) Disconnect parking brake cable from parking lever.
- 9) Remove the following.



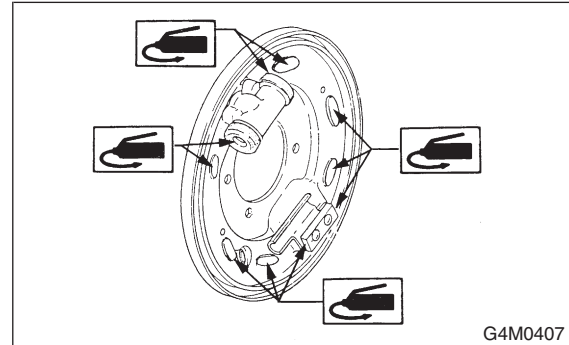
- (1) Retainer
- (2) Washer
- (3) Parking lever
- (4) Upper shoe return spring
- (5) Trailing shoe
- (6) Leading shoe
- (7) Shoe hold-down spring
- (8) Shoe hold-down cup
- (9) Adjusting lever
- (10) Adjuster spring
- (11) Adjuster
- (12) Lower shoe return spring

B: INSTALLATION S405584A11

- 1) Clean back plate and wheel cylinder.
- 2) Apply grease to portions indicated by arrows in Figure.

Brake grease:

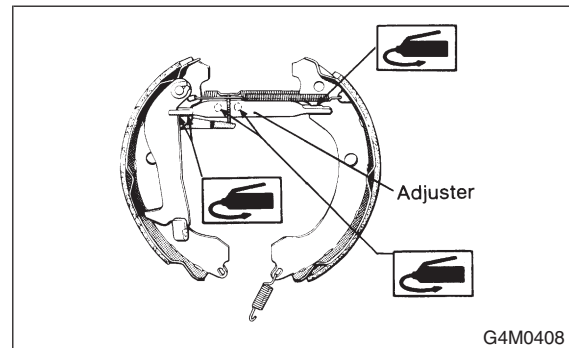
Dow Corning Molykote No. 7439 (Part No. 725191460)



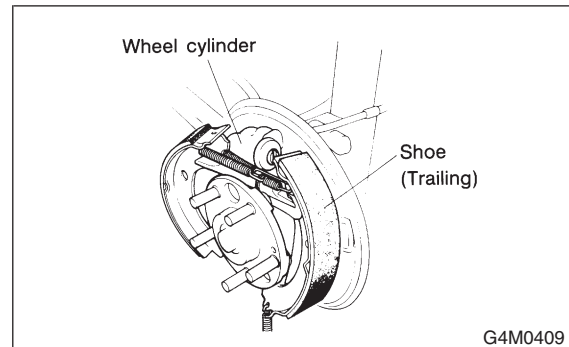
- 3) Apply grease to adjusting screw and both ends of adjuster.

Brake grease:

Dow Corning Molykote No. 7439 (Part No. 725191460)



- 4) Connect upper shoe return spring to shoes.
- 5) While positioning shoes (one at a time) in groove on wheel cylinder, secure shoes.



- 6) Connect lower shoe return spring.
- 7) Fix shoes by connecting hold-down cup to hold-down pin.

C: INSPECTION S405584A10

1. SHOE S405584A1001

- 1) Measure the lining thickness.

Lining thickness:

Standard 4.1 mm (0.161 in)

Service limit 1.5 mm (0.059 in)

- 2) If the deformation or wear of back plate, shoe, etc. are notable, replace them.
- 3) When the shoe return spring tension is excessively weakened, replace it, taking care to identify upper and lower springs.

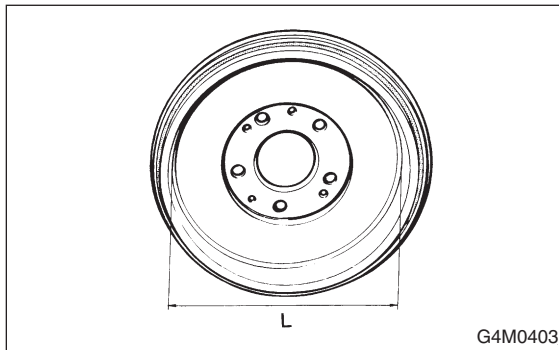
2. DRUM S405584A1002

- 1) If the inside surface of brake drum is streaked, correct the surface. And, if it is unevenly worn, taperingly streaked, or the outside surface of brake drum is damaged, correct or replace it.
- 2) Measure the drum inner diameter.

Drum inner diameter: "L"

Standard 228.6 mm (9 in)

Service limit 230.6 mm (9.08 in)

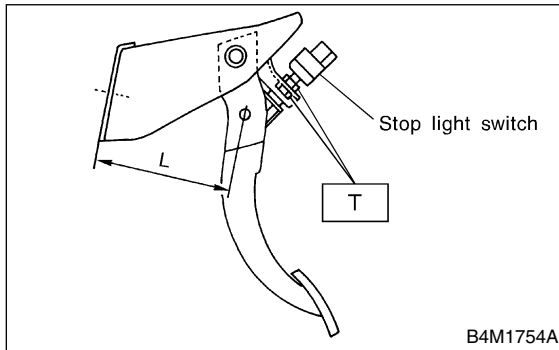


G4M0403

17. Stop Light Switch S405542

A: REMOVAL S405542A18

- 1) Disconnect ground terminal from battery.
- 2) Disconnect stop light switch connector.
- 3) Loosen nuts, and unscrew stop light switch to remove.

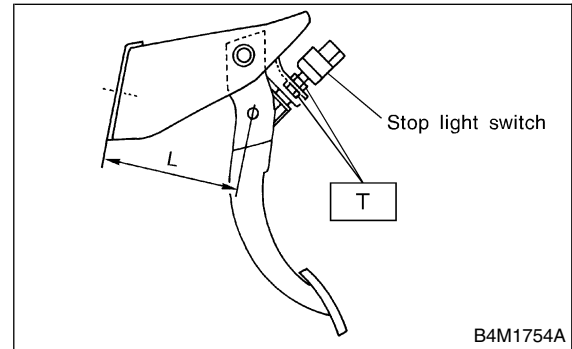


B: INSTALLATION S405542A11

- 1) Screw the stop light switch onto a bracket and secure it temporarily with a nut.
- 2) Adjust stop light switch position, and then tighten the nut. <Ref. to BR-58 ADJUSTMENT, Stop Light Switch.>

Tightening torque:

8 N·m (0.8 kgf-m, 5.8 ft-lb)



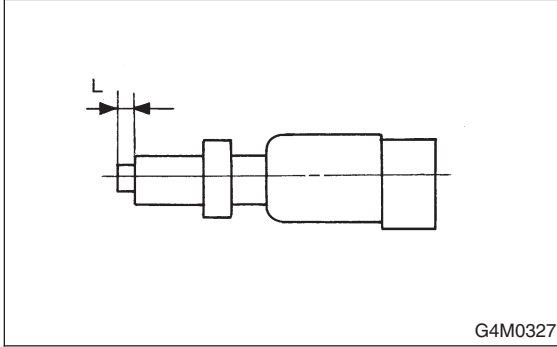
STOP LIGHT SWITCH

C: INSPECTION

S405542A10

1) If stop light switch does not operate properly (or if it does not stop at the specified position), replace with a new one.

Specified position: L
2 mm (0.079 in)

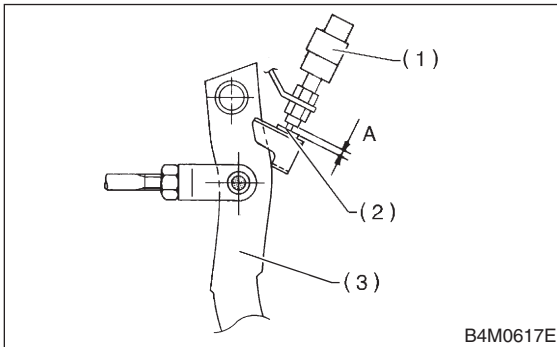


2) Measure the clearance between threaded end of stop light switch and stopper.

CAUTION:

Be careful not to rotate stop light switch.

Stop light switch clearance: A
0.3 mm (0.012 in)



- (1) Stop light switch
- (2) Stopper
- (3) Brake pedal

3) If it is not in specified value, adjust it by adjusting position of stop light switch.

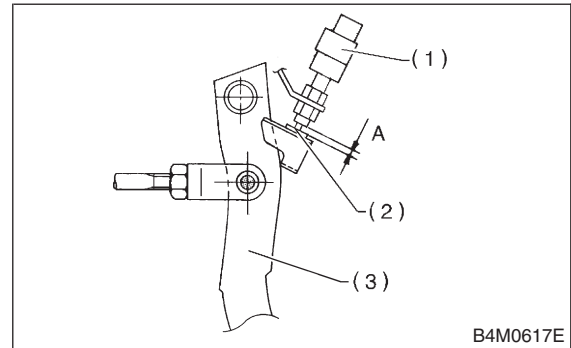
CAUTION:

Be careful not to rotate stop light switch.

D: ADJUSTMENT

S405542A01

Loosen the lock nut, and adjust stop light switch position until the clearance between threaded end of the stop light switch and the stopper becomes 0.3 mm (0.012 in). Then, tighten the lock nut.



GENERAL DESCRIPTION

Parking Brake

1. General Description S404001

A: SPECIFICATIONS S404001E49

1. 2200 cc MODEL S404001E4901

Type	Mechanical on rear brake drums
Effective drum diameter	228.6 mm (9 in)
Lining dimensions (length × width × thickness)	218.8 × 35.0 × 4.1 mm (8.61 × 1.378 × 0.161 in)
Clearance adjustment	Automatic adjustment
Lever stroke	7 to 8 notches/196 N (20 kgf, 44 lb)

2. 2500 cc MODEL S404001E4902

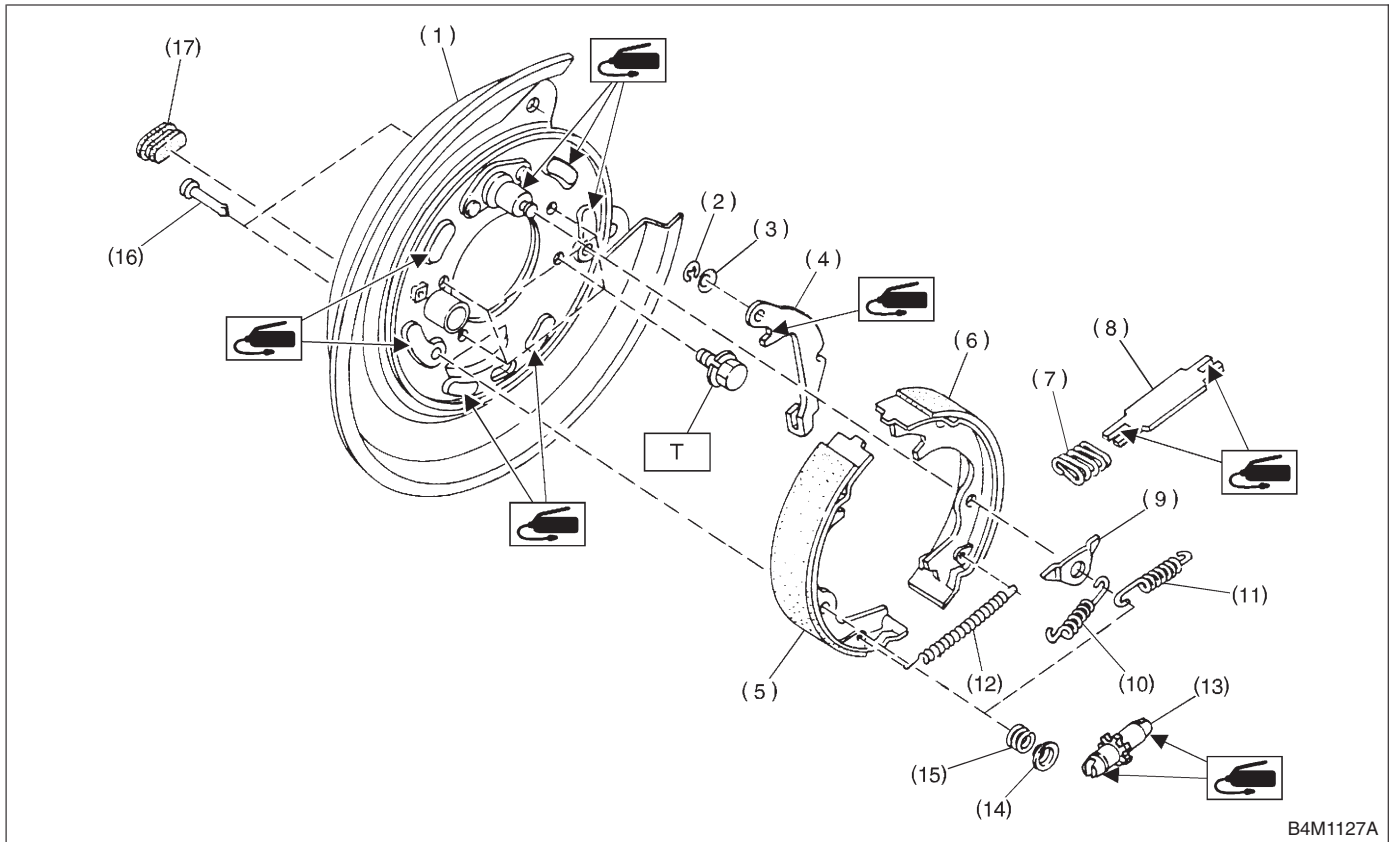
Type	Mechanical on rear brakes, drum in disc
Effective drum diameter	170 mm (6.69 in)
Lining dimensions (length × width × thickness)	162.6 × 30.0 × 3.2 mm (6.40 × 1.181 × 0.126 in)
Clearance adjustment	Manual adjustment
Lever stroke	7 to 8 notches/196 N (20 kgf, 44 lb)

B: COMPONENT

S404001A05

1. PARKING BRAKE

S404001A0503



- (1) Back plate
- (2) Retainer
- (3) Spring washer
- (4) Lever
- (5) Parking brake shoe (Primary)
- (6) Parking brake shoe (Secondary)
- (7) Strut spring

- (8) Strut
- (9) Shoe guide plate
- (10) Primary return spring
- (11) Secondary return spring
- (12) Adjusting spring
- (13) Adjuster
- (14) Shoe hold-down cup

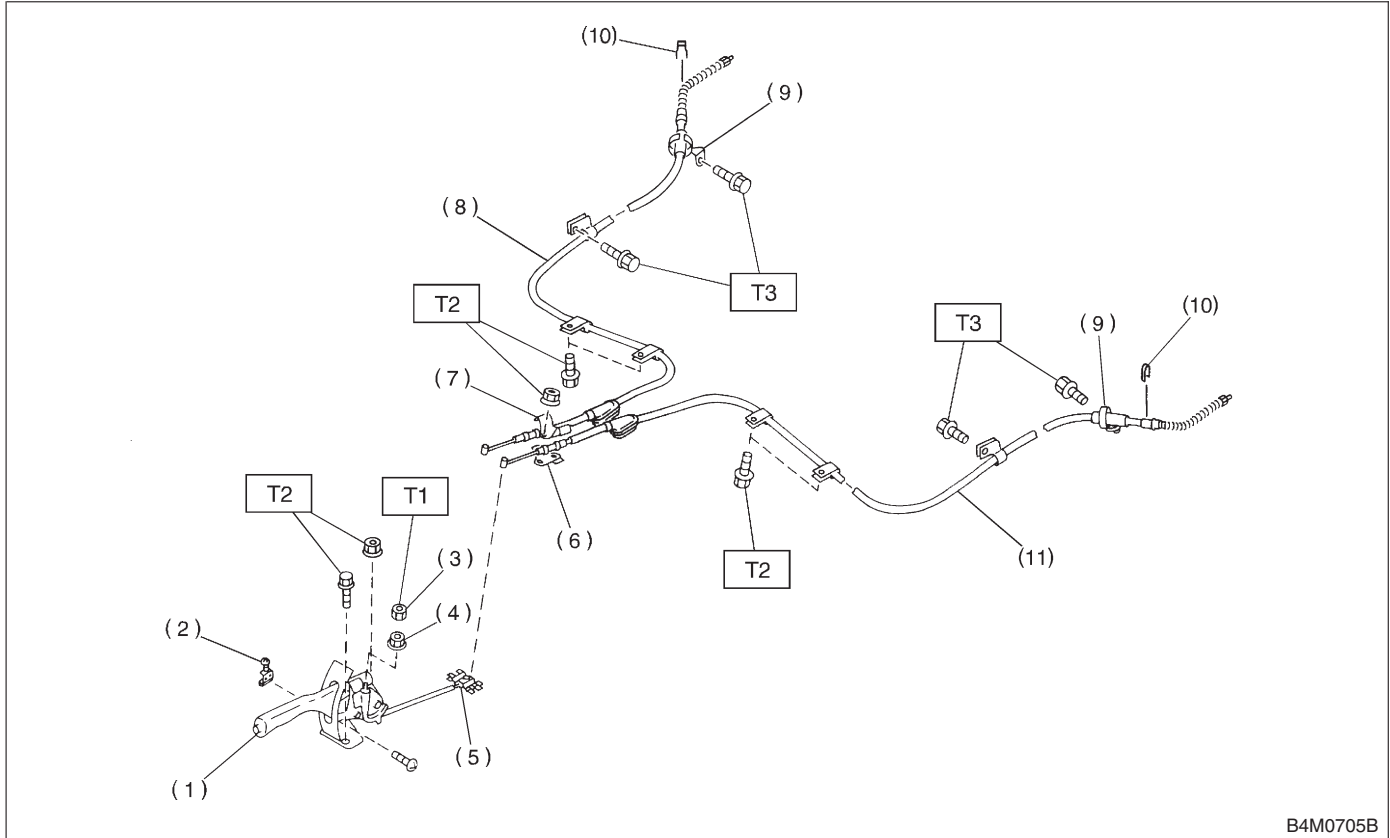
- (15) Shoe hold down spring
- (16) Shoe hold down pin
- (17) Adjusting hole cover

Tightening torque: N·m (kgf-m, ft-lb)
T: 52 (5.3, 38.3)

GENERAL DESCRIPTION

Parking Brake

2. PARKING BRAKE CABLE S404001A0502



- | | |
|--------------------------|---|
| (1) Parking brake lever | (7) Clamp |
| (2) Parking brake switch | (8) Parking brake cable RH |
| (3) Lock nut | (9) Cable guide |
| (4) Adjusting nut | (10) Clamp (Rear disc brake model only) |
| (5) Equalizer | (11) Parking brake cable LH |
| (6) Bracket | |

Tightening torque: N·m (kgf-m, ft-lb)**T1: 5.9 (0.60, 4.3)****T2: 18 (1.8, 13.0)****T3: 32 (3.3, 24)**

C: CAUTION S404001A03

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part on the vehicle is hot after running.
- Use SUBARU genuine grease etc. or the equivalent. Do not mix grease etc. with that of another grade or from other manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Apply grease onto sliding or revolution surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of grease to avoid damage and deformation.
- Before securing a part on a vice, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vice.
- Keep grease etc. away from parking brake shoes.

PARKING BRAKE ASSEMBLY (REAR DISC BRAKE)

Parking Brake

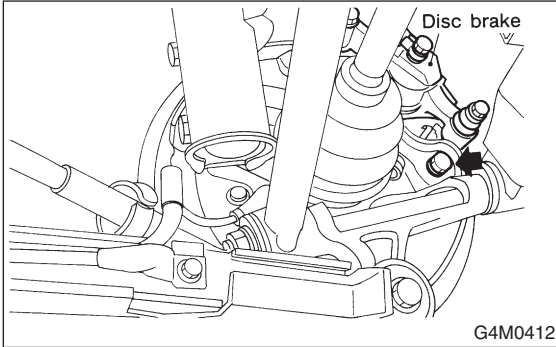
4. Parking Brake Assembly (Rear Disc Brake)

S404552

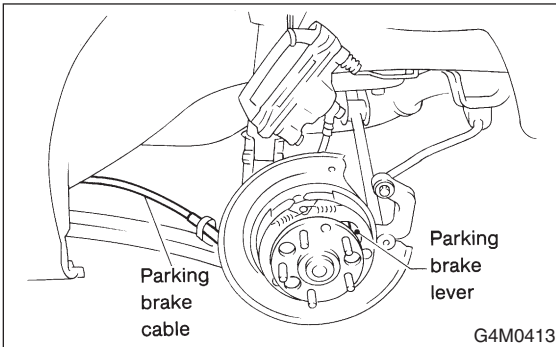
A: REMOVAL

S404552A18

1) Remove the two mounting bolts to the disc brake assembly and remove the disc brake assembly.



- 2) Suspend the disc brake assembly so that the hose is not stretched.
- 3) Remove the disc rotor.
- 4) Remove shoe return spring from parking brake assembly.
- 5) Remove front shoe hold down spring and pin with pliers.
- 6) Remove strut and strut spring.
- 7) Remove adjuster assembly from parking brake assembly.
- 8) Remove brake shoe.
- 9) Remove rear shoe hold-down spring and pin with pliers.
- 10) Remove parking cable from parking lever.



11) Using a standard screwdriver, raise retainer. Remove parking lever and washer from brake shoe.

B: INSTALLATION

S404552A11

CAUTION:

Be sure lining surface is free from oil contamination.

Brake grease:

Dow Corning Molykote No. 7439 (Part No. 725191460)

1) Apply brake grease to the following places.

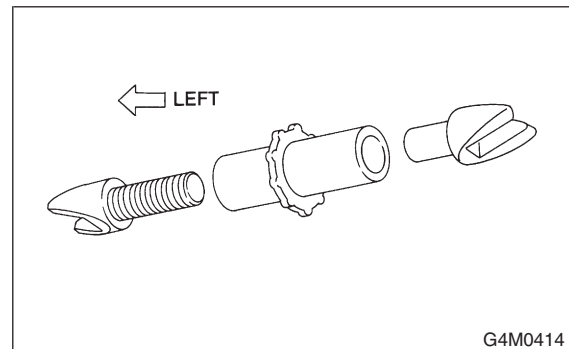
- Six contact surfaces of shoe rim and back plate packing
 - Contact surface of shoe wave and anchor pin
 - Contact surface of lever and strut
 - Contact surface of shoe wave and adjuster assembly
 - Contact surface of shoe wave and strut
 - Contact surface of lever and shoe wave
- 2) Install in reverse order of removal.

CAUTION:

- Use new retainers and clinch them when installing brake shoes to levers.
- Ensure that parking lever moves smoothly.
- Do not confuse left parking lever with right one.
- Do not confuse left strut with right one.

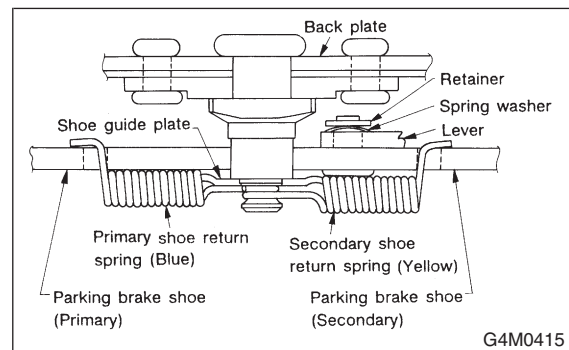
NOTE:

Ensure that adjuster assembly is securely installed with screw in the left side, facing vehicle front.



NOTE:

Ensure that shoe return spring is installed as shown in Figure.



3) Adjust parking brakes. <Ref. to PB-10 ADJUSTMENT, Parking Brake Assembly (Rear Disc Brake).>

CAUTION:

After replacing parking brake lining, be sure to drive vehicle for "break-in" purposes.

- (1) Drive the vehicle about 35 km/h (22 MPH).
- (2) With the parking brake release button pushed in, pull the parking brake lever gently, pulling with a force of approximately 147 N (15 kgf, 33 lb).
- (3) Drive the vehicle for about 200 m (0.12 mile) in this condition.
- (4) Wait 5 to 10 minutes for the parking brake to cool down. Repeat this procedure once more.
- (5) After breaking-in, re-adjust parking brakes.

C: INSPECTION S404552A10

- 1) Measure brake disc inside diameter. If the disc is scored or worn, replace the brake disc.

Disc inside diameter:

Standard

170 mm (6.69 in)

Service limit

171 mm (6.73 in)

- 2) Measure the lining thickness. If it exceeds the limit, replace shoe assembly.

Lining thickness:

Standard

3.2 mm (0.126 in)

Service limit

1.5 mm (0.059 in)

CAUTION:

Replace the brake shoes on the right and left brake assembly at the same time.

PARKING BRAKE ASSEMBLY (REAR DISC BRAKE)

Parking Brake

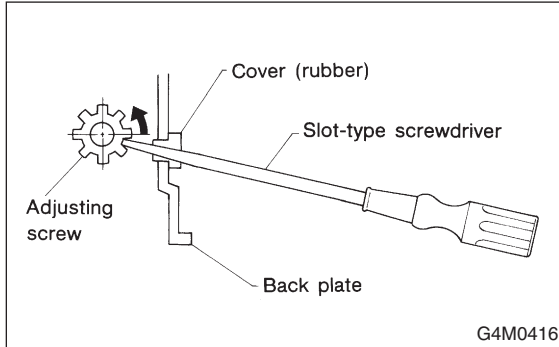
D: ADJUSTMENT

S404552A01

1. SHOE CLEARANCE

S404552A0101

- 1) Remove adjusting hole cover from back plate.
- 2) Turn adjusting screw using a slot-type screwdriver until brake shoe is in close contact with disc rotor.

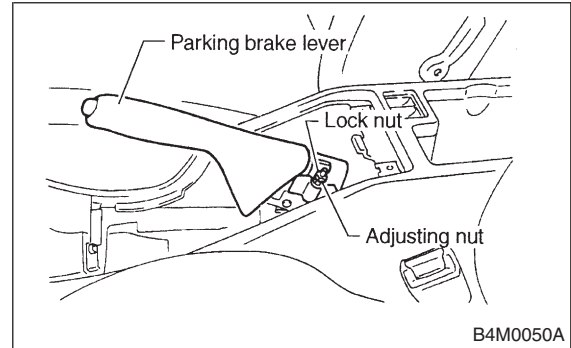


- 3) Turn back (downward) adjusting screw 3 or 4 notches.
- 4) Install adjusting hole cover to back plate.

2. LEVER STROKE

S404552A0102

- 1) Remove console box lid.
- 2) Forcibly pull parking brake lever 3 to 5 times.
- 3) Adjust parking brake lever by turning adjusting nut until parking brake lever stroke is set at 7 to 8 notches with operating force of 196 N (20 kgf, 44 lb).



- 4) Tighten lock nut.
- 5) Install console box lid.

Lever stroke:

7 to 8 notches when pulled with a force of 196 N (20 kgf, 44 lb)

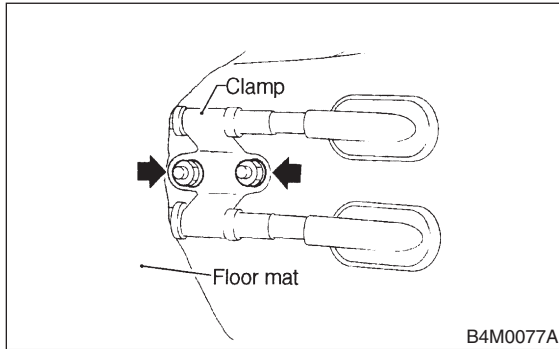
Tightening torque (Lock nut):

5.9 N·m (0.60 kgf-m, 4.3 ft-lb)

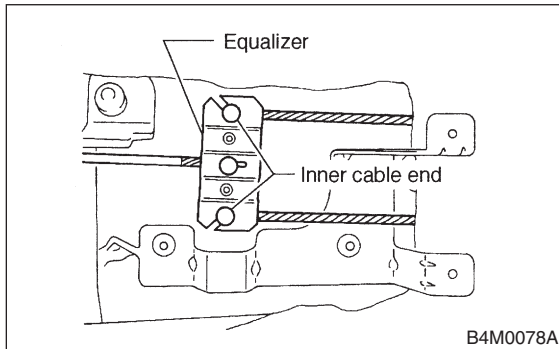
3. Parking Brake Cable S404170

A: REMOVAL S404170A18

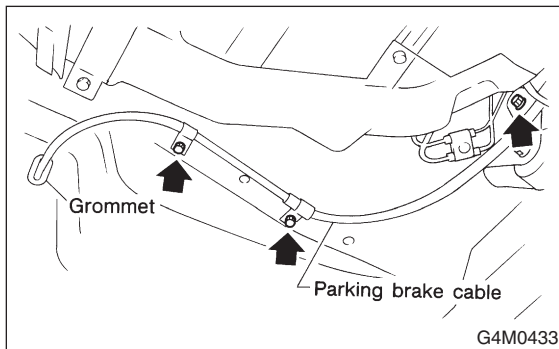
- 1) Lift-up vehicle.
- 2) Remove rear wheels.
- 3) Remove rear cushion.
- 4) Remove console box from front floor.
- 5) Loosen parking cable adjusting nut.
- 6) Roll up floor mat and remove clamps.



- 7) Remove inner cable end from equalizer.



- 8) Pull out parking brake cable from parking brake assembly. <Ref. to PB-8 REMOVAL, Parking Brake Assembly (Rear Disc Brake).> or <Ref. to BR-36 REMOVAL, Rear Drum Brake Assembly.>
- 9) Pull out clamp from parking brake assembly.
- 10) Remove bolt and bracket from trailing link bracket.
- 11) Remove bolt and clamp from rear floor.



- 12) Detach grommet from rear floor.
- 13) Remove cable assembly from cabin by forcibly pulling it backward.

- 14) Detach parking brake cable from cable guide at rear trailing link.

B: INSTALLATION S404170A11

Install in the reverse order of removal.

NOTE:

- Be sure to pass cable through cable guide inside the tunnel.
- Be sure to adjust the shoe clearance. (Rear disc brake only) <Ref. to PB-10 ADJUSTMENT, Parking Brake Assembly (Rear Disc Brake).>

C: INSPECTION S404170A10

Check the removed cable and replace if damaged, rusty, or malfunctioning.

- 1) Check for smooth operation of the cable.
- 2) Check the inner cable for damage and rust.
- 3) Check the outer cable for damage, bends, and cracks.
- 4) Check the boot for damage, cracks, and deterioration.

2. Parking Brake Lever S404171

A: REMOVAL S404171A18

- 1) Remove console box from front floor.
- 2) Disconnect electric connector for parking brake switch.
- 3) Loosen parking brake adjuster, and remove inner cable end from equalizer.
- 4) Remove parking brake lever.

B: INSTALLATION S404171A11

Install in the reverse order of removal.

Tightening torque (Lever installing bolt and nut):

18 N·m (1.8 kgf-m, 13.0 ft-lb)

C: INSPECTION S404171A10

While pulling parking brake lever upward, count the notches.

Lever stroke:

7 to 8 notches when pulled with a force of 196 N (20 kgf, 44 lb)

Incorrect, adjust the parking brake. <Ref. to PB-6 ADJUSTMENT, Parking Brake Lever.>

D: ADJUSTMENT S404171A01

- 1) Adjust parking brake lever by turning adjusting nut until parking brake lever stroke is set at 7 to 8 notches with operating force of 196 N (20 kgf, 44 lb).
- 2) Tighten lock nut.

Tightening torque (Lock nut):

5.9 N·m (0.60 kgf-m, 4.3 ft-lb)

