

BASIC DIAGNOSTIC PROCEDURE

ABS (DIAGNOSTICS)

1. Basic Diagnostic Procedure S006501

A: PROCEDURE S006501E45

1. WITHOUT SUBARU SELECT MONITOR S006501E4501

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.

| No. | Step | Check | Yes | No |
|-----|--|--|-------------------------|--|
| 1 | CHECK PRE-INSPECTION. 1) Ask the customer when and how the trouble occurred using interview checklist. <Ref. to ABS-5 Check List for Interview.> 2) Before performing diagnosis, inspect unit which might influence the ABS problem. <Ref. to ABS-8 INSPECTION, General Description.> | Is unit that might influence the ABS problem normal? | Go to step 2. | Repair or replace each unit. |
| 2 | CHECK INDICATION OF TROUBLE CODE. Calling up trouble code. <Ref. to ABS-18 Read Diagnostic Trouble Code.> | Is trouble code readable? | Go to step 3. | Inspect using diagnostic chart for ABS warning light failure. <Ref. to ABS-26 Diagnostics Chart with Diagnosis Connector.> NOTE: Call up trouble code again after inspecting ABS warning light. <Ref. to ABS-18 Read Diagnostic Trouble Code.> |
| 3 | CHECK TROUBLE CODE. NOTE: Record all trouble codes. | Is only the start code issued? | Go to step 4. | Go to step 5. |
| 4 | PERFORM THE GENERAL DIAGNOSTICS. 1) Inspect using "General Diagnostics Table". <Ref. to ABS-163 General Diagnostics Table.> 2) Perform the clear memory mode. <Ref. to ABS-20 WITHOUT SUBARU SELECT MONITOR, OPERATION, Clear Memory Mode.> 3) Perform the inspection mode. <Ref. to ABS-19 Inspection Mode.> Calling up the trouble code. <Ref. to ABS-18 Read Diagnostic Trouble Code.> | Is only the start code issued? | Complete the diagnosis. | Go to step 5. |

BASIC DIAGNOSTIC PROCEDURE

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--------------------------------|-------------------------|---|
| 5 | PERFORM THE DIAGNOSIS. 1) Inspect using "Diagnostics Chart with Diagnostic Connector". <Ref. to ABS-26 Diagnostics Chart with Diagnosis Connector.> NOTE: For trouble code list, refer to "List of Diagnostics Trouble Code". <Ref. to ABS-22 WITHOUT SUBARU SELECT MONITOR, LIST, List of Diagnostics Trouble Code.> 2) Repair trouble cause. 3) Perform the clear memory mode. <Ref. to ABS-20 WITHOUT SUBARU SELECT MONITOR, OPERATION, Clear Memory Mode.> 4) Perform the inspection mode. <Ref. to ABS-19 Inspection Mode.> 5) Calling up the trouble code. <Ref. to ABS-18 Read Diagnostic Trouble Code.> | Is only the start code issued? | Complete the diagnosis. | Inspect using "Diagnostics Chart with Diagnostic Connector". <Ref. to ABS-26 Diagnostics Chart with Diagnosis Connector.> |

BASIC DIAGNOSTIC PROCEDURE

ABS (DIAGNOSTICS)

2. WITH SUBARU SELECT MONITOR S006501E4502

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-24 WITH SUBARU SELECT MONITOR, LIST, List of Diagnostics Trouble Code.>

| No. | Step | Check | Yes | No |
|-----|--|---|-------------------------|--|
| 1 | CHECK PRE-INSPECTION. 1) Ask the customer when and how the trouble occurred using interview checklist. <Ref. to ABS-5 Check List for Interview.> 2) Before performing diagnosis, inspect unit which might influence the ABS problem. <Ref. to ABS-8 INSPECTION, General Description.> | Is unit that might influence the ABS problem normal? | Go to step 2. | Repair or replace each unit. |
| 2 | CHECK INDICATION OF TROUBLE CODE DISPLAY. 1) Turn ignition switch to OFF. 2) Connect the SUBARU SELECT MONITOR to data link connector. 3) Turn ignition switch to ON and SUBARU SELECT MONITOR to ON. 4) Read diagnostic trouble code. <Ref. to ABS-17 READ CURRENT DATA, OPERATION, Subaru Select Monitor.> 5) Record all trouble codes and frame data. | Is the corresponding trouble encoding? | Go to step 3. | Go to step 4. |
| 3 | PERFORM THE GENERAL DIAGNOSTICS. 1) Inspect using "General Diagnostics Table". <Ref. to ABS-163 General Diagnostics Table.> 2) Perform the clear memory mode. <Ref. to ABS-17 CLEAR MEMORY MODE, OPERATION, Subaru Select Monitor.> 3) Perform the inspection mode. <Ref. to ABS-19 Inspection Mode.> 4) Calling up the trouble code. <Ref. to ABS-16 READ DIAGNOSTIC TROUBLE CODE, OPERATION, Subaru Select Monitor.> | Is no trouble code designated and ABS warning light goes out after turning on? | Complete the diagnosis. | Go to step 4. |
| 4 | PERFORM THE DIAGNOSIS. 1) Inspect using "Diagnostics Chart with Subaru Select Monitor". <Ref. to ABS-88 Diagnostics Chart with Subaru Select Monitor.> NOTE: For trouble code list, refer to "List of Diagnostics Trouble Code". <Ref. to ABS-22 WITHOUT SUBARU SELECT MONITOR, LIST, List of Diagnostics Trouble Code.> 2) Repair trouble cause. 3) Perform the clear memory mode. <Ref. to ABS-17 CLEAR MEMORY MODE, OPERATION, Subaru Select Monitor.> 4) Perform the inspection mode. <Ref. to ABS-19 Inspection Mode.> 5) Calling up the trouble code. <Ref. to ABS-16 READ DIAGNOSTIC TROUBLE CODE, OPERATION, Subaru Select Monitor.> | Is no trouble code designated and does ABS warning light go out after turning on? | Complete the diagnosis. | Inspect using "Diagnostics Chart with Subaru Select Monitor". <Ref. to ABS-88 Diagnostics Chart with Subaru Select Monitor.> |

2. Check List for Interview S006502

A: CHECK S006502A04

Check the following items about the vehicle's state.

1. STATE OF ABS WARNING LIGHT

| | | | |
|-----------------------------|--|----------------------------|-----|
| ABS warning light comes on. | <input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Only once <input type="checkbox"/> Does not come on <input checked="" type="checkbox"/> When / how long does it come on?: | | |
| Ignition key position | <input type="checkbox"/> LOCK <input type="checkbox"/> ACC <input type="checkbox"/> ON (before starting engine) <input type="checkbox"/> START <input type="checkbox"/> On after starting (Engine is running) <input type="checkbox"/> On after starting (Engine is stop) | | |
| Timing | <input type="checkbox"/> Immediately after ignition is ON. <input type="checkbox"/> Immediately after ignition starts. | | |
| | <input type="checkbox"/> When advancing | km/h to km/h MPH to MPH | |
| | <input type="checkbox"/> While traveling at a constant speed | km/h | MPH |
| | <input type="checkbox"/> When decelerating | km/h to km/h MPH to MPH | |
| | <input type="checkbox"/> When turning to right | Steering angle : | deg |
| | | Steering time : | sec |
| | <input type="checkbox"/> When turning to left | Steering angle : | deg |
| | | Steering time : | sec |
| | <input type="checkbox"/> When moving other electrical parts | | |
| | <input checked="" type="checkbox"/> Parts name : <input checked="" type="checkbox"/> Operating condition : | | |

2. SYMPTOMS

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

CHECK LIST FOR INTERVIEW

ABS (DIAGNOSTICS)

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

3. CONDITIONS UNDER WHICH TROUBLE OCCURS

| | | |
|-------------|------------------------|--|
| Environment | a) Weather | <input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Various/Others : |
| | b) Ambient temperature | °F (°C) |
| | c) Road | <input type="checkbox"/> Urban area <input type="checkbox"/> Suburbs <input type="checkbox"/> Highway <input type="checkbox"/> General road <input type="checkbox"/> Ascending slope <input type="checkbox"/> Descending slope <input type="checkbox"/> Paved road <input type="checkbox"/> Gravel road <input type="checkbox"/> Muddy road <input type="checkbox"/> Sandy place <input type="checkbox"/> Others : |
| | d) Road surface | <input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> New-fallen snow <input type="checkbox"/> Compressed snow <input type="checkbox"/> Frozen slope <input type="checkbox"/> Others : |

CHECK LIST FOR INTERVIEW

ABS (DIAGNOSTICS)

| | | | |
|-------------|---|---|-----|
| Condition | a) Brakes | Deceleration : g | |
| | | <input type="checkbox"/> Continuous / <input type="checkbox"/> Intermittent | |
| | b) Accelerator | Acceleration : g | |
| | | <input type="checkbox"/> Continuous / <input type="checkbox"/> Intermittent | |
| | c) Vehicle speed | km/h | MPH |
| | | <input type="checkbox"/> Advancing <input type="checkbox"/> Accelerating <input type="checkbox"/> Reducing speed <input type="checkbox"/> Low speed <input type="checkbox"/> Turning <input type="checkbox"/> 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. : <input type="checkbox"/> Yes / <input type="checkbox"/> No | | |
| | g) Chain is passed around tires. : <input type="checkbox"/> Yes / <input type="checkbox"/> No | | |
| | h) T tire is used. : <input type="checkbox"/> Yes / <input type="checkbox"/> No | | |
| | i) Condition of suspension alignment : | | |
| | j) Loading state : | | |
| | k) Repair parts are used. : <input type="checkbox"/> Yes / <input type="checkbox"/> No | | |
| ● What : | | | |
| l) Others : | | | |

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

4. BRAKE DRAG S006001A1003

Check brake drag.

5. BRAKE PAD AND ROTOR S006001A1004

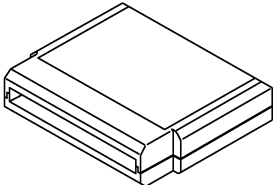

Check brake pad and rotor.

- Front <Ref. to BR-17 INSPECTION, Front Brake Pad.> and <Ref. to BR-19 INSPECTION, Front Disc Rotor.>
- Rear <Ref. to BR-26 INSPECTION, Rear Brake Pad.> and <Ref. to BR-29 INSPECTION, Rear Disc Brake Assembly.>

6. TIRE S006001A1005

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

C: PREPARATION TOOL S006001A17**1. SPECIAL TOOLS** S006001A1701

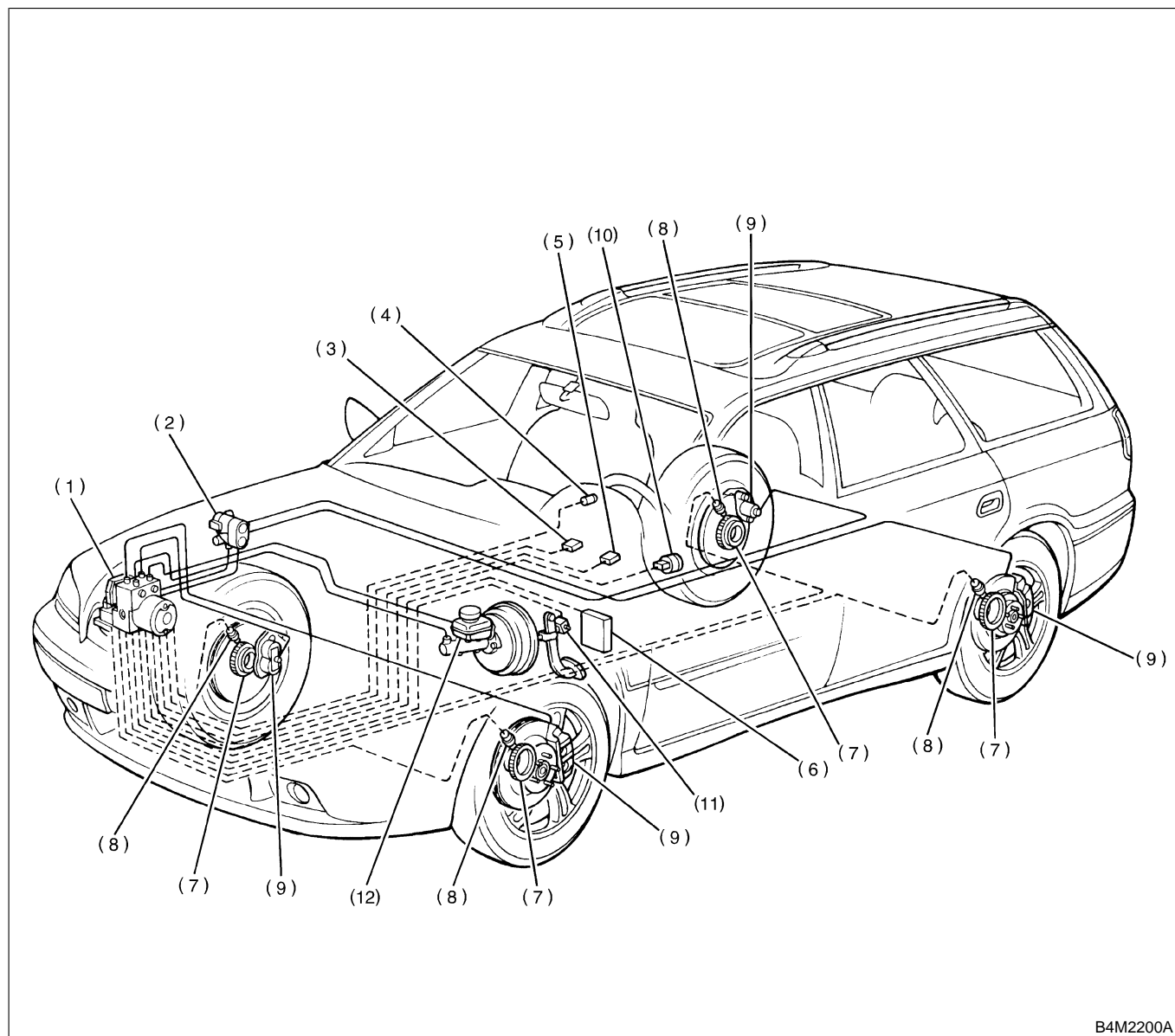
| ILLUSTRATION | TOOL NUMBER | DESCRIPTION | REMARKS |
|--|-------------|--------------------|--|
|  B2M3876 | 24082AA150 | CARTRIDGE | Troubleshooting for electrical systems. |
|  B2M3877 | 22771AA030 | SELECT MONITOR KIT | Troubleshooting for electrical systems. <ul style="list-style-type: none"> • English: 22771AA030 (Without printer) • German: 22771AA070 (Without printer) • French: 22771AA080 (Without printer) • Spanish: 22771AA090 (Without printer) |

2. GENERAL PURPOSE TOOLS S006001A1702

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

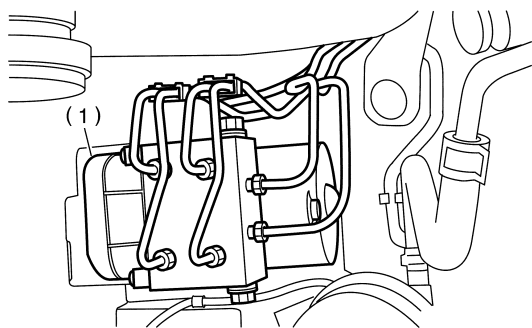
4. Electrical Components Location S006507

A: LOCATION S006507A13

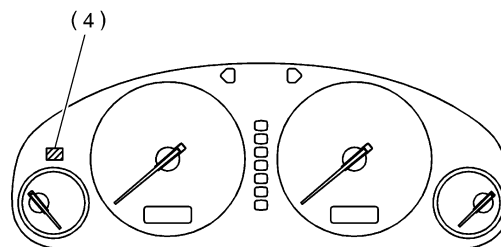


B4M2200A

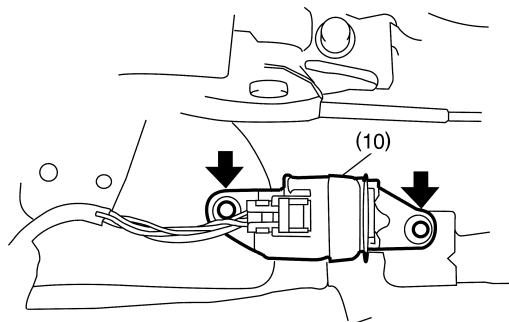
- | | | |
|---|---|------------------------|
| (1) ABS control module and hydraulic control unit (ABSCM&H/U) | (5) Data link connector (for Subaru select monitor) | (8) ABS sensor |
| (2) Proportioning valve | (6) Transmission control module (only AT vehicle) | (9) Wheel cylinder |
| (3) Diagnosis connector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



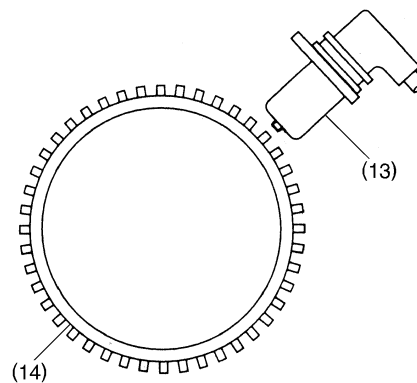
B4M1646A



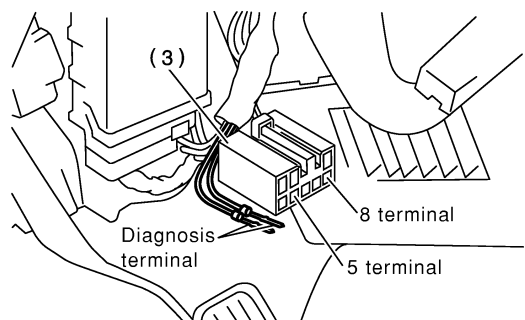
B4M2225A



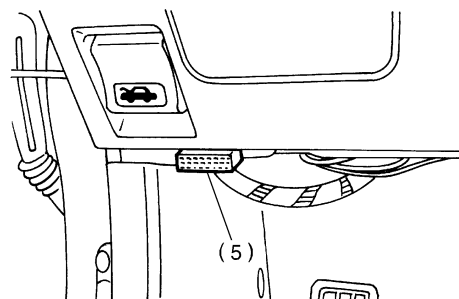
B4M1734A



B4M2262A



B4M1767A

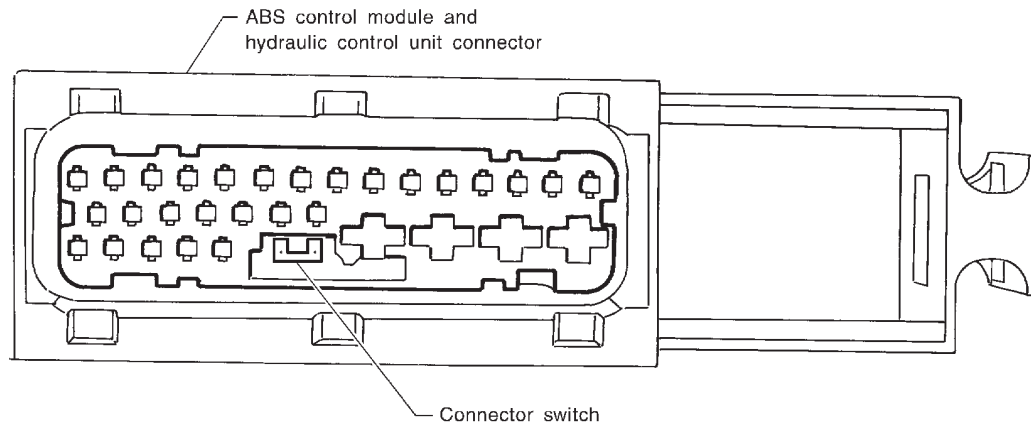


B2M2960D

5. Control Module I/O Signal S006524

A: ELECTRICAL SPECIFICATION

S006524A08



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 | | | | | | | | | | |

B4M1228A

NOTE:

- The terminal numbers in the ABS control module and hydraulic control unit connector are as shown in the figure.
- When the connector is removed from the ABSCM&H/U, the connector switch closes the circuit between terminal No. 21 and No. 23. The ABS warning light illuminates.

| Contents | | Terminal No. (+)(-) | Input/Output signal |
|--------------------------------------|-------------------|------------------------|--|
| | | | Measured value and measuring conditions |
| ABS sensor*2 (Wheel speed sensor) | Front left wheel | 9—10 | 0.12 — 1 V (When it is 20 Hz.) |
| | Front right wheel | 11—12 | |
| | Rear left wheel | 7—8 | |
| | Rear right wheel | 14—15 | |
| Valve relay power supply | | 24—23 | 10 — 15 V |
| Motor relay power supply | | 25—23 | 10 — 15 V |
| G sensor*2 (AWD model only) | power supply | 30—28 | 4.75 — 5.25 V |
| | ground | 28 | — |
| | output | 6—28 | 2.3±0.2 V when vehicle is in horizontal position. |
| Stop light switch*1 | | 2—23 | Less than 1.5 V when the stop light is OFF and, 10 — 15 V when the stop light is ON. |
| ABS warning light*2 | | 21—23 | Less than 1.5 V during 1.5 seconds when ignition switch is ON, and 10 — 15 V after 1.5 seconds. |
| AT ABS signal*2 (AT model only) | | 31—23 | Less than 1.5 V when the ABS control still operates and more than 5.5 V when ABS does not operate. |
| ABS operation signal monitor*2 | | 3—23 | Less than 1.5 V when the ABS control still operates and more than 5.5 V when ABS does not operate. |
| Select monitor*2 | Data is received. | 20—23 | Less than 1.5 V when no data is received. |
| | Data is sent. | 5—23 | 4.75 — 5.25 V when no data is sent. |
| ABS diagnosis connector*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.

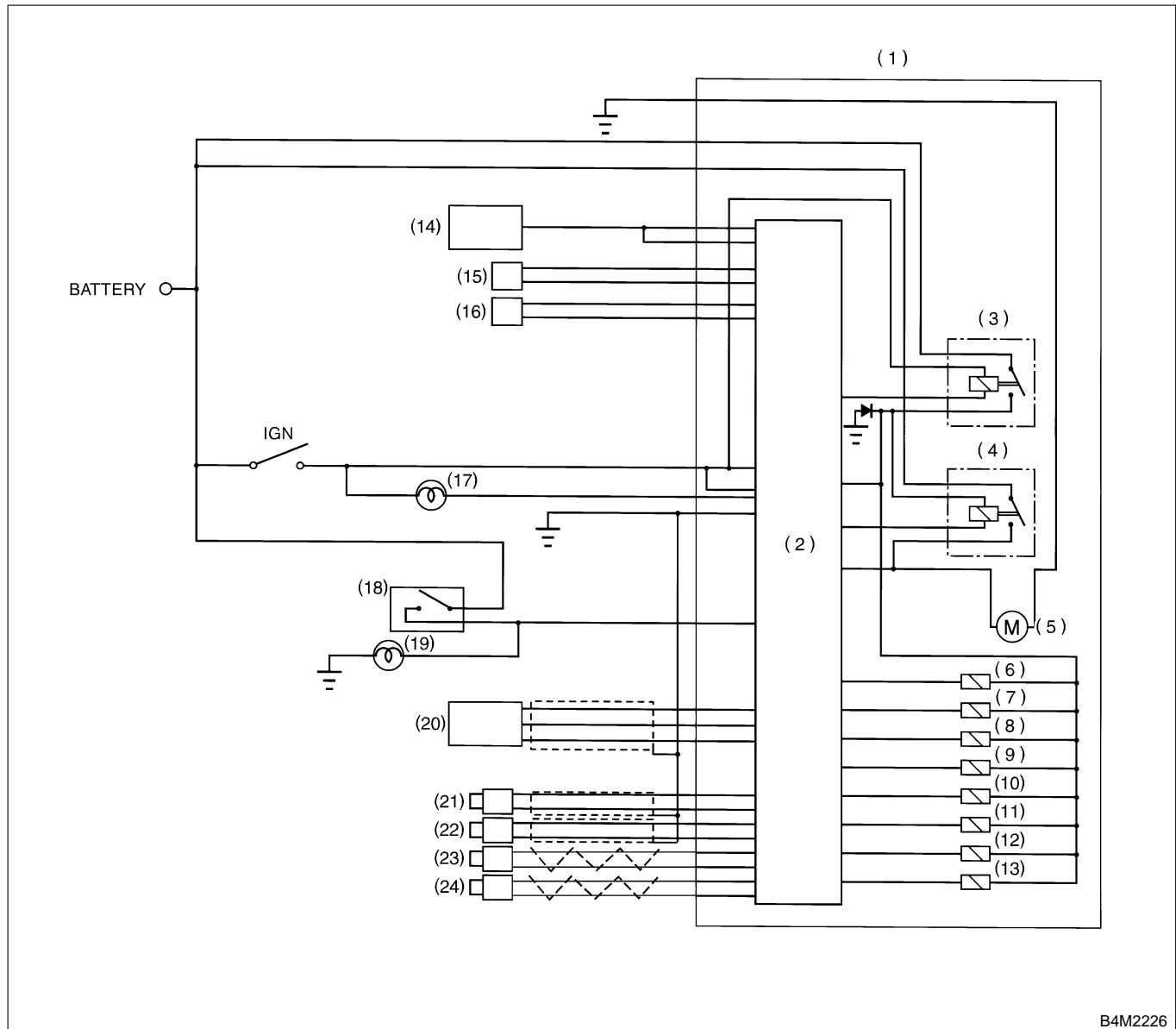
*2: Measure the I/O signal voltage at connector (B62) or (F55).

CONTROL MODULE I/O SIGNAL

ABS (DIAGNOSTICS)

B: SCHEMATIC

S006524A21



B4M2226

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

6. Data Link Connector S006505

A: NOTE S006505A15

Refer to “EN(H4)” section for information about the differential connector. <Ref. to EN(H4)-49 Data Link Connector.>

7. Subaru Select Monitor

S006503

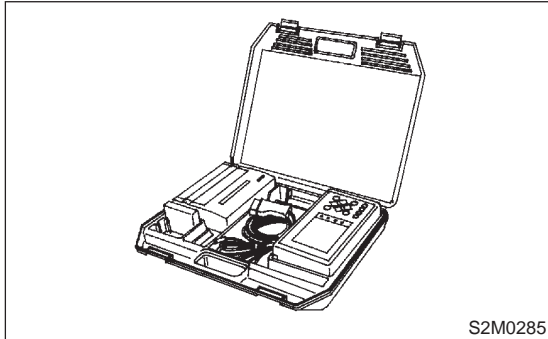
A: OPERATION

S006503A16

1. READ DIAGNOSTIC TROUBLE CODE

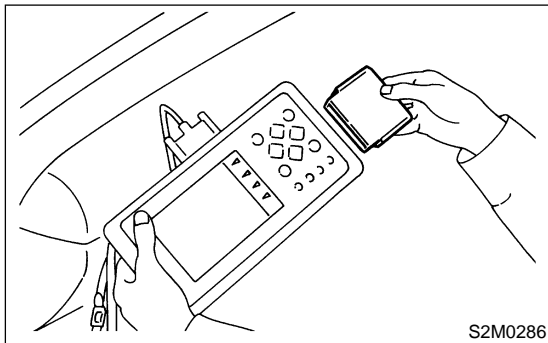
S006503A1601

1) Prepare Subaru Select Monitor kit.



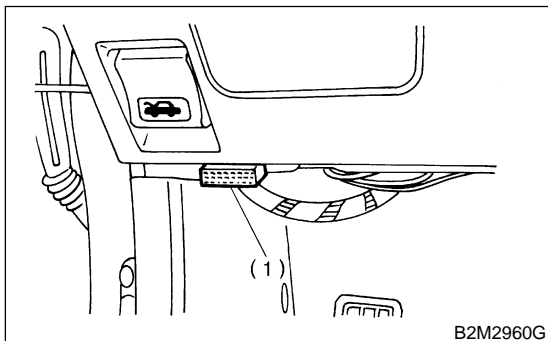
2) Connect diagnosis cable to Subaru Select Monitor.

3) Insert cartridge into Subaru Select Monitor.
<Ref. to ABS-9 SPECIAL TOOLS, PREPARATION TOOL, General Description.>



4) Connect Subaru Select Monitor to data link connector.

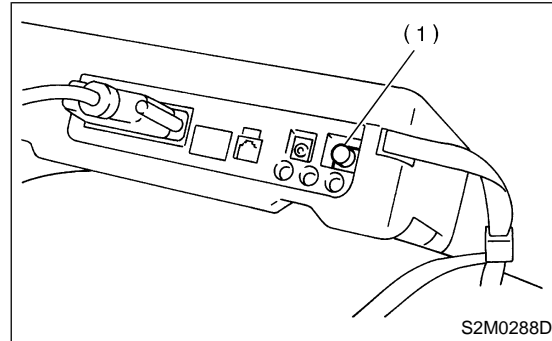
(1) Data link connector located in the lower portion of the instrument panel (on the driver's side).



(1) Data link connector

(2) Connect diagnosis cable to data link connector.

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



(1) Power switch

6) On the «Main Menu» display screen, select the {Each System Check} and press 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 DIAGNOSTICS TROUBLE CODE. <Ref. to ABS-22 List of Diagnostics 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.

READ DIAGNOSTIC TROUBLE CODE

ABS (DIAGNOSTICS)

8. Read Diagnostic Trouble Code

S006508

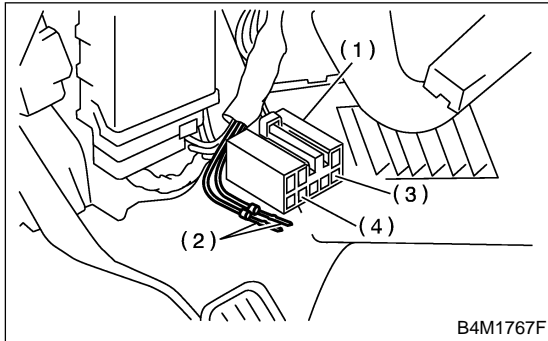
A: OPERATION

S006508A16

1. WITHOUT SUBARU SELECT MONITOR

S006508A1602

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



- (1) Diagnosis connector
- (2) Diagnosis terminal
- (3) 8 terminal
- (4) 5 terminal

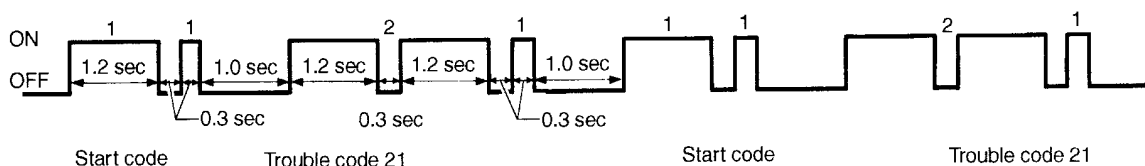
6) After the start code (11) is shown, the trouble codes will be shown in order of the last information first. These repeat for a maximum of 3 minutes.

NOTE:

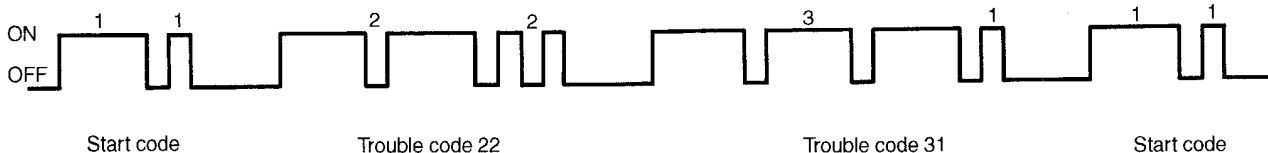
- When there are no trouble codes in memory, only the start code (11) is shown.
- When on-board diagnosis of the ABS control module detects a problem, the information (up to a maximum of three) will be stored in the EEPROM as a trouble code. When there are more than three, the most recent three will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

Example of code indication

Trouble code: 21



Trouble code: 22, 31



2. WITH SUBARU SELECT MONITOR

S006508A1601

Refer to SUBARU SELECT MONITOR for information about how to obtain and understand trouble codes.
<Ref. to ABS-16 Subaru Select Monitor.>

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.

10. Clear Memory Mode

S006513

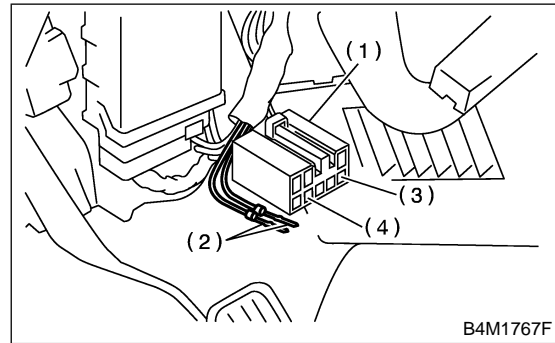
A: OPERATION

S006513A16

1. WITHOUT SUBARU SELECT MONITOR

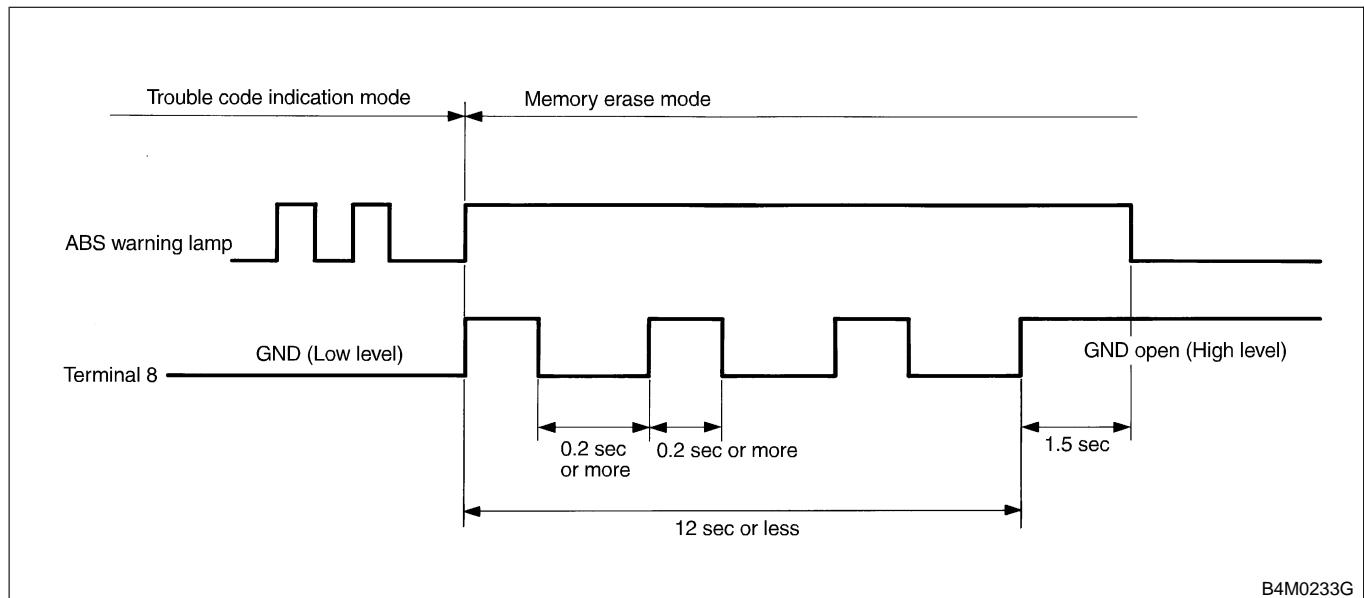
S006513A1602

1) After calling up a trouble code, disconnect diagnosis connector terminal 8 from diagnosis terminal.



- (1) Diagnosis connector
- (2) Diagnosis terminal
- (3) 8 terminal
- (4) 5 terminal

2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal 8 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.

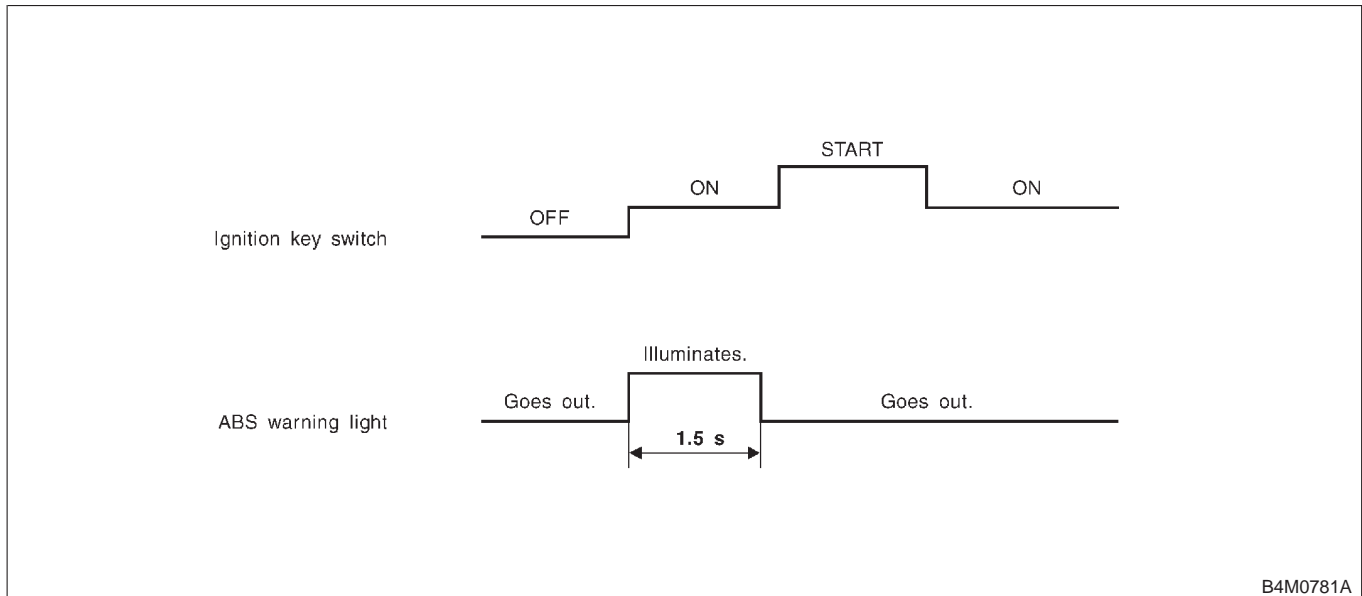
2. WITH SUBARU SELECT MONITOR

S006513A1601

Refer to SUBARU SELECT MONITOR for information about how to clear trouble codes. <Ref. to ABS-16 Subaru Select Monitor.>

11. ABS Warning Light Illumination Pattern S006581

A: INSPECTION S006581A10



B4M0781A

- 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-26 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.

LIST OF DIAGNOSTICS TROUBLE CODE

ABS (DIAGNOSTICS)

12. List of Diagnostics 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-36 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-36 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-36 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-36 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-42 TROUBLE CODE 22 — ABNORMAL ABS SENSOR (FRONT RH) —, Diagnostics Chart with Diagnosis Connector.> |
| 24 | | Front left ABS sensor | <Ref. to ABS-42 TROUBLE CODE 24 — ABNORMAL ABS SENSOR (FRONT LH) —, Diagnostics Chart with Diagnosis Connector.> |
| 26 | | Rear right ABS sensor | <Ref. to ABS-42 TROUBLE CODE 26 — ABNORMAL ABS SENSOR (REAR RH) —, Diagnostics Chart with Diagnosis Connector.> |
| 28 | | Rear left ABS sensor | <Ref. to ABS-42 TROUBLE CODE 28 — ABNORMAL ABS SENSOR (REAR LH) —, Diagnostics Chart with Diagnosis Connector.> |
| 29 | | Any one of four | <Ref. to ABS-48 TROUBLE CODE 29 — ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —, Diagnostics Chart with Diagnosis Connector.> |

LIST OF DIAGNOSTICS TROUBLE CODE

ABS (DIAGNOSTICS)

| 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-52 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-56 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-52 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-56 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-52 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-56 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-52 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-56 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-60 TROUBLE CODE 41 — ABNORMAL ABS CONTROL MODULE —, Diagnostics Chart with Diagnosis Connector.> |
| 42 | Source voltage is abnormal. | | <Ref. to ABS-62 TROUBLE CODE 42 — SOURCE VOLTAGE IS ABNORMAL. —, Diagnostics Chart with Diagnosis Connector.> |
| 44 | A combination of AT control abnormal | | <Ref. to ABS-66 TROUBLE CODE 44 — A COMBINATION OF AT CONTROL ABNORMAL —, Diagnostics Chart with Diagnosis Connector.> |
| 51 | Abnormal valve relay | | <Ref. to ABS-70 TROUBLE CODE 51 — ABNORMAL VALVE RELAY —, Diagnostics Chart with Diagnosis Connector.> |
| 52 | Abnormal motor and/or motor relay | | <Ref. to ABS-74 TROUBLE CODE 52 — ABNORMAL MOTOR AND/OR MOTOR RELAY —, Diagnostics Chart with Diagnosis Connector.> |
| 54 | Abnormal stop light switch | | <Ref. to ABS-78 TROUBLE CODE 54 — ABNORMAL STOP LIGHT SWITCH —, Diagnostics Chart with Diagnosis Connector.> |
| 56 | Abnormal G sensor output voltage | | <Ref. to ABS-82 TROUBLE CODE 56 — ABNORMAL G SENSOR OUTPUT VOLTAGE —, Diagnostics Chart with Diagnosis Connector.> |

LIST OF DIAGNOSTICS TROUBLE CODE

ABS (DIAGNOSTICS)

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-88 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-92 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-96 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-102 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-96 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-102 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-96 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-102 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-96 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-102 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-108 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-112 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-116 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-112 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-116 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-112 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-116 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-112 TROUBLE CODE 37 — REAR LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.> |

LIST OF DIAGNOSTICS TROUBLE CODE

ABS (DIAGNOSTICS)

| Code | Display screen | Contents of diagnosis | Index No. |
|------|--|---|---|
| 38 | Rear left outlet valve malfunction | Rear left outlet valve malfunction | <Ref. to ABS-116 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-120 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-122 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-124 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-126 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-128 TROUBLE CODE 44 — ABS-AT CONTROL (CONTROLLED) —, Diagnostics Chart with Subaru Select Monitor.> |
| 51 | Valve relay malfunction | Valve relay malfunction | <Ref. to ABS-130 TROUBLE CODE 51 — VALVE RELAY MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.> |
| 51 | Valve relay ON failure | Valve relay ON failure | <Ref. to ABS-132 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-134 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-138 TROUBLE CODE 52 — MOTOR RELAY ON FAILURE —, Diagnostics Chart with Subaru Select Monitor.> |
| 52 | Motor malfunction | Motor malfunction | <Ref. to ABS-142 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-146 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-148 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-152 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-156 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-160 TROUBLE CODE 56 — DETECTION OF G SENSOR STICK —, Diagnostics Chart with Subaru Select Monitor.> |

NOTE:

High μ means high friction coefficient against road surface.

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.

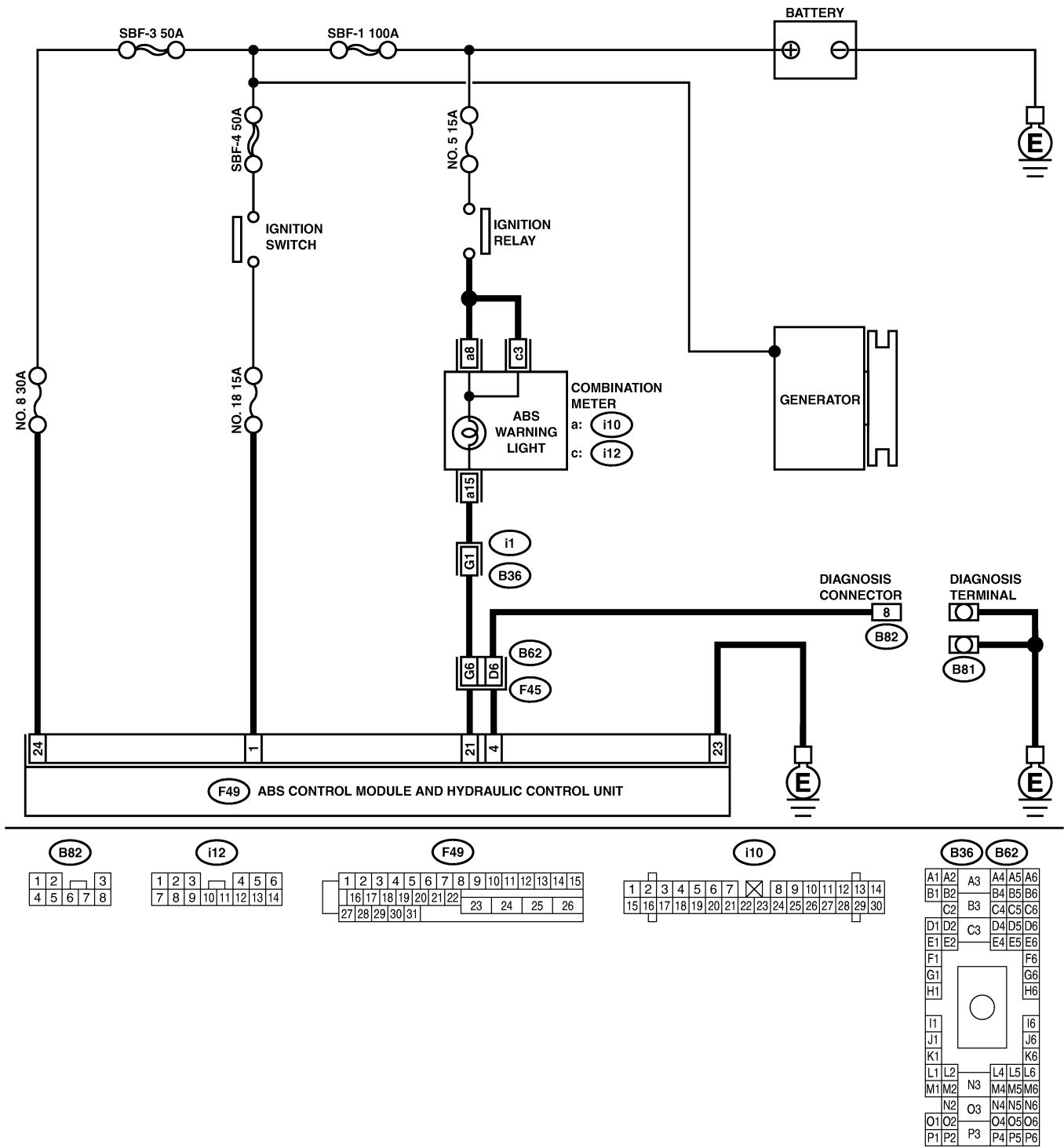
TROUBLE SYMPTOM:

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

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1454

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| 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. <Ref. to IDI-17 Combination Meter Assembly.> |
| 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. <Ref. to IDI-17 Combination Meter Assembly.> |
| 3 | CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS. 1) Disconnect connector (B62) from connector (F45). 2) Measure voltage between connector (B62) and chassis ground. Connector & terminal (B62) No. G6 (+) — 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 (B62) and chassis ground. Connector & terminal (B62) No. G6 (+) — Chassis ground (-): | Is the 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 from combination meter. 3) Install combination meter. 4) Turn ignition switch to ON. 5) Measure voltage between connector (B62) and chassis ground. Connector & terminal (B62) No. G6 (+) — Chassis ground (-): | Is the voltage between 10 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 (F45) and chassis ground. Connector & terminal (F45) No. G6 (+) — 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 (F45) and chassis ground. Connector & terminal (F45) No. G6 (+) — Chassis ground (-): | Is the 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 — GND: | Is the resistance less than 0.5 Ω? | Go to step 9. | Repair ABSCM&H/U ground harness. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|-------------------|---|
| 9 | CHECK WIRING HARNESS. Measure resistance between connector (F45) and chassis ground. Connector & terminal (F45) No. G6 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Go to step 10. | Repair harness/connector. |
| 10 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connectors between combination meter and ABSCM&H/U? | Repair connector. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

B: ABS WARNING LIGHT DOES NOT GO OFF. S006522E25

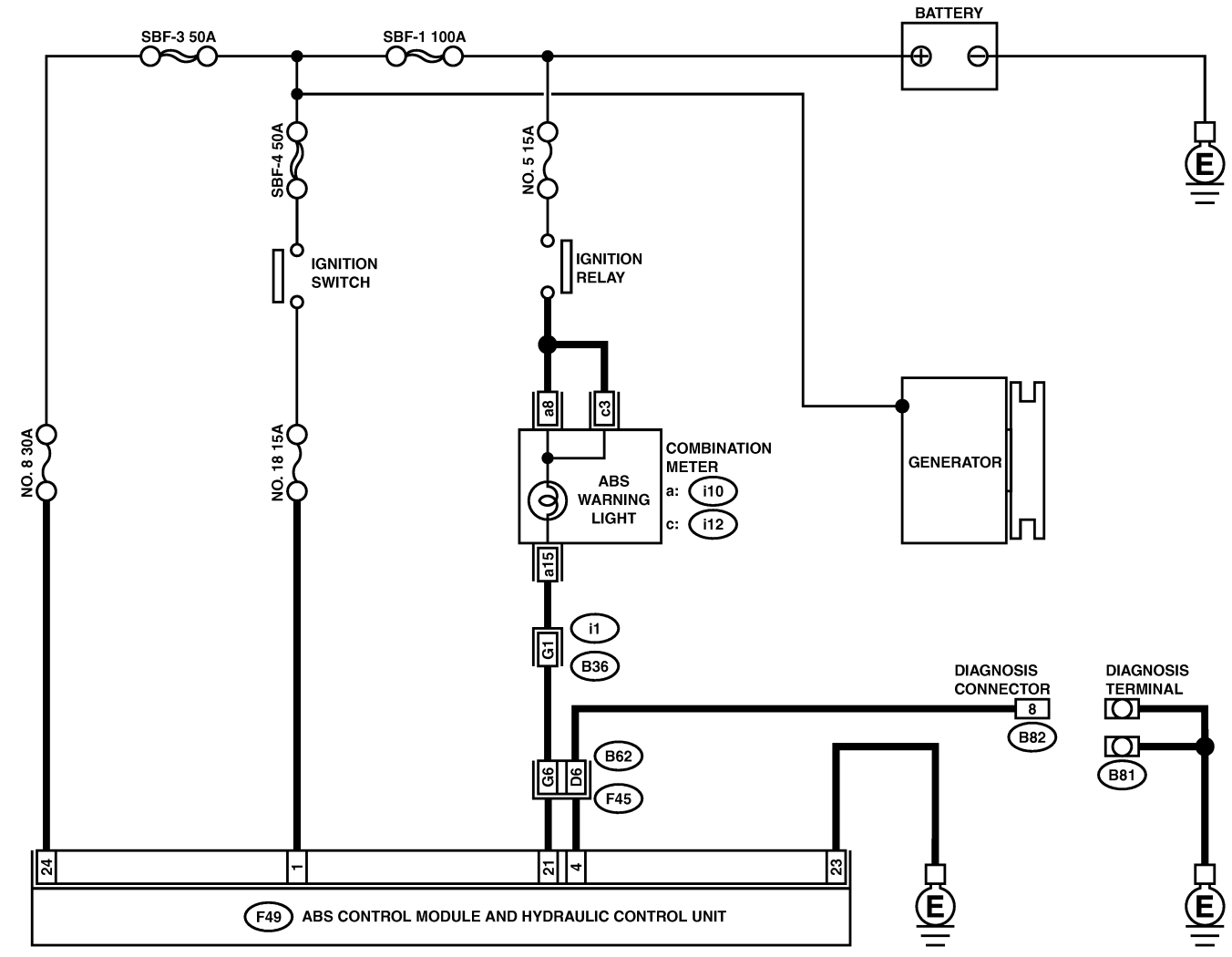
DIAGNOSIS:

- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



| |
|-----------|
| B82 |
| 1 2 3 |
| 4 5 6 7 8 |

| |
|----------------------|
| i12 |
| 1 2 3 4 5 6 |
| 7 8 9 10 11 12 13 14 |

| |
|-------------------------------------|
| 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 |

| |
|---|
| i10 |
| 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 |

| |
|-------------------|
| B36 |
| B62 |
| A1 A2 A3 A4 A5 A6 |
| B1 B2 B3 B4 B5 B6 |
| C1 C2 C3 C4 C5 C6 |
| D1 D2 D3 D4 D5 D6 |
| E1 E2 E3 E4 E5 E6 |
| F1 F2 F3 F4 F5 F6 |
| G1 G2 G3 G4 G5 G6 |
| H1 H2 H3 H4 H5 H6 |
| I1 I2 I3 I4 I5 I6 |
| J1 J2 J3 J4 J5 J6 |
| K1 K2 K3 K4 K5 K6 |
| L1 L2 L3 L4 L5 L6 |
| M1 M2 M3 M4 M5 M6 |
| N1 N2 N3 N4 N5 N6 |
| O1 O2 O3 O4 O5 O6 |
| P1 P2 P3 P4 P5 P6 |

B4M1454

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| 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. <i>Terminals</i> <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 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. 8. 3) Disconnect connector from ABSCM&H/U. 4) Measure resistance between ABSCM&H/U connector and chassis ground. <i>Connector & terminal (F49) No. 4 — Chassis ground:</i> | 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. <i>Terminal</i> <i>Generator B terminal (+) — Chassis ground (-):</i> | Is the voltage between 10 and 15 V? | Go to step 5. | Repair generator. <Ref. to SC(H4)-15 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. <i>Connector & terminal (F49) No. 1 (+) — Chassis ground (-):</i> | 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 (F45) from connector (B62). 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? | Go to step 9. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 9 | CHECK ABSCM&H/U. Measure resistance between ABSCM&H/U terminals. <i>Terminal</i> <i>No. 21 — No. 23:</i> | Is the resistance more than 1 M Ω ? | Go to step 10. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|-------------------|---|
| 10 | CHECK WIRING HARNESS. Measure resistance between connector (F45) and chassis ground. Connector & terminal (F45) No. G6 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Go to step 11. | Repair harness. |
| 11 | CHECK WIRING HARNESS. 1) Connect connector to ABSCM&H/U. 2) Measure resistance between connector (F45) and chassis ground. Connector & terminal (F45) No. G6 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 12. | Repair harness. |
| 12 | CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR. | Is there poor contact in ABSCM&H/U connector? | Repair connector. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

C: TROUBLE CODE DOES NOT APPEAR. S006522E50

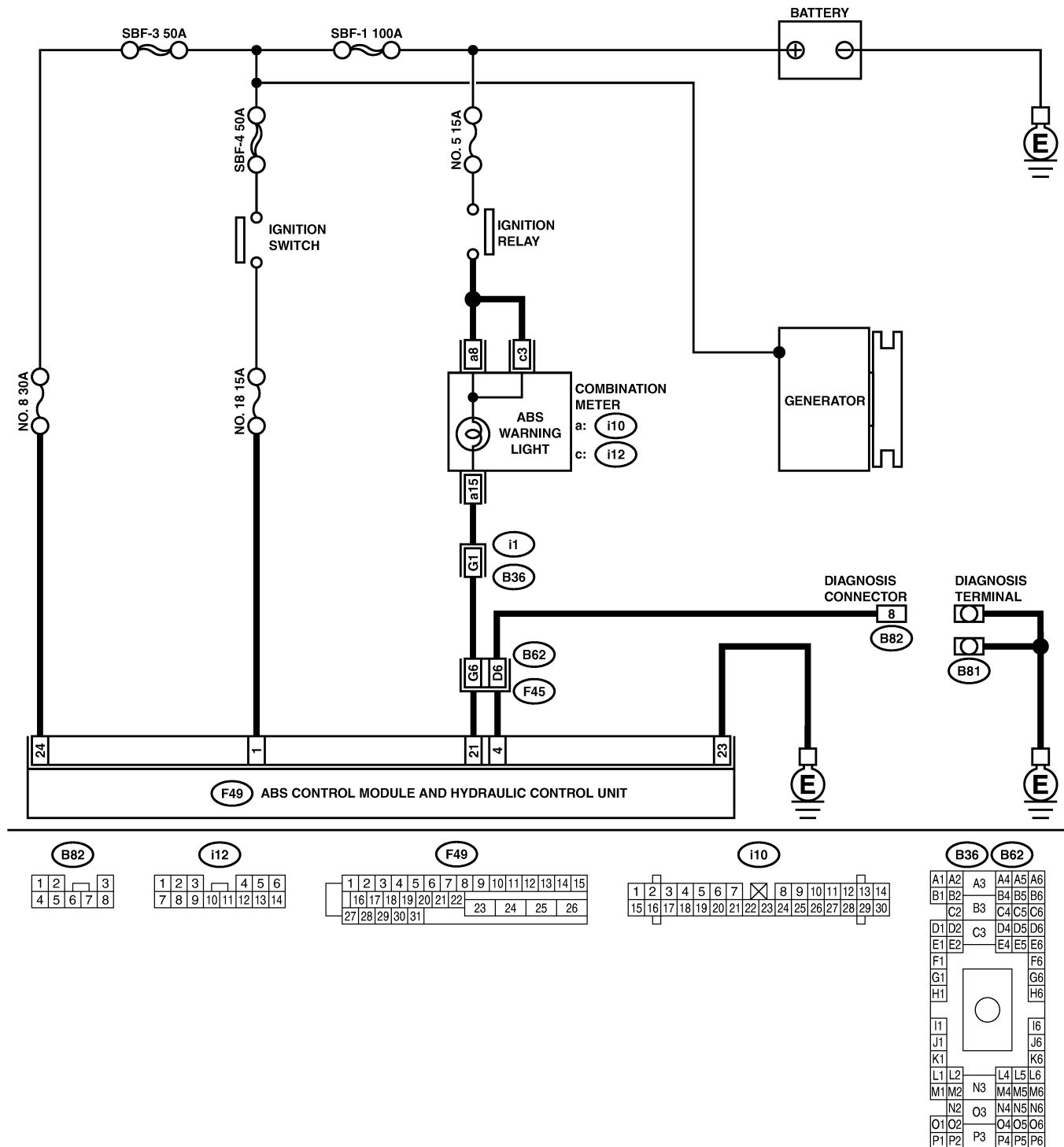
DIAGNOSIS:

- 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:



B4M1454

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|-------------------|--|
| 1 | CHECK DIAGNOSIS TERMINAL. 1) Turn ignition switch to OFF. 2) 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 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. 8. 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 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? | Repair connector. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

D: TROUBLE CODE 21

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

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to ABS-36 TROUBLE CODE 27 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

E: TROUBLE CODE 23

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

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to ABS-36 TROUBLE CODE 27 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

F: TROUBLE CODE 25

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

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to ABS-36 TROUBLE CODE 27 — ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

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

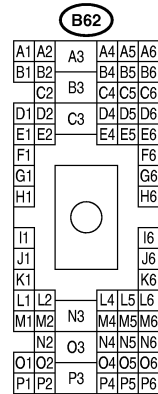
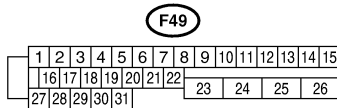
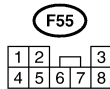
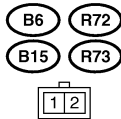
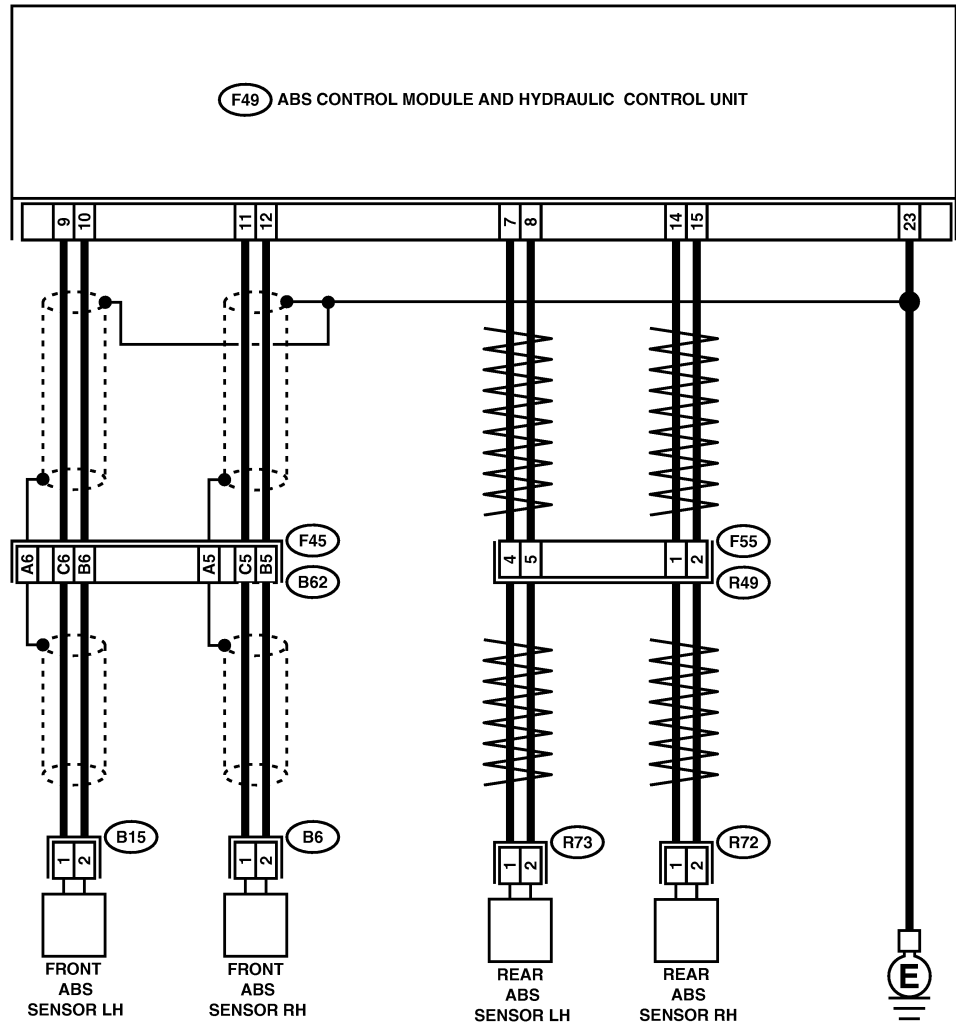
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1455

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---------------|--|
| 1 | CHECK ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ABS sensor. 3) Measure resistance of ABS sensor connector terminals. Terminal <i>Front RH No. 1 — No. 2:</i> <i>Front LH No. 1 — No. 2:</i> <i>Rear RH No. 1 — No. 2:</i> <i>Rear LH No. 1 — No. 2:</i> | Is the resistance between 1 and 1.5 kΩ? | Go to step 2. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |
| 2 | CHECK BATTERY SHORT OF ABS SENSOR. 1) Disconnect 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 3. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |
| 3 | CHECK BATTERY SHORT OF ABS SENSOR. 1) Turn 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 4. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |
| 4 | CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR. 1) Turn 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> <i>Trouble code 25 / (F49) No. 14 — No. 15:</i> <i>Trouble code 27 / (F49) No. 7 — No. 8:</i> | Is the resistance between 1 and 1.5 kΩ? | Go to step 5. | Repair harness/connector between ABSCM&H/U and ABS sensor. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|----------------|--|
| 5 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between ABSCM&H/U connector 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 voltage less than 1 V? | Go to step 6. | Repair harness between ABSCM&H/U and ABS sensor. |
| 6 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between ABSCM&H/U connector 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 voltage less than 1 V? | Go to step 7. | Repair harness between ABSCM&H/U and ABS sensor. |
| 7 | CHECK INSTALLATION OF ABS SENSOR. Turn ignition switch to OFF. Tightening torque: 32 N·m (3.3 kgf-m, 24 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 8. | Tighten ABS sensor installation bolts securely. |
| 8 | CHECK ABS SENSOR GAP. Measure tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Front wheel 0.3 — 0.8 mm (0.012 — 0.031 in) Rear wheel 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 9. | 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. |
| 9 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 10. | Replace tone wheel. Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|--|--|
| 10 | CHECK GROUND SHORT OF ABS SENSOR. 1) Turn ignition switch to ON. 2) Measure resistance between ABS sensor and chassis ground. Terminal Front RH No. 1 — Chassis ground: Front LH No. 1 — Chassis ground: Rear RH No. 1 — Chassis ground: Rear LH No. 1 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 11. | Replace ABS sensor and ABSCM&H/U. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> and <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 11 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Connect connector to ABS sensor. 3) Measure resistance between ABSCM&H/U connector terminal and chassis ground. Connector & terminal Trouble code 21 / (F49) No. 11 — Chassis ground: Trouble code 23 / (F49) No. 9 — Chassis ground: Trouble code 25 / (F49) No. 14 — Chassis ground: Trouble code 27 / (F49) No. 7 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 12. | Repair harness between ABSCM&H/U and ABS sensor. Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 12 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between ABSCM&H/U and ABS sensor? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. NOTE: Check harness and connectors between ABSCM&H/U and ABS sensor. |

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

H: TROUBLE CODE 22

— ABNORMAL ABS SENSOR (FRONT RH) — S006522E64

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to ABS-42 TROUBLE CODE 28 — ABNORMAL ABS SENSOR (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

I: TROUBLE CODE 24

— ABNORMAL ABS SENSOR (FRONT LH) — S006522E65

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to ABS-42 TROUBLE CODE 28 — ABNORMAL ABS SENSOR (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

J: TROUBLE CODE 26

— ABNORMAL ABS SENSOR (REAR RH) — S006522E66

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to ABS-42 TROUBLE CODE 28 — ABNORMAL ABS SENSOR (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

K: TROUBLE CODE 28

— ABNORMAL ABS SENSOR (REAR LH) — S006522E67

DIAGNOSIS:

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

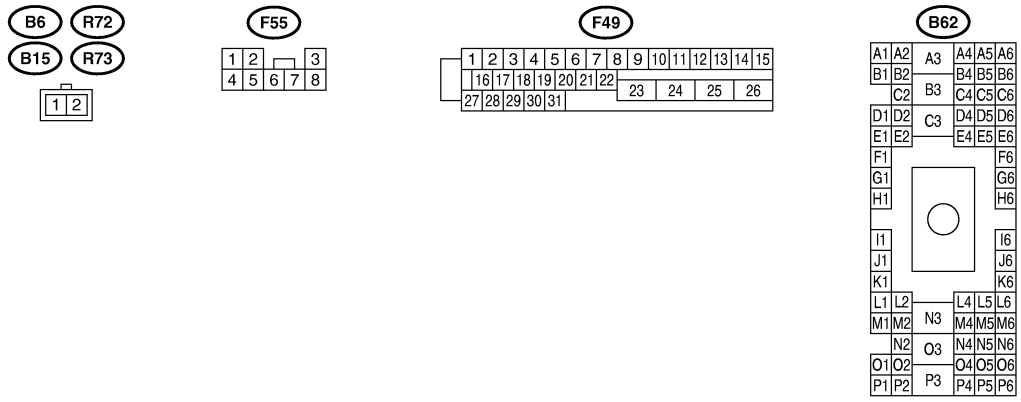
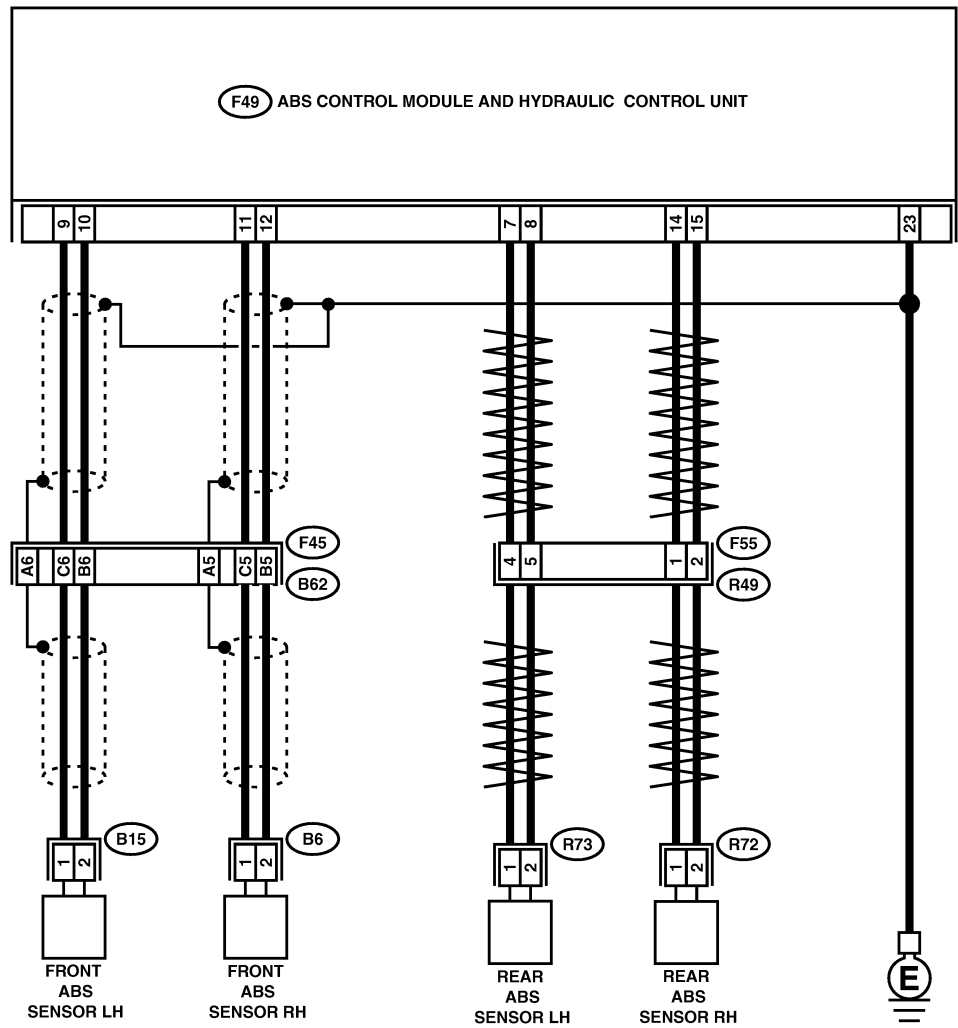
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1455

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|---|---|
| 1 | CHECK INSTALLATION OF ABS SENSOR. Turn ignition switch to OFF. Tightening torque: 32±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 2. | Tighten ABS sensor installation bolts securely. |
| 2 | CHECK ABS SENSOR GAP. Measure tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Front wheel 0.3 — 0.8 mm (0.012 — 0.031 in) Rear wheel 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 3. | 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. |
| 3 | PREPARE OSCILLOSCOPE. | Is an oscilloscope available? | Go to step 4. | Go to step 5. |
| 4 | 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 ABS control module sometimes stores the trouble code 29. Connector & terminal Trouble code 22 / (B62) No. C5 (+) — No. B5 (-): Trouble code 24 / (B62) No. C6 (+) — No. B6 (-): Trouble code 26 / (F55) No. 1 (+) — No. 2 (-): Trouble code 28 / (F55) No. 4 (+) — No. 5 (-): | Is oscilloscope pattern smooth, as shown in figure? | Go to step 8. | Go to step 7. |
| 5 | CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL. Remove disc rotor or drum from hub in accordance with trouble code. | Is the ABS sensor piece or the tone wheel contaminated by dirt or other foreign matter? | Thoroughly remove dirt or other foreign matter. | Go to step 6. |
| 6 | CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL. | Are there broken or damaged in the ABS sensor piece or the tone wheel? | Replace ABS sensor or tone wheel. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> and Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> | Go to step 7. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|----------------|---|
| 7 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 8. | Replace tone wheel. Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> |
| 8 | CHECK RESISTANCE OF ABS SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from ABS sensor. 3) Measure resistance between ABS sensor connector terminals. Terminal Front RH No. 1 — No. 2: Front LH No. 1 — No. 2: Rear RH No. 1 — No. 2: Rear LH No. 1 — No. 2: | Is the resistance between 1 and 1.5 kΩ? | Go to step 9. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |
| 9 | CHECK GROUND SHORT OF ABS SENSOR. Measure 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 10. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |
| 10 | CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR. 1) Connect connector to ABS sensor. 2) Disconnect connector from ABSCM&H/U. 3) Measure resistance at ABSCM&H/U connector terminals. Connector & terminal Trouble code 22 / (F49) No. 11 — No. 12: Trouble code 24 / (F49) No. 9 — No. 10: Trouble code 26 / (F49) No. 14 — No. 15: Trouble code 28 / (F49) No. 7 — No. 8: | Is the resistance between 1 and 1.5 kΩ? | Go to step 11. | Repair harness/connector between ABSCM&H/U and ABS sensor. |
| 11 | 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 12. | Repair harness/connector between ABSCM&H/U and ABS sensor. |
| 12 | CHECK GROUND CIRCUIT OF ABSCM&H/U. Measure resistance between ABSCM&H/U and chassis ground. Connector & terminal (F49) No. 23 — GND: | Is the resistance less than 0.5 Ω? | Go to step 13. | Repair ABSCM&H/U ground harness. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|--|---|
| 13 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between ABSCM&H/U and ABS sensor? | Repair connector. | Go to step 14. |
| 14 | CHECK SOURCES OF SIGNAL NOISE. | Is the car telephone or the wireless transmitter properly installed? | Go to step 15. | Properly install the car telephone or the wireless transmitter. |
| 15 | 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 16. |
| 16 | CHECK SHIELD CIRCUIT. 1) Connect all connectors. 2) Measure resistance between shield connector and chassis ground. Connector & terminal <i>Trouble code 22 / (B62) No. A5 — Chassis ground:</i> <i>Trouble code 24 / (B62) No. A6 — Chassis ground:</i> NOTE: For the Trouble code 26 and 28 : Go to step 17. | Is the resistance less than 0.5 Ω ? | Go to step 17. | Repair shield harness. |
| 17 | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> | Go to step 18. |
| 18 | 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 DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

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

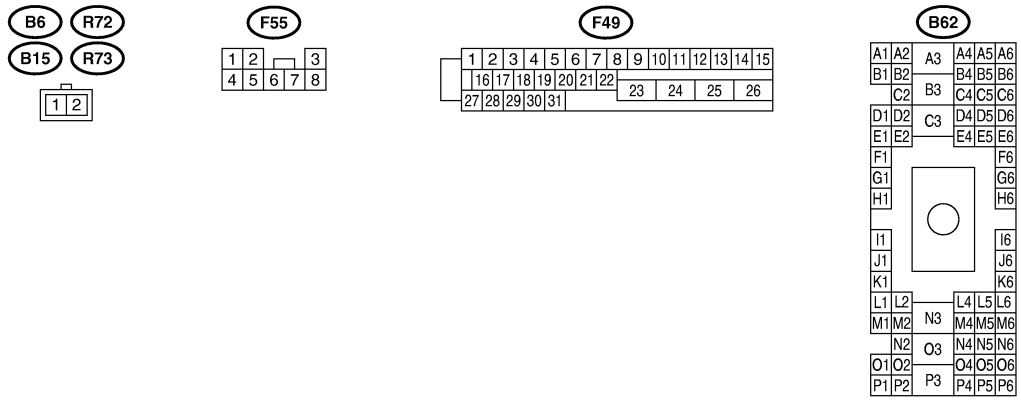
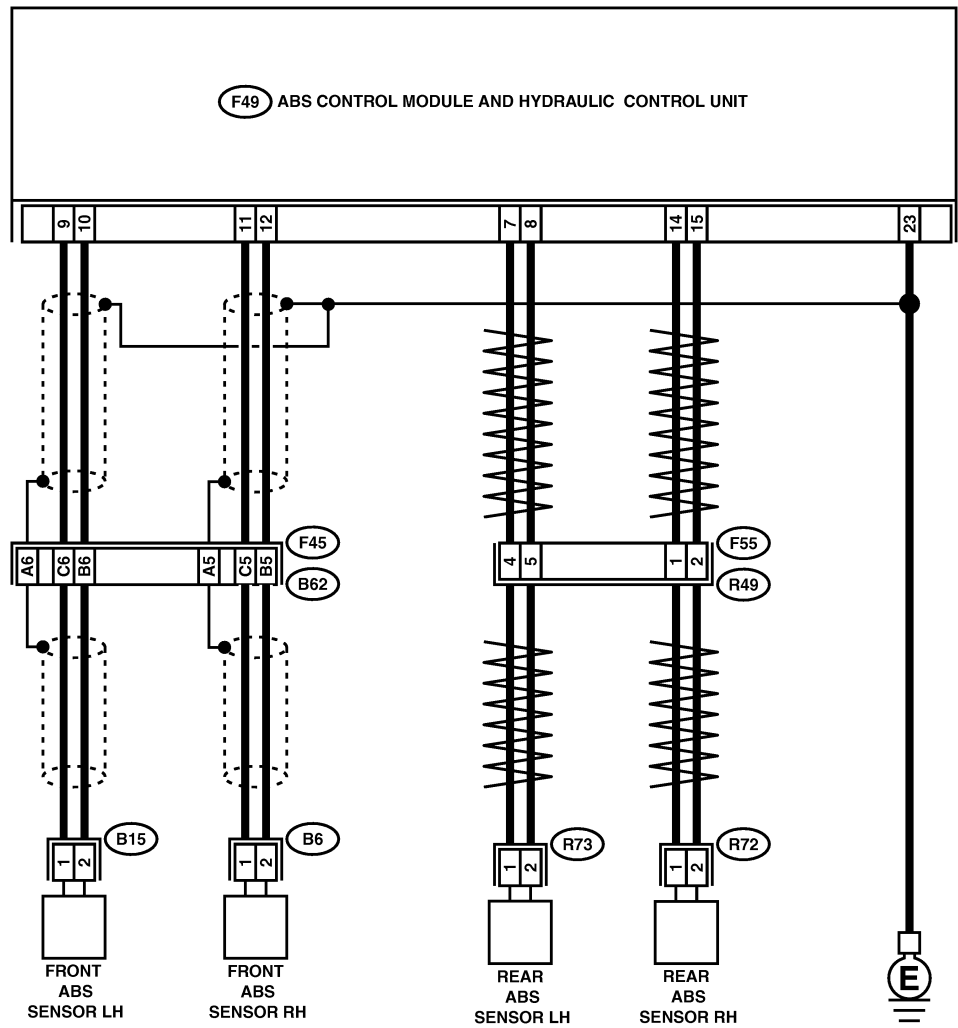
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1455

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| 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±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 6. | Tighten ABS sensor installation bolts securely. |
| 6 | CHECK ABS SENSOR GAP. Measure tone wheel to ABS sensor 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> 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 7. | 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. |
| 7 | PREPARE OSCILLOSCOPE. | Is an oscilloscope available? | Go to step 8. | Go to step 9. |
| 8 | 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>(B62) No. C5 (+) — No. B5 (–) (Front RH):</i> <i>(B62) No. C6 (+) — No. B6 (–) (Front LH):</i> <i>(F55) No. 1 (+) — No. 2 (–) (Rear RH):</i> <i>(F55) No. 4 (+) — No. 5 (–) (Rear LH):</i> | Is oscilloscope pattern smooth, as shown in figure? | Go to step 12. | Go to step 9. |
| 9 | CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL. Remove disc rotor from hub. | Is the ABS sensor piece or the tone wheel contaminated by dirt or other foreign matter? | Thoroughly remove dirt or other foreign matter. | Go to step 10. |

ABS-50

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|---|
| 10 | CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL. | Are there broken or damaged teeth in the ABS sensor piece or the tone wheel? | Replace ABS sensor or tone wheel. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> and Front: <Ref. to ABS-17Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> | Go to step 11. |
| 11 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 12. | Replace tone wheel. Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> |
| 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

M: TROUBLE CODE 31

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

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 37. <Ref. to ABS-52 TROUBLE CODE 37 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

N: TROUBLE CODE 33

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

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 37. <Ref. to ABS-52 TROUBLE CODE 37 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

O: TROUBLE CODE 35

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

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 37. <Ref. to ABS-52 TROUBLE CODE 37 — ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

P: TROUBLE CODE 37

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

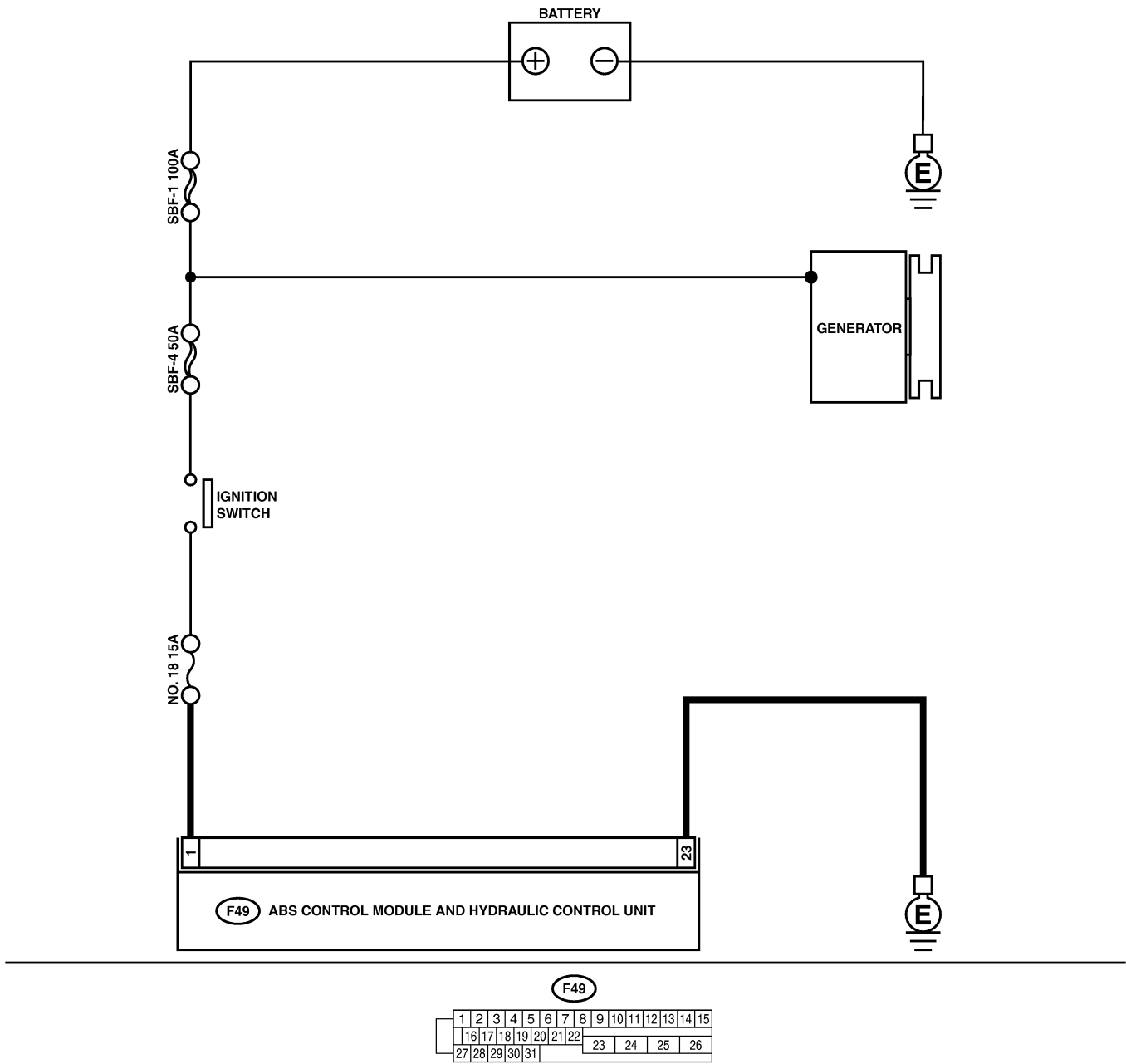
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M2334

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|--|--|
| 1 | 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 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

Q: TROUBLE CODE 32

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

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 38. <Ref. to ABS-56 TROUBLE CODE 38 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

R: TROUBLE CODE 34

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

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 38. <Ref. to ABS-56 TROUBLE CODE 38 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

S: TROUBLE CODE 36

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

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 38. <Ref. to ABS-56 TROUBLE CODE 38 — ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U (REAR LH) —, Diagnostics Chart with Diagnosis Connector.>

T: TROUBLE CODE 38

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

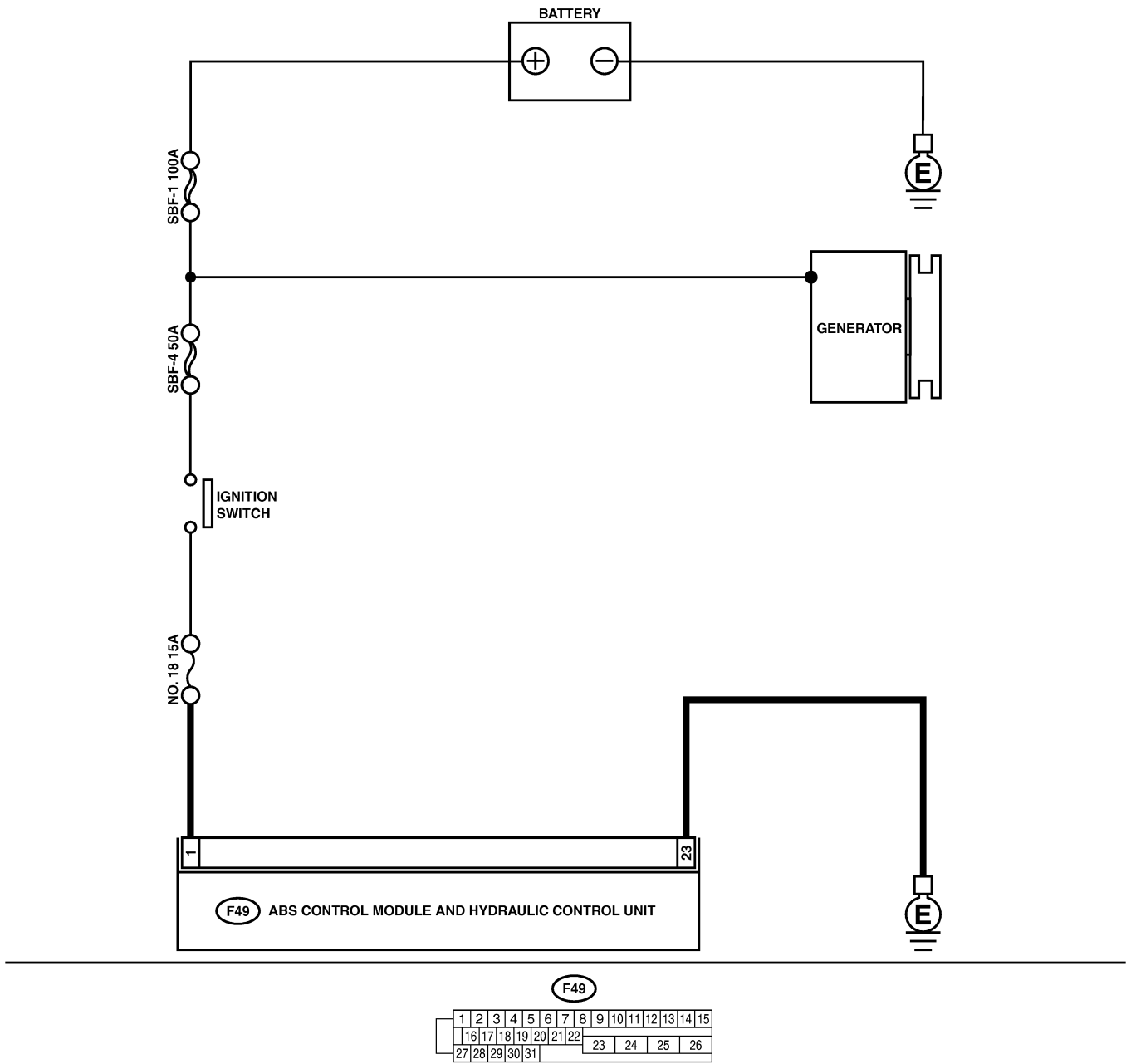
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M2334

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|--|--|
| 1 | 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 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

U: TROUBLE CODE 41
— ABNORMAL ABS CONTROL MODULE —

S006522D29

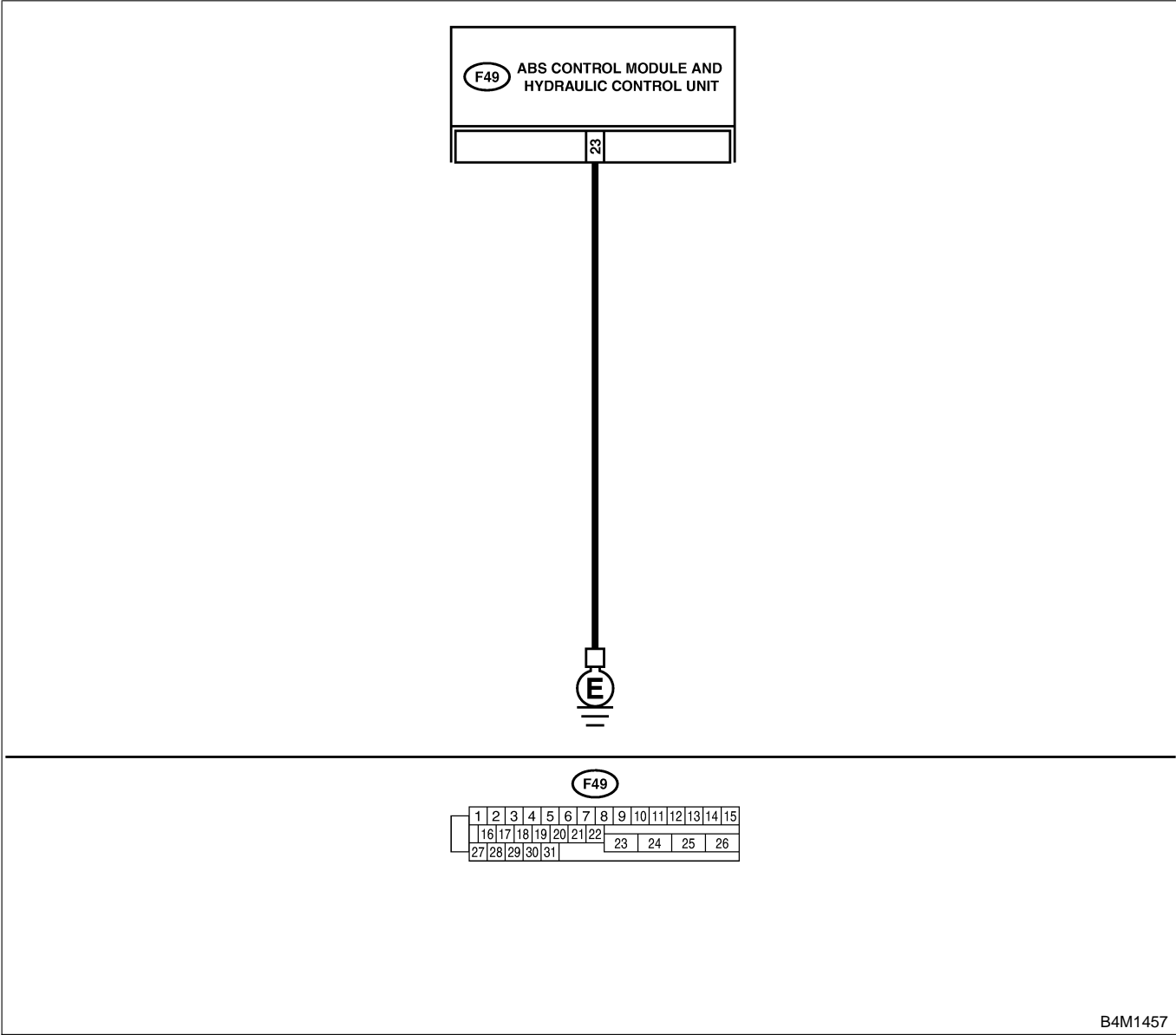
DIAGNOSIS:

- Faulty ABSCM&H/U.

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1457

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

V: TROUBLE CODE 42

— SOURCE VOLTAGE IS ABNORMAL. — S006522D37

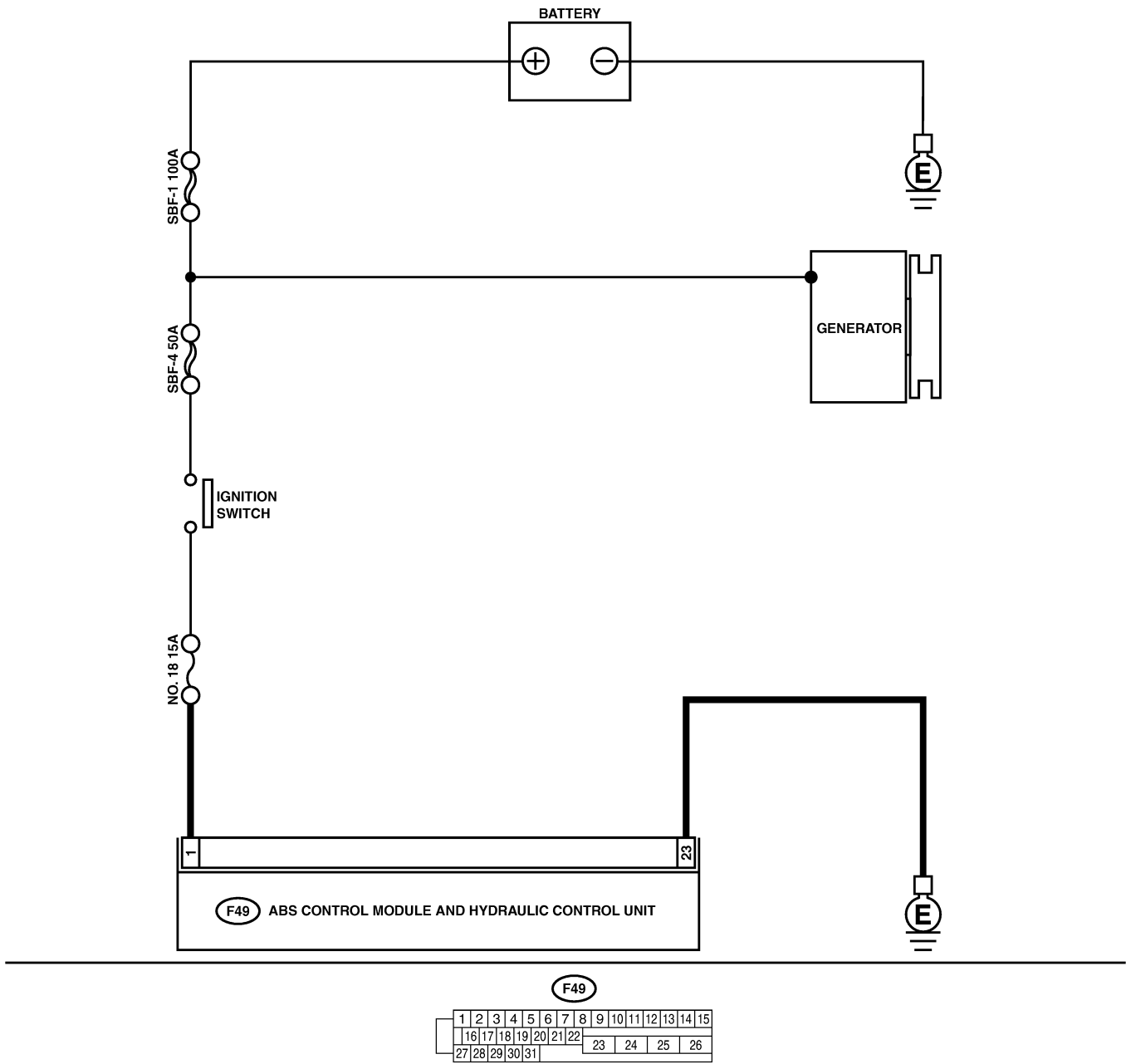
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M2334

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| 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 and 17 V? | Go to step 2. | Repair generator. <Ref. to SC(H4)-15 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 and 17 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

W: TROUBLE CODE 44

— A COMBINATION OF AT CONTROL ABNORMAL — S006522D42

DIAGNOSIS:

- Combination of AT control faults

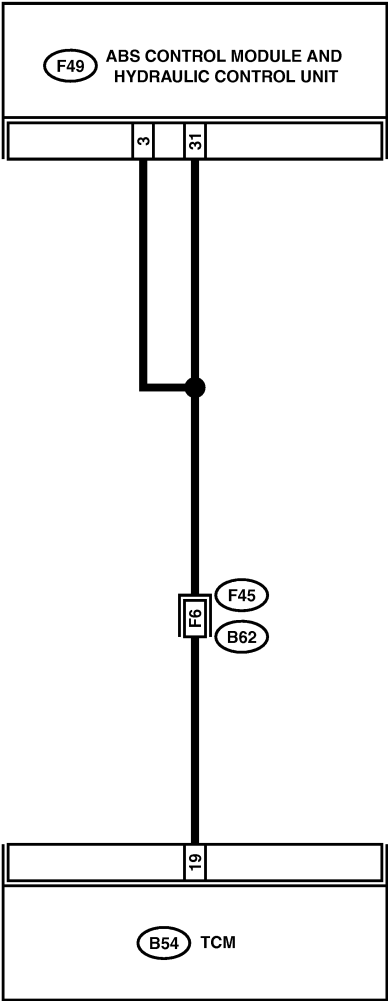
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B54

| | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | | | | 22 | 23 | 24 |

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 | | | | | | | | | | |

B62

| | | | | | |
|----|----|----|----|----|----|
| A1 | A2 | A3 | A4 | A5 | A6 |
| B1 | B2 | B3 | B4 | B5 | B6 |
| C2 | | | C4 | C5 | C6 |
| D1 | D2 | C3 | D4 | D5 | D6 |
| E1 | E2 | | E4 | E5 | E6 |
| F1 | | | | | F6 |
| G1 | | | | | G6 |
| H1 | | | | | H6 |
| I1 | | | | | I6 |
| J1 | | | | | J6 |
| K1 | | | | | K6 |
| L1 | L2 | | L4 | L5 | L6 |
| M1 | M2 | N3 | M4 | M5 | M6 |
| N2 | | O3 | N4 | N5 | N6 |
| O1 | O2 | | O4 | O5 | O6 |
| P1 | P2 | P3 | P4 | P5 | P6 |

B4M1458

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--|---|
| 1 | CHECK SPECIFICATIONS OF THE ABSCM&H/U. Check specifications of the mark to the ABSCM&H/U. C5: AT (Except OUTBACK) C6: MT (Except OUTBACK) CE: AT (OUTBACK) CF: MT (OUTBACK) | Is an ABSCM&H/U for AT model installed on a MT model? | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. Connector & terminal (F49) No. 3 — Chassis ground: | 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. Connector & terminal (F49) No. 3 (+) — Chassis ground (-): | 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. Connector & terminal (F49) No. 3 (+) — Chassis ground (-): | 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. Connector & terminal (B54) No. 19 (+) — Chassis ground (-): | Is the voltage between 10 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. Connector & terminal (F49) No. 3 (+) — Chassis ground (-): (F49) No. 31 (+) — Chassis ground (-): | Is the voltage between 10 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> | Go to step 10. |
| 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 (DIAGNOSTICS)

X: TROUBLE CODE 51

— ABNORMAL VALVE RELAY — S006522D61

DIAGNOSIS:

- Faulty valve relay

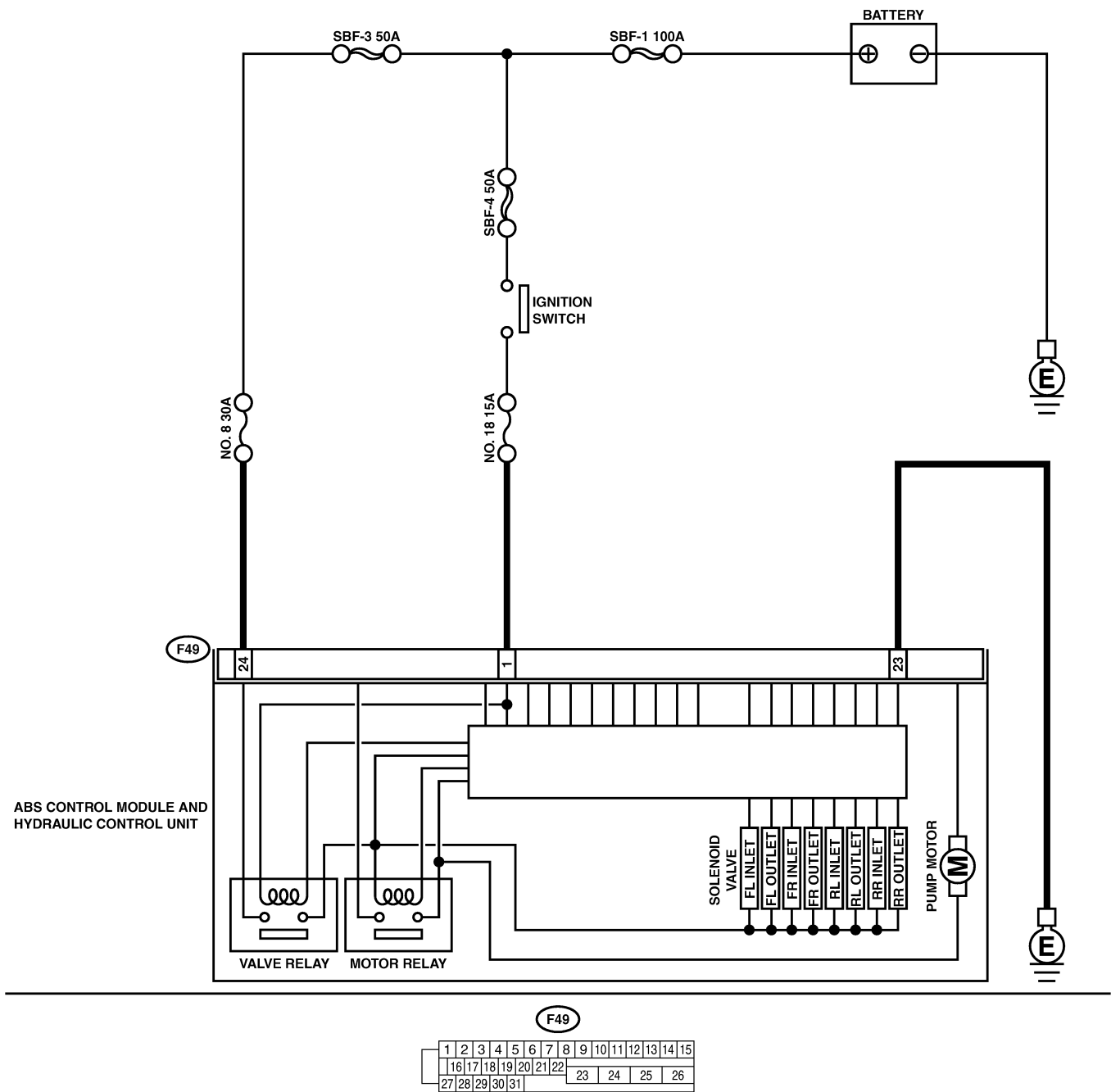
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1459

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| 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 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 M Ω ? | Go to step 4. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 4 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between generator, battery and ABSCM&H/U? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

Y: TROUBLE CODE 52

— ABNORMAL MOTOR AND/OR MOTOR RELAY — S006522D65

DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

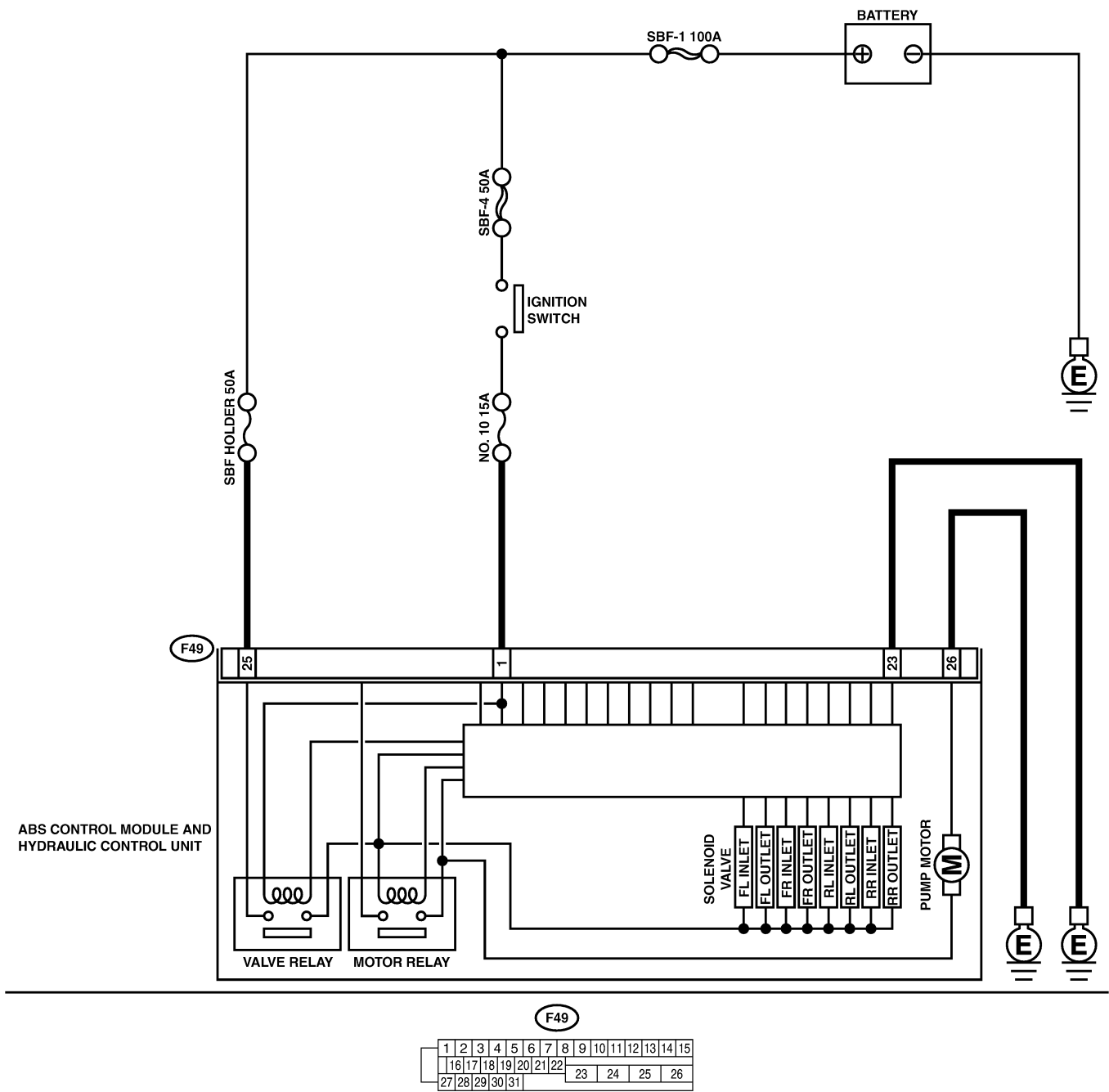
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1460

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| 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 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 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-11 ABS Sequence Control.> NOTE: Use the diagnosis connector to operate the sequence control. | Can motor revolution noise (buzz) be heard when carrying out the sequence control? | Go to step 6. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

Z: TROUBLE CODE 54

— ABNORMAL STOP LIGHT SWITCH — S006522D72

DIAGNOSIS:

- Faulty stop light switch

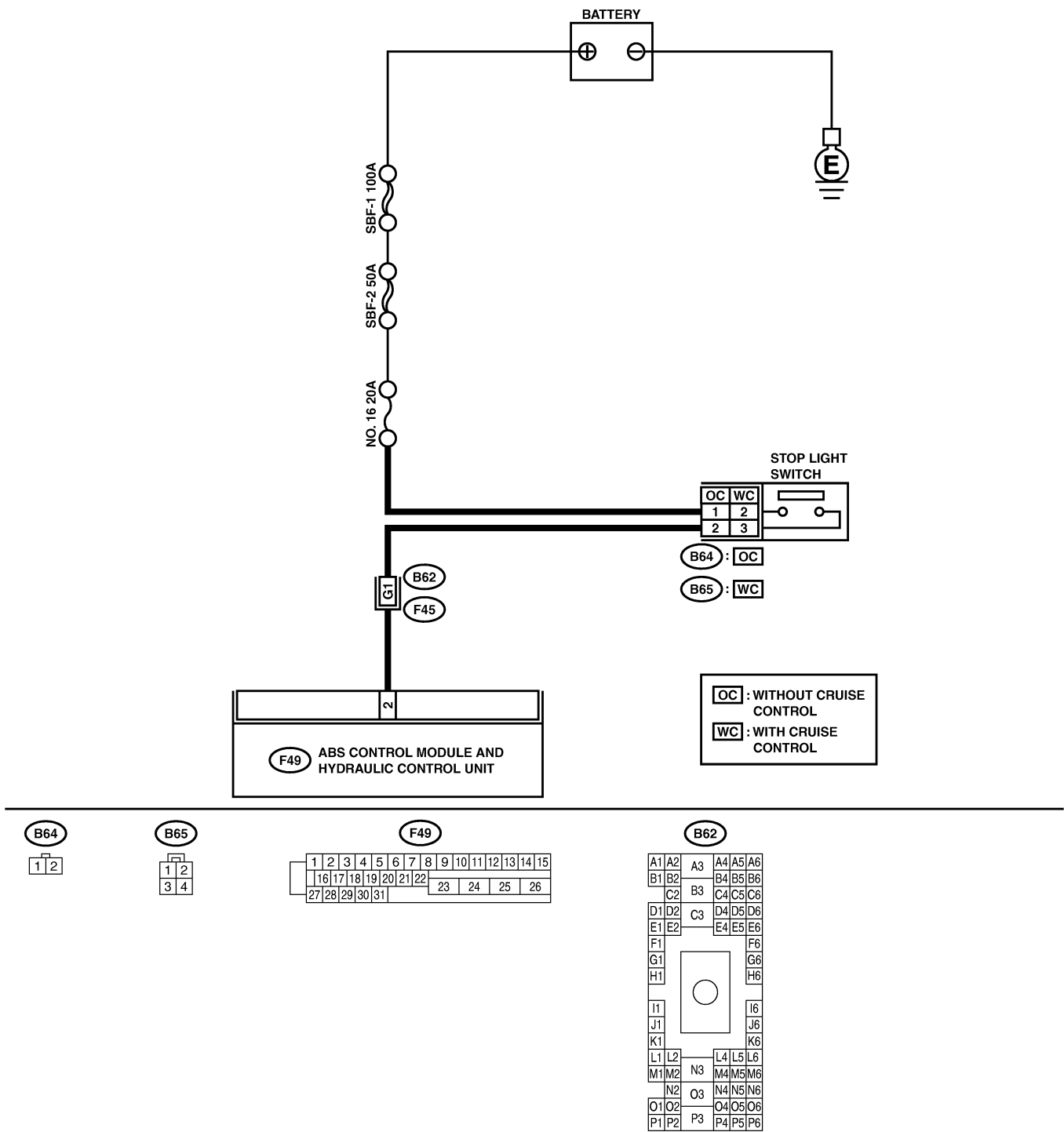
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1461

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| 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 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

AA: TROUBLE CODE 56

— ABNORMAL G SENSOR OUTPUT VOLTAGE — S006522E77

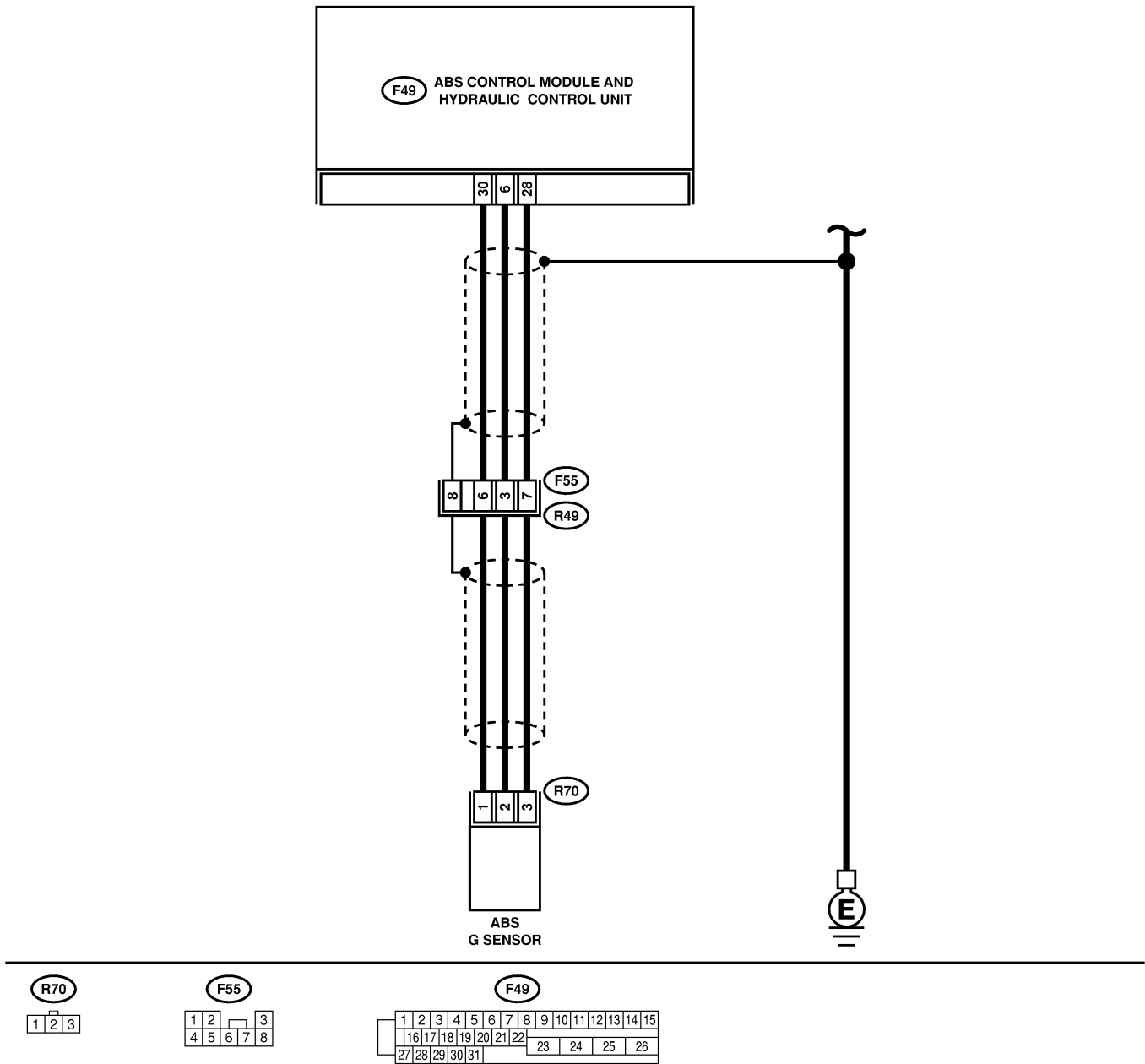
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1462

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| 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. C5: AT (Except OUTBACK) C6: MT (Except OUTBACK) CE: AT (OUTBACK) CF: MT (OUTBACK) | Does the vehicle specification and the ABSCM&H/U specification match? | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 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 2.4 V when G sensor is horizontal? | Go to step 10. | Replace G sensor. <Ref. to ABS-24 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. <Ref. to ABS-24 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. <Ref. to ABS-24 G Sensor.> |
| 12 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector between ABSCM&H/U and G sensor? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

AB: SELECT MONITOR S006522E48

Applicable cartridge of select monitor: <Ref. to ABS-9 SPECIAL TOOLS, PREPARATION TOOL, General Description.>

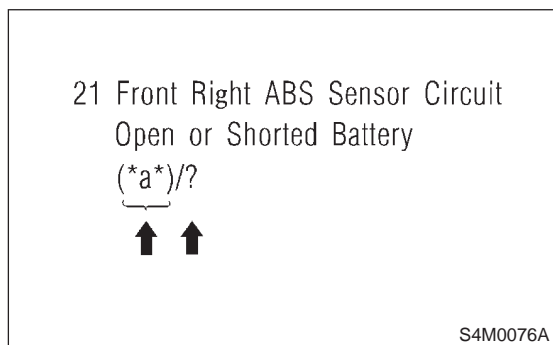
NOTE:

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 CONTROL

S006522E23

| Display screen | Contents to be monitored | Index No. |
|----------------------|--|--|
| ABS sequence control | Perform ABS sequence control by operating valve and pump motor sequentially. | <Ref. to ABS-11 ABS Sequence Control.> |

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 trouble code, preceded by a question mark “?”, appears on the select monitor display. This shows it may be an unreliable reading.

| Display screen | Contents to be monitored |
|-------------------------|--|
| FR wheel speed | Wheel speed detected by 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 |
| ABS-AT control | ABS operation signal from ABS control module to TCM |
| ABS operation signal | ABS operation signal |

14. Diagnostics Chart with Subaru Select Monitor S006583

A: COMMUNICATION FOR INITIALIZING IMPOSSIBLE S006583E34

DIAGNOSIS:

- Faulty harness connector

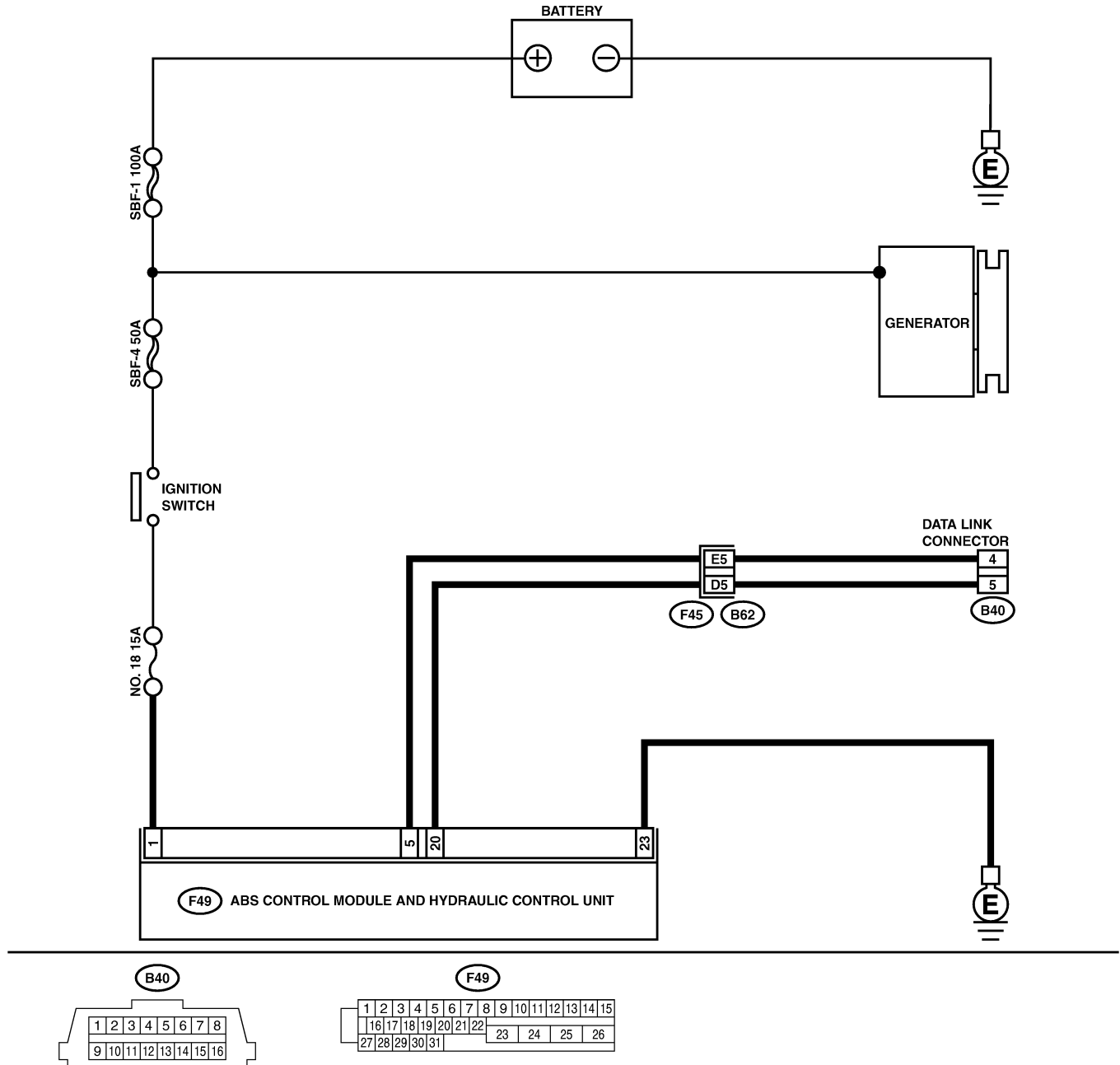
TROUBLE SYMPTOM:

- ABS warning light remains on.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1463

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 1 | CHECK IGNITION SWITCH. | Is ignition switch ON? | Go to step 2. | Turn ignition switch ON, and select ABS/TCS 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. <Ref. to SC(H4)-15 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 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? | Repair connector. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |

MEMO:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

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.

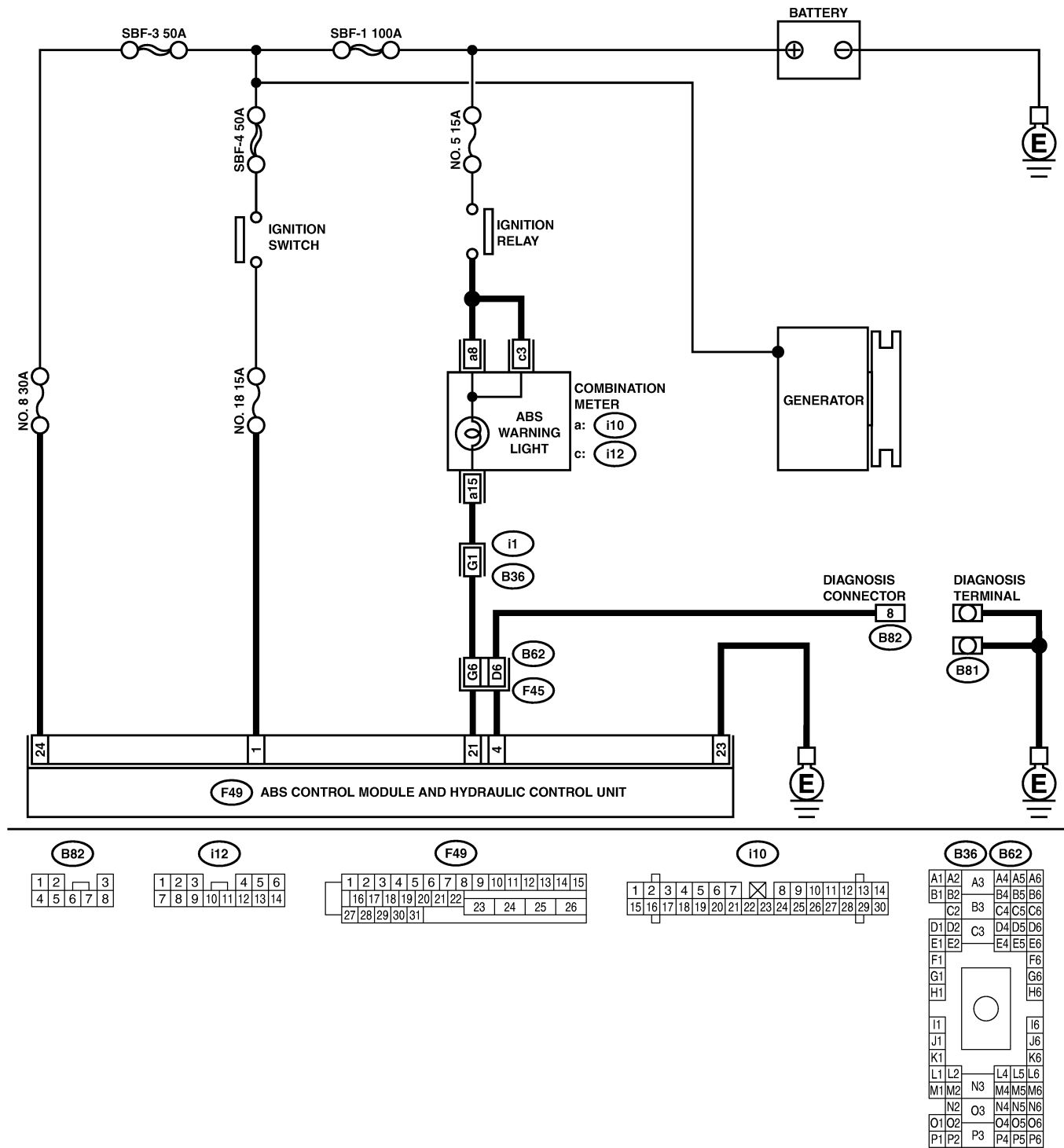
NOTE:

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

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1454

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|-------------------|--|
| 1 | CHECK WIRING HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector (F45) from connector (B62). 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? | Go to step 3. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 4 | CHECK WIRING HARNESS. Measure resistance between connector (F45) and chassis ground. Connector & terminal (F45) No. G6 — 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 (F45) and chassis ground. Connector & terminal (F45) No. G6 — 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? | Repair connector. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |

MEMO:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

C: TROUBLE CODE 21

— OPEN OR SHORT CIRCUIT IN FRONT RIGHT ABS SENSOR CIRCUIT — S006583C50

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to ABS-96 TROUBLE CODE 27 — OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>

D: TROUBLE CODE 23

— OPEN OR SHORT CIRCUIT IN FRONT LEFT ABS SENSOR CIRCUIT — S006583C60

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to ABS-96 TROUBLE CODE 27 — OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>

E: TROUBLE CODE 25

— OPEN OR SHORT CIRCUIT IN REAR RIGHT ABS SENSOR CIRCUIT — S006583C69

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to ABS-96 TROUBLE CODE 27 — OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT —, Diagnostics Chart with Subaru Select Monitor.>

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

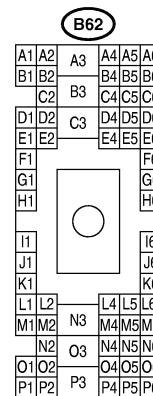
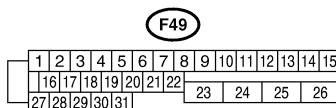
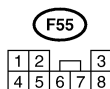
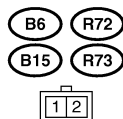
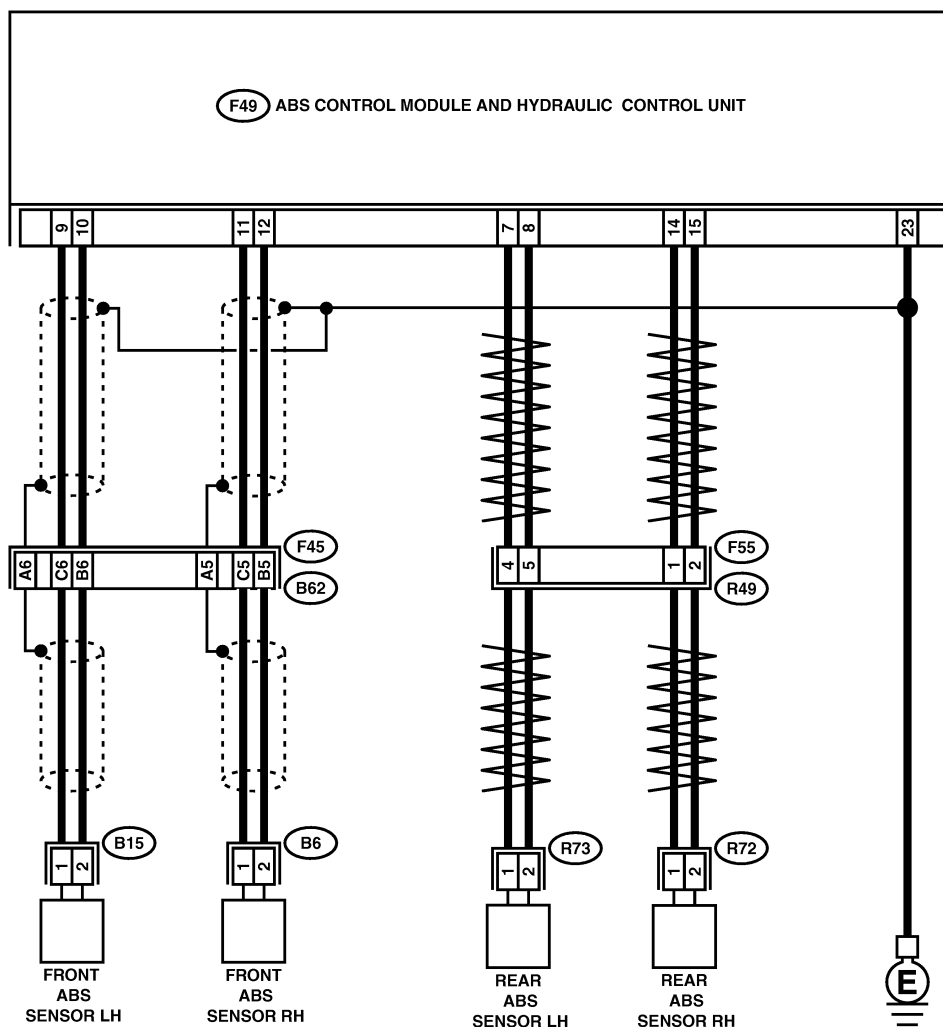
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1455

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 INSTALLATION OF ABS SENSOR. <i>Tightening torque:</i> 32±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 3. | Tighten ABS sensor installation bolts securely. |
| 3 | CHECK ABS SENSOR GAP. Measure tone wheel to ABS sensor piece gap over entire perimeter of the wheel. <i>Front wheel</i> 0.3 — 0.8 mm (0.012 — 0.031 in) <i>Rear wheel</i> 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 4. | 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. |
| 4 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 5. | Replace tone wheel. Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> |
| 5 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connectors between ABSCM&H/U and ABS sensor? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. NOTE: Check harness and connectors between ABSCM&H/U and ABS sensor. |
| 8 | CHECK ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ABS sensor. 3) Measure resistance of ABS sensor connector terminals. <i>Terminal</i> Front RH No. 1 — No. 2: Front LH No. 1 — No. 2: Rear RH No. 1 — No. 2: Rear LH No. 1 — No. 2: | Is the resistance between 1 and 1.5 kΩ? | Go to step 9. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|----------------|--|
| 9 | 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 10. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |
| 10 | CHECK BATTERY SHORT OF ABS SENSOR. 1) Turn 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 11. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |
| 11 | CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR. 1) Turn 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> <i>Trouble code 25 / (F49) No. 14 — No. 15:</i> <i>Trouble code 27 / (F49) No. 7 — No. 8:</i> | Is the resistance between 1 and 1.5 kΩ? | Go to step 12. | Repair harness/connector between ABSCM&H/U and ABS sensor. |
| 12 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between ABSCM&H/U connector 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 voltage less than 1 V? | Go to step 13. | Repair harness between ABSCM&H/U and ABS sensor. |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|----------------|--|
| 13 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between ABSCM&H/U connector 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 voltage less than 1 V? | Go to step 14. | Repair harness between ABSCM&H/U and ABS sensor. |
| 14 | CHECK INSTALLATION OF ABS SENSOR. Tightening torque: 32±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 15. | Tighten ABS sensor installation bolts securely. |
| 15 | CHECK ABS SENSOR GAP. Measure tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Front wheel 0.3 — 0.8 mm (0.012 — 0.031 in) Rear wheel 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 16. | 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. |
| 16 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 17. | Replace tone wheel. Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> |
| 17 | CHECK GROUND SHORT OF ABS SENSOR. 1) Turn ignition switch to ON. 2) Measure resistance between ABS sensor and chassis ground. Terminal Front RH No. 1 — Chassis ground: Front LH No. 1 — Chassis ground: Rear RH No. 1 — Chassis ground: Rear LH No. 1 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 18. | Replace ABS sensor and ABSCM&H/U. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> and <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 18 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Connect connector to ABS sensor. 3) Measure resistance between ABSCM&H/U connector terminal and chassis ground. Connector & terminal Trouble code 21 / (F49) No. 11 — Chassis ground: Trouble code 23 / (F49) No. 9 — Chassis ground: Trouble code 25 / (F49) No. 14 — Chassis ground: Trouble code 27 / (F49) No. 7 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 19. | Repair harness between ABSCM&H/U and ABS sensor. And replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 19 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between ABSCM&H/U and ABS sensor? | Repair connector. | Go to step 20. |
| 20 | 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 21. |
| 21 | 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. |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

G: TROUBLE CODE 22

— FRONT RIGHT ABNORMAL ABS SENSOR SIGNAL — S006583C54

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to ABS-102 TROUBLE CODE 28 — REAR LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>

H: TROUBLE CODE 24

— FRONT LEFT ABNORMAL ABS SENSOR SIGNAL — S006583C64

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to ABS-102 TROUBLE CODE 28 — REAR LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>

I: TROUBLE CODE 26

— REAR RIGHT ABNORMAL ABS SENSOR SIGNAL — S006583C73

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to ABS-102 TROUBLE CODE 28 — REAR LEFT ABNORMAL ABS SENSOR SIGNAL —, Diagnostics Chart with Subaru Select Monitor.>

J: TROUBLE CODE 28

— REAR LEFT ABNORMAL ABS SENSOR SIGNAL — S006583C82

DIAGNOSIS:

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

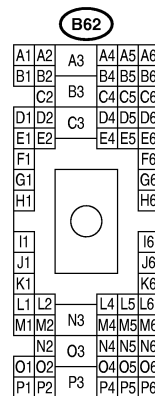
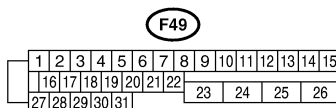
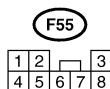
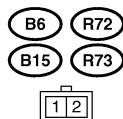
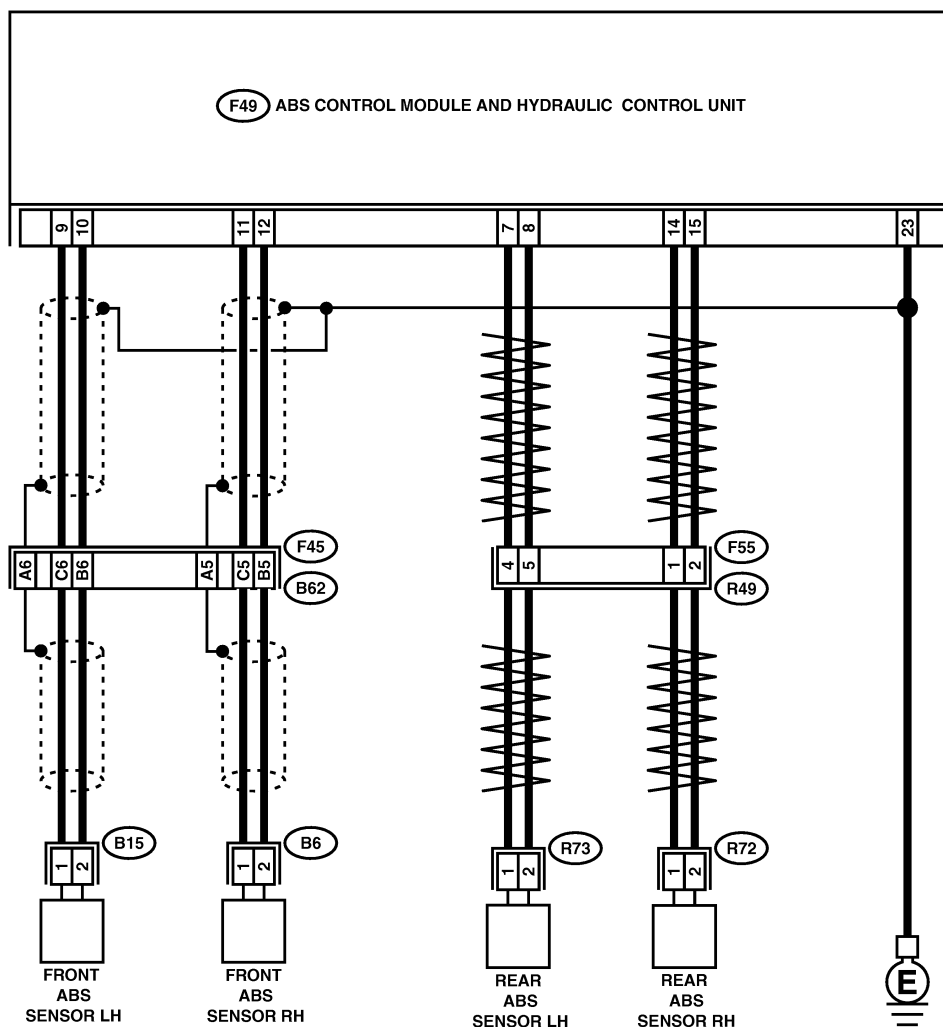
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1455

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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? | 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 / (B62) No. A5 — Chassis ground: Trouble code 24 / (B62) No. A6 — Chassis ground: NOTE: For the Trouble code 26 and 28: Go to step 6. | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 9. | Tighten ABS sensor installation bolts securely. |
| 9 | CHECK ABS SENSOR GAP. Measure tone wheel to ABS sensor piece gap over entire perimeter of the wheel. Front wheel 0.3 — 0.8 mm (0.012 — 0.031 in) Rear wheel 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 10. | 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. |
| 10 | PREPARE OSCILLOSCOPE. | Is an oscilloscope available? | Go to step 11. | Go to step 12. |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|---|--|
| 11 | 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 / (B62) No. C5 (+) — No. B5 (-):</i> <i>Trouble code 24 / (B62) No. C6 (+) — No. B6 (-):</i> <i>Trouble code 26 / (F55) No. 1 (+) — No. 2 (-):</i> <i>Trouble code 28 / (F55) No. 4 (+) — No. 5 (-):</i> | Is oscilloscope pattern smooth, as shown in figure? | Go to step 15. | Go to step 12. |
| 12 | CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL. Remove disc rotor or drum from hub in accordance with trouble code. | Is the ABS sensor piece or the tone wheel contaminated by dirt or other foreign matter? | Thoroughly remove dirt or other foreign matter. | Go to step 13. |
| 13 | CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL. | Are there broken or damaged in the ABS sensor piece or the tone wheel? | Replace ABS sensor or tone wheel. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> and Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> | Go to step 14. |
| 14 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 15. | Replace tone wheel. Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> |
| 15 | CHECK RESISTANCE OF ABS SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from ABS sensor. 3) Measure resistance between ABS sensor connector terminals. Terminal <i>Front RH No. 1 — No. 2:</i> <i>Front LH No. 1 — No. 2:</i> <i>Rear RH No. 1 — No. 2:</i> <i>Rear LH No. 1 — No. 2:</i> | Is the resistance between 1 and 1.5 kΩ? | Go to step 16. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|--|--|
| 16 | CHECK GROUND SHORT OF ABS SENSOR. 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 17. | Replace ABS sensor. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> |
| 17 | CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR. 1) Connect connector to ABS sensor. 2) Disconnect connector from ABSCM&H/U. 3) Measure resistance at ABSCM&H/U connector terminals. Connector & terminal <i>Trouble code 22 / (F49) No. 11 — No. 12:</i> <i>Trouble code 24 / (F49) No. 9 — No. 10:</i> <i>Trouble code 26 / (F49) No. 14 — No. 15:</i> <i>Trouble code 28 / (F49) No. 7 — No. 8:</i> | Is the resistance between 1 and 1.5 kΩ? | Go to step 18. | Repair harness/connector between ABSCM&H/U and ABS sensor. |
| 18 | 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 19. | Repair harness/connector between ABSCM&H/U and ABS sensor. |
| 19 | CHECK GROUND CIRCUIT OF ABSCM&H/U. Measure resistance between ABSCM&H/U and chassis ground. Connector & terminal <i>(F49) No. 23 — GND:</i> | Is the resistance less than 0.5 Ω? | Go to step 20. | Repair ABSCM&H/U ground harness. |
| 20 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between ABSCM&H/U and ABS sensor? | Repair connector. | Go to step 21. |
| 21 | CHECK SOURCES OF SIGNAL NOISE. | Is the car telephone or the wireless transmitter properly installed? | Go to step 22. | Properly install the car telephone or the wireless transmitter. |
| 22 | 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 23. |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|---------------------------------|
| 23 | CHECK SHIELD CIRCUIT. 1) Connect all connectors. 2) Measure resistance between shield connector and chassis ground. Connector & terminal Trouble code 22 / (B62) No. A5 — Chassis ground: Trouble code 24 / (B62) No. A6 — Chassis ground: NOTE: For the Trouble code 26 and 28 : Go to step 24 . | Is the resistance less than 0.5 Ω ? | Go to step 24 . | Repair shield harness. |
| 24 | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> | Go to step 25 . |
| 25 | 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 SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

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

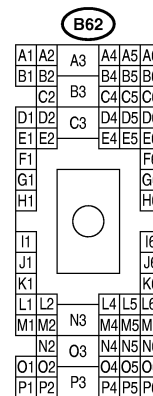
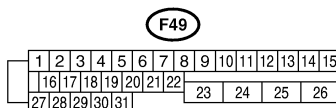
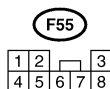
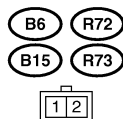
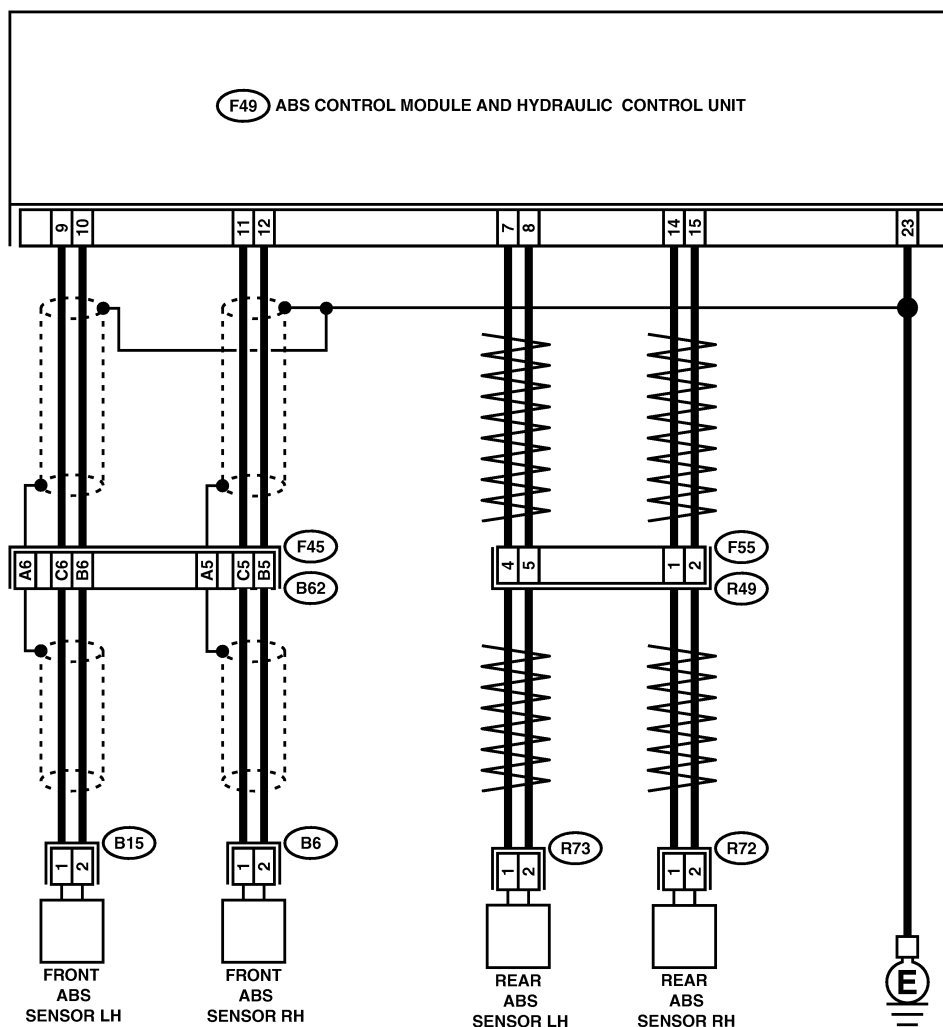
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1455

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 6. | Tighten ABS sensor installation bolts securely. |
| 6 | CHECK ABS SENSOR GAP. Measure tone wheel to ABS sensor piece gap over entire perimeter of the wheel. <i>Front wheel</i> 0.3 — 0.8 mm (0.012 — 0.031 in) <i>Rear wheel</i> 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 7. | 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. |
| 7 | PREPARE OSCILLOSCOPE. | Is an oscilloscope available? | Go to step 8. | Go to step 9. |
| 8 | CHECK ABS SENSOR SIGNAL. 1) Raise all four wheels of ground. 2) Turn ignition switch OFF. 3) Connect the oscilloscope to the connector (B62) in accordance with trouble code. 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 (B62) No. C5 (+) — No. B5 (–) (Front RH): (B62) No. C6 (+) — No. B6 (–) (Front LH): (F55) No. 1 (+) — No. 2 (–) (Rear RH): (F55) No. 4 (+) — No. 5 (–) (Rear LH): | Is oscilloscope pattern smooth, as shown in figure? | Go to step 12. | Go to step 9. |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---|---|
| 9 | CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL. Remove disc rotor from hub. | Is the ABS sensor piece or the tone wheel contaminated by dirt or other foreign matter? | Thoroughly remove dirt or other foreign matter. | Go to step 10. |
| 10 | CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL. | Are there broken or damaged teeth in the ABS sensor piece or the tone wheel? | Replace ABS sensor or tone wheel. Front: <Ref. to ABS-14 Front ABS Sensor.> Rear: <Ref. to ABS-17 Rear ABS Sensor.> and Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> | Go to step 11. |
| 11 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 12. | Replace tone wheel. Front: <Ref. to ABS-22 Front Tone Wheel.> Rear: <Ref. to ABS-23 Rear Tone Wheel.> |
| 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

L: TROUBLE CODE 31

— FRONT RIGHT INLET VALVE MALFUNCTION — S006583C93

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 37. <Ref. to ABS-112 TROUBLE CODE 37 — REAR LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

M: TROUBLE CODE 33

— FRONT LEFT INLET VALVE MALFUNCTION — S006583D03

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 37. <Ref. to ABS-112 TROUBLE CODE 37 — REAR LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

N: TROUBLE CODE 35

— REAR RIGHT INLET VALVE MALFUNCTION — S006583D11

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 37. <Ref. to ABS-112 TROUBLE CODE 37 — REAR LEFT INLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

O: TROUBLE CODE 37

— REAR LEFT INLET VALVE MALFUNCTION — S006583D20

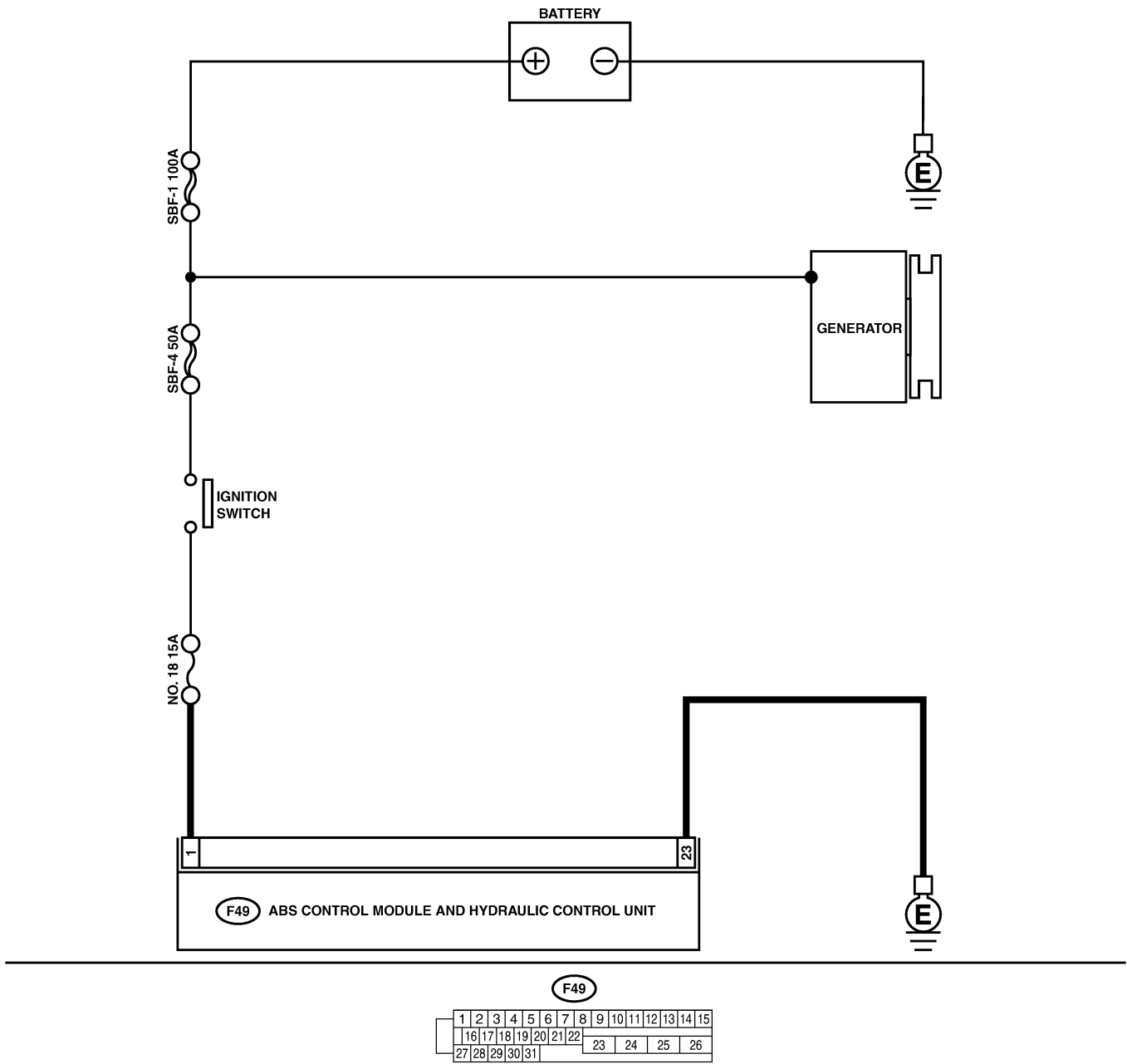
DIAGNOSIS:

- Faulty harness/connector
- Faulty inlet solenoid valve

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M2334

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

P: TROUBLE CODE 32

— FRONT RIGHT OUTLET VALVE MALFUNCTION — S006583C99

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 38. <Ref. to ABS-116 TROUBLE CODE 38 — REAR LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

Q: TROUBLE CODE 34

— FRONT LEFT OUTLET VALVE MALFUNCTION — S006583D08

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 38. <Ref. to ABS-116 TROUBLE CODE 38 — REAR LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

R: TROUBLE CODE 36

— REAR RIGHT OUTLET VALVE MALFUNCTION — S006583D15

NOTE:

For the diagnostic procedure, refer to TROUBLE CODE 38. <Ref. to ABS-116 TROUBLE CODE 38 — REAR LEFT OUTLET VALVE MALFUNCTION —, Diagnostics Chart with Subaru Select Monitor.>

S: TROUBLE CODE 38

— REAR LEFT OUTLET VALVE MALFUNCTION — S006583D24

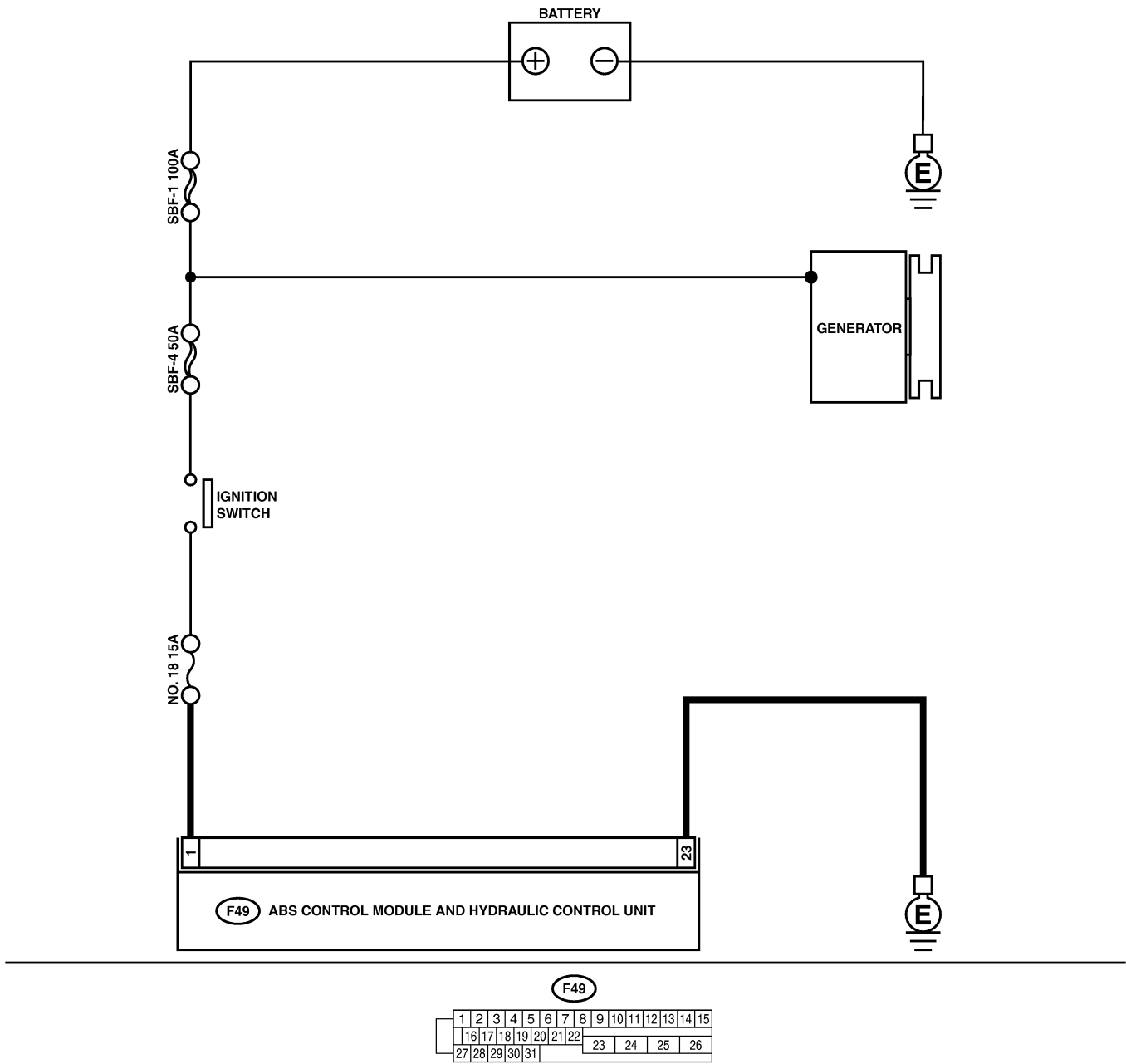
DIAGNOSIS:

- Faulty harness/connector
- Faulty outlet solenoid valve

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M2334

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

T: TROUBLE CODE 41

— ABS CONTROL MODULE MALFUNCTION —

S006583D31

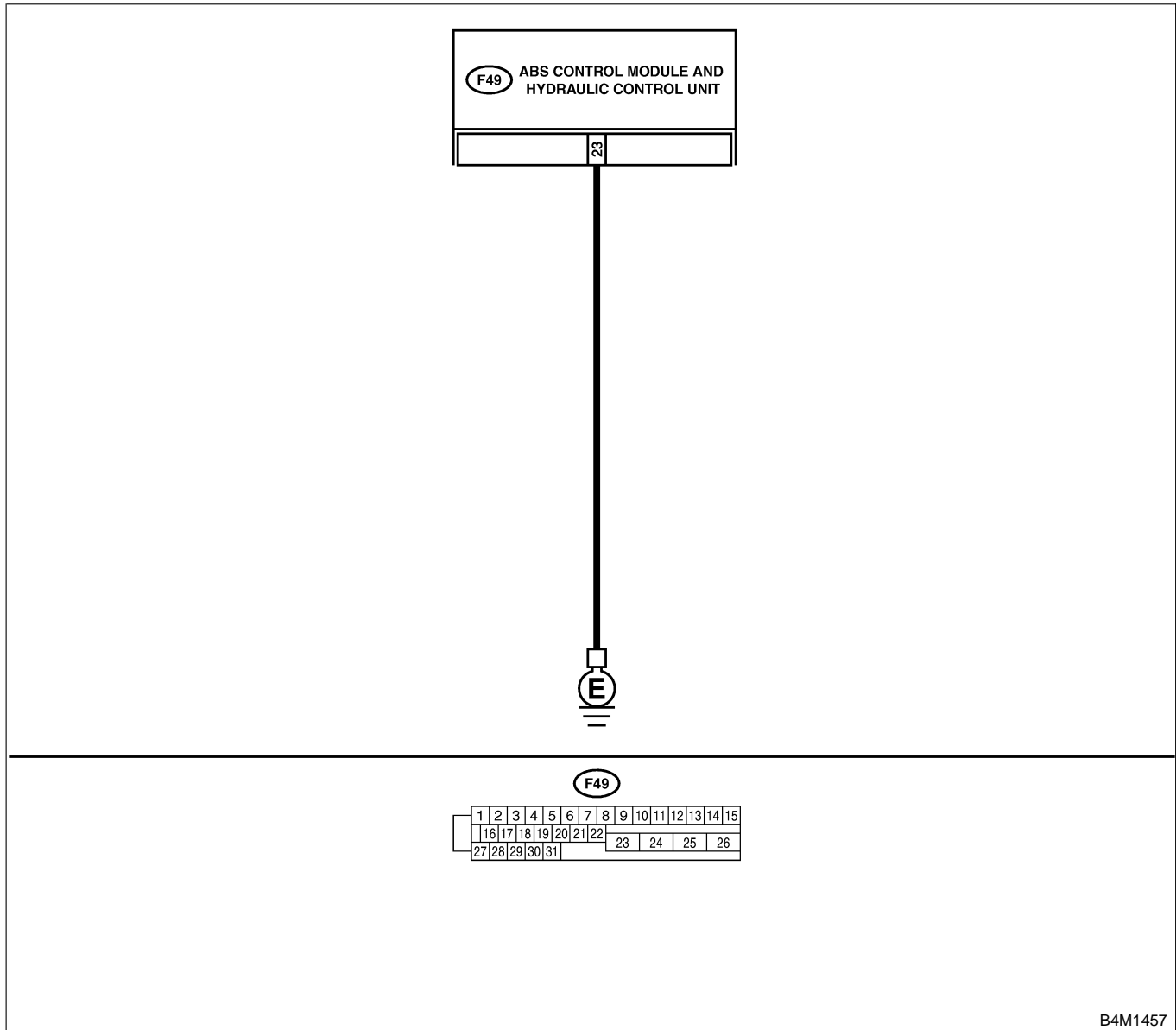
DIAGNOSIS:

- Faulty ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

U: TROUBLE CODE 42

— POWER SUPPLY VOLTAGE TOO LOW —

S006583D36

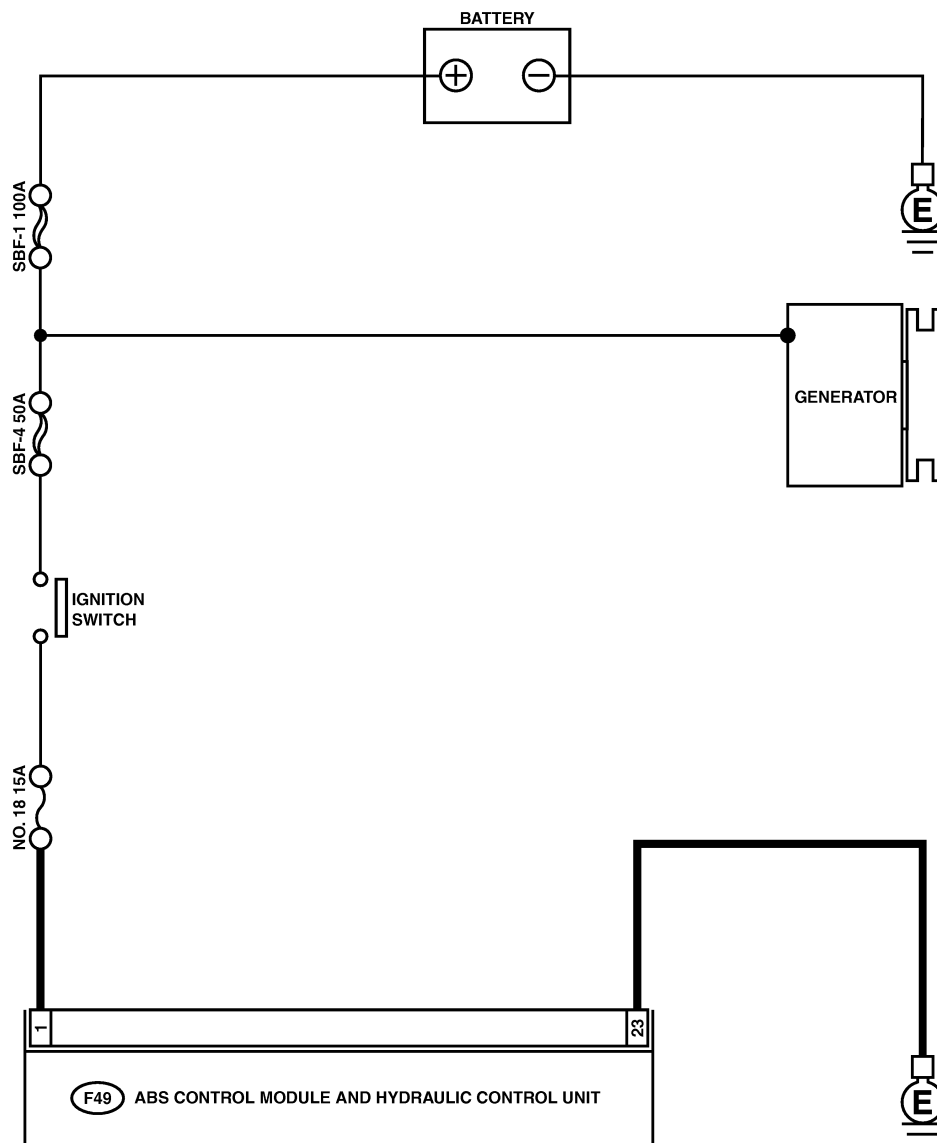
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



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 | | | | | | | | | | |

B4M2334

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 and 15 V? | Go to step 2. | Repair generator. <Ref. to SC(H4)-15 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 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

V: TROUBLE CODE 42

— POWER SUPPLY VOLTAGE TOO HIGH — S006583D35

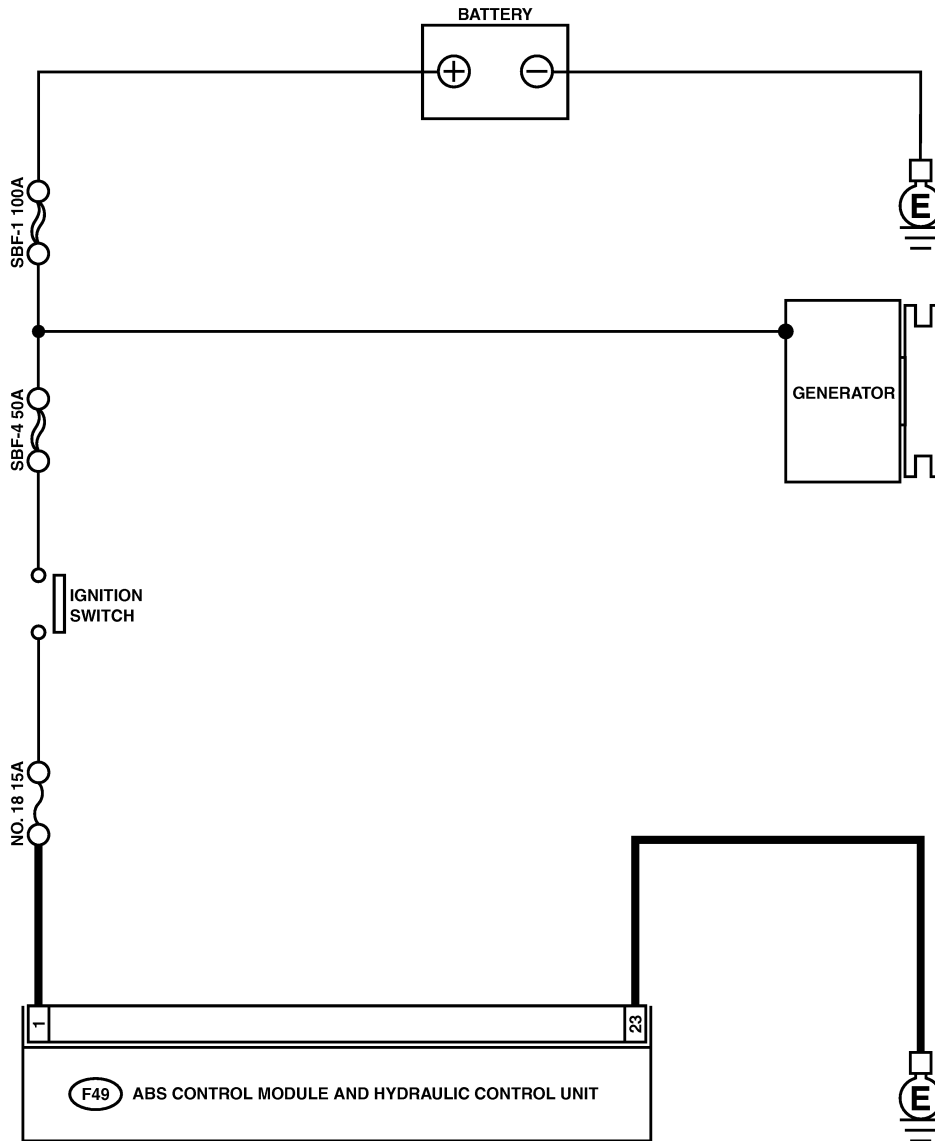
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



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 | | | | | | | | | | |

B4M2334

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 and 17 V? | Go to step 2. | Repair generator. <Ref. to SC(H4)-15 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 and 17 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

W: TROUBLE CODE 44

— ABS-AT CONTROL (NON CONTROLLED) —

S006583E79

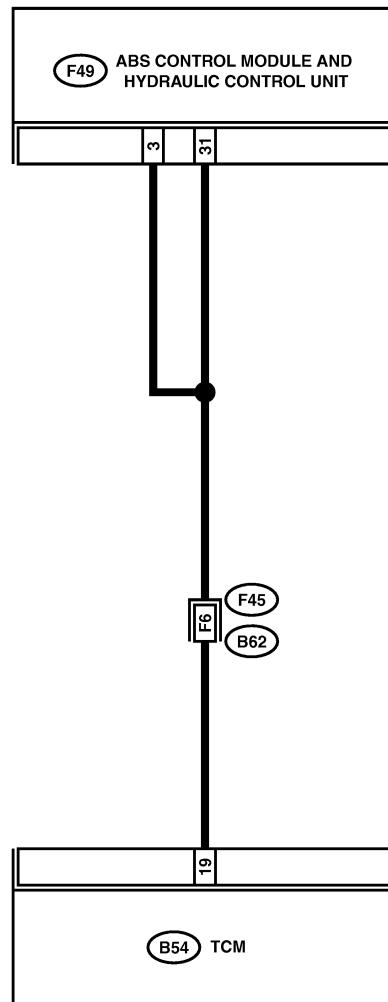
DIAGNOSIS:

- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



| | | | | | | | | | | | |
|-----|----|----|----|----|----|----|----|----|--|--|--|
| B54 | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | | | |
| 19 | 20 | 21 | | | | 22 | 23 | 24 | | | |

| | | | | | | | | | | | |
|-----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | | | | | |

| | | | | | | | | | | | |
|-----|----|----|----|----|----|--|--|--|--|--|--|
| B62 | | | | | | | | | | | |
| A1 | A2 | A3 | A4 | A5 | A6 | | | | | | |
| B1 | B2 | B3 | B4 | B5 | B6 | | | | | | |
| C1 | C2 | C3 | C4 | C5 | C6 | | | | | | |
| D1 | D2 | D3 | D4 | D5 | D6 | | | | | | |
| E1 | E2 | E3 | E4 | E5 | E6 | | | | | | |
| F1 | F2 | F3 | F4 | F5 | F6 | | | | | | |
| G1 | G2 | G3 | G4 | G5 | G6 | | | | | | |
| H1 | H2 | H3 | H4 | H5 | H6 | | | | | | |
| I1 | I2 | I3 | I4 | I5 | I6 | | | | | | |
| J1 | J2 | J3 | J4 | J5 | J6 | | | | | | |
| K1 | K2 | K3 | K4 | K5 | K6 | | | | | | |
| L1 | L2 | L3 | L4 | L5 | L6 | | | | | | |
| M1 | M2 | M3 | M4 | M5 | M6 | | | | | | |
| N1 | N2 | N3 | N4 | N5 | N6 | | | | | | |
| O1 | O2 | O3 | O4 | O5 | O6 | | | | | | |
| P1 | P2 | P3 | P4 | P5 | P6 | | | | | | |

B4M1458

ABS-126

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--|---|
| 1 | CHECK SPECIFICATIONS OF THE ABSCM&H/U. Check specifications of the mark to the ABSCM&H/U. C5: AT (Except OUTBACK) C6: MT (Except OUTBACK) CE: AT (OUTBACK) CF: MT (OUTBACK) | Is an ABSCM&H/U for AT model installed on a MT model? | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. Connector & terminal (F49) No. 3 — Chassis ground: | 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. Connector & terminal (B54) No. 19 (+) — Chassis ground (-): | Is the voltage between 10 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. Connector & terminal (F49) No. 3 (+) — Chassis ground (-): (F49) No. 31 (+) — Chassis ground (-): | Is the voltage more than 10 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

X: TROUBLE CODE 44

— ABS-AT CONTROL (CONTROLLED) — S006583E80

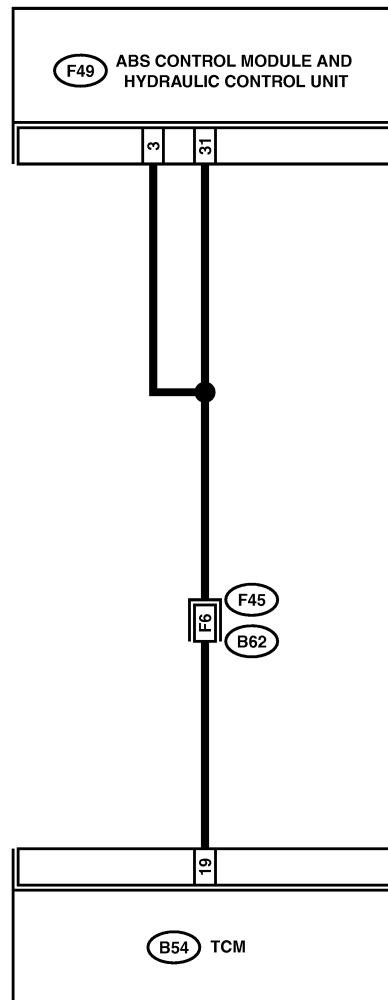
DIAGNOSIS:

- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



| | | | | | | | | | | | |
|-----|----|----|----|----|----|----|----|----|--|--|--|
| B54 | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | | | |
| 19 | 20 | 21 | | | | 22 | 23 | 24 | | | |

| | | | | | | | | | | | |
|-----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | | | | | |

| | | | | | | | | | | | |
|-----|----|----|----|----|----|--|--|--|--|--|--|
| B62 | | | | | | | | | | | |
| A1 | A2 | A3 | A4 | A5 | A6 | | | | | | |
| B1 | B2 | B3 | B4 | B5 | B6 | | | | | | |
| C1 | C2 | C3 | C4 | C5 | C6 | | | | | | |
| D1 | D2 | D3 | D4 | D5 | D6 | | | | | | |
| E1 | E2 | E3 | E4 | E5 | E6 | | | | | | |
| F1 | F2 | F3 | F4 | F5 | F6 | | | | | | |
| G1 | G2 | G3 | G4 | G5 | G6 | | | | | | |
| H1 | H2 | H3 | H4 | H5 | H6 | | | | | | |
| I1 | I2 | I3 | I4 | I5 | I6 | | | | | | |
| J1 | J2 | J3 | J4 | J5 | J6 | | | | | | |
| K1 | K2 | K3 | K4 | K5 | K6 | | | | | | |
| L1 | L2 | L3 | L4 | L5 | L6 | | | | | | |
| M1 | M2 | M3 | M4 | M5 | M6 | | | | | | |
| N1 | N2 | N3 | N4 | N5 | N6 | | | | | | |
| O1 | O2 | O3 | O4 | O5 | O6 | | | | | | |
| P1 | P2 | P3 | P4 | P5 | P6 | | | | | | |

B4M1458

ABS-128

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 10 and 13 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

Y: TROUBLE CODE 51

— VALVE RELAY MALFUNCTION —

S006583E81

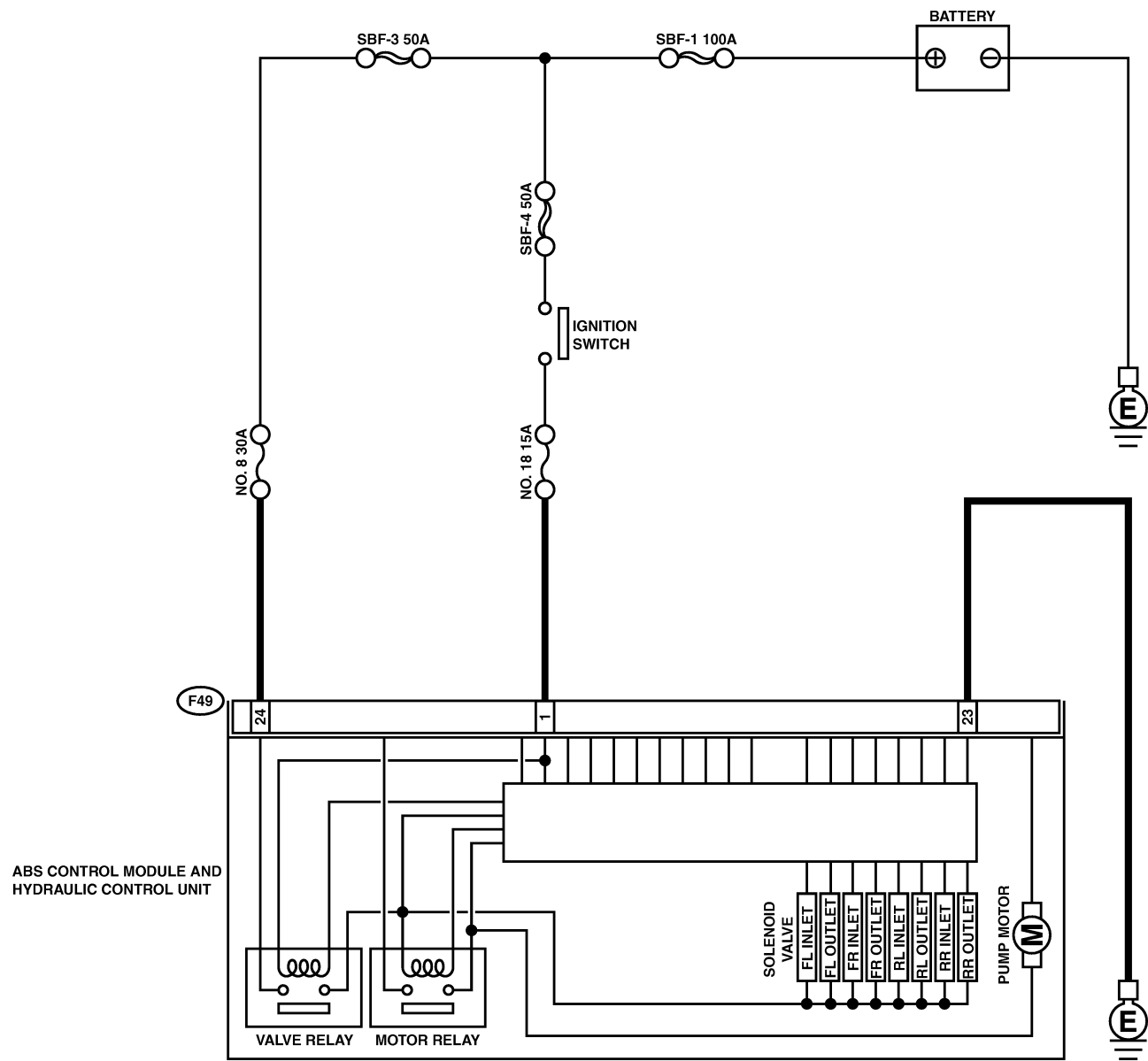
DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



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 | | | | | | | | | | |

B4M1459

ABS-130

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

Z: TROUBLE CODE 51

— VALVE RELAY ON FAILURE —

S006583D63

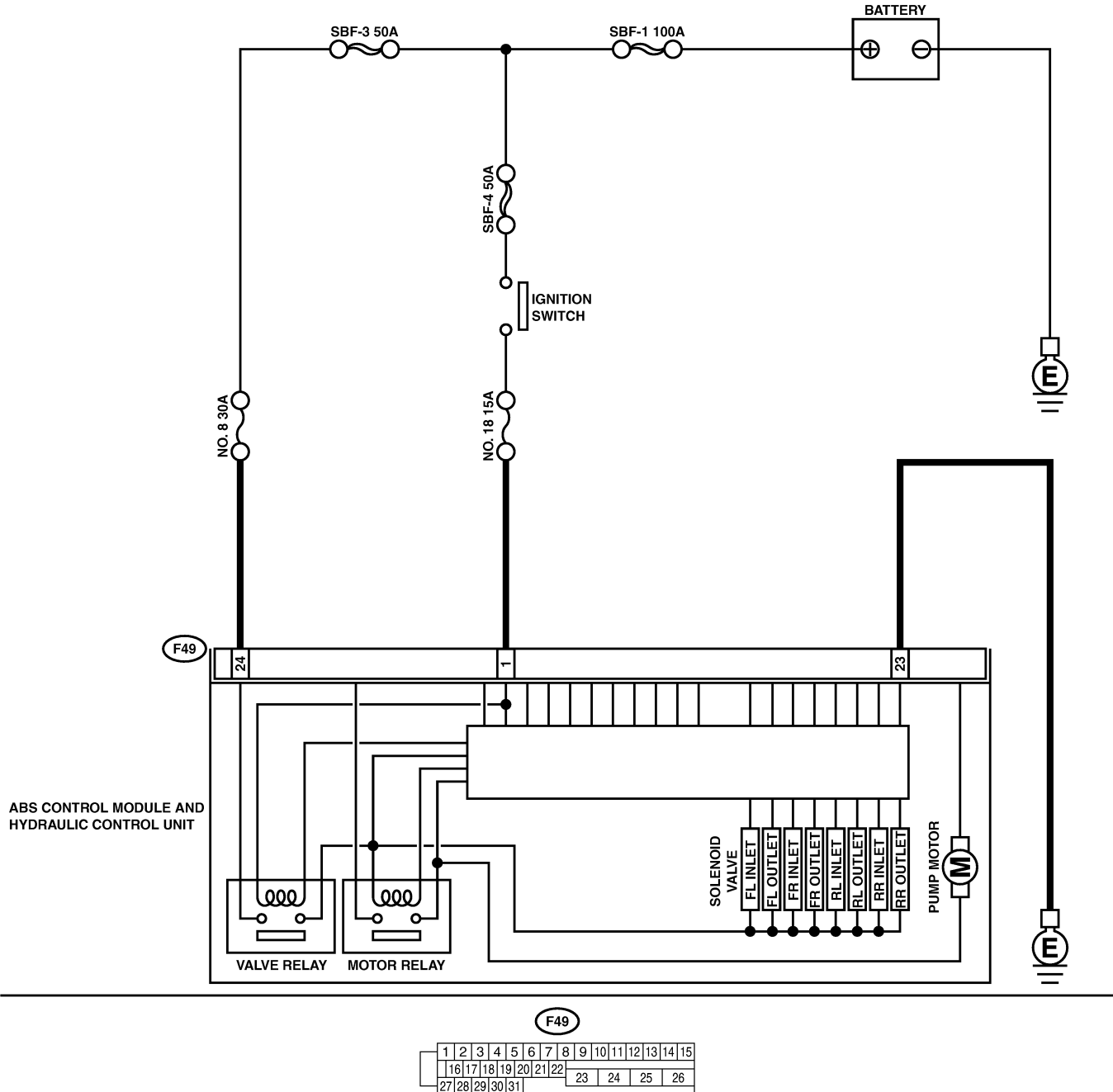
DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1459

ABS-132

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---|---|
| 1 | CHECK VALVE RELAY IN ABSCM&H/U. Measure resistance between ABSCM&H/U terminals. <i>Terminals</i> No. 23 (+) — No. 24 (-): | Is the resistance more than 1 MΩ? | Go to step 2. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 2 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between generator, battery and ABSCM&H/U? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

AA: TROUBLE CODE 52

— OPEN CIRCUIT IN MOTOR RELAY CIRCUIT — S006583E82

DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

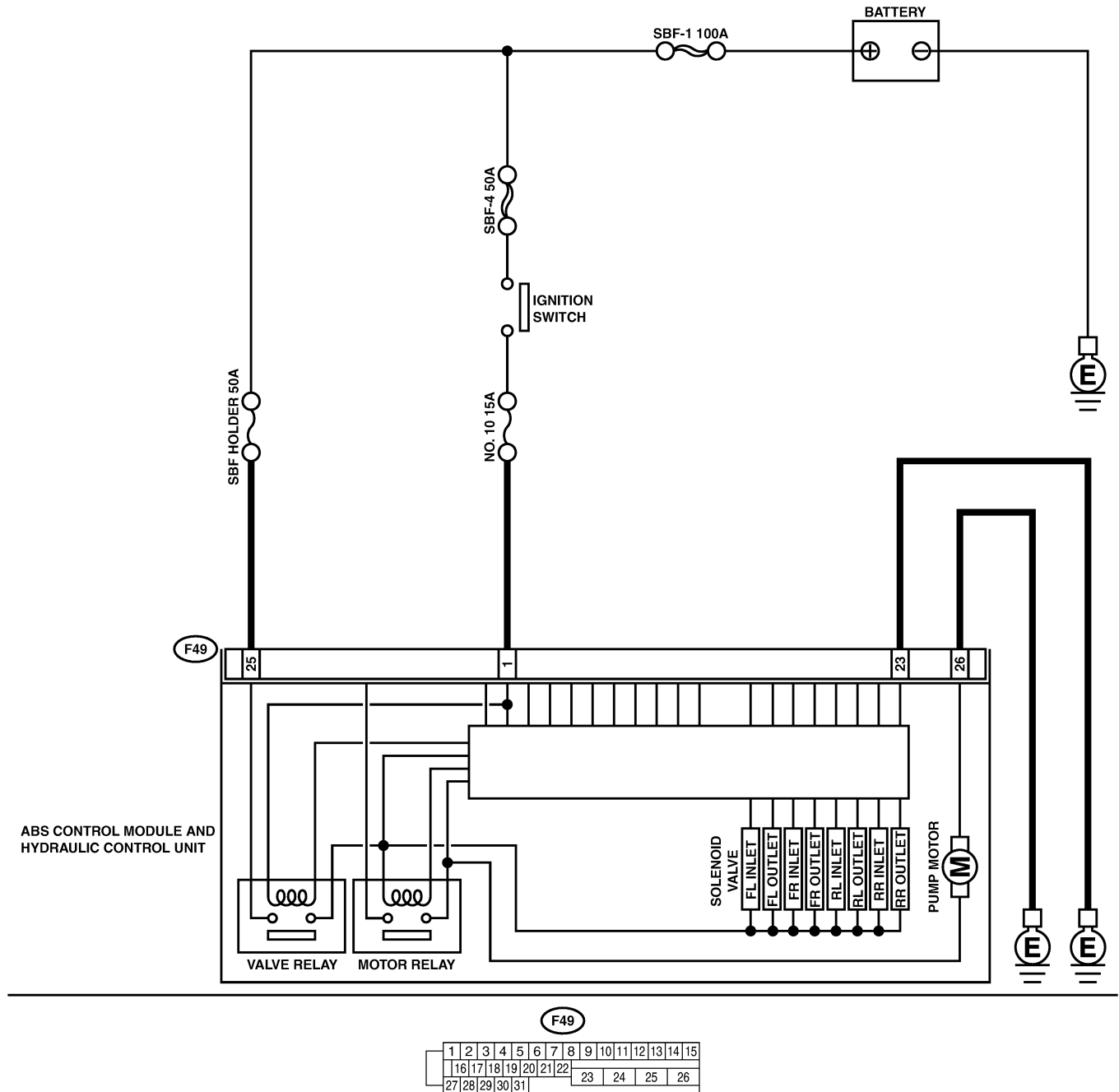
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1460

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 and 13 V? | Go to step 2. | Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6. |
| 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-11 ABS Sequence Control.> NOTE: Use the diagnosis connector to operate the sequence control. | Can motor revolution noise (buzz) be heard when carrying out the check sequence? | Go to step 4. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

MEMO:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

AB: TROUBLE CODE 52

— MOTOR RELAY ON FAILURE — S006583E83

DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

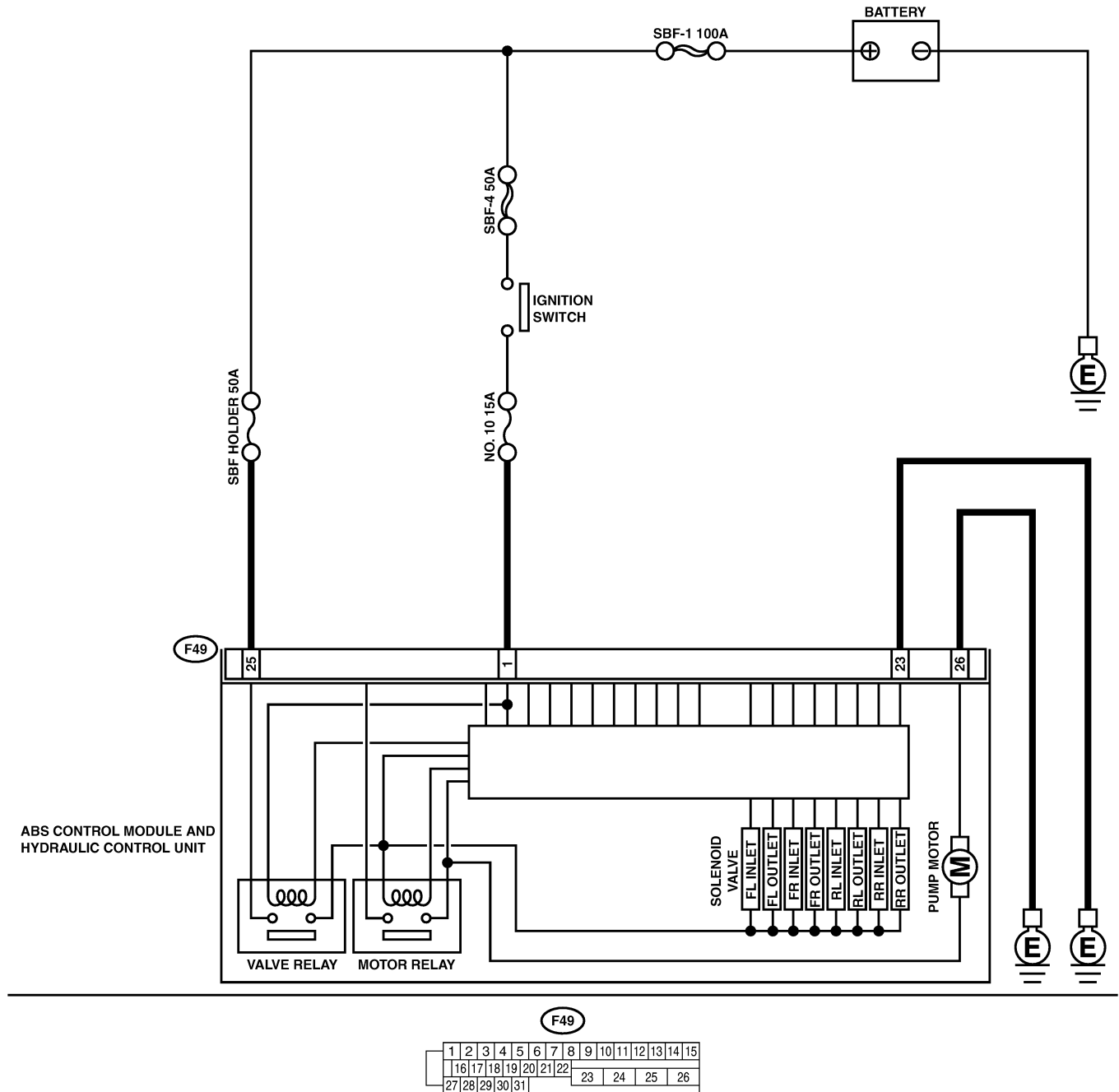
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1460

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> |
| 2 | CHECK MOTOR OPERATION. Operate the sequence control. <Ref. to ABS-11 ABS Sequence Control.> NOTE: Use the diagnosis connector to operate the sequence control. | Can motor revolution noise (buzz) be heard when carrying out the sequence control? | Go to step 3. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

AC: TROUBLE CODE 52 — MOTOR MALFUNCTION —

S006583D68

DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

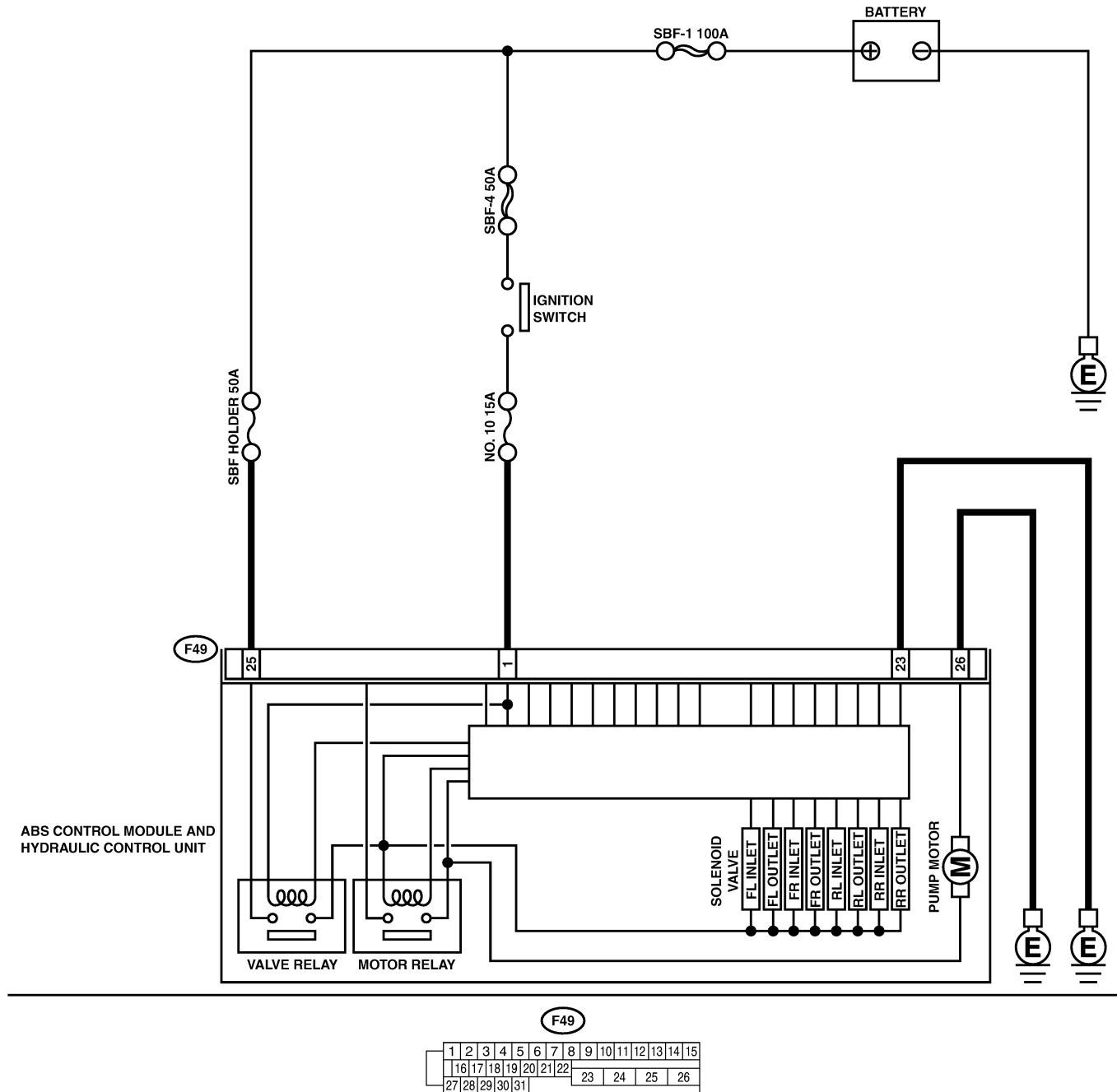
TROUBLE SYMPTOM:

- ABS does not operate.

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

WIRING DIAGRAM:



B4M1460

ABS-143

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 and 13 V? | Go to step 2. | Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6. |
| 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 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-11 ABS Sequence Control.> NOTE: Use the diagnosis connector to operate the sequence control. | Can motor revolution noise (buzz) be heard when carrying out the sequence control? | Go to step 6. | Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

MEMO:

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

AD: TROUBLE CODE 54

— STOP LIGHT SWITCH SIGNAL CIRCUIT MALFUNCTION —

S006583E84

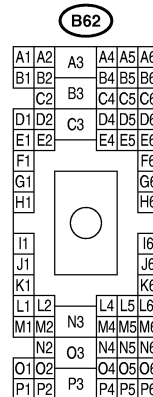
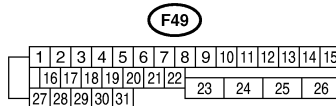
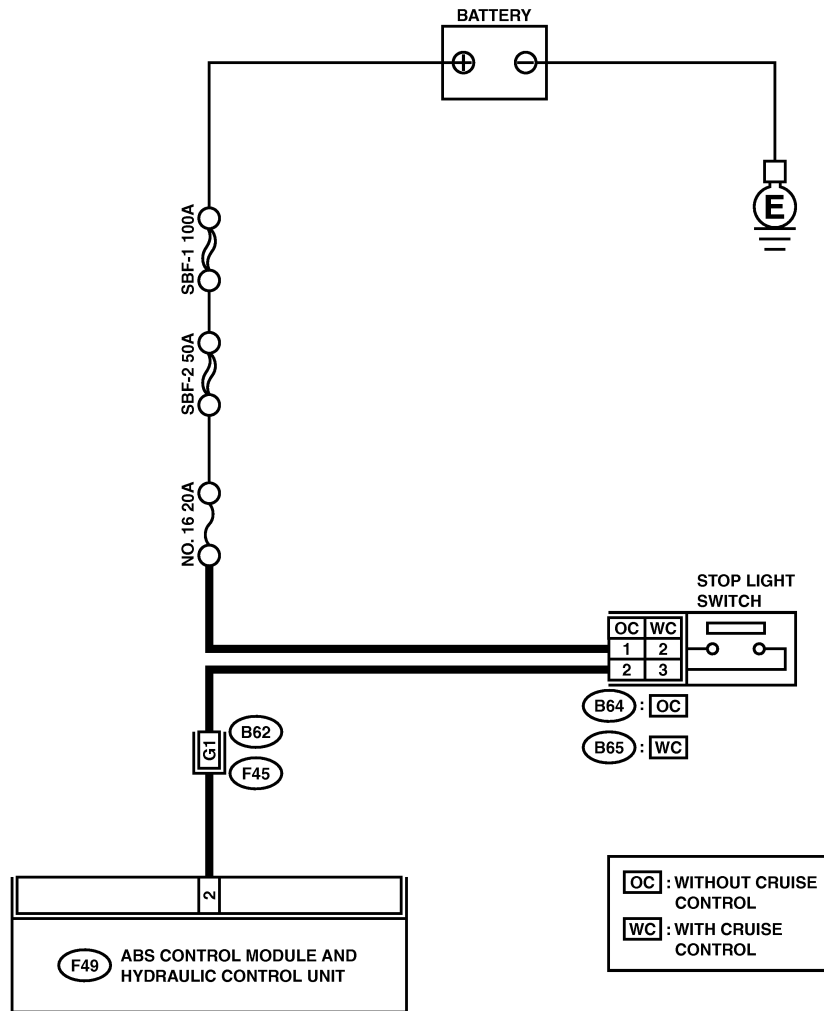
DIAGNOSIS:

- Faulty stop light switch

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1461

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 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 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

AE: TROUBLE CODE 56

— OPEN OR SHORT CIRCUIT IN G SENSOR CIRCUIT —

S006583E85

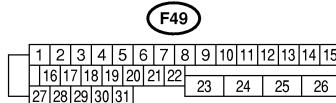
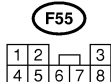
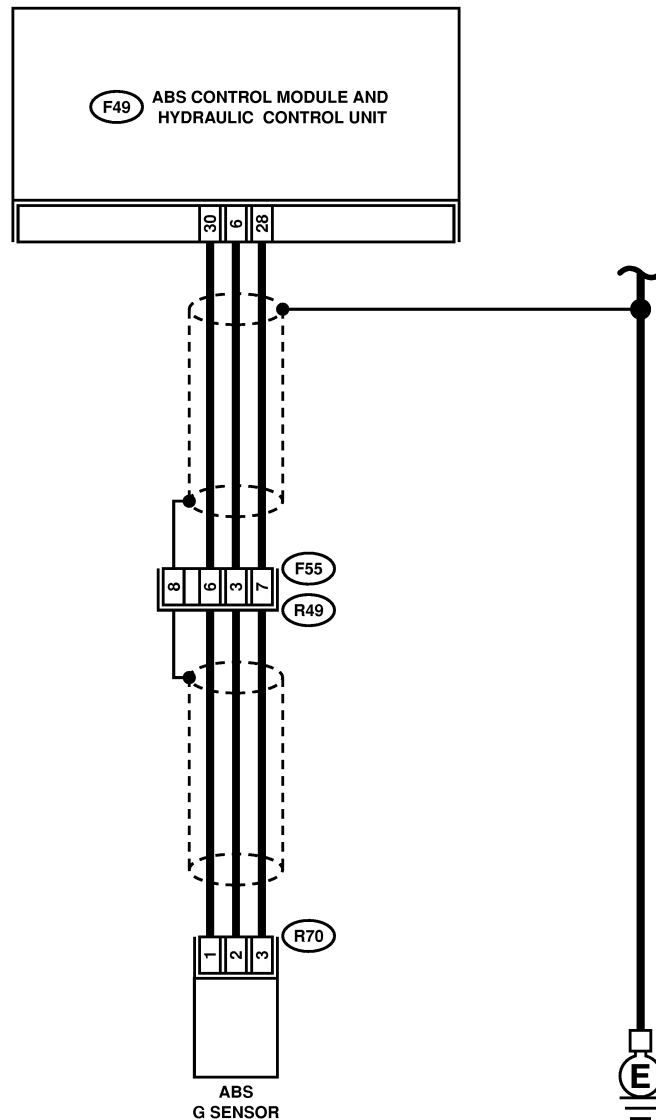
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1462

ABS-148

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 CONNEC-TORS. | Is there poor contact in connector between ABSCM&H/U and G sensor? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. <Ref. to ABS-24 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. <Ref. to ABS-24 G Sensor.> |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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. <Ref. to ABS-24 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

AF: TROUBLE CODE 56

— BATTERY SHORT IN G SENSOR CIRCUIT —

S006583E86

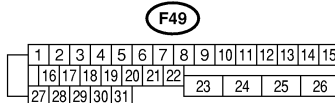
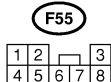
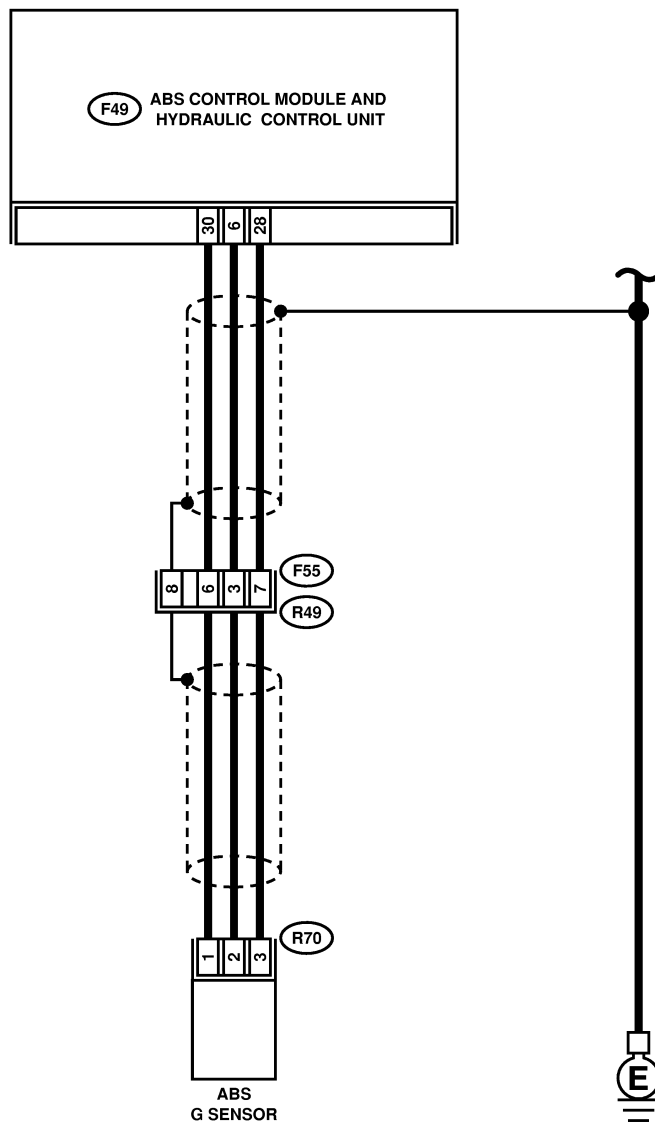
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1462

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 CONNECTIONS. | Is there poor contact in connector between ABSCM&H/U and G sensor? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 16. |
| 6 | CHECK FREEZE FRAME DATA. Read front left wheel speed on the select monitor display. | Is the front left wheel speed on monitor display 0 km? | Go to step 7. | Go to step 16. |
| 7 | CHECK FREEZE FRAME DATA. Read rear right wheel speed on the select monitor display. | Is the rear right wheel speed on monitor display 0 km? | Go to step 8. | Go to step 16. |
| 8 | CHECK FREEZE FRAME DATA. Read rear left wheel speed on the select monitor display. | Is the rear left wheel speed on monitor display 0 km? | Go to step 9. | Go to step 16. |
| 9 | CHECK FREEZE FRAME DATA. Read G sensor output on the select monitor display. | Is the G sensor output on monitor display more than 3.65 V? | Go to step 10. | Go to step 16. |
| 10 | CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS. 1) Turn 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 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 12. | Repair harness between G sensor and ABSCM&H/U. |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|--|--|
| 12 | 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 13. | Repair harness between G sensor and ABSCM&H/U. |
| 13 | CHECK POOR CONTACT IN CONNEC-TORS. | Is there poor contact in connector between ABSCM&H/U and G sensor? | Repair connector. | Go to step 14. |
| 14 | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> | Go to step 15. |
| 15 | 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. |
| 16 | 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 17. | Repair harness/connector between G sensor and ABSCM&H/U. |
| 17 | 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 18. | Repair harness/connector 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. <Ref. to ABS-24 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. <Ref. to ABS-24 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. <Ref. to ABS-24 G Sensor.> |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

AG: TROUBLE CODE 56

— ABNORMAL G SENSOR HIGH μ OUTPUT —

S006583E87

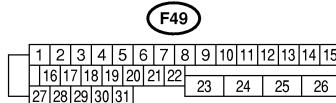
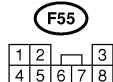
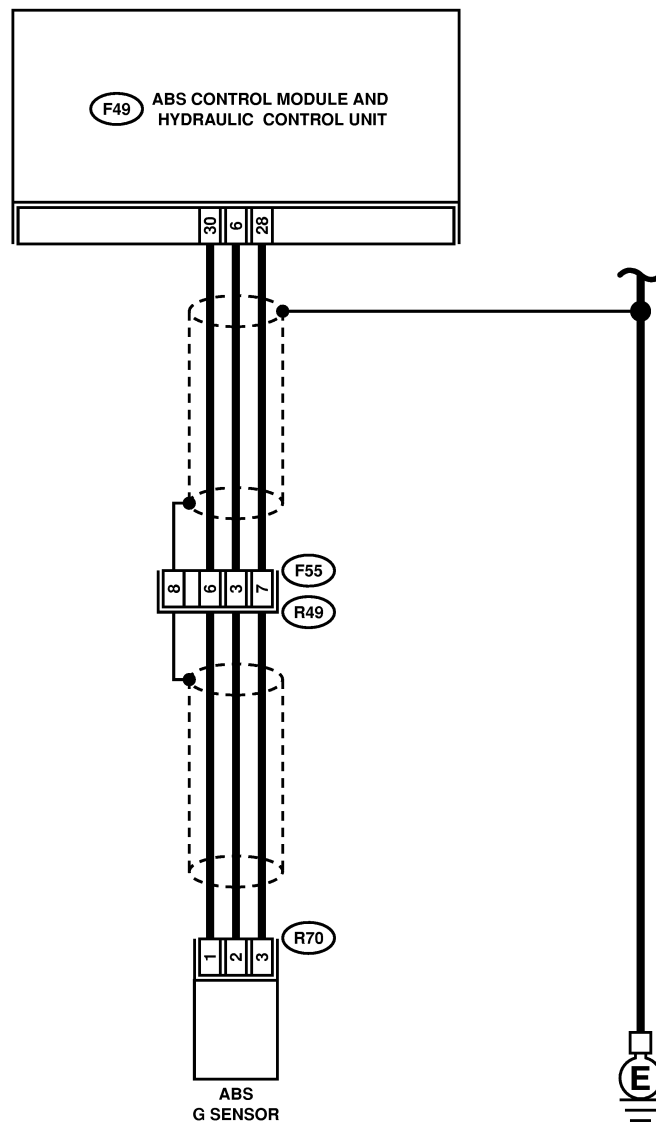
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1462

ABS-156

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 2.3 ± 0.2 V when the G sensor is in horizontal position? | Go to step 2. | Go to step 6. |
| 2 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connector between ABSCM&H/U and G sensor? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 k Ω ? | 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 M Ω ? | Go to step 7. | Repair harness between G sensor and ABSCM&H/U. Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. <Ref. to ABS-24 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. <Ref. to ABS-24 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. <Ref. to ABS-24 G Sensor.> |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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 (DIAGNOSTICS)

AH: TROUBLE CODE 56

— DETECTION OF G SENSOR STICK —

S006583E88

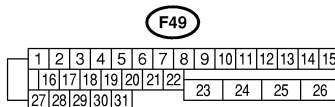
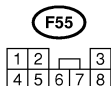
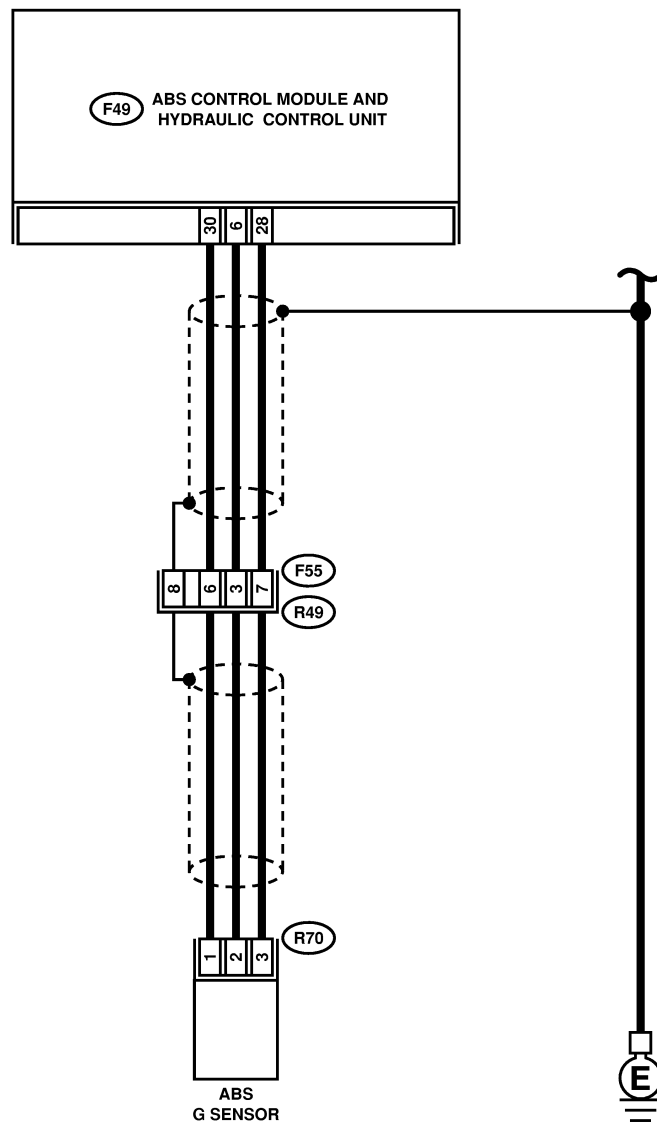
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1462

ABS-160

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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. <Ref. to ABS-24 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. <Ref. to ABS-24 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? | 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. 3 (-): | Is the voltage between 2.1 and 2.5 V when G sensor is horizontal? | Go to step 10. | Replace G sensor. <Ref. to ABS-24 G Sensor.> |

DIAGNOSTICS CHART WITH SUBARU SELECT MONITOR

ABS (DIAGNOSTICS)

| 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 3.7 and 4.1 V when G sensor is inclined forwards to 90°? | Go to step 11. | Replace G sensor. <Ref. to ABS-24 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. <Ref. to ABS-24 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. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (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. |

15. General Diagnostics Table S006121

A: INSPECTION S006121A10

| Symptom | | Probable faulty units/parts |
|---|--------------------------------|--|
| Vehicle instability during braking | Vehicle pulls to either side. | <ul style="list-style-type: none"> ● 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. | <ul style="list-style-type: none"> ● 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 | <ul style="list-style-type: none"> ● 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. | <ul style="list-style-type: none"> ● ABSCM&H/U (solenoid valve, motor) ● ABS sensor ● Incorrect wiring or piping connections |
| | Brake dragging | <ul style="list-style-type: none"> ● ABSCM&H/U (solenoid valve) ● ABS sensor ● Master cylinder ● Brake (caliper & piston) ● Parking brake ● Axle & wheels ● Brake pedal play |
| | Long brake pedal stroke | <ul style="list-style-type: none"> ● Air in brake line ● Brake pedal play |
| | Vehicle pitching | <ul style="list-style-type: none"> ● Suspension play or fatigue (reduced damping) ● Incorrect wiring or piping connections ● Road surface (uneven) |
| | Unstable or uneven braking | <ul style="list-style-type: none"> ● 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 | <ul style="list-style-type: none"> ● Incorrect wiring or piping connections ● Road surface (uneven) |
| | Noise from ABSCM&H/U | <ul style="list-style-type: none"> ● ABSCM&H/U (mount bushing) ● ABS sensor ● Brake piping |
| | Noise from front of vehicle | <ul style="list-style-type: none"> ● 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 | <ul style="list-style-type: none"> ● ABS sensor ● Brake (caliper & piston, pads, rotor) ● Parking brake ● Brake piping ● Suspension play or fatigue |

GENERAL DIAGNOSTICS TABLE

ABS (DIAGNOSTICS)

MEMO:

MEMO:

| |
|--|
| |
|--|

1. General Description S401001

A: SPECIFICATIONS S401001E49

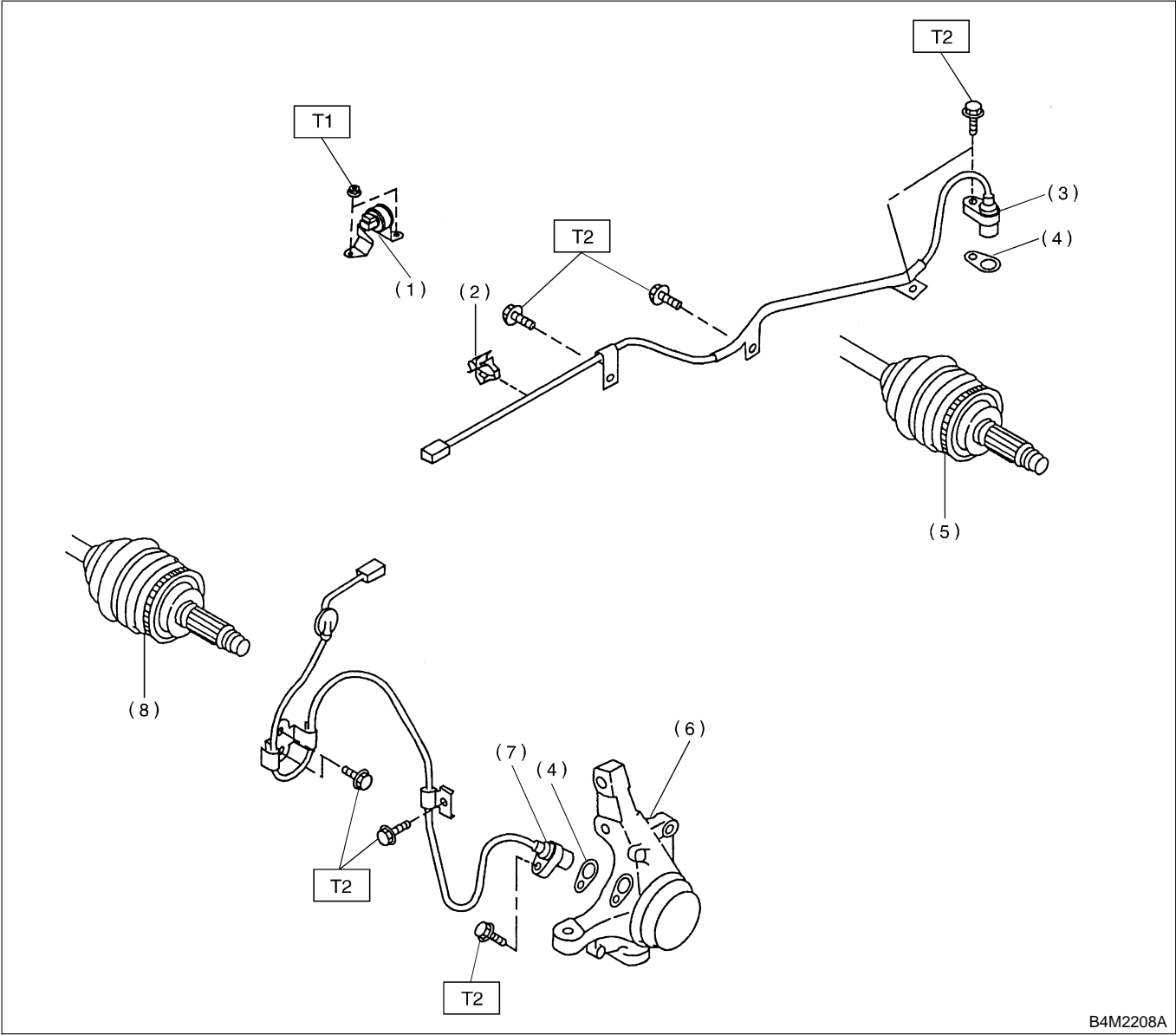
| Item | | | | Standard or remarks | |
|---|-----------------------|----------|----------------|-------------------------------------|--|
| ABS sensor | ABS sensor gap | | Front | 0.3 — 0.8 mm (0.012 — 0.031 in) | |
| | | | Rear | 0.44 — 0.94 mm (0.0173 — 0.0370 in) | |
| | ABS sensor resistance | | | 1.25±0.25 kΩ | |
| | Marks of the harness | Front LH | Except OUTBACK | Yellow | |
| | | | OUTBACK | Brown | |
| | | Front RH | Except OUTBACK | Light blue | |
| | | | OUTBACK | White | |
| | | Rear LH | | White | |
| | | Rear RH | | Yellow | |
| G sensor | G sensor voltage | | | 2.3±0.2 V | |
| ABS control module and hydraulic control unit (ABSCM&H/U) marks | AT (Except OUTBACK) | | | C5 | |
| | MT (Except OUTBACK) | | | C6 | |
| | AT (OUTBACK) | | | CE | |
| | MT (OUTBACK) | | | CF | |

B: COMPONENT

S401001A05

1. SENSOR

S401001A0501



B4M2208A

- | | |
|------------------------|-------------------------|
| (1) G sensor | (6) Housing |
| (2) Clip | (7) Front ABS sensor LH |
| (3) Rear ABS sensor LH | (8) Tone wheel (Front) |
| (4) ABS spacer | |
| (5) Tone wheel (Rear) | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 7.4 (0.75, 5.4)

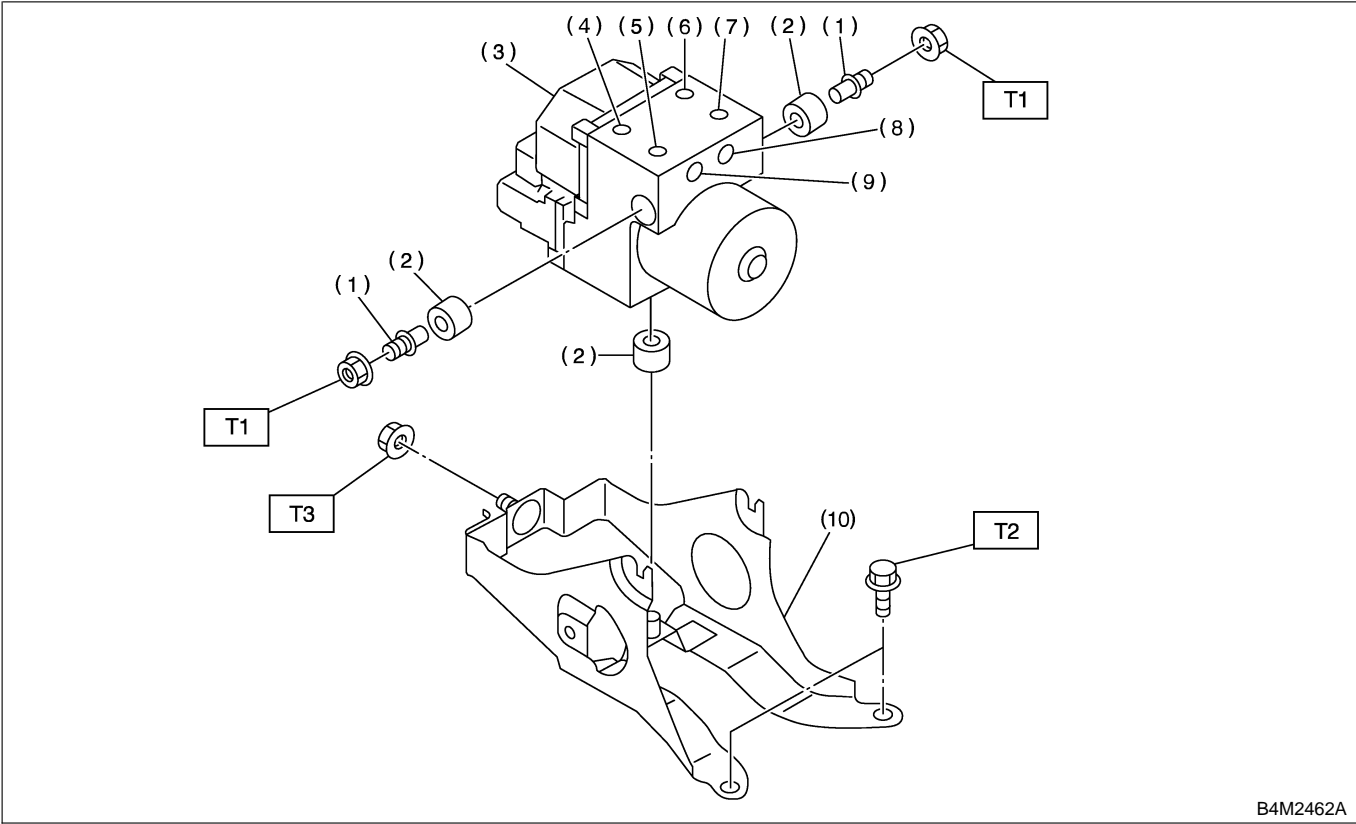
T2: 32 (3.3, 24)

GENERAL DESCRIPTION

ABS

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

S401001A0502



B4M2462A

- (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, 13.06)
T2: 32 (3.3, 24)
T3: 38 (3.8, 28)

C: CAUTION S401001A03

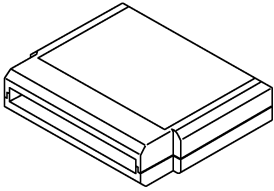

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation 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.

GENERAL DESCRIPTION

ABS

D: PREPARATION TOOL S401001A17

1. SPECIAL TOOLS S401001A1701

| ILLUSTRATION | TOOL NUMBER | DESCRIPTION | REMARKS |
|--|-------------|--------------------|--|
|  B2M3876 | 24082AA150 | CARTRIDGE | Troubleshooting for electrical systems. |
|  B2M3877 | 22771AA030 | SELECT MONITOR KIT | Troubleshooting for electrical systems. <ul style="list-style-type: none"> English: 22771AA030 (Without printer) German: 22771AA070 (Without printer) French: 22771AA080 (Without printer) Spanish: 22771AA090 (Without printer) |

2. GENERAL PURPOSE TOOLS S401001A1702

| TOOL NAME | REMARKS |
|----------------|--|
| Circuit tester | Used for measuring resistance, voltage and ampere. |
| Pressure gauge | Used for measuring oil pressure. |
| Oscilloscope | Used for measuring sensor. |

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

S401543

A: REMOVAL

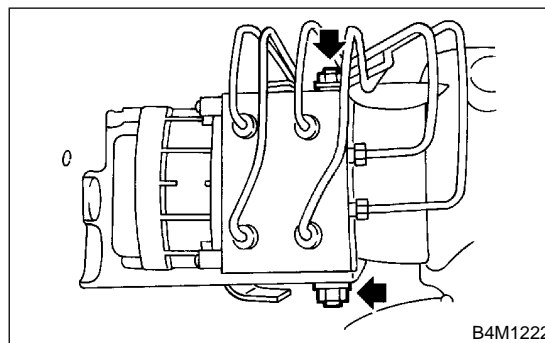
S401543A18

- 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.

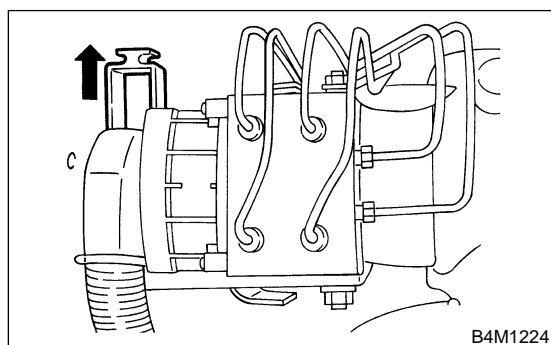
CAUTION:

The contact will be insufficient if the terminal gets wet.

- 4) Pull off the lock of the ABSCM&H/U connector to remove it.



B4M1222



B4M1224

- 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 ground terminal from bracket.
- 9) 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 (Nippco LT or GB) to bracket attaching bolt after tightening.
- Do not pull harness when disconnecting 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) Install ABSCM&H/U ground terminal to bracket.

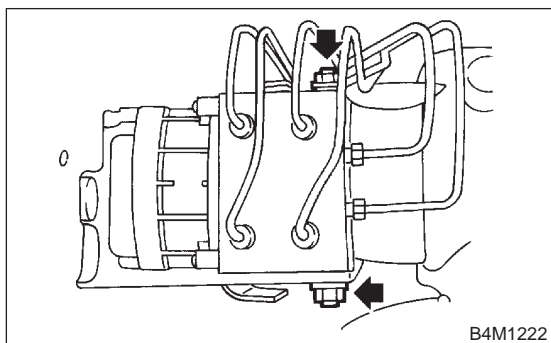
Tightening torque:

32 N·m (3.3 kgf-m, 24 ft-lb)

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

Tightening torque:

15 N·m (1.5 kgf-m, 10.8 ft-lb)



- 4) Using cable clip, secure ABSCM&H/U harness to bracket.
- 5) 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.

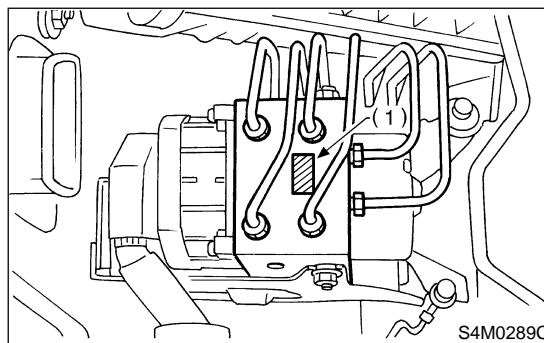
- 6) Install air intake duct.
- 7) Connect ground cable to battery.
- 8) Bleed air from the brake system.

C: INSPECTION

S401543A10

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

| Mark | Model |
|------|---------------------|
| C5 | AT (Except OUTBACK) |
| C6 | MT (Except OUTBACK) |
| CE | AT (OUTBACK) |
| CF | MT (OUTBACK) |



- (1) Mark

1. CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE

S401543A1001

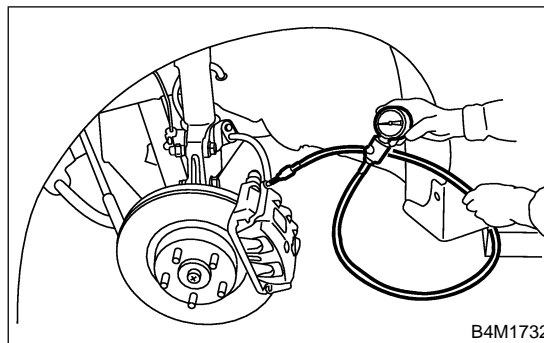
- 1) Lift-up vehicle and remove wheels.
- 2) Disconnect the air bleeder screws from the FL and FR caliper bodies.
- 3) Connect two pressure gauges to the FL and FR caliper bodies.

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-11 ABS Sequence Control.>
- 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.

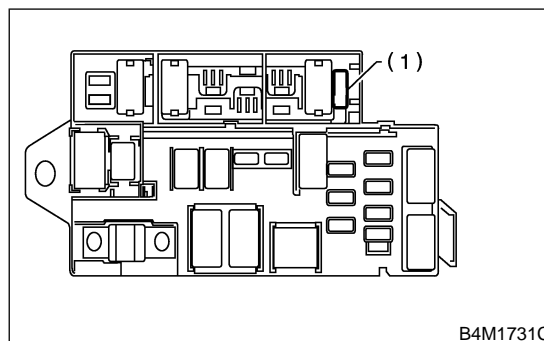
| | Front wheel | Rear wheel |
|-------------------|---|---|
| Initial value | 3,432 kPa (35 kg/cm ² , 498 psi) | 3,432 kPa (35 kg/cm ² , 498 psi) |
| When decompressed | 490 kPa (5 kg/cm ² , 71 psi) or less | 490 kPa (5 kg/cm ² , 71 psi) or less |
| When compressed | 3,432 kPa (35 kg/cm ² , 498 psi) 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-11 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

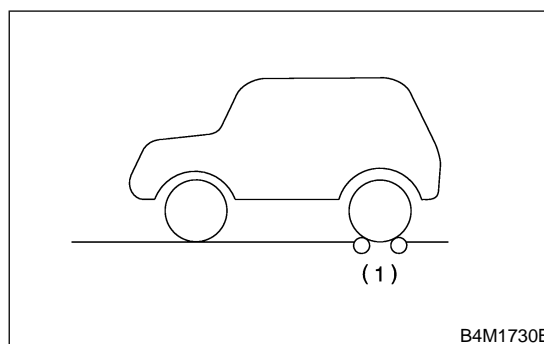
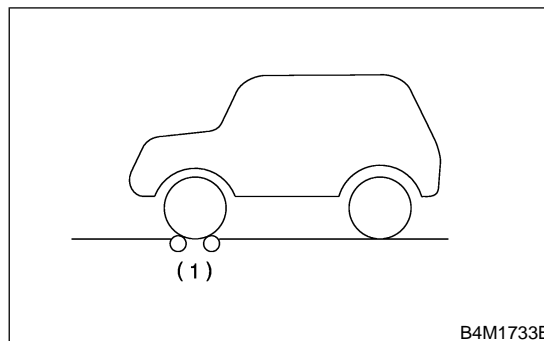
S401543A1002

- 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.



(1) FWD connector

- 2) Prepare for operating ABS sequence control.
<Ref. to ABS-11 ABS Sequence Control.>
- 3) Set the front wheels or rear wheels on the brake tester and set the select lever's position at "neutral".



(1) Brake tester

- 4) Operate the brake tester.
- 5) Perform ABS sequence control.
<Ref. to ABS-11 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.

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

ABS

(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 kg, 221 lb) | 981 N (100 kg, 221 lb) |
| When decompressed | 490 N (50 kg, 110 lb) or less | 490 N (50 kg, 110 lb) or less |
| When compressed | 981 N (100 kg, 221 lb) or more | 981 N (100 kg, 221 lb) or more |

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

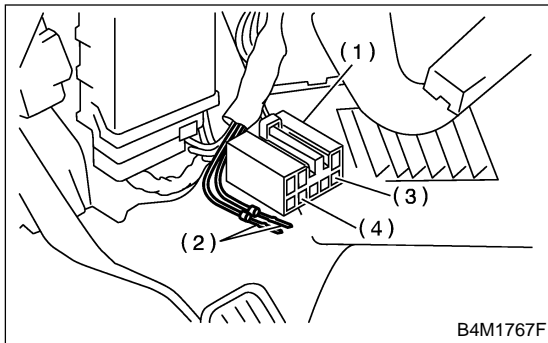
3. ABS Sequence Control S401187

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. 5 and No. 8 of the diagnosis connector beside driver's seat heater unit.



- (1) Diagnosis connector
- (2) Diagnosis terminal
- (3) 8 terminal
- (4) 5 terminal

- 2) Set the speed of all wheels at 2.75 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 "ABS SEQUENCE CONTROL WITH DIAGNOSIS CONNECTOR".

<Ref. to ABS-11 ABS SEQUENCE CONTROL WITH DIAGNOSIS CONNECTOR, OPERATION, ABS Sequence Control.>

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

- 1) Connect select monitor to data link connector under driver's seat instrument panel lower cover.
- 2) Turn ignition switch ON.
- 3) Turn select monitor switch ON.
- 4) Put select monitor to "BRAKE CONTROL" 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 kg, 221 lb).

(2) When using the pressure gauge, depress brake pedal so as to make the pressure gauge indicate 3,432 kPa (35 kg/cm², 498 psi).

CAUTION:

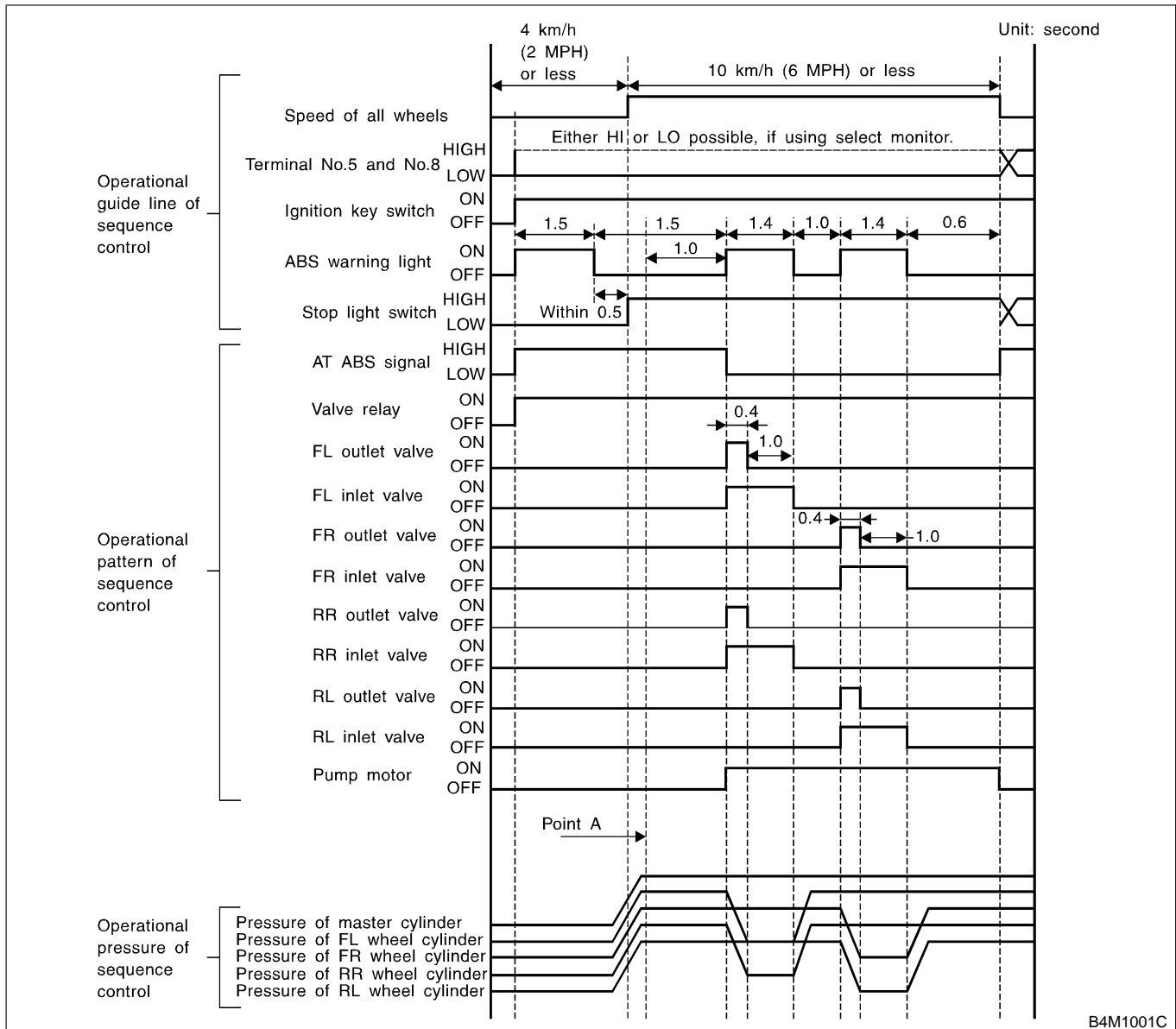
Do not depress the clutch pedal.

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

ABS SEQUENCE CONTROL

ABS

3. CONDITIONS FOR ABS SEQUENCE CONTROL S401187A1603



NOTE:

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

B: SPECIFICATION S401187A22**1. CONDITIONS FOR COMPLETION OF
ABS SEQUENCE CONTROL** S401187A2201

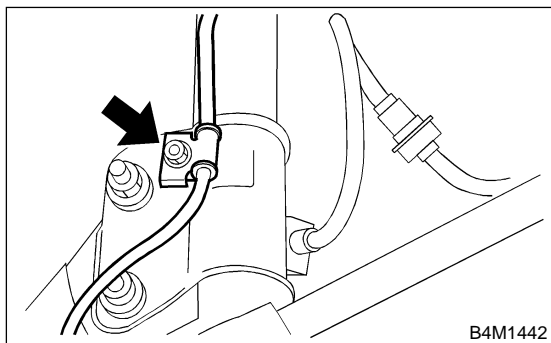
When the following conditions develop, the ABS sequence control stops and ABS operation is returned to the normal control mode.

- 1) When the speed of at least one wheel reaches 10 km/h (6 MPH).
- 2) When terminal No. 5 or No. 8 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.)

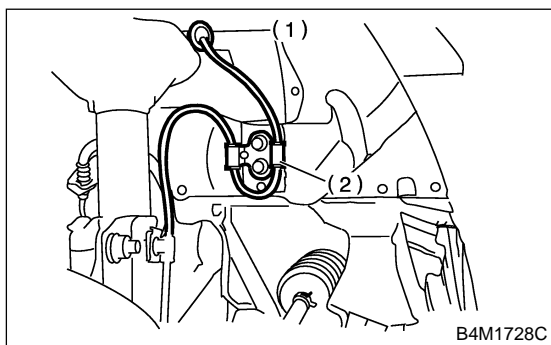
4. Front ABS Sensor S401190

A: REMOVAL S401190A18

- 1) Disconnect battery ground cable.
- 2) Disconnect front ABS sensor connector located next to front strut mounting house in engine compartment.
- 3) Remove bolts which secure sensor harness to strut.



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

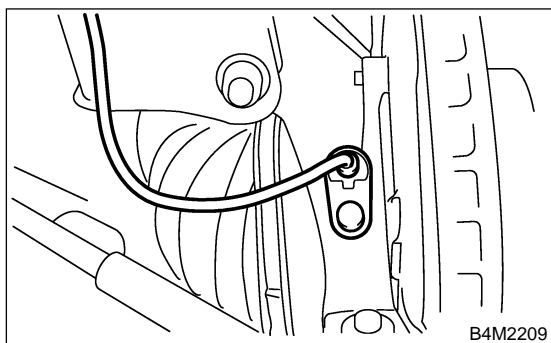


- (1) To front ABS sensor connector
- (2) Bracket

- 5) 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.

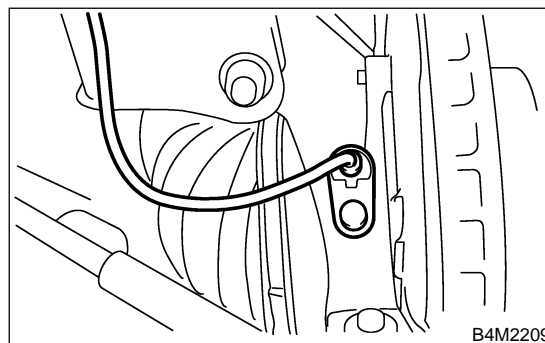


B: INSTALLATION S401190A11

- 1) Temporarily install front ABS sensor on housing.

CAUTION:

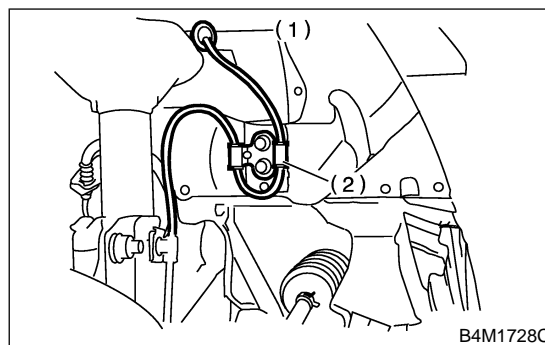
Be careful not to strike ABS sensor's pole piece and tone wheel's teeth against adjacent metal parts during installation.



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

Tightening torque:

32 N·m (3.3 kgf-m, 24 ft-lb)

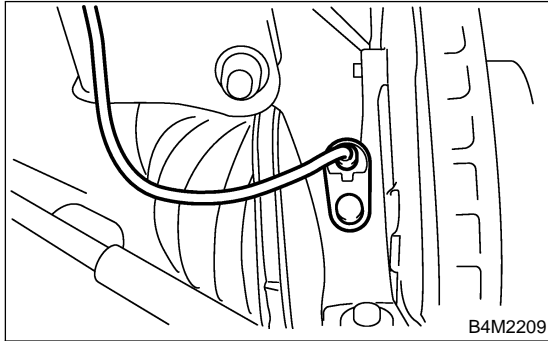


- (1) To front ABS sensor connector
- (2) Bracket

3) Place a thickness gauge between ABS sensor's 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.

| Model | LH | RH |
|----------------|--------|------------|
| Except OUTBACK | Yellow | White |
| OUTBACK | Brown | Light blue |

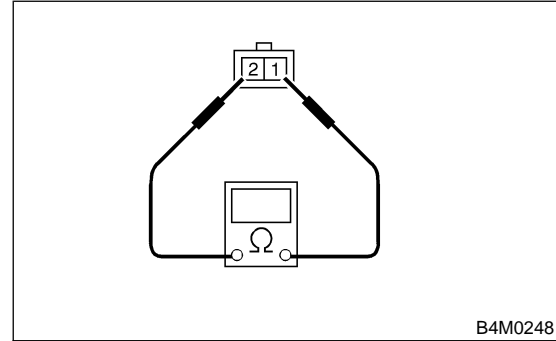
NOTE:
 If the clearance is outside specifications, readjust.

- After confirmation of the ABS sensor clearance, connect connector to ABS sensor.
- Connect connector to battery ground cable.

C: INSPECTION S401190A10

1. ABS SENSOR S401190A1001

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



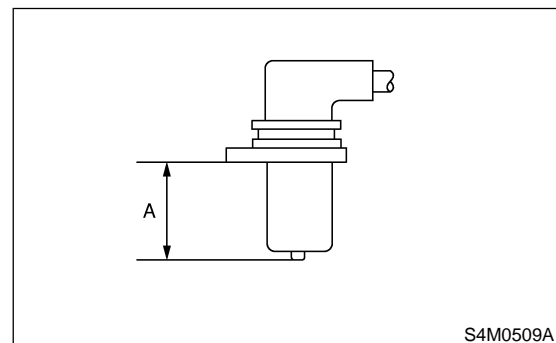
| Terminal No. | Standard |
|--------------|--------------|
| 1 and 2 | 1.25±0.25 kΩ |

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.

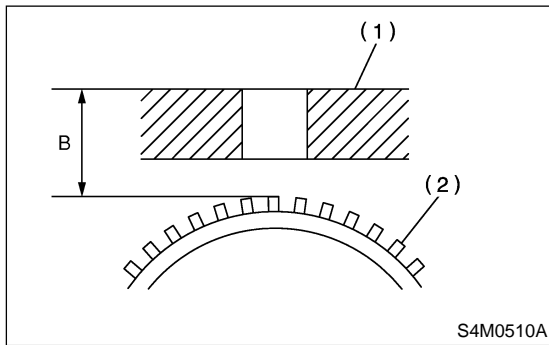
2. SENSOR GAP S401190A1002

- Measure the distance "A" between ABS sensor surface and sensor pole face.



- Measure the distance "B" between surface where the front axle housing meets the ABS sensor, and the tone wheel.

NOTE:
 Measure so that the gauge touches the tone wheel teeth top.



- (1) Axle housing
(2) Tone wheel

3) Find the gap between the ABS sensor pole face and the surface of the tone wheel teeth by putting the measured values in the formula below and calculating.

$$\text{ABS sensor clearance} = B - A$$

ABS sensor standard clearance:

0.3 — 0.8 mm (0.012 — 0.031 in)

NOTE:

If the clearance is outside specifications, readjust.

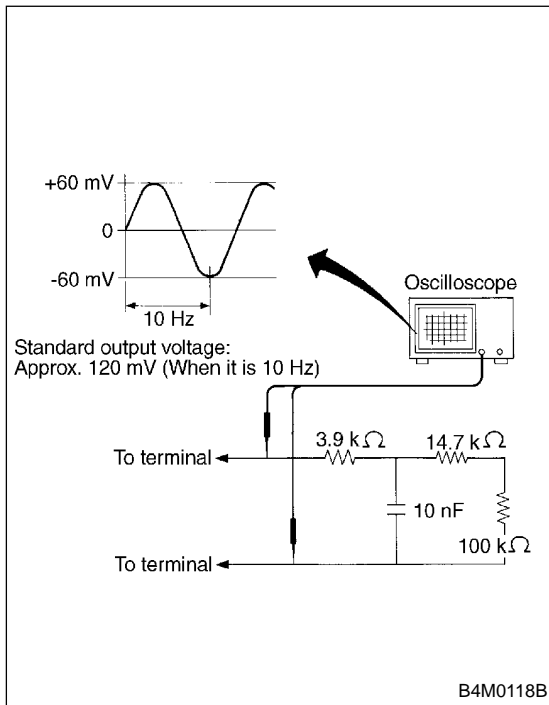
3. OUTPUT VOLTAGE

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.



D: ADJUSTMENT

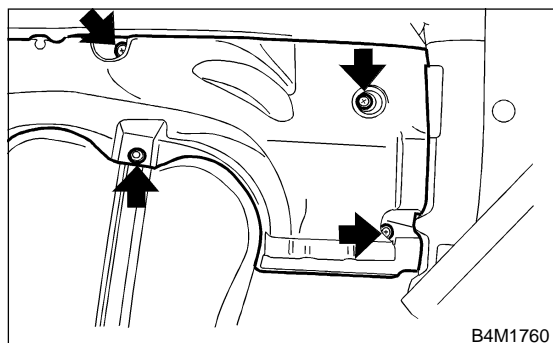
S401190A01

Adjust the gap using spacer (Part No. 26755A000).

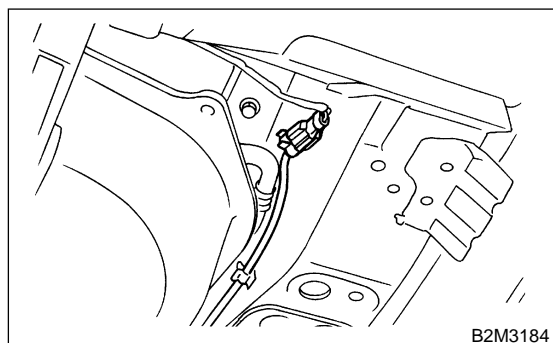
5. Rear ABS Sensor S401185

A: REMOVAL S401185A18

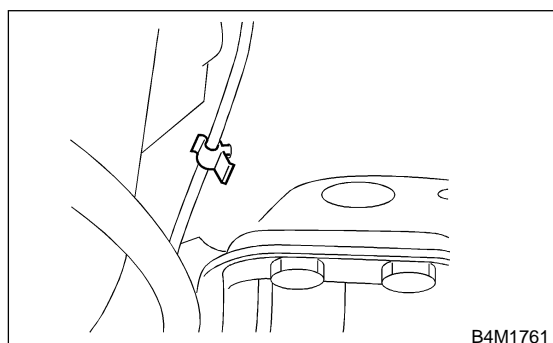
- 1) Disconnect battery ground cable.
- 2) Lift-up the vehicle.
- 3) Remove fuel tank cover.



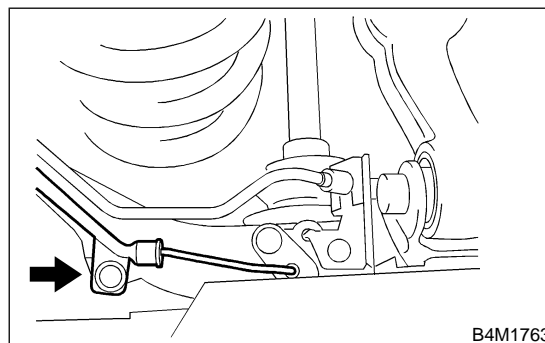
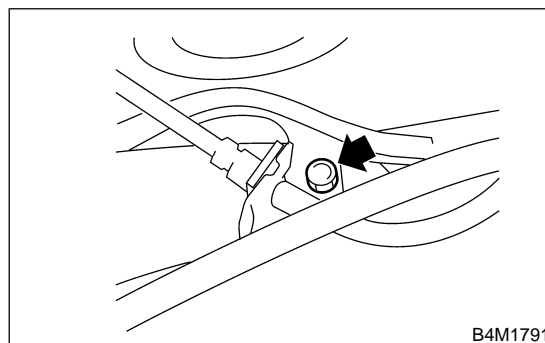
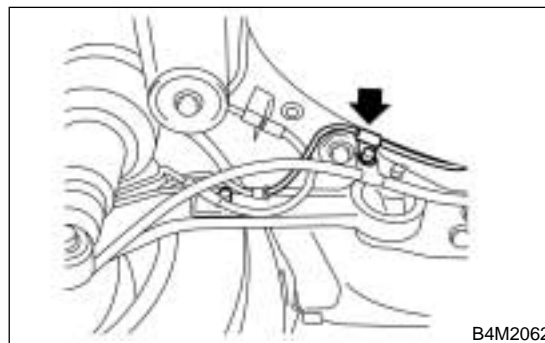
- 4) Disconnect rear ABS sensor connector.



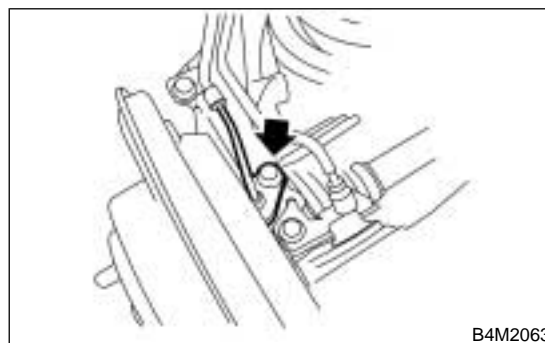
- 5) Remove rear sensor harness from clip on body side.



- 6) Remove bolts which hold rear sensor harness brackets.



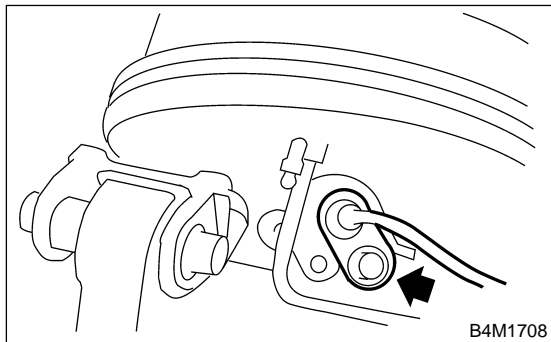
- 7) Remove rear ABS sensor from rear arm.
With disc brake model:



REAR ABS SENSOR

ABS

With drum brake model:



8) When inspecting rear tone wheel, remove rear drive shaft as rear tone wheel is unitized with BJ assembly of rear drive shaft.
<Ref. to DS-33 Rear Drive Shaft.>

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

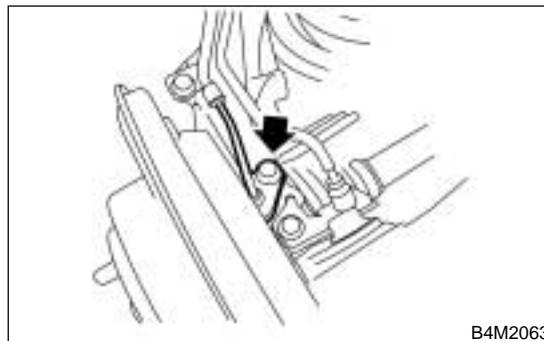
S401185A11

- 1) Install rear drive shaft to the vehicle.
<Ref. to DS-33 Rear Drive Shaft.>
- 2) Temporarily install rear ABS sensor on rear arm.

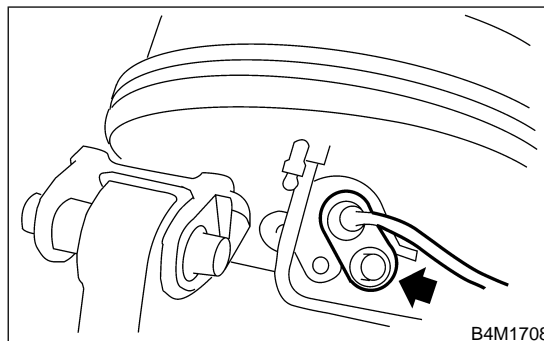
CAUTION:

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

With disc brake model:



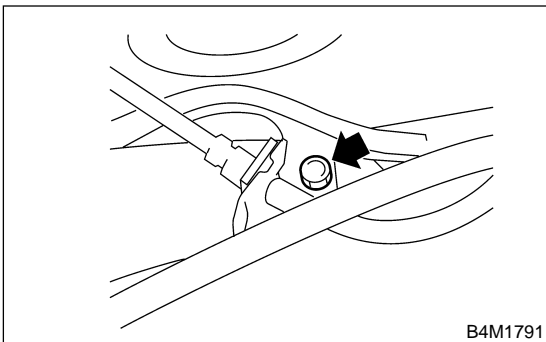
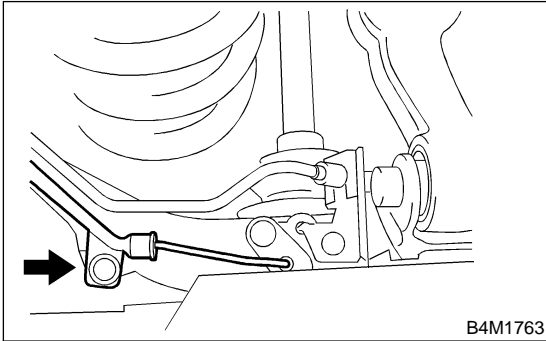
With drum brake model:



3) Install rear sensor harness brackets in the original positions and install harness on the clip.

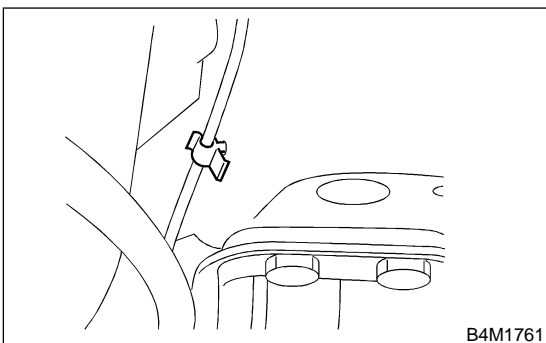
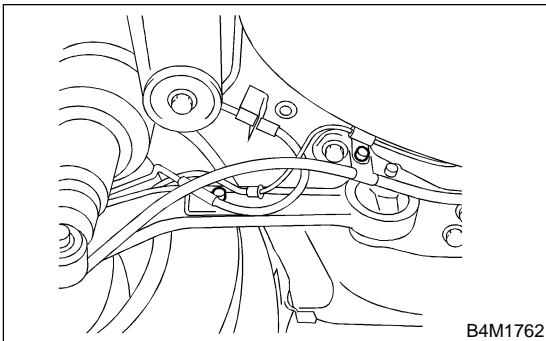
Tightening torque:

32 N·m (3.3 kgf-m, 24 ft-lb)



Tightening torque:

32 N·m (3.3 kgf-m, 24 ft-lb)



4) Place a thickness gauge between ABS sensor's and tone wheel's tooth face. After standard clearance is obtained over the entire perimeter, tighten ABS sensor on rear arm to specified torque.

ABS sensor standard clearance:

0.44 — 0.94 mm (0.0173 — 0.0370 in)

Tightening torque:

32 N·m (3.3 kgf-m, 24 ft-lb)

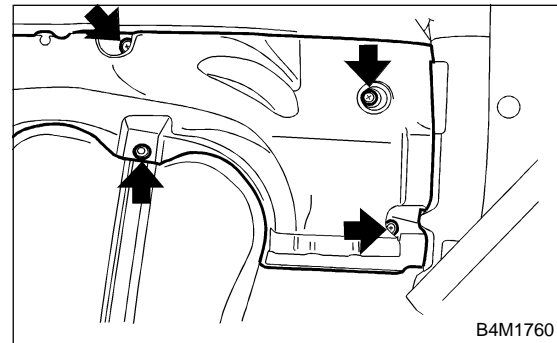
CAUTION:

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.

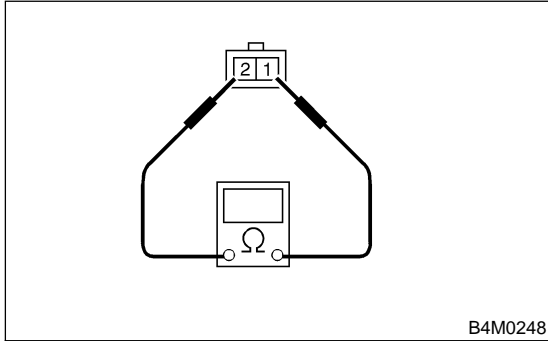
5) After confirmation of the ABS sensor clearance, connect connector to ABS sensor and install fuel tank cover.



6) Connect connector to battery ground cable.

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.



| Terminal No. | Standard |
|--------------|--------------|
| 1 and 2 | 1.25±0.25 kΩ |

CAUTION:

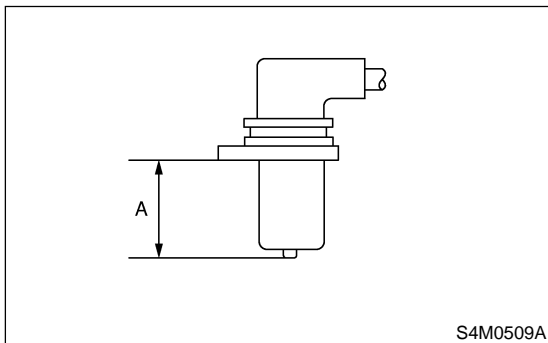
If resistance is outside the standard value, replace ABS sensor with new one.

NOTE:

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

2. SENSOR GAP S401185A1002

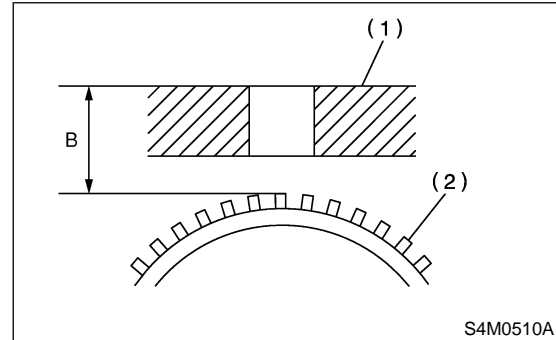
- 1) Measure the distance “A” between ABS sensor surface and sensor pole face.



- 2) Measure the distance “B” between surface where the front axle housing meets the ABS sensor, and the tone wheel.

NOTE:

Measure so that the gauge touches the tone wheel teeth top.



- (1) Axle housing
- (2) Tone wheel

- 3) Find the gap between the ABS sensor pole face and the surface of the tone wheel teeth by putting the measured values in the formula below and calculating.

$$\text{ABS sensor clearance} = B - A$$

ABS sensor standard clearance:

0.44 — 0.94 mm (0.0173 — 0.0370 in)

NOTE:

If the clearance is outside specifications, readjust.

3. OUTPUT VOLTAGE S401185A1003

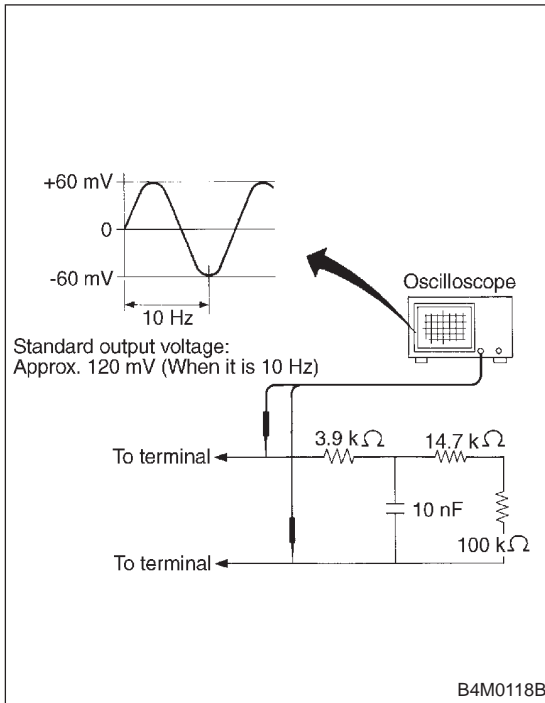
Output voltage can be checked by the following method. Install resistor and condenser, then rotate wheel about 2.75 km/h (2 MPH) or equivalent.

NOTE:

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

D: ADJUSTMENT S401185A01

Adjust the gap using spacer (Part No. 26755AA000).



6. Front Tone Wheel S401184

A: REMOVAL S401184A18

Refer to Front Drive Shaft, because front tone wheel is integrated with front drive shaft.

<Ref. to DS-28 REMOVAL, Front Drive Shaft.>

B: INSTALLATION S401184A11

Refer to Front Drive Shaft, because front tone wheel is integrated with front drive shaft.

<Ref. to DS-28 INSTALLATION, Front Drive Shaft.>

C: INSPECTION S401184A10

Visually check tone wheels teeth (44 pieces) for cracks or dents. If necessary, replace tone wheel with a new one.

NOTE:

Replace BJ assembly with new one as a single unit if there are any defects found on tone wheel is unitized with BJ assembly of drive shaft.

7. Rear Tone Wheel S401182

A: REMOVAL S401182A18

Refer to Rear Drive Shaft, because rear tone wheel is integrated with rear drive shaft.

<Ref. to DS-33 REMOVAL, Rear Drive Shaft.>

B: INSTALLATION S401182A11

Refer to Rear Drive Shaft, because rear tone wheel is integrated with rear drive shaft.

<Ref. to DS-33 INSTALLATION, Rear Drive Shaft.>

C: INSPECTION S401182A10

Visually check tone wheels teeth (44 pieces) for cracks or dents. If necessary, replace tone wheel with a new one.

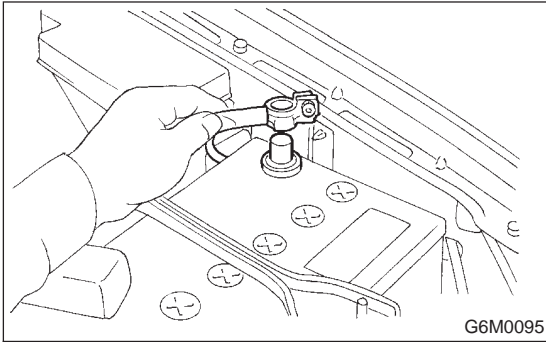
NOTE:

Replace BJ assembly with new one as a single unit if there are any defects found on tone wheel is unitized with BJ assembly of drive shaft.

8. G Sensor S401183

A: REMOVAL S401183A18

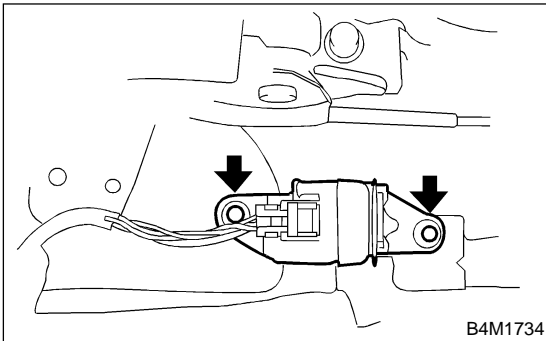
- 1) Disconnect battery ground terminal.



- 2) Remove console cover.
<Ref. to EI-36 Console Box.>
- 3) Disconnect connector from G sensor.
- 4) Remove G sensor from body.

CAUTION:

Do not drop or bump G sensor.

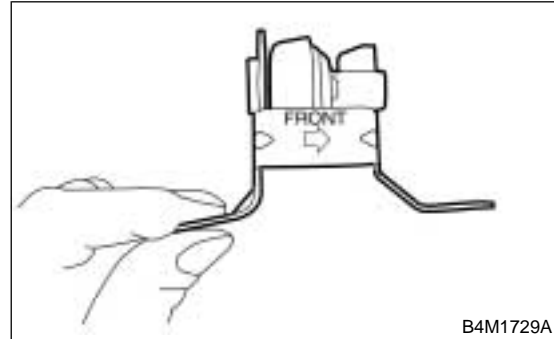


B: INSTALLATION S401183A11

- 1) Install in the reverse order of removal.

NOTE:

Do not install G sensor in the wrong direction. There is an arrow mark on the sensor showing which side faces the vehicle front.



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. |

MEMO:

GENERAL DESCRIPTION

Brake

1. General Description

S405001

A: SPECIFICATIONS

S405001E49

| | | | | |
|---|---|--|--|--|
| Front disc brake | Size | 14 inch type | 15 inch type | 16 inch type |
| | Type | Disc (Floating type, ventilated) | | |
| | Effective disc diameter | 210 mm (8.27 in) | 228 mm (8.98 in) | 248 mm (9.76 in) |
| | Disc thickness × Outer diameter | 24 × 260 mm (0.94 × 10.24 in) | 24 × 277 mm (0.94 × 10.91 in) | 24 × 294 mm (0.94 × 11.57 in) |
| | Effective cylinder diameter | 57.2 mm (2.252 in) | 42.8 mm (1.685 in) × 2 | |
| | Pad dimensions (length × width × thickness) | 112.4 × 44.3 × 11.0 mm (4.425 × 1.744 × 0.433 in) | 112.3 × 50.0 × 11.0 mm (4.421 × 1.969 × 0.433 in) | |
| | Clearance adjustment | Automatic adjustment | | |
| | Rear disc brake | Type | — | Disc (Floating type) |
| Effective disc diameter | | — | 254 mm (10.0 in) | |
| Disc thickness × Outer diameter | | — | 10 × 290 mm (0.39 × 11.42 in) | |
| Effective cylinder diameter | | — | 38.1 mm (1.500 in) | |
| Pad dimensions (length × width × thickness) | | — | 82.4 × 33.7 × 9.0 mm (3.244 × 1.327 × 0.354 in) | |
| Clearance adjustment | | — | Automatic adjustment | |
| Rear drum brake | | Type | Drum (Leading-Trailing type) | — |
| | Effective drum diameter | 228.6 mm (9 in) | — | — |
| | Effective cylinder diameter | 20.6 mm (0.811 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 | 25.4 mm (1 in) | 26.99 mm (1-1/16 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) | 205 + 230 mm (8.07 + 9.06 in) | |
| Proportioning valve | Split point | 3,678 kPa (37.5 kg/cm ² , 533 psi) | 2,942 kPa (30 kg/cm ² , 427 psi) | 3,678 kPa (37.5 kg/cm ² , 533 psi) |
| | Reducing ratio | 0.3 | | |
| 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) | 14 mm (0.55 in) | 6.5 mm (0.256 in) |
| | Disc thickness | 10 mm (0.39 in) | 8.5 mm (0.335 in) |
| | Disc runout | — | 0.075 mm (0.0030 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) |
| Parking brake | Lever stroke | 7 to 8 notches/196 N (20 kg, 44 lb) | |

| | | Brake pedal force | Fluid pressure | | |
|---------------|--|----------------------|---|--|--------------|
| | | | 14 inch type | 15 inch type | 16 inch type |
| Brake booster | Brake fluid pressure without engine running | 147 N (15 kg, 33 lb) | 785 kPa (8 kg/cm ² , 114 psi) | 686 kPa (7 kg/cm ² , 100 psi) | |
| | | 294 N (30 kg, 66 lb) | 1,961 kPa (20 kg/cm ² , 284 psi) | 1,765 kPa (18 kg/cm ² , 256 psi) | |
| | Brake fluid pressure with engine running and vacuum at 66.7 kPa (500 mmHg, 19.69 inHg) | 147 N (15 kg, 33 lb) | 6,375 kPa (65 kg/cm ² , 924 psi) | 5,688 kPa (58 kg/cm ² , 825 psi) | |
| | | 294 N (30 kg, 66 lb) | 9,121 kPa (93 kg/cm ² , 1,322 psi) | 9,905 kPa (101 kg/cm ² , 1,436 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 kg, 2 lb).] |
|-------------|-----------|---|

GENERAL DESCRIPTION

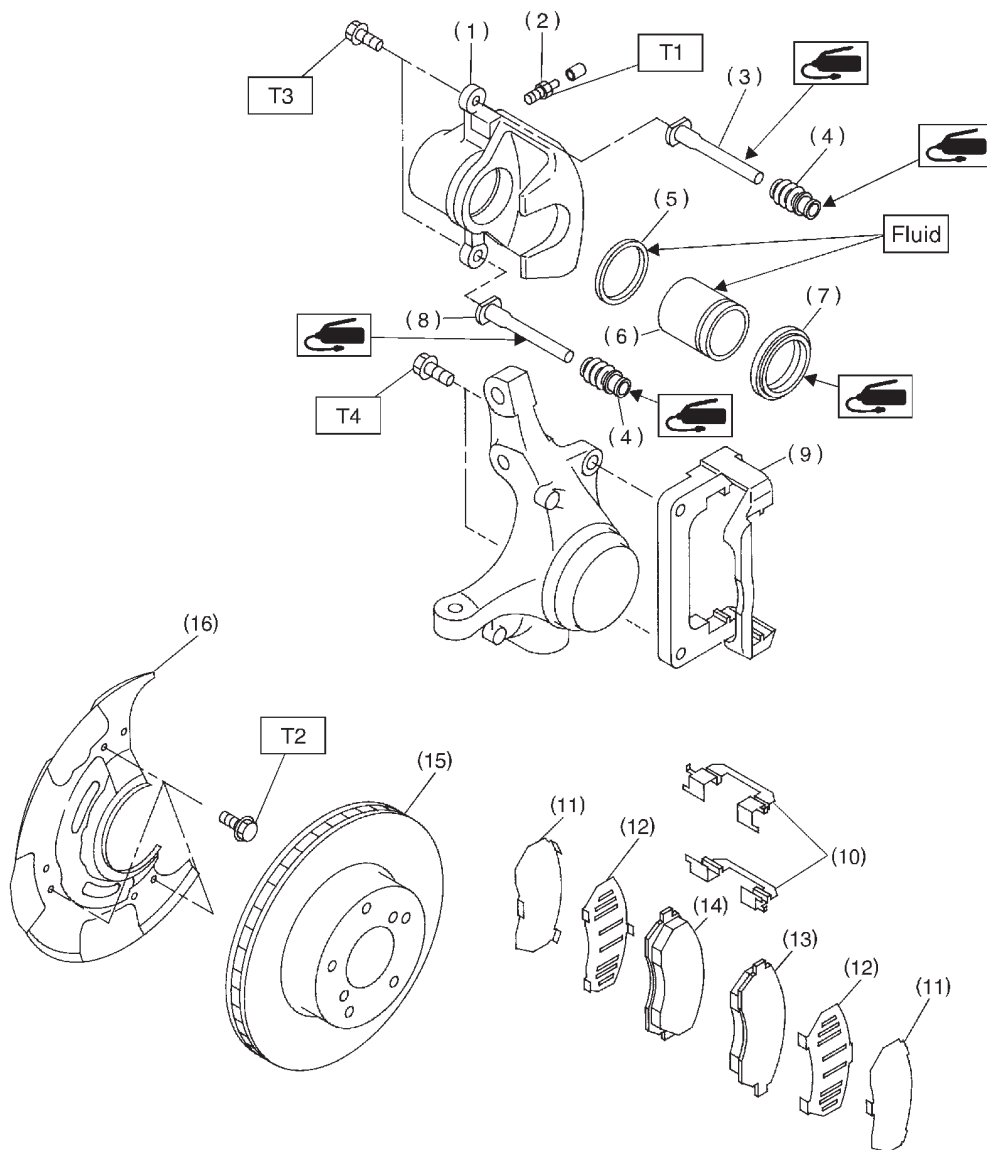
Brake

B: COMPONENT

S405001A05

1. 14 inch TYPE

S405001A0501



B4M1208D

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

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

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

T1: 8 (0.8, 5.8)

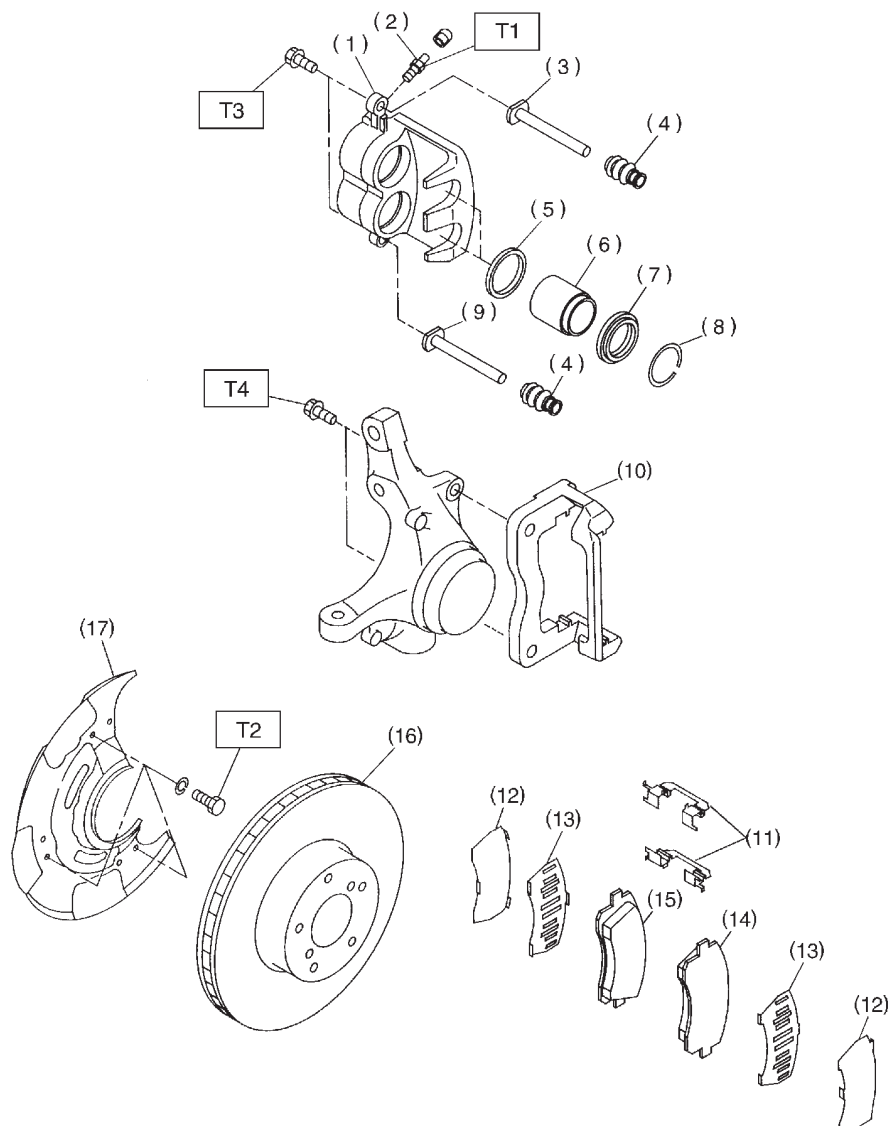
T2: 18 (1.8, 13.0)

T3: 37 (3.8, 27.5)

T4: 78 (8.0, 58)

BR-4

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)

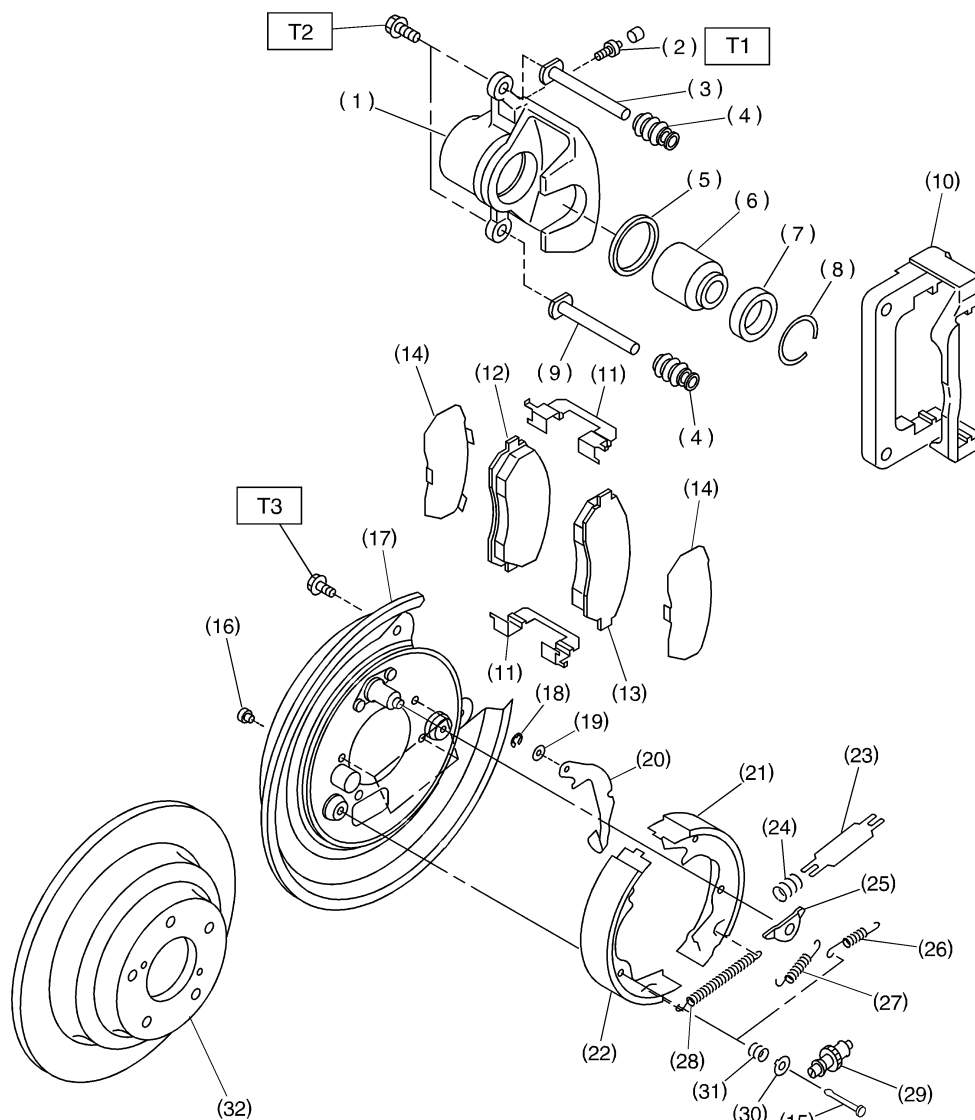
T3: 39 (4.0, 28.9)

T4: 78 (8.0, 58)

GENERAL DESCRIPTION

Brake

3. REAR DISC BRAKE S405001A0503



B4M1835A

- | | | |
|-----------------------|-------------------------------------|---------------------------------|
| (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)

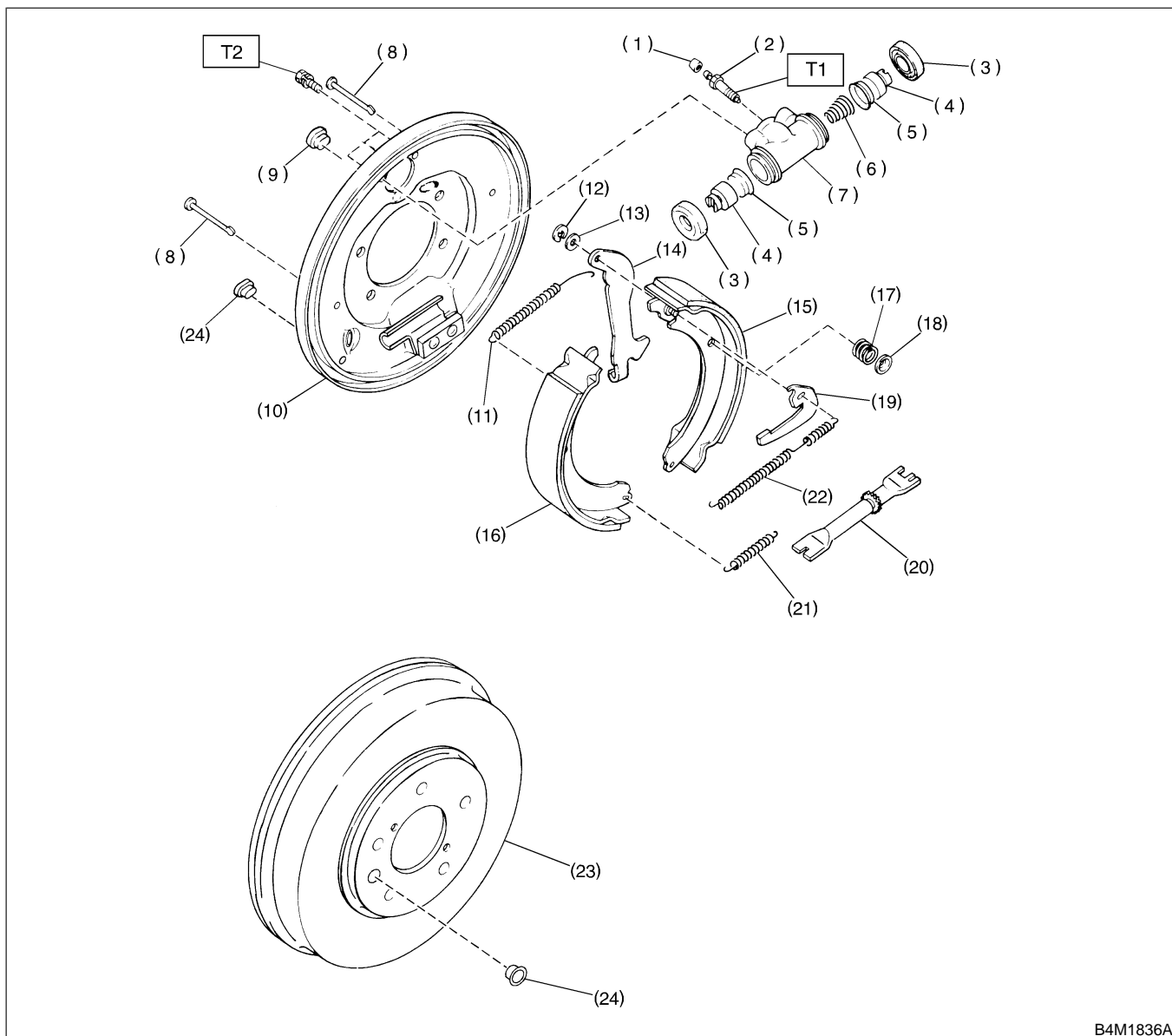
T1: 8 (0.8, 5.8)

T2: 39 (4.0, 28.9)

T3: 52 (5.3, 38.3)

BR-6

4. REAR DRUM BRAKE S405001A0504



B4M1836A

- | | | |
|-------------------------|-------------------------------|-------------------------------|
| (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 | |

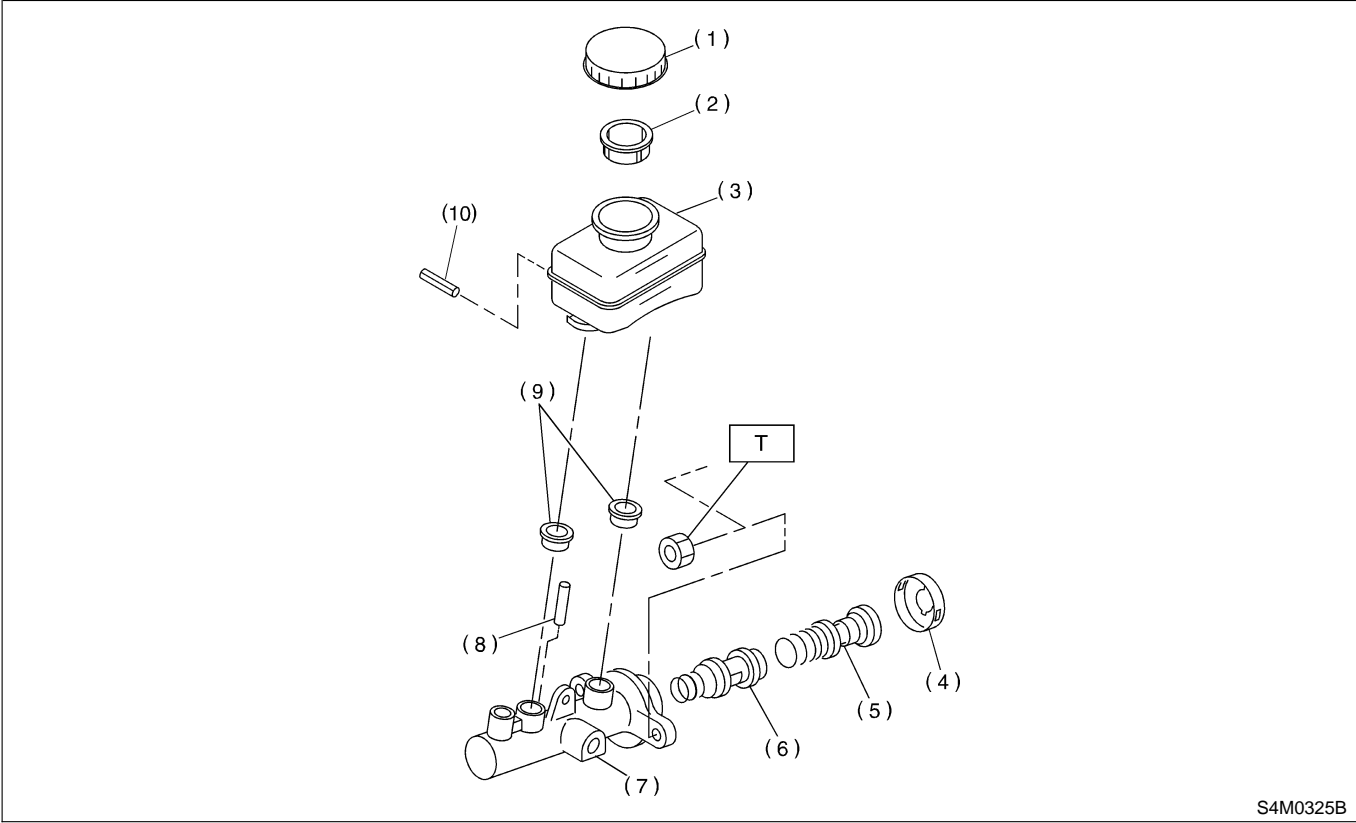
Tightening torque: N-m (kgf-m, ft-lb)

T1: 8 (0.8, 5.8)

T2: 10 (1.0, 7.2)

5. MASTER CYLINDER S405001A0505

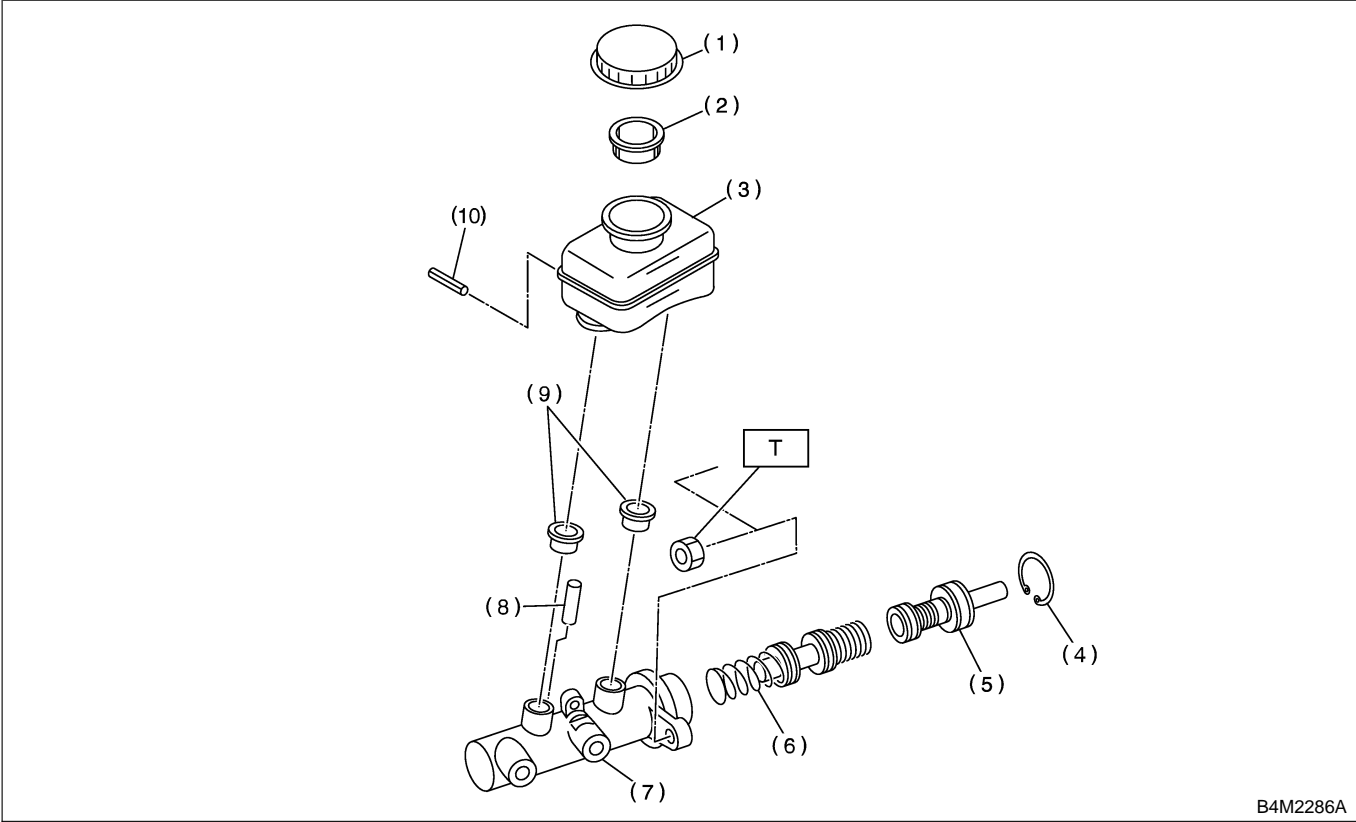
● Without VDC model



- | | |
|---------------------|-----------------------------|
| (1) Cap | (6) Secondary piston |
| (2) Filter | (7) Cylinder body |
| (3) Reservoir tank | (8) Cylinder pin (With ABS) |
| (4) Piston retainer | (9) Seal |
| (5) Primary piston | (10) Pin |

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

● With VDC model

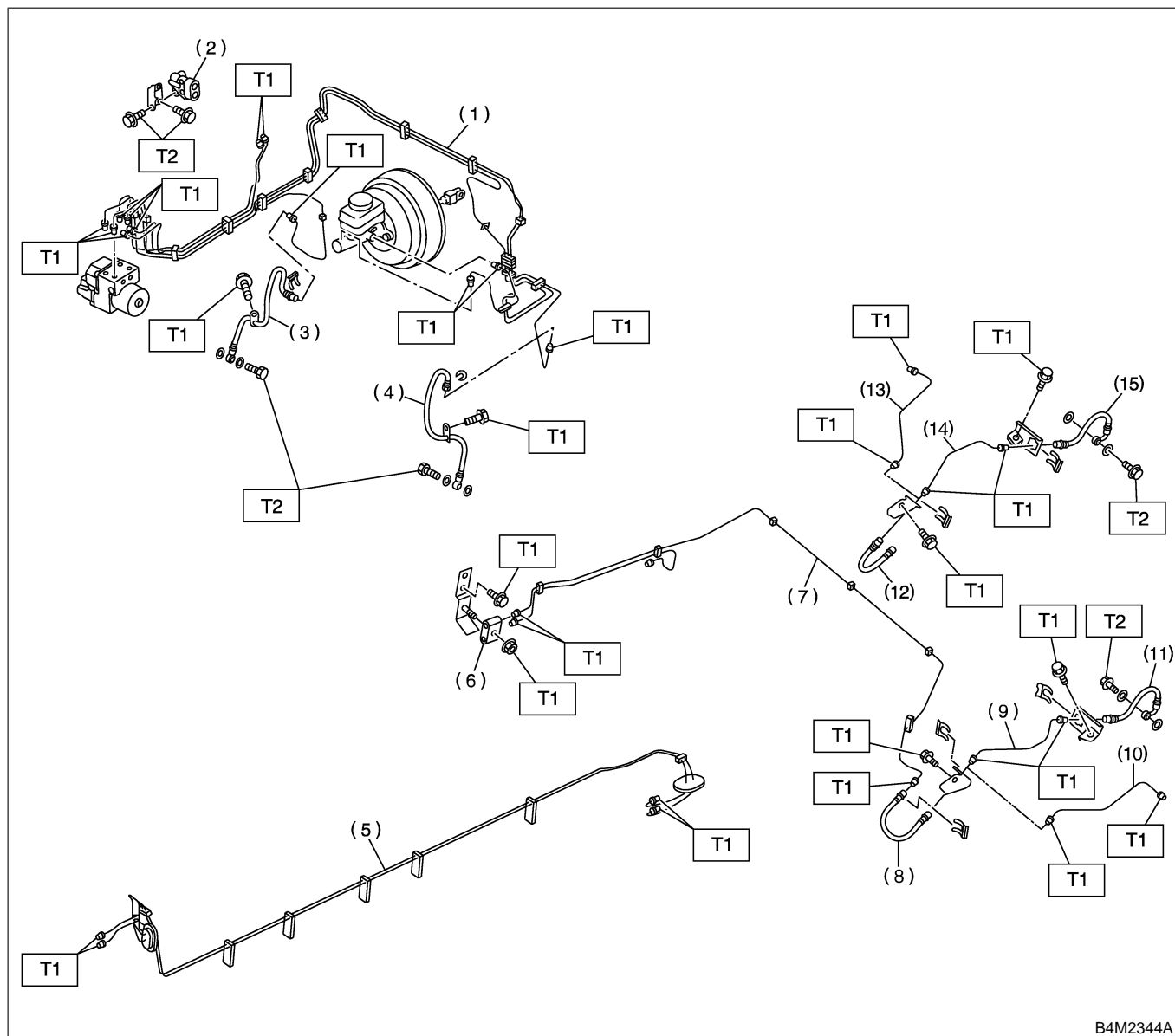


- | | |
|--------------------|----------------------|
| (1) Cap | (6) Secondary piston |
| (2) Filter | (7) Cylinder body |
| (3) Reservoir tank | (8) Cylinder pin |
| (4) C-ring | (9) Seal |
| (5) Primary piston | (10) Pin |

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

6. BRAKE PIPES AND HOSE

S405001A0506



B4M2344A

- (1) Front brake pipe assembly
- (2) Proportioning valve
- (3) Front brake hose RH
- (4) Front brake hose LH
- (5) Center brake pipe assembly
- (6) Two-way connector
- (7) Rear brake pipe assembly
- (8) Rear brake hose LH

- (9) Rear brake pipe LH (Disc brake model)
- (10) Rear brake pipe LH (Drum brake model)
- (11) Rear brake hose rear LH
- (12) Rear brake hose RH
- (13) Rear brake pipe RH (Drum brake model)

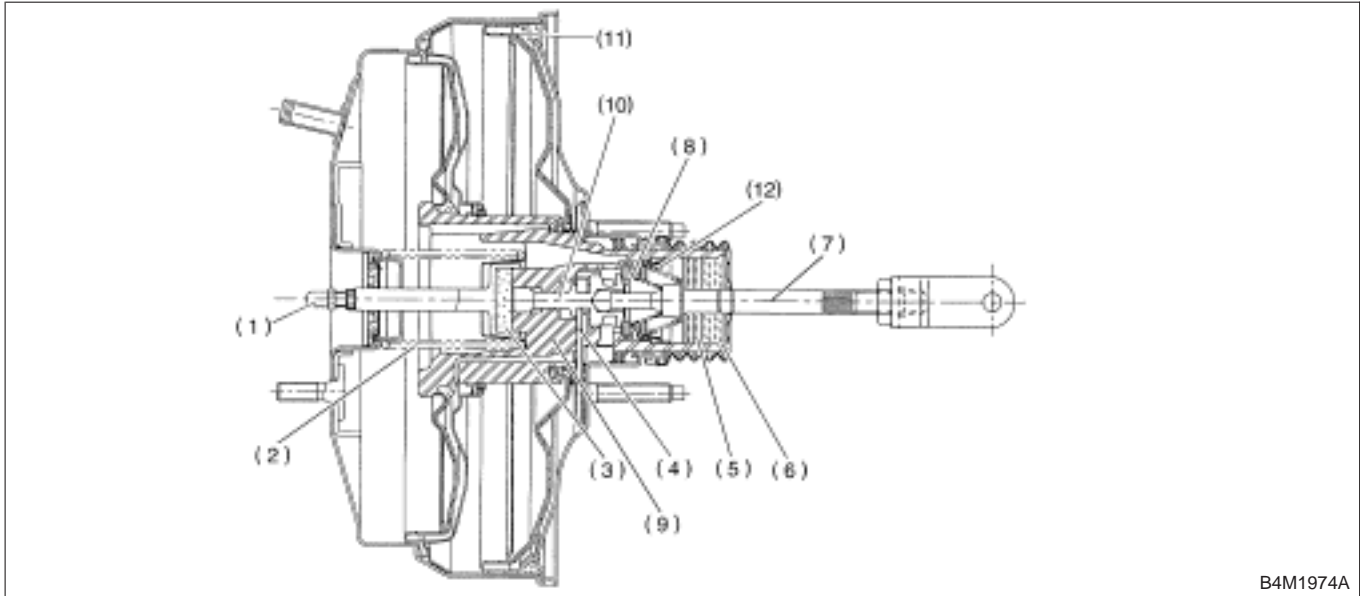
- (14) Rear brake pipe RH (Disc brake model)
- (15) Rear brake hose rear RH

Tightening torque: N·m (kgf·m, ft·lb)

T1: 15 (1.5, 10.8)

T2: 18 (1.8, 13.0)

7. BRAKE BOOSTER S405001A0507



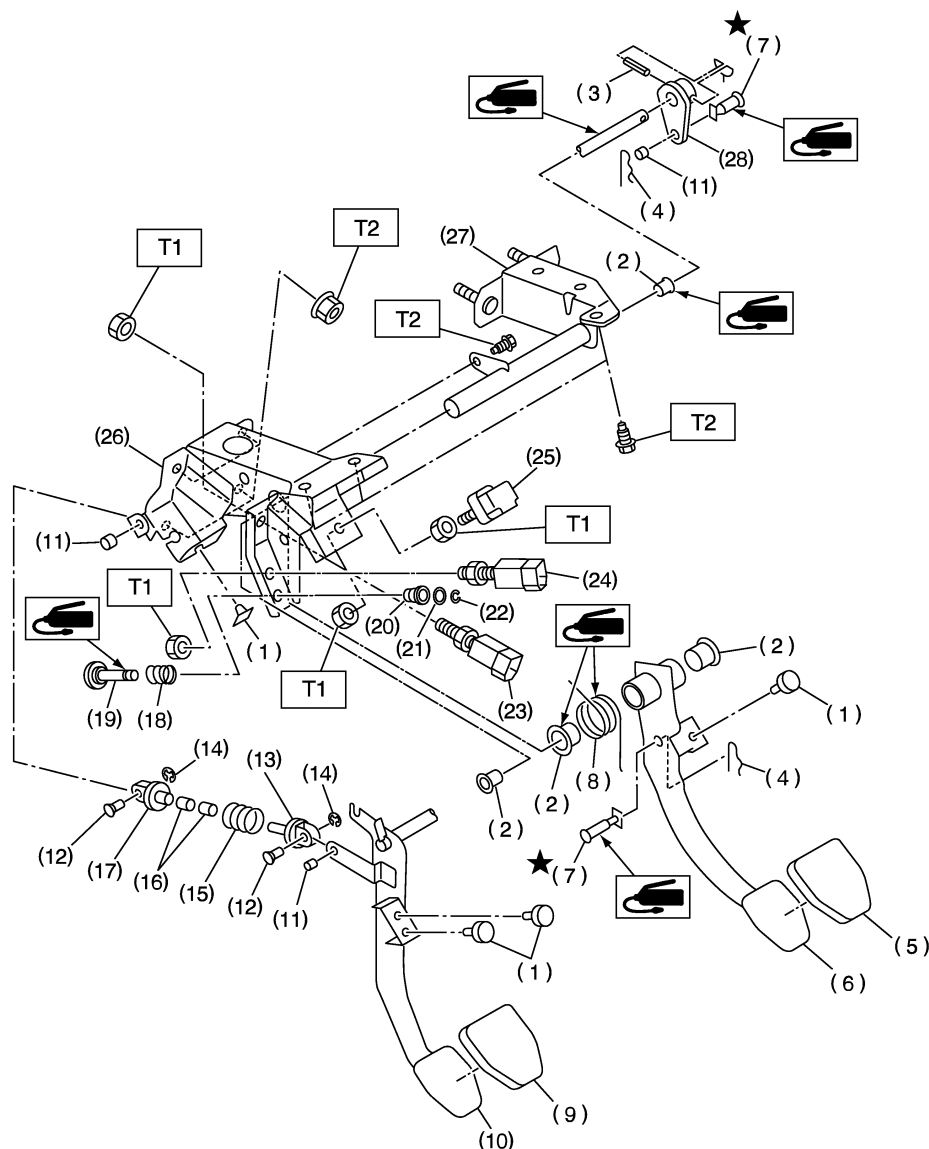
B4M1974A

- | | | |
|-------------------|-------------------|--------------------------|
| (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 |

GENERAL DESCRIPTION

Brake

8. BRAKE PEDAL FOR MT MODEL S405001A0508



B4M2345A

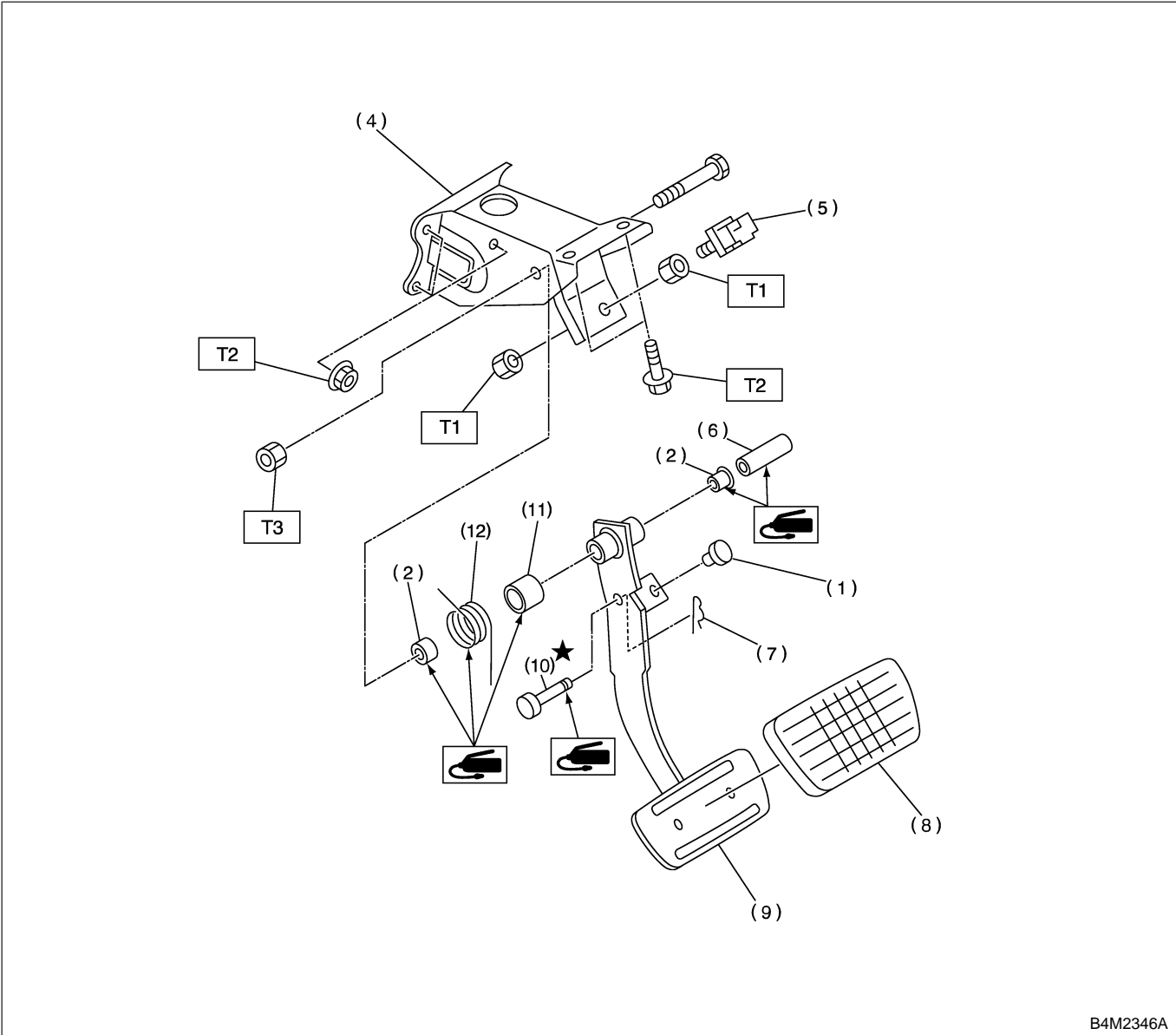
- | | | |
|------------------------|--|--|
| (1) Stopper | (13) Assist rod A | (24) Clutch switch (With cruise control) |
| (2) Bushing | (14) Clip | (25) Stop light switch |
| (3) Spring pin | (15) Assist spring | (26) Pedal bracket |
| (4) Snap pin | (16) Assist bushing | (27) Clutch master cylinder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

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

T1: 8 (0.8, 5.8)

T2: 18 (1.8, 13.0)

9. BRAKE PEDAL FOR AT MODEL S405001A0509



- | | |
|-----------------------|-------------------------|
| (1) Stopper | (7) Snap pin |
| (2) Bushing | (8) Brake pedal pad |
| (3) Plug | (9) Brake pedal |
| (4) Pedal bracket | (10) Clevis pin |
| (5) Stop light switch | (11) Brake spacer |
| (6) Spacer | (12) 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.

Brake

1. SPECIAL TOOLS S405001A1701

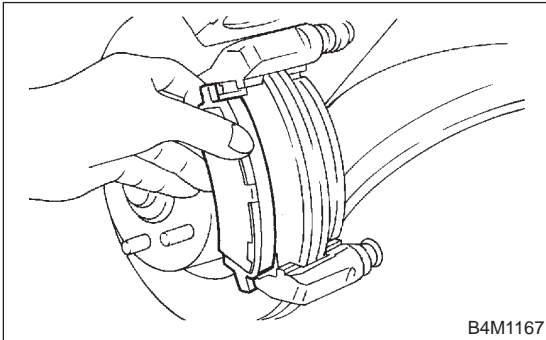
2. GENERAL PURPOSE TOOLS S405001A1702

00.5.31/68j/4br

2. Front Brake Pad S405178

A: REMOVAL S405178A18

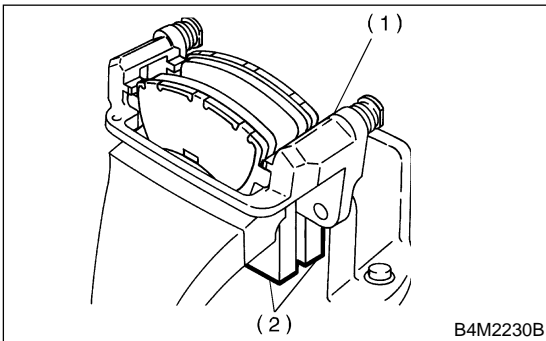
- 1) Remove lock pin.
- 2) Raise caliper body.
- 3) Remove pad.



NOTE:

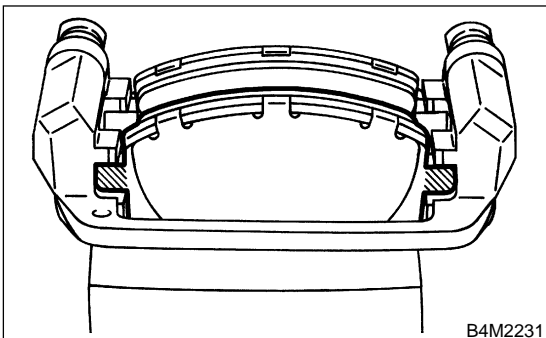
If brake pad is difficult to remove, proceed as follows:

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



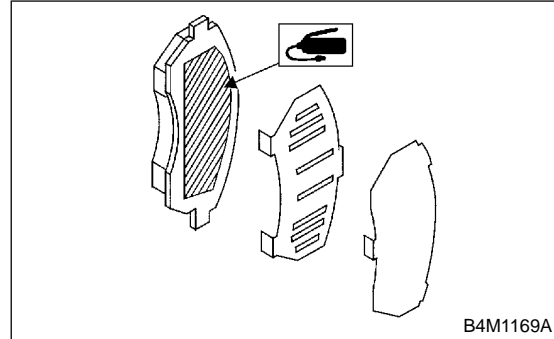
- (1) Support
- (2) Wooden blocks

- (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.



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.



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

Tightening torque:

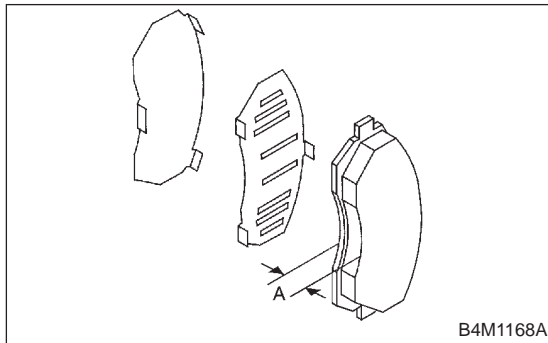
39 N·m (4.0 kgf-m, 28.9 ft-lb)

NOTE:

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

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.

3. Front Disc Rotor

S405173

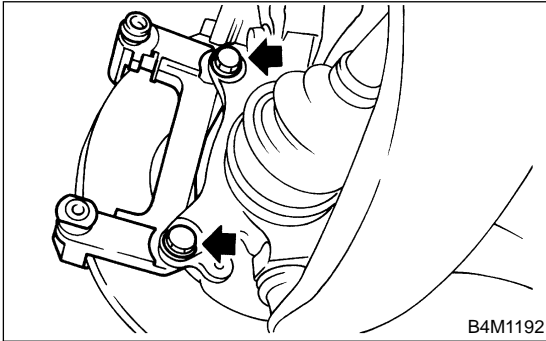
A: REMOVAL

S405173A18

- 1) Remove the brake pad.
<Ref. to BR-16 REMOVAL, Front Brake Pad.>
- 2) Remove the support.

NOTE:

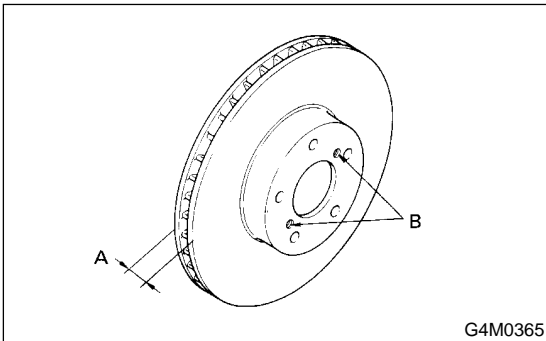
Remove support only when replacing it or the rotor.
If need not be removed when servicing caliper body assembly.



- 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:

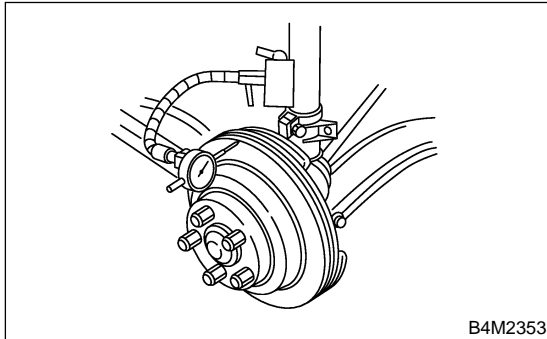
- Always replace the pads for both the left and right wheels at the same time. Also replace pad clips if they are twisted or worn.
- A wear indicator is provided on the inner disc brake pad. If the pad wears down to such an extent that the end of the wear indicator contacts the disc rotor, a squeaking 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-21 INSTALLATION, Front Disc Brake Assembly.>

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.

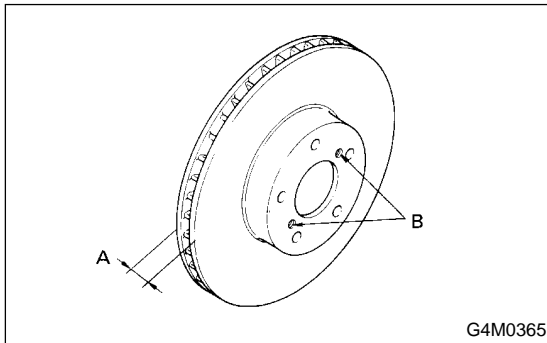


NOTE:

Make sure that dial gauge is set 5 mm (0.20 in) inward of rotor outer perimeter.

Disc rotor runout limit:
0.075 mm (0.0030 in)

- 3) Measure disc rotor thickness.



NOTE:

Make sure that micrometer is set 5 mm (0.20 in) inward of rotor outer perimeter.

| | | Standard value | Service limit | Disc outer dia. |
|------------------------|-----|-----------------------|-----------------------|----------------------|
| Disc rotor thickness A | 14" | 24.0 mm (0.945 in) | 22.0 mm (0.866 in) | 260 mm (10.24 in) |
| | 15" | 24.0 mm (0.945 in) | 22.0 mm (0.866 in) | 277 mm (10.91 in) |
| | 16" | 24.0 mm (0.945 in) | 22.0 mm (0.866 in) | 294 mm (11.57 in) |

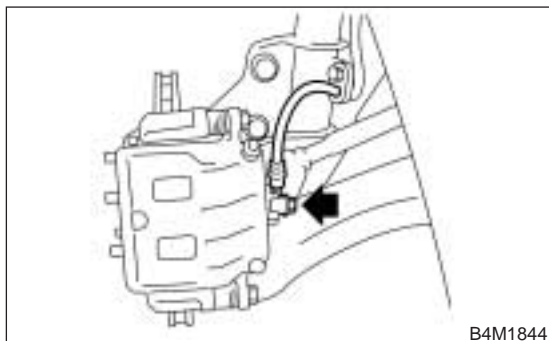
4. Front Disc Brake Assembly

S405176

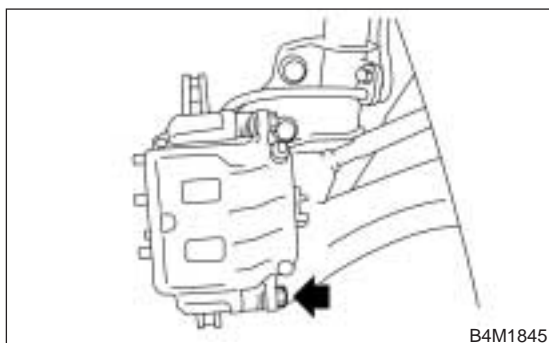
A: REMOVAL

S405176A18

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



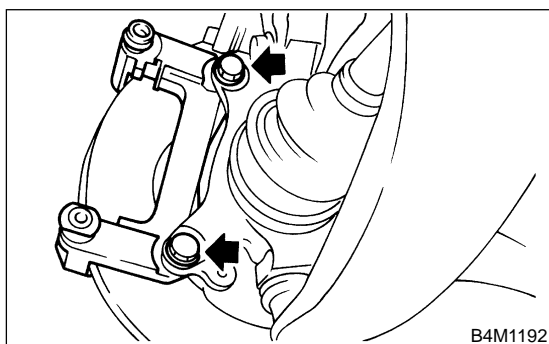
- 2) Remove bolt securing lock pin to caliper body.



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

NOTE:

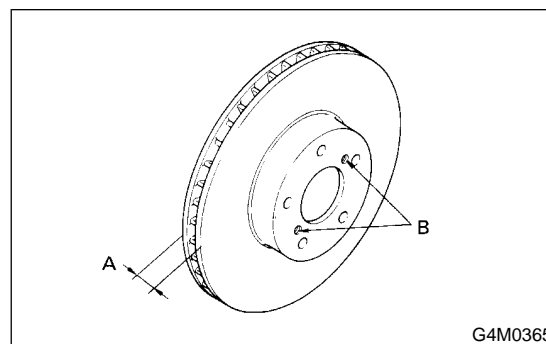
Remove support only when replacing it or the rotor. It need not be removed when servicing caliper body assembly.



- 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.

B: INSTALLATION

S405176A11

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

Tightening torque:

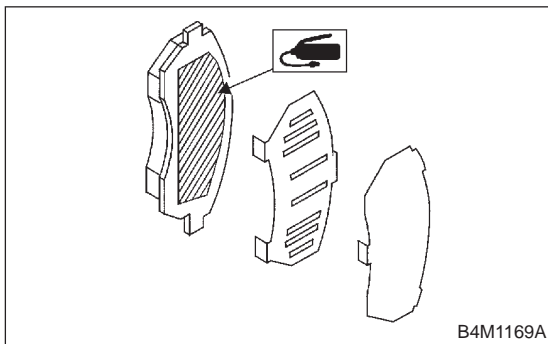
78 N·m (8 kgf-m, 58 ft-lb)

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:

14 inch type

37 N·m (3.8 kgf-m, 27.5 ft-lb)

Except 14 inch type

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:

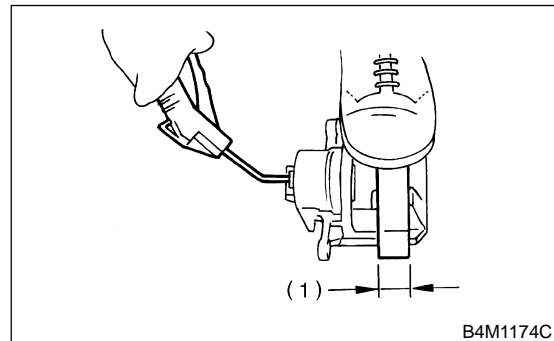
Be careful not to allow foreign particles to enter inlet (at brake hose connector).

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

CAUTION:

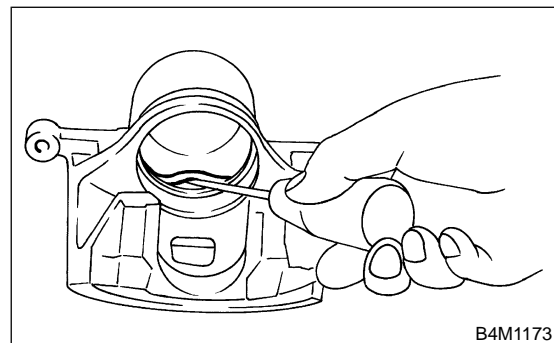
● Place a wooden block as shown in Figure to prevent damage to piston.

- Do not apply excessively high-pressure.



- (1) Place a 30 mm (1.18 in) wide wooden block here.

- 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

S405176A0603

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

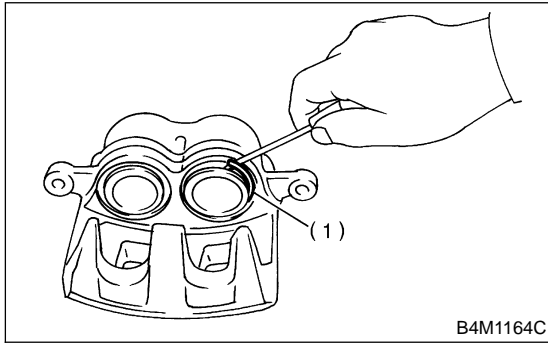
CAUTION:

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

FRONT DISC BRAKE ASSEMBLY

Brake

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

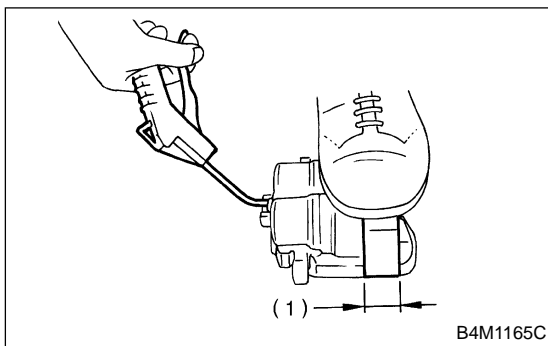


(1) Boot ring

- 3) Remove boot from piston end.
- 4) Gradually supply compressed air via caliper body brake hose to force piston out.

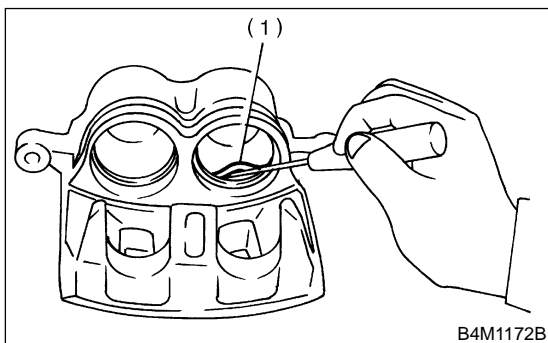
CAUTION:

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



(1) Place a 30 mm (1.18 in) wide wooden block here.

- 5) Remove piston seal from caliper body cylinder.



(1) Piston pin

- 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.

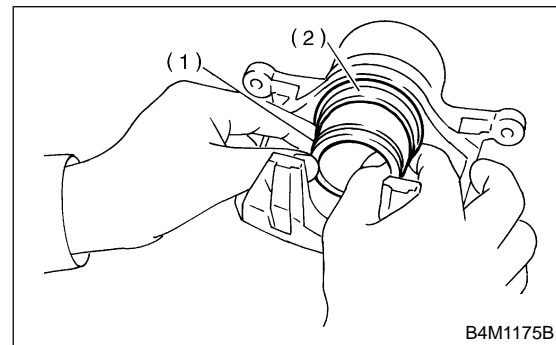
Grease:

NIGLUBE RX-2 (Part No. 003606000)

- 5) Insert piston into cylinder.

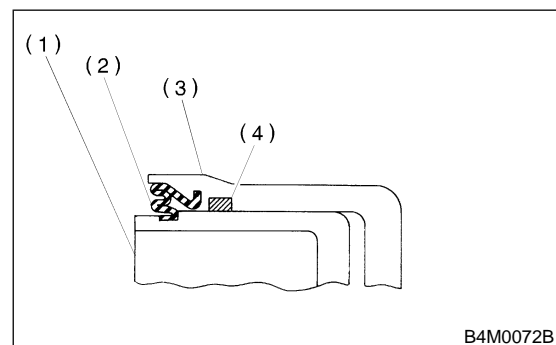
CAUTION:

Do not force piston into cylinder.



- (1) Piston
- (2) Piston boot

- 6) Position boot in grooves on cylinder and piston.



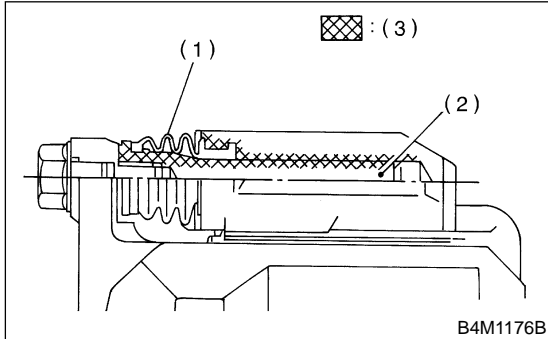
- (1) Piston
- (2) Piston boot
- (3) Caliper body
- (4) Piston seal

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.



- (1) Pin boot
- (2) Lock pin or guide pin
- (3) Apply grease.

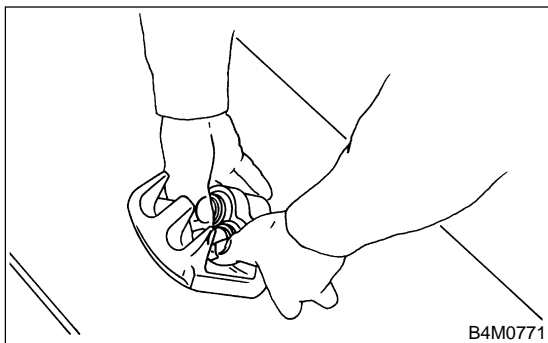
2. 15 inch AND 16 inch TYPE

S405176A0203

- 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.

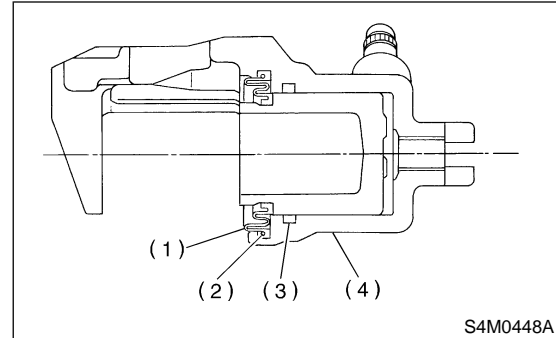


5) Apply a coat of specified grease to boot and fit in groove on ends of cylinder and piston.

Grease:

NIGLUBE RX-2 (Part No. 003606000)

To facilitate installation, fit boot starting with piston end.

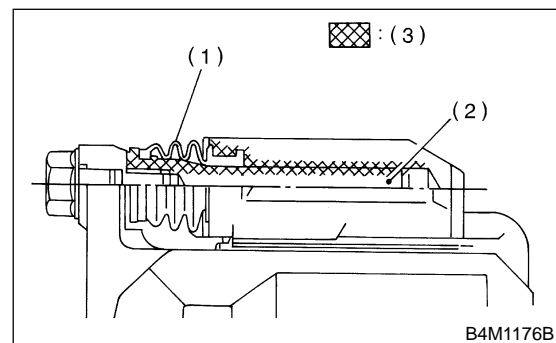


- (1) Piston boot
- (2) Boot ring
- (3) Piston seal
- (4) Caliper body

- 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)



- (1) Pin boot
- (2) Lock pin or guide pin
- (3) Apply grease.

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

FRONT DISC BRAKE ASSEMBLY

Brake

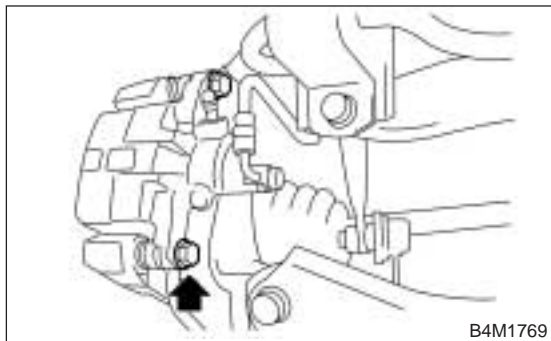
E: INSPECTION S405176A10

- 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.

5. Rear Brake Pad S405175

A: REMOVAL S405175A18

- 1) Remove lock pin.

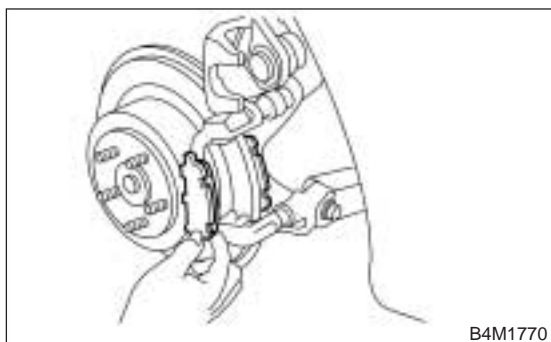


- 2) Raise caliper body.
- 3) Remove pad from support.

NOTE:

If brake pad is difficult to remove, use the same procedure as for front disc brake pad.

<Ref. to BR-16 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:

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.

C: INSPECTION S405175A10

Check pad thickness (including back metal).

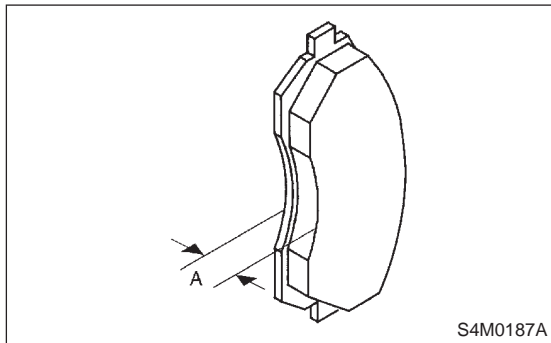
Pad thickness: A

Standard value

14.0 mm (0.551 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.

6. Rear Disc Brake Assembly

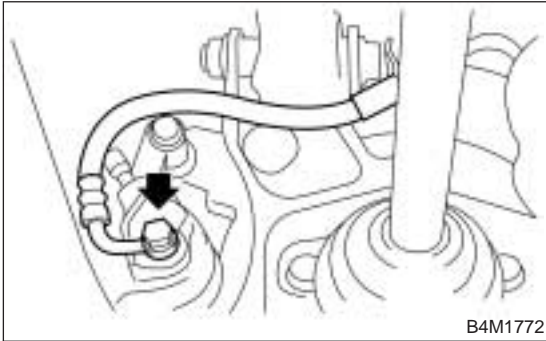
S405172

A: REMOVAL S405172A18

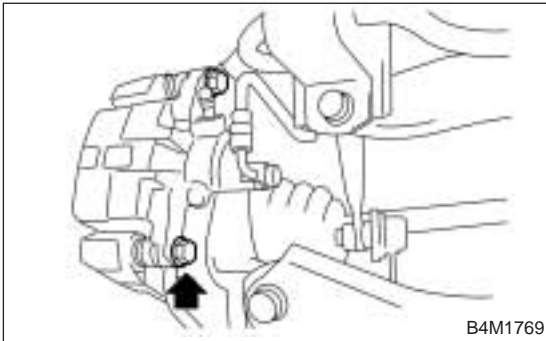
- 1) Lift-up vehicle and remove wheels.
- 2) Disconnect brake hose from caliper body assembly.

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:

78 N·m (8.0 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.
- 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:

39 N·m (4.0 kgf-m, 28.9 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.

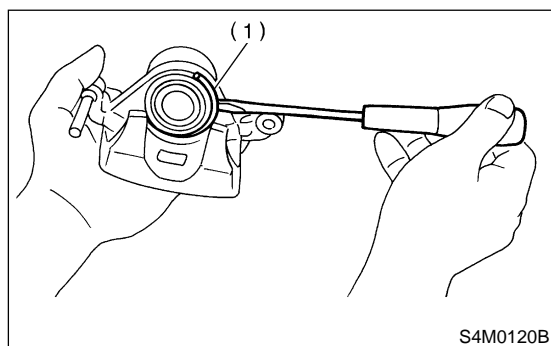
REAR DISC BRAKE ASSEMBLY

Brake

C: DISASSEMBLY

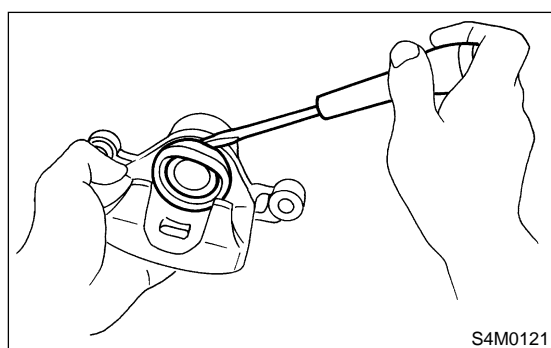
S405172A06

1) Remove the boot ring.



(1) Boot ring

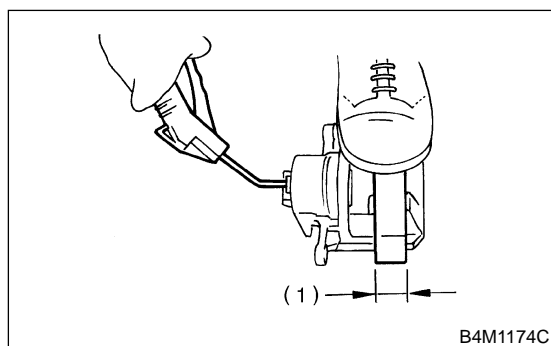
2) Remove the piston boot.



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

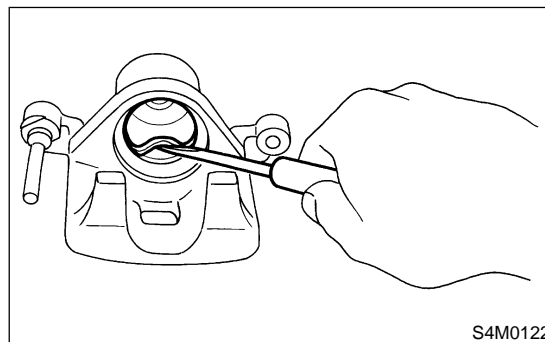
CAUTION:

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



(1) Place a 30 mm (1.18 in) wide wooden block here.

4) Remove piston seal from caliper body cylinder.



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

6) Remove guide pin boot.

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:

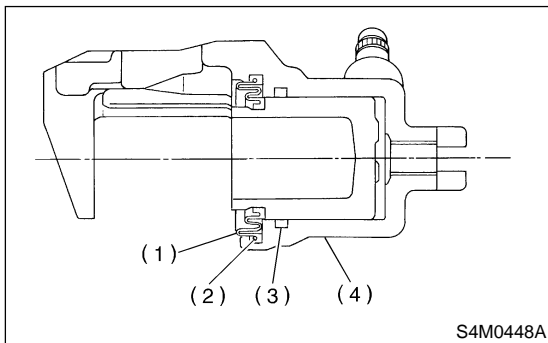
Do not force piston into cylinder.

- 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.

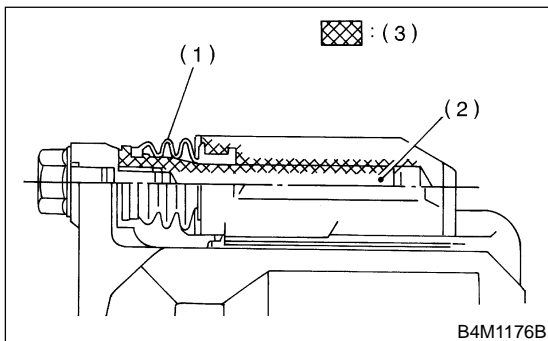


- (1) Piston boot
- (2) Boot ring
- (3) Piston seal
- (4) Caliper body

- 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)



- (1) Pin boot
- (2) Lock pin or guide pin
- (3) Apply grease.

- 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.

7. Rear Drum Brake Shoe

S405174

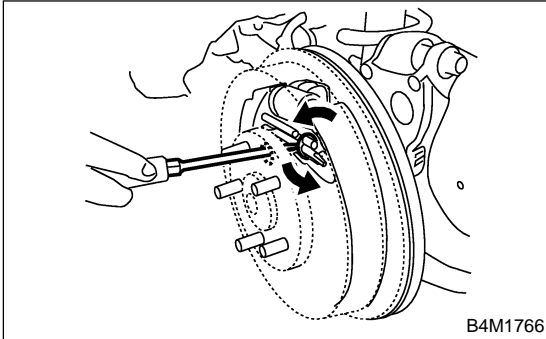
A: REMOVAL

S405174A18

- 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.

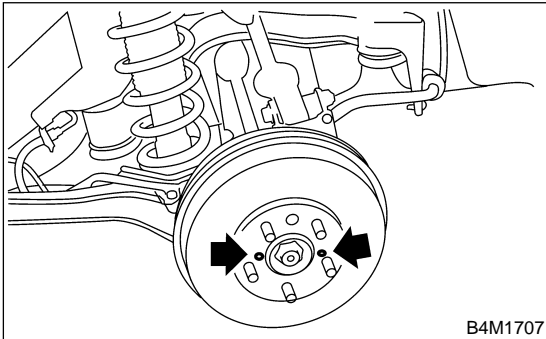
NOTE:

- If it is difficult to remove brake drum, remove adjusting hole cover from drum, and then turn adjuster assembly pawls using a slot-type screw-driver until brake shoe separates from the drum.



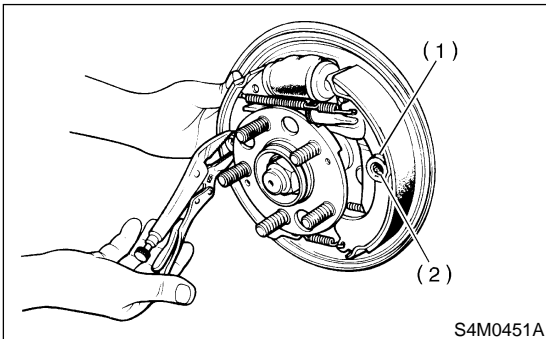
B4M1766

- If brake drum is difficult to remove, drive it out by installing an 8-mm bolt into bolt hole in brake drum.



B4M1707

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

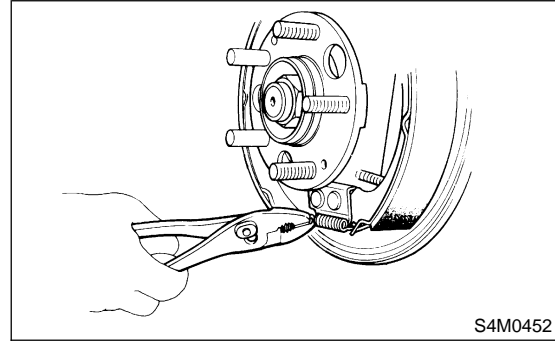


S4M0451A

- (1) Hold-down cup
- (2) Hold-down pin

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

- 6) Disconnect lower shoe return spring from shoes.

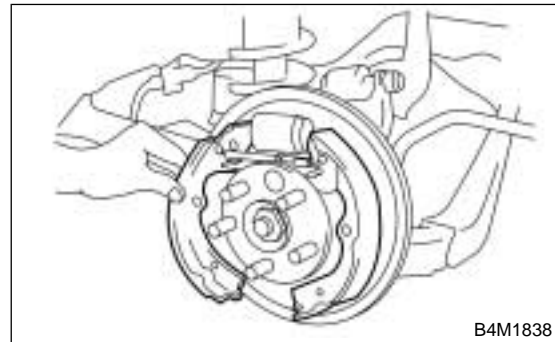


S4M0452

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

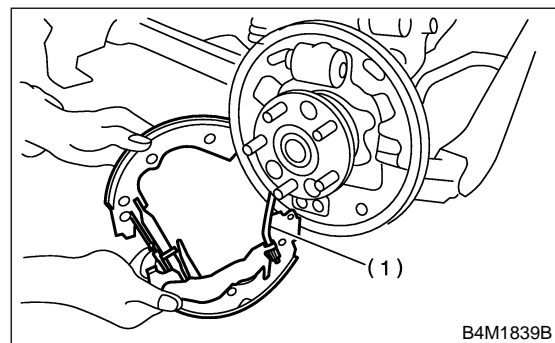
CAUTION:

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



B4M1838

- 8) Disconnect parking brake cable from parking lever.



B4M1839B

- (1) Parking brake cable

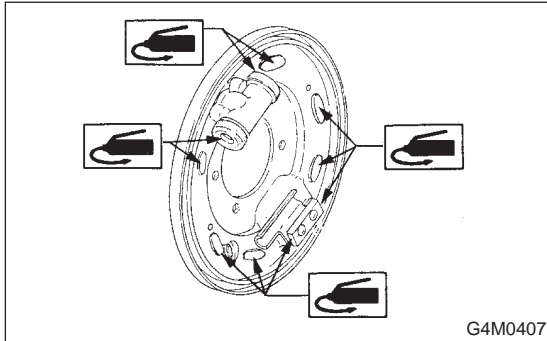
B: INSTALLATION

S405174A11

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

Brake grease:

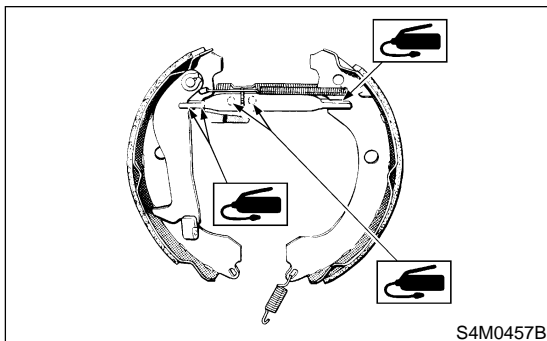
Dow Corning Molykote No. 7439 (Part No. 725191460)



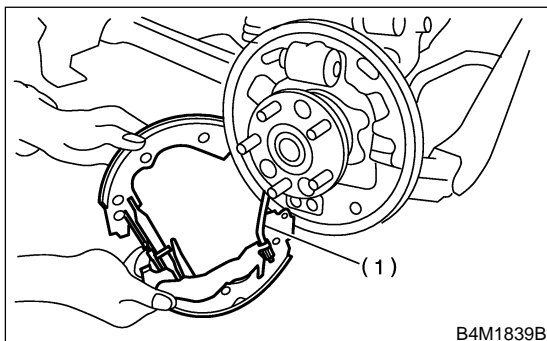
- 3) Apply grease to adjusting screw and both ends of adjuster.

Brake grease:

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

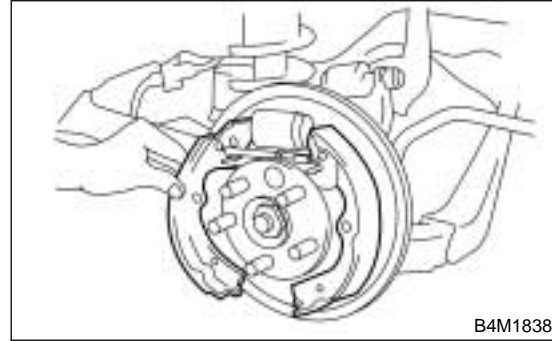


- 4) Connect upper shoe return spring to shoes.
- 5) Connect parking brake cable to parking lever.

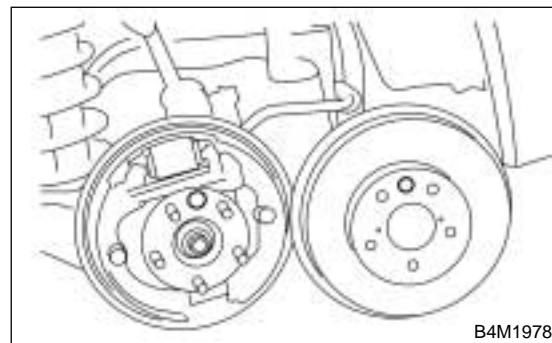


(1) Parking brake cable

- 6) While positioning shoes (one at a time) in groove on wheel cylinder, secure shoes.



- 7) Fix shoes by connecting hold-down cup to hold-down pin.
- 8) Connect lower shoe return spring.
- 9) Set the outside diameter of brake shoes less than 0.5 to 0.8 mm (0.020 to 0.031 in) in comparison with the inside diameter of brake drum.
- 10) Match the holes on hub and drum and install drum on hub.



C: INSPECTION S405174A10

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.

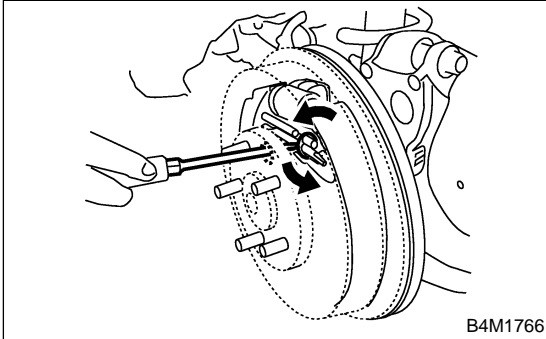
8. Rear Drum Brake Drum S405180

A: REMOVAL S405180A18

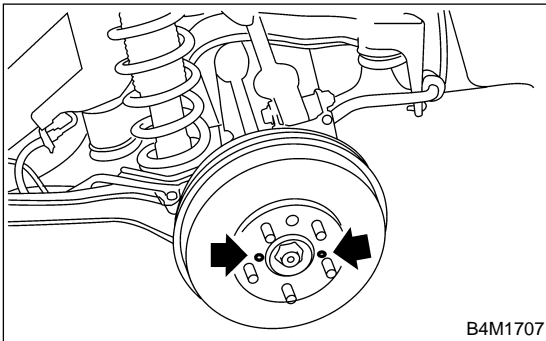
- 1) Loosen wheel nuts, jack-up vehicle, support it with rigid racks, and remove wheel.
- 2) Release parking brake.
- 3) Remove brake drum from brake assembly.

NOTE:

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

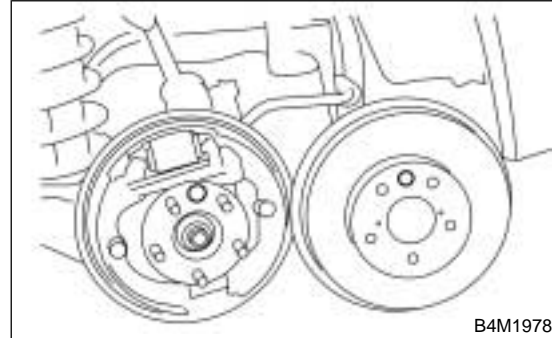


- If brake drum is difficult to remove, drive it out by installing an 8-mm bolt into bolt hole in brake drum.



B: INSTALLATION S405180A11

- 1) Set the outside diameter of brake shoes less than 0.5 to 0.8 mm (0.020 to 0.031 in) in comparison with the inside diameter of brake drum.
- 2) Match the holes on hub and drum and install drum on hub.



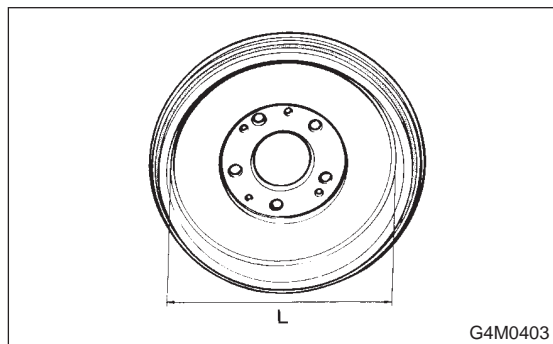
C: INSPECTION S405180A10

- 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)



9. Rear Drum Brake Assembly

S405179

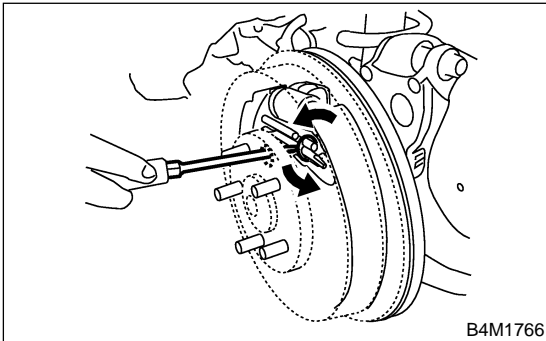
A: REMOVAL

S405179A18

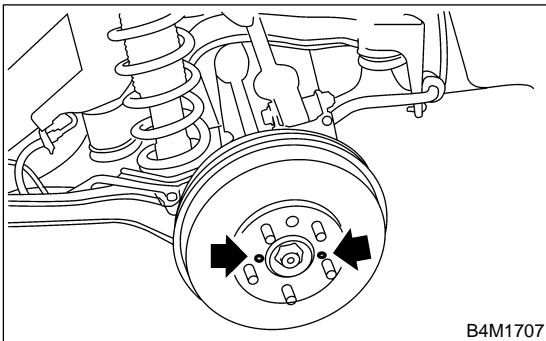
- 1) Loosen wheel nuts, jack-up vehicle, support it with rigid racks, and remove wheel.
- 2) Release parking brake.
- 3) Remove brake drum from brake assembly.

NOTE:

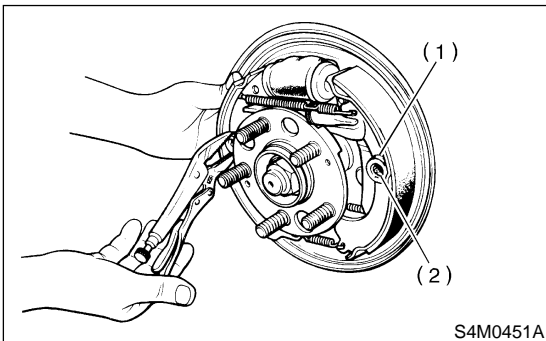
- If it is difficult to remove brake drum, remove adjusting hole cover from drum, and then turn adjuster assembly pawls using a slot-type screwdriver until brake shoe separates from the drum.



- If brake drum is difficult to remove, drive it out by installing an 8-mm bolt into bolt hole in brake drum.

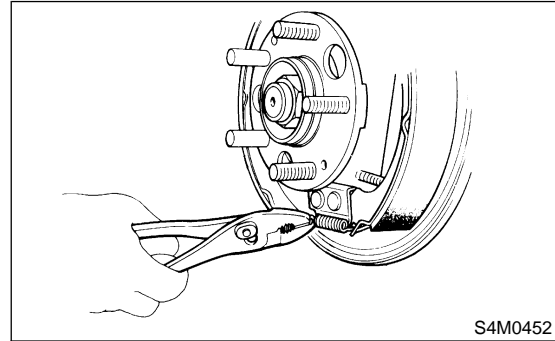


- 4) Hold hold-down pin by securing rear of back plate with your hand.



- (1) Hold-down cup
- (2) Hold-down pin

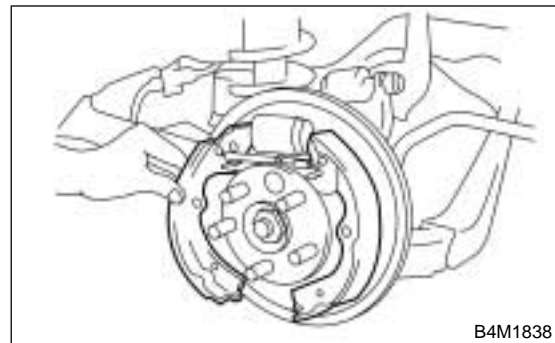
- 5) Disconnect hold-down cup from hold-down pin by rotating hold-down cup.
- 6) Disconnect lower shoe return spring from shoes.



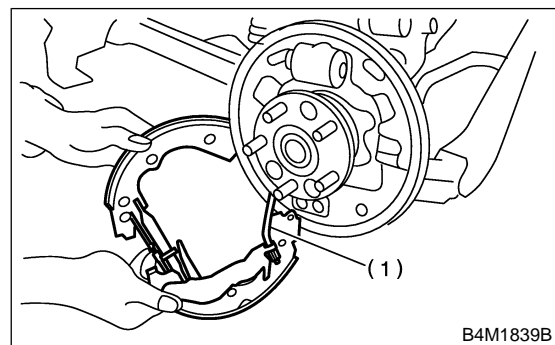
- 7) Remove shoes one by one from back plate with adjuster.

CAUTION:

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



- 8) Disconnect parking brake cable from parking lever.

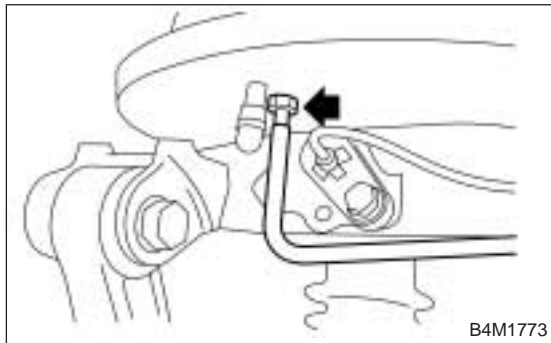


- (1) Parking brake cable

REAR DRUM BRAKE ASSEMBLY

Brake

9) Unscrew the brake pipe flare nut and disconnect brake pipe.

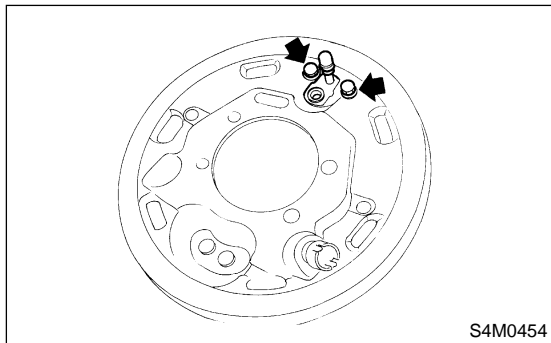


10) Remove hub.

<Ref. to DS-22 REMOVAL, Hub Unit Bearing.>

11) Remove brake assembly.

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

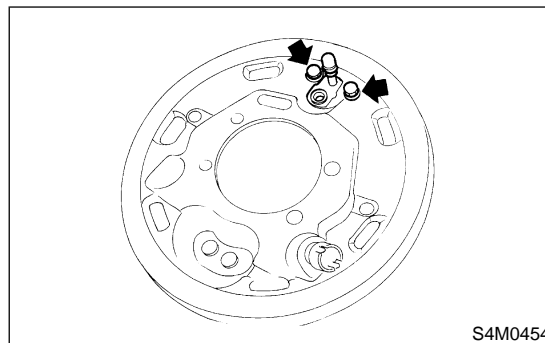


B: INSTALLATION S405179A11

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

Tightening torque:

10 N·m (1.0 kgf-m, 7.2 ft-lb)

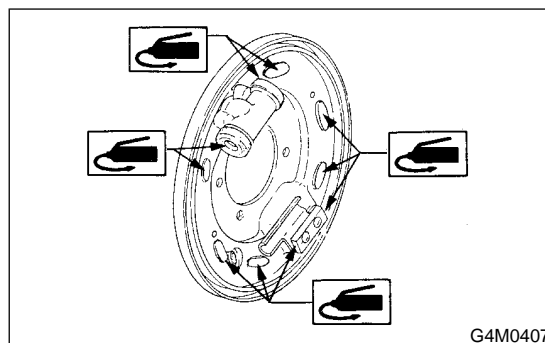


2) Clean back plate and wheel cylinder.

3) Apply grease to portions indicated by arrows in Figure.

Brake grease:

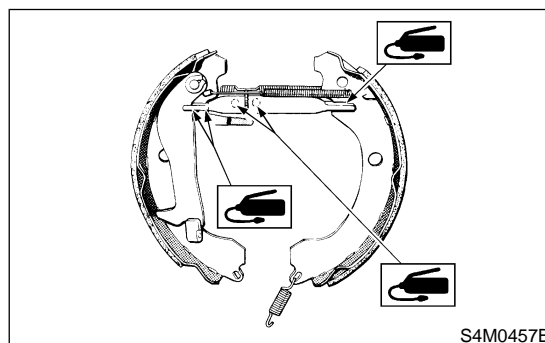
Dow Corning Molykote No. 7439 (Part No. 725191460)



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

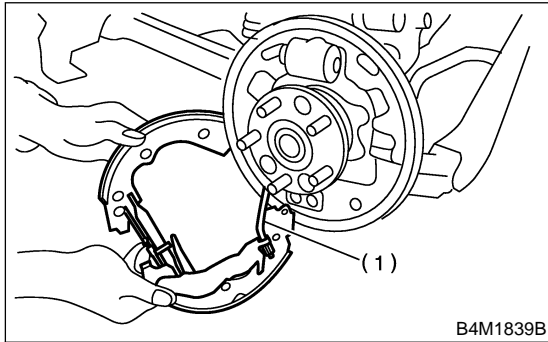
Brake grease:

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



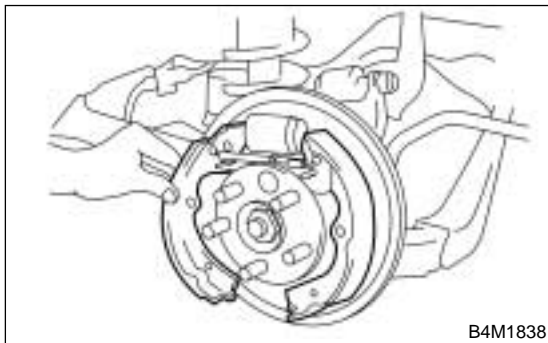
5) Connect upper shoe return spring to shoes.

- 6) Connect parking brake cable to parking lever.

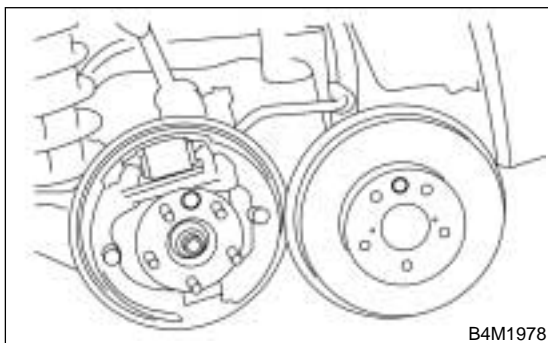


(1) Parking brake cable

- 7) While positioning shoes (one at a time) in groove on wheel cylinder, secure shoes.



- 8) Fix shoes by connecting hold-down cup to hold-down pin.
 9) Connect lower shoe return spring.
 10) Set the outside diameter of brake shoes less than 0.5 to 0.8 mm (0.020 to 0.031 in) in comparison with the inside diameter of brake drum.
 11) Match the holes on hub and drum and install drum on hub.



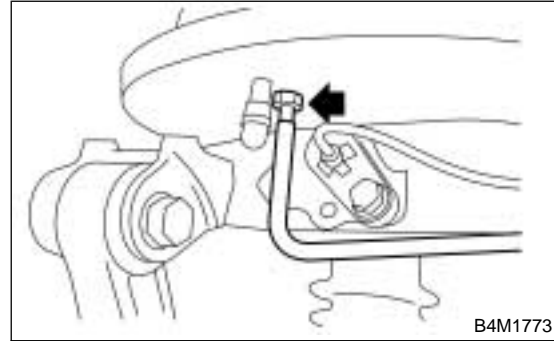
- 12) Install hub.

<Ref. to DS-23 INSTALLATION, Hub Unit Bearing.>

- 13) Connect brake pipe, and tighten brake pipe flange nut.

Tightening torque:

15 N·m (1.5 kgf-m, 10.8 ft-lb)



- 14) Install shoes.

<Ref. to BR-31 INSTALLATION, Rear Drum Brake Shoe.>

- 15) Install brake drum.

- 16) After installing brake assembly, bleed air from brake line.

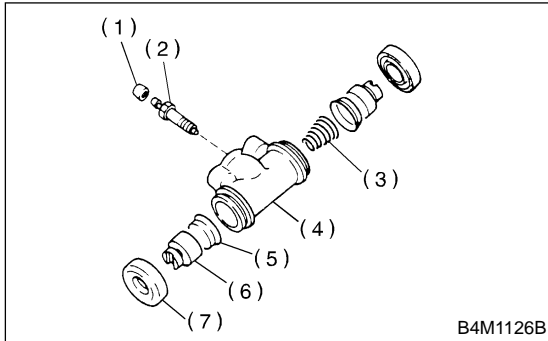
REAR DRUM BRAKE ASSEMBLY

Brake

C: DISASSEMBLY

S405179A06

1) Remove right and left dust boots from wheel cylinder.



- (1) Bleeder cap
- (2) Bleeder screw
- (3) Spring
- (4) Cylinder
- (5) Cup
- (6) Piston
- (7) Boot

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:

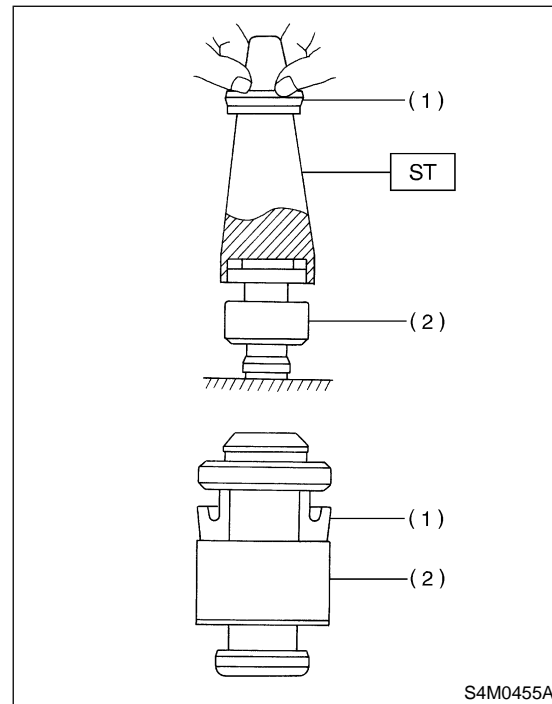
• When replacing the repair kit, make sure that the sizes of cylinder and cup are the same as those which were replaced.

• Use only the tool of the correct size.

| ST: ADAPTER | |
|--------------------|------------|
| Applicable size | Part No. |
| 20.6 mm (13/16 in) | 26699AE000 |

CAUTION:

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



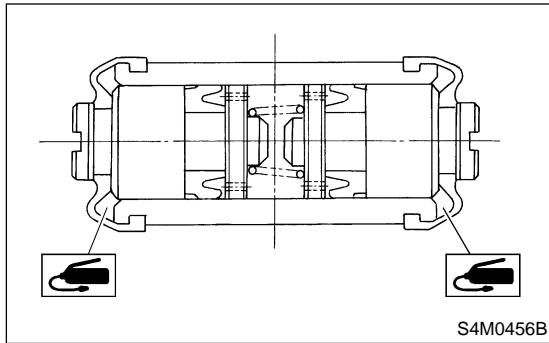
- (1) Cup
- (2) Piston

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

CAUTION:
Never use brake grease.

Grease:

NIGLUBE RX-2 (Part No. 003606000)



E: INSPECTION

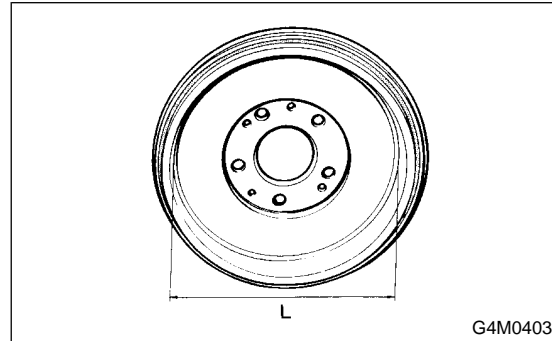
S405179A10

- 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.

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

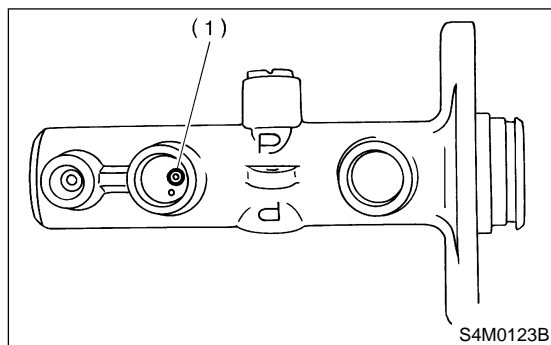
S405168A0602

- 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.

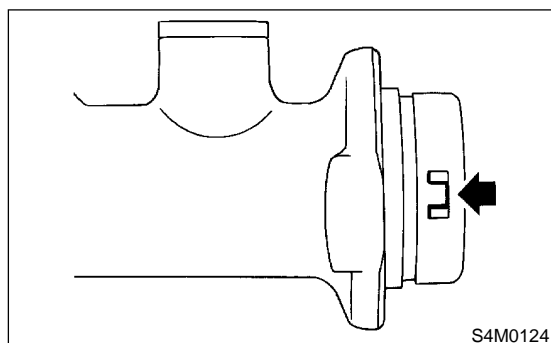


(1) Cylinder pin

- 3) Pry up the pawl and remove the piston retainer. (Without VDC)

NOTE:

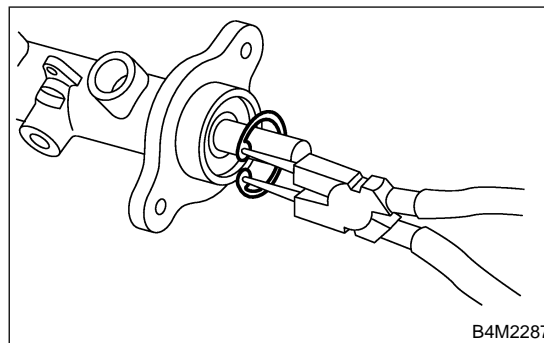
Piston may jump out from master cylinder.



- 4) Using pliers, remove C-ring. (With VDC)

NOTE:

Piston may jump out from master cylinder.



- 5) Extract primary piston assembly and secondary piston assembly.

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.

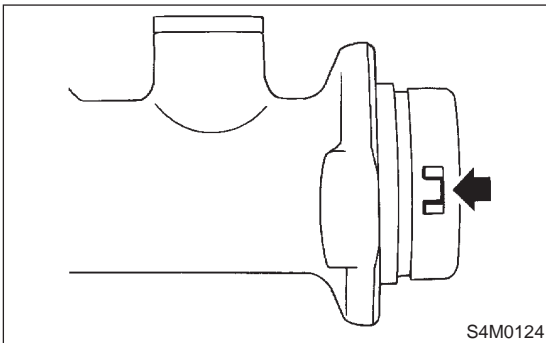
D: ASSEMBLY S405168A02**1. PRECAUTIONS FOR ASSEMBLING**

S405168A0201

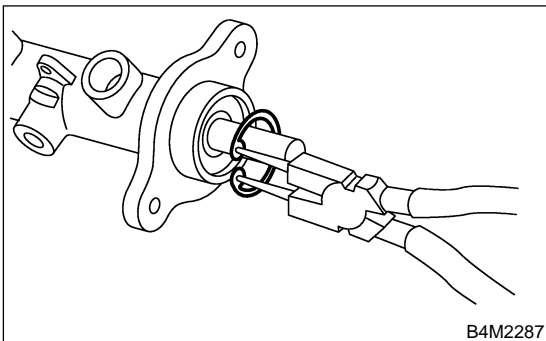
- 1) When assembling, be sure to use recommended brake fluid.
- 2) Ensure that the inside wall of cylinder, pistons, and piston cups are free from dirt when assembling.
- 3) Be extremely careful not to damage, scratch, or dent cylinder inside wall, pistons, and piston cups.
- 4) Do not drop parts. Never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

2. ASSEMBLING PROCEDURE S405168A0202

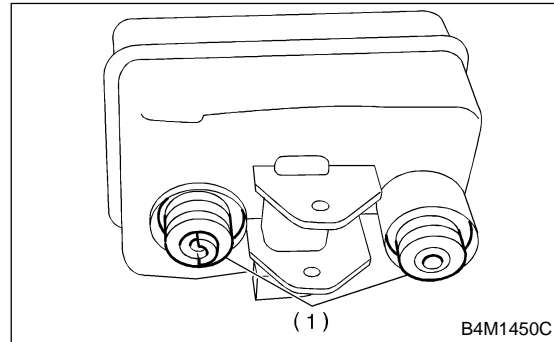
- 1) Assembling piston assembly:
Apply recommended brake fluid to inside wall of cylinder, and to outer surface of piston assembly, and install piston assemblies carefully into cylinder.
- 2) Assembling cylinder pin:
- 3) Press the pawl and install the piston retainer into the master cylinder. (Without VDC)



- 4) Using pliers, install C-ring in its groove. (With VDC)

CAUTION:**Make sure to install it firmly to groove.**

- 5) Install seal to reservoir tank.



(1) Seal

- 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.

11. Brake Booster S405166

A: REMOVAL S405166A18

1) Remove or disconnect 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.

NOTE:

- 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:

Without VDC

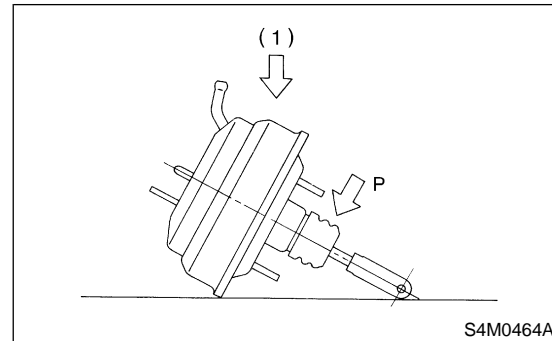
L = 10 mm (0.39 in)

With VDC

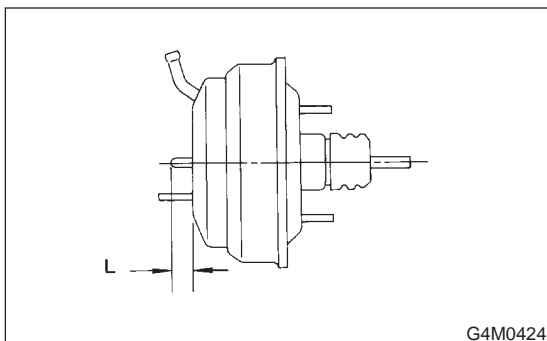
L = 1.8 mm (0.071 in)

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.



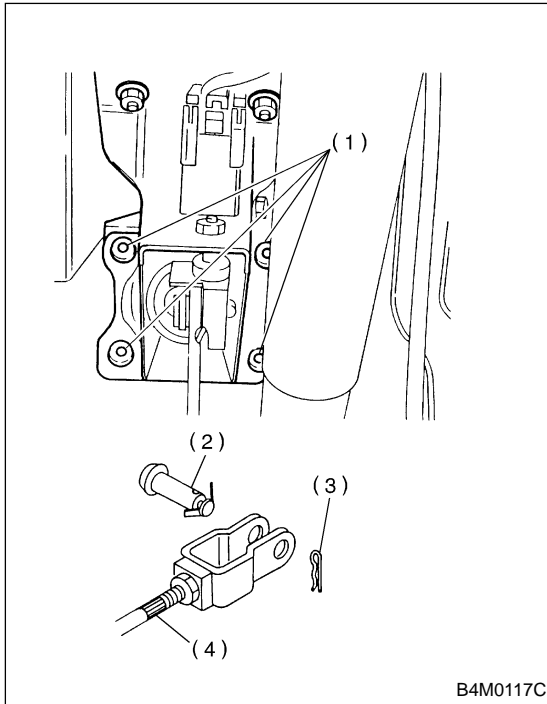
(1) Force



B: INSTALLATION

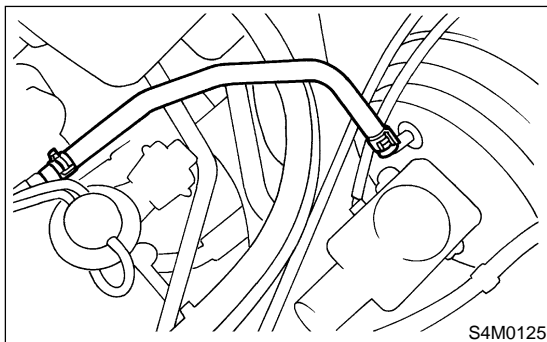
S405166A11

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



- (1) Nuts
- (2) Clevis pin
- (3) Snap pin
- (4) Operating rod

- 3) Connect vacuum hose to brake booster.



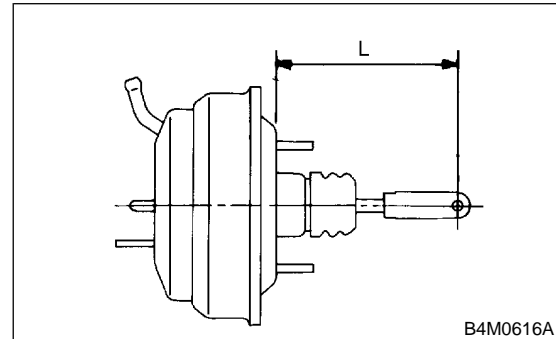
- 4) Mount master cylinder onto brake booster.
- 5) Connect brake pipes to master cylinder.
- 6) Connect electric connector for brake fluid level indicator.

- 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.



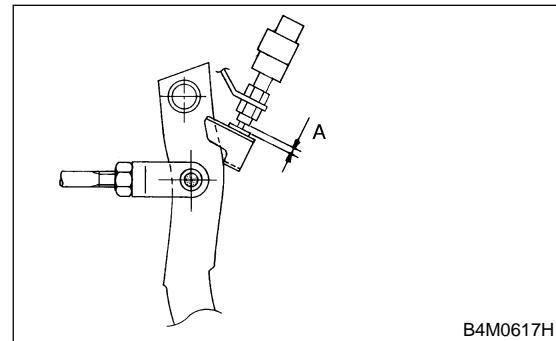
- 8) Measure the clearance between threaded end of stop light switch and stopper. If it is not in specified value, adjust it by adjusting position of stop light switch.

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 GAUGES) S405166A1001

CAUTION:

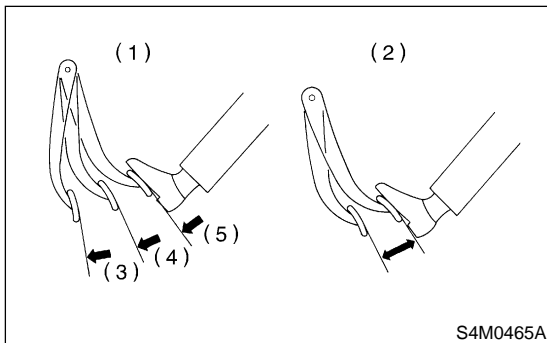
When checking operation, be sure to securely apply the hand brake.

● 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.



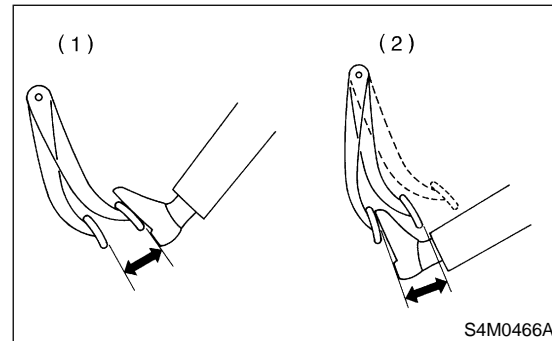
- (1) OK
- (2) NOT OK
- (3) 1st
- (4) 2nd
- (5) 3rd

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.



- (1) When engine is stopped
- (2) When engine is started

- 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)

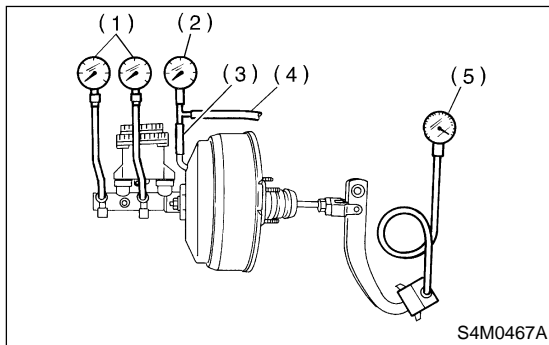
S405166A1002

CAUTION:

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

● Checking with gauges

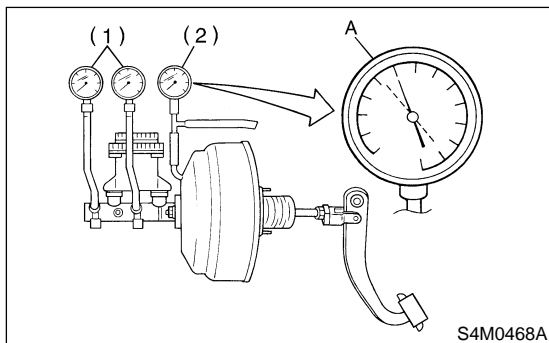
Connect gauges as shown in Figure. After bleeding air from pressure gauges, proceed to each check.



- (1) Pressure gauge
- (2) Vacuum gauge
- (3) Adapter hose
- (4) Vacuum hose
- (5) Pedal force gauge

● 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.



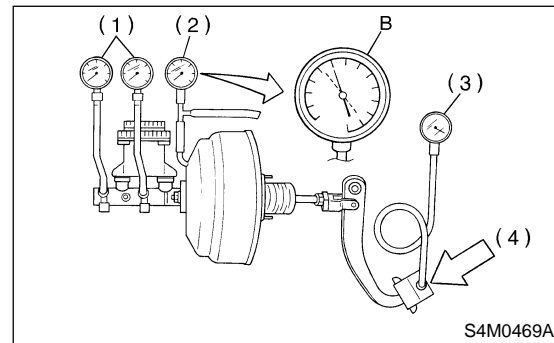
- (1) Pressure gauge
- (2) Vacuum gauge

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 kg, 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.



- (1) Pressure gauge
- (2) Vacuum gauge
- (3) Pedal force gauge
- (4) Depress

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-46 INSPECTION, Brake Booster.>

BRAKE BOOSTER

Brake

● 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.

| | | | |
|-------------------|-----|---|--|
| Brake pedal force | | 147 N (15 kg, 33 lb) | 294 N (30 kg, 66 lb) |
| Fluid pressure | 14" | 785 kPa (8 kg/cm ² , 114 psi) | 1,961 kPa (20 kg/cm ² , 284 psi) |
| | 15" | 686 kPa (7 kg/cm ² , 100 psi) | 1,765 kPa (18 kg/cm ² , 256 psi) |
| | 16" | | |

● 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.

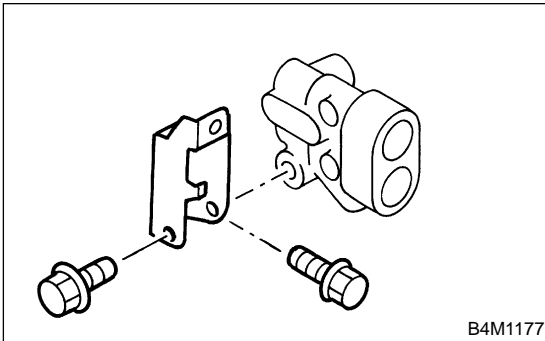
| | | | |
|-------------------|-----|--|---|
| Brake pedal force | | 147 N (15 kg, 33 lb) | 294 N (30 kg, 66 lb) |
| Fluid pressure | 14" | 6,375 kPa (65 kg/cm ² , 924 psi) | 9,121 kPa (93 kg/cm ² , 1,322 psi) |
| | 15" | 5,688 kPa (58 kg/cm ² , 825 psi) | 9,905 kPa (101 kg/cm ² , 1,436 psi) |
| | 16" | | |

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:

18 N·m (1.8 kgf-m, 13.0 ft-lb)

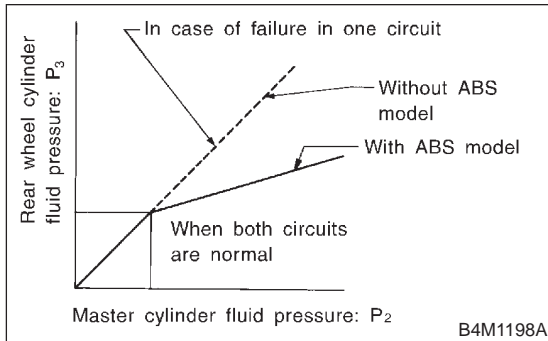
C: INSPECTION S405167A10

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, refer to "SPECIFICATIONS".

<Ref. to BR-2 SPECIFICATIONS, General Description.>

13. Brake Fluid S405162

A: INSPECTION S405162A10

- 1) Check that brake fluid level remains between "MIN" and "MAX". If out of the specified range, refill or drain fluid. If fluid level becomes close to "MIN", refill fluid.
- 2) Check fluid for discoloration. If fluid color has excessively changed, drain the fluid and refill with new fluid.

B: 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 reservoir tank filled with brake fluid to eliminate entry of air.
- Brake pedal operating must be very slow.
- For convenience and safety, two people should do the work.
- 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 left 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.

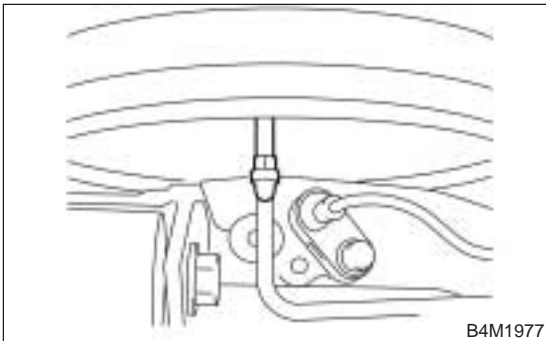
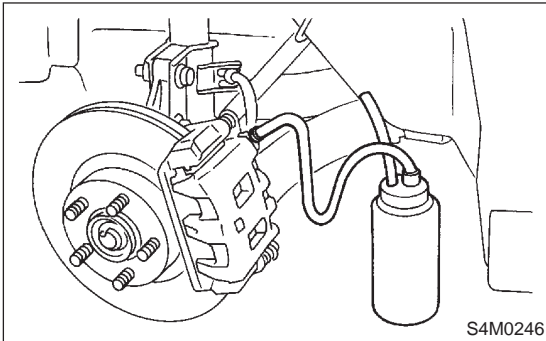
Recommended brake fluid:

FMVSS No. 116, fresh DOT3 or 4 brake fluid

BRAKE FLUID

Brake

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



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)

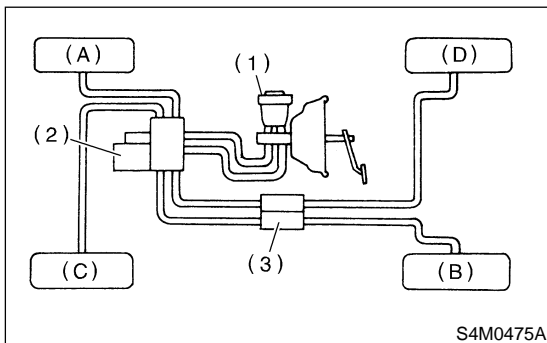
10) Bleed air from each wheel cylinder using the same procedures as described in steps 6) through 7) above.

11) Depress brake pedal with a force of approximately 294 N (30 kg, 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 vehicle for a short distance between 2 to 3 km (1 to 2 miles) to make sure that brakes are operating properly.

CAUTION:

Brake fluid replacement sequence; (A) Front right → (B) Rear left → (C) Front left → (D) Rear right



- (1) Master cylinder
- (2) Hydraulic unit
- (3) Proportioning valve

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 steps 6) and 7) above until there are no air bubbles in drained brake fluid and new fluid flows through vinyl tube.

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:

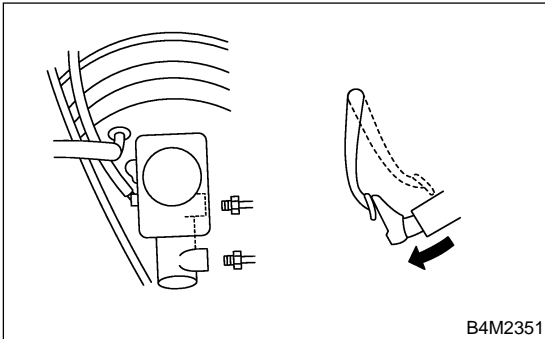
- Start with the brakes (wheels) connected to the secondary chamber of the master cylinder.
- The time interval between two brake pedal operations (from the time when the pedal is released to the time when it is depressed another time) shall be approximately 3 seconds.
- The air bleeder on each brake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

1. MASTER CYLINDER S405163E4501

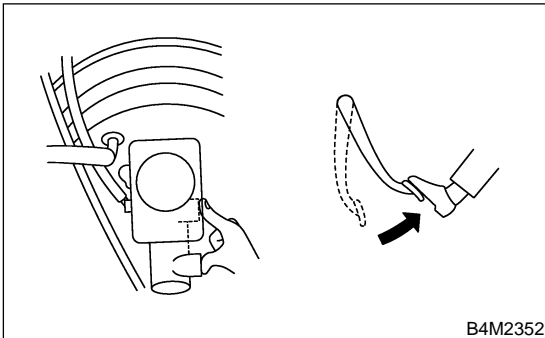
NOTE:

If master cylinder is disassembled or reservoir tank is empty, bleed master cylinder.

- 1) Disconnect brake line at primary and secondary sides.
- 2) Carefully depress and hold brake pedal.



- 3) Close outlet plug with your finger, and release brake pedal.



- 4) Repeat above steps 2) and 3) until master cylinder is completely bled.
- 5) Install brake pipes to master cylinder.

Tightening torque:

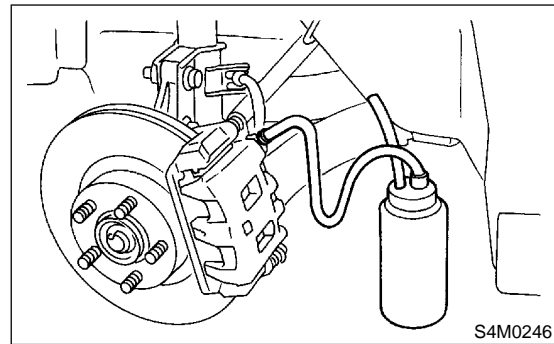
8 N·m (0.8 kgf-m, 5.8 ft-lb)

2. BRAKE LINE S405163E4502

NOTE:

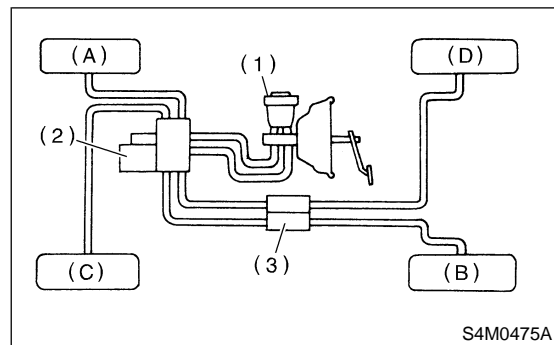
- During bleeding operation, keep the brake reservoir tank filled with brake fluid to eliminate entry of air.
- Brake pedal operating must be very slow.
- For convenience and safety, two people should do the work.

- 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.



CAUTION:

Brake fluid replacement sequence; (A) Front right → (B) Rear left → (C) Front left → (D) Rear right



- (1) Master cylinder
- (2) Hydraulic unit
- (3) Proportioning valve

- 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.

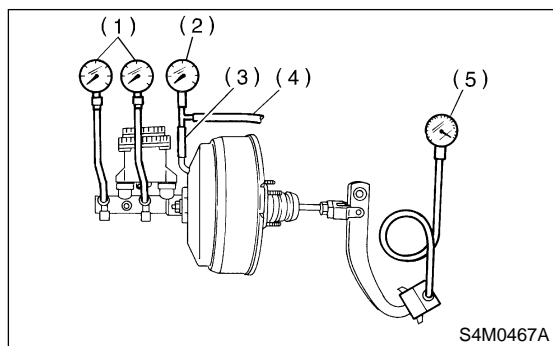
Air bleeder tightening torque:

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) 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.



(1) Steering wheel

(2) Toe board

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.

7) If the distance is more than specifications, there is a possibility that air is in the brake line. Bleed brake line until pedal stroke meets the specification.

8) Operate hydraulic control unit in the sequence control mode.

With ABS: <Ref. to ABS-11 ABS Sequence Control.>

With VDC: <Ref. to VDC-21 VDC Sequence Control.>

9) Recheck the brake stroke.

10) If the distance is more than specifications, there is a possibility air is in the inside of the hydraulic unit. Repeat above steps 2) to 9) above until pedal stroke meets the specification.

11) Add brake fluid to the required level (MAX. level) of reservoir tank.

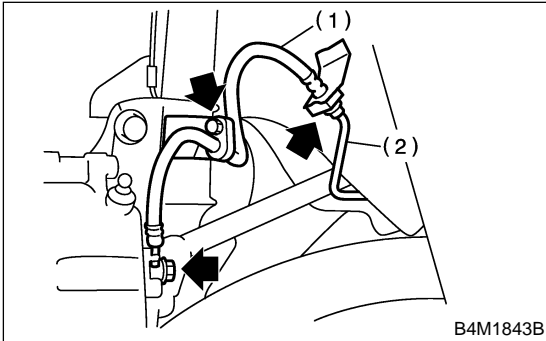
12) As a final step, test run the vehicle at low speed and apply brakes relatively hard 2 to 3 times to ensure that brakes provide normal braking action on all four wheels without dragging and uneven braking.

15. Brake Hose S405164

A: REMOVAL S405164A18

1. FRONT BRAKE HOSE S405164A1801

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



- (1) Brake hose
- (2) Brake pipe

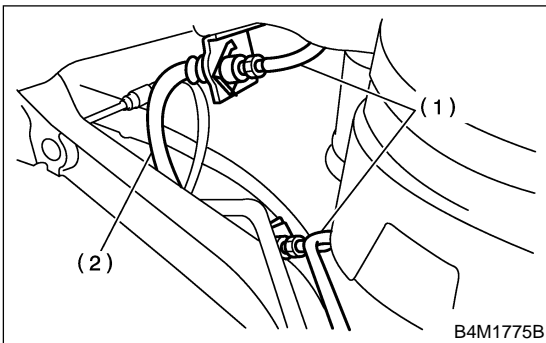
- 2) Pull out clamp to remove brake hose.
- 3) Remove bolt at strut and union bolt.

2. REAR BRAKE HOSE S405164A1802

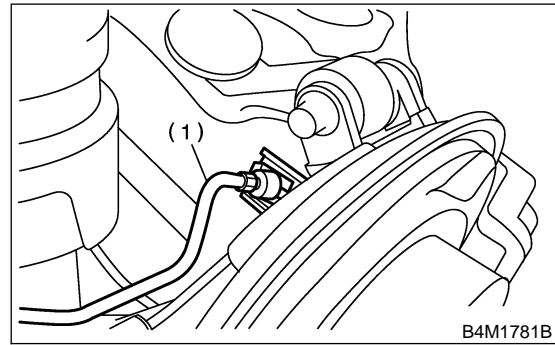
- 1) Separate brake pipe from brake hose.

NOTE:

Always use flare nut wrench and be careful not to deform flare nut.



- (1) Brake pipe
- (2) Brake hose



- (1) Brake pipe
- 2) Pull out clamp to remove brake hose.

B: INSTALLATION

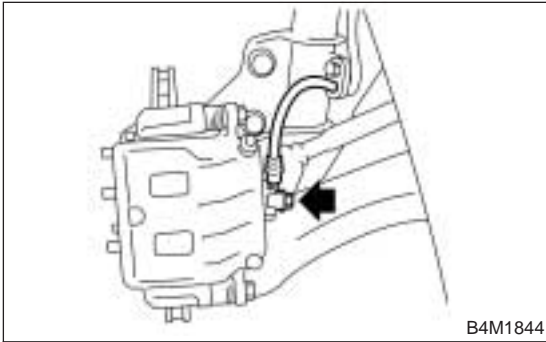
S405164A11

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.

Tightening 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.

Tightening torque (Brake pipe flare nut):
15 N·m (1.5 kgf-m, 10.8 ft-lb)

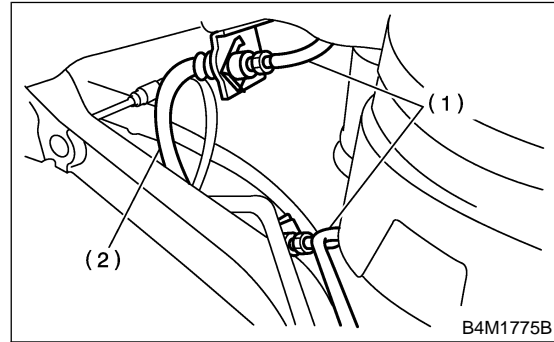
- 8) Bleed air from the brake system.

2. REAR BRAKE HOSE

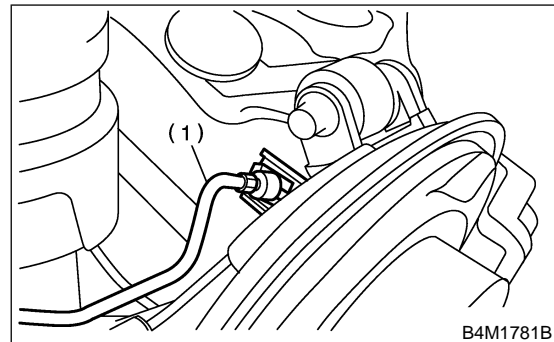
S405164A1102

- 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) While holding hexagonal part of brake hose fitting with a wrench, tighten flare nut to the specified torque.

Tightening torque (Brake pipe flare nut):
15 N·m (1.5 kgf-m, 10.8 ft-lb)



- (1) Brake pipe
- (2) Brake hose



- (1) Brake pipe

- 4) Bleed air from the brake system.

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 Pipe S405165

A: REMOVAL S405165A18

NOTE:

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

CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
- Be careful not to damage Airbag system wiring harness when servicing the center brake pipe.
- When removing the brake pipe, make sure that it is not bent.

B: INSTALLATION S405165A11

NOTE:

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

CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
- Be careful not to damage Airbag system wiring harness when servicing the center brake pipe.
- When installing the brake pipe, make sure that it is not bent.
- After installing the brake pipe and hose, bleed the air.
- After installing the brake hose, make sure that it does not touch the tire or suspension assembly, etc.

Brake pipe tightening torque:

15 N·m (1.5 kg-m, 10.8 ft-lb)

C: INSPECTION S405165A10

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

NOTE:

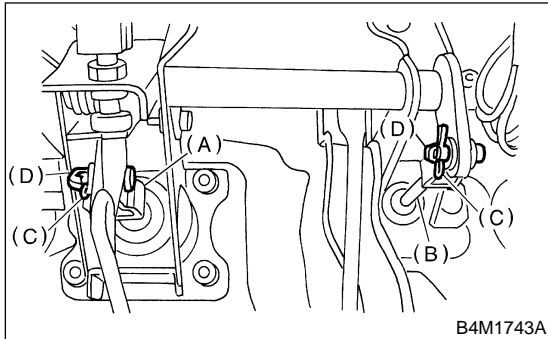
Use a mirror when inspecting low-visible part or back side.

17. Brake Pedal S405541

A: REMOVAL S405541A18

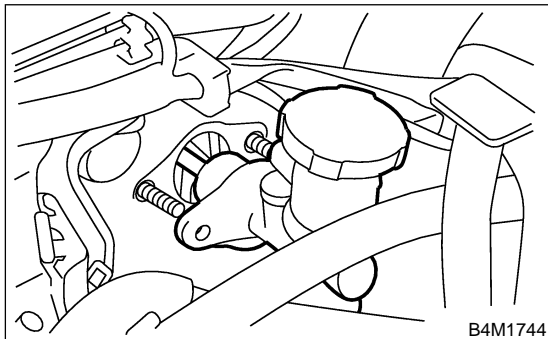
1. MT MODEL S405541A1801

- 1) Remove steering column.
<Ref. to PS-20 REMOVAL, Tilt Steering Column.>
- 2) Disconnect connectors from stop light and clutch switches.
- 3) Remove snap pins which secure lever to push rod and operating rod.
- 4) Remove clevis pins which secure lever to push rod and operating rod.



- (A) Operating rod
- (B) Push rod
- (C) Snap pin
- (D) Clevis pin

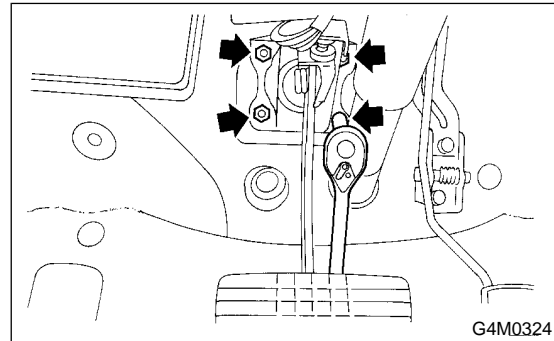
- 5) Remove nut which secures clutch master cylinder.



- 6) Remove bolts and nuts which secure brake and clutch pedals, and remove pedal assembly.

2. 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 light 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 BR-62 ASSEMBLY, Brake Pedal.>

3) Inspect after pedal installation <Ref. to BR-63 INSPECTION, Brake Pedal.>

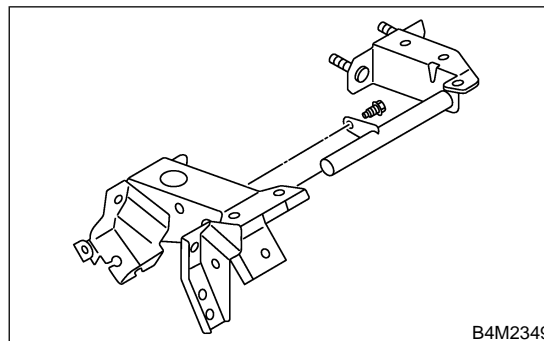
C: DISASSEMBLY

S405541A06

1. MT MODEL

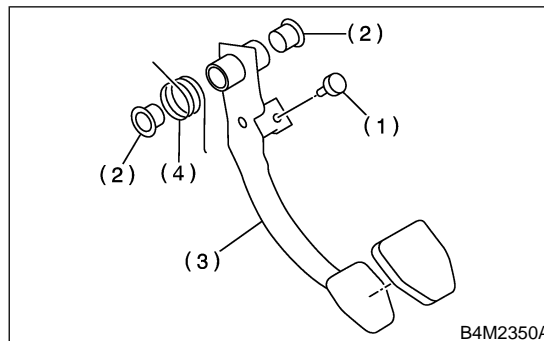
S405541A0601

- 1) Remove the brake switch.
<Ref. to BR-64 REMOVAL, Stop Light Switch.>
- 2) Remove the clutch pedal.
<Ref. to CL-21 DISASSEMBLY, Clutch Pedal.>
- 3) Remove the clutch master cylinder bracket.



B4M2349

- 4) Remove bush, spring and stopper.



B4M2350A

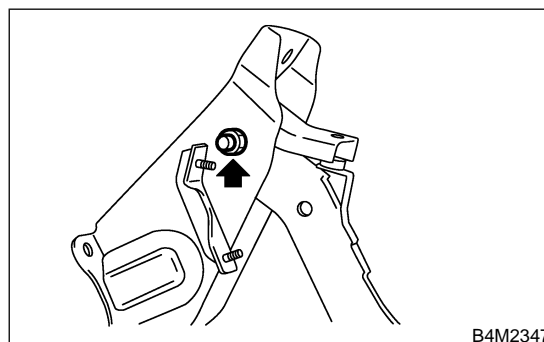
- (1) Stopper
- (2) Bushing
- (3) Brake pedal
- (4) Brake pedal spring

- 5) Remove the brake pedal pad.

2. AT MODEL

S405541A0602

- 1) Remove the brake switch.
- 2) Unbolt, and then remove the brake pedal.

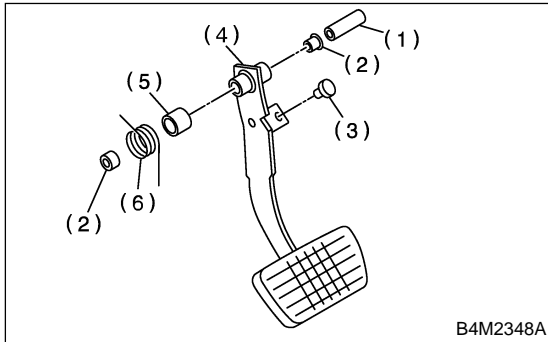


B4M2347

BRAKE PEDAL

Brake

3) Remove bush, spacer and spring.



- (1) Spacer
- (2) Plug
- (3) Stopper
- (4) Brake pedal
- (5) Brake spacer
- (6) Brake pedal spring

4) Remove the brake pedal pad.

D: 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.

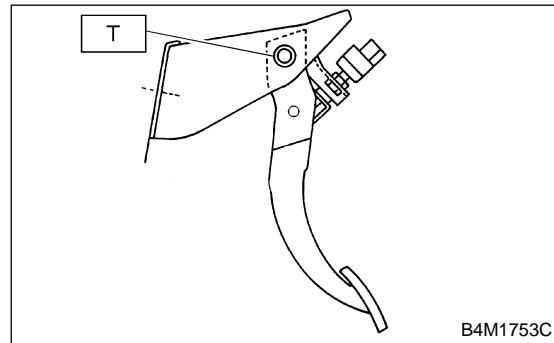
3) Align bores of pedal bracket, clutch pedal and brake pedal, attach brake pedal return spring and clutch pedal effort reducing spring (vehicle with hill holder), and then install pedal bolt.

NOTE:

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

Tightening torque:

T: 29 N·m (3.0 kgf-m, 21.7 ft-lb)



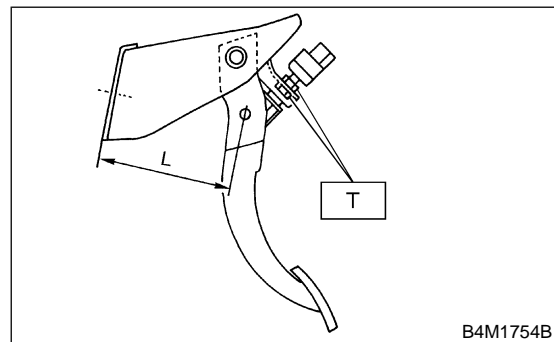
4) Set brake pedal position by adjusting position of stop light switch.

Pedal position: L

125.9 mm (4.96 in)

Tightening torque:

T: 8 N·m (0.8 kgf-m, 5.8 ft-lb)



E: INSPECTION S405541A10

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

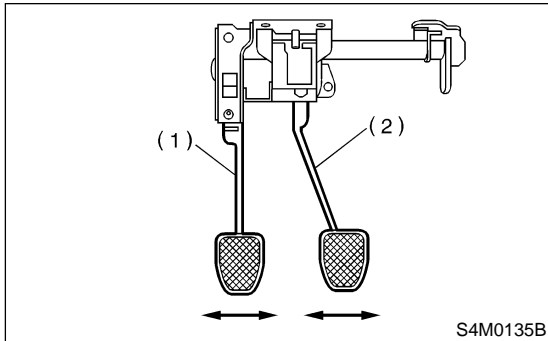
CAUTION:

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

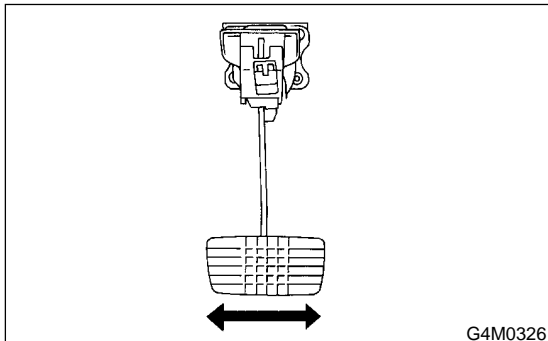
Deflection of brake and clutch pedal:

Service limit

5.0 mm (0.197 in) or less



- (1) Clutch pedal
- (2) Brake pedal



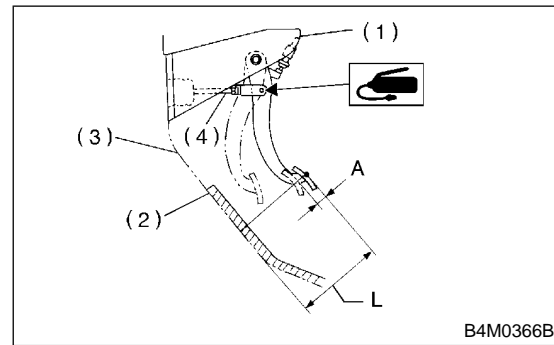
2) Check position of pedal pad.

Pedal height: L

148 mm (5.83 in)

Brake pedal free play: A

1 — 3 mm (0.04 — 0.12 in) [Depress brake pedal pad with a force of less than 10 N (1 kg, 2 lb).]



- (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.

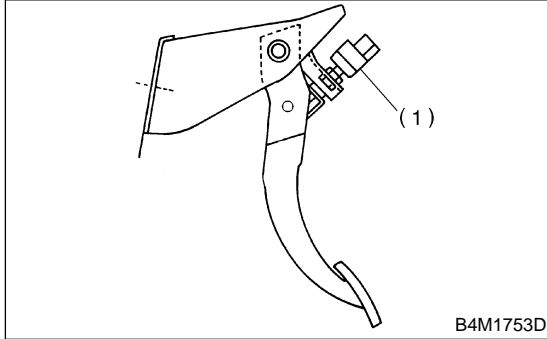
STOP LIGHT SWITCH

Brake

18. 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.



(1) Stop light switch

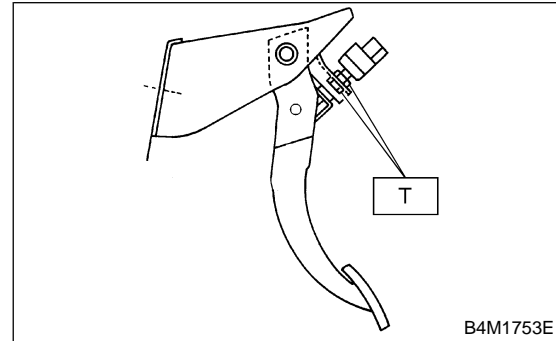
B: INSTALLATION S405542A11

- 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-65 ADJUSTMENT, Stop Light Switch.>

Tightening torque:

8 N·m (0.8 kgf-m, 5.8 ft-lb)



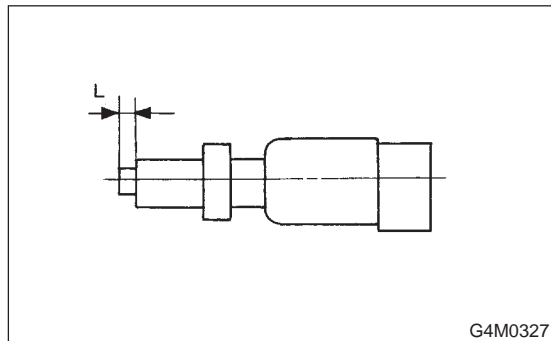
C: INSPECTION

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

$2^{+1.5}_{-0} \text{ mm } (0.079^{+0.059}_{-0} \text{ in})$



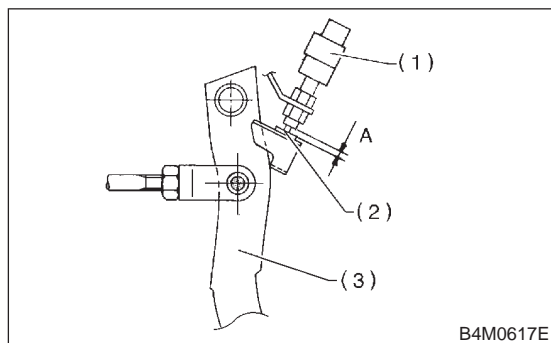
2) Measure the clearance between threaded end of stop light switch and stopper.

CAUTION:

Be careful not to rotate stop light switch.

Stop light switch clearance: A

$0.3 \text{ mm } (0.012 \text{ in})$



- (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.

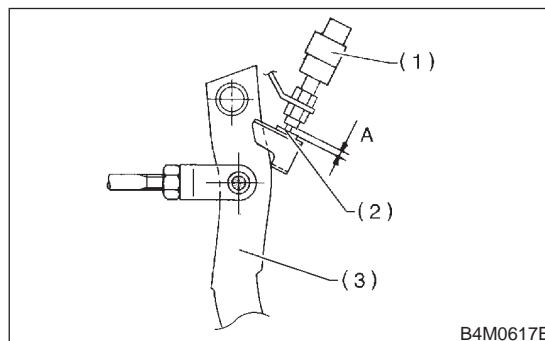
CAUTION:

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.



19. General Diagnostics S405278

A: INSPECTION S405278A10

| | Trouble and possible cause | Corrective action |
|---|---|--|
| 1. Insufficient braking | (1) Fluid leakage from the hydraulic mechanism | Repair or replace (cup, piston seal, piston boot, master cylinder piston kit, pipe or hose). |
| | (2) Entry of air into the hydraulic mechanism | Bleed the air. |
| | (3) Excessively wide shoe clearance | Adjust the clearance. |
| | (4) Wear, deteriorated surface material, adhering water or fluid on the lining | Replace, grind or clean. |
| | (5) Improper operation of master cylinder, disc caliper, brake booster or check valve | Correct or replace. |
| 2. Unstable or uneven braking | (1) Fluid on the lining, drum or rotor | Eliminate cause of fluid leakage, clean, or replace. |
| | (2) Drum or rotor eccentricity | Correct or replace the drum or rotor. |
| | (3) Worn brake drum, or damage to the drum caused by sand | Correct by grinding, or replace. |
| | (4) Improper lining contact, deteriorated surface material, improper inferior material, or wear | Correct by grinding, or replace. |
| | (5) Deformed back plate | Correct or replace. |
| | (6) Improper tire inflation | Inflate to correct pressure. |
| | (7) Disordered wheel alignment | Adjust alignment. |
| | (8) Loosened back plate or the support installing bolts | Retighten. |
| | (9) Loosened wheel bearing | Retighten to normal tightening torque or replace. |
| | (10) Trouble in the hydraulic system | Replace the cylinder, brake pipe or hose. |
| | (11) Uneven effect of the parking brake | Check, adjust, or replace the rear brake and cable system. |
| 3. Excessive pedal stroke | (1) Entry of air into the hydraulic mechanism | Bleed the air. |
| | (2) Excessive play in the master cylinder push rod | Adjust. |
| | (3) Fluid leakage from the hydraulic mechanism | Repair or replace (cup, piston seal, piston boot, master cylinder piston kit, pipe or hose). |
| | (4) Improperly adjusted shoe clearance | Adjust. |
| | (5) Improper lining contact or worn lining | Correct or replace. |
| 4. Brake dragging or improper brake return | (1) Insufficient pedal play | Adjust play. |
| | (2) Improper master cylinder return | Clean or replace the cylinder. |
| | (3) Clogged hydraulic system | Replace. |
| | (4) Improper return or adjustment of parking brake | Correct or adjust. |
| | (5) Weakened spring tension or breakage of shoe return spring | Replace the spring. |
| | (6) Excessively narrow shoe clearance | Adjust the clearance. |
| | (7) Improper disc caliper operation | Correct or replace. |
| | (8) Improper adjusted wheel bearing | Adjust or replace. |
| 5. Brake noise (1) (creak sound) | (1) Hardened or deteriorated lining | Replace the shoe assembly or pad. |
| | (2) Worn lining | Replace the shoe assembly or pad. |
| | (3) Loosened back plate or the support installing bolts | Retighten. |
| | (4) Loose wheel bearing | Retighten to normal tightening torque. |
| | (5) Dirty drum or rotor | Clean the drum or rotor, or clean and replace the brake assembly. |

GENERAL DIAGNOSTICS

Brake

| | Trouble and possible cause | Corrective action |
|---|--|--|
| 6. Brake noise (2) (hissing sound) | (1) Worn lining | Replace the shoe assembly or pad. |
| | (2) Improper installed shoe or pad | Correct or replace the shoe assembly or pad. |
| | (3) Loose or bent drum or rotor | Retighten or replace. |
| 7. Brake noise (3) (click sound) | In the case of the disc brake: | |
| | (1) Excessively worn pad or the support | Replace the pad or the support. |
| | In the case of the drum brake: | |
| | (1) Excessively worn shoe ridge | Replace the back plate. |
| | (2) Lack of oil on the shoe ridge surface and anchor | Add more grease. |

GENERAL DIAGNOSTICS

Brake

MEMO:

GENERAL DESCRIPTION

Parking Brake

1. General Description S404001

A: SPECIFICATIONS S404001E49

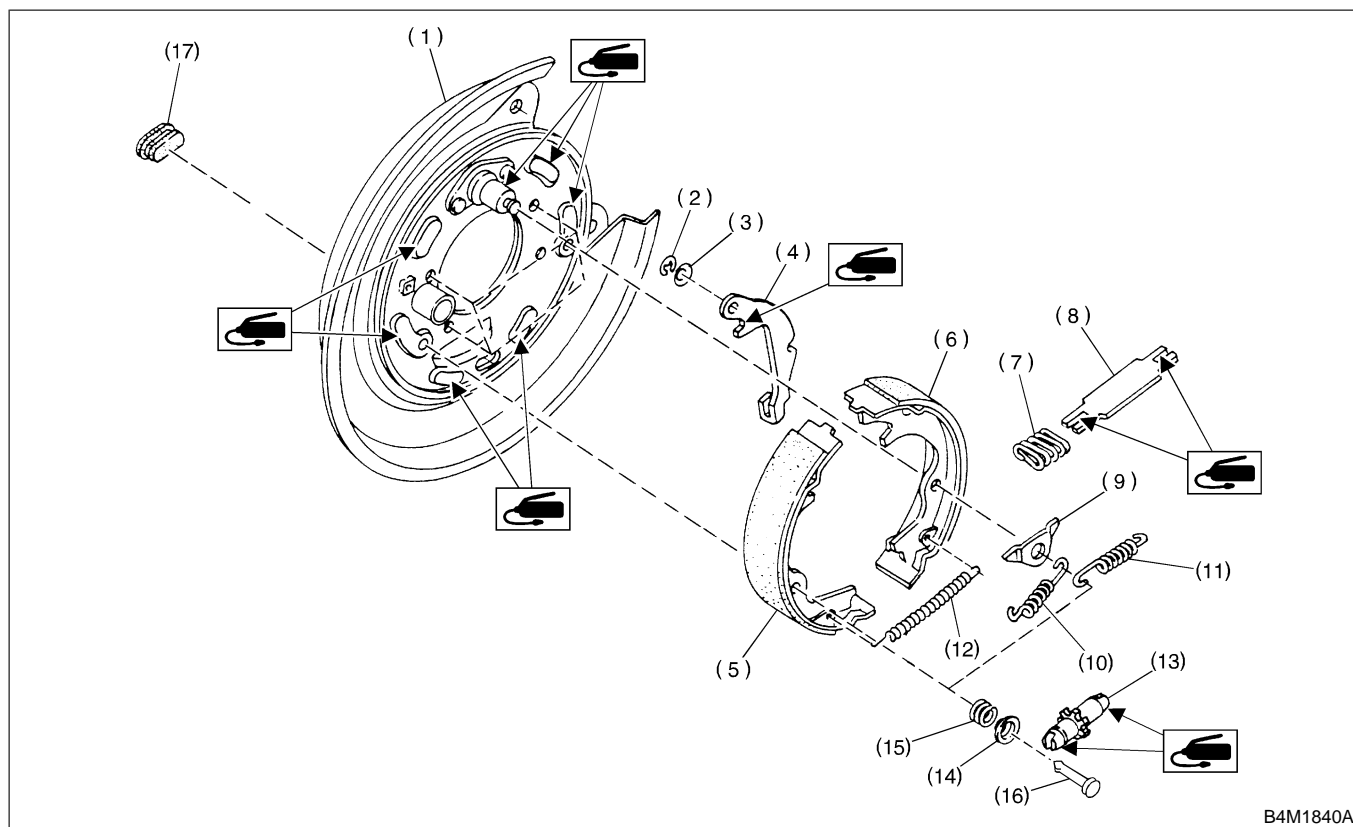
| Model | Rear drum brake | Rear disc brake | |
|---|---|--|--|
| | | 15 inch type | |
| Type | Mechanical on rear brakes, drum in disc | | |
| Effective drum diameter | mm (in) | 228.6 (9) | 170 (6.69) |
| Lining dimensions (length × width × thickness) | mm (in) | 218.8 × 35.0 × 4.1 (8.61 × 1.378 × 0.161) | 162.6 × 30.0 × 3.2 (6.40 × 1.181 × 0.126) |
| Clearance adjustment | Automatic adjustment | | Manual adjustment |
| Lever stroke | noches/N (kg, lb) | 7 to 8/196 (20, 44) | |

B: COMPONENT

S404001A05

1. PARKING BRAKE (REAR DISC BRAKE)

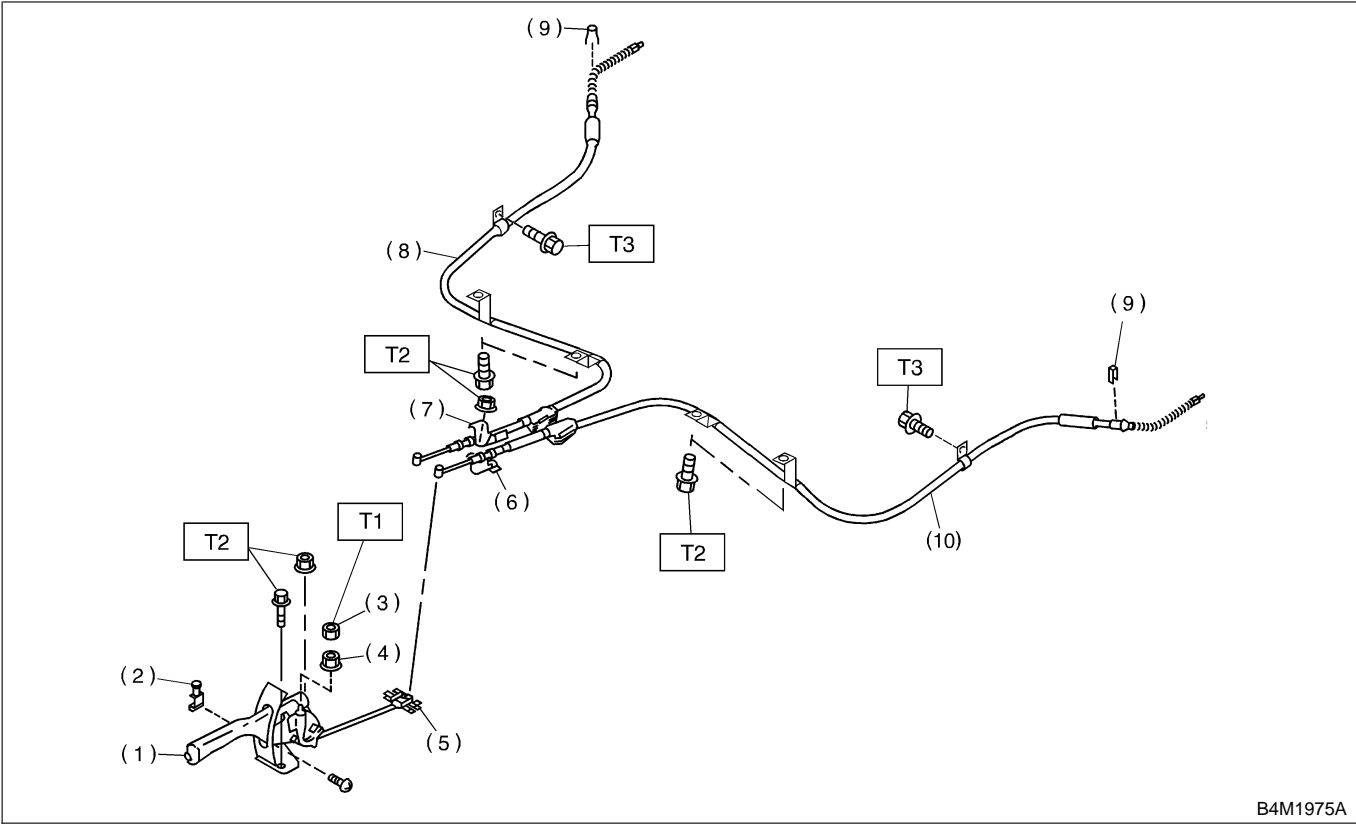
S404001A0501



B4M1840A

- | | | |
|------------------------------------|------------------------------|----------------------------|
| (1) Back plate | (7) Strut spring | (13) Adjuster |
| (2) Retainer | (8) Strut | (14) Shoe hold-down cup |
| (3) Spring washer | (9) Shoe guide plate | (15) Shoe hold down spring |
| (4) Lever | (10) Primary return spring | (16) Shoe hold down pin |
| (5) Parking brake shoe (Primary) | (11) Secondary return spring | (17) Adjusting hole cover |
| (6) Parking brake shoe (Secondary) | (12) Adjusting spring | |

2. PARKING BRAKE CABLE S404001A0502



B4M1975A

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

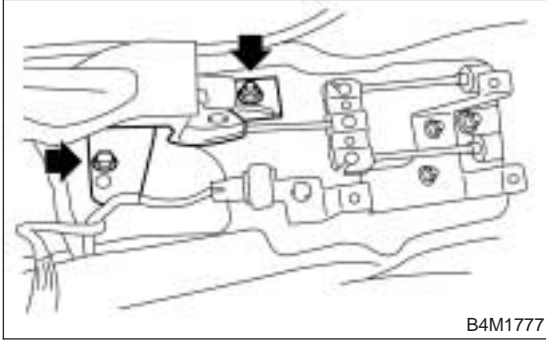
PARKING BRAKE LEVER

Parking Brake

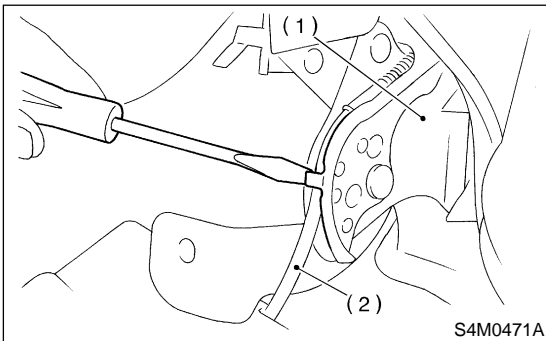
2. Parking Brake Lever S404171

A: REMOVAL S404171A18

- 1) Lift-up the vehicle.
- 2) Remove rear tire and wheel.
- 3) Remove rear cushion.
- 4) Loosen parking cable adjusting nut and console bracket.
- 5) Remove parking brake lever.



- 6) Unbend parking brake lever pawls and remove cable.



- (1) Parking brake lever
- (2) Cable

B: INSTALLATION S404171A11

Install in the reverse order of removal.

Tightening torque:

Parking brake lever;

18 N·m (1.8 kgf-m, 13.0 ft-lb)

Adjusting nut;

5.9 N·m (0.6 kgf-m, 4.3 ft-lb)

NOTE:

- Be sure to pass cable through guide inside the tunnel.
- Be sure to adjust the lever stroke. <Ref. to PB-6 ADJUSTMENT, Parking Brake Lever.>

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 kg, 44 lb)

Incorrect, adjust the parking brake. <Ref. to PB-11 ADJUSTMENT, Parking Brake Assembly (Rear Disc Brake).>

D: ADJUSTMENT S404171A01

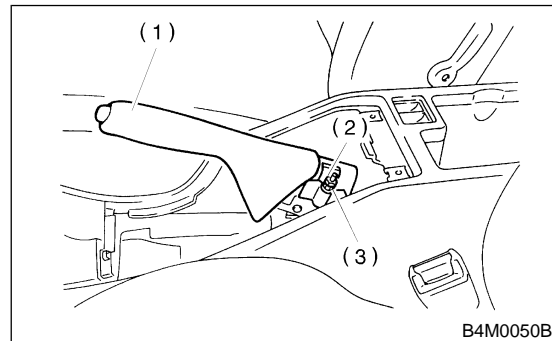
- 1) Remove console cover.
- 2) Forcibly pull parking brake lever 3 to 5 times.
- 3) Adjust parking brake lever by turning adjuster until parking brake lever stroke is set at 7 to 8 notches with operating force of 196 N (20 kg, 44 lb).
- 4) Tighten lock nut.

Lever stroke:

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

Tightening torque (Lock nut):

5.9 N·m (0.60 kgf-m, 4.3 ft-lb)



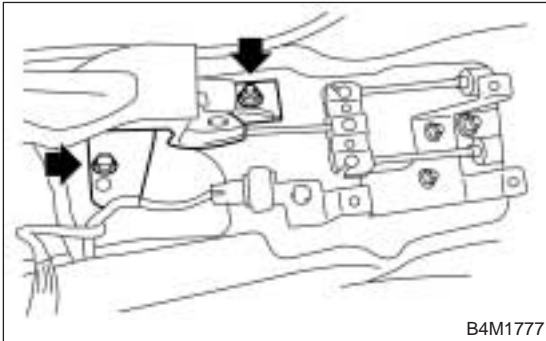
- (1) Parking brake lever
- (2) Lock nut
- (3) Adjusting nut

- 5) Install console cover.

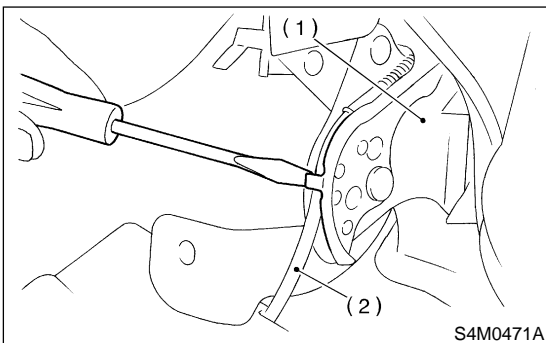
3. Parking Brake Cable S404170

A: REMOVAL S404170A18

- 1) Lift-up vehicle.
- 2) Remove rear tires and wheels.
- 3) Remove rear cushion.
- 4) Remove console box from front floor.
- 5) Loosen parking cable adjusting nut and console bracket.
- 6) Remove parking brake lever.



- 7) Unbend parking brake lever pawls and remove cable.



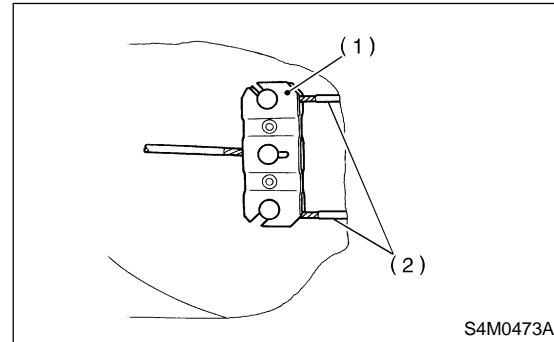
- (1) Parking brake lever
- (2) Cable

- 8) Roll up floor mat and remove clamps.



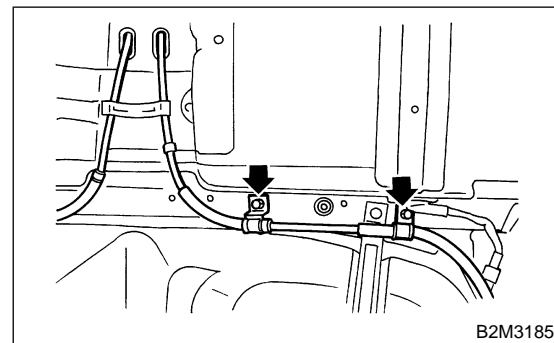
- 9) Remove equalizer cover.

- 10) Remove inner cable end from equalizer.



- (1) Equalizer
- (2) Inner cable end

- 11) Pull out parking brake cable from rear brake.
<Ref. to PB-9 REMOVAL, Parking Brake Assembly (Rear Disc Brake).>
- 12) Pull out clamp from rear brake.
- 13) Remove bolt and bracket from trailing link bracket.
- 14) Remove bolt and clamp from rear floor.



- 15) Detach grommet from rear floor.
- 16) Remove cable assembly from cabin by forcibly pulling it backward.
- 17) Detach parking brake cable from cable guide at rear trailing link.

PARKING BRAKE CABLE

Parking Brake

B: INSTALLATION S404170A11

Install (new) parking brake assembly in the reverse order of removal.

NOTE:

- Be sure to pass cable through cable guide inside the tunnel.
- Be sure to adjust the lever stroke. <Ref. to PB-6 ADJUSTMENT, Parking Brake Lever.>

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.

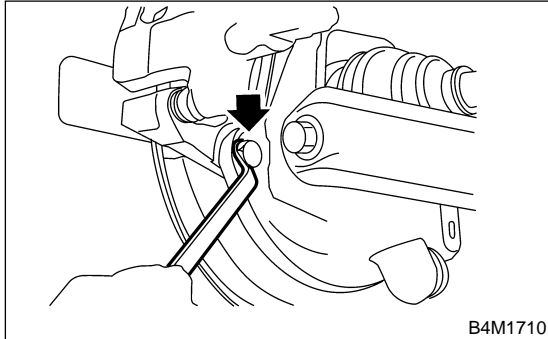
4. Parking Brake Assembly (Rear Disc Brake)

S404552

A: REMOVAL

S404552A18

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

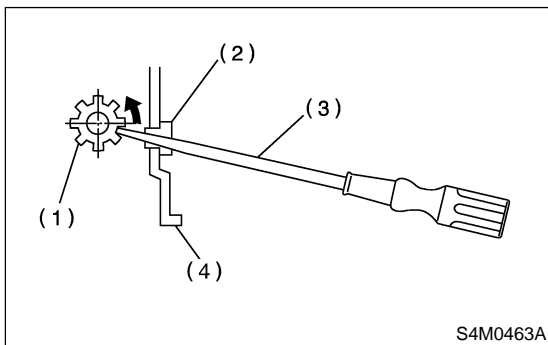


- 2) Suspend the disc brake assembly so that the hose is not stretched.
- 3) Pull down and release parking brake.
- 4) Remove the disc rotor.

NOTE:

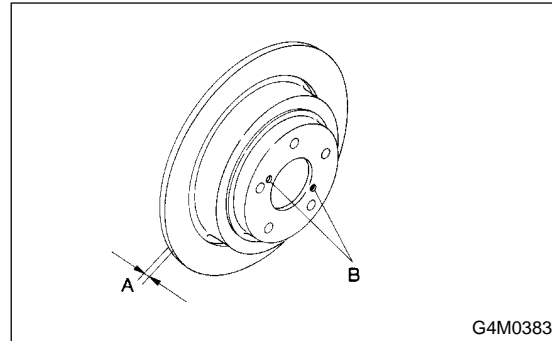
If the disc rotor is difficult to remove try the following two methods in order.

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

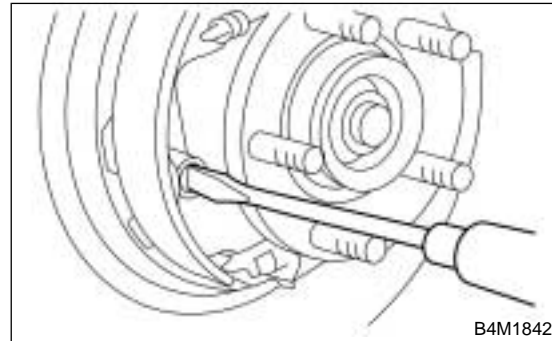


- (1) Adjusting screw
- (2) Cover (rubber)
- (3) Slot-type screwdriver
- (4) Back plate

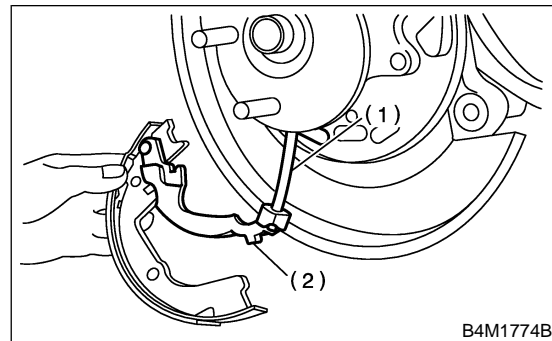
- (2) If disc rotor seizes up within hub, drive disc rotor out by installing an 8-mm bolt in holes B on the rotor.



- 5) Remove shoe return spring from parking brake assembly.
- 6) Using a standard screwdriver, remove front shoe hold down spring and pin.



- 7) Remove strut and strut spring.
- 8) Remove adjuster assembly from parking brake assembly.
- 9) Using a standard screwdriver, remove rear shoe hold-down spring and pin.
- 10) Remove brake shoe.
- 11) Remove parking cable from parking lever.



- (1) Parking brake cable
- (2) Parking brake lever

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

PARKING BRAKE ASSEMBLY (REAR DISC BRAKE)

Parking Brake

B: INSTALLATION

S404552A11

CAUTION:

Be sure lining surface is free from oil contamination.

Brake grease:

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

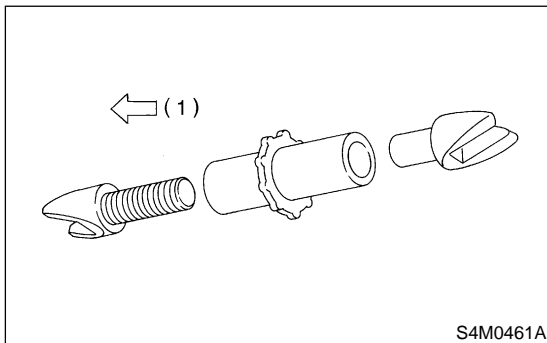
- 1) Apply brake grease to the following places.
 - Six contact surfaces of shoe rim and back plate packing
 - Contact surface of shoe wave and anchor pin
 - Contact surface of lever and strut
 - Contact surface of shoe wave and adjuster assembly
 - Contact surface of shoe wave and strut
 - Contact surface 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:

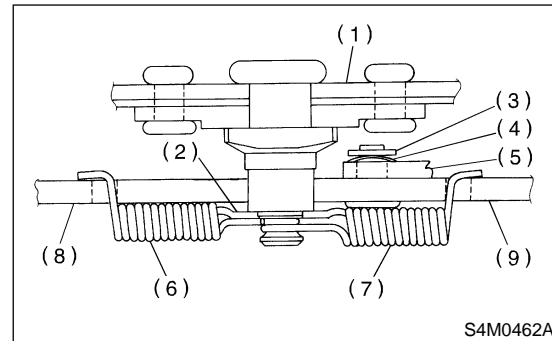
Ensure that adjuster assembly is securely installed with screw in the left side, facing vehicle front.



(1) LEFT

NOTE:

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



- (1) Back plate
- (2) Shoe guide plate
- (3) Retainer
- (4) Spring washer
- (5) Lever
- (6) Primary shoe return spring (Blue)
- (7) Secondary shoe return spring (Yellow)
- (8) Parking brake shoe (Primary)
- (9) Parking brake shoe (Secondary)

3) Adjust parking brakes. <Ref. to PB-11 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.
- (3) Drive the vehicle for about 200 meter (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)

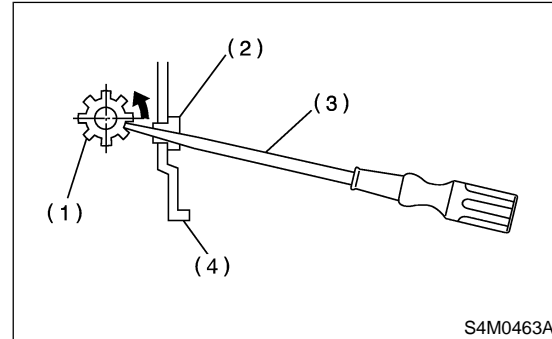
CAUTION:

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

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.

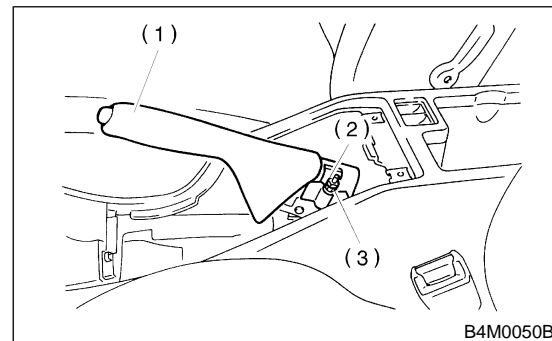


- (1) Adjusting screw
- (2) Cover (rubber)
- (3) Slot-type screwdriver
- (4) Back plate

- 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 adjuster until parking brake lever stroke is set at 6 notches with operating force of 196 N (20 kg, 44 lb).



- (1) Parking brake lever
- (2) Lock nut
- (3) Adjusting nut

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

Lever stroke:

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

Tightening torque (Adjuster lock nut):

5.9 N·m (0.60 kgf-m, 4.3 ft-lb)

GENERAL DIAGNOSTIC TABLE

Parking Brake

5. General Diagnostic Table S404257

A: INSPECTION S404257A10

| Symptom | Possible cause | Remedy |
|------------------|--|----------------------|
| Brake drag | ● Parking brake lever is maladjusted. | ● Adjustment. |
| | ● Parking brake cable does not move. | ● Repair or replace. |
| | ● Parking brake shoe clearance is maladjusted. | ● Adjustment. |
| | ● Return spring is faulty. | ● Replace. |
| Noise from brake | ● Return spring is faulty. | ● Replace. |
| | ● Shoe hold down spring is faulty. | ● Replace. |

BASIC DIAGNOSTIC PROCEDURE

VDC (DIAGNOSTICS)

1. Basic Diagnostic Procedure

S005501

A: PROCEDURE

S005501E45

1. WITHOUT SUBARU SELECT MONITOR

S005501E4501

| No. | Step | Check | Yes | No |
|-----|---|--|-------------------------|--|
| 1 | CHECK PRE-INSPECTION. 1) Ask the customer when and how the trouble occurred using interview checklist. <Ref. to VDC-5 Check List for Interview.> 2) Before performing diagnosis, inspect unit which might influence the VDC problem. <Ref. to VDC-8 INSPECTION, General Description.> | Is unit that might influence the VDC problem normal? | Go to step 2. | Repair or replace each unit. |
| 2 | CHECK INDICATION OF TROUBLE CODE. Calling up trouble code. <Ref. to VDC-22 WITHOUT SUBARU SELECT MONITOR, OPERATION, Read Diagnostic Trouble Code.> | Is trouble code readable? | Go to step 3. | Inspect using diagnostic chart for warning light failure. <Ref. to VDC-34 Diagnostics Chart with Diagnosis Connector.> NOTE: Call up trouble code again after inspecting warning light. <Ref. to VDC-22 WITHOUT SUBARU SELECT MONITOR, OPERATION, Read Diagnostic Trouble Code.> |
| 3 | CHECK TROUBLE CODE. NOTE: Record all trouble codes. | Is only the start code issued? | Go to step 4. | Go to step 5. |
| 4 | PERFORM THE GENERAL DIAGNOSTICS. 1) Inspect using "General Diagnostics Table". <Ref. to VDC-251 General Diagnostic Table.> 2) Perform the clear memory mode. <Ref. to VDC-24 WITHOUT SUBARU SELECT MONITOR, OPERATION, Clear Memory Mode.> 3) Perform the inspection mode. <Ref. to VDC-23 Inspection Mode.> Calling up the trouble code. <Ref. to VDC-22 WITHOUT SUBARU SELECT MONITOR, OPERATION, Read Diagnostic Trouble Code.> | Is only the start code issued? | Complete the diagnosis. | Go to step 5. |

BASIC DIAGNOSTIC PROCEDURE

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--------------------------------|-------------------------|---|
| 5 | PERFORM THE DIAGNOSIS. 1) Inspect using "Diagnostics Chart with Diagnostic Connector". <Ref. to VDC-34 Diagnostics Chart with Diagnosis Connector.> NOTE: For trouble code list, refer to "List of Diagnostics Trouble Code". <Ref. to VDC-26 WITHOUT SUBARU SELECT MONITOR, LIST, List of Diagnostics Trouble Code.> 2) Repair trouble cause. 3) Perform the clear memory mode. <Ref. to VDC-24 WITHOUT SUBARU SELECT MONITOR, OPERATION, Clear Memory Mode.> 4) Perform the inspection mode. <Ref. to VDC-23 Inspection Mode.> 5) Calling up the trouble code. <Ref. to VDC-22 WITHOUT SUBARU SELECT MONITOR, OPERATION, Read Diagnostic Trouble Code.> | Is only the start code issued? | Complete the diagnosis. | Inspect using "Diagnostics Chart with Diagnostic Connector". <Ref. to VDC-34 Diagnostics Chart with Diagnosis Connector.> |

CAUTION:

Remove foreign matter (dust, water, etc.) from the VDCCM 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 and/or VDC warning light illuminates, read and record trouble code indicated by ABS warning light.

BASIC DIAGNOSTIC PROCEDURE

VDC (DIAGNOSTICS)

2. WITH SUBARU SELECT MONITOR S005501E4502

| No. | Step | Check | Yes | No |
|-----|---|--|-------------------------|--|
| 1 | CHECK PRE-INSPECTION. 1) Ask the customer when and how the trouble occurred using interview checklist. <Ref. to VDC-5 Check List for Interview.> 2) Before performing diagnosis, inspect unit which might influence the VDC problem. <Ref. to VDC-8 INSPECTION, General Description.> | Is unit that might influence the VDC problem normal? | Go to step 2. | Repair or replace each unit. |
| 2 | CHECK INDICATION OF TROUBLE CODE DISPLAY. 1) Turn ignition switch to OFF. 2) Connect the SUBARU SELECT MONITOR to data link connector. 3) Turn ignition switch to ON and SUBARU SELECT MONITOR to ON. 4) Calling up the trouble code. <Ref. to VDC-22 WITH SUBARU SELECT MONITOR, OPERATION, Read Diagnostic Trouble Code.> 5) Record all trouble codes and frame data. | Is the corresponding trouble encoding? | Go to step 3. | Go to step 4. |
| 3 | PERFORM THE GENERAL DIAGNOSTICS. 1) Inspect using "General Diagnostics Table". <Ref. to VDC-251 INSPECTION, General Diagnostic Table.> 2) Perform the clear memory mode. <Ref. to VDC-24 WITH SUBARU SELECT MONITOR, OPERATION, Clear Memory Mode.> 3) Perform the inspection mode. <Ref. to VDC-23 OPERATION, Inspection Mode.> 4) Calling up the trouble code. <Ref. to VDC-22 WITH SUBARU SELECT MONITOR, OPERATION, Read Diagnostic Trouble Code.> | Is no trouble code designated or do VDC and ABS warning lights constantly remain on? | Complete the diagnosis. | Go to step 4. |
| 4 | PERFORM THE DIAGNOSIS. 1) Inspect using "Diagnostics Chart with Subaru Select Monitor". <Ref. to VDC-126 Diagnostics Chart with Select Monitor.> NOTE: For trouble code list, refer to "List of Diagnostics Trouble Code". <Ref. to VDC-29 WITH SUBARU SELECT MONITOR, LIST, List of Diagnostics Trouble Code.> 2) Repair trouble cause. 3) Perform the clear memory mode. <Ref. to VDC-24 WITH SUBARU SELECT MONITOR, OPERATION, Clear Memory Mode.> 4) Perform the inspection mode. <Ref. to VDC-23 OPERATION, Inspection Mode.> 5) Calling up the trouble code. <Ref. to ABS-16 READ DIAGNOSTIC TROUBLE CODE, OPERATION, Subaru Select Monitor.> | Is no trouble code designated or do VDC and ABS warning lights constantly remain on? | Complete the diagnosis. | Inspect using "Diagnostics Chart with Subaru Select Monitor". <Ref. to VDC-126 Diagnostics Chart with Select Monitor.> |

NOTE:

- To check harness for broken wires or short circuits, shake it while holding it or the connector.
- Check list for interview. <Ref. to VDC-5 Check List for Interview.>

2. Check List for Interview S005502

A: CHECK S005502A04

Check the following items about the vehicle's state.

1. STATE OF ABS AND/OR VDC WARNING LIGHT

| | | | |
|---|---|------------------|------|
| ABS and/or VDC warning light comes on. | <input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Only once <input type="checkbox"/> Does not come on <input checked="" type="checkbox"/> When / how long does it come on?: | | |
| Ignition key position | <input type="checkbox"/> LOCK <input type="checkbox"/> ACC <input type="checkbox"/> ON (before starting engine) <input type="checkbox"/> START <input type="checkbox"/> On after starting (Engine is running) | | |
| Timing | <input type="checkbox"/> Immediately after ignition is ON. <input type="checkbox"/> Immediately after ignition starts. | | |
| | <input type="checkbox"/> When advancing | km/h to | km/h |
| | | MPH to | MPH |
| | <input type="checkbox"/> While traveling at a constant speed | km/h | MPH |
| | <input type="checkbox"/> When decelerating | km/h to | km/h |
| | | MPH to | MPH |
| | <input type="checkbox"/> When turning to right | Steering angle : | deg |
| | | Steering time : | sec |
| | <input type="checkbox"/> When turning to left | Steering angle : | deg |
| | | Steering time : | sec |
| <input type="checkbox"/> When moving other electrical parts | | | |
| <input checked="" type="checkbox"/> Parts name : <input checked="" type="checkbox"/> Operating condition : | | | |

2. STATE OF VDC OFF INDICATOR LIGHT

| | | | |
|---|--|------------------|------|
| VDC OFF indicator light comes on. | <input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Only once <input type="checkbox"/> Does not come on <input checked="" type="checkbox"/> When / how long does it come on?: | | |
| Ignition key position | <input type="checkbox"/> LOCK <input type="checkbox"/> ACC <input type="checkbox"/> ON (before starting engine) <input type="checkbox"/> START <input type="checkbox"/> On after starting (Engine is running) <input type="checkbox"/> On after starting (Engine is stop) | | |
| Timing | <input type="checkbox"/> Immediately after ignition is ON. <input type="checkbox"/> Immediately after ignition starts. | | |
| | <input type="checkbox"/> When advancing | km/h to | km/h |
| | | MPH to | MPH |
| | <input type="checkbox"/> While traveling at a constant speed | km/h | MPH |
| | <input type="checkbox"/> When decelerating | km/h to | km/h |
| | | MPH to | MPH |
| | <input type="checkbox"/> When turning to right | Steering angle : | deg |
| | | Steering time : | sec |
| | <input type="checkbox"/> When turning to left | Steering angle : | deg |
| | | Steering time : | sec |
| <input type="checkbox"/> When moving other electrical parts | | | |
| <input checked="" type="checkbox"/> Parts name : <input checked="" type="checkbox"/> Operating condition : | | | |

CHECK LIST FOR INTERVIEW

VDC (DIAGNOSTICS)

3. STATE OF VDC OPERATION INDICATOR LIGHT

| | | | |
|--|--|------------------|------|
| VDC operation indicator light comes on. | <input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Only once <input type="checkbox"/> Does not come on <input checked="" type="checkbox"/> When / how long does it come on?: | | |
| Ignition key position | <input type="checkbox"/> LOCK <input type="checkbox"/> ACC <input type="checkbox"/> ON (before starting engine) <input type="checkbox"/> START <input type="checkbox"/> On after starting (Engine is running) <input type="checkbox"/> On after starting (Engine is stop) | | |
| Timing | <input type="checkbox"/> Immediately after ignition is ON. <input type="checkbox"/> Immediately after ignition starts. | | |
| | <input type="checkbox"/> When advancing | km/h to | km/h |
| | | MPH to | MPH |
| | <input type="checkbox"/> While traveling at a constant speed | km/h | MPH |
| | <input type="checkbox"/> When decelerating | km/h to | km/h |
| | | MPH to | MPH |
| | <input type="checkbox"/> When turning to right | Steering angle : | deg |
| | | Steering time : | sec |
| | <input type="checkbox"/> When turning to left | Steering angle : | deg |
| | | Steering time : | sec |
| <input type="checkbox"/> When moving other electrical parts <input checked="" type="checkbox"/> Parts name : <input checked="" type="checkbox"/> Operating condition : | | | |

4. CONDITIONS UNDER WHICH TROUBLE OCCURS

| | | |
|-------------|------------------------|--|
| Environment | a) Weather | <input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Various/Others : |
| | b) Ambient temperature | °C (°F) |
| | c) Road | <input type="checkbox"/> Urban area <input type="checkbox"/> Suburbs <input type="checkbox"/> Highway <input type="checkbox"/> General road <input type="checkbox"/> Ascending slope <input type="checkbox"/> Descending slope <input type="checkbox"/> Paved road <input type="checkbox"/> Gravel road <input type="checkbox"/> Muddy road <input type="checkbox"/> Sandy place <input type="checkbox"/> Straight <input type="checkbox"/> Sharp curve <input type="checkbox"/> Slow curve <input type="checkbox"/> S-shaped curve <input type="checkbox"/> Road with inclination on each side <input type="checkbox"/> Others : |
| | d) Road surface | <input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> New-fallen snow <input type="checkbox"/> Compressed snow <input type="checkbox"/> Frozen slope <input type="checkbox"/> Others : |

CHECK LIST FOR INTERVIEW

VDC (DIAGNOSTICS)

| | | | |
|--|---|---|-----|
| Condition | a) Brakes | Deceleration : g | |
| | | <input type="checkbox"/> Continuous / <input type="checkbox"/> Intermittent | |
| | b) Accelerator | Acceleration : g | |
| | | <input type="checkbox"/> Continuous / <input type="checkbox"/> Intermittent | |
| | c) Vehicle speed | km/h | MPH |
| | | <input type="checkbox"/> Advancing <input type="checkbox"/> Accelerating <input type="checkbox"/> Reducing speed <input type="checkbox"/> Low speed <input type="checkbox"/> Turning <input type="checkbox"/> 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) Steering wheel | <input type="checkbox"/> Sharp turn <input type="checkbox"/> Slow turn <input type="checkbox"/> Straight-ahead operation <input type="checkbox"/> Returned slowly <input type="checkbox"/> Returned quickly | |
| | g) Tire/wheel size | <input type="checkbox"/> Specified <input type="checkbox"/> Other than specified () | |
| | h) Tire type | <input type="checkbox"/> Summer tire <input type="checkbox"/> Studless tire (Brand name:) | |
| | i) Chain is passed around tires. : <input type="checkbox"/> Yes / <input type="checkbox"/> No | | |
| | j) T tire is used. : <input type="checkbox"/> Yes / <input type="checkbox"/> No | | |
| | k) Condition of suspension alignment : | | |
| l) Loading state : | | | |
| m) Repair parts are used. : <input type="checkbox"/> Yes / <input type="checkbox"/> No | | | |
| ● What : | | | |
| n) Others : | | | |

3. General Description S005001

A: CAUTION S005001A03

1. SUPPLEMENTAL RESTRAINT SYSTEM “AIRBAG” S005001A0301

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 S005001A10

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

1. BATTERY S005001A1001

Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more

Specific gravity: Above 1.260

2. BRAKE FLUID S005001A1002

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

3. HYDRAULIC UNIT S005001A1006

Check the hydraulic unit VDC.

- With brake tester <Ref. to VDC-17 CHECKING THE HYDRAULIC UNIT VDC OPERATION WITH BRAKE TESTER, INSPECTION, Hydraulic Control Unit (H/U).>
- Without brake tester <Ref. to VDC-16 CHECKING THE HYDRAULIC UNIT VDC OPERATION BY PRESSURE GAUGE, INSPECTION, Hydraulic Control Unit (H/U).>

4. BRAKE DRAG S005001A1003

Check brake drag.

5. BRAKE PAD AND ROTOR S005001A1004

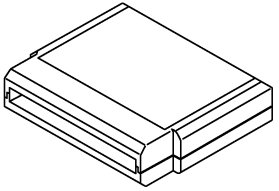

Check brake pad and rotor.

- Front <Ref. to BR-17 INSPECTION, Front Brake Pad.>, <Ref. to BR-19 INSPECTION, Front Disc Rotor.>
- Rear <Ref. to BR-26 INSPECTION, Rear Brake Pad.>, <Ref. to BR-29 INSPECTION, Rear Disc Brake Assembly.>

6. TIRE S005001A1005

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

C: PREPARATION TOOL S005001A17**1. SPECIAL TOOLS** S005001A1701

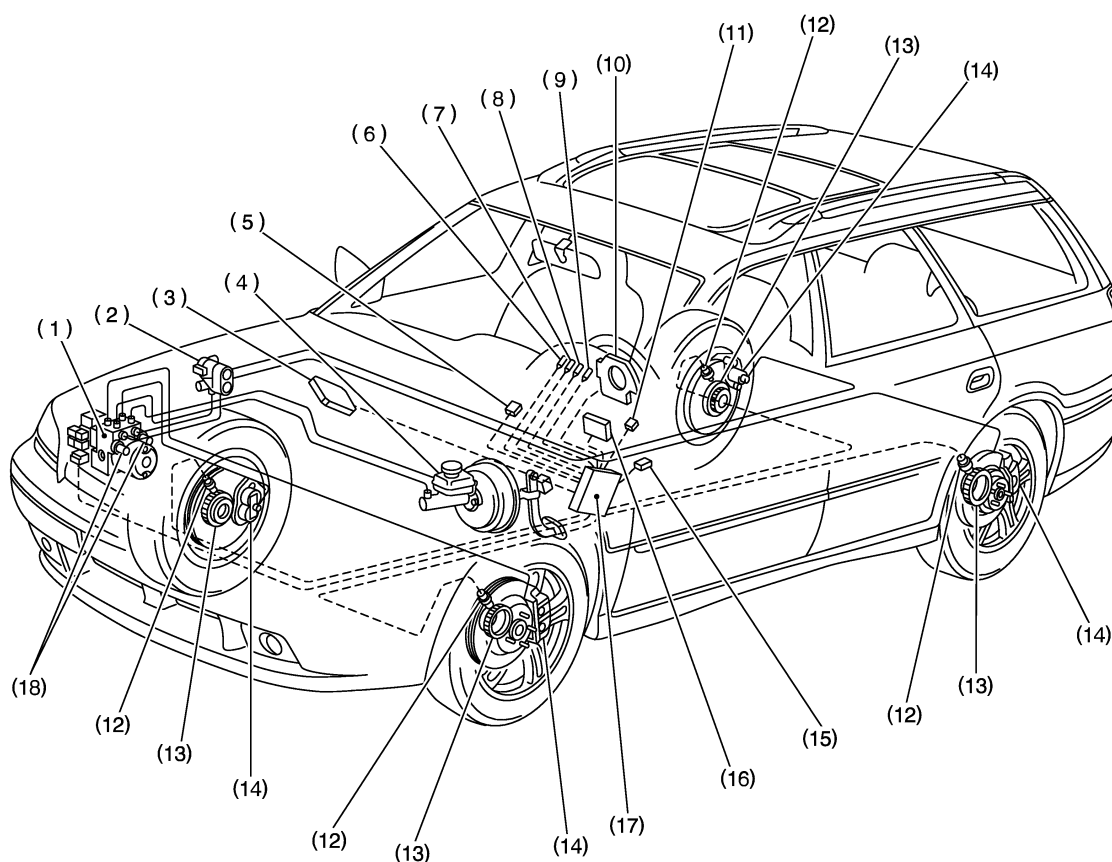
| ILLUSTRATION | TOOL NUMBER | DESCRIPTION | REMARKS |
|--|-------------|--------------------|--|
|  B2M3876 | 24082AA150 | CARTRIDGE | Troubleshooting for electrical systems. |
|  B2M3877 | 22771AA030 | SELECT MONITOR KIT | Troubleshooting for electrical systems. <ul style="list-style-type: none"> • English: 22771AA030 (Without printer) • German: 22771AA070 (Without printer) • French: 22771AA080 (Without printer) • Spanish: 22771AA090 (Without printer) |

2. GENERAL PURPOSE TOOLS S005001A1702

| TOOL NAME | REMARKS |
|----------------|--|
| Circuit Tester | Used for measuring resistance, voltage and ampere. |
| Oscilloscope | Used for measuring sensor. |

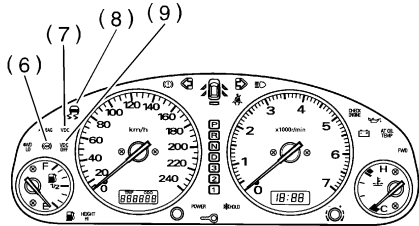
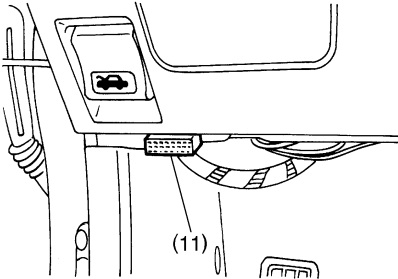
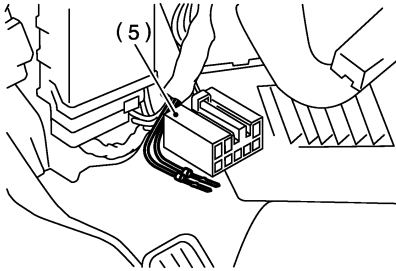
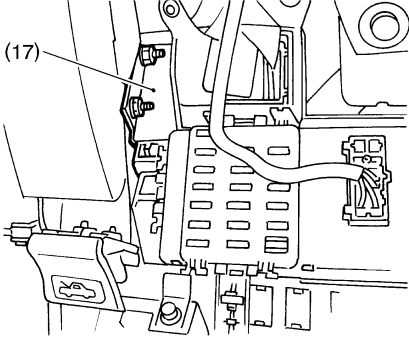
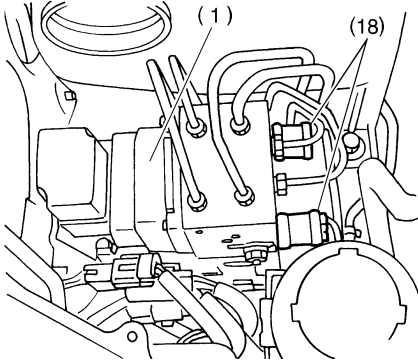
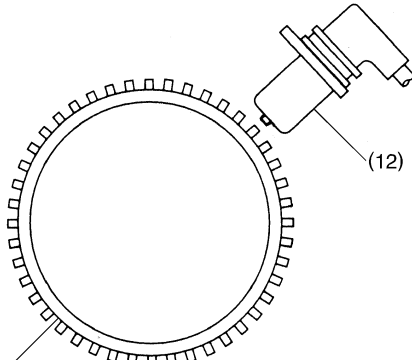
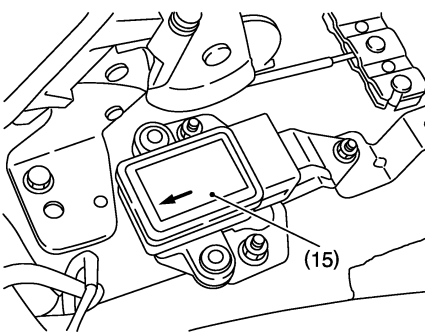
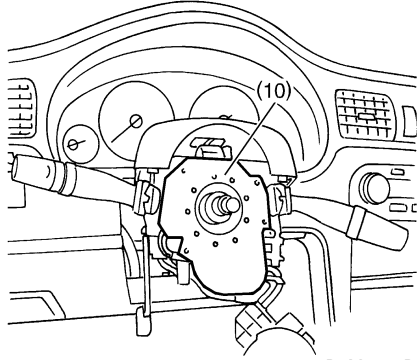
4. Electrical Components Location S005507

A: LOCATION S005507A13



B4M2335A

- | | | |
|---|--|----------------------------------|
| (1) VDC hydraulic control unit (VDCH/U) | (7) VDC warning light | (13) Tone wheel |
| (2) Proportioning valve | (8) VDC operating indicator light | (14) Wheel cylinder |
| (3) Engine control module | (9) VDC OFF indicator light | (15) Yaw rate & lateral G sensor |
| (4) Master cylinder | (10) Steering angle sensor | (16) Transmission control module |
| (5) Diagnosis connector | (11) Data link connector (for SUBARU select monitor) | (17) VDC control module (VDCCM) |
| (6) ABS warning light | (12) ABS sensor | (18) Pressure sensor |

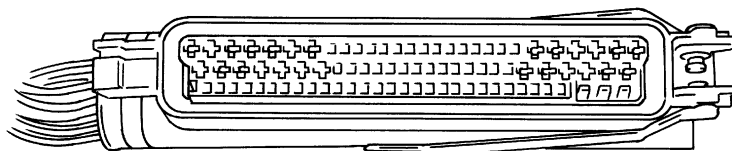
| | | |
|---|---|---|
|  <p>B4M2112B</p> |  <p>B4M2113B</p> |  <p>B4M2114B</p> |
|  <p>B4M2177C</p> |  <p>B4M2115C</p> |  <p>B4M2262B</p> |
|  <p>B4M2456A</p> |  <p>B4M2120B</p> | <p>SUBARU</p> |

5. Control Module I/O Signal

S005524

A: ELECTRICAL SPECIFICATION

S005524A08



F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |



| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 |



| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | |
| 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | |



| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 |
| 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | | |

B4M1024C

NOTE:

- The terminal numbers in the VDC control module connector are as shown in the figure.
- When the connector is removed from the VDCCM, the connector switch closes the circuit between terminal No. 53, No. 54 and No. 55. The ABS and VDC warning light illuminate.

CONTROL MODULE I/O SIGNAL

VDC (DIAGNOSTICS)

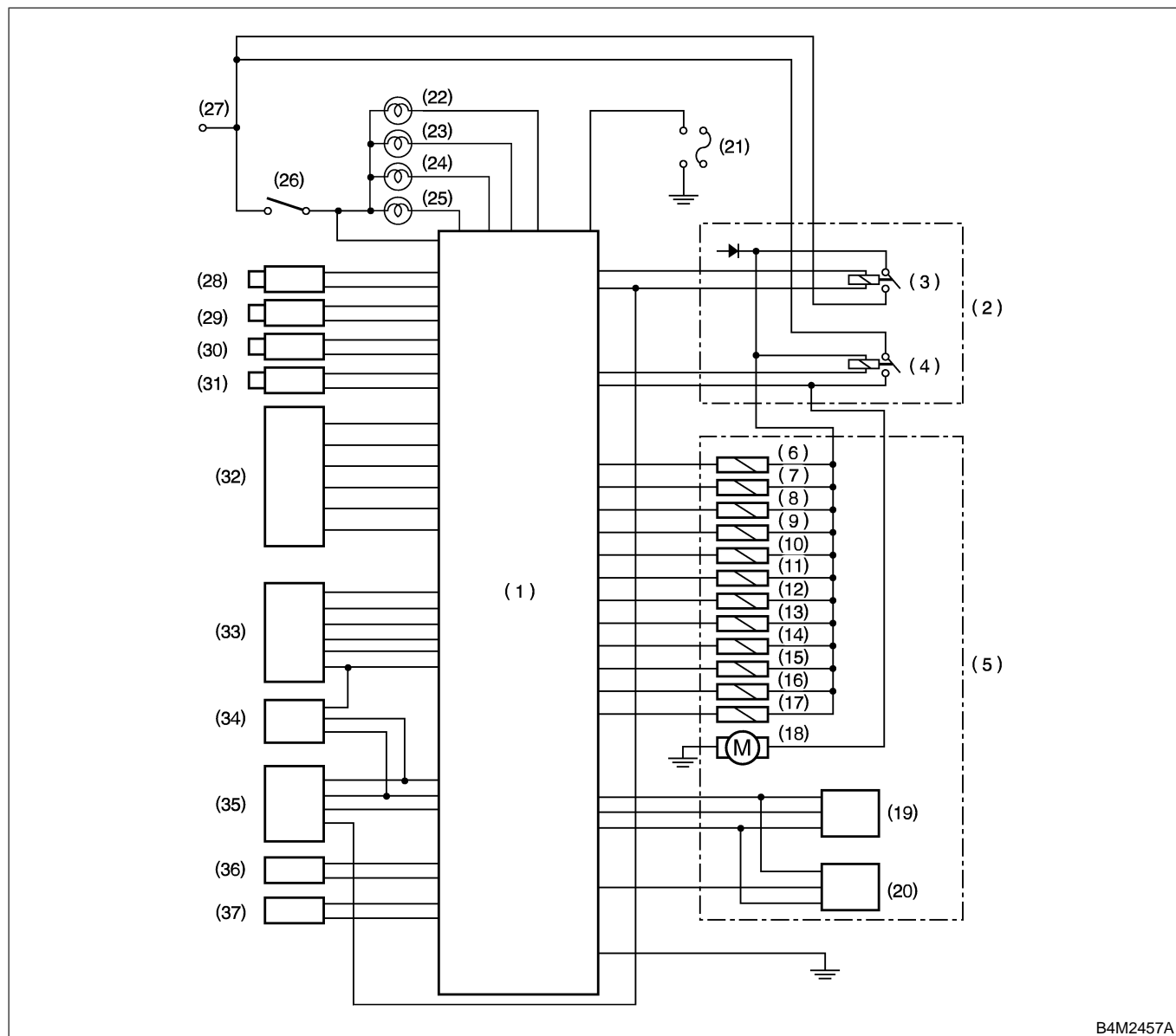
| Contents | | Terminal No. (+)-() | Input/Output signal |
|------------------------------------|-----------------------------------|-------------------------|---|
| | | | Measured value and measuring condition |
| Ignition switch | | 28—1 | 10 — 15 V when ignition switch is ON. |
| ABS sensor (Wheel speed sensor) | Front left wheel | 49—19 | 0.12 — 1 V (When it is 20 Hz.) |
| | Front right wheel | 14—15 | |
| | Rear left wheel | 18—46 | |
| | Rear right wheel | 16—17 | |
| Yaw rate and lateral G sensor | Output (Lateral G sensor) | 70—64 | 2.2 — 2.8 V when vehicle is in horizontal position. |
| | Power supply | 63—64 | 10 — 15 V when ignition switch is ON. |
| | Output (Yaw rate sensor) | 65—64 | Wave form <Ref. to VDC-15 WAVE FORM, MEASUREMENT, Control Module I/O Signal.> |
| | Reference (Yaw rate sensor) | 66—64 | 2.1 — 2.9 V |
| | Test | 67—64 | 40 ms pulse signal with a cycle of 5 — 1 V <Ref. to VDC-15 WAVE FORM, MEASUREMENT, Control Module I/O Signal.> |
| | Ground | 64 | — |
| CAN communication line (+) | | 81—1 | 2.5 — 1.5 V pulse signal <Ref. to VDC-15 WAVE FORM, MEASUREMENT, Control Module I/O Signal.> |
| CAN communication line (-) | | 83—1 | 3.5 — 2.5 V pulse signal <Ref. to VDC-15 WAVE FORM, MEASUREMENT, Control Module I/O Signal.> |
| Engine module | AET | 21—1 | 1.5 V or less (ABS/TCS/VDC operating); 10 V or more (ABS/TCS/VDC not operating) |
| | AEB | 43—1 | 10 — 15 V (Ignition switch ON and vehicle at standstill) |
| | AEC | 8—1 | 10 — 15 V (Ignition switch ON and vehicle at standstill) |
| | EAS | 75—1 | 3.5 — 1.5 V pulse signal |
| | EAC | 45—1 | 3.5 — 1.5 V pulse signal |
| | Revolution | 9—1 | 10 — 1.5 V pulse signal |
| Relay box | Valve relay power supply | 27—1 | 10 — 15 V when ignition switch is ON. |
| | Valve relay coil | 47—1 | Less than 1.5 V when ignition switch is ON. |
| | Motor relay coil | 22—1 | 1.5 V or less (ABS/TCS/VDC operating); 10 V or more (ABS/TCS/VDC not operating) |
| | Motor monitoring | 10—1 | 10 V or less (ABS/TCS/VDC operating); 1.5 V or more (ABS/TCS/VDC not operating) |
| Hydraulic control unit | Front left inlet solenoid valve | 24—1 | 10 — 15 V when the valve is OFF and less than 1.5 V when the valve is ON. |
| | Front right inlet solenoid valve | 30—1 | |
| | Rear left inlet solenoid valve | 31—1 | |
| | Rear right inlet solenoid valve | 23—1 | |
| | Front left outlet solenoid valve | 51—1 | |
| | Front right outlet solenoid valve | 3—1 | |
| | Rear left outlet solenoid valve | 4—1 | |
| | Rear right outlet solenoid valve | 50—1 | |
| | Primary cut solenoid valve | 25—1 | |
| | Secondary cut solenoid valve | 26—1 | |
| | Primary suction solenoid valve | 29—1 | |
| | Secondary suction solenoid valve | 2—1 | |
| Pressure sensor | Power supply | 78—76 | 4.75 — 5.25 V when ignition switch is ON. |
| | Primary output | 77—76 | 0.6 V (Brake pedal released) |
| | Ground | 76 | — |
| | Secondary output | 36—76 | 0.6 V (Brake pedal released) |
| VDC operation indicator light | | 32—1 | Less than 1.5 V during 1.5 seconds when ignition switch is ON, and 10 — 15 V after 1.5 seconds. |
| VDC OFF indicator light | | 52—1 | 1.5 V or less (Ignition switch ON and VDC OFF indicator light ON); 10 — 15 V (Ignition switch ON and VDC OFF indicator light OFF) |
| VDC warning light | | 53—1 | Less than 1.5 V during 1.5 seconds when ignition switch is ON, and 10 — 15 V after 1.5 seconds. |
| ABS warning light | | 54—1 | Less than 1.5 V during 1.5 seconds when ignition switch is ON, and 10 — 15 V after 1.5 seconds. |
| Diagnosis connector | Terminal No. 8 | 13 | — |
| | Terminal No. 5 | 74 | — |
| Select monitor | Data is received. | 11—1 | Less than 1.5 V when no data is received. |
| | Data is sent. | 38—1 | 4.75 — 5.25 V when no data is sent. |
| VDC OFF switch | | 40—1 | 10 — 15 V when ignition switch is ON. 0 V (Fuse installed) |
| Ground | | 1 | — |
| Ground | | 55 | — |

CONTROL MODULE I/O SIGNAL

VDC (DIAGNOSTICS)

B: SCHEMATIC

S005524A2.1



B4M2457A

- | | | |
|---------------------------------------|---------------------------------------|------------------------------------|
| (1) VDC control module | (14) Primary suction solenoid valve | (26) Ignition relay |
| (2) Relay box | (15) Primary cut solenoid valve | (27) BATTERY |
| (3) Valve relay | (16) Secondary suction solenoid valve | (28) Front left ABS sensor |
| (4) Motor relay | (17) Secondary cut solenoid valve | (29) Front right ABS sensor |
| (5) Hydraulic control unit | (18) Motor | (30) Rear left ABS sensor |
| (6) Front left inlet solenoid valve | (19) Primary pressure sensor | (31) Rear right ABS sensor |
| (7) Front left outlet solenoid valve | (20) Secondary pressure sensor | (32) Yaw rate and lateral G sensor |
| (8) Front right inlet solenoid valve | (21) VDC OFF switch | (33) Engine control module |
| (9) Front right outlet solenoid valve | (22) ABS warning light | (34) Transmission control module |
| (10) Rear left inlet solenoid valve | (23) VDC warning light | (35) Steering angle sensor |
| (11) Rear left outlet solenoid valve | (24) VDC operating indicator light | (36) Diagnosis connector |
| (12) Rear right inlet solenoid valve | (25) VDC OFF indicator light | (37) Data link connector |
| (13) Rear right outlet solenoid valve | | |

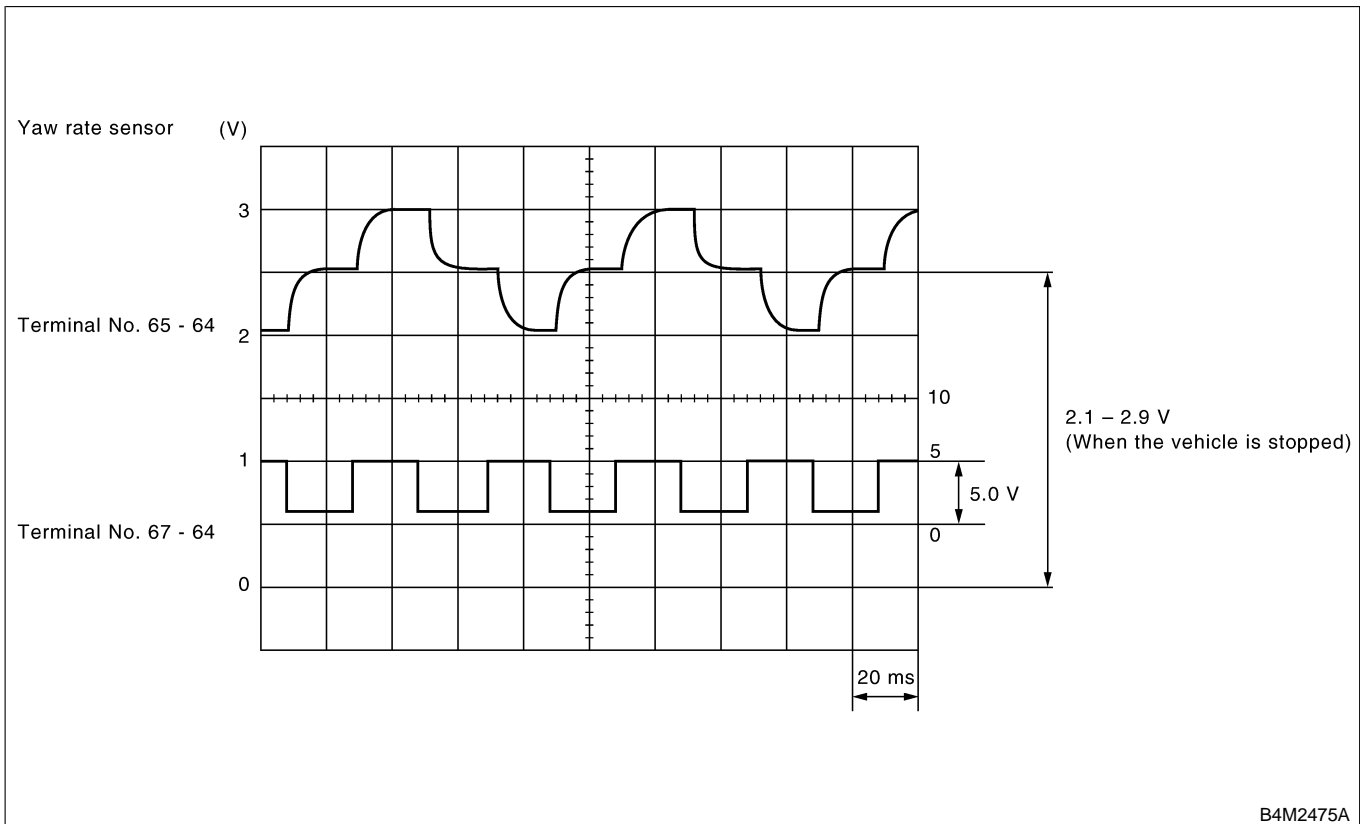
VDC-14

C: MEASUREMENT S005524A14

Measure input/output signal voltage.

NOTE:

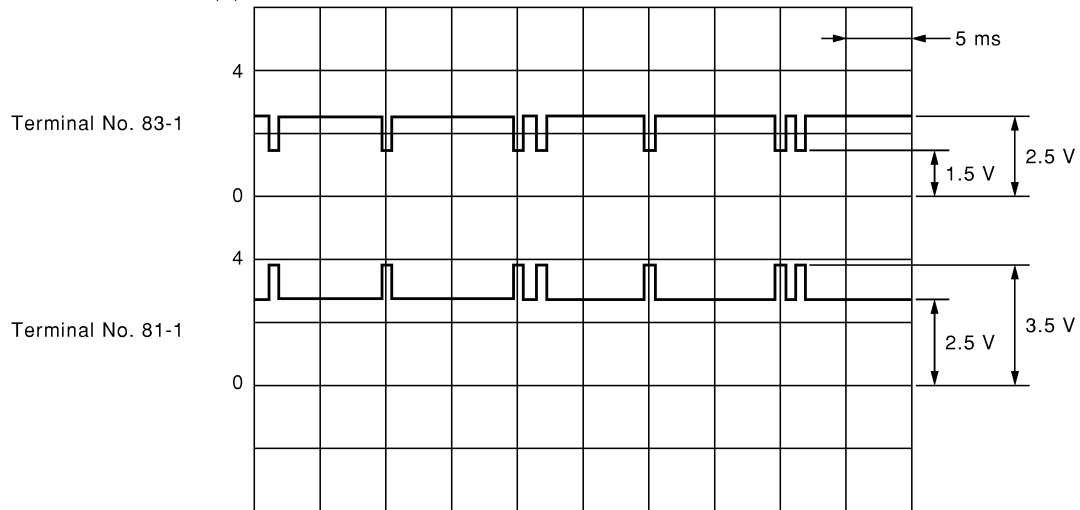
Measure with the VDCCM connector cover removed. <Ref. to VDC-17 VDCCM Connector Cover.>

1. WAVE FORM S005524A1401

CONTROL MODULE I/O SIGNAL

VDC (DIAGNOSTICS)

Can communication line (V)



B4M2264A

VDC-16

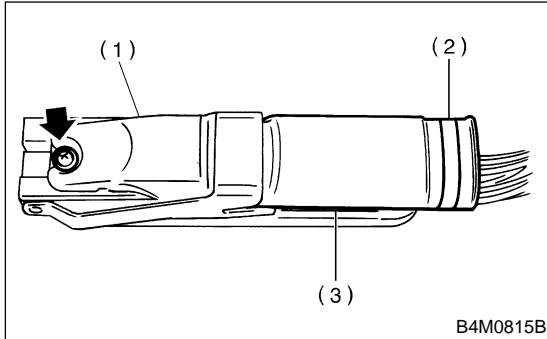
6. VDCCM Connector Cover S005598

A: REMOVE S005598E47

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from VDCCM.
- 3) Remove band.
- 4) Remove cable clamp cover.
- 5) Remove screws securing connector cover.

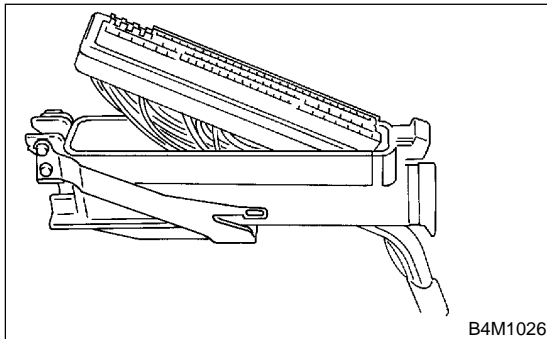
CAUTION:

Do not allow harness to catch on adjacent parts during installation.



- (1) Connector cover
- (2) Band
- (3) Cable clamp cover

6) Remove connector cover.

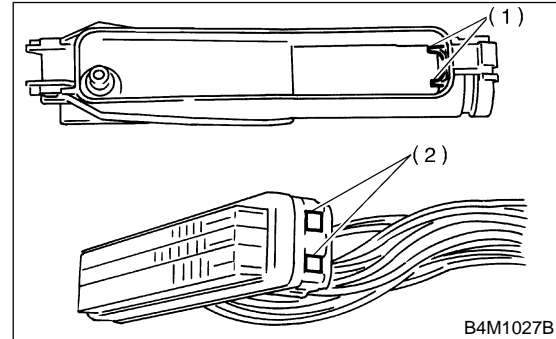


B: INSTALLATION S005598A11

Install in the reverse order of removal.

NOTE:

Align connector cover rib with connector hole before installation.



- (1) Rib
- (2) Hole

7. Data Link Connector S005505

A: NOTE S005505A15

Refer to “EN(H6)” section for information about the data link connector.

8. Subaru Select Monitor

S005503

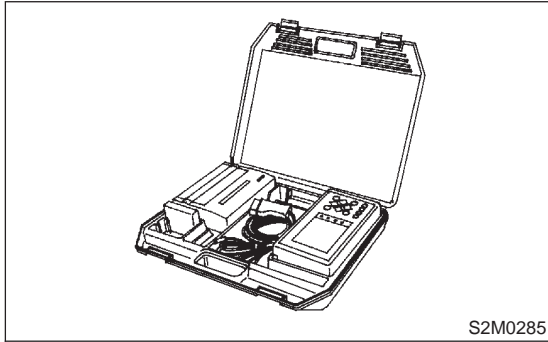
A: OPERATION

S005503A16

1. READ DIAGNOSTIC TROUBLE CODE

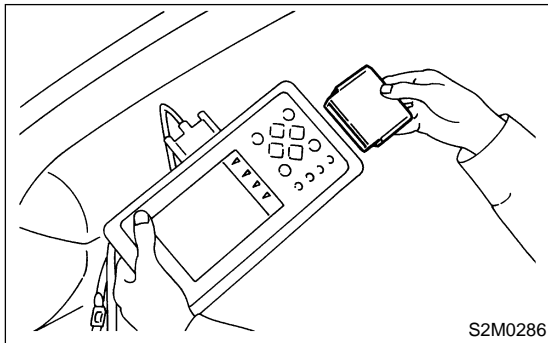
S005503A1601

- 1) Prepare Subaru Select Monitor kit.



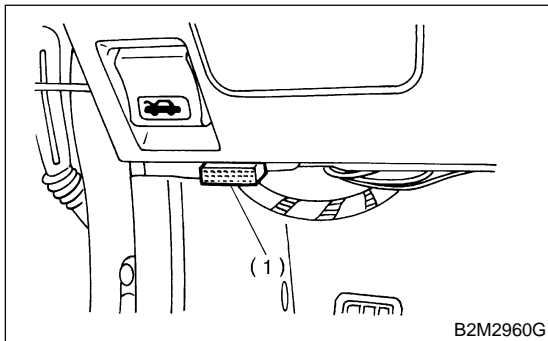
- 2) Connect diagnosis cable to Subaru Select Monitor.

- 3) Insert cartridge into Subaru Select Monitor.
<Ref. to VDC-9 SPECIAL TOOLS, PREPARATION TOOL, General Description.>



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

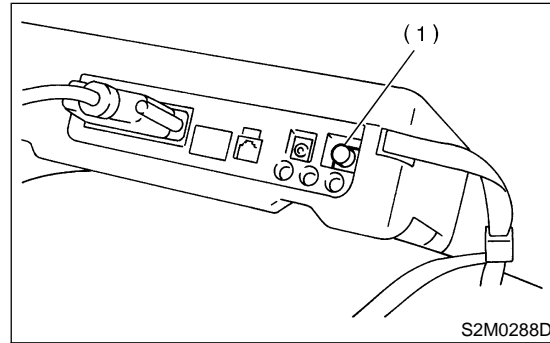
- (1) Data link connector located in the lower portion of the instrument panel (on the driver's side).



- (1) Data link connector

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

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



- (1) Power switch

- 6) On the «Main Menu» display screen, select the {Each System Check} and press 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 «Brake 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 DIAGNOSTIC TROUBLE CODE LIST.

<Ref. to VDC-26 List of Diagnostics Trouble Code.>

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

21 Front Right ABS Sensor Circuit
Open or Shorted Battery
(*a*)



B4M2173A

a refers to the troubles in order of occurrence (Latest, Old, Older).

SUBARU SELECT MONITOR

VDC (DIAGNOSTICS)

| 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. |

2. READ CURRENT DATA

S005503A1602

- 1) On the «Main Menu» display screen, select {Each System Check} and press the «YES» key.
 - 2) On the «System Selection Menu» display screen, select {Brake Control System} and press «YES» key.
 - 3) Press the «YES» key after the VDC type is displayed.
 - 4) On the «Brake Control Diagnosis» display screen, select {Current Data Display & Save} and press the «YES» key.
 - 5) On the «Data Display Menu» display screen, select {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 |
| Steering angle sensor | Steering wheel angle detected by the steering angle sensor is displayed. | deg |
| Yaw rate sensor | Vehicle's angular velocity detected by the yaw rate sensor is displayed. | deg/s |
| Lateral G sensor | Vehicle's lateral acceleration detected by the lateral G sensor is displayed. | V |
| Pressure sensor 1 | Brake fluid pressure detected by the primary pressure sensor is displayed. | V |
| Pressure sensor 2 | Brake fluid pressure detected by the secondary pressure sensor is displayed. | V |
| Longitudinal G sensor | Longitudinal G sensor is not equipped on vehicles after '00MY. But longitudinal G sensor will remain on monitor and 0 V will be displayed. | V |
| ABS CM power voltage | Voltage supplied to VDCCM is displayed. | V |
| Torque driver requires | Engine torque requested by the driver is displayed. | N·m |
| Current torque | Current engine torque is displayed. | N·m |
| Valve relay signal | Drive condition of the valve relay is displayed. | ON or OFF |
| Motor relay signal | Drive condition of the motor relay is displayed. | ON or OFF |
| VDC OFF lamp | ON operation of the VDC OFF indicator lamp is displayed. | ON or OFF |
| Motor relay monitor | Operating condition of the motor relay is displayed. | High or Low |
| PW signal | Accelerator position signal is displayed. | 1 or 0 |
| AET signal | Engine control start signal is displayed. | OPEN or GND |
| AEB signal | Engine control signal is displayed. | OPEN or GND |
| AEC signal | Engine control signal is displayed. | OPEN or GND |
| EAM signal | Engine control command signal is displayed. | 1 or 0 |

NOTE:

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

3. CLEAR MEMORY MODE S005503A1603

- 1) On the «Main Menu» display screen, select {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 the engine type is displayed.
- 4) On the «Brake Control Diagnosis» display screen, select {Clear Memory} and press the «YES» key.
- 5) When '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.

4. FUNCTION CHECK S005503A1604

| Display screen | Contents to be monitored | Index No. |
|--|--|---|
| ABS sequence control mode | Perform ABS sequence control by operating valve and pump motor sequentially. | <Ref. to VDC-18 ABS Sequence Control.> |
| VDC check mode | Perform VDC sequence control by operating valve and pump motor sequentially. | <Ref. to VDC-21 VDC Sequence Control.> |
| Set mode St. r. A. Sen. N & Lat. G Sen. Op | Set both the neutral position of the steering angle sensor and the zero "0" point of the lateral G sensor. | <Ref. to VDC-27 Steering Angle Sensor.> |

READ DIAGNOSTIC TROUBLE CODE

VDC (DIAGNOSTICS)

9. Read Diagnostic Trouble Code

S005508

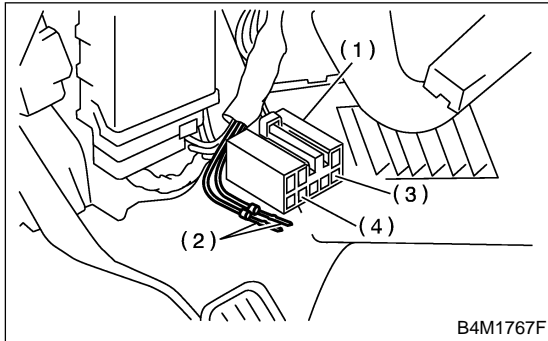
A: OPERATION

S005508A16

1. WITHOUT SUBARU SELECT MONITOR

S005508A1602

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



- (1) Diagnosis connector
- (2) Diagnosis terminal
- (3) 8 terminal
- (4) 5 terminal

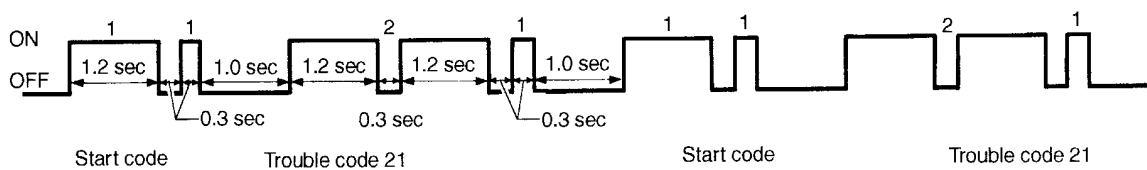
6) After the start code (11) is shown, the trouble codes will be shown in order of the last information first. These repeat for a maximum of 5 minutes.

NOTE:

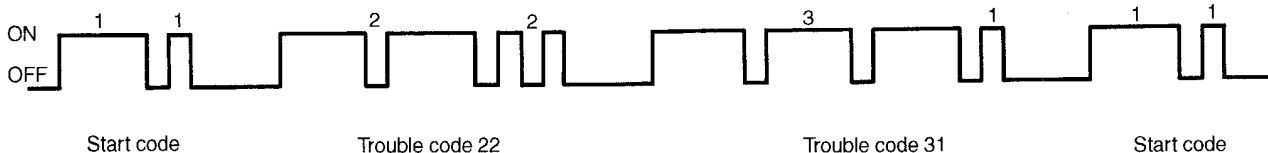
- When there are no trouble codes in memory, only the start code (11) is shown.
- When on-board diagnosis of the VDC control module detects a problem, the information (up to a maximum of three) will be stored in the EEPROM as a trouble code. When there are more than three, the most recent three will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

Example of code indication

Trouble code: 21



Trouble code: 22, 31



2. WITH SUBARU SELECT MONITOR

S005508A1601

Refer to SUBARU SELECT MONITOR for information about how to obtain and understand trouble codes.
<Ref. to VDC-19 Subaru Select Monitor.>

10. Inspection Mode S005510

A: OPERATION S005510A16

Reproduce the condition under which the problem has occurred as much as possible.

Drive the vehicle at least ten minutes.

NOTE:

Make sure vehicle does not pull to one side during normal driving.

CLEAR MEMORY MODE

VDC (DIAGNOSTICS)

11. Clear Memory Mode

S005513

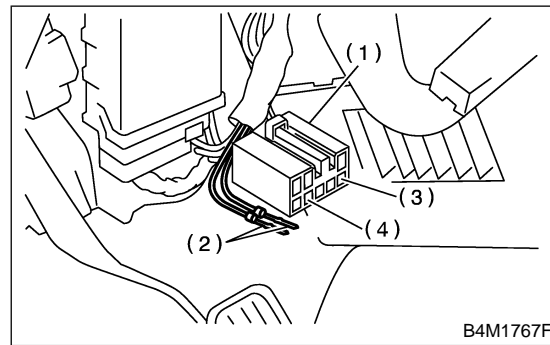
A: OPERATION

S005513A16

1. WITHOUT SUBARU SELECT MONITOR

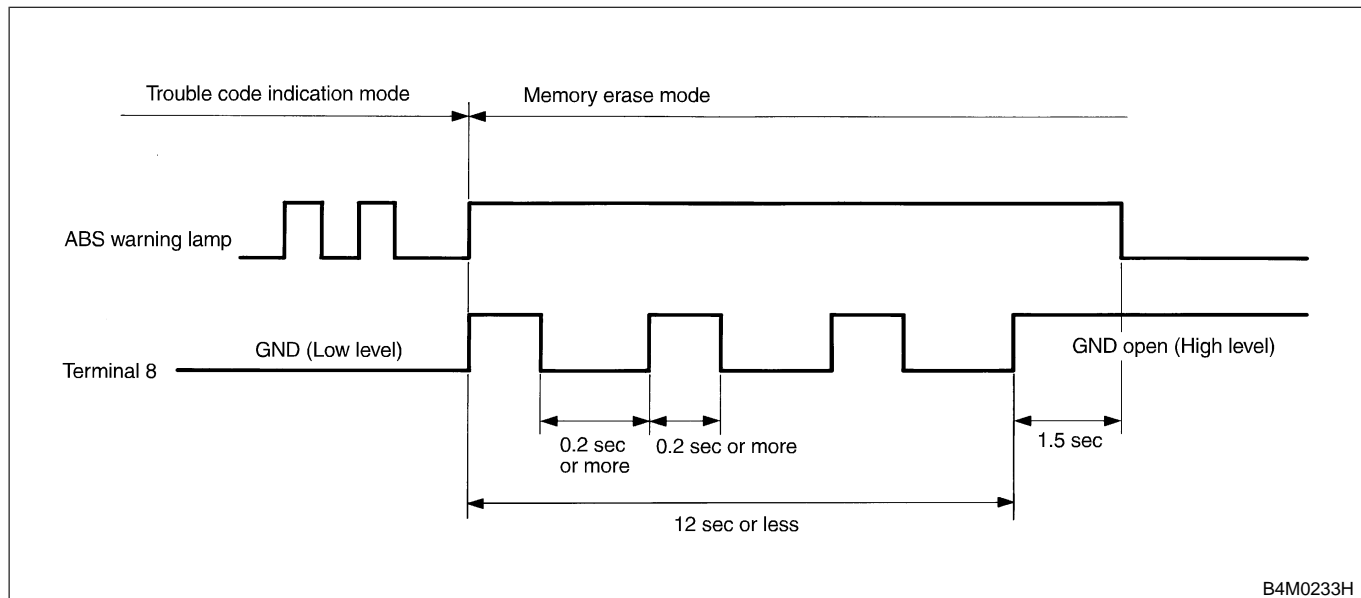
S005513A1602

1) After calling up a trouble code, disconnect diagnosis connector terminal 8 from diagnosis terminal.



- (1) Diagnosis connector
- (2) Diagnosis terminal
- (3) 8 terminal
- (4) 5 terminal

2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal 8 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

S005513A1601

Refer to SUBARU SELECT MONITOR for information about how to clear trouble codes. <Ref. to VDC-19 Subaru Select Monitor.>

A: INSPECTION S005531A10

LIST OF DIAGNOSTICS TROUBLE CODE

VDC (DIAGNOSTICS)

13. List of Diagnostics Trouble Code S005511

A: LIST S005511A12

1. WITHOUT SUBARU SELECT MONITOR S005511A1201

| 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 VDC-48 TROUBLE CODE 21 (FRONT RH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH), Diagnostics Chart with Diagnosis Connector.> |
| 23 | | Front left ABS sensor | <Ref. to VDC-48 TROUBLE CODE 23 (FRONT LH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH), Diagnostics Chart with Diagnosis Connector.> |
| 25 | | Rear right ABS sensor | <Ref. to VDC-48 TROUBLE CODE 25 (REAR RH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH), Diagnostics Chart with Diagnosis Connector.> |
| 27 | | Rear left ABS sensor | <Ref. to VDC-48 TROUBLE CODE 27 (REAR LH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH), Diagnostics Chart with Diagnosis Connector.> |
| 22 | Abnormal ABS sensor (Abnormal ABS sensor signal) | Front right ABS sensor | <Ref. to VDC-54 TROUBLE CODE 22 (FRONT RH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL), Diagnostics Chart with Diagnosis Connector.> |
| 24 | | Front left ABS sensor | <Ref. to VDC-54 TROUBLE CODE 24 (FRONT LH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL), Diagnostics Chart with Diagnosis Connector.> |
| 26 | | Rear right ABS sensor | <Ref. to VDC-54 TROUBLE CODE 26 (REAR RH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL), Diagnostics Chart with Diagnosis Connector.> |
| 28 | | Rear left ABS sensor | <Ref. to VDC-54 TROUBLE CODE 28 (REAR LH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL), Diagnostics Chart with Diagnosis Connector.> |
| 29 | | Any one of four | <Ref. to VDC-60 TROUBLE CODE 29 ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR), Diagnostics Chart with Diagnosis Connector.> |

LIST OF DIAGNOSTICS TROUBLE CODE

VDC (DIAGNOSTICS)

| Trouble code | Contents of diagnosis | | Index No. |
|--------------|--|--------------------------|---|
| 31 | Abnormal solenoid valve circuit(s) | Front right inlet valve | <Ref. to VDC-64 TROUBLE CODE 31 (FRONT RH INLET) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 32 | | Front right outlet valve | <Ref. to VDC-70 TROUBLE CODE 32 (FRONT RH OUTLET) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 33 | | Front left inlet valve | <Ref. to VDC-64 TROUBLE CODE 33 (FRONT LH INLET) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 34 | | Front left outlet valve | <Ref. to VDC-70 TROUBLE CODE 34 (FRONT LH OUTLET) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 35 | | Rear right inlet valve | <Ref. to VDC-64 TROUBLE CODE 35 (REAR RH INLET) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 36 | | Rear right outlet valve | <Ref. to VDC-70 TROUBLE CODE 36 (REAR RH OUTLET) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 37 | | Rear left inlet valve | <Ref. to VDC-64 TROUBLE CODE 37 (REAR LH INLET) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 38 | | Rear left outlet valve | <Ref. to VDC-70 TROUBLE CODE 38 (REAR LH OUTLET) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 61 | | Primary cut valve | <Ref. to VDC-64 TROUBLE CODE 61 (PRIMARY CUT) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 62 | | Secondary cut valve | <Ref. to VDC-64 TROUBLE CODE 62 (SECONDARY CUT) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 63 | | Primary suction valve | <Ref. to VDC-70 TROUBLE CODE 63 (PRIMARY SUCTION) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 64 | | Secondary suction valve | <Ref. to VDC-70 TROUBLE CODE 64 (SECONDARY SUCTION) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.> |
| 41 | Abnormal VDC control module | | <Ref. to VDC-76 TROUBLE CODE 41 ABNORMAL VDC CONTROL MODULE, Diagnostics Chart with Diagnosis Connector.> |
| 42 | Source voltage is abnormal. | | <Ref. to VDC-78 TROUBLE CODE 42 SOURCE VOLTAGE IS ABNORMAL., Diagnostics Chart with Diagnosis Connector.> |
| 43 | Faulty VDCCM-ECM communication line | | <Ref. to VDC-80 TROUBLE CODE 43 FAULTY VDCCM — ECM COMMUNICATION LINE, Diagnostics Chart with Diagnosis Connector.> |
| 44 | A communication with AT control abnormal | | <Ref. to VDC-84 TROUBLE CODE 44 A COMMUNICATION WITH AT CONTROL ABNORMAL, Diagnostics Chart with Diagnosis Connector.> |
| 45 | Control module out of specification | | <Ref. to VDC-86 TROUBLE CODE 45 CONTROL MODULE OUT OF SPECIFICATION, Diagnostics Chart with Diagnosis Connector.> |
| 46 | Abnormal voltage of 5 V power supply | | <Ref. to VDC-88 TROUBLE CODE 46 ABNORMAL VOLTAGE OF 5 V POWER SUPPLY, Diagnostics Chart with Diagnosis Connector.> |
| 47 | Faulty CAN communication line | | <Ref. to VDC-90 TROUBLE CODE 47 FAULTY CAN COMMUNICATION LINE, Diagnostics Chart with Diagnosis Connector.> |

LIST OF DIAGNOSTICS TROUBLE CODE

VDC (DIAGNOSTICS)

| Trouble code | Contents of diagnosis | Index No. |
|--------------|-------------------------------------|---|
| 48 | Faulty ECM-VDCCM communication line | <Ref. to VDC-94 TROUBLE CODE 48 FAULTY ECM — VDCCM COMMUNICATION LINE, Diagnostics Chart with Diagnosis Connector.> |
| 49 | Abnormal engine speed signal | <Ref. to VDC-96 TROUBLE CODE 49 ABNORMAL ENGINE SPEED SIGNAL, Diagnostics Chart with Diagnosis Connector.> |
| 51 | Abnormal valve relay | <Ref. to VDC-98 TROUBLE CODE 51 ABNORMAL VALVE RELAY, Diagnostics Chart with Diagnosis Connector.> |
| 52 | Abnormal motor and/or motor relay | <Ref. to VDC-104 TROUBLE CODE 52 ABNORMAL MOTOR AND/OR MOTOR RELAY, Diagnostics Chart with Diagnosis Connector.> |
| 71 | Abnormal steering angle sensor | <Ref. to VDC-110 TROUBLE CODE 71 ABNORMAL STEERING ANGLE SENSOR, Diagnostics Chart with Diagnosis Connector.> |
| 72 | Abnormal yaw rate sensor | <Ref. to VDC-114 TROUBLE CODE 72 ABNORMAL YAW RATE SENSOR, Diagnostics Chart with Diagnosis Connector.> |
| 73 | Abnormal lateral G sensor | <Ref. to VDC-118 TROUBLE CODE 73 ABNORMAL LATERAL G SENSOR, Diagnostics Chart with Diagnosis Connector.> |
| 74 | Abnormal pressure sensor | <Ref. to VDC-122 TROUBLE CODE 74 ABNORMAL PRESSURE SENSOR, Diagnostics Chart with Diagnosis Connector.> |

If any of the following multiple trouble codes are present in memory, check the area corresponding to the first trouble code. If no problem is detected, check the areas corresponding to the other trouble codes in order of their appearance.

| Combination of trouble codes | Problem area | Index No. |
|------------------------------|--|--|
| 46, 74 | (F87) — No. 78, 68 or 69 lead circuit is shorted to ground or battery. | <Ref. to VDC-88 TROUBLE CODE 46 ABNORMAL VOLTAGE OF 5 V POWER SUPPLY, Diagnostics Chart with Diagnosis Connector.> |
| 44, 71 | (F87) — No. 83 or 81 lead circuit is open. | <Ref. to VDC-110 TROUBLE CODE 71 ABNORMAL STEERING ANGLE SENSOR, Diagnostics Chart with Diagnosis Connector.> |
| 51, 48, 71 | (F87) — No. 27 lead circuit is open. | <Ref. to VDC-110 TROUBLE CODE 71 ABNORMAL STEERING ANGLE SENSOR, Diagnostics Chart with Diagnosis Connector.> |
| 71, 51, 44 | (F87) — No. 27 lead circuit is open. | <Ref. to VDC-110 TROUBLE CODE 71 ABNORMAL STEERING ANGLE SENSOR, Diagnostics Chart with Diagnosis Connector.> |
| 72, 73 | (F87) — No. 63 lead circuit is open. | <Ref. to VDC-118 TROUBLE CODE 73 ABNORMAL LATERAL G SENSOR, Diagnostics Chart with Diagnosis Connector.> |

2. WITH SUBARU SELECT MONITOR S005511A1202

| Code | Display screen | Contents of diagnosis | Index No. |
|------|--|---|---|
| — | Communication for initializing impossible | Select monitor communication failure | <Ref. to VDC-126 COMMUNICATION FOR INITIALIZING IMPOSSIBLE (SELECT MONITOR COMMUNICATION FAILURE), Diagnostics Chart with Select Monitor.> |
| — | No trouble code | Although no trouble code appears on the select monitor display, the ABS warning light and/or VDC warning light and/or VDC operating indicator light and/or VDC OFF indicator light remains on. | <Ref. to VDC-34 Diagnostics Chart with Diagnosis Connector.> |
| — | No trouble code | Although no trouble code appears on the select monitor display, the ABS warning light and/or VDC warning light and/or VDC operating indicator light and/or VDC OFF indicator light remains off. | <Ref. to VDC-34 Diagnostics Chart with Diagnosis Connector.> |
| 21 | Front right ABS sensor circuit open or shorted battery | Open or short circuit in front right ABS sensor circuit | <Ref. to VDC-128 TROUBLE CODE 21 FRONT RIGHT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY, Diagnostics Chart with Select Monitor.> |
| 22 | Front right ABS sensor signal | Front right ABS sensor abnormal signal | <Ref. to VDC-134 TROUBLE CODE 22 FRONT RIGHT ABS SENSOR SIGNAL, Diagnostics Chart with Select Monitor.> |
| 23 | Front left ABS sensor circuit open or shorted battery | Open or short circuit in front left ABS sensor circuit | <Ref. to VDC-128 TROUBLE CODE 23 FRONT LEFT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY, Diagnostics Chart with Select Monitor.> |
| 24 | Front left ABS sensor signal | Front left ABS sensor abnormal signal | <Ref. to VDC-134 TROUBLE CODE 24 FRONT LEFT ABS SENSOR SIGNAL, Diagnostics Chart with Select Monitor.> |
| 25 | Rear right ABS sensor circuit open or shorted battery | Open or short circuit in rear right ABS sensor circuit | <Ref. to VDC-128 TROUBLE CODE 25 REAR RIGHT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY, Diagnostics Chart with Select Monitor.> |
| 26 | Rear right ABS sensor signal | Rear right ABS sensor abnormal signal | <Ref. to VDC-134 TROUBLE CODE 26 REAR RIGHT ABS SENSOR SIGNAL, Diagnostics Chart with Select Monitor.> |
| 27 | Rear left ABS sensor circuit open or shorted battery | Open or short circuit in rear left ABS sensor circuit | <Ref. to VDC-128 TROUBLE CODE 27 REAR LEFT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY, Diagnostics Chart with Select Monitor.> |
| 28 | Rear left ABS sensor signal | Rear left ABS sensor abnormal signal | <Ref. to VDC-134 TROUBLE CODE 28 REAR LEFT ABS SENSOR SIGNAL, Diagnostics Chart with Select Monitor.> |
| 29 | Any one of four ABS sensor signal | Abnormal ABS sensor signal on any one of four sensor | <Ref. to VDC-140 TROUBLE CODE 29 ANY ONE OF FOUR ABS SENSOR SIGNAL, Diagnostics Chart with Select Monitor.> |
| 31 | FR hold valve malfunction | Front right inlet solenoid valve | <Ref. to VDC-144 TROUBLE CODE 31 FR HOLD VALVE MALFUNCTION (FRONT RIGHT INLET VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 32 | FR pressure reducing valve malfunction | Front right outlet solenoid valve malfunction | <Ref. to VDC-150 TROUBLE CODE 32 FR PRESSURE REDUCING VALVE MALFUNCTION (FRONT RIGHT OUTLET VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 33 | FL hold valve malfunction | Front left inlet solenoid valve malfunction | <Ref. to VDC-144 TROUBLE CODE 33 FL HOLD VALVE MALFUNCTION (FRONT LEFT INLET VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 34 | FL pressure reducing valve malfunction | Front left outlet solenoid valve | <Ref. to VDC-150 TROUBLE CODE 34 FL PRESSURE REDUCING VALVE MALFUNCTION (FRONT LEFT OUTLET VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |

LIST OF DIAGNOSTICS TROUBLE CODE

VDC (DIAGNOSTICS)

| Code | Display screen | Contents of diagnosis | Index No. |
|------|--|---|--|
| 35 | RR hold valve malfunction | Rear right inlet solenoid valve malfunction | <Ref. to VDC-144 TROUBLE CODE 35 RR HOLD VALVE MALFUNCTION (REAR RIGHT INLET VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 36 | RR pressure reducing valve malfunction | Rear right outlet solenoid valve | <Ref. to VDC-150 TROUBLE CODE 36 RR PRESSURE REDUCING VALVE MALFUNCTION (REAR RIGHT OUTLET VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 37 | RL hold valve malfunction | Rear left inlet solenoid valve malfunction | <Ref. to VDC-144 TROUBLE CODE 37 RL HOLD VALVE MALFUNCTION (REAR LEFT INLET VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 38 | RL pressure reducing valve malfunction | Rear left outlet solenoid valve | <Ref. to VDC-150 TROUBLE CODE 38 RL PRESSURE REDUCING VALVE MALFUNCTION (REAR LEFT OUTLET VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 41 | Electrical control module | VDC control module malfunction | <Ref. to VDC-156 TROUBLE CODE 41 ELECTRICAL CONTROL MODULE (VDC CONTROL MODULE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 42 | Power supply voltage low | Power supply voltage too low | <Ref. to VDC-158 TROUBLE CODE 42 POWER SUPPLY VOLTAGE LOW, Diagnostics Chart with Select Monitor.> |
| 43 | AET communication line malfunction | AET communication line malfunction | <Ref. to VDC-160 TROUBLE CODE 43 AET COMMUNICATION LINE MALFUNCTION, Diagnostics Chart with Select Monitor.> |
| 43 | AEB communication line malfunction | AEB communication line malfunction | <Ref. to VDC-162 TROUBLE CODE 43 AEB COMMUNICATION LINE MALFUNCTION, Diagnostics Chart with Select Monitor.> |
| 43 | AEC communication line malfunction | AEC communication line malfunction | <Ref. to VDC-164 TROUBLE CODE 43 AEC COMMUNICATION LINE MALFUNCTION, Diagnostics Chart with Select Monitor.> |
| 44 | TCM communication circuit | TCM communication line malfunction | <Ref. to VDC-166 TROUBLE CODE 44 TCM COMMUNICATION CIRCUIT, Diagnostics Chart with Select Monitor.> |
| 45 | Incorrect VDC control module | Incorrect VDC control module | <Ref. to VDC-168 TROUBLE CODE 45 INCORRECT VDC CONTROL MODULE, Diagnostics Chart with Select Monitor.> |
| 45 | TCM malfunction specifications | TCM malfunction specifications | <Ref. to VDC-169 TROUBLE CODE 45 TCM MALFUNCTION SPECIFICATIONS, Diagnostics Chart with Select Monitor.> |
| 46 | Abnormal voltage of 5 V power supply | Abnormal voltage of 5 V power supply | <Ref. to VDC-170 TROUBLE CODE 46 ABNORMAL VOLTAGE OF 5 V POWER SUPPLY, Diagnostics Chart with Select Monitor.> |
| 47 | Improper CAN communication | CAN communication line malfunction | <Ref. to VDC-172 TROUBLE CODE 47 IMPROPER CAN COMMUNICATION, Diagnostics Chart with Select Monitor.> |
| 48 | Improper EAC communication | EAC communication line malfunction | <Ref. to VDC-176 TROUBLE CODE 48 IMPROPER EAC COMMUNICATION, Diagnostics Chart with Select Monitor.> |
| 48 | EAS communication line grounding shorted | EAS communication line grounding | <Ref. to VDC-178 TROUBLE CODE 48 EAS COMMUNICATION LINE GROUNDING SHORTED, Diagnostics Chart with Select Monitor.> |
| 48 | Erroneous communication from EGI to VDC | Faulty ECM-VDCCM communication line | <Ref. to VDC-180 TROUBLE CODE 48 ERRONEOUS COMMUNICATION FROM EGI TO VDC, Diagnostics Chart with Select Monitor.> |
| 49 | Abnormal engine speed signal | Abnormal engine speed signal | <Ref. to VDC-182 TROUBLE CODE 49 ABNORMAL ENGINE SPEED SIGNAL, Diagnostics Chart with Select Monitor.> |
| 51 | Valve relay | Valve relay malfunction | <Ref. to VDC-184 TROUBLE CODE 51 VALVE RELAY, Diagnostics Chart with Select Monitor.> |
| 51 | Valve relay ON failure | Valve relay ON failure | <Ref. to VDC-190 TROUBLE CODE 51 VALVE RELAY ON FAILURE, Diagnostics Chart with Select Monitor.> |
| 52 | Motor and motor relay OFF failure | Motor and motor relay OFF failure | <Ref. to VDC-194 TROUBLE CODE 52 MOTOR AND MOTOR RELAY OFF FAILURE, Diagnostics Chart with Select Monitor.> |
| 52 | Motor and motor relay ON failure | Motor and motor relay ON failure | <Ref. to VDC-198 TROUBLE CODE 52 MOTOR AND MOTOR RELAY ON FAILURE, Diagnostics Chart with Select Monitor.> |
| 52 | Motor malfunction | Motor malfunction | <Ref. to VDC-204 TROUBLE CODE 52 MOTOR MALFUNCTION, Diagnostics Chart with Select Monitor.> |
| 61 | Normal opening valve 2 malfunction | Primary cut valve malfunction | <Ref. to VDC-144 TROUBLE CODE 61 NORMAL OPENING VALVE 2 MALFUNCTION (PRIMARY CUT VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |

LIST OF DIAGNOSTICS TROUBLE CODE

VDC (DIAGNOSTICS)

| Code | Display screen | Contents of diagnosis | Index No. |
|------|--|--|--|
| 62 | Normal opening valve 1 malfunction | Secondary cut valve malfunction | <Ref. to VDC-144 TROUBLE CODE 62 NORMAL OPENING VALVE 1 MALFUNCTION (SECONDARY CUT VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 63 | Normal closing valve 2 malfunction | Primary suction valve malfunction | <Ref. to VDC-150 TROUBLE CODE 63 NORMAL CLOSING VALVE 2 MALFUNCTION (PRIMARY SUCTION VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 64 | Normal closing valve 1 malfunction | Secondary suction valve malfunction | <Ref. to VDC-150 TROUBLE CODE 64 NORMAL CLOSING VALVE 1 MALFUNCTION (SECONDARY SUCTION VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.> |
| 71 | Steering angle sensor offset is too big. | Steering angle sensor offset is too big. | <Ref. to VDC-208 TROUBLE CODE 71 STEERING ANGLE SENSOR OFFSET IS TOO BIG., Diagnostics Chart with Select Monitor.> |
| 71 | Change range of steering angle sensor is too big. | Change range of steering angle sensor is too big. | <Ref. to VDC-210 TROUBLE CODE 71 CHANGE RANGE OF STEERING ANGLE SENSOR IS TOO BIG., Diagnostics Chart with Select Monitor.> |
| 71 | Steering angle sensor malfunction | Steering angle sensor malfunction | <Ref. to VDC-212 TROUBLE CODE 71 STEERING ANGLE SENSOR MALFUNCTION, Diagnostics Chart with Select Monitor.> |
| 71 | No signal from steering angle sensor | No signal from steering angle sensor | <Ref. to VDC-214 TROUBLE CODE 71 NO SIGNAL FROM STEERING ANGLE SENSOR, Diagnostics Chart with Select Monitor.> |
| 72 | Abnormal yaw rate sensor output | Abnormal yaw rate sensor output | <Ref. to VDC-216 TROUBLE CODE 72 ABNORMAL YAW RATE SENSOR OUTPUT, Diagnostics Chart with Select Monitor.> |
| 72 | Voltage inputted to yaw rate sensor exceeds specification. | Voltage inputted to yaw rate sensor exceeds specification. | <Ref. to VDC-218 TROUBLE CODE 72 VOLTAGE INPUTTED TO YAW RATE SENSOR EXCEEDS SPECIFICATION., Diagnostics Chart with Select Monitor.> |
| 72 | Abnormal yaw rate sensor reference voltage | Abnormal yaw rate sensor reference voltage | <Ref. to VDC-222 TROUBLE CODE 72 ABNORMAL YAW RATE SENSOR REFERENCE VOLTAGE, Diagnostics Chart with Select Monitor.> |
| 72 | Change range of yaw rate sensor signal is too big. | Change range of yaw rate sensor signal is too big. | <Ref. to VDC-226 TROUBLE CODE 72 CHANGE RANGE OF YAW RATE SENSOR SIGNAL IS TOO BIG., Diagnostics Chart with Select Monitor.> |
| 73 | Lateral G sensor offset is too big. | Lateral G sensor offset is too big. | <Ref. to VDC-230 TROUBLE CODE 73 LATERAL G SENSOR OFFSET IS TOO BIG., Diagnostics Chart with Select Monitor.> |
| 73 | Abnormal lateral G sensor output | Abnormal lateral G sensor output | <Ref. to VDC-230 TROUBLE CODE 73 ABNORMAL LATERAL G SENSOR OUTPUT, Diagnostics Chart with Select Monitor.> |
| 73 | Change range of lateral G sensor is too big. | Change range of lateral G sensor is too big. | <Ref. to VDC-230 TROUBLE CODE 73 CHANGE RANGE OF LATERAL G SENSOR IS TOO BIG., Diagnostics Chart with Select Monitor.> |
| 73 | Excessive lateral G sensor signal | Excessive lateral G sensor signal | <Ref. to VDC-230 TROUBLE CODE 73 EXCESSIVE LATERAL G SENSOR SIGNAL, Diagnostics Chart with Select Monitor.> |
| 73 | Voltage inputted to lateral G sensor exceeds specification. | Voltage inputted to lateral G sensor exceeds specification. | <Ref. to VDC-234 TROUBLE CODE 73 VOLTAGE INPUTTED TO LATERAL G SENSOR EXCEEDS SPECIFICATION., Diagnostics Chart with Select Monitor.> |
| 74 | Voltage inputted to pressure sensor 1 exceeds specification. | Voltage inputted to primary pressure sensor exceeds specification. | <Ref. to VDC-238 TROUBLE CODE 74 VOLTAGE INPUTTED TO PRESSURE SENSOR 1 EXCEEDS SPECIFICATION. (PRIMARY PRESSURE SENSOR), Diagnostics Chart with Select Monitor.> |
| 74 | Voltage inputted to pressure sensor 2 exceeds specification. | Voltage inputted to secondary pressure sensor exceeds specification. | <Ref. to VDC-242 TROUBLE CODE 74 VOLTAGE INPUTTED TO PRESSURE SENSOR 2 EXCEEDS SPECIFICATION. (SECONDARY PRESSURE SENSOR), Diagnostics Chart with Select Monitor.> |
| 74 | Pressure sensor 1 offset is too big. | Primary pressure sensor offset is too big. | <Ref. to VDC-246 TROUBLE CODE 74 PRESSURE SENSOR 1 OFFSET IS TOO BIG. (PRIMARY PRESSURE SENSOR), Diagnostics Chart with Select Monitor.> |
| 74 | Pressure sensor 2 offset is too big. | Secondary pressure sensor offset is too big. | <Ref. to VDC-246 TROUBLE CODE 74 PRESSURE SENSOR 2 OFFSET IS TOO BIG. (SECONDARY PRESSURE SENSOR), Diagnostics Chart with Select Monitor.> |

LIST OF DIAGNOSTICS TROUBLE CODE

VDC (DIAGNOSTICS)

| Code | Display screen | Contents of diagnosis | Index No. |
|------|--|--|---|
| 74 | Differential pressure of pressure sensor is too big. | Differential pressure of pressure sensor is too big. | <Ref. to VDC-248 TROUBLE CODE 74 DIFFERENTIAL PRES-SURE OF PRESSURE SENSOR IS TOO BIG., Diagnostics Chart with Select Monitor.> |

If any of the following multiple trouble codes are present in memory, check the area corresponding to the first trouble code. If no problem is detected, check the areas corresponding to the other trouble codes in order of their appearance.

| Combination of trouble codes | Problem area | Index No. |
|--|--|--|
| 46 Abnormal voltage of 5 V power supply 74 Voltage inputted to pressure sensor 2 exceeds specification. | (F87) — No. 78, 68 or 69 lead circuit is shorted to ground or battery. | <Ref. to VDC-170 TROUBLE CODE 46 ABNORMAL VOLTAGE OF 5 V POWER SUPPLY, Diagnostics Chart with Select Monitor.> |
| 44 TCM communication circuit 71 No signal from steering angle sensor | (F87) — No. 83 or 81 lead circuit is open. | <Ref. to VDC-214 TROUBLE CODE 71 NO SIGNAL FROM STEERING ANGLE SENSOR, Diagnostics Chart with Select Monitor.> |
| 51 Valve relay 48 Improper EAC communication 71 No signal from steering angle sensor | (F87) — No. 27 lead circuit is open. | <Ref. to VDC-214 TROUBLE CODE 71 NO SIGNAL FROM STEERING ANGLE SENSOR, Diagnostics Chart with Select Monitor.> |
| 71 No signal from steering angle sensor 51 Valve relay 44 TCM communication circuit | (F87) — No. 27 lead circuit is open. | <Ref. to VDC-214 TROUBLE CODE 71 NO SIGNAL FROM STEERING ANGLE SENSOR, Diagnostics Chart with Select Monitor.> |
| 73 Voltage inputted to lateral G sensor exceeds specification. 72 Voltage inputted to yaw rate sensor exceeds specifications. | (F87) — No. 23 lead circuit is open. | <Ref. to VDC-230 TROUBLE CODE 73 EXCESSIVE LATERAL G SENSOR SIGNAL, Diagnostics Chart with Select Monitor.> |

MEMO:

14. Diagnostics Chart with Diagnosis Connector S005522

A: ABS WARNING LIGHT, VDC WARNING LIGHT, VDC OPERATING INDICATOR LIGHT OR VDC OFF INDICATOR LIGHT DOES NOT COME ON.

S005522E26

DIAGNOSIS:

- ABS warning light circuit is open or shorted.
- VDC warning light circuit is open or shorted.
- VDC operating indicator light circuit is open or shorted.
- VDC OFF indicator light circuit is open or shorted.

TROUBLE SYMPTOM:

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

VDC (DIAGNOSTICS)



00.5.31/68j/0vdc

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| 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. <Ref. to IDI-17 Combination Meter Assembly.> |
| 2 | CHECK LIGHT BULB. 1) Turn ignition switch to OFF. 2) Remove combination meter. 3) Remove ABS warning light bulb, VDC warning light bulb, VDC operating indicator light bulb or VDC OFF indicator light bulb from combination meter. | Is light bulb OK? | Go to step 3. | Replace faulty light bulb. <Ref. to IDI-17 DISASSEMBLY, Combination Meter Assembly.> |
| 3 | CHECK BATTERY SHORT OF LIGHT HARNESS. 1) Disconnect VDCCM connector from VDCCM. 2) Place a sheet of thick paper [thickness 1.5 mm (0.059 in)] in switch area of VDCCM connector. 3) Turn ignition switch to ON. 4) Measure voltage between VDC connector and chassis ground. Connector & terminal ABS warning light (F87) No. 54 (+) — Chassis ground (-): VDC warning light (F87) No. 53 (+) — Chassis ground (-): VDC operating indicator light (F87) No. 32 (+) — Chassis ground (-): VDC OFF indicator light (F87) No. 52 (+) — Chassis ground (-): | Is voltage less than 3 V? | Go to step 4. | Repair light harness. |
| 4 | CHECK WIRING HARNESS. 1) Turn ignition switch to OFF. 2) Install ABS warning light bulb from combination meter. 3) Install combination meter. 4) Place a sheet of thick paper [thickness 1.5 mm (0.059 in)] in switch area of VDCCM connector. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM connector and chassis ground. Connector & terminal ABS warning light (F87) No. 54 (+) — Chassis ground (-): VDC warning light (F87) No. 53 (+) — Chassis ground (-): VDC operating indicator light (F87) No. 32 (+) — Chassis ground (-): VDC OFF indicator light (F87) No. 52 (+) — Chassis ground (-): | Is voltage between 10 and 15 V? | Go to step 5. | Repair wiring harness. |
| 5 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connectors between combination meter and VDCCM? | Repair connector. | Go to step 6. |
| 6 | CHECK WARNING AND INDICATOR LIGHTS. 1) Connect connector to VDCCM. 2) Turn ignition switch to ON. | Do ABS warning light, VDC warning light, VDC operating indicator light and VDC OFF indicator light turn on? | A temporary poor contact. | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

B: ABS AND VDC WARNING LIGHTS DO NOT GO OFF. S005522F13

DIAGNOSIS:

- ABS warning light circuit is open or shorted.
- VDC warning light circuit is open or shorted.
- Diagnosis circuit is open.

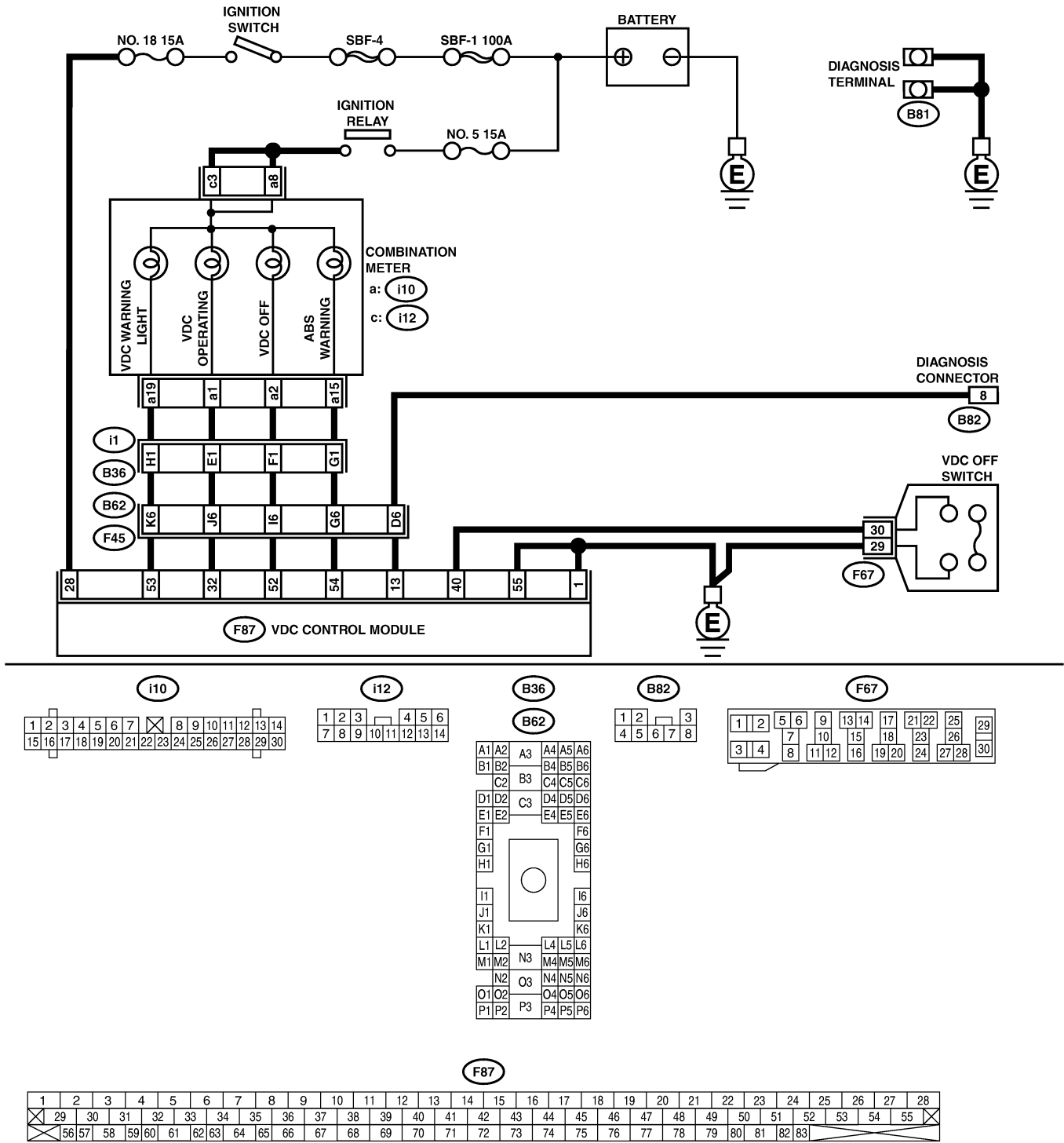
TROUBLE SYMPTOM:

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

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



B4M2318

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|-------------------|--|
| 1 | CHECK INSTALLATION OF VDCCM CONNECTOR. Turn ignition switch to OFF. | Is VDCCM connector inserted into VDCCM until the clamp locks onto it? | Go to step 2. | Insert VDCCM connector into VDCCM until the clamp locks onto it. |
| 2 | CHECK DIAGNOSIS TERMINAL. Measure resistance between diagnosis terminals (B81) and chassis ground. <i>Terminals</i> <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 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. 8. 3) Disconnect connector from VDCCM. 4) Measure resistance between VDCCM connector and chassis ground. <i>Connector & terminal</i> <i>(F87) No. 13 — Chassis ground:</i> | Is the resistance less than 0.5 Ω ? | Go to step 4. | Repair harness connector between VDCCM and diagnosis connector. |
| 4 | CHECK WIRING HARNESS. 1) Place a sheet of thick paper [thickness 1.5 mm (0.059 in)] in switch area of VDCCM connector. 2) Turn ignition switch to ON. | Do the ABS warning light and VDC warning light remain off? | Go to step 5. | Repair front wiring harness. |
| 5 | CHECK PROJECTION AT VDCCM. 1) Turn ignition switch to OFF. 2) Check for broken projection at the VDCCM terminal. | Are the projection broken? | Go to step 6. | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> |
| 6 | CHECK POWER SUPPLY OF VDCCM. 1) Disconnect connector from VDCCM. 2) Start engine. 3) Idle the engine. 4) Measure voltage between VDCCM connector and chassis ground. <i>Connector & terminal</i> <i>(F87) No. 28 (+) — Chassis ground (-):</i> | Is the voltage between 10 and 15 V? | Go to step 7. | Repair VDCCM power supply circuit. |
| 7 | CHECK POOR CONTACT IN VDCCM CONNECTOR. | Is there poor contact in VDCCM connector? | Repair connector. | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

MEMO:

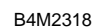
VDC-41

VDC (DIAGNOSTICS)

DIAGNOSIS:

- ### TROUBLE SYMPTOM:

- ### WIRING DIAGRAM:



DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|------------------------|
| 1 | CHECK WIRING HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect VDCCM connector from VDCCM. 3) Turn ignition switch to ON. | Does the VDC operating indicator light remain off? | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Repair wiring harness. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

D: VDC OFF INDICATOR LIGHT DOES NOT GO OFF. S005522E52

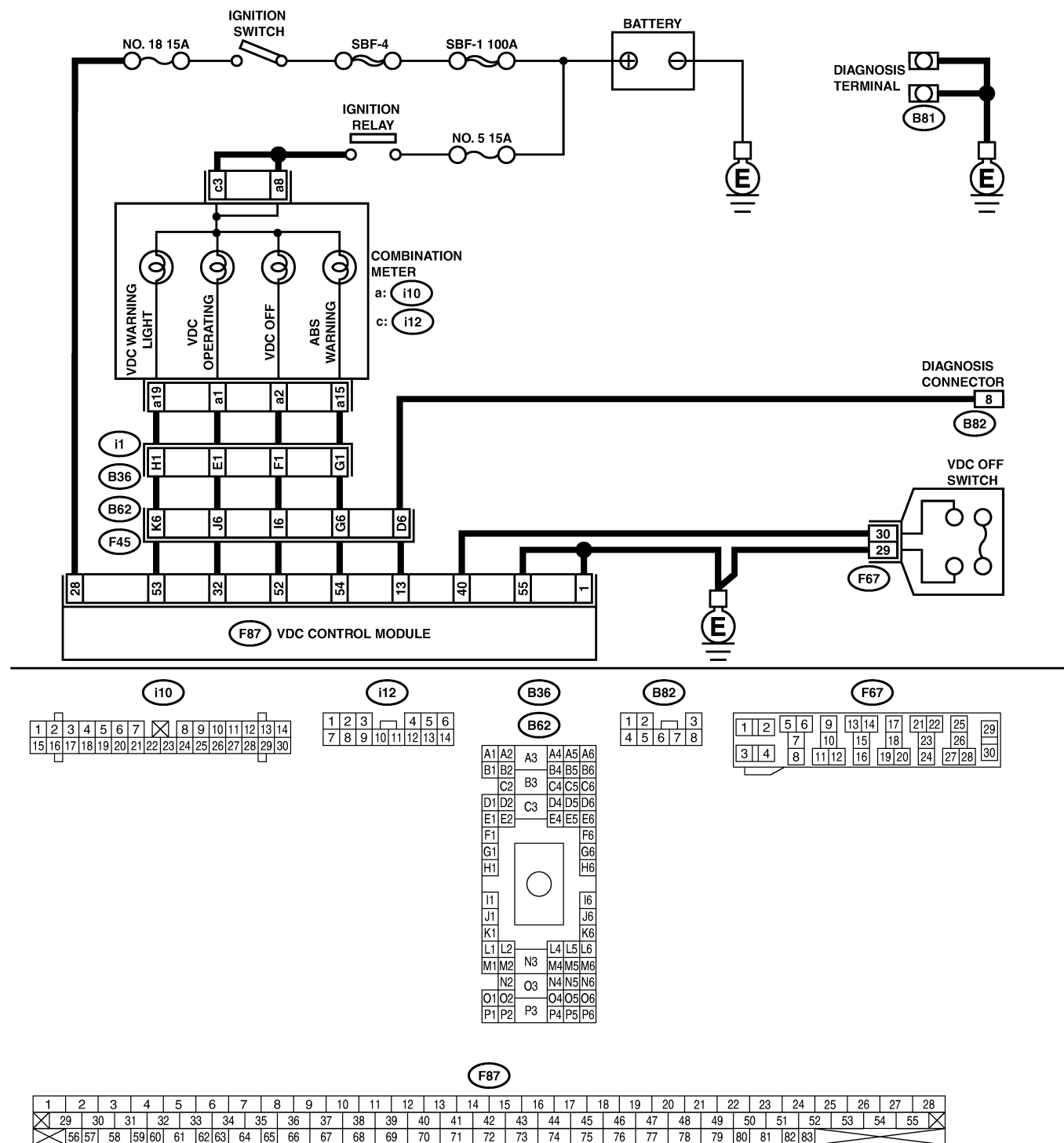
DIAGNOSIS:

- VDC OFF indicator light circuit is open or shorted.
- VDC OFF switch is shorted.

TROUBLE SYMPTOM:

- When starting the engine and while VDC OFF indicator light is kept ON.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|--|--------------------------------|
| 1 | CHECK VDC OFF SWITCH. 1) Turn ignition switch to OFF. 2) Check VDC OFF switch. | Is fuse installed to VDC OFF switch? | Remove fuse. | Go to step 2. |
| 2 | CHECK ENGINE COOLANT TEMPERATURE. | Does VDC OFF indicator light come on when engine coolant temperature is too low? Does it go out after engine has warmed up? | The VDC is normal. | Go to step 3. |
| 3 | CHECK BRAKE. | Does VDC OFF indicator light come on after frequent brake pedal operation? | VDC is normal. Stop vehicle and wait until brakes cool down. | Go to step 4. |
| 4 | CHECK WIRING HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect VDCCM connector from VDCCM. 3) Turn ignition switch to ON. | Does the VDC OFF indicator light remain off? | Go to step 5. | Repair wiring harness. |
| 5 | CHECK VDC OFF SWITCH LINE. 1) Disconnect fuse from VDC OFF switch. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 40 — Chassis ground: | Is the resistance more than 1 MΩ? | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Repair VDC OFF switch circuit. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

E: TROUBLE CODE DOES NOT APPEAR. S005522E50

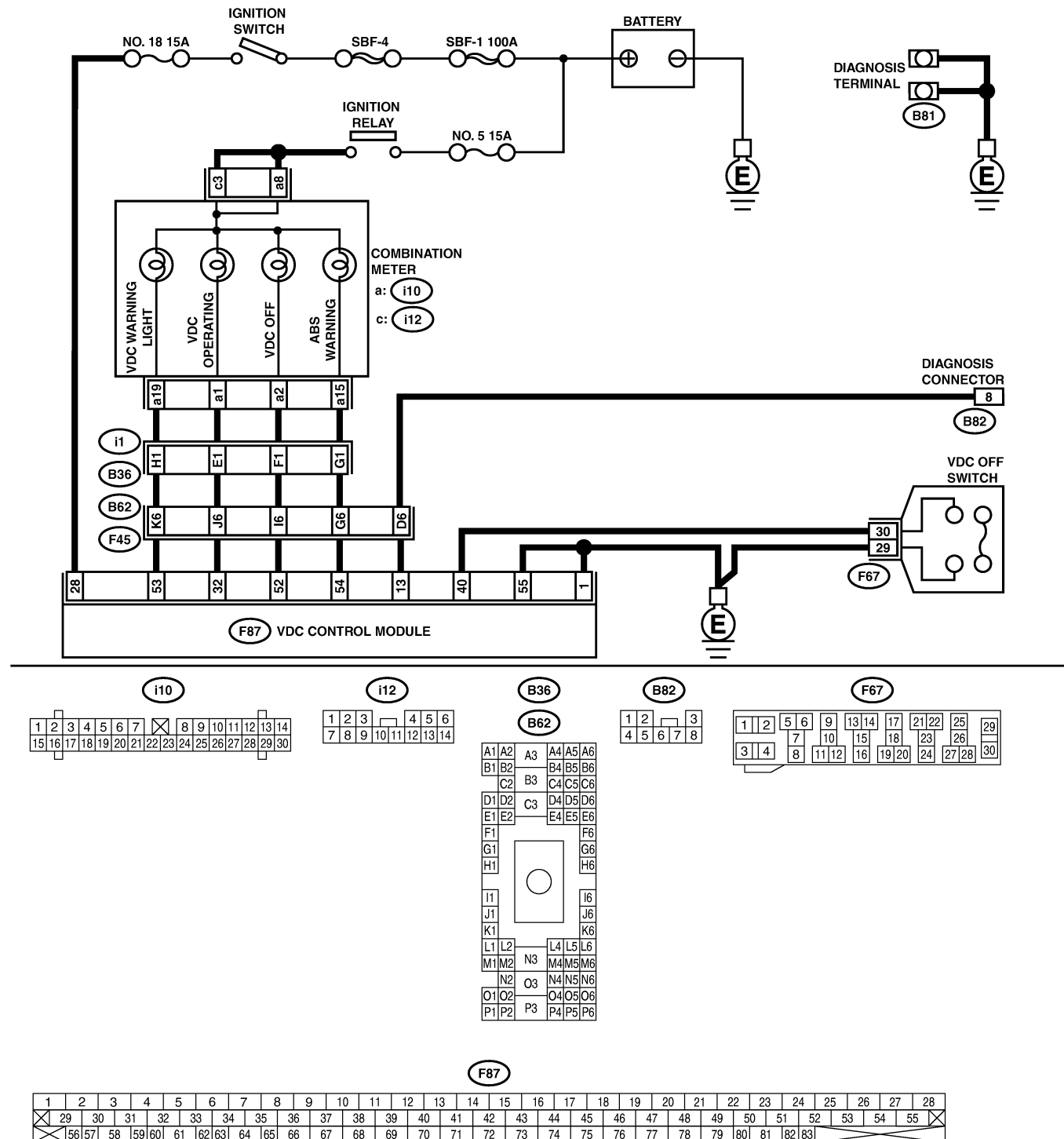
DIAGNOSIS:

- 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:



B4M2318

VDC-46

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|-------------------|---|
| 1 | CHECK DIAGNOSIS TERMINAL. Measure resistance between diagnosis terminals (B81) and chassis ground. <i>Terminals</i> <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. 8. 3) Disconnect connector from VDCCM. 4) Measure resistance between VDCCM connector and chassis ground. <i>Connector & terminal</i> <i>(F87) No. 13 — Chassis ground:</i> | Is the resistance less than 0.5 Ω ? | Go to step 3. | Repair harness connector between VDCCM and diagnosis connector. |
| 3 | CHECK POOR CONTACT IN VDCCM CONNECTOR. | Is there poor contact in VDCCM connector? | Repair connector. | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

F: TROUBLE CODE 21 (FRONT RH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH)

S005522C46

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to VDC-48 TROUBLE CODE 27 (REAR LH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH), Diagnostics Chart with Diagnosis Connector.>

G: TROUBLE CODE 23 (FRONT LH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH)

S005522C57

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to VDC-48 TROUBLE CODE 27 (REAR LH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH), Diagnostics Chart with Diagnosis Connector.>

H: TROUBLE CODE 25 (REAR RH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH)

S005522C67

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to VDC-48 TROUBLE CODE 27 (REAR LH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH), Diagnostics Chart with Diagnosis Connector.>

I: TROUBLE CODE 27 (REAR LH) ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH)

S005522C75

DIAGNOSIS:

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

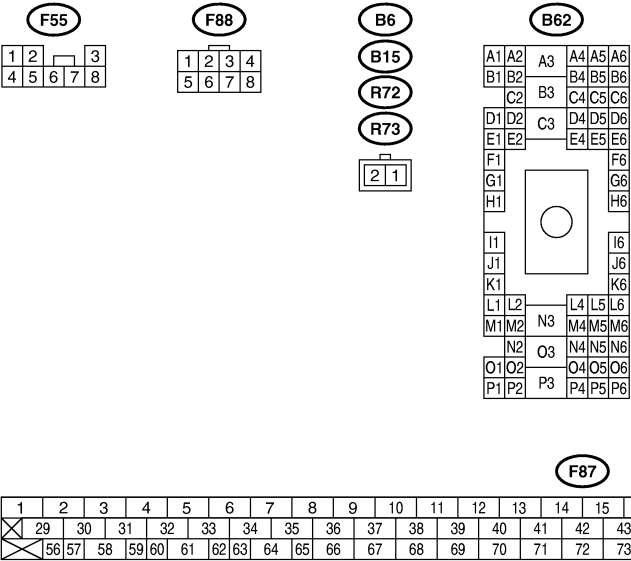
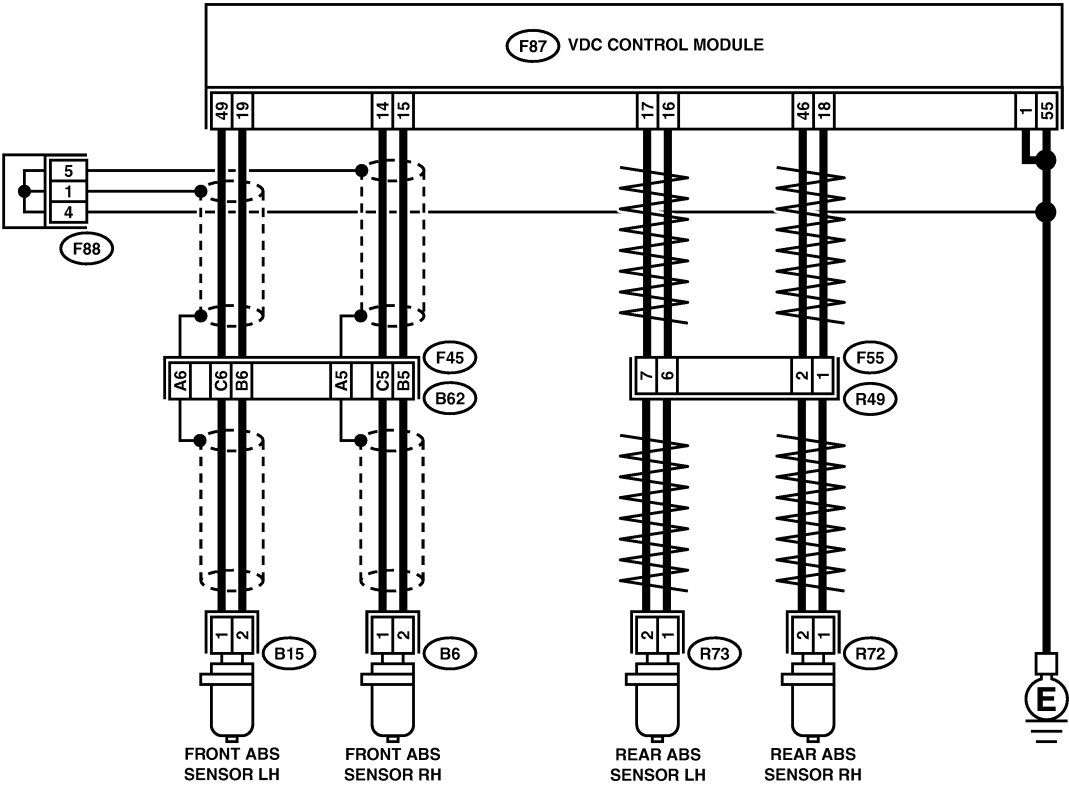
TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



B4M2319

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---------------|--|
| 1 | CHECK ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ABS sensor. 3) Measure resistance of ABS sensor connector terminals. Terminal <i>Front RH No. 1 — No. 2:</i> <i>Front LH No. 1 — No. 2:</i> <i>Rear RH No. 1 — No. 2:</i> <i>Rear LH No. 1 — No. 2:</i> | Is the resistance between 1.0 and 1.5 k Ω ? | Go to step 2. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |
| 2 | CHECK BATTERY SHORT OF ABS SENSOR. 1) Disconnect connector from VDCCM. 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 3. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |
| 3 | 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 4. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |
| 4 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ABS SENSOR. 1) Turn ignition switch to OFF. 2) Connect connector to ABS sensor. 3) Measure resistance between VDCCM connector terminals. Connector & terminal <i>Trouble code 21 / (F87) No. 14 — No. 15:</i> <i>Trouble code 23 / (F87) No. 49 — No. 19:</i> <i>Trouble code 25 / (F87) No. 18 — No. 46:</i> <i>Trouble code 27 / (F87) No. 16 — No. 17:</i> | Is the resistance between 1.0 and 1.5 k Ω ? | Go to step 5. | Repair harness/connector between VDCCM and ABS sensor. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 5 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 21 / (F87) No. 14 (+) — Chassis ground (-):</i> <i>Trouble code 23 / (F87) No. 49 (+) — Chassis ground (-):</i> <i>Trouble code 25 / (F87) No. 18 (+) — Chassis ground (-):</i> <i>Trouble code 27 / (F87) No. 16 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 6. | Repair harness between VDCCM and ABS sensor. |
| 6 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 21 / (F87) No. 14 (+) — Chassis ground (-):</i> <i>Trouble code 23 / (F87) No. 49 (+) — Chassis ground (-):</i> <i>Trouble code 25 / (F87) No. 18 (+) — Chassis ground (-):</i> <i>Trouble code 27 / (F87) No. 16 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 7. | Repair harness between VDCCM and ABS sensor. |
| 7 | CHECK INSTALLATION OF ABS SENSOR. Tightening torque: 32±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 8. | Tighten ABS sensor installation bolts securely. |
| 8 | 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 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 9. | 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. |
| 9 | CHECK HUB AND TONE WHEEL RUNOUT. Measure hub and tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 10. | Repair hub and tone wheel. Front <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-33 Rear Tone Wheel.> |
| 10 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and ABS sensor? | Repair connector. | Go to step 11. |
| 11 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Go to step 12. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---------------------------------------|---|--|
| 12 | 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 VDCCM and ABS sensor. |

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

J: TROUBLE CODE 22 (FRONT RH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) S005522C52

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to VDC-54 TROUBLE CODE 28 (REAR LH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL), Diagnostics Chart with Diagnosis Connector.>

K: TROUBLE CODE 24 (FRONT LH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) S005522C62

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to VDC-54 TROUBLE CODE 28 (REAR LH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL), Diagnostics Chart with Diagnosis Connector.>

L: TROUBLE CODE 26 (REAR RH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) S005522C71

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to VDC-54 TROUBLE CODE 28 (REAR LH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL), Diagnostics Chart with Diagnosis Connector.>

M: TROUBLE CODE 28 (REAR LH) ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) S005522C80

DIAGNOSIS:

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

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|---|
| 1 | CHECK INSTALLATION OF ABS SENSOR. <i>Tightening torque:</i> 32±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 2. | Tighten ABS sensor installation bolts securely. |
| 2 | 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> 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 3. | 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. |
| 3 | CHECK OSCILLOSCOPE. | Is an oscilloscope available? | Go to step 4. | Go to step 5. |
| 4 | CHECK ABS SENSOR SIGNAL. 1) Raise all four wheels of ground. 2) Turn ignition switch OFF. 3) Remove VDCCM connector cover. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect the oscilloscope to the connector. 5) Turn ignition switch ON. 6) Rotate wheels and measure voltage at specified frequency. NOTE: When this inspection is completed, the VDCCM sometimes stores the trouble code 29. <i>Connector & terminal</i> <i>Trouble code 22 / (F87) No. 14 (+) — No. 15 (-):</i> <i>Trouble code 24 / (F87) No. 49 (+) — No. 19 (-):</i> <i>Trouble code 26 / (F87) No. 18 (+) — No. 46 (-):</i> <i>Trouble code 28 / (F87) No. 16 (+) — No. 17 (-):</i> | Is oscilloscope pattern smooth, as shown in figure? | Go to step 8. | Go to step 5. |
| 5 | 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 6. |
| 6 | 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. Front <Ref. to VDC-30 Front ABS Sensor.> and <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-31 Rear ABS Sensor.> and <Ref. to VDC-33 Rear Tone Wheel.> | Go to step 7. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|----------------|--|
| 7 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 8. | Repair tone wheel. Front <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-33 Rear Tone Wheel.> |
| 8 | CHECK RESISTANCE OF ABS SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from ABS sensor. 3) Measure resistance between ABS sensor connector terminals. Terminal Front RH No. 1 — No. 2: Front LH No. 1 — No. 2: Rear RH No. 1 — No. 2: Rear LH No. 1 — No. 2: | Is the resistance between 1.0 and 1.5 kΩ? | Go to step 9. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |
| 9 | 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 10. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |
| 10 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ABS SENSOR. 1) Connect connector to ABS sensor. 2) Disconnect connector from VDCCM. 3) Measure resistance at VDCCM connector terminals. Connector & terminal Trouble code 22 / (F87) No. 14 — No. 15: Trouble code 24 / (F87) No. 49 — No. 19: Trouble code 26 / (F87) No. 18 — No. 46: Trouble code 28 / (F87) No. 16 — No. 17: | Is the resistance between 1.0 and 1.5 kΩ? | Go to step 11. | Repair harness/connector between VDCCM and ABS sensor. |
| 11 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM connector and chassis ground. Connector & terminal Trouble code 22 / (F87) No. 14 — Chassis ground: Trouble code 24 / (F87) No. 49 — Chassis ground: Trouble code 26 / (F87) No. 18 — Chassis ground: Trouble code 28 / (F87) No. 16 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 12. | Repair harness/connector between VDCCM and ABS sensor. |
| 12 | CHECK GROUND CIRCUIT OF VDCCM. Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 1 — Chassis ground: (F87) No. 55 — Chassis ground: | Is the resistance less than 0.5 Ω? | Go to step 13. | Repair VDCCM ground harness. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|--|---|
| 13 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and ABS sensor? | Repair connector. | Go to step 14. |
| 14 | CHECK SOURCES OF SIGNAL NOISE. | Is the car telephone or the wireless transmitter properly installed? | Go to step 15. | Properly install the car telephone or the wireless transmitter. |
| 15 | 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 16. |
| 16 | CHECK SHIELD CIRCUIT. 1) Connect all connectors. 2) Measure resistance between shield connector and chassis ground. Connector & terminal Trouble code 22 / (B62) No. A5 — Chassis ground: Trouble code 24 / (B62) No. A6 — Chassis ground: NOTE: For the trouble code 26 and 28, Go to step 17. | Is the resistance less than 0.5 Ω ? | Go to step 17. | Repair shield harness. |
| 17 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Go to step 18. |
| 18 | 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 DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

N: TROUBLE CODE 29 ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) S005522C84

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.
- VDC does not operate.

VDC (DIAGNOSTICS)

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| 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 VDC 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±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 6. | Tighten ABS sensor installation bolts securely. |
| 6 | 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> 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 7. | 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. |
| 7 | CHECK OSCILLOSCOPE. | Is an oscilloscope available? | Go to step 8. | Go to step 9. |
| 8 | CHECK ABS SENSOR SIGNAL. 1) Raise all four wheels of ground. 2) Turn ignition switch OFF. 3) Remove VDCCM connector cover. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect the oscilloscope to the connector. 5) Turn ignition switch ON. 6) Rotate wheels and measure voltage at specified frequency. NOTE: When this inspection is completed, the VDCCM sometimes stores the trouble code 29. Connector & terminal (F87) No. 14 (+) — No. 15 (-) (Front RH): (F87) No. 49 (+) — No. 19 (-) (Front LH): (F87) No. 18 (+) — No. 46 (-) (Rear RH): (F87) No. 16 (+) — No. 17 (-) (Rear LH): | Is oscilloscope pattern smooth, as shown in figure? | Go to step 12. | Go to step 9. |

VDC-62

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 9 | 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 10. |
| 10 | 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. Front <Ref. to VDC-30 Front ABS Sensor.> and <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-31 Rear ABS Sensor.> and <Ref. to VDC-33 Rear Tone Wheel.> | Go to step 11. |
| 11 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 12. | Repair tone wheel. Front <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-33 Rear Tone Wheel.> |
| 12 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

O: TROUBLE CODE 31 (FRONT RH INLET) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S)

S005522C90

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-64 TROUBLE CODE 62 (SECONDARY CUT) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

P: TROUBLE CODE 33 (FRONT LH INLET) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S)

S005522D00

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-64 TROUBLE CODE 62 (SECONDARY CUT) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

Q: TROUBLE CODE 35 (REAR RH INLET) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S)

S005522D09

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-64 TROUBLE CODE 62 (SECONDARY CUT) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

R: TROUBLE CODE 37 (REAR LH INLET) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S)

S005522D18

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-64 TROUBLE CODE 62 (SECONDARY CUT) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

S: TROUBLE CODE 61 (PRIMARY CUT) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S)

S005522D76

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-64 TROUBLE CODE 62 (SECONDARY CUT) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

T: TROUBLE CODE 62 (SECONDARY CUT) ABNORMAL INLET AND CUT SOLENOID VALVE CIRCUIT(S)

S005522D77

DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in VDCH/U

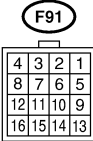
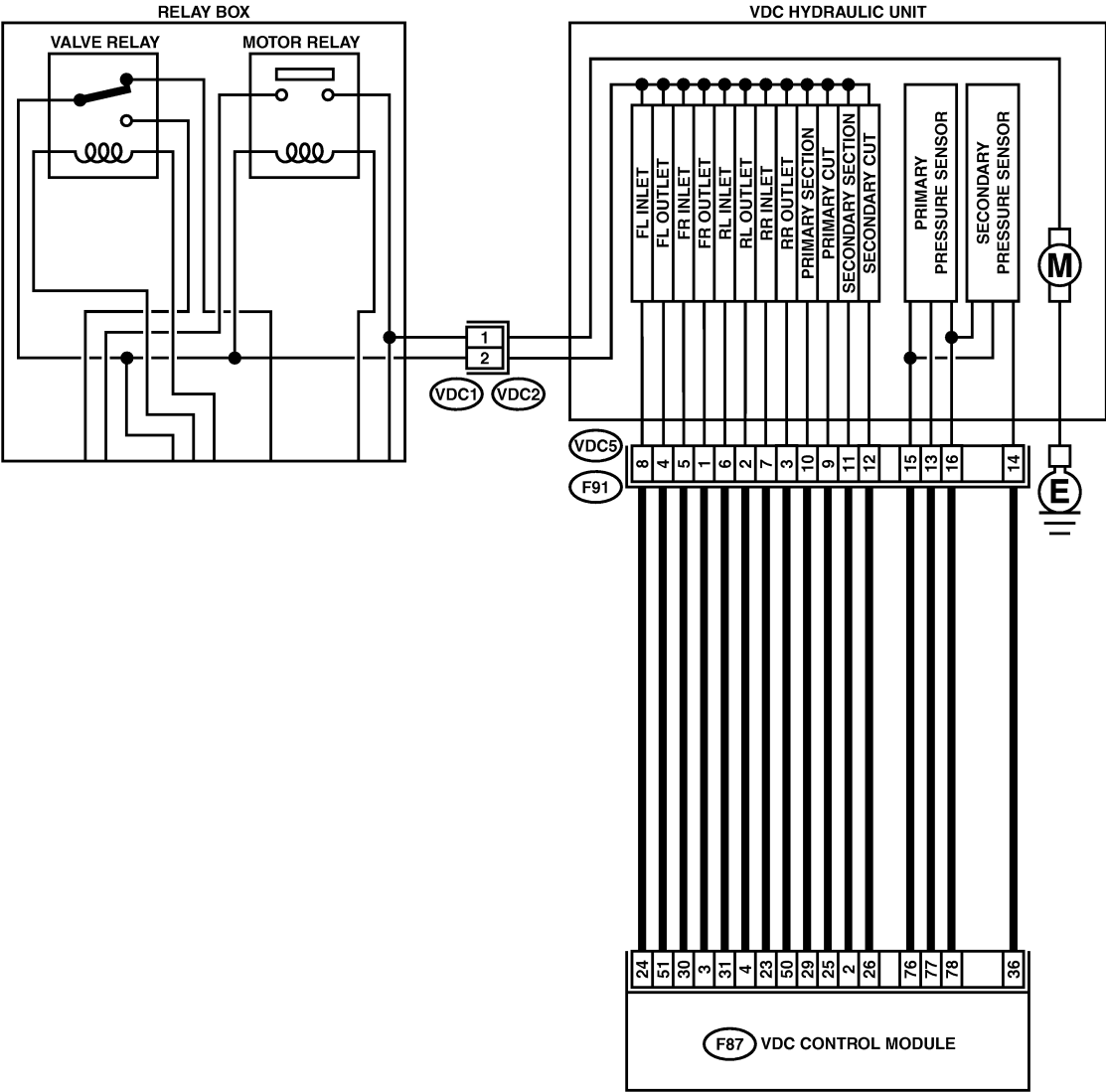
TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

B4M2320

VDC-65

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---------------|--|
| 1 | CHECK RESISTANCE OF SOLENOID VALVE. 1) Turn ignition switch to OFF. 2) Disconnect two connectors (VDC1, F91) from VDCH/U. 3) Measure resistance between VDCH/U connector terminals. Connector & terminal <i>Trouble code 31/(VDC5) No. 5 — (VDC2) No. 2:</i> <i>Trouble code 33/(VDC5) No. 8 — (VDC2) No. 2:</i> <i>Trouble code 35/(VDC5) No. 7 — (VDC2) No. 2:</i> <i>Trouble code 37/(VDC5) No. 6 — (VDC2) No. 2:</i> <i>Trouble code 61/(VDC5) No. 9 — (VDC2) No. 2:</i> <i>Trouble code 62/(VDC5) No. 12 — (VDC2) No. 2:</i> | Is the resistance between 8.04 and 9.04 Ω ? | Go to step 2. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 2 | CHECK GROUND SHORT OF SOLENOID VALVE. Measure resistance between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 31/(VDC5) No. 5 — Chassis ground:</i> <i>Trouble code 33/(VDC5) No. 8 — Chassis ground:</i> <i>Trouble code 35/(VDC5) No. 7 — Chassis ground:</i> <i>Trouble code 37/(VDC5) No. 6 — Chassis ground:</i> <i>Trouble code 61/(VDC5) No. 9 — Chassis ground:</i> <i>Trouble code 62/(VDC5) No. 12 — Chassis ground:</i> | Is the resistance more than 1 M Ω ? | Go to step 3. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 3 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Disconnect connector from VDCCM. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 31/(VDC5) No. 5 (+) — Chassis ground (-):</i> <i>Trouble code 33/(VDC5) No. 8 (+) — Chassis ground (-):</i> <i>Trouble code 35/(VDC5) No. 7 (+) — Chassis ground (-):</i> <i>Trouble code 37/(VDC5) No. 6 (+) — Chassis ground (-):</i> <i>Trouble code 61/(VDC5) No. 9 (+) — Chassis ground (-):</i> <i>Trouble code 62/(VDC5) No. 12 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 4. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|-------------------------------|---------------|--|
| 4 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 31/(VDC5) No. 5 (+) — Chassis ground (-):</i> <i>Trouble code 33/(VDC5) No. 8 (+) — Chassis ground (-):</i> <i>Trouble code 35/(VDC5) No. 7 (+) — Chassis ground (-):</i> <i>Trouble code 37/(VDC5) No. 6 (+) — Chassis ground (-):</i> <i>Trouble code 61/(VDC5) No. 9 (+) — Chassis ground (-):</i> <i>Trouble code 62/(VDC5) No. 12 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 5. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 5 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 31/(F87) No. 30 (+) — Chassis ground (-):</i> <i>Trouble code 33/(F87) No. 24 (+) — Chassis ground (-):</i> <i>Trouble code 35/(F87) No. 23 (+) — Chassis ground (-):</i> <i>Trouble code 37/(F87) No. 31 (+) — Chassis ground (-):</i> <i>Trouble code 61/(F87) No. 25 (+) — Chassis ground (-):</i> <i>Trouble code 62/(F87) No. 26 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 6. | Repair harness between VDCCM and VDCH/U. |
| 6 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 31/(F87) No. 30 (+) — Chassis ground (-):</i> <i>Trouble code 33/(F87) No. 24 (+) — Chassis ground (-):</i> <i>Trouble code 35/(F87) No. 23 (+) — Chassis ground (-):</i> <i>Trouble code 37/(F87) No. 31 (+) — Chassis ground (-):</i> <i>Trouble code 61/(F87) No. 25 (+) — Chassis ground (-):</i> <i>Trouble code 62/(F87) No. 26 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 7. | Repair harness between VDCCM and VDCH/U. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 7 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 31/(F87) No. 30 — Chassis ground:</i> <i>Trouble code 33/(F87) No. 24 — Chassis ground:</i> <i>Trouble code 35/(F87) No. 23 — Chassis ground:</i> <i>Trouble code 37/(F87) No. 31 — Chassis ground:</i> <i>Trouble code 61/(F87) No. 25 — Chassis ground:</i> <i>Trouble code 62/(F87) No. 26 — Chassis ground:</i> | Is the resistance more than 1 MΩ? | Go to step 8. | Repair harness between VDCCM and VDCH/U. |
| 8 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND VDCH/U. 1) Connect connector (F91) to VDCH/U. 2) Measure resistance between VDCCM connector and VDCH/U connector. Connector & terminal <i>Trouble code 31/(F87) No. 30 — (VDC2) No. 2:</i> <i>Trouble code 33/(F87) No. 24 — (VDC2) No. 2:</i> <i>Trouble code 35/(F87) No. 23 — (VDC2) No. 2:</i> <i>Trouble code 37/(F87) No. 31 — (VDC2) No. 2:</i> <i>Trouble code 61/(F87) No. 25 — (VDC2) No. 2:</i> <i>Trouble code 62/(F87) No. 26 — (VDC2) No. 2:</i> | Is the resistance between 7 and 10 Ω? | Go to step 9. | Repair harness/connector between VDCCM and VDCH/U. |
| 9 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and VDCH/U? | Repair connector. | Go to step 10. |
| 10 | CHECK VDCCM. 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? | Repair VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

U: TROUBLE CODE 32 (FRONT RH OUTLET) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S)

S005522C96

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-70 TROUBLE CODE 64 (SECONDARY SUCTION) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

V: TROUBLE CODE 34 (FRONT LH OUTLET) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S)

S005522D05

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-70 TROUBLE CODE 64 (SECONDARY SUCTION) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

W: TROUBLE CODE 36 (REAR RH OUTLET) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S)

S005522D13

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-70 TROUBLE CODE 64 (SECONDARY SUCTION) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

X: TROUBLE CODE 38 (REAR LH OUTLET) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S)

S005522D22

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-70 TROUBLE CODE 64 (SECONDARY SUCTION) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

Y: TROUBLE CODE 63 (PRIMARY SUCTION) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S)

S005522D81

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-70 TROUBLE CODE 64 (SECONDARY SUCTION) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S), Diagnostics Chart with Diagnosis Connector.>

Z: TROUBLE CODE 64 (SECONDARY SUCTION) ABNORMAL OUTLET AND SUCTION SOLENOID VALVE CIRCUIT(S)

S005522D83

DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in VDCH/U

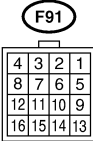
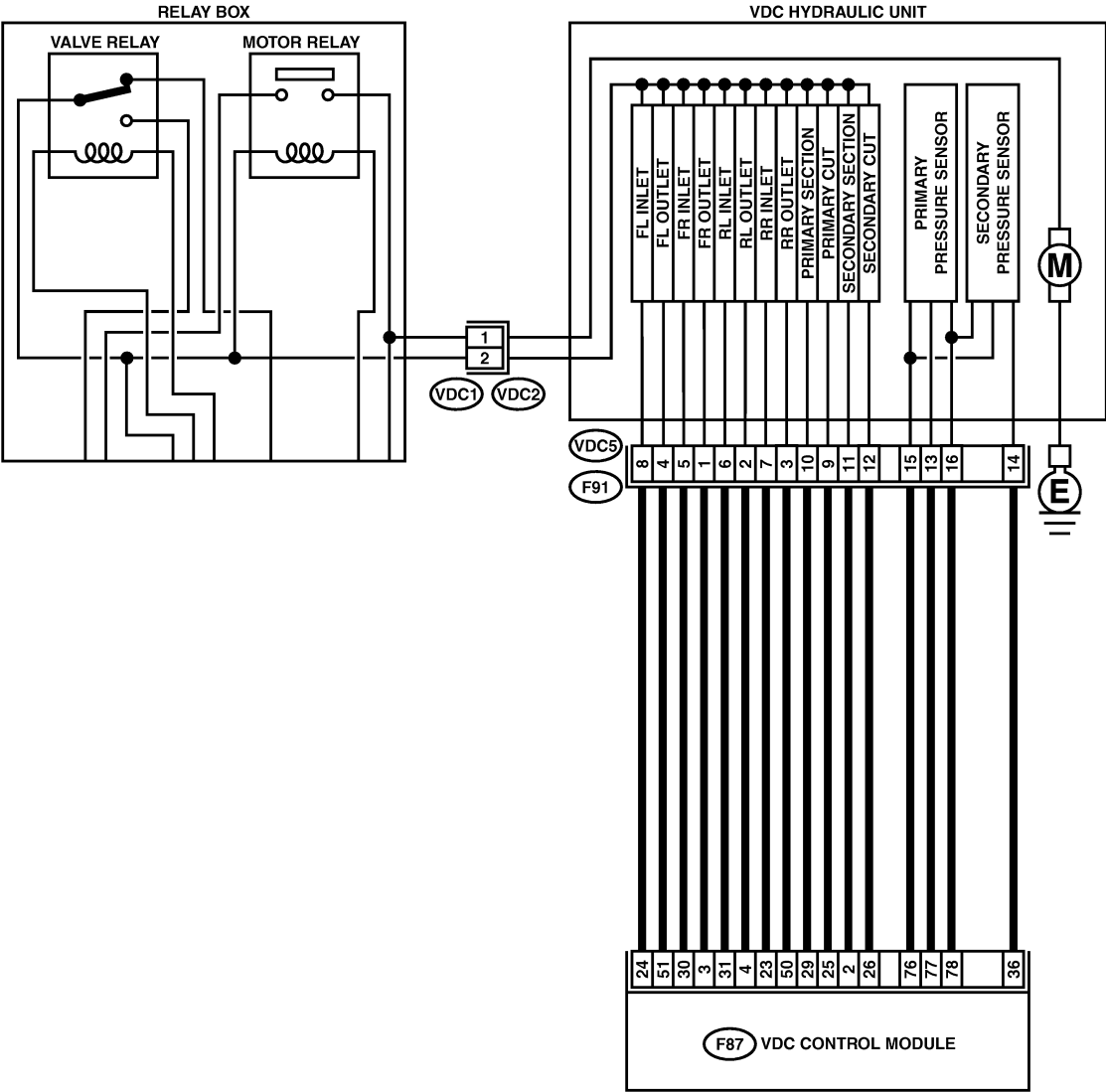
TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | |

B4M2320

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---------------|--|
| 1 | CHECK RESISTANCE OF SOLENOID VALVE. 1) Turn ignition switch to OFF. 2) Disconnect two connectors (VDC1, F91) from VDCH/U. 3) Measure resistance between VDCH/U connector terminals. Connector & terminal <i>Trouble code 32/(VDC5) No. 1 — (VDC2) No. 2:</i> <i>Trouble code 34/(VDC5) No. 4 — (VDC2) No. 2:</i> <i>Trouble code 36/(VDC5) No. 3 — (VDC2) No. 2:</i> <i>Trouble code 38/(VDC5) No. 2 — (VDC2) No. 2:</i> <i>Trouble code 63/(VDC5) No. 10 — (VDC2) No. 2:</i> <i>Trouble code 64/(VDC5) No. 11 — (VDC2) No. 2:</i> | Is the resistance between 3.8 and 4.8 Ω ? | Go to step 2. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 2 | CHECK GROUND SHORT OF SOLENOID VALVE. Measure resistance between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 32/(VDC5) No. 1 — Chassis ground:</i> <i>Trouble code 34/(VDC5) No. 4 — Chassis ground:</i> <i>Trouble code 36/(VDC5) No. 3 — Chassis ground:</i> <i>Trouble code 38/(VDC5) No. 2 — Chassis ground:</i> <i>Trouble code 63/(VDC5) No. 10 — Chassis ground:</i> <i>Trouble code 64/(VDC5) No. 11 — Chassis ground:</i> | Is the resistance more than 1 M Ω ? | Go to step 3. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 3 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Disconnect connector from VDCCM. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 32/(VDC5) No. 1 (+) — Chassis ground (-):</i> <i>Trouble code 34/(VDC5) No. 4 (+) — Chassis ground (-):</i> <i>Trouble code 36/(VDC5) No. 3 (+) — Chassis ground (-):</i> <i>Trouble code 38/(VDC5) No. 2 (+) — Chassis ground (-):</i> <i>Trouble code 63/(VDC5) No. 10 (+) — Chassis ground (-):</i> <i>Trouble code 64/(VDC5) No. 11 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 4. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|-------------------------------|---------------|--|
| 4 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 32/(VDC5) No. 1 (+) — Chassis ground (-):</i> <i>Trouble code 34/(VDC5) No. 4 (+) — Chassis ground (-):</i> <i>Trouble code 36/(VDC5) No. 3 (+) — Chassis ground (-):</i> <i>Trouble code 38/(VDC5) No. 2 (+) — Chassis ground (-):</i> <i>Trouble code 63/(VDC5) No. 10 (+) — Chassis ground (-):</i> <i>Trouble code 64/(VDC5) No. 11 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 5. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 5 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 32/(F87) No. 3 (+) — Chassis ground (-):</i> <i>Trouble code 34/(F87) No. 51 (+) — Chassis ground (-):</i> <i>Trouble code 36/(F87) No. 50 (+) — Chassis ground (-):</i> <i>Trouble code 38/(F87) No. 4 (+) — Chassis ground (-):</i> <i>Trouble code 63/(F87) No. 29 (+) — Chassis ground (-):</i> <i>Trouble code 64/(F87) No. 2 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 6. | Repair harness between VDCCM and VDCH/U. |
| 6 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 32/(F87) No. 3 (+) — Chassis ground (-):</i> <i>Trouble code 34/(F87) No. 51 (+) — Chassis ground (-):</i> <i>Trouble code 36/(F87) No. 50 (+) — Chassis ground (-):</i> <i>Trouble code 38/(F87) No. 4 (+) — Chassis ground (-):</i> <i>Trouble code 63/(F87) No. 29 (+) — Chassis ground (-):</i> <i>Trouble code 64/(F87) No. 2 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 7. | Repair harness between VDCCM and VDCH/U. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 7 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 32/(F87) No. 3 — Chassis ground:</i> <i>Trouble code 34/(F87) No. 51 — Chassis ground:</i> <i>Trouble code 36/(F87) No. 50 — Chassis ground:</i> <i>Trouble code 38/(F87) No. 4 — Chassis ground:</i> <i>Trouble code 63/(F87) No. 29 — Chassis ground:</i> <i>Trouble code 64/(F87) No. 2 — Chassis ground:</i> | Is the resistance more than 1 MΩ? | Go to step 8. | Repair harness between VDCCM and VDCH/U. |
| 8 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND VDCH/U. 1) Connect connector (F91) to VDCH/U. 2) Measure resistance between VDCCM connector and VDCH/U connector. Connector & terminal <i>Trouble code 32/(F87) No. 3 — (VDC2) No. 1:</i> <i>Trouble code 34/(F87) No. 51 — (VDC2) No. 1:</i> <i>Trouble code 36/(F87) No. 50 — (VDC2) No. 1:</i> <i>Trouble code 38/(F87) No. 4 — (VDC2) No. 1:</i> <i>Trouble code 63/(F87) No. 29 — (VDC2) No. 1:</i> <i>Trouble code 64/(F87) No. 2 — (VDC2) No. 1:</i> | Is the resistance between 3 and 6 Ω? | Go to step 9. | Repair harness/connector between VDCCM and VDCH/U. |
| 9 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and VDCH/U? | Repair connector. | Go to step 10. |
| 10 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

AA: TROUBLE CODE 41 ABNORMAL VDC CONTROL MODULE S005522D30

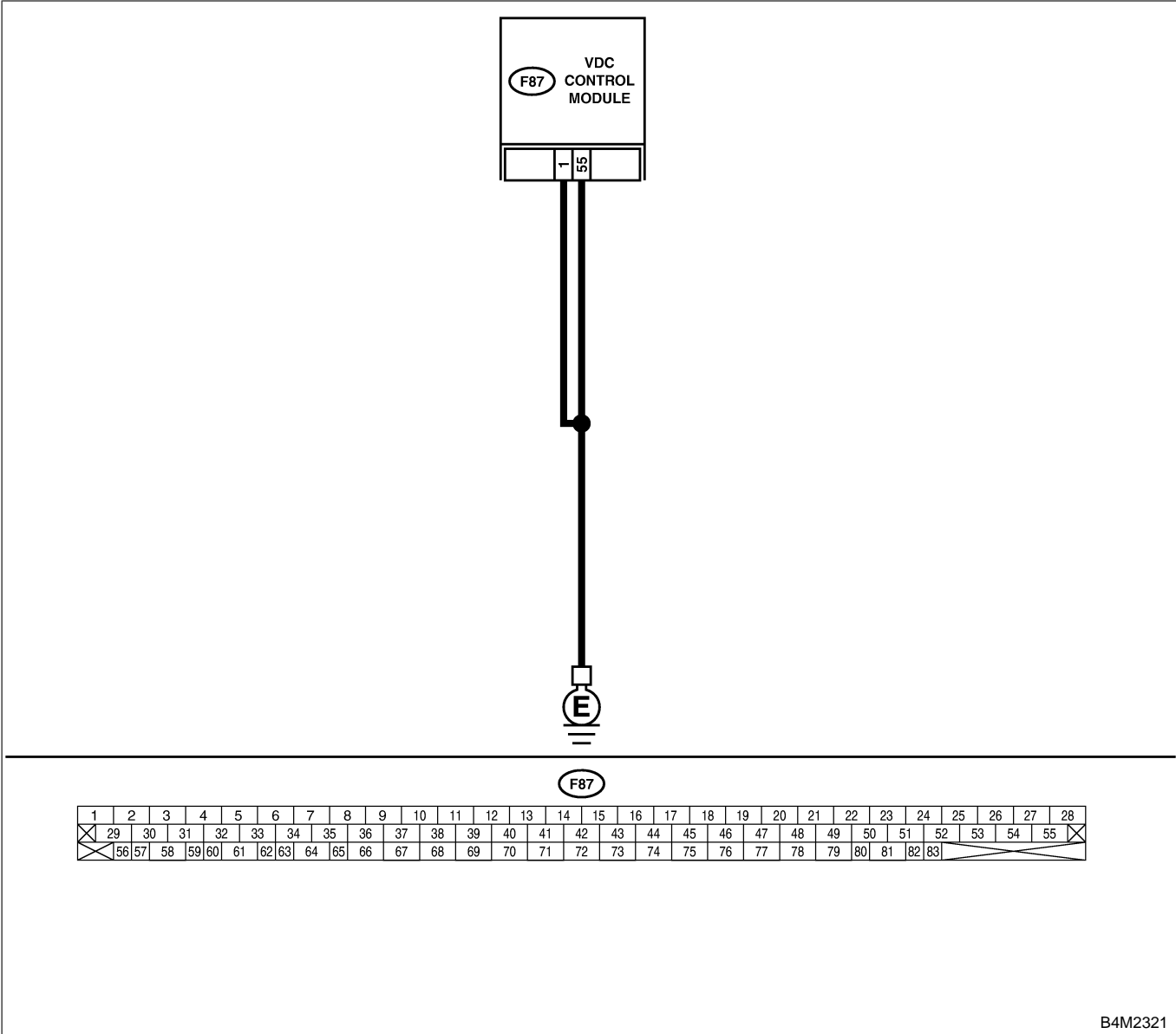
DIAGNOSIS:

- Faulty VDCCM

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---|---|
| 1 | CHECK GROUND CIRCUIT OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 1 — Chassis ground: (F87) No. 55 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Go to step 2. | Repair VDCCM ground harness. |
| 2 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between battery, ignition switch and VDCCM? | 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 VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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

VDC (DIAGNOSTICS)

AB: TROUBLE CODE 42 SOURCE VOLTAGE IS ABNORMAL. S005522D37

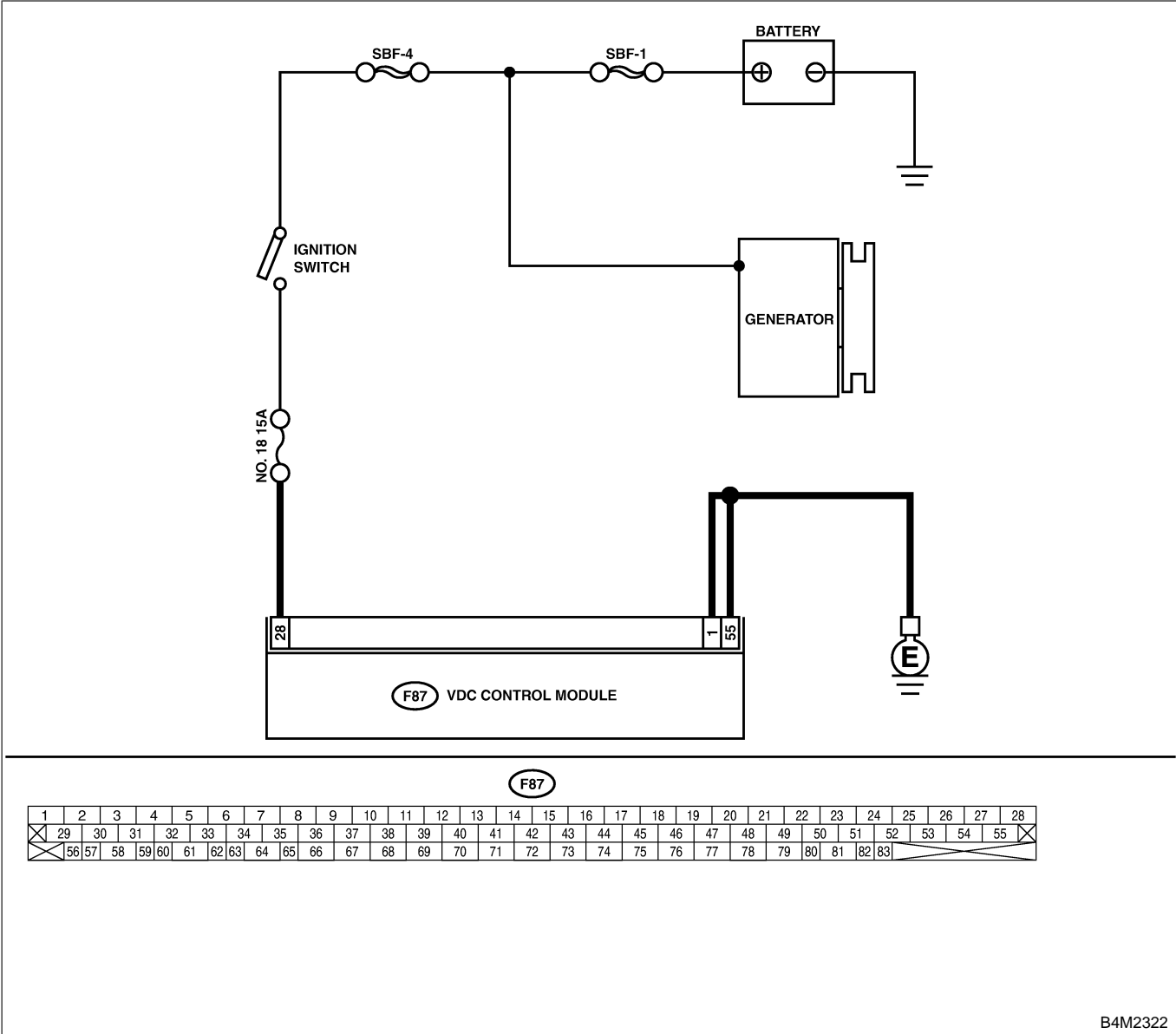
DIAGNOSIS:

- Power source voltage of the VDCCM is low.

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| 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 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 VDCCM. 1) Disconnect connector from VDCCM. 2) Run the engine at idle. 3) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 28 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 4. | Repair harness connector between battery, ignition switch and VDCCM. |
| 4 | CHECK GROUND CIRCUIT OF VDCCM. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 1 — Chassis ground: (F87) No. 55 — Chassis ground: | Is the resistance less than 0.5 Ω? | Go to step 5. | Repair VDCCM ground harness. |
| 5 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between generator, battery and VDCCM? | Repair connector. | Go to step 6. |
| 6 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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

VDC (DIAGNOSTICS)

AC: TROUBLE CODE 43 FAULTY VDCCM — ECM COMMUNICATION LINE

S005522D41

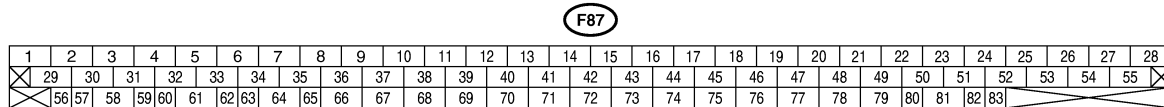
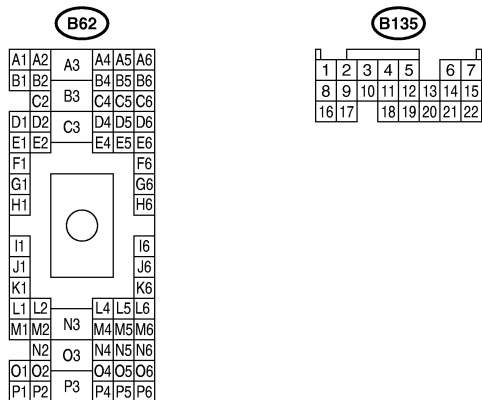
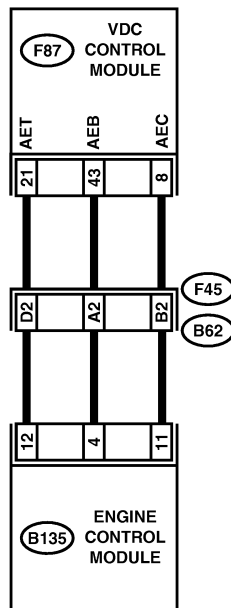
DIAGNOSIS:

- AET communication line is broken or short circuited.
- AEB communication line is broken or short circuited.
- AEC communication line is broken or short circuited.

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2323

VDC-80

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|---|
| 1 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Disconnect connector from ECM. 4) Measure resistance between VDCCM connector and ECM. Terminal (F87) No. 21 — (B135) No. 12: (F87) No. 43 — (B135) No. 4: (F87) No. 8 — (B135) No. 11: | Is the resistance less than 0.5 Ω ? | Go to step 2. | Repair harness/connector between VDCCM and ECM. |
| 2 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM connector and chassis ground. Terminal (F87) No. 21 — Chassis ground: (F87) No. 43 — Chassis ground: (F87) No. 8 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 3. | Repair harness/connector between VDCCM and ECM. |
| 3 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM connector and chassis ground. Terminal (F87) No. 21 (+) — Chassis ground (-): (F87) No. 43 (+) — Chassis ground (-): (F87) No. 8 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 4. | Repair harness/connector between VDCCM and ECM. |
| 4 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Terminal (F87) No. 21 (+) — Chassis ground (-): (F87) No. 43 (+) — Chassis ground (-): (F87) No. 8 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 5. | Repair harness/connector between VDCCM and ECM. |
| 5 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Connect connector to ECM. 3) Turn ignition switch to ON. 4) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 21 (+) — Chassis ground (-): (F87) No. 43 (+) — Chassis ground (-): (F87) No. 8 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 6. | Go to step 9. |
| 6 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between ECM and VDCCM? | Repair connector. | Go to step 7. |
| 7 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---|----------------|
| 9 | CHECK ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM connector terminal and chassis ground. Connector & terminal (B135) No. 12 (+) — Chassis ground (-): (B135) No. 4 (+) — Chassis ground (-): (B135) No. 11 (+) — Chassis ground (-): | Is the voltage between 10 V and 15 V? | Repair harness/connector between ECM and VDCCM. | Go to step 10. |
| 10 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector ECM? | Repair connector. | Go to step 11. |
| 11 | CHECK ENGINE. | Is the engine functioning normally? | Replace ECM. | Repair engine. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

AD: TROUBLE CODE 44 A COMMUNICATION WITH AT CONTROL ABNORMAL

S005522D43

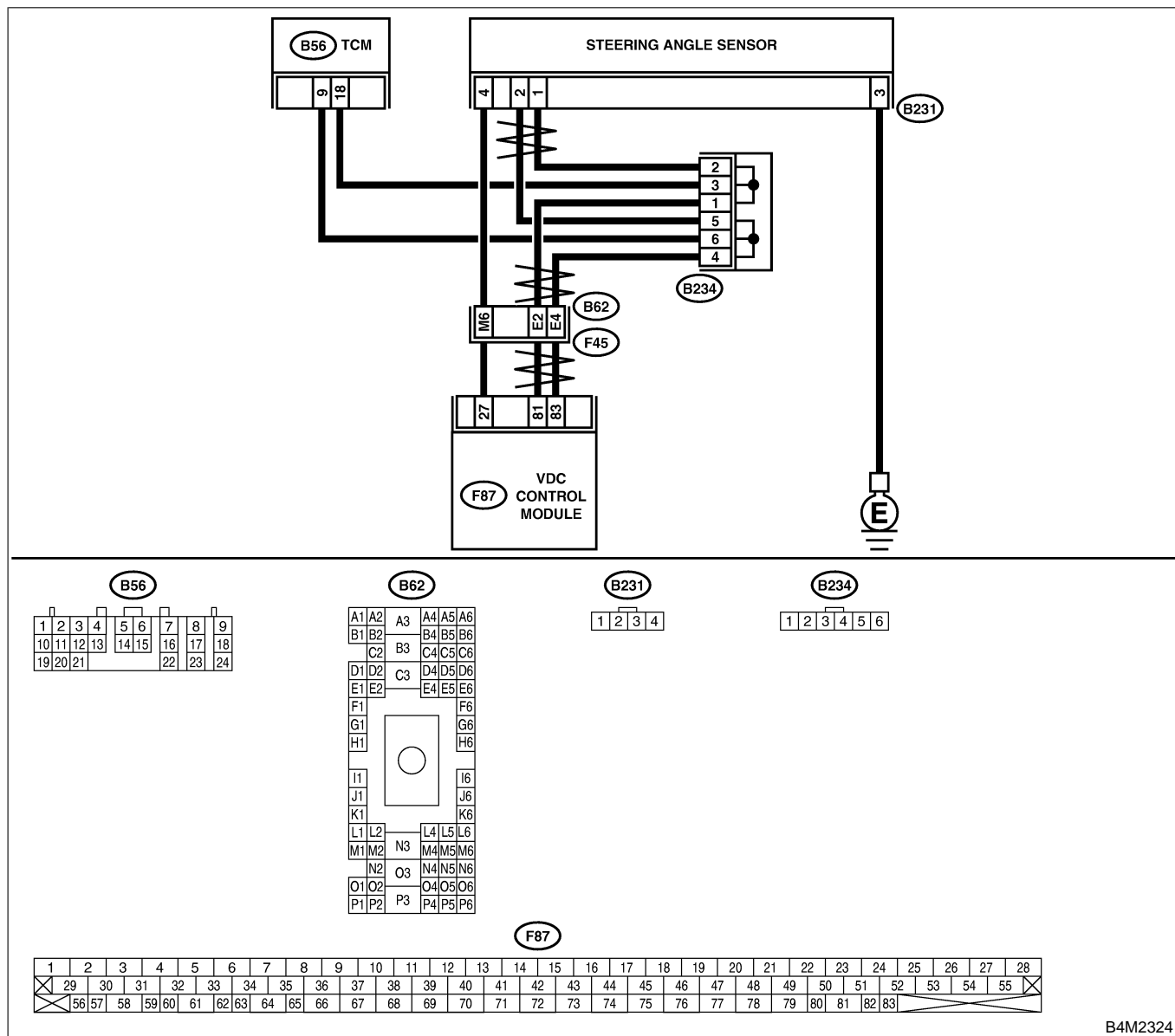
DIAGNOSIS:

- Communication with AT control faults

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2324

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--|---------------------------------------|
| 1 | CHECK RESISTANCE OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect two connectors from TCM. 3) Measure resistance between TCM connector terminals. <i>Connector & terminal</i> <i>(B56) No. 9 — No. 18:</i> | Is the resistance $60 \pm 3 \Omega$? | Go to step 2. | Repair harness between TCM and VDCCM. |
| 2 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in TCM connectors? | Repair connector. | Go to step 3. |
| 3 | CHECK TCM. 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 TCM. <Ref. to AT-42 Transmission Control Module (TCM).> | 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. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

AE: TROUBLE CODE 45 CONTROL MODULE OUT OF SPECIFICATION

S005522D46

DIAGNOSIS:

- Control module out of specification

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

| No. | Step | Check | Yes | No |
|-----|---|---|---|---|
| 1 | CHECK TCM. | Is the same trouble code as in the current diagnosis still being output? | Go to step 2. | Proceed with the diagnosis corresponding to the trouble code. |
| 2 | CHECK VDCCM SPECIFICATIONS. Check the VDCCM identification mark. VDCCM identification mark E1 | Does the VDCCM identification mark agree with the vehicle specifications? | Go to step 3. | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> |
| 3 | CHECK TCM SPECIFICATIONS. Check the TCM identification mark. TCM identification mark XD | Does the TCM identification mark agree with the vehicle specifications? | Go to step 4. | Replace TCM. <Ref. to AT-42 Transmission Control Module (TCM).> |
| 4 | CHECK TCM. 1) Replace TCM. <Ref. to AT-42 Transmission Control Module (TCM).> 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? | Go to step 5. | The original TCM has been faulty. |
| 5 | CHECK VDCCM. 1) Install original TCM. 2) Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> 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? | Go to step 6. | The original VDCCM has been faulty. |
| 6 | CHECK VDCCM. | Is the same trouble code as in the current diagnosis still being output? | Replace TCM. <Ref. to AT-42 Transmission Control Module (TCM).> | Proceed with the diagnosis corresponding to the trouble code. |

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

AF: TROUBLE CODE 46 ABNORMAL VOLTAGE OF 5 V POWER SUPPLY

S005522D51

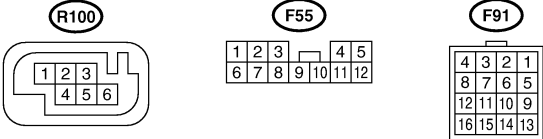
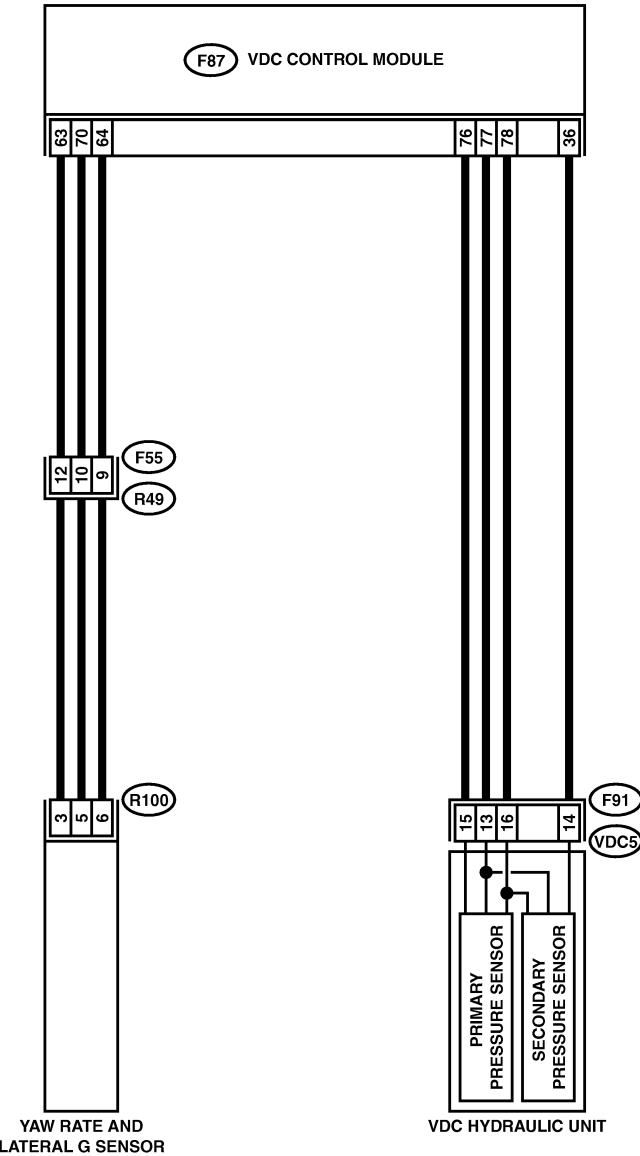
DIAGNOSIS:

- 5 volt power supply is abnormal.

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| F87 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

B4M2325

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|-----------------------------------|-------------------------|--|
| 1 | CHECK GROUND SHORT OF SENSOR AND HARNESS. 1) Turn ignition switch OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground (Lateral G sensor): (F87) No. 78 — Chassis ground (Pressure sensor): | Is the resistance more than 1 MΩ? | Go to step 3. | Go to step 2. |
| 2 | CHECK GROUND SHORT OF HARNESS. 1) Disconnect connector from faulty sensors. 2) Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground (Lateral G sensor): (F87) No. 78 — Chassis ground (Pressure sensor): | Is the resistance more than 1 MΩ? | Replace faulty sensors. | Repair or replace harness connector between VDCCM and faulty sensor. |
| 3 | CHECK BATTERY SHORT OF SENSOR AND HARNESS. Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (–) (Lateral G sensor): (F87) No. 78 (+) — Chassis ground (–) (Pressure sensor): | Is the voltage less than 0.5 V? | Go to step 4. | Go to step 5. |
| 4 | CHECK BATTERY SHORT OF SENSOR AND HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (–) (Lateral G sensor): (F87) No. 78 (+) — Chassis ground (–) (Pressure sensor): | Is the voltage less than 0.5 V? | Replace VDCCM. | Go to step 5. |
| 5 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from faulty sensors. 3) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (–) (Lateral G sensor): (F87) No. 78 (+) — Chassis ground (–) (Pressure sensor): | Is the voltage less than 0.5 V? | Go to step 6. | Repair or replace harness connector between VDCCM and faulty sensor. |
| 6 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (–) (Lateral G sensor): (F87) No. 78 (+) — Chassis ground (–) (Pressure sensor): | Is the voltage less than 0.5 V? | Replace faulty sensor. | Repair or replace harness connector between VDCCM and faulty sensor. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

AG: TROUBLE CODE 47 FAULTY CAN COMMUNICATION LINE

S005522D52

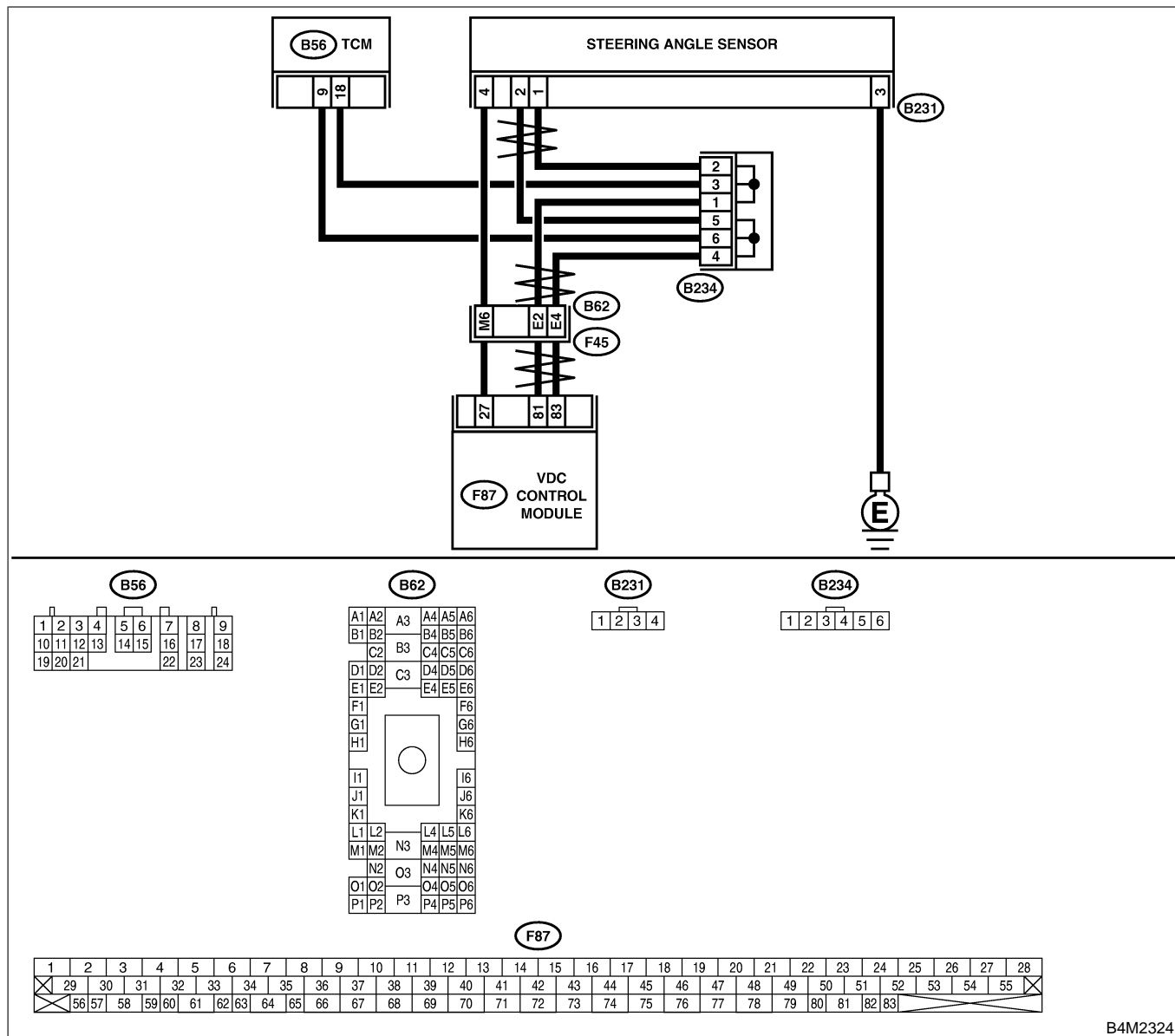
DIAGNOSIS:

- CAN communication line is broken or short circuited.

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2324

VDC-90

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|--|---|
| 1 | CHECK HARNESS BETWEEN VDCCM, STEERING ANGLE SENSOR AND TCM. 1) Turn ignition switch OFF. 2) Disconnect connector from VDCCM, TCM and steering angle sensor. 3) Measure resistance between VDCCM, TCM and steering angle sensor. Connector & terminal (F87) No. 83 — (B56) No. 9: (F87) No. 81 — (B56) No. 18: (F87) No. 83 — (B231) No. 2: (F87) No. 81 — (B231) No. 1: | Is the resistance less than 0.5 Ω? | Go to step 3. | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN STEERING ANGLE SENSOR AND TCM. Measure resistance between TCM and steering angle sensor. Connector & terminal (B56) No. 9 — (B231) No. 2: (B56) No. 18 — (B231) No. 1: | Is the resistance less than 0.5 Ω? | Repair or replace harness connector between VDCCM and steering angle sensor. | Repair or replace harness connector between TCM and steering angle sensor. |
| 3 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 83 — Chassis ground: (F87) No. 81 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 4. | Repair or replace harness connector between VDCCM, TCM and steering angle sensor. |
| 4 | CHECK BATTERY SHORT OF SENSOR. Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 83 — Chassis ground: (F87) No. 81 — Chassis ground: | Is the voltage less than 0.5 V? | Go to step 5. | Repair or replace harness connector between VDCCM, TCM and steering angle sensor. |
| 5 | CHECK BATTERY SHORT OF SENSOR. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 83 — Chassis ground: (F87) No. 81 — Chassis ground: | Is the voltage less than 0.5 V? | Go to step 6. | Repair or replace harness connector between VDCCM, TCM and steering angle sensor. |
| 6 | CHECK STEERING ANGLE SENSOR. 1) Turn ignition switch to OFF. 2) Connect connector to steering angle sensor. 3) Measure resistance between VDCCM connector terminals. Connector & terminal (F87) No. 83 — No. 81: | Is the resistance 120±6 Ω? | Go to step 8. | Go to step 7. |
| 7 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in steering angle sensor? | Replace steering angle sensor. | Repair or replace steering angle sensor connector. |
| 8 | CHECK VDCCM. 1) Connect connector to VDCCM. 2) Disconnect connector from steering angle sensor. 3) Measure resistance between steering angle sensor connector terminals. Connector & terminal (B231) No. 1 — No. 2: | Is the resistance 120±6 Ω? | Go to step 10. | Go to step 9. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--------------------------------|---|
| 9 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in steering angle sensor? | Replace VDCCM. | Repair or replace VDCCM connector. |
| 10 | CHECK TCM. 1) Connect connector to TCM. 2) Disconnect connector from VDCCM. 3) Measure resistance between steering angle sensor terminals. Connector & terminal (B231) No. 1 — No. 2: | Is the resistance more than 1 MΩ? | Go to step 12. | Go to step 11. |
| 11 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in steering angle sensor? | Replace TCM. | Repair or replace TCM connector. |
| 12 | CHECK VDCCM. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code. | Are other trouble codes being output? | Go to step 13. | A temporary poor contact. |
| 13 | CHECK TROUBLE CODE. | Is the same trouble code as in the current diagnosis still being output? | Go to step 14. | Proceed with the diagnosis corresponding to the trouble code. |
| 14 | CHECK AT SYSTEM TROUBLE CODE. | Is the AT system trouble code No. 86? | Replace steering angle sensor. | Replace VDCCM. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

MEMO:

VDC (DIAGNOSTICS)

S005522D56

- EAS communication line is broken or short circuited.
- EAC communication line is broken or short circuited.

- ABS does not operate.
- VDC does not operate.

The diagram illustrates the electrical connection between the Engine Control Module (ECM), the Vehicle Dynamic Control (VDC) Control Module, and the B62 sensor.

Engine Control Module (B137): The ECM is connected to the B62 sensor via a 12-pin connector. The connector has two rows of pins: 12, 11, and 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

B62 Sensor: The B62 sensor is connected to the ECM via a 12-pin connector. The connector has two rows of pins: 12, 11, and 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

VDC Control Module (F87): The VDC Control Module is connected to the B62 sensor via a 12-pin connector. The connector has two rows of pins: 12, 11, and 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

Pinout Details:

B62 Sensor Pinout:

| | | | | | |
|----|----|----|----|----|----|
| A1 | A2 | A3 | A4 | A5 | A6 |
| B1 | B2 | B3 | B4 | B5 | B6 |
| C1 | C2 | C3 | C4 | C5 | C6 |
| D1 | D2 | D3 | D4 | D5 | D6 |
| E1 | E2 | E3 | E4 | E5 | E6 |
| F1 | F2 | F3 | F4 | F5 | F6 |
| G1 | G2 | G3 | G4 | G5 | G6 |
| H1 | H2 | H3 | H4 | H5 | H6 |
| I1 | I2 | I3 | I4 | I5 | I6 |
| J1 | J2 | J3 | J4 | J5 | J6 |
| K1 | K2 | K3 | K4 | K5 | K6 |
| L1 | L2 | L3 | L4 | L5 | L6 |
| M1 | M2 | M3 | M4 | M5 | M6 |
| N1 | N2 | N3 | N4 | N5 | N6 |
| O1 | O2 | O3 | O4 | O5 | O6 |
| P1 | P2 | P3 | P4 | P5 | P6 |

F87 Module Pinout:

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---------------|--|
| 1 | CHECK HARNESS BETWEEN ECM AND VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connectors from VDCCM and ECM. 3) Measure resistance between VDCCM and ECM. Connector & terminal (F87) No. 75 — (B137) No. 11: (F87) No. 45 — (B137) No. 12: | Is the resistance less than 0.5 Ω ? | Go to step 2. | Repair or replace open circuit between VDCCM and ECM. |
| 2 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM and ECM. Connector & terminal (F87) No. 75 — Chassis ground: (F87) No. 45 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 3. | Repair or replace ground short circuit between VDCCM and ECM. |
| 3 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 75 — Chassis ground: (F87) No. 45 — Chassis ground: | Is the voltage less than 0.5 V? | Go to step 4. | Repair or replace battery short circuit between VDCCM and ECM. |
| 4 | CHECK INPUT VOLTAGE TO ECM. 1) Turn ignition switch to OFF. 2) Connect connector to VDCCM. 3) Turn ignition switch to ON. 4) Measure voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 11 (+) — Chassis ground (-): (B137) No. 12 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 6. | Go to step 5. |
| 5 | CHECK POOR CONTACT IN ECM CONNECTORS. | Is there poor contact in ECM connector? | Replace ECM. | Repair or replace ECM connector. |
| 6 | ERASE MEMORY. 1) Connect all connectors. 2) Erase the memory. | Can the memory be erased? | Go to step 7. | Replace VDCCM. |
| 7 | CHECK TROUBLE CODE. 1) Perform inspection mode. 2) Read out the trouble code. | Is the same trouble code as in the current diagnosis still being output? | Replace ECM. | A temporary poor contact. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

AI: TROUBLE CODE 49 ABNORMAL ENGINE SPEED SIGNAL S005522D58

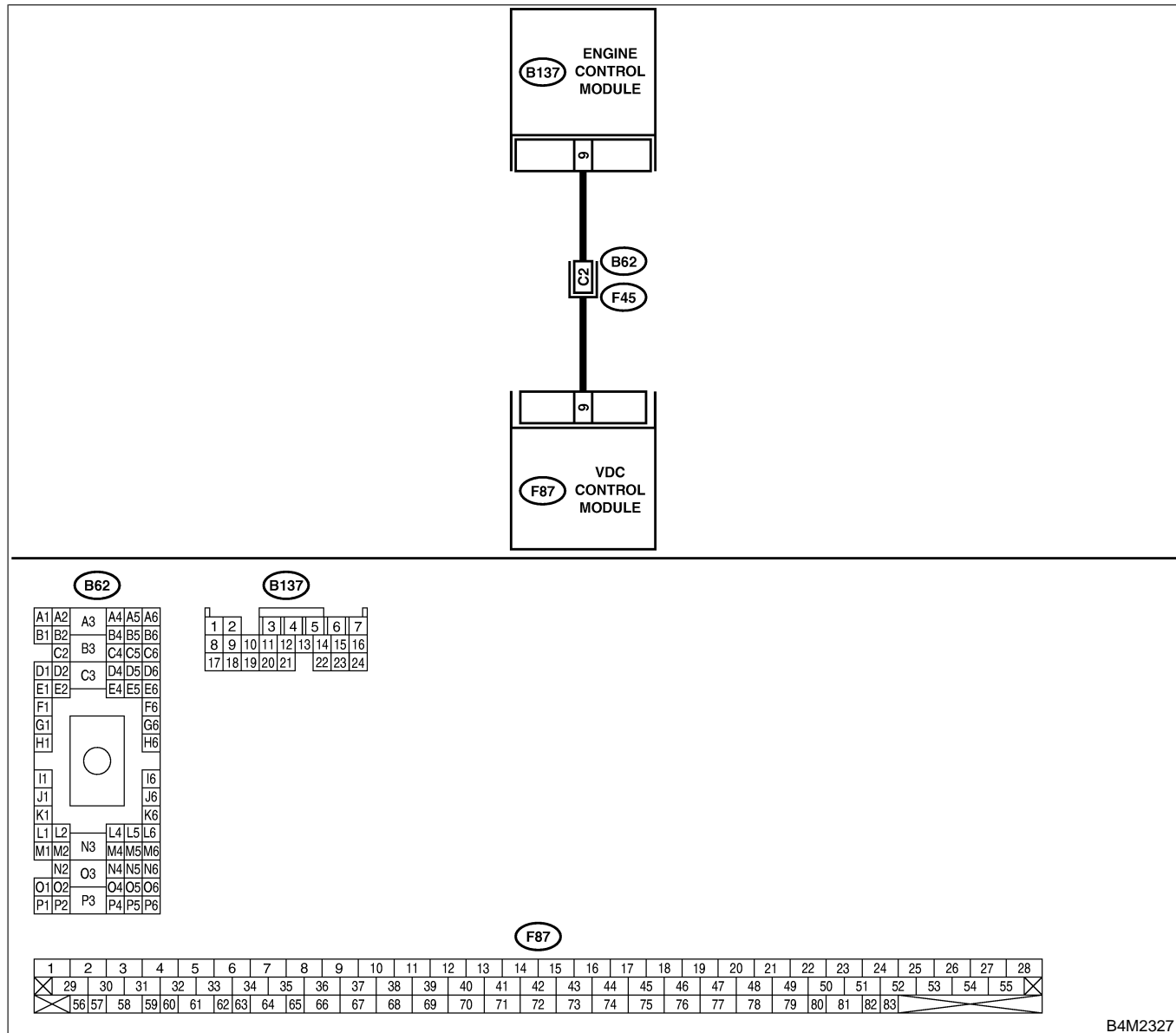
DIAGNOSIS:

- Engine speed signal line is broken or short circuited.

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2327

VDC-96

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|--|---|
| 1 | CHECK TACHOMETER OPERATION IN COMBINATION METER. | Does tachometer operate normally? | Go to step 2. | Repair tachometer. |
| 2 | CHECK HARNESS BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM and ECM. 3) Measure resistance between VDCCM connector and ECM. Connector & terminal (F87) No. 9 — (B137) No. 9: | Is the resistance less than 0.5 Ω? | Go to step 3. | Repair harness connector between VDCCM and ECM. |
| 3 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and ECM? | Repair connector. | Go to step 4. |
| 4 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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

VDC (DIAGNOSTICS)

AJ: TROUBLE CODE 51 ABNORMAL VALVE RELAY

S005522D61

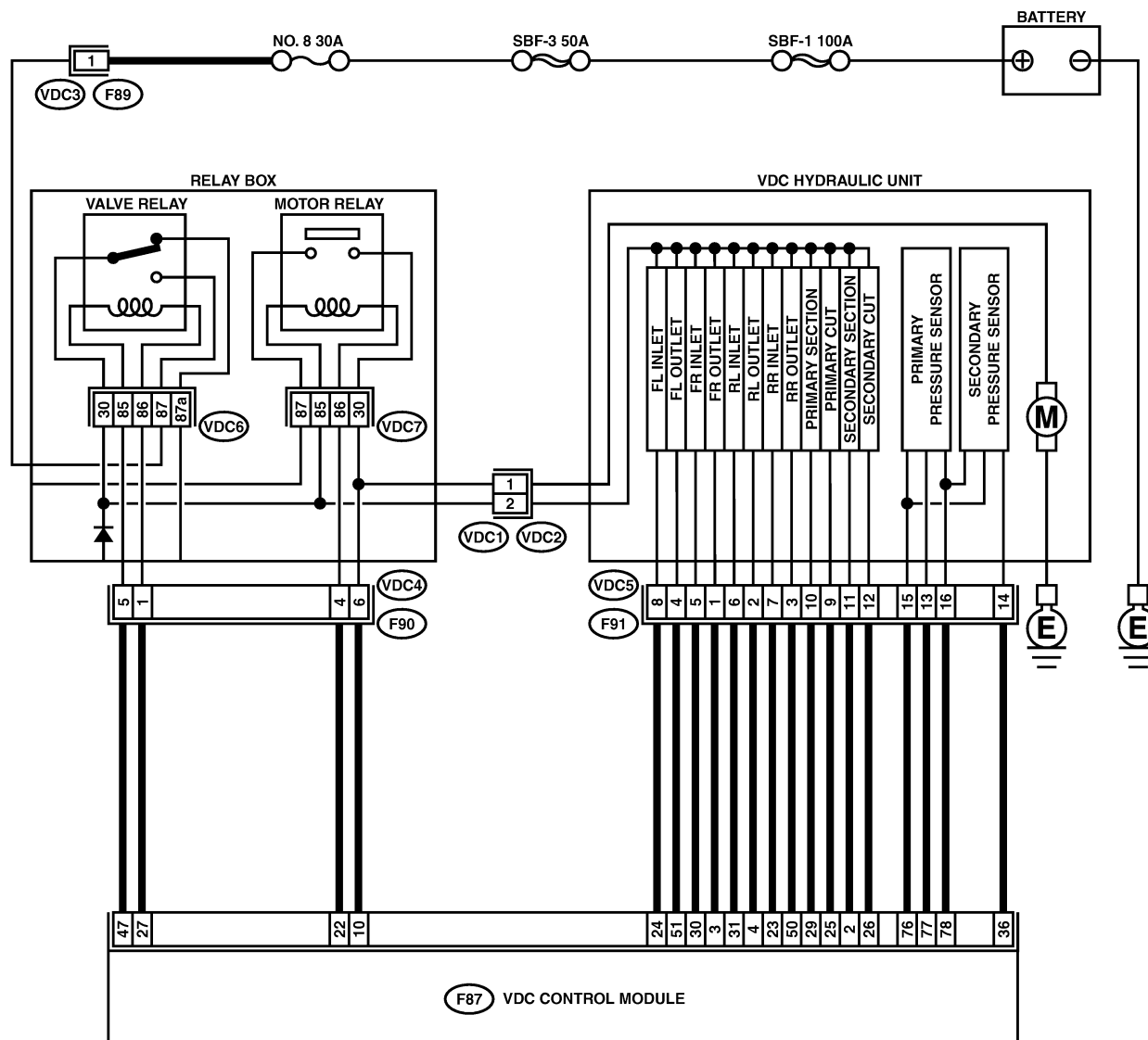
DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



F89

VDC1

1 2

F90

1 2 3
4 5 6

F91

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

VDC6

87
85 86
30

VDC7

87
85 86
30

F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

B4M2328

VDC-98

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---------------|---|
| 1 | CHECK RESISTANCE OF VALVE RELAY. 1) Turn ignition switch to OFF. 2) Remove valve relay from relay box. 3) Measure resistance between valve relay terminals. <i>Terminals</i> No. 85 — No. 86: | Is the resistance between 93 and 113 Ω ? | Go to step 2. | Replace valve relay. |
| 2 | CHECK CONTACT POINT OF VALVE RELAY. 1) Connect battery to valve relay terminals No. 85 and No. 86. 2) Measure resistance between valve relay terminals. <i>Terminals</i> No. 30 — No. 87: | Is the resistance less than 0.5 Ω ? | Go to step 3. | Replace valve relay. |
| 3 | CHECK CONTACT POINT OF VALVE RELAY. Measure resistance between valve relay terminals. <i>Terminals</i> No. 30 — No. 87a: | Is the resistance more than 1 M Ω ? | Go to step 4. | Replace valve relay. |
| 4 | CHECK CONTACT POINT OF VALVE RELAY. 1) Disconnect battery from valve relay terminals. 2) Measure resistance between valve relay terminals. <i>Terminals</i> No. 30 — No. 87: | Is the resistance more than 1 M Ω ? | Go to step 5. | Replace valve relay. |
| 5 | CHECK CONTACT POINT OF VALVE RELAY. Measure resistance between valve relay terminals. <i>Terminals</i> No. 30 — No. 87a: | Is the resistance less than 0.5 Ω ? | Go to step 6. | Replace valve relay. |
| 6 | CHECK SHORT OF VALVE RELAY. Measure resistance between valve relay terminals. <i>Terminals</i> No. 86 — No. 87: No. 86 — No. 87a: | Is the resistance more than 1 M Ω ? | Go to step 7. | Replace valve relay. |
| 7 | CHECK POWER SUPPLY FOR VALVE RELAY. 1) Disconnect connector (F89) from relay box. 2) Measure voltage between relay box connector and chassis ground. <i>Connector & terminal</i> (F89) No. 1 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 8. | Repair harness between battery and relay box connector. Check fuse No. 8. |
| 8 | CHECK OPEN CIRCUIT AND GROUND SHORT IN POWER SUPPLY CIRCUIT OF RELAY BOX. 1) Disconnect connector (VDC1) from VDCH/U. 2) Connect connector (F89) to relay box. 3) Measure voltage of relay box. <i>Connector & terminal</i> (VDC6) No. 87 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 9. | Replace relay box and check fuse No. 8. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|------------------------------------|----------------|---|
| 9 | CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX. 1) Turn ignition switch to OFF. 2) Disconnect connector (F90) from relay box. 3) Measure resistance between relay box connector and valve relay installing point. Connector & terminal (VDC4) No. 5 — (VDC6) No. 85: (VDC4) No. 1 — (VDC6) No. 86: | Is the resistance less than 0.5 Ω? | Go to step 10. | Replace relay box. |
| 10 | CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. Measure resistance between relay box connector and chassis ground. Connector & terminal (VDC4) No. 5 — Chassis ground: (VDC4) No. 1 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 11. | Replace relay box and check fuse No. 8. |
| 11 | CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. Measure voltage between relay box connector and chassis ground. Connector & terminal (VDC4) No. 5 (+) — Chassis ground (-): (VDC4) No. 1 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 12. | Replace relay box. Check fuse No. 8. |
| 12 | CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. 1) Turn ignition switch to ON. 2) Measure voltage between relay box connector and chassis ground. Connector & terminal (VDC4) No. 5 (+) — Chassis ground (-): (VDC4) No. 1 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 13. | Replace relay box. Check fuse No. 8. |
| 13 | CHECK OPEN CIRCUIT IN CONTROL SYSTEM HARNESS OF VALVE RELAY. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM connector and relay box connector. Connector & terminal (F87) No. 47 — (F90) No. 5: (F87) No. 27 — (F90) No. 1: | Is the resistance less than 0.5 Ω? | Go to step 14. | Repair harness between VDCCM and relay box. |
| 14 | CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY. Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 47 — Chassis ground: (F87) No. 27 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 15. | Repair harness between VDCCM and relay box and check all fuses. |
| 15 | CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY. Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 27 (+) — Chassis ground (-): (F87) No. 47 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 16. | Repair harness between VDCCM and relay box. |

VDC-100

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|----------------|---|
| 16 | CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 27 (+) — Chassis ground (-): (F87) No. 47 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 17. | Repair harness between VDCCM and relay box. |
| 17 | CHECK OPEN CIRCUIT IN CONTACT POINT CIRCUIT OF RELAY BOX. Measure resistance between VDCH/U connector and valve relay installing point. Connector & terminal (VDC1) No. 2 — (VDC6) No. 30: | Is the resistance less than 0.5 Ω ? | Go to step 18. | Replace relay box. |
| 18 | CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (VDC1) No. 2 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 19. | Replace relay box and check fuse No. 8. |
| 19 | CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (VDC1) No. 2 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 20. | Replace relay box. Check fuse No. 8. |
| 20 | CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (VDC1) No. 2 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 21. | Replace relay box. Check fuse No. 8. |
| 21 | CHECK RESISTANCE OF INLET AND CUT SOLENOID VALVES. 1) Disconnect connector from VDCH/U. 2) Measure resistance between VDCH/U connector terminals. Connector & terminal (VDC5) No. 8 — (VDC2) No. 2: (VDC5) No. 5 — (VDC2) No. 2: (VDC5) No. 6 — (VDC2) No. 2: (VDC5) No. 7 — (VDC2) No. 2: (VDC5) No. 9 — (VDC2) No. 2: (VDC5) No. 12 — (VDC2) No. 2: | Is the resistance between 8.04 and 9.04 Ω ? | Go to step 22. | Replace VDCH/U. |
| 22 | CHECK RESISTANCE OF OUTLET SOLENOID VALVE. Measure resistance between VDCH/U connector terminals. Connector & terminal (VDC5) No. 4 — (VDC2) No. 2: (VDC5) No. 1 — (VDC2) No. 2: (VDC5) No. 2 — (VDC2) No. 2: (VDC5) No. 3 — (VDC2) No. 2: (VDC5) No. 10 — (VDC2) No. 2: (VDC5) No. 11 — (VDC2) No. 2: | Is the resistance between 3.8 and 4.8 Ω ? | Go to step 23. | Replace VDCH/U. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|-----------------------------------|----------------|--|
| 23 | CHECK GROUND SHORT OF SOLENOID VALVE. Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (VDC2) No. 2 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 24. | Replace VDCH/U and check all fuses. |
| 24 | CHECK BATTERY SHORT OF SOLENOID VALVE. Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (VDC2) No. 2 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 25. | Replace VDCH/U and check all fuses. |
| 25 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (VDC2) No. 2 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 26. | Replace VDCH/U and check all fuses. |
| 26 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 30 (+) — Chassis ground (-): (F87) No. 24 (+) — Chassis ground (-): (F87) No. 23 (+) — Chassis ground (-): (F87) No. 31 (+) — Chassis ground (-): (F87) No. 26 (+) — Chassis ground (-): (F87) No. 25 (+) — Chassis ground (-): (F87) No. 3 (+) — Chassis ground (-): (F87) No. 51 (+) — Chassis ground (-): (F87) No. 50 (+) — Chassis ground (-): (F87) No. 4 (+) — Chassis ground (-): (F87) No. 2 (+) — Chassis ground (-): (F87) No. 29 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 27. | Repair harness between VDCH/U and VDCCM and check all fuses. |
| 27 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 30 (+) — Chassis ground (-): (F87) No. 24 (+) — Chassis ground (-): (F87) No. 23 (+) — Chassis ground (-): (F87) No. 31 (+) — Chassis ground (-): (F87) No. 26 (+) — Chassis ground (-): (F87) No. 25 (+) — Chassis ground (-): (F87) No. 3 (+) — Chassis ground (-): (F87) No. 51 (+) — Chassis ground (-): (F87) No. 50 (+) — Chassis ground (-): (F87) No. 4 (+) — Chassis ground (-): (F87) No. 2 (+) — Chassis ground (-): (F87) No. 29 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 28. | Repair harness between VDCH/U and VDCCM and check all fuses. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 28 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 30 — Chassis ground: (F87) No. 24 — Chassis ground: (F87) No. 23 — Chassis ground: (F87) No. 31 — Chassis ground: (F87) No. 26 — Chassis ground: (F87) No. 25 — Chassis ground: (F87) No. 3 — Chassis ground: (F87) No. 51 — Chassis ground: (F87) No. 50 — Chassis ground: (F87) No. 4 — Chassis ground: (F87) No. 2 — Chassis ground: (F87) No. 29 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 29. | Repair harness between VDCH/U and VDCCM. |
| 29 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND VDCH/U. 1) Connect connector (F91) to VDCH/U. 2) Measure resistance between VDCCM connector and VDCH/U connector. Connector & terminal (F87) No. 30 — (VDC2) No. 2: (F87) No. 24 — (VDC2) No. 2: (F87) No. 23 — (VDC2) No. 2: (F87) No. 31 — (VDC2) No. 2: (F87) No. 26 — (VDC2) No. 2: (F87) No. 25 — (VDC2) No. 2: | Is the resistance between 8.0 and 10.0 Ω? | Go to step 30. | Repair harness/connector between VDCH/U and VDCCM. |
| 30 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND VDCH/U. Measure resistance between VDCCM connector and VDCH/U connector. Connector & terminal (F87) No. 3 — (VDC2) No. 2: (F87) No. 51 — (VDC2) No. 2: (F87) No. 50 — (VDC2) No. 2: (F87) No. 4 — (VDC2) No. 2: (F87) No. 2 — (VDC2) No. 2: (F87) No. 29 — (VDC2) No. 2: | Is the resistance between 4.3 and 5.3 Ω? | Go to step 31. | Repair harness/connector between VDCH/U and VDCCM. |
| 31 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector between VDCCM and VDCH/U? | Repair connector. | Go to step 32. |
| 32 | CHECK VDCCM. 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 VDCCM. | Go to step 33. |
| 33 | 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

VDC (DIAGNOSTICS)

AK: TROUBLE CODE 52 ABNORMAL MOTOR AND/OR MOTOR RELAY S005522D65

DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

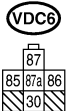
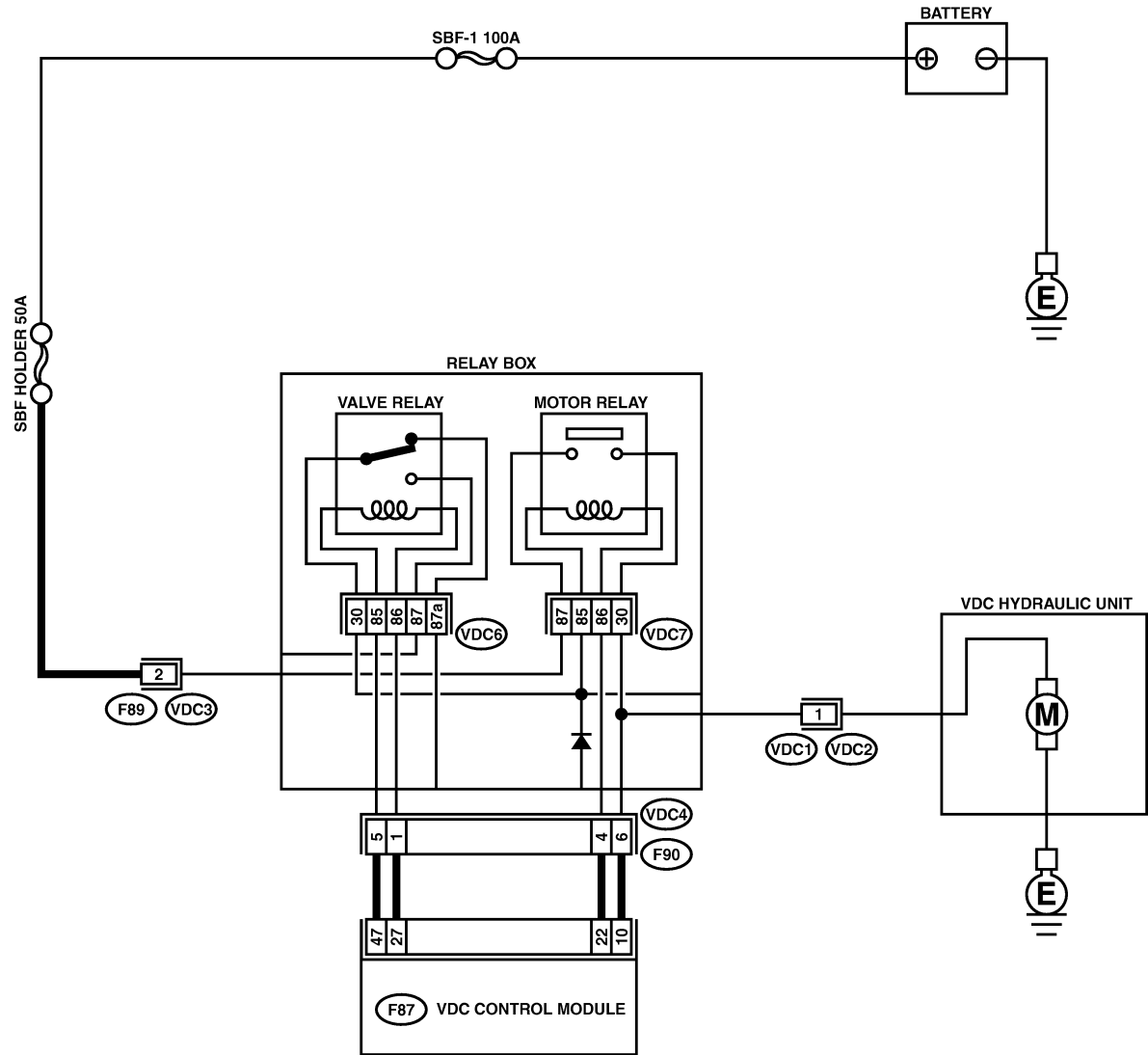
TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |

B4M2329

VDC-105

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---------------|--|
| 1 | CHECK RESISTANCE OF MOTOR RELAY. 1) Turn ignition switch to OFF. 2) Remove motor relay from relay box. 3) Measure resistance between motor relay terminals. <i>Terminals</i> No. 85 — No. 86: | Is the resistance between 70 and 90 Ω ? | Go to step 2. | Replace motor relay. |
| 2 | CHECK CONTACT POINT OF MOTOR RELAY. 1) Connect battery to motor relay terminals No. 85 and No. 86. 2) Measure resistance between motor relay terminals. <i>Terminals</i> No. 30 — No. 87: | Is the resistance less than 0.5 Ω ? | Go to step 3. | Replace motor relay. |
| 3 | CHECK CONTACT POINT OF MOTOR RELAY. 1) Disconnect battery from motor relay terminals. 2) Measure resistance between motor relay terminals. <i>Terminals</i> No. 30 — No. 87: | Is the resistance more than 1 M Ω ? | Go to step 4. | Replace motor relay. |
| 4 | CHECK SHORT OF MOTOR RELAY. Measure resistance between motor relay terminals. <i>Terminals</i> No. 85 — No. 30: No. 85 — No. 87: | Is the resistance more than 1 M Ω ? | Go to step 5. | Replace motor relay. |
| 5 | CHECK INPUT VOLTAGE OF RELAY BOX. 1) Disconnect connector (F89) from relay box. 2) Disconnect connector from VDCCM. 3) Measure voltage between relay box connector and chassis ground. <i>Connector & terminal</i> (F89) No. 2 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 6. | Repair harness/connector between battery and relay box, and check fuse SBF holder. |
| 6 | CHECK INPUT VOLTAGE OF MOTOR RELAY. 1) Connect connector (F89) to relay box. 2) Measure voltage between relay box and chassis ground. <i>Connector & terminal</i> (VDC7) No. 87 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 7. | Replace relay box. |
| 7 | CHECK OPEN CIRCUIT IN CONTACT POINT CIRCUIT OF RELAY BOX. 1) Turn ignition switch to OFF. 2) Disconnect connectors (VDC2, F90) from relay box. 3) Measure resistance between relay box connector unit and motor relay installing portion. <i>Connector & terminal</i> (VDC1) No. 1 — (VDC7) No. 30: | Is the resistance less than 0.5 Ω ? | Go to step 8. | Replace relay box. |
| 8 | CHECK OPEN CIRCUIT IN MONITOR SYSTEM CIRCUIT OF RELAY BOX. Measure resistance between relay box connector and motor relay installing point. <i>Connector & terminal</i> (VDC4) No. 6 — (VDC7) No. 30: | Is the resistance less than 0.5 Ω ? | Go to step 9. | Replace relay box. |

VDC-106

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|----------------|---|
| 9 | CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX. Measure resistance between motor relay installing point and relay box connector. Connector & terminal (VDC4) No. 4 — (VDC7) No. 85: | Is the resistance less than 0.5 Ω ? | Go to step 10. | Replace relay box. |
| 10 | CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX. 1) Remove valve relay from relay box. 2) Measure resistance between motor relay installing point and valve relay installing point. Connector & terminal (VDC7) No. 86 — (VDC6) No. 30: | Is the resistance less than 0.5 Ω ? | Go to step 11. | Replace relay box. |
| 11 | CHECK GROUND SHORT IN CIRCUIT OF RELAY BOX. Measure resistance between relay box connector unit and chassis ground. Connector & terminal (VDC4) No. 4 — Chassis ground: (VDC4) No. 6 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 12. | Replace relay box. |
| 12 | CHECK BATTERY SHORT IN CIRCUIT OF RELAY BOX. Measure voltage between relay box connector and chassis ground. Connector & terminal (VDC4) No. 4 (+) — Chassis ground (-): (VDC4) No. 6 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 13. | Replace relay box. |
| 13 | CHECK BATTERY SHORT IN CIRCUIT OF RELAY BOX. 1) Turn ignition switch to ON. 2) Measure voltage between relay box connector and chassis ground. Connector & terminal (VDC4) No. 4 (+) — Chassis ground (-): (VDC4) No. 6 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 14. | Replace relay box. |
| 14 | CHECK OPEN CIRCUIT IN RELAY CONTROL SYSTEM HARNESS. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM connector and relay box connector. Connector & terminal (F87) No. 22 — (F90) No. 4: (F87) No. 10 — (F90) No. 6: | Is the resistance less than 0.5 Ω ? | Go to step 15. | Repair harness connector between VDCCM and relay box. |
| 15 | CHECK GROUND SHORT IN HARNESS BETWEEN RELAY BOX AND VDCCM. Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 22 — Chassis ground: (F87) No. 10 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 16. | Repair harness between VDCCM and relay box. Check fuse SBF holder. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 16 | CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND VDCCM. Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 22 (+) — Chassis ground (-): (F87) No. 10 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 17. | Repair harness between VDCCM and relay box. Check fuse SBF holder. |
| 17 | CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND VDCCM. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 22 (+) — Chassis ground (-): (F87) No. 10 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 18. | Repair harness between VDCCM and relay box. Check fuse SBF holder. |
| 18 | CHECK CONDITION OF MOTOR GROUND. Tightening torque: 32±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Is the motor ground terminal tightly clamped? | Go to step 19. | Tighten the clamp of motor ground terminal. |
| 19 | CHECK VDCCM MOTOR DRIVE TERMINAL. 1) Turn ignition switch OFF. 2) Remove VDC connector cover. <Ref. to VDC-17 VDCCM Connector Cover.> 3) Connect all connectors. 4) Install motor relay and valve relay to relay box. 5) Operate the ABS check sequence. <Ref. to VDC-18 ABS Sequence Control.> 6) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 22 (+) — No. 1 (-): | Does the voltage drop from between 10 V and 13 V to less than 1.5 V, and rise to between 10 V and 13 V again when carrying out the check sequence? | Go to step 20. | Replace VDCCM. |
| 20 | CHECK MOTOR OPERATION. Operate the check sequence. <Ref. to VDC-21 VDC Sequence Control.> | Can motor revolution noise (buzz) be heard when carrying out the check sequence? | Go to step 21. | Replace VDCH/U. |
| 21 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connector between VDCH/U, relay box and VDCCM? | Repair connector. | Go to step 22. |
| 22 | CHECK VDCCM. 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 VDCCM. | 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. |

MEMO:

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

AL: TROUBLE CODE 71 ABNORMAL STEERING ANGLE SENSOR

S005522D88

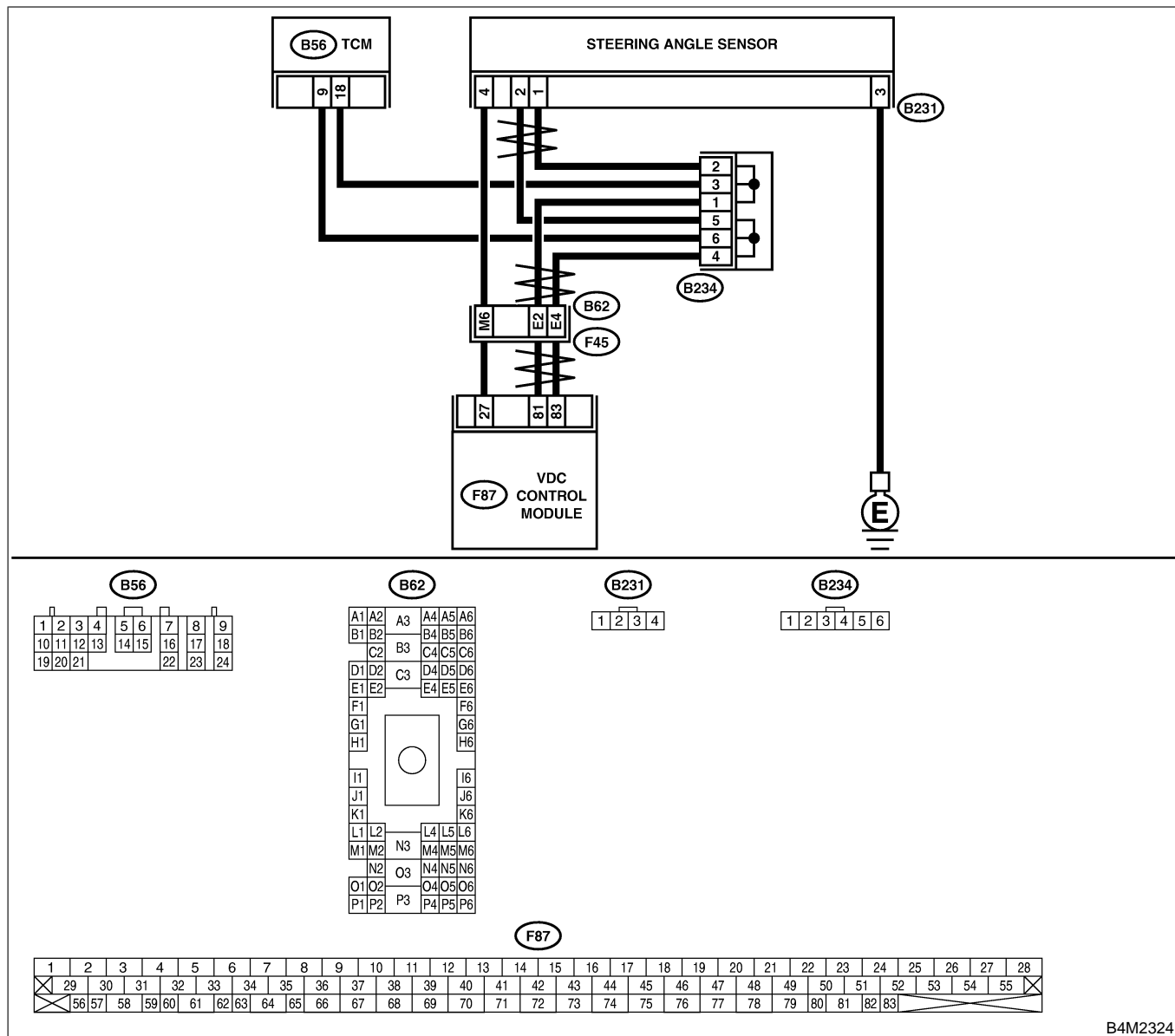
DIAGNOSIS:

- Faulty steering angle sensor

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2324

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|--|--|
| 1 | CHECK THE STEERING WHEEL. 1) Drive the vehicle on a flat road. 2) Stop the vehicle in a straight line. 3) Check the angle of steering wheel. | Is the angle of steering wheel within 5°? | Go to step 2. | Perform centering alignment of steering. |
| 2 | CHECK RUNNING FIELD. Check if the vehicle was driven on banked road surfaces or sandy surfaces (not dirt road surfaces). | Was the vehicle driven on banked road surfaces or sandy surfaces (not dirt road surfaces)? | Driving on banked road surfaces or sandy surfaces (not dirt road surfaces) sometimes results in a VDCCM memory trouble code. | Go to step 3. |
| 3 | CHECK POWER SUPPLY OF STEERING ANGLE SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from steering angle sensor. 3) Turn ignition switch to ON. 4) Measure voltage between steering angle sensor and chassis ground. Connector & terminal (B231) No. 4 — Chassis ground: | Is the voltage between 10 and 15 V? | Go to step 6. | Go to step 4. |
| 4 | CHECK OUTPUT VOLTAGE OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover for VDCCM connector. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 27 — Chassis ground: | Is the voltage between 10 and 15 V? | Repair harness between yaw rate sensor and VDCCM. | Go to step 5. |
| 5 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in yaw rate sensor connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 6 | CHECK GROUND CIRCUIT OF STEERING ANGLE SENSOR. Measure resistance between steering sensor and chassis ground. Connector & terminal (B231) No. 3 — Chassis ground: | Is the resistance less than 0.5 Ω? | Go to step 7. | Repair steering angle sensor ground harness. |
| 7 | CHECK HARNESS OF STEERING ANGLE SENSOR. 1) Connect connector to steering angle sensor. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM connector terminals. Connector & terminal (F87) No. 81 — No. 83: | Is the resistance 120±6 Ω? | Repair harness between steering angle sensor and VDCCM. | Go to step 8. |
| 8 | CHECK STEERING ANGLE SENSOR. 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? | Go to step 10. | Go to step 9. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--|---|
| 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. |
| 10 | CHECK VDCCM. 1) Turn ignition switch to OFF. 2) Replace steering angle sensor. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. | The original steering angle sensor has been faulty. |

MEMO:

VDC (DIAGNOSTICS)

DIAGNOSIS:

- VDC does not operate.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|--|---|
| 1 | CHECK THE STEERING WHEEL. 1) Drive the vehicle on a flat road. 2) Stop the vehicle in a straight line. 3) Check the angle of steering wheel. | Is the angle of steering wheel within 5°? | Go to step 2. | Perform centering alignment of steering. |
| 2 | CHECK RUNNING FIELD. | Was the vehicle driven on banked road surfaces or sandy surfaces (not dirt road surfaces) or surfaces with holes or bumps at high speeds? | Driving on banked road surfaces or sandy surfaces (not dirt road surfaces) or surfaces with holes or bumps at high speeds, sometimes results in a VDCCM memory trouble code. | Go to step 3. |
| 3 | CHECK INSTALLATION OF YAW RATE AND LATERAL G SENSOR. Check installation of yaw rate and lateral G sensor. | Is the yaw rate and lateral G sensor fixed securely? | Go to step 4. | Install yaw rate and lateral G sensor securely. |
| 4 | CHECK POWER SUPPLY OF YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from yaw rate and lateral G sensor. 3) Turn ignition switch to ON. 4) Measure voltage between yaw rate and lateral G sensor and chassis ground. Connector & terminal (R100) No. 3 — Chassis ground: | Is the voltage between 10 and 15 V? | Go to step 7. | Go to step 5. |
| 5 | CHECK OUTPUT VOLTAGE OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover for VDCCM connector. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground: | Is the voltage between 10 and 15 V? | Repair harness between yaw rate and lateral G sensor and VDCCM. | Go to step 6. |
| 6 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in yaw rate and lateral G sensor connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 7 | CHECK GROUND CIRCUIT OF YAW RATE AND LATERAL G SENSOR. Measure resistance between yaw rate and lateral G sensor and chassis ground. Connector & terminal (R100) No. 6 — Chassis ground: | Is the resistance less than 0.5 Ω? | Go to step 10. | Go to step 8. |
| 8 | CHECK GROUND CIRCUIT OF VDCCM. 1) Disconnect connector from VDCCM. 2) Remove cover from VDCCM connector. <Ref. to VDC-17 VDCCM Connector Cover.> 3) Connect connector to VDCCM. 4) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 64 — Chassis ground: | Is the resistance less than 0.5 Ω? | Repair harness between yaw rate and lateral G sensor and VDCCM. | Go to step 9. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|-------------------------------------|---|
| 9 | CHECK POOR CONTACT IN CONNEC-TORS. | Is there poor contact in VDCCM connector? | Repair or replace VDCCM connec-tor. | Replace VDCCM. |
| 10 | CHECK HARNESS OF YAW RATE AND LATERAL G SENSOR. 1) Disconnect connector from VDCCM. 2) Measure resistance between VDCCM and yaw rate and lateral G sensor. Connector & terminal (F87) No. 65 — (R100) No. 4: (F87) No. 66 — (R100) No. 1: (F87) No. 67 — (R100) No. 2: | Is the resistance less than 0.5 Ω? | Go to step 11. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 11 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 65 — Chassis ground: (F87) No. 66 — Chassis ground: (F87) No. 67 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 12. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 12 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 65 (+) — Chassis ground (-): (F87) No. 66 (+) — Chassis ground (-): (F87) No. 67 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 13. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 13 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 65 (+) — Chassis ground (-): (F87) No. 66 (+) — Chassis ground (-): (F87) No. 67 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 14. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 14 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch to OFF. 2) Install yaw rate and lateral G sensor to body. 3) Connect all connectors. 4) Turn ignition switch to ON. 5) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 66 (+) — No. 64 (-): | Is the voltage between 2.1 and 2.9 V? | Go to step 15. | Replace yaw rate and lateral G sensor. |
| 15 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch to ON. 2) Check oscilloscope signal pattern between VDCCM connector terminals. <Ref. to VDC-15 WAVE FORM, MEASUREMENT, Control Module I/O Signal.> Connector & terminal (F87) No. 67 (+) — No. 64 (-): | Is the oscilloscope pattern the same as shown in the figure? | Go to step 16. | Replace VDCCM. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|----------------|--|
| 16 | CHECK YAW RATE SENSOR. Check oscilloscope pattern between yaw rate and lateral G sensor terminals. <Ref. to VDC-15 WAVE FORM, MEASUREMENT, Control Module I/O Signal.> Connector & terminal (F87) No. 65 (+) — No. 64 (-): | Is the oscilloscope pattern the same as shown in the figure? | Replace VDCCM. | Replace yaw rate and lateral G sensor. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

AN: TROUBLE CODE 73 ABNORMAL LATERAL G SENSOR S005522E00

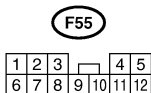
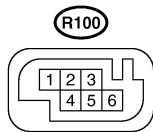
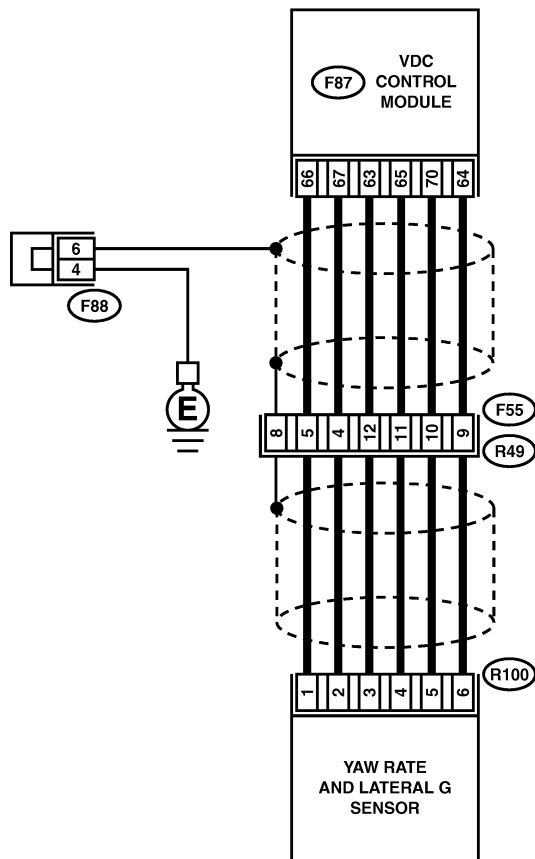
DIAGNOSIS:

- Faulty lateral G sensor

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---------------|---|
| 1 | CHECK INSTALLATION OF LATERAL G SENSOR. Check installation of lateral G sensor. | Is the yaw rate and lateral G sensor fixed securely? | Go to step 2. | Install yaw rate and lateral G sensor securely. |
| 2 | CHECK INPUT VOLTAGE OF G SENSOR. 1) Turn ignition switch to OFF. 2) Remove console box. 3) Disconnect connector from yaw rate and lateral G sensor. 4) Turn ignition switch to ON. 5) Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 3 (+) — No. 6 (-): | Is the voltage between 10 and 15 V? | Go to step 3. | Repair harness/connector between yaw rate and lateral G sensor and VDCCM. |
| 3 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch to OFF. 2) Measure resistance between yaw rate and lateral G sensor terminals. Terminals No. 3 — No. 5: | Is the resistance between 4.3 and 4.9 k Ω ? | Go to step 4. | Replace yaw rate and lateral G sensor. |
| 4 | CHECK OPEN CIRCUIT IN YAW RATE AND LATERAL G SENSOR OUTPUT HARNESS AND GROUND HARNESS. 1) Connect connector to yaw rate and lateral G sensor. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM connector terminals. Connector & terminal (F87) No. 63 — No. 70: | Is the resistance between 4.3 and 4.9 k Ω ? | Go to step 5. | Repair harness/connector between yaw rate and lateral G sensor and VDCCM. |
| 5 | CHECK GROUND SHORT IN YAW RATE AND LATERAL G SENSOR HARNESS. 1) Disconnect connector from yaw rate and lateral G sensor. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground: (F87) No. 70 — Chassis ground: (F87) No. 64 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 6. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 6 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (-): (F87) No. 70 (+) — Chassis ground (-): (F87) No. 64 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 7. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 7 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (-): (F87) No. 70 (+) — Chassis ground (-): (F87) No. 64 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 8. | Repair harness between yaw rate and lateral G sensor and VDCCM. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---|--|
| 8 | CHECK LATERAL G SENSOR. 1) Turn ignition switch to OFF. 2) Remove yaw rate and lateral G sensor from vehicle. 3) Connect connector to yaw rate and lateral G sensor. 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 5 (+) — No. 6 (-): | Is the voltage between 2.3 and 2.7 V when yaw rate and lateral G sensor is horizontal? | Go to step 9. | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |
| 9 | CHECK YAW RATE AND LATERAL G SENSOR. Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 5 (+) — No. 6 (-): | Is the voltage between 3.3 and 3.7 V when yaw rate and lateral G sensor is horizontal, and is inclined 90° to the left in front of the sensor? | Go to step 10. | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |
| 10 | CHECK YAW RATE AND LATERAL G SENSOR. Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 5 (+) — No. 6 (-): | Is the voltage between 1.3 and 1.7 V when yaw rate and lateral G sensor is horizontal, and is inclined 90° to the right in front of the sensor? | Go to step 11. | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |
| 11 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector between VDCCM and yaw rate and lateral G sensor? | Repair connector. | Go to step 12. |
| 12 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

AO: TROUBLE CODE 74 ABNORMAL PRESSURE SENSOR S005522E08

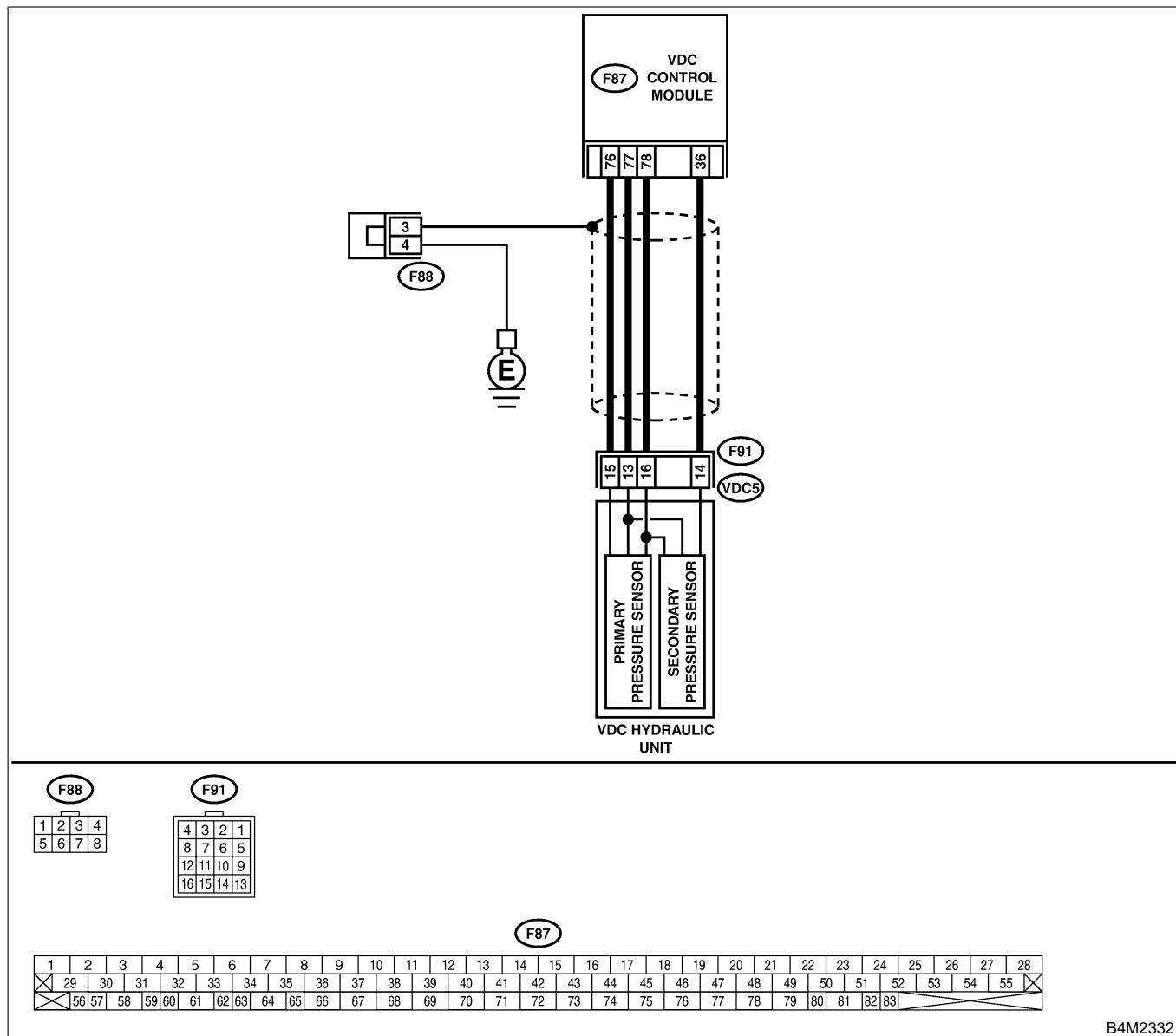
DIAGNOSIS:

- Faulty pressure sensor

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2332

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 1 | CHECK GROUND CIRCUIT OF PRESSURE SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector (F91) from VDCH/U. 3) Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 15 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Go to step 4. | Go to step 2. |
| 2 | CHECK GROUND CIRCUIT OF VDCCM. 1) Disconnect connector from VDCCM. 2) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 3) Connect connector to VDCCM. 4) Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 76 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Replace harness between VDCH/U and VDCCM. | Go to step 3. |
| 3 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in VDCCM connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 4 | CHECK POWER SUPPLY OF PRESSURE SENSOR. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector terminals. Connector & terminal (F91) No. 16 (+) — No. 15 (-): | Is the voltage between 4.75 and 5.25 V? | Go to step 7. | Go to step 5. |
| 5 | CHECK POWER SUPPLY OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 78 (+) — No. 76 (-): | Is the voltage between 4.75 and 5.25 V? | Repair harness between VDCH/U and VDCCM. | Go to step 6. |
| 6 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in VDCCM connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 7 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 — Chassis ground: (F91) No. 14 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 8. | Repair harness between VDCH/U and VDCCM. |
| 8 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 (+) — Chassis ground (-): (F91) No. 14 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 9. | Repair harness between VDCH/U and VDCCM. |

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 9 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 (+) — Chassis ground (-): (F91) No. 14 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 10. | Repair harness between VDCH/U and VDCCM. |
| 10 | CHECK OUTPUT VOLTAGE OF PRESSURE SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Connect all connectors. 6) Turn ignition switch to ON. 7) Do not depress brake pedal. 8) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 77 (+) — No. 76 (-): (F87) No. 36 (+) — No. 76 (-): | Is the voltage between 0.53 and 0.67 V? | Go to step 11. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 11 | CHECK BRAKE PEDAL STROKE. Measure the stroke between non-forced pedal position and forced pedal position with 50 kg (110 lb). | Is the stroke less than 95 mm (3.74 in)? | Go to step 12. | Perform bleeding. |
| 12 | CHECK INPUT VOLTAGE OF PRESSURE SENSOR. 1) Depress the brake pedal with 50 kg (110 lb). 2) Measure voltage between VDCCM connector terminals. Connector & terminal A (F87) No. 77 (+) — No. 76 (-): B (F87) No. 36 (+) — No. 76 (-): | Is the voltage between A and B more than 0.2 V? | Go to step 13. | Replace VDCH/U. |
| 13 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector between VDCCM and pressure sensor? | Repair connector. | Go to step 14. |
| 14 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Go to step 15. |
| 15 | 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

VDC (DIAGNOSTICS)

MEMO:

VDC-125

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

15. Diagnostics Chart with Select Monitor S005504

A: COMMUNICATION FOR INITIALIZING IMPOSSIBLE (SELECT MONITOR COMMUNICATION FAILURE) S005504E35

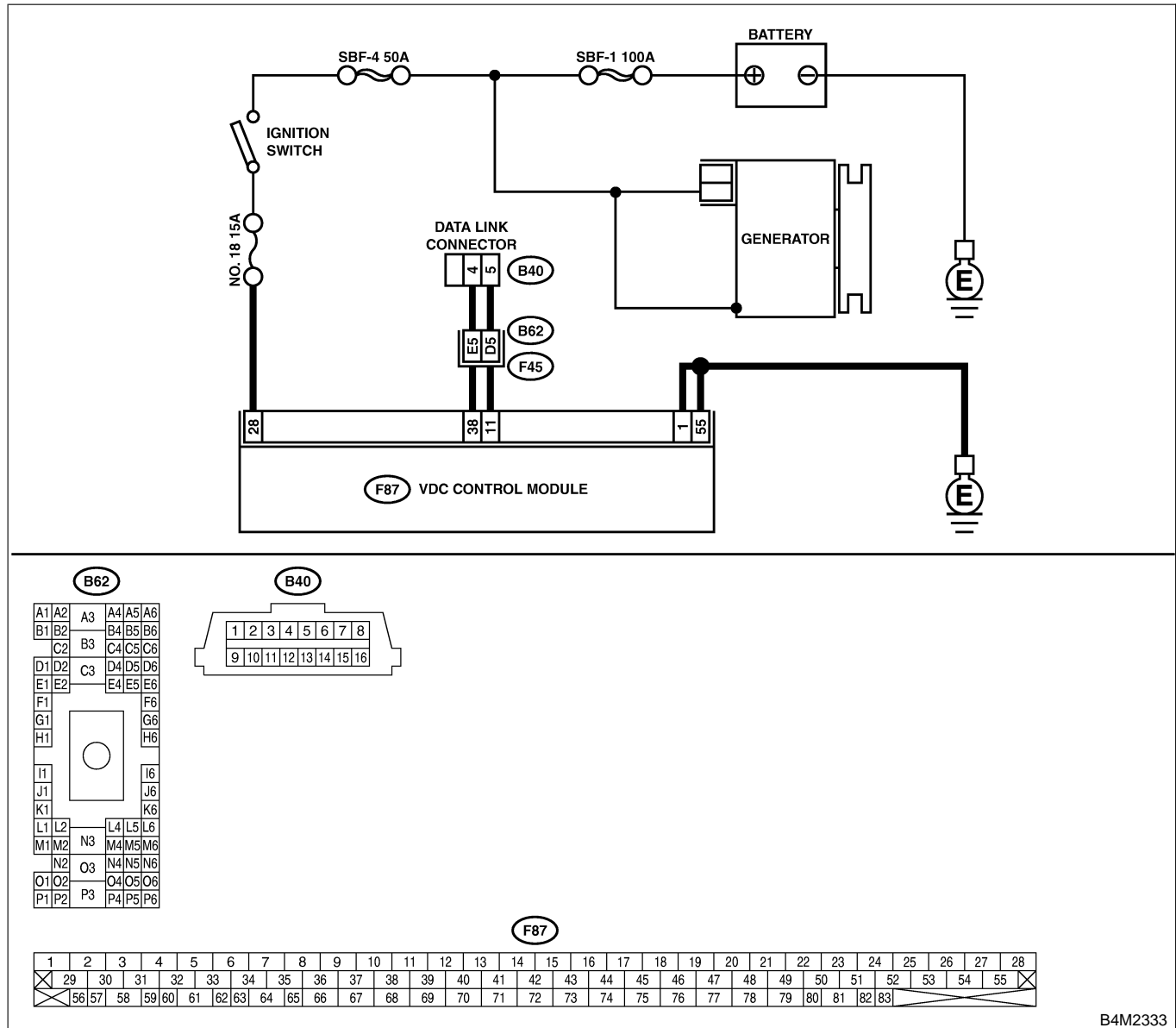
DIAGNOSIS:

- Faulty harness connector

TROUBLE SYMPTOM:

- ABS warning light remains on.

WIRING DIAGRAM:



B4M2333

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| 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 VDCCM CONNECTOR. Turn ignition switch to OFF. | Is VDCCM connector inserted into VDCCM until the clamp locks onto it? | Go to step 6. | Insert VDCCM connector into VDCCM until the clamp locks onto it. |
| 6 | CHECK POWER SUPPLY OF VDCCM. 1) Disconnect connector from VDCCM. 2) Start engine. 3) Idle the engine. 4) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 28 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 7. | Repair VDCCM power supply circuit. |
| 7 | CHECK GROUND CIRCUIT OF VDCCM. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 1 — Chassis ground: (F87) No. 55 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Go to step 8. | Repair harness/connector between VDCCM and chassis ground. |
| 8 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND DATA LINK CONNECTOR. 1) Turn ignition switch OFF. 2) Measure resistance between VDCCM connector and data link connector. Connector & terminal (F87) No. 11 — (B40) No. 5: (F87) No. 38 — (B40) No. 4: | Is the resistance less than 0.5 Ω ? | Go to step 9. | Repair harness and connector between VDCCM and data link connector. |
| 9 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and data link connector? | Repair connector. | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

B: TROUBLE CODE 21 FRONT RIGHT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY

S005504C48

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to VDC-128 TROUBLE CODE 27 REAR LEFT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY, Diagnostics Chart with Select Monitor.>

C: TROUBLE CODE 23 FRONT LEFT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY

S005504C58

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to VDC-128 TROUBLE CODE 27 REAR LEFT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY, Diagnostics Chart with Select Monitor.>

D: TROUBLE CODE 25 REAR RIGHT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY

S005504C70

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 27. <Ref. to VDC-128 TROUBLE CODE 27 REAR LEFT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY, Diagnostics Chart with Select Monitor.>

E: TROUBLE CODE 27 REAR LEFT ABS SENSOR CIRCUIT OPEN OR SHORTED BATTERY

S005504C79

DIAGNOSIS:

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

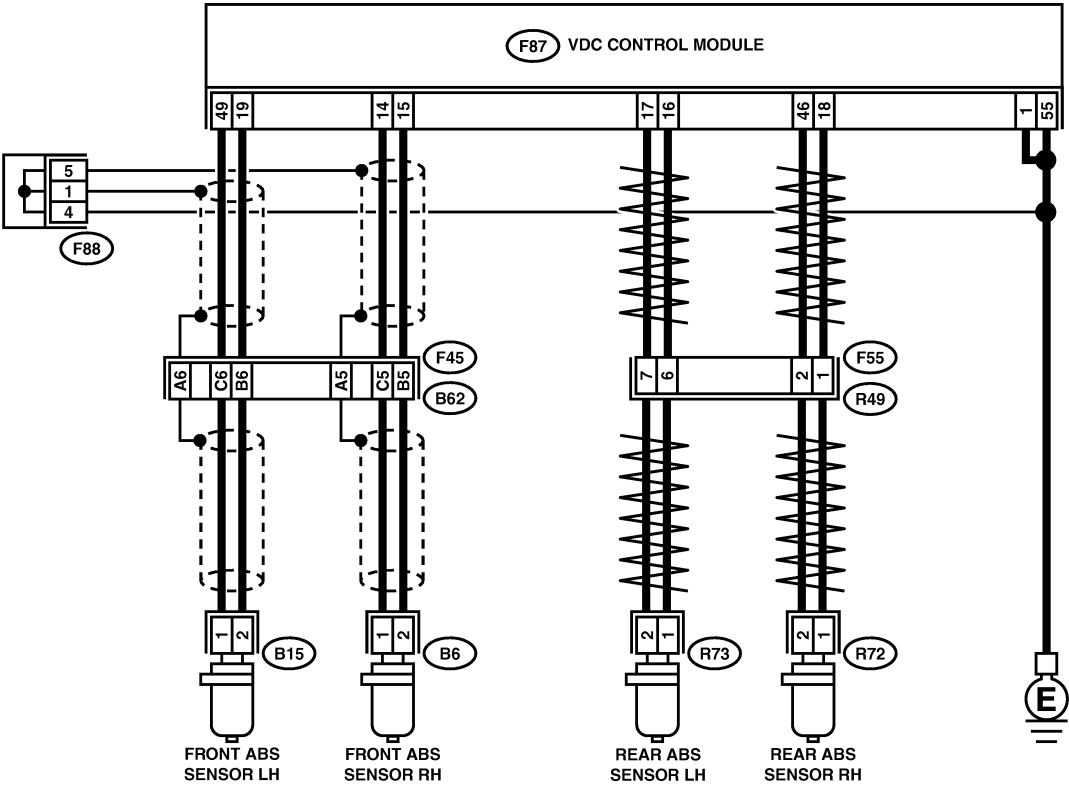
TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



F55

| | | |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |

F88

| | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |

B6

B15

R72

R73

| | |
|---|---|
| 2 | 1 |
|---|---|

B62

| | | | | | |
|----|----|----|----|----|----|
| A1 | A2 | A3 | A4 | A5 | A6 |
| B1 | B2 | B3 | B4 | B5 | B6 |
| C1 | C2 | C3 | C4 | C5 | C6 |
| D1 | D2 | D3 | D4 | D5 | D6 |
| E1 | E2 | E3 | E4 | E5 | E6 |
| F1 | F2 | F3 | F4 | F5 | F6 |
| G1 | G2 | G3 | G4 | G5 | G6 |
| H1 | H2 | H3 | H4 | H5 | H6 |
| I1 | I2 | I3 | I4 | I5 | I6 |
| J1 | J2 | J3 | J4 | J5 | J6 |
| K1 | K2 | K3 | K4 | K5 | K6 |
| L1 | L2 | L3 | L4 | L5 | L6 |
| M1 | M2 | M3 | M4 | M5 | M6 |
| N1 | N2 | N3 | N4 | N5 | N6 |
| O1 | O2 | O3 | O4 | O5 | O6 |
| P1 | P2 | P3 | P4 | P5 | P6 |

F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |

B4M2319

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| 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 9. |
| 2 | CHECK INSTALLATION OF ABS SENSOR. <i>Tightening torque:</i> 32±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 3. | Tighten ABS sensor installation bolts securely. |
| 3 | 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> 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 4. | 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. |
| 4 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 5. | Repair tone wheel. Front <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-33 Rear Tone Wheel.> |
| 5 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connectors between VDCCM and ABS sensor? | Repair connector. | Go to step 6. |
| 6 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. NOTE: Check harness and connectors between VDCCM and ABS sensor. |
| 8 | CHECK ABS SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ABS sensor. 3) Measure resistance of ABS sensor connector terminals. <i>Terminal</i> <i>Front RH No. 1 — No. 2:</i> <i>Front LH No. 1 — No. 2:</i> <i>Rear RH No. 1 — No. 2:</i> <i>Rear LH No. 1 — No. 2:</i> | Is the resistance between 1.0 and 1.5 kΩ? | Go to step 9. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|----------------|--|
| 9 | CHECK BATTERY SHORT OF ABS SENSOR. 1) Disconnect connector from VDCCM. 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 10. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |
| 10 | 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 11. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |
| 11 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ABS SENSOR. 1) Turn ignition switch to OFF. 2) Connect connector to ABS sensor. 3) Measure resistance between VDCCM connector terminals. Connector & terminal <i>Trouble code 21 / (F87) No. 14 — No. 15:</i> <i>Trouble code 23 / (F87) No. 49 — No. 19:</i> <i>Trouble code 25 / (F87) No. 18 — No. 46:</i> <i>Trouble code 27 / (F87) No. 16 — No. 17:</i> | Is the resistance between 1.0 and 1.5 kΩ? | Go to step 12. | Repair harness/connector between VDCCM and ABS sensor. |
| 12 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 21 / (F87) No. 14 (+) — Chassis ground (-):</i> <i>Trouble code 23 / (F87) No. 49 (+) — Chassis ground (-):</i> <i>Trouble code 25 / (F87) No. 18 (+) — Chassis ground (-):</i> <i>Trouble code 27 / (F87) No. 16 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 13. | Repair harness between VDCCM and ABS sensor. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 13 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 21 / (F87) No. 14 (+) — Chassis ground (-):</i> <i>Trouble code 23 / (F87) No. 49 (+) — Chassis ground (-):</i> <i>Trouble code 25 / (F87) No. 18 (+) — Chassis ground (-):</i> <i>Trouble code 27 / (F87) No. 16 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 14. | Repair harness between VDCCM and ABS sensor. |
| 14 | CHECK INSTALLATION OF ABS SENSOR. Tightening torque: 32±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 15. | Tighten ABS sensor installation bolts securely. |
| 15 | 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 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 16. | 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. |
| 16 | CHECK HUB AND TONE WHEEL RUNOUT. Measure hub and tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 17. | Repair hub and tone wheel. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |
| 17 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and ABS sensor? | Repair connector. | Go to step 18. |
| 18 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 VDCCM and ABS sensor. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

VDC-133

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

F: TROUBLE CODE 22 FRONT RIGHT ABS SENSOR SIGNAL S005504C55

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to VDC-134 TROUBLE CODE 28 REAR LEFT ABS SENSOR SIGNAL, Diagnostics Chart with Select Monitor.>

G: TROUBLE CODE 24 FRONT LEFT ABS SENSOR SIGNAL S005504C65

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to VDC-134 TROUBLE CODE 28 REAR LEFT ABS SENSOR SIGNAL, Diagnostics Chart with Select Monitor.>

H: TROUBLE CODE 26 REAR RIGHT ABS SENSOR SIGNAL S005504C74

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 28. <Ref. to VDC-134 TROUBLE CODE 28 REAR LEFT ABS SENSOR SIGNAL, Diagnostics Chart with Select Monitor.>

I: TROUBLE CODE 28 REAR LEFT ABS SENSOR SIGNAL S005504C83

DIAGNOSIS:

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

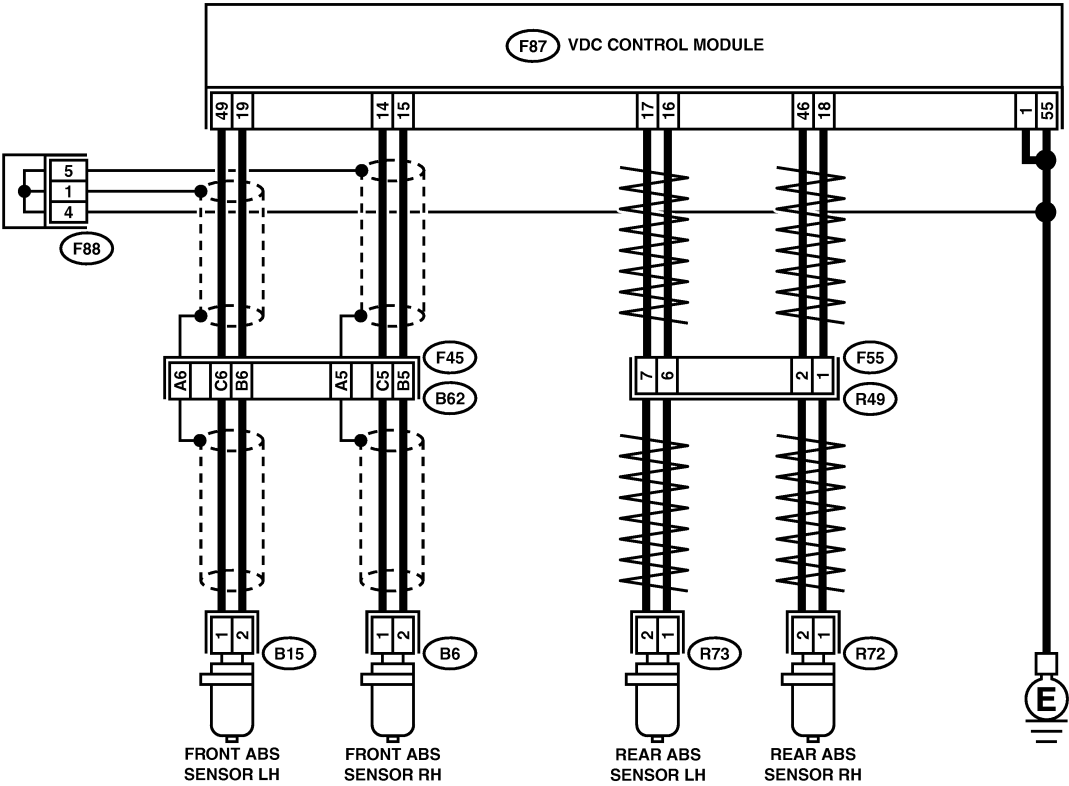
TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



F55

| | | |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |

F88

| | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |

B6

B15

R72

R73

| | |
|---|---|
| 2 | 1 |
|---|---|

B62

| | | | | | |
|----|----|----|----|----|----|
| A1 | A2 | A3 | A4 | A5 | A6 |
| B1 | B2 | B3 | B4 | B5 | B6 |
| C1 | C2 | C3 | C4 | C5 | C6 |
| D1 | D2 | D3 | D4 | D5 | D6 |
| E1 | E2 | E3 | E4 | E5 | E6 |
| F1 | F2 | F3 | F4 | F5 | F6 |
| G1 | G2 | G3 | G4 | G5 | G6 |
| H1 | H2 | H3 | H4 | H5 | H6 |
| I1 | I2 | I3 | I4 | I5 | I6 |
| J1 | J2 | J3 | J4 | J5 | J6 |
| K1 | K2 | K3 | K4 | K5 | K6 |
| L1 | L2 | L3 | L4 | L5 | L6 |
| M1 | M2 | M3 | M4 | M5 | M6 |
| N1 | N2 | N3 | N4 | N5 | N6 |
| O1 | O2 | O3 | O4 | O5 | O6 |
| P1 | P2 | P3 | P4 | P5 | P6 |

F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |

B4M2319

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| 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 VDCCM and ABS sensor? | 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 / (B62) No. A5 — Chassis ground: Trouble code 24 / (B62) No. A6 — Chassis ground: NOTE: For the trouble code 26 and 28, Go to step 6. | Is the resistance less than 0.5 Ω? | Go to step 6. | Repair shield harness. |
| 6 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 9. | Tighten ABS sensor installation bolts securely. |
| 9 | 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 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 10. | 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. |
| 10 | CHECK OSCILLOSCOPE. | Is an oscilloscope available? | Go to step 11. | Go to step 12. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--|---|
| 11 | CHECK ABS SENSOR SIGNAL. 1) Raise all four wheels of ground. 2) Turn ignition switch OFF. 3) Remove VDCCM connector cover. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect the oscilloscope to the connector. 5) Turn ignition switch ON. 6) Rotate wheels and measure voltage at specified frequency. NOTE: When this inspection is completed, the VDCCM sometimes stores the trouble code 29. Connector & terminal Trouble code 22 / (F87) No. 14 (+) — No. 15 (–): Trouble code 24 / (F87) No. 49 (+) — No. 19 (–): Trouble code 26 / (F87) No. 18 (+) — No. 46 (–): Trouble code 28 / (F87) No. 16 (+) — No. 17 (–): | Is oscilloscope pattern smooth, as shown in figure? | Go to step 15. | Go to step 12. |
| 12 | 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 13. |
| 13 | 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. Front <Ref. to VDC-30 Front ABS Sensor.> and <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-31 Rear ABS Sensor.> and <Ref. to VDC-33 Rear Tone Wheel.> | Go to step 14. |
| 14 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 15. | Repair tone wheel. Front <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-33 Rear Tone Wheel.> |
| 15 | CHECK RESISTANCE OF ABS SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from ABS sensor. 3) Measure resistance between ABS sensor connector terminals. Terminal Front RH No. 1 — No. 2: Front LH No. 1 — No. 2: Rear RH No. 1 — No. 2: Rear LH No. 1 — No. 2: | Is the resistance between 1.0 and 1.5 kΩ? | Go to step 16. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|--|--|
| 16 | CHECK GROUND SHORT OF ABS SENSOR. 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 17. | Replace ABS sensor. Front <Ref. to VDC-30 Front ABS Sensor.> Rear <Ref. to VDC-31 Rear ABS Sensor.> |
| 17 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ABS SENSOR. 1) Connect connector to ABS sensor. 2) Disconnect connector from VDCCM. 3) Measure resistance at VDCCM connector terminals. Connector & terminal <i>Trouble code 22 / (F87) No. 14 — No. 15:</i> <i>Trouble code 24 / (F87) No. 49 — No. 19:</i> <i>Trouble code 26 / (F87) No. 18 — No. 46:</i> <i>Trouble code 28 / (F87) No. 16 — No. 17:</i> | Is the resistance between 1.0 and 1.5 kΩ? | Go to step 18. | Repair harness/connector between VDCCM and ABS sensor. |
| 18 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 22 / (F87) No. 14 — Chassis ground:</i> <i>Trouble code 24 / (F87) No. 49 — Chassis ground:</i> <i>Trouble code 26 / (F87) No. 18 — Chassis ground:</i> <i>Trouble code 28 / (F87) No. 16 — Chassis ground:</i> | Is the resistance more than 1 MΩ? | Go to step 19. | Repair harness/connector between VDCCM and ABS sensor. |
| 19 | CHECK GROUND CIRCUIT OF VDCCM. Measure resistance between VDCCM and chassis ground. Connector & terminal <i>(F87) No. 1 — Chassis ground:</i> <i>(F87) No. 55 — Chassis ground:</i> | Is the resistance less than 0.5 Ω? | Go to step 20. | Repair VDCCM ground harness. |
| 20 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and ABS sensor? | Repair connector. | Go to step 21. |
| 21 | CHECK SOURCES OF SIGNAL NOISE. | Is the car telephone or the wireless transmitter properly installed? | Go to step 22. | Properly install the car telephone or the wireless transmitter. |
| 22 | 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 23. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|--|---------------------------------|
| 23 | CHECK SHIELD CIRCUIT. 1) Connect all connectors. 2) Measure resistance between shield connector and chassis ground. Connector & terminal Trouble code 22 / (B62) No. A5 — Chassis ground: Trouble code 24 / (B62) No. A6 — Chassis ground: NOTE: For the trouble code 26 and 28, Go to step 25. | Is the resistance less than 0.5 Ω ? | Go to step 24. | Repair shield harness. |
| 24 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Go to step 25. |
| 25 | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

J: TROUBLE CODE 29 ANY ONE OF FOUR ABS SENSOR SIGNAL S005504C87

DIAGNOSIS:

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

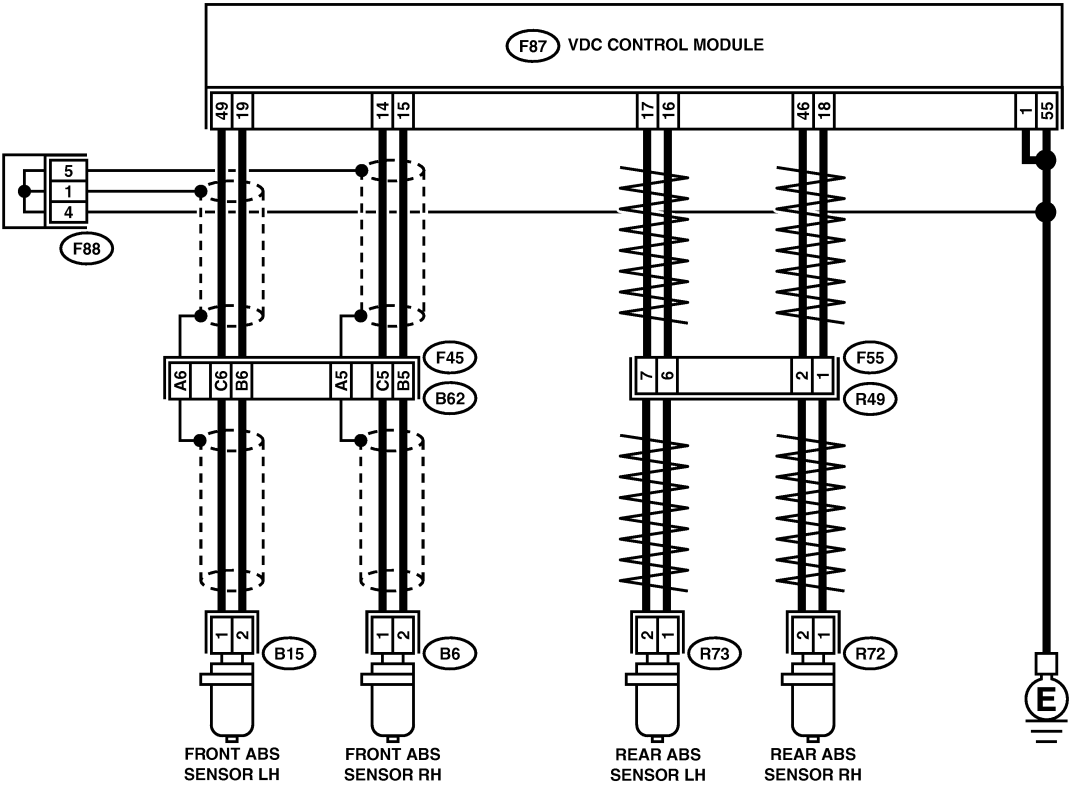
TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



F55

| | | |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |

F88

| | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |

B6

B15

R72

R73

| | |
|---|---|
| 2 | 1 |
|---|---|

B62

| | | | | | |
|----|----|----|----|----|----|
| A1 | A2 | A3 | A4 | A5 | A6 |
| B1 | B2 | B3 | B4 | B5 | B6 |
| C1 | C2 | C3 | C4 | C5 | C6 |
| D1 | D2 | D3 | D4 | D5 | D6 |
| E1 | E2 | E3 | E4 | E5 | E6 |
| F1 | F2 | F3 | F4 | F5 | F6 |
| G1 | G2 | G3 | G4 | G5 | G6 |
| H1 | H2 | H3 | H4 | H5 | H6 |
| I1 | I2 | I3 | I4 | I5 | I6 |
| J1 | J2 | J3 | J4 | J5 | J6 |
| K1 | K2 | K3 | K4 | K5 | K6 |
| L1 | L2 | L3 | L4 | L5 | L6 |
| M1 | M2 | M3 | M4 | M5 | M6 |
| N1 | N2 | N3 | N4 | N5 | N6 |
| O1 | O2 | O3 | O4 | O5 | O6 |
| P1 | P2 | P3 | P4 | P5 | P6 |

F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |

B4M2319

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| 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 VDC 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±10 N·m (3.3±1.0 kgf-m, 24±7 ft-lb) | Are the ABS sensor installation bolts tightened securely? | Go to step 6. | Tighten ABS sensor installation bolts securely. |
| 6 | 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> 0.44 — 0.94 mm (0.0173 — 0.0370 in) | Is the gap within the specifications? | Go to step 7. | 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. |
| 7 | CHECK OSCILLOSCOPE. | Is an oscilloscope available? | Go to step 8. | Go to step 9. |
| 8 | CHECK ABS SENSOR SIGNAL. 1) Raise all four wheels of ground. 2) Turn ignition switch OFF. 3) Remove VDCCM connector cover. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect the oscilloscope to the connector. 5) Turn ignition switch ON. 6) Rotate wheels and measure voltage at specified frequency. NOTE: When this inspection is completed, the VDCCM sometimes stores the trouble code 29. Connector & terminal (F49) No. 14 (+) — No. 15 (-) (Front RH): (F49) No. 49 (+) — No. 19 (-) (Front LH): (F49) No. 18 (+) — No. 46 (-) (Rear RH): (F49) No. 16 (+) — No. 17 (-) (Rear LH): | Is oscilloscope pattern smooth, as shown in figure? | Go to step 12. | Go to step 9. |

VDC-142

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 9 | 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 10. |
| 10 | 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. Front <Ref. to VDC-30 Front ABS Sensor.> and <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-31 Rear ABS Sensor.> and <Ref. to VDC-33 Rear Tone Wheel.> | Go to step 11. |
| 11 | CHECK TONE WHEEL RUNOUT. Measure tone wheel runout. | Is the runout less than 0.05 mm (0.0020 in)? | Go to step 12. | Repair tone wheel. Front <Ref. to VDC-32 Front Tone Wheel.> Rear <Ref. to VDC-33 Rear Tone Wheel.> |
| 12 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

K: TROUBLE CODE 31 FR HOLD VALVE MALFUNCTION (FRONT RIGHT INLET VALVE MALFUNCTION)

S005504C92

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-144 TROUBLE CODE 62 NORMAL OPENING VALVE 1 MALFUNCTION (SECONDARY CUT VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

L: TROUBLE CODE 33 FL HOLD VALVE MALFUNCTION (FRONT LEFT INLET VALVE MALFUNCTION)

S005504D02

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-144 TROUBLE CODE 62 NORMAL OPENING VALVE 1 MALFUNCTION (SECONDARY CUT VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

M: TROUBLE CODE 35 RR HOLD VALVE MALFUNCTION (REAR RIGHT INLET VALVE MALFUNCTION)

S005504D12

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-144 TROUBLE CODE 62 NORMAL OPENING VALVE 1 MALFUNCTION (SECONDARY CUT VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

N: TROUBLE CODE 37 RL HOLD VALVE MALFUNCTION (REAR LEFT INLET VALVE MALFUNCTION)

S005504D21

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-144 TROUBLE CODE 62 NORMAL OPENING VALVE 1 MALFUNCTION (SECONDARY CUT VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

O: TROUBLE CODE 61 NORMAL OPENING VALVE 2 MALFUNCTION (PRIMARY CUT VALVE MALFUNCTION)

S005504D78

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 62. <Ref. to VDC-144 TROUBLE CODE 62 NORMAL OPENING VALVE 1 MALFUNCTION (SECONDARY CUT VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

P: TROUBLE CODE 62 NORMAL OPENING VALVE 1 MALFUNCTION (SECONDARY CUT VALVE MALFUNCTION)

S005504D80

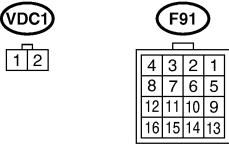
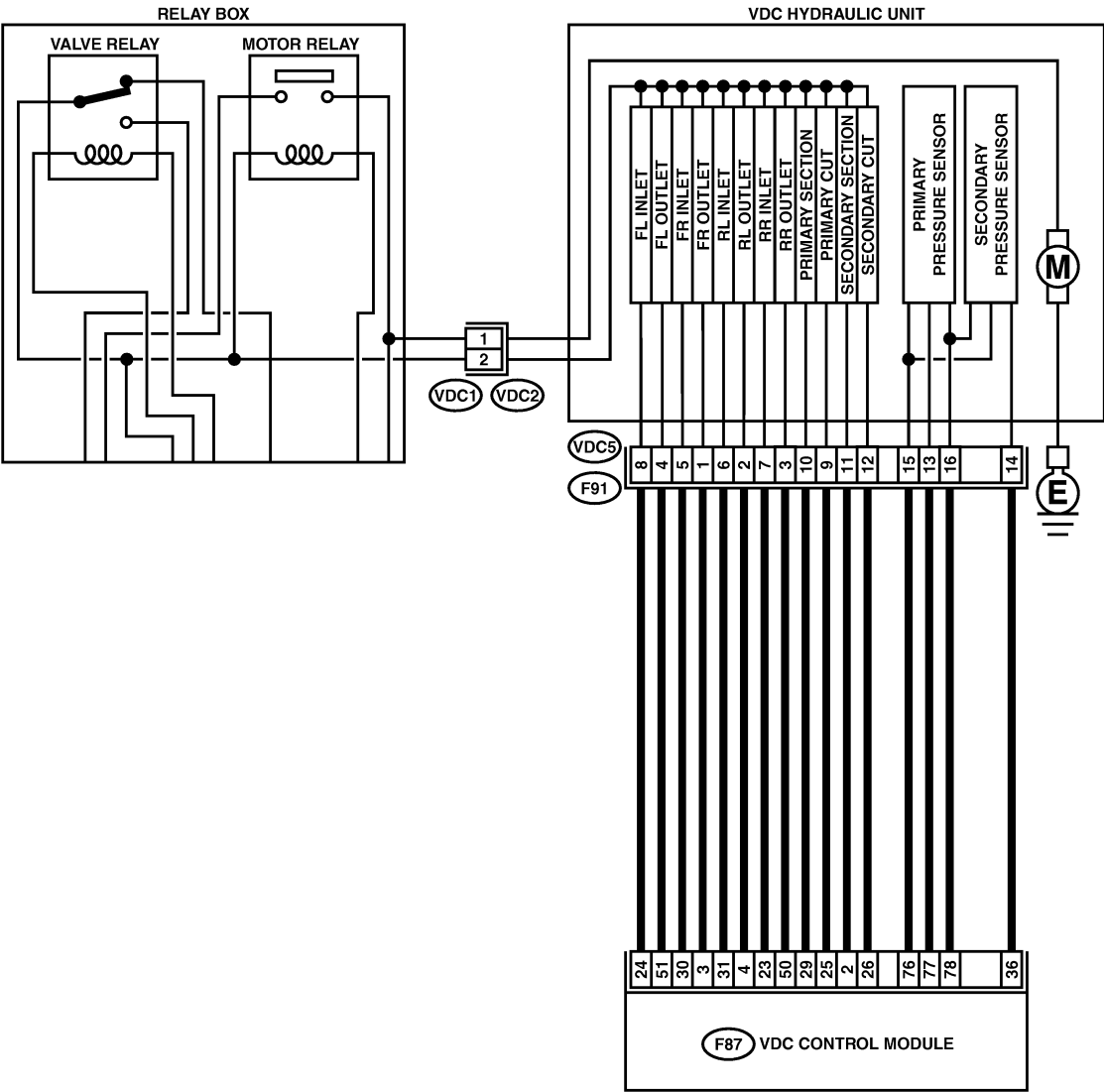
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in VDCH/U

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

B4M2320

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---------------|--|
| 1 | CHECK RESISTANCE OF SOLENOID VALVE. 1) Turn ignition switch to OFF. 2) Disconnect two connectors (VDC1, F91) from VDCH/U. 3) Measure resistance between VDCH/U connector terminals. Connector & terminal <i>Trouble code 31/(VDC5) No. 5 — (VDC2) No. 2:</i> <i>Trouble code 33/(VDC5) No. 8 — (VDC2) No. 2:</i> <i>Trouble code 35/(VDC5) No. 7 — (VDC2) No. 2:</i> <i>Trouble code 37/(VDC5) No. 6 — (VDC2) No. 2:</i> <i>Trouble code 61/(VDC5) No. 9 — (VDC2) No. 2:</i> <i>Trouble code 62/(VDC5) No. 12 — (VDC2) No. 2:</i> | Is the resistance between 8.04 and 9.04 Ω ? | Go to step 2. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 2 | CHECK GROUND SHORT OF SOLENOID VALVE. Measure resistance between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 31/(VDC5) No. 5 — Chassis ground:</i> <i>Trouble code 33/(VDC5) No. 8 — Chassis ground:</i> <i>Trouble code 35/(VDC5) No. 7 — Chassis ground:</i> <i>Trouble code 37/(VDC5) No. 6 — Chassis ground:</i> <i>Trouble code 61/(VDC5) No. 9 — Chassis ground:</i> <i>Trouble code 62/(VDC5) No. 12 — Chassis ground:</i> | Is the resistance more than 1 M Ω ? | Go to step 3. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 3 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Disconnect connector from VDCCM. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 31/(VDC5) No. 5 (+) — Chassis ground (-):</i> <i>Trouble code 33/(VDC5) No. 8 (+) — Chassis ground (-):</i> <i>Trouble code 35/(VDC5) No. 7 (+) — Chassis ground (-):</i> <i>Trouble code 37/(VDC5) No. 6 (+) — Chassis ground (-):</i> <i>Trouble code 61/(VDC5) No. 9 (+) — Chassis ground (-):</i> <i>Trouble code 62/(VDC5) No. 12 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 4. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|-------------------------------|---------------|--|
| 4 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 31/(VDC5) No. 5 (+) — Chassis ground (-):</i> <i>Trouble code 33/(VDC5) No. 8 (+) — Chassis ground (-):</i> <i>Trouble code 35/(VDC5) No. 7 (+) — Chassis ground (-):</i> <i>Trouble code 37/(VDC5) No. 6 (+) — Chassis ground (-):</i> <i>Trouble code 61/(VDC5) No. 9 (+) — Chassis ground (-):</i> <i>Trouble code 62/(VDC5) No. 12 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 5. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 5 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 31/(F87) No. 30 (+) — Chassis ground (-):</i> <i>Trouble code 33/(F87) No. 24 (+) — Chassis ground (-):</i> <i>Trouble code 35/(F87) No. 23 (+) — Chassis ground (-):</i> <i>Trouble code 37/(F87) No. 31 (+) — Chassis ground (-):</i> <i>Trouble code 61/(F87) No. 25 (+) — Chassis ground (-):</i> <i>Trouble code 62/(F87) No. 26 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 6. | Repair harness between VDCCM and VDCH/U. |
| 6 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 31/(F87) No. 30 (+) — Chassis ground (-):</i> <i>Trouble code 33/(F87) No. 24 (+) — Chassis ground (-):</i> <i>Trouble code 35/(F87) No. 23 (+) — Chassis ground (-):</i> <i>Trouble code 37/(F87) No. 31 (+) — Chassis ground (-):</i> <i>Trouble code 61/(F87) No. 25 (+) — Chassis ground (-):</i> <i>Trouble code 62/(F87) No. 26 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 7. | Repair harness between VDCCM and VDCH/U. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 7 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 31/(F87) No. 30 — Chassis ground:</i> <i>Trouble code 33/(F87) No. 24 — Chassis ground:</i> <i>Trouble code 35/(F87) No. 23 — Chassis ground:</i> <i>Trouble code 37/(F87) No. 31 — Chassis ground:</i> <i>Trouble code 61/(F87) No. 25 — Chassis ground:</i> <i>Trouble code 62/(F87) No. 26 — Chassis ground:</i> | Is the resistance more than 1 MΩ? | Go to step 8. | Repair harness between VDCCM and VDCH/U. |
| 8 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND VDCH/U. 1) Connect connector (F91) to VDCH/U. 2) Measure resistance between VDCCM connector and VDCH/U connector. Connector & terminal <i>Trouble code 31/(F87) No. 30 — (VDC2) No. 2:</i> <i>Trouble code 33/(F87) No. 24 — (VDC2) No. 2:</i> <i>Trouble code 35/(F87) No. 23 — (VDC2) No. 2:</i> <i>Trouble code 37/(F87) No. 31 — (VDC2) No. 2:</i> <i>Trouble code 61/(F87) No. 25 — (VDC2) No. 2:</i> <i>Trouble code 62/(F87) No. 26 — (VDC2) No. 2:</i> | Is the resistance between 7 and 10 Ω? | Go to step 9. | Repair harness/connector between VDCCM and VDCH/U. |
| 9 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and VDCH/U? | Repair connector. | Go to step 10. |
| 10 | CHECK VDCCM. 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? | Repair VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

VDC-149

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

Q: TROUBLE CODE 32 FR PRESSURE REDUCING VALVE MALFUNCTION (FRONT RIGHT OUTLET VALVE MALFUNCTION)

S005504C98

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-150 TROUBLE CODE 64 NORMAL CLOSING VALVE 1 MALFUNCTION (SECONDARY SUCTION VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

R: TROUBLE CODE 34 FL PRESSURE REDUCING VALVE MALFUNCTION (FRONT LEFT OUTLET VALVE MALFUNCTION)

S005504D07

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-150 TROUBLE CODE 64 NORMAL CLOSING VALVE 1 MALFUNCTION (SECONDARY SUCTION VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

S: TROUBLE CODE 36 RR PRESSURE REDUCING VALVE MALFUNCTION (REAR RIGHT OUTLET VALVE MALFUNCTION)

S005504D16

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-150 TROUBLE CODE 64 NORMAL CLOSING VALVE 1 MALFUNCTION (SECONDARY SUCTION VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

T: TROUBLE CODE 38 RL PRESSURE REDUCING VALVE MALFUNCTION (REAR LEFT OUTLET VALVE MALFUNCTION)

S005504D25

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-150 TROUBLE CODE 64 NORMAL CLOSING VALVE 1 MALFUNCTION (SECONDARY SUCTION VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

U: TROUBLE CODE 63 NORMAL CLOSING VALVE 2 MALFUNCTION (PRIMARY SUCTION VALVE MALFUNCTION)

S005504D82

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 64. <Ref. to VDC-150 TROUBLE CODE 64 NORMAL CLOSING VALVE 1 MALFUNCTION (SECONDARY SUCTION VALVE MALFUNCTION), Diagnostics Chart with Select Monitor.>

V: TROUBLE CODE 64 NORMAL CLOSING VALVE 1 MALFUNCTION (SECONDARY SUCTION VALVE MALFUNCTION)

S005504D84

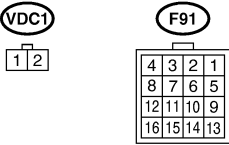
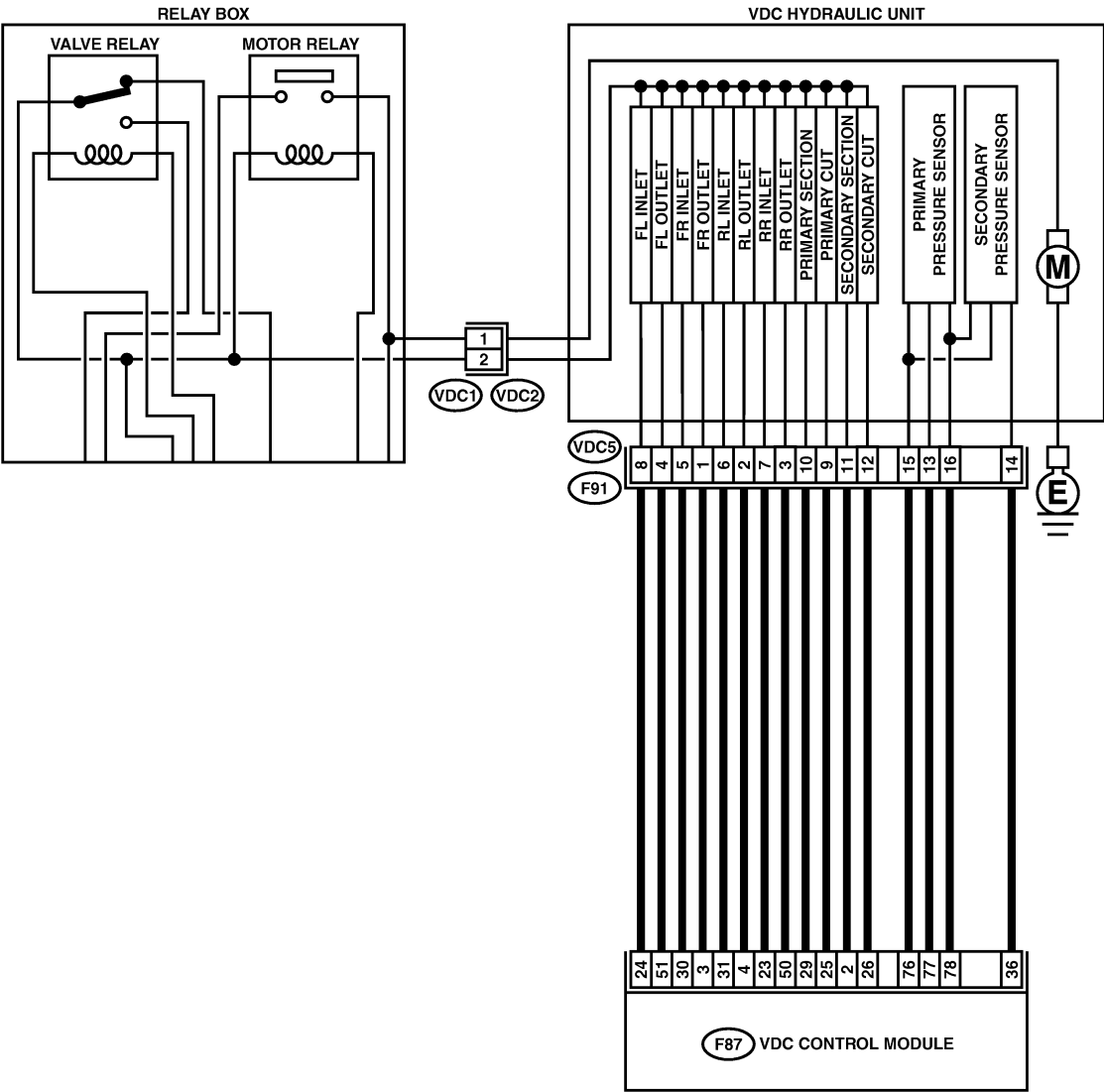
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in VDCH/U

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | |

B4M2320

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---------------|--|
| 1 | CHECK RESISTANCE OF SOLENOID VALVE. 1) Turn ignition switch to OFF. 2) Disconnect two connectors (VDC1, F91) from VDCH/U. 3) Measure resistance between VDCH/U connector terminals. Connector & terminal <i>Trouble code 32/(VDC5) No. 1 — (VDC2) No. 2:</i> <i>Trouble code 34/(VDC5) No. 4 — (VDC2) No. 2:</i> <i>Trouble code 36/(VDC5) No. 3 — (VDC2) No. 2:</i> <i>Trouble code 38/(VDC5) No. 2 — (VDC2) No. 2:</i> <i>Trouble code 63/(VDC5) No. 10 — (VDC2) No. 2:</i> <i>Trouble code 64/(VDC5) No. 11 — (VDC2) No. 2:</i> | Is the resistance between 3.8 and 4.8 Ω ? | Go to step 2. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 2 | CHECK GROUND SHORT OF SOLENOID VALVE. Measure resistance between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 32/(VDC5) No. 1 — Chassis ground:</i> <i>Trouble code 34/(VDC5) No. 4 — Chassis ground:</i> <i>Trouble code 36/(VDC5) No. 3 — Chassis ground:</i> <i>Trouble code 38/(VDC5) No. 2 — Chassis ground:</i> <i>Trouble code 63/(VDC5) No. 10 — Chassis ground:</i> <i>Trouble code 64/(VDC5) No. 11 — Chassis ground:</i> | Is the resistance more than 1 M Ω ? | Go to step 3. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 3 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Disconnect connector from VDCCM. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 32/(VDC5) No. 1 (+) — Chassis ground (-):</i> <i>Trouble code 34/(VDC5) No. 4 (+) — Chassis ground (-):</i> <i>Trouble code 36/(VDC5) No. 3 (+) — Chassis ground (-):</i> <i>Trouble code 38/(VDC5) No. 2 (+) — Chassis ground (-):</i> <i>Trouble code 63/(VDC5) No. 10 (+) — Chassis ground (-):</i> <i>Trouble code 64/(VDC5) No. 11 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 4. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|-------------------------------|---------------|--|
| 4 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal <i>Trouble code 32/(VDC5) No. 1 (+) — Chassis ground (-):</i> <i>Trouble code 34/(VDC5) No. 4 (+) — Chassis ground (-):</i> <i>Trouble code 36/(VDC5) No. 3 (+) — Chassis ground (-):</i> <i>Trouble code 38/(VDC5) No. 2 (+) — Chassis ground (-):</i> <i>Trouble code 63/(VDC5) No. 10 (+) — Chassis ground (-):</i> <i>Trouble code 64/(VDC5) No. 11 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 5. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 5 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 32/(F87) No. 3 (+) — Chassis ground (-):</i> <i>Trouble code 34/(F87) No. 51 (+) — Chassis ground (-):</i> <i>Trouble code 36/(F87) No. 50 (+) — Chassis ground (-):</i> <i>Trouble code 38/(F87) No. 4 (+) — Chassis ground (-):</i> <i>Trouble code 63/(F87) No. 29 (+) — Chassis ground (-):</i> <i>Trouble code 64/(F87) No. 2 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 6. | Repair harness between VDCCM and VDCH/U. |
| 6 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 32/(F87) No. 3 (+) — Chassis ground (-):</i> <i>Trouble code 34/(F87) No. 51 (+) — Chassis ground (-):</i> <i>Trouble code 36/(F87) No. 50 (+) — Chassis ground (-):</i> <i>Trouble code 38/(F87) No. 4 (+) — Chassis ground (-):</i> <i>Trouble code 63/(F87) No. 29 (+) — Chassis ground (-):</i> <i>Trouble code 64/(F87) No. 2 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 7. | Repair harness between VDCCM and VDCH/U. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 7 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal <i>Trouble code 32/(F87) No. 3 — Chassis ground:</i> <i>Trouble code 34/(F87) No. 51 — Chassis ground:</i> <i>Trouble code 36/(F87) No. 50 — Chassis ground:</i> <i>Trouble code 38/(F87) No. 4 — Chassis ground:</i> <i>Trouble code 63/(F87) No. 29 — Chassis ground:</i> <i>Trouble code 64/(F87) No. 2 — Chassis ground:</i> | Is the resistance more than 1 MΩ? | Go to step 8. | Repair harness between VDCCM and VDCH/U. |
| 8 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND VDCH/U. 1) Connect connector (F91) to VDCH/U. 2) Measure resistance between VDCCM connector and VDCH/U connector. Connector & terminal <i>Trouble code 32/(F87) No. 3 — (VDC2) No. 1:</i> <i>Trouble code 34/(F87) No. 51 — (VDC2) No. 1:</i> <i>Trouble code 36/(F87) No. 50 — (VDC2) No. 1:</i> <i>Trouble code 38/(F87) No. 4 — (VDC2) No. 1:</i> <i>Trouble code 63/(F87) No. 29 — (VDC2) No. 1:</i> <i>Trouble code 64/(F87) No. 2 — (VDC2) No. 1:</i> | Is the resistance between 4 and 6 Ω? | Go to step 9. | Repair harness/connector between VDCCM and VDCH/U. |
| 9 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and VDCH/U? | Repair connector. | Go to step 10. |
| 10 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

VDC-155

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

W: TROUBLE CODE 41 ELECTRICAL CONTROL MODULE (VDC CONTROL MODULE MALFUNCTION) S005504D32

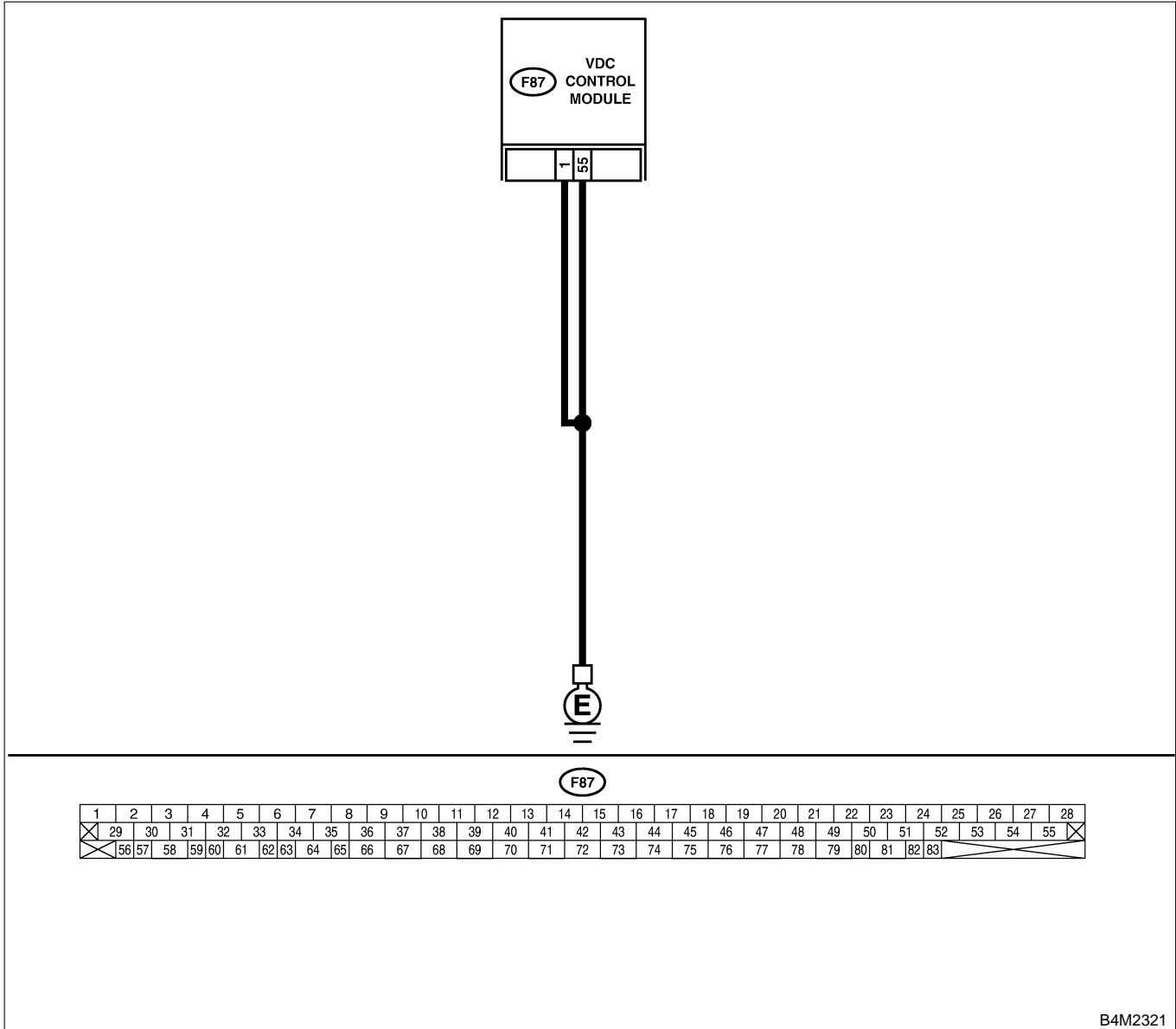
DIAGNOSIS:

- Faulty VDCCM

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---|---|
| 1 | CHECK GROUND CIRCUIT OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 1 — Chassis ground: (F87) No. 55 — Chassis ground: | Is the resistance less than 0.5 Ω? | Go to step 2. | Repair VDCCM ground harness. |
| 2 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between battery, ignition switch and VDCCM? | 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 VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

X: TROUBLE CODE 42 POWER SUPPLY VOLTAGE LOW

S005504D34

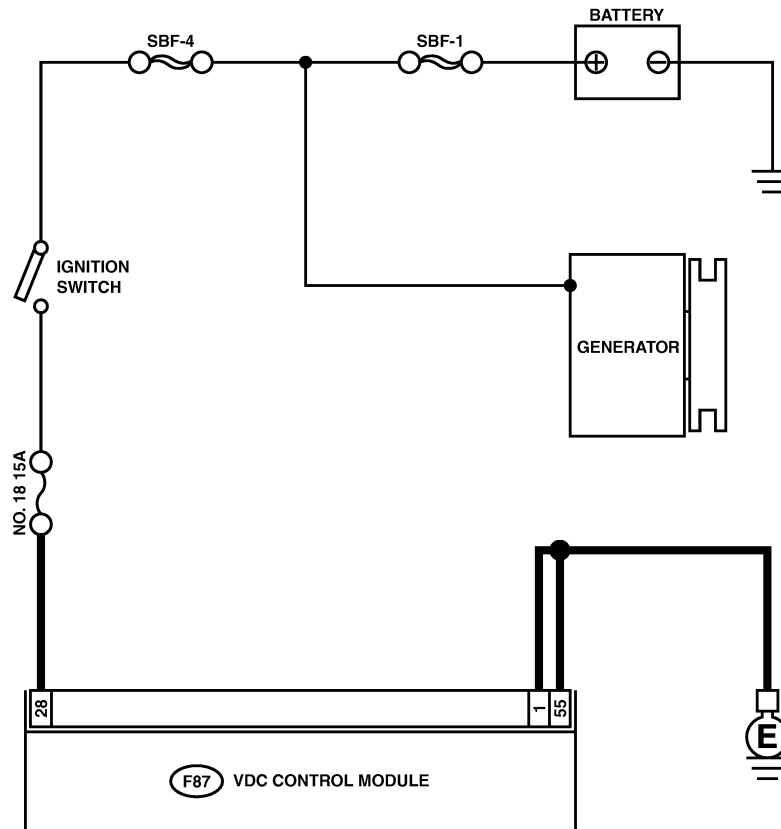
DIAGNOSIS:

- Power source voltage of the VDCCM is low.

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



(F87)

| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

B4M2322

VDC-158

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| 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 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 VDCCM. 1) Disconnect connector from VDCCM. 2) Run the engine at idle. 3) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 28 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 4. | Repair harness connector between battery, ignition switch and VDCCM. |
| 4 | CHECK GROUND CIRCUIT OF VDCCM. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 1 — Chassis ground: (F87) No. 55 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Go to step 5. | Repair VDCCM ground harness. |
| 5 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between generator, battery and VDCCM? | Repair connector. | Go to step 6. |
| 6 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

Y: TROUBLE CODE 43 AET COMMUNICATION LINE MALFUNCTION S005504D40

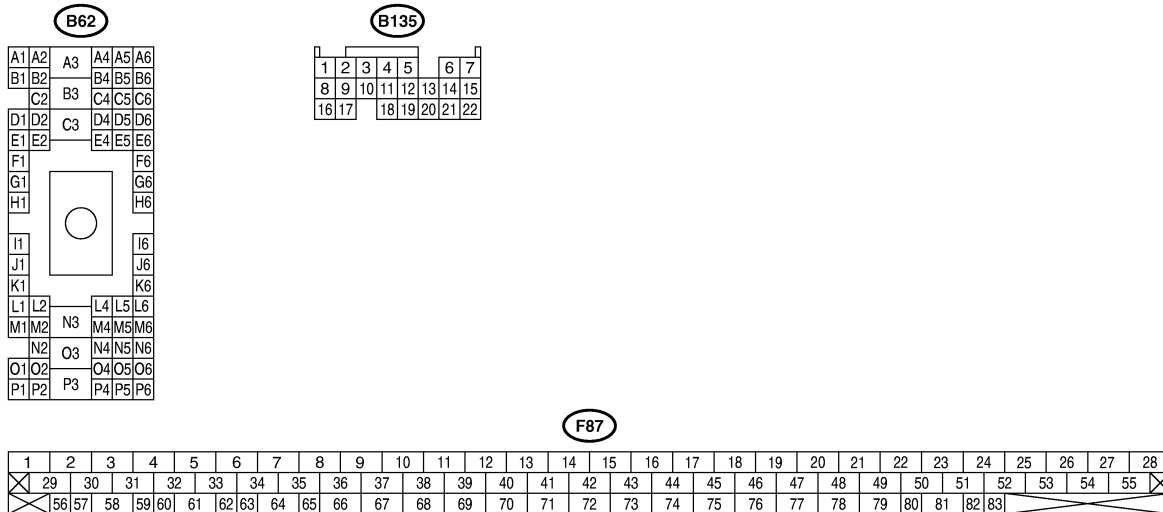
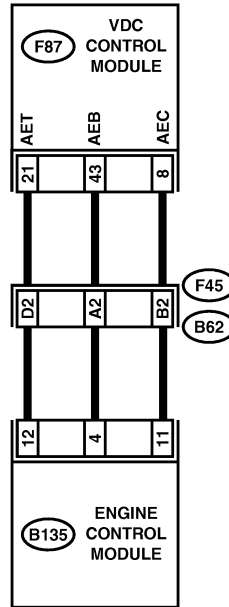
DIAGNOSIS:

- AET communication line is broken or short circuited.

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2323

VDC-160

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|---|
| 1 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Disconnect connector from ECM. 4) Measure resistance between VDCCM connector and ECM. Terminal (F87) No. 21 — (B135) No. 6: | Is the resistance less than 0.5 Ω ? | Go to step 2. | Repair harness/connector between VDCCM and ECM. |
| 2 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM connector and chassis ground. Terminal (F87) No. 21 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 3. | Repair harness/connector between VDCCM and ECM. |
| 3 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM connector and chassis ground. Terminal (F87) No. 21 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 4. | Repair harness/connector between VDCCM and ECM. |
| 4 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Terminal (F87) No. 21 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 5. | Repair harness/connector between VDCCM and ECM. |
| 5 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Connect connector to ECM. 3) Turn ignition switch to ON. 4) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 21 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 6. | Go to step 9. |
| 6 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between ECM and VDCCM? | Repair connector. | Go to step 7. |
| 7 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |
| 9 | CHECK ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM connector terminal and chassis ground. Connector & terminal (B135) No. 12 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Repair harness/connector between ECM and VDCCM. | Go to step 10. |
| 10 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector ECM? | Repair connector. | Go to step 11. |
| 11 | CHECK ENGINE. | Is the engine functioning normally? | Replace ECM. | Repair engine. |

VDC-161

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

Z: TROUBLE CODE 43 AEB COMMUNICATION LINE MALFUNCTION S005504D38

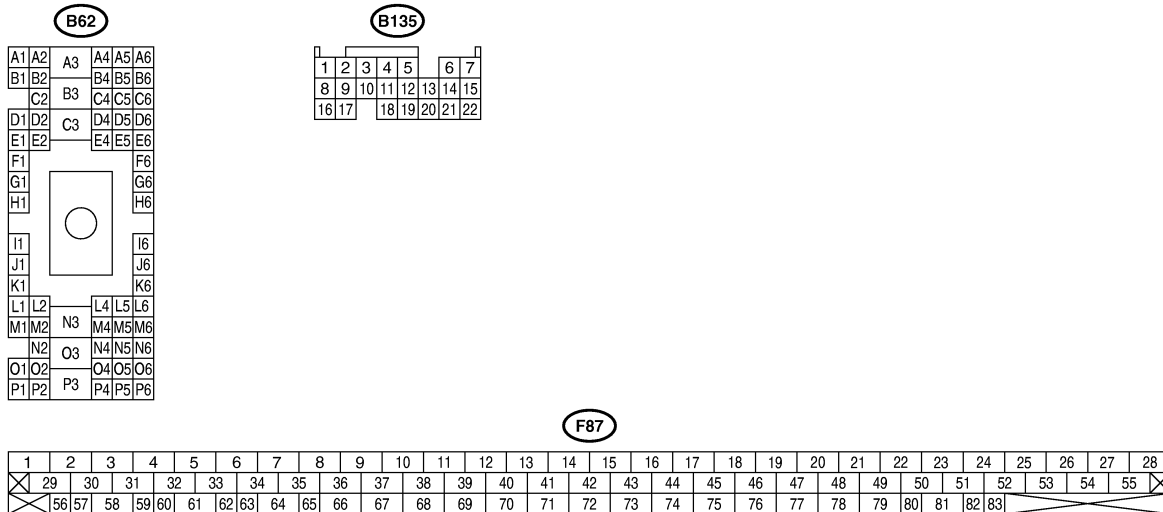
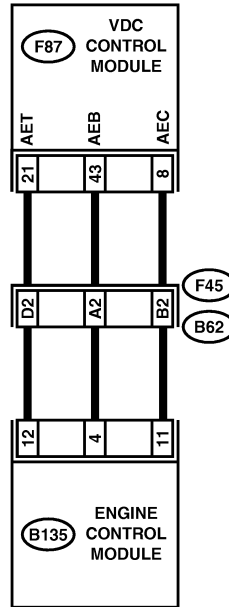
DIAGNOSIS:

- AEB communication line is broken or short circuited.

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2323

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|---|
| 1 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Disconnect connector from ECM. 4) Measure resistance between VDCCM connector and ECM. Terminal (F87) No. 43 — (B135) No. 4: | Is the resistance less than 0.5 Ω? | Go to step 2. | Repair harness/connector between VDCCM and ECM. |
| 2 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM connector and chassis ground. Terminal (F87) No. 43 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 3. | Repair harness/connector between VDCCM and ECM. |
| 3 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM connector and chassis ground. Terminal (F87) No. 43 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 4. | Repair harness/connector between VDCCM and ECM. |
| 4 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Terminal (F87) No. 43 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 5. | Repair harness/connector between VDCCM and ECM. |
| 5 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Connect connector to ECM. 3) Turn ignition switch to ON. 4) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 43 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 6. | Go to step 9. |
| 6 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between ECM and VDCCM? | Repair connector. | Go to step 7. |
| 7 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |
| 9 | CHECK ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM connector terminal and chassis ground. Connector & terminal (B135) No. 5 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Repair harness/connector between ECM and VDCCM. | Go to step 10. |
| 10 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector ECM? | Repair connector. | Go to step 11. |
| 11 | CHECK ENGINE. | Is the engine functioning normally? | Replace ECM. | Repair engine. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AA: TROUBLE CODE 43 AEC COMMUNICATION LINE MALFUNCTION S005504D39

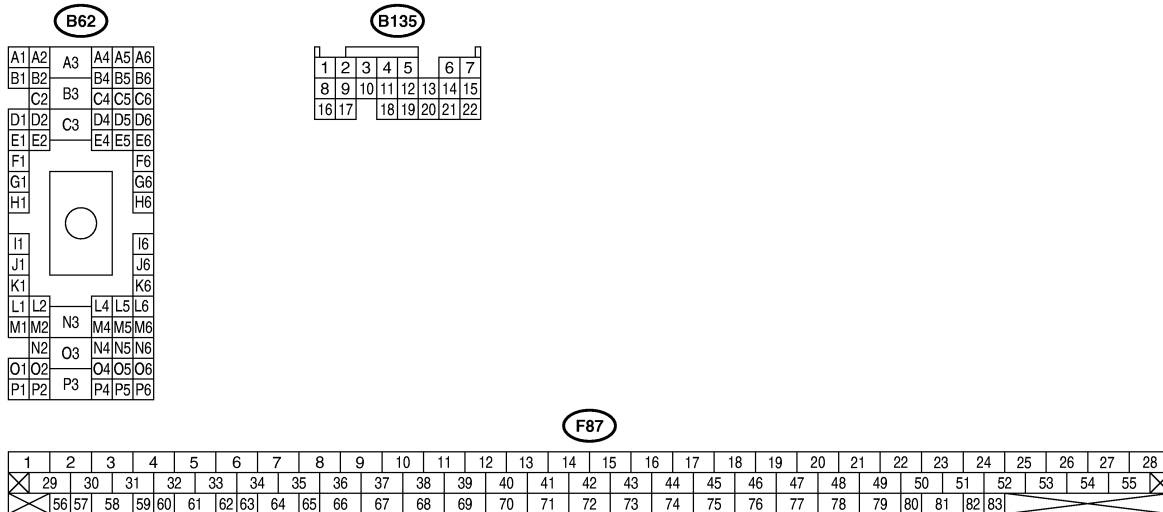
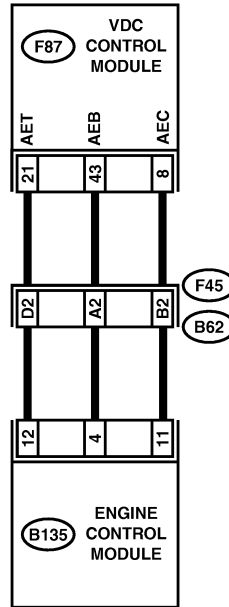
DIAGNOSIS:

- AEC communication line is broken or short circuited.

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2323

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

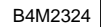
| No. | Step | Check | Yes | No |
|-----|---|--|---|---|
| 1 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Disconnect connector from ECM. 4) Measure resistance between VDCCM connector and ECM. Terminal (F87) No. 8 — (B135) No. 11: | Is the resistance less than 0.5 Ω ? | Go to step 2. | Repair harness/connector between VDCCM and ECM. |
| 2 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM connector and chassis ground. Terminal (F87) No. 8 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 3. | Repair harness/connector between VDCCM and ECM. |
| 3 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM connector and chassis ground. Terminal (F87) No. 8 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 4. | Repair harness/connector between VDCCM and ECM. |
| 4 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Terminal (F87) No. 8 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 5. | Repair harness/connector between VDCCM and ECM. |
| 5 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Connect connector to ECM. 3) Turn ignition switch to ON. 4) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 8 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 6. | Go to step 9. |
| 6 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between ECM and VDCCM? | Repair connector. | Go to step 7. |
| 7 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |
| 9 | CHECK ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM connector terminal and chassis ground. Connector & terminal (B135) No. 11 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Repair harness/connector between ECM and VDCCM. | Go to step 10. |
| 10 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector ECM? | Repair connector. | Go to step 11. |
| 11 | CHECK ENGINE. | Is the engine functioning normally? | Replace ECM. | Repair engine. |

VDC-165

VDC (DIAGNOSTICS)

S005504D44

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--|---------------------------------------|
| 1 | CHECK RESISTANCE OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect two connectors from TCM. 3) Measure resistance between TCM connector terminals. <i>Connector & terminal (B56) No. 9 — No. 18:</i> | Is the resistance $60 \pm 3 \Omega$? | Go to step 2. | Repair harness between TCM and VDCCM. |
| 2 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in TCM connectors? | Repair connector. | Go to step 3. |
| 3 | CHECK TCM. 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 TCM. <Ref. to AT-42 Transmission Control Module (TCM).> | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AC: TROUBLE CODE 45 INCORRECT VDC CONTROL MODULE

S005504D47

DIAGNOSIS:

- Control module out of specification

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

| No. | Step | Check | Yes | No |
|-----|---|---|---|---|
| 1 | CHECK VDCCM SPECIFICATIONS. Check the VDCCM identification mark. VDCCM identification mark E1 | Does the VDCCM identification mark agree with the vehicle specifications? | Go to step 2. | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> |
| 2 | CHECK TCM SPECIFICATIONS. Check the TCM identification mark. TCM identification mark XD | Does the TCM identification mark agree with the vehicle specifications? | Go to step 3. | Replace TCM. <Ref. to AT-42 Transmission Control Module (TCM).> |
| 3 | CHECK TCM. 1) Replace TCM. <Ref. to AT-42 Transmission Control Module (TCM).> 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? | Go to step 4. | The original TCM has been faulty. |
| 4 | CHECK TCM. | Is the same trouble code as in the current diagnosis still being output? | Go to step 5. | Proceed with the diagnosis corresponding to the trouble code. |
| 5 | CHECK VDCCM. 1) Install original TCM. 2) Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> 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? | Go to step 6. | The original VDCCM has been faulty. |
| 6 | CHECK VDCCM. | Is the same trouble code as in the current diagnosis still being output? | Replace TCM. <Ref. to AT-42 Transmission Control Module (TCM).> | Proceed with the diagnosis corresponding to the trouble code. |

AD: TROUBLE CODE 45 TCM MALFUNCTION SPECIFICATIONS

S005504D49

DIAGNOSIS:

- Control module out of specification

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

| No. | Step | Check | Yes | No |
|-----|---|---|-------------------|----------------|
| 1 | CHECK AT SYSTEM. 1) Start the engine. 2) Check AT system trouble code. | Is AT system trouble code stored in memory? | Repair AT system. | Replace VDCCM. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AE: TROUBLE CODE 46 ABNORMAL VOLTAGE OF 5 V POWER SUPPLY

S005504D51

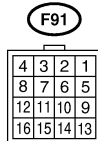
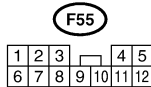
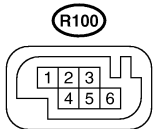
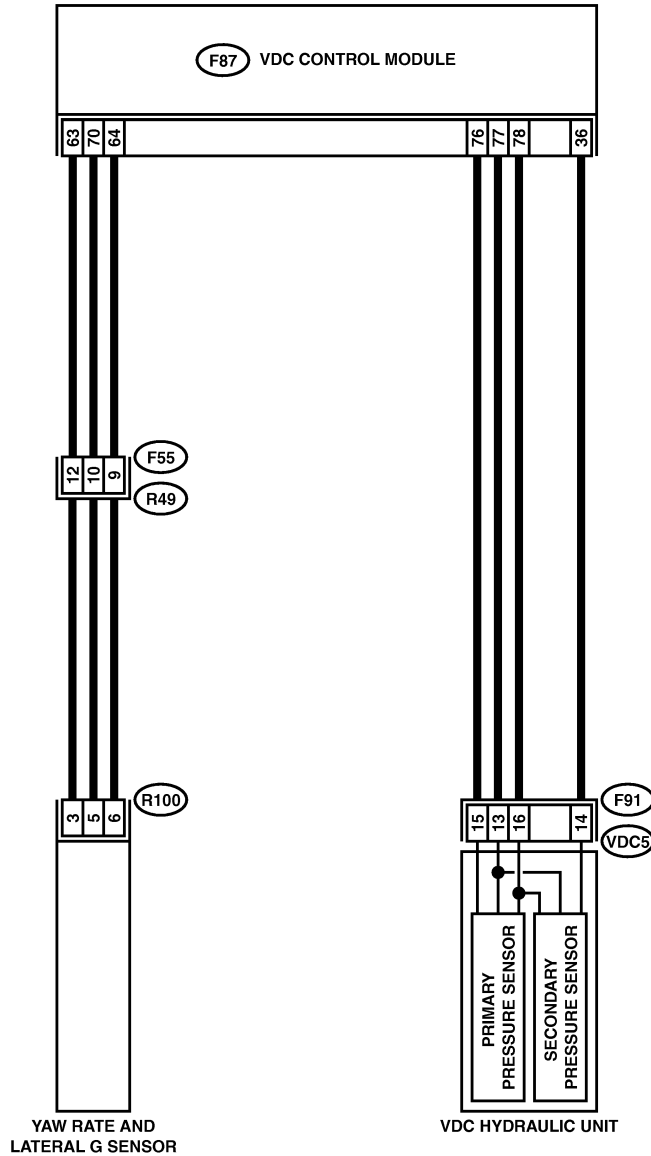
DIAGNOSIS:

- 5 volt power supply is abnormal.

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

B4M2325

VDC-170

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|-----------------------------------|-------------------------|--|
| 1 | CHECK GROUND SHORT OF SENSOR AND HARNESS. 1) Turn ignition switch OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground (Lateral G sensor): (F87) No. 78 — Chassis ground (Pressure sensor): | Is the resistance more than 1 MΩ? | Go to step 3. | Go to step 2. |
| 2 | CHECK GROUND SHORT OF HARNESS. 1) Disconnect connector from faulty sensors. 2) Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground (Lateral G sensor): (F87) No. 78 — Chassis ground (Pressure sensor): | Is the resistance more than 1 MΩ? | Replace faulty sensors. | Repair or replace harness connector between VDCCM and faulty sensor. |
| 3 | CHECK BATTERY SHORT OF SENSOR AND HARNESS. Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (–) (Lateral G sensor): (F87) No. 78 (+) — Chassis ground (–) (Pressure sensor): | Is the voltage less than 0.5 V? | Go to step 4. | Go to step 5. |
| 4 | CHECK BATTERY SHORT OF SENSOR AND HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (–) (Lateral G sensor): (F87) No. 78 (+) — Chassis ground (–) (Pressure sensor): | Is the voltage less than 0.5 V? | Replace VDCCM. | Go to step 5. |
| 5 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from faulty sensors. 3) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (–) (Lateral G sensor): (F87) No. 78 (+) — Chassis ground (–) (Pressure sensor): | Is the voltage less than 0.5 V? | Go to step 6. | Repair or replace harness connector between VDCCM and faulty sensor. |
| 6 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 63 (+) — Chassis ground (–) (Lateral G sensor): (F87) No. 78 (+) — Chassis ground (–) (Pressure sensor): | Is the voltage less than 0.5 V? | Replace faulty sensor. | Repair or replace harness connector between VDCCM and faulty sensor. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AF: TROUBLE CODE 47 IMPROPER CAN COMMUNICATION

S005504D53

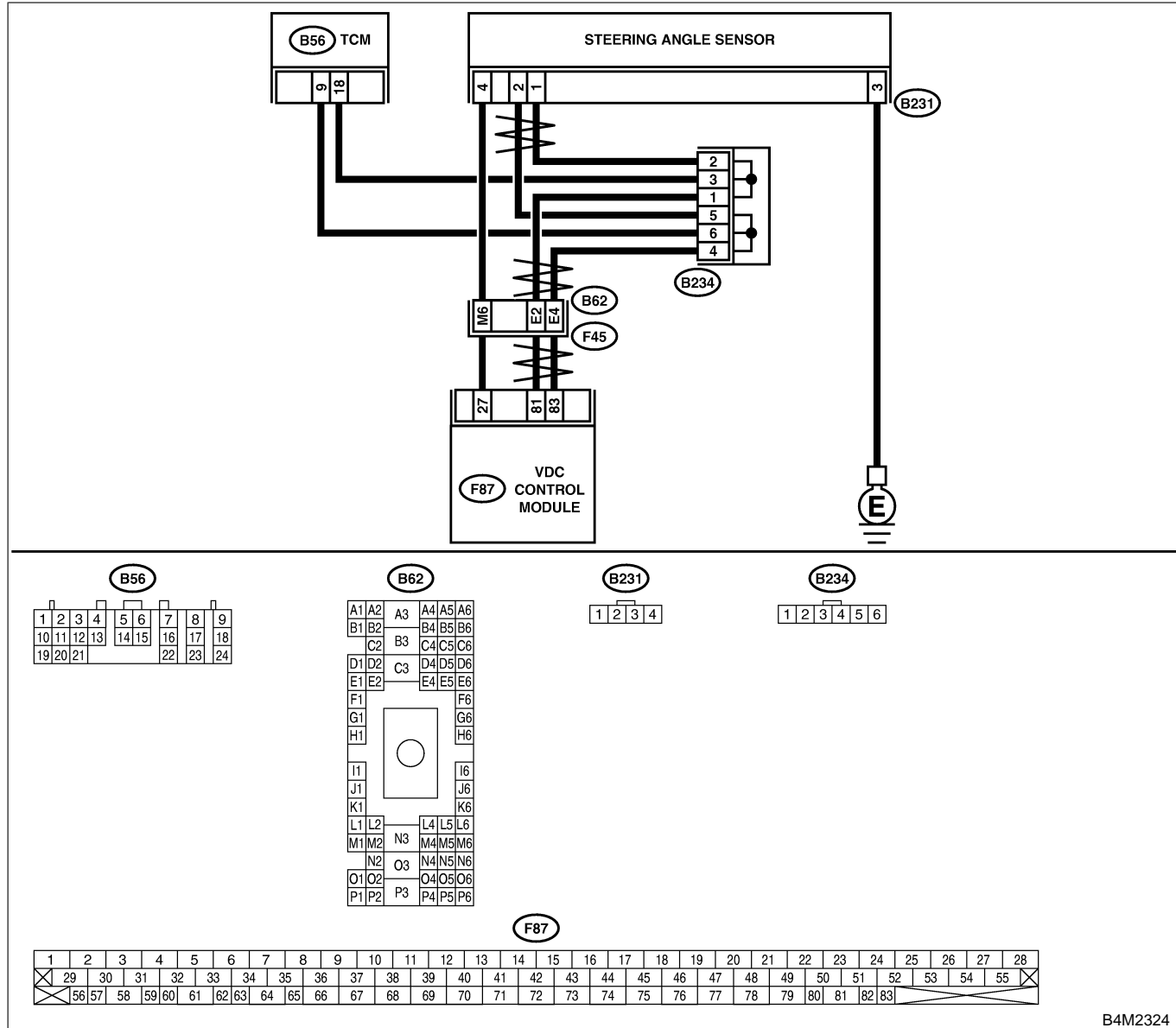
DIAGNOSIS:

- CAN communication line is broken or short circuited.

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2324

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|--|---|
| 1 | CHECK HARNESS BETWEEN VDCCM, STEERING ANGLE SENSOR AND TCM. 1) Turn ignition switch OFF. 2) Disconnect connector from VDCCM, TCM and steering angle sensor. 3) Measure resistance between VDCCM, TCM and steering angle sensor. Connector & terminal (F87) No. 83 — (B56) No. 9: (F87) No. 81 — (B56) No. 18: (F87) No. 83 — (B231) No. 2: (F87) No. 81 — (B231) No. 1: | Is the resistance less than 0.5 Ω? | Go to step 3. | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN STEERING ANGLE SENSOR AND TCM. Measure resistance between TCM and steering angle sensor. Connector & terminal (B56) No. 9 — (B231) No. 2: (B56) No. 18 — (B231) No. 1: | Is the resistance less than 0.5 Ω? | Repair or replace harness connector between VDCCM and steering angle sensor. | Repair or replace harness connector between TCM and steering angle sensor. |
| 3 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 83 — Chassis ground: (F87) No. 81 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 4. | Repair or replace harness connector between VDCCM, TCM and steering angle sensor. |
| 4 | CHECK BATTERY SHORT OF SENSOR. Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 83 — Chassis ground: (F87) No. 81 — Chassis ground: | Is the voltage less than 0.5 V? | Go to step 5. | Repair or replace harness connector between VDCCM, TCM and steering angle sensor. |
| 5 | CHECK BATTERY SHORT OF SENSOR. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 83 — Chassis ground: (F87) No. 81 — Chassis ground: | Is the voltage less than 0.5 V? | Go to step 6. | Repair or replace harness connector between VDCCM, TCM and steering angle sensor. |
| 6 | CHECK STEERING ANGLE SENSOR. 1) Turn ignition switch to OFF. 2) Connect connector to steering angle sensor. 3) Measure resistance between VDCCM connector terminals. Connector & terminal (F87) No. 83 — No. 81: | Is the resistance 120±6 Ω? | Go to step 8. | Go to step 7. |
| 7 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in steering angle sensor? | Replace steering angle sensor. | Repair or replace steering angle sensor connector. |
| 8 | CHECK VDCCM. 1) Connect connector to VDCCM. 2) Disconnect connector from steering angle sensor. 3) Measure resistance between steering angle sensor connector terminals. Connector & terminal (B231) No. 1 — No. 2: | Is the resistance 120±6 Ω? | Go to step 10. | Go to step 9. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--------------------------------|---|
| 9 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in steering angle sensor? | Replace VDCCM. | Repair or replace VDCCM connector. |
| 10 | CHECK TCM. 1) Connect connector to TCM. 2) Disconnect connector from VDCCM. 3) Measure resistance between steering angle sensor terminals. Connector & terminal (B231) No. 1 — No. 2: | Is the resistance more than 1 MΩ? | Go to step 12. | Go to step 11. |
| 11 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in steering angle sensor? | Replace TCM. | Repair or replace TCM connector. |
| 12 | CHECK VDCCM. 1) Connect all connectors. 2) Erase the memory. 3) Perform inspection mode. 4) Read out the trouble code. | Are other trouble codes being output? | Go to step 13. | A temporary poor contact. |
| 13 | CHECK TROUBLE CODE. | Is the same trouble code as in the current diagnosis still being output? | Go to step 14. | Proceed with the diagnosis corresponding to the trouble code. |
| 14 | CHECK AT SYSTEM TROUBLE CODE. | Is the AT system trouble code No. 86? | Replace steering angle sensor. | Replace VDCCM. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

VDC-175

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AG: TROUBLE CODE 48 IMPROPER EAC COMMUNICATION

S005504D57

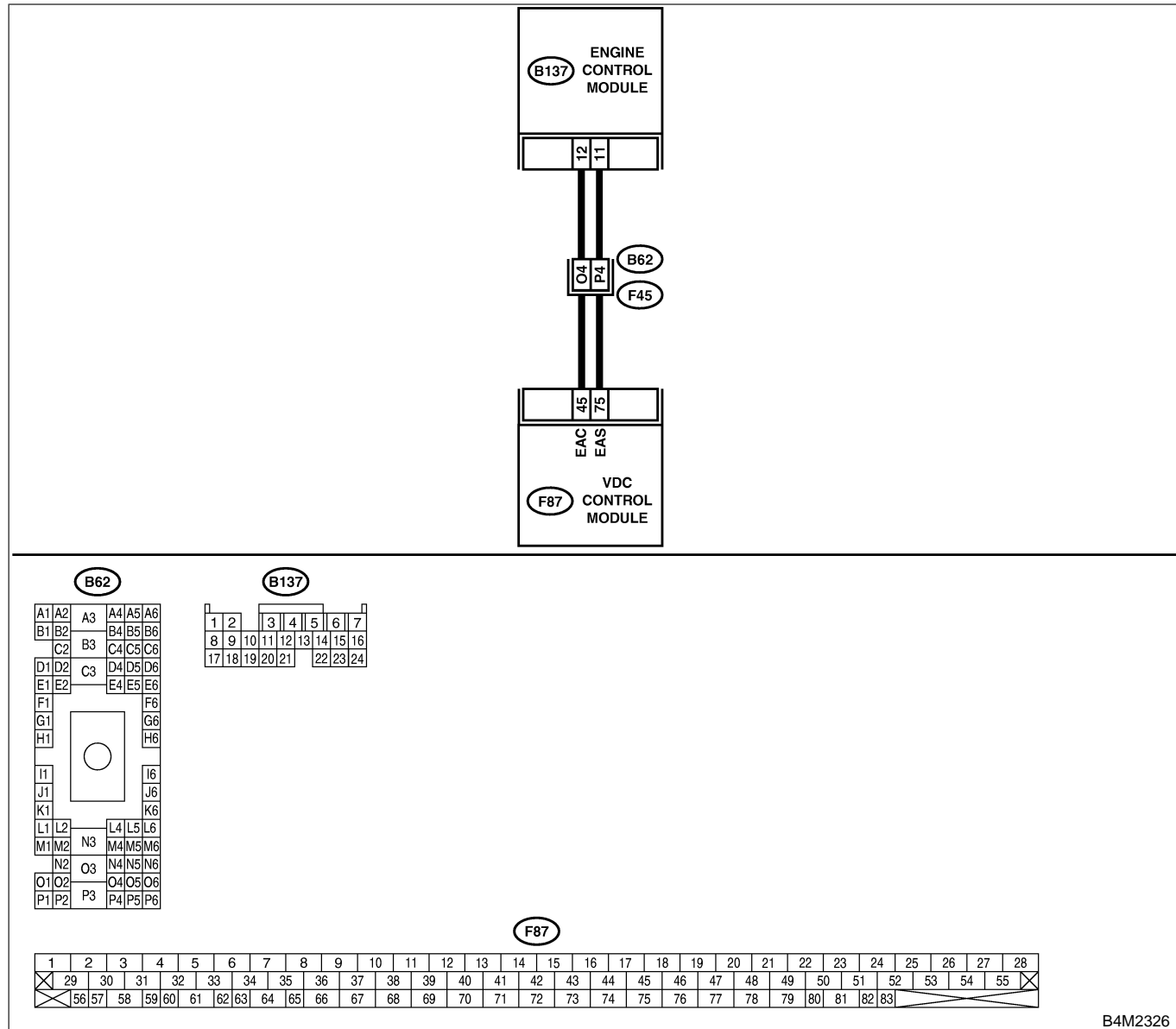
DIAGNOSIS:

- EAC communication line is broken or short circuited.

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2326

VDC-176

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---------------|--|
| 1 | CHECK HARNESS BETWEEN ECM AND VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM and ECM. 3) Measure resistance between VDCCM and ECM. Connector & terminal (F87) No. 45 — (B137) No. 12: | Is the resistance less than 0.5 Ω ? | Go to step 2. | Repair or replace open circuit between VDCCM and ECM. |
| 2 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM and ECM. Connector & terminal (F87) No. 45 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 3. | Repair or replace ground short circuit between VDCCM and ECM. |
| 3 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 45 — Chassis ground: | Is the voltage less than 0.5 V? | Go to step 4. | Repair or replace battery short circuit between VDCCM and ECM. |
| 4 | CHECK INPUT VOLTAGE FROM ECM. 1) Turn ignition switch to OFF. 2) Connect connector to VDCCM. 3) Turn ignition switch to ON. 4) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 12 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 6. | Go to step 5. |
| 5 | CHECK POOR CONTACT IN ECM CONNECTORS. | Is there poor contact in ECM connector? | Replace ECM. | Repair or replace ECM connector. |
| 6 | ERASE MEMORY. 1) Connect all connectors. 2) Erase the memory. | Can the memory be erased? | Go to step 7. | Replace VDCCM. |
| 7 | CHECK TROUBLE CODE. 1) Perform inspection mode. 2) Read out the trouble code. | Is the same trouble code as in the current diagnosis still being output? | Replace ECM. | A temporary poor contact. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AH: TROUBLE CODE 48 EAS COMMUNICATION LINE GROUNDING SHORTED

S005504D54

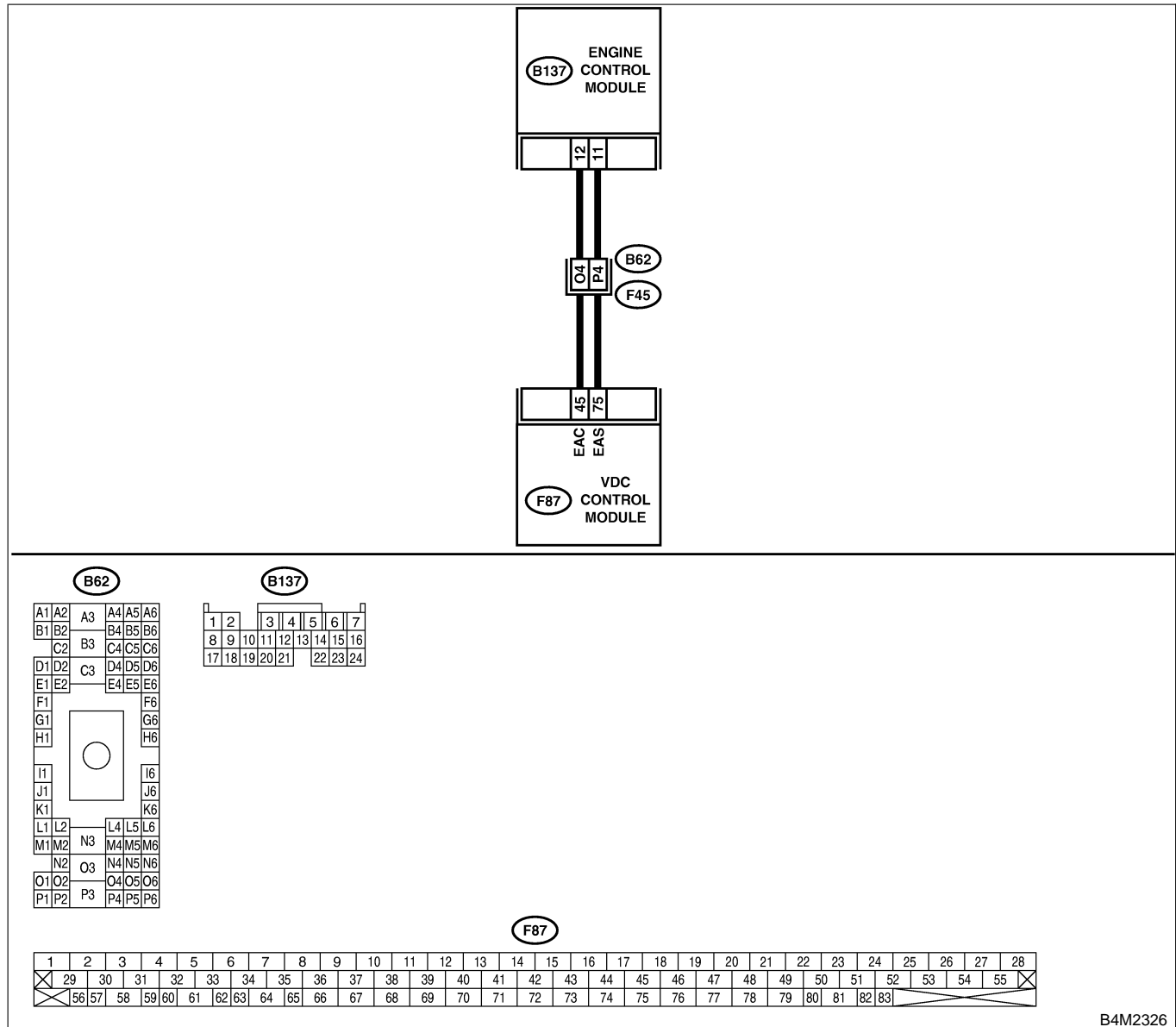
DIAGNOSIS:

- EAS communication line is short circuited.

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2326

VDC-178

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---------------|---|
| 1 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM and ECM. 3) Measure resistance between VDCCM and ECM. Connector & terminal (F87) No. 75 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 2. | Repair or replace ground short circuit between VDCCM and ECM. |
| 2 | CHECK INPUT VOLTAGE FROM ECM. 1) Connect connector to VDCCM. 2) Turn ignition switch to ON. 3) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 11 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 4. | Go to step 3. |
| 3 | CHECK POOR CONTACT IN ECM CONNECTORS. | Is there poor contact in ECM connector? | Replace ECM. | Repair or replace ECM connector. |
| 4 | ERASE MEMORY. 1) Connect all connectors. 2) Erase the memory. | Can the memory be erased? | Go to step 5. | Replace VDCCM. |
| 5 | CHECK TROUBLE CODE. 1) Perform inspection mode. 2) Read out the trouble code. | Is the same trouble code as in the current diagnosis still being output? | Replace ECM. | A temporary poor contact. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AI: TROUBLE CODE 48 ERRONEOUS COMMUNICATION FROM EGI TO VDC

S005504D55

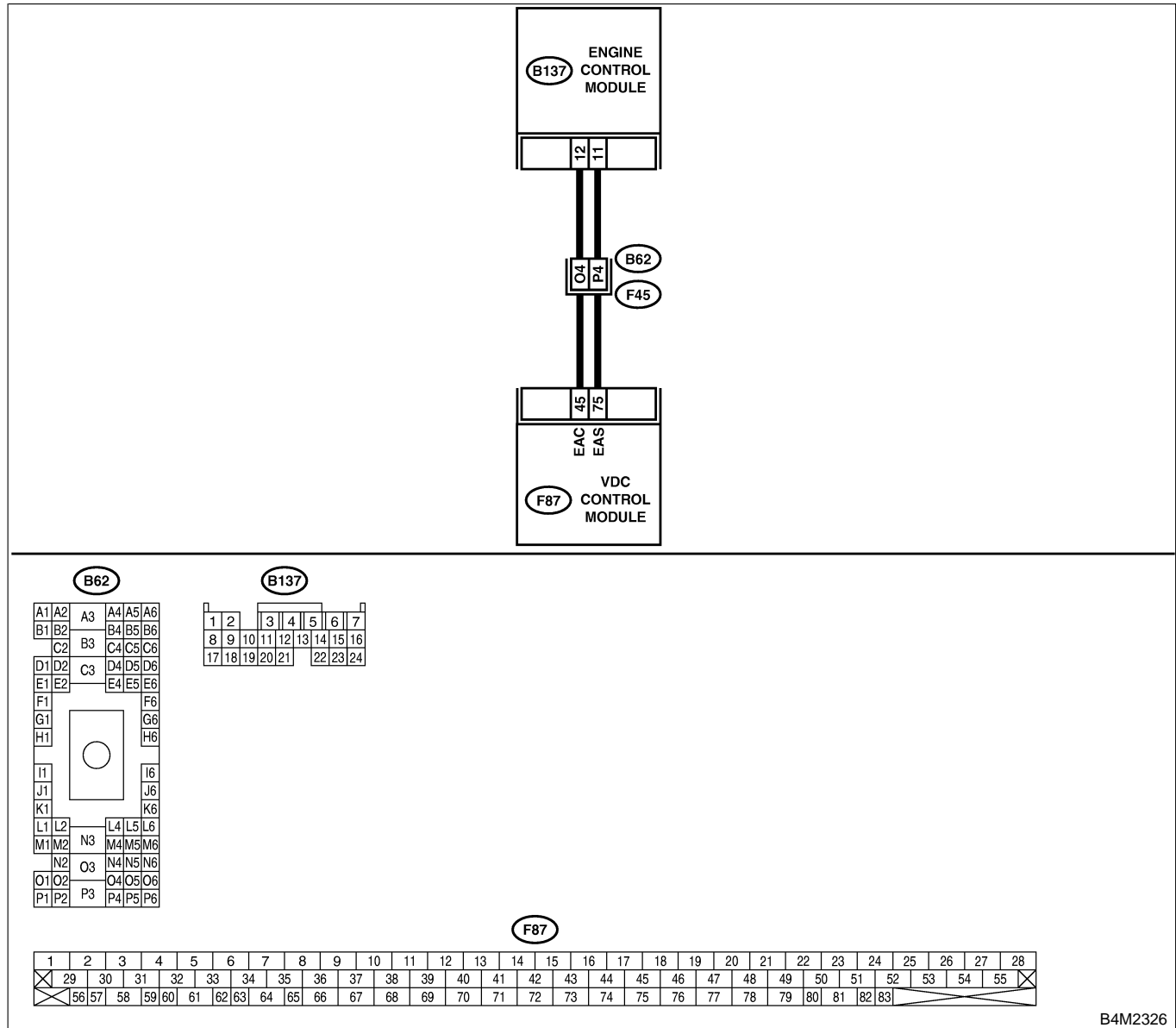
DIAGNOSIS:

- EAS communication line is broken or short circuited.
- EAC communication line is broken or short circuited.

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2326

VDC-180

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---------------|--|
| 1 | CHECK HARNESS BETWEEN ECM AND VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM and ECM. 3) Measure resistance between VDCCM and ECM. Connector & terminal (F87) No. 75 — (B137) No. 11: (F87) No. 45 — (B137) No. 12: | Is the resistance less than 0.5 Ω ? | Go to step 2. | Repair or replace open circuit between VDCCM and ECM. |
| 2 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 75 — Chassis ground: (F87) No. 45 — Chassis ground: | Is the voltage less than 0.5 V? | Go to step 3. | Repair or replace battery short circuit between VDCCM and ECM. |
| 3 | CHECK INPUT VOLTAGE FROM ECM. 1) Turn ignition switch to OFF. 2) Connect connector to VDCCM. 3) Turn ignition switch to ON. 4) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 11 (+) — Chassis ground (-): (B137) No. 12 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 5. | Go to step 4. |
| 4 | CHECK POOR CONTACT IN ECM CONNECTORS. | Is there poor contact in ECM connector? | Replace ECM. | Repair or replace ECM connector. |
| 5 | ERASE MEMORY. 1) Connect all connectors. 2) Erase the memory. | Can the memory be erased? | Go to step 6. | Replace VDCCM. |
| 6 | CHECK TROUBLE CODE. 1) Perform inspection mode. 2) Read out the trouble code. | Is the same trouble code as in the current diagnosis still being output? | Replace ECM. | A temporary poor contact. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AJ: TROUBLE CODE 49 ABNORMAL ENGINE SPEED SIGNAL S005504D58

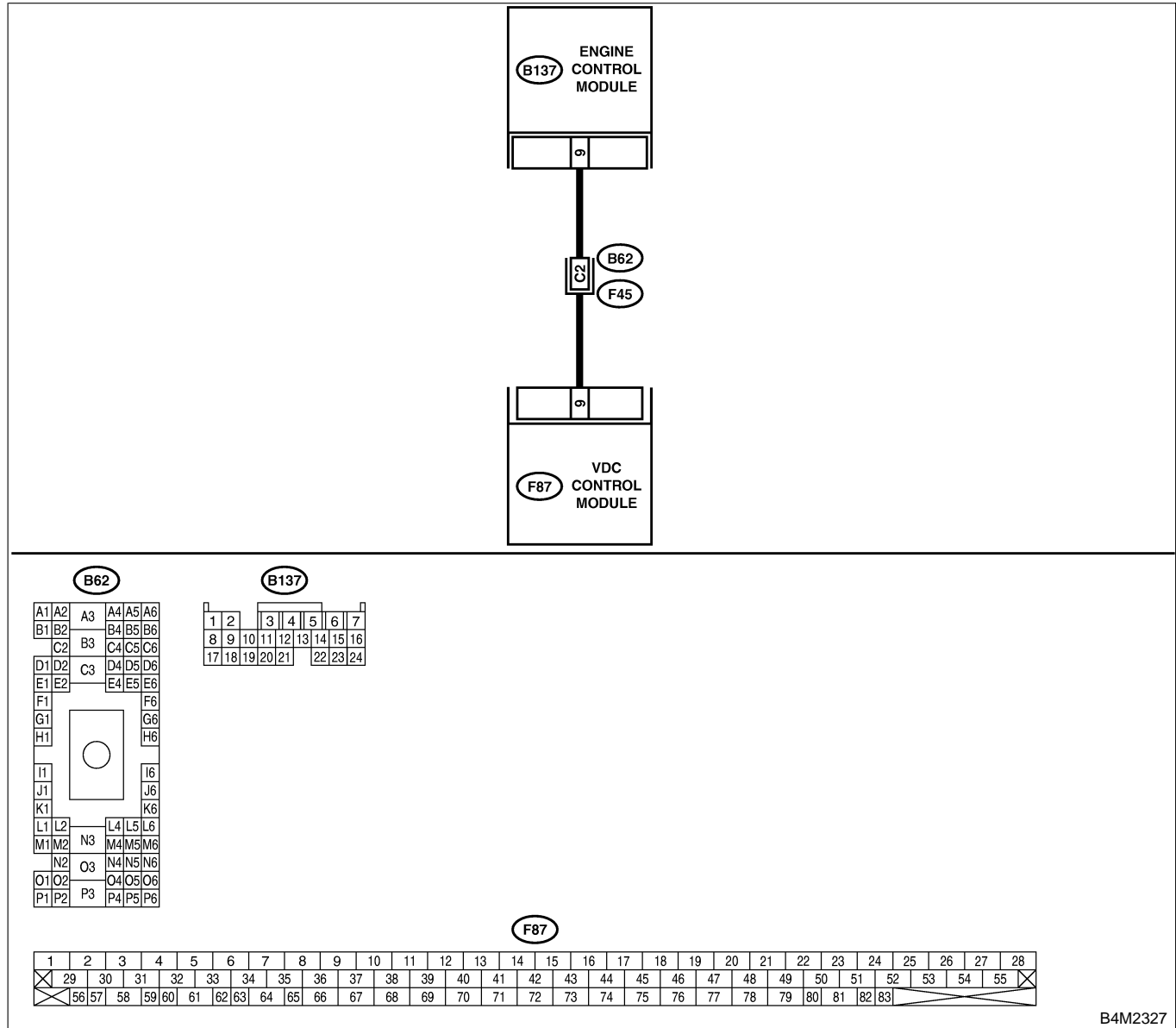
DIAGNOSIS:

- Engine speed signal line is broken or short circuited.

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|--|---|
| 1 | CHECK TACHOMETER OPERATION IN COMBINATION METER. | Does tachometer operate normally? | Go to step 2. | Repair tachometer. |
| 2 | CHECK HARNESS BETWEEN VDCCM AND ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM and ECM. 3) Measure resistance between VDCCM connector and ECM. Connector & terminal (F87) No. 9 — (B137) No. 9: | Is the resistance less than 0.5 Ω ? | Go to step 3. | Repair harness connector between VDCCM and ECM. |
| 3 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connectors between VDCCM and ECM? | Repair connector. | Go to step 4. |
| 4 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

AK: TROUBLE CODE 51 VALVE RELAY

S005504D62

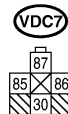
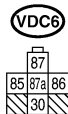
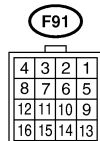
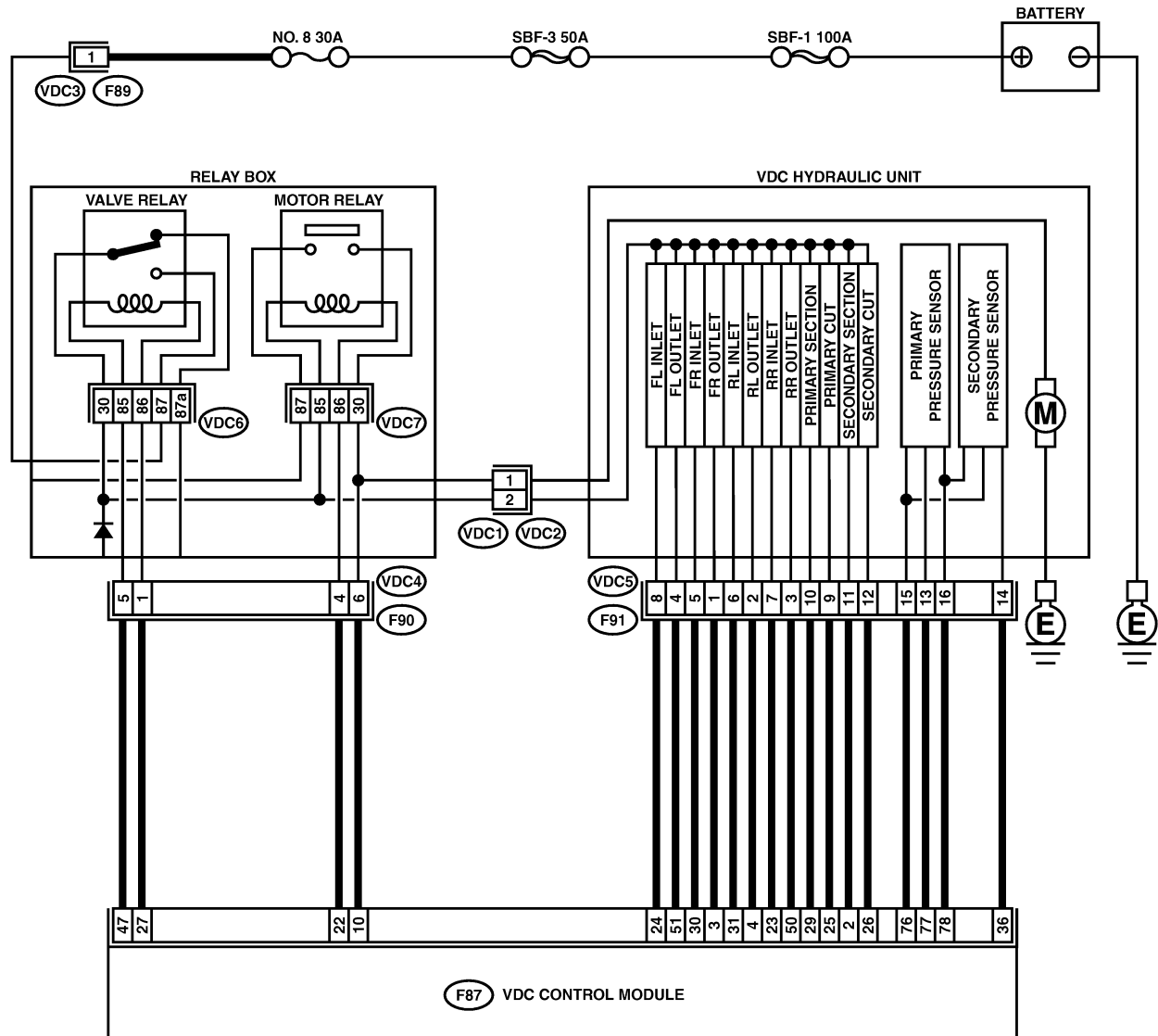
DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |

B4M2328

VDC-184

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---------------|---|
| 1 | CHECK RESISTANCE OF VALVE RELAY. 1) Turn ignition switch to OFF. 2) Remove valve relay from relay box. 3) Measure resistance between valve relay terminals. <i>Terminals</i> No. 85 — No. 86: | Is the resistance between 93 and 113 Ω ? | Go to step 2. | Replace valve relay. |
| 2 | CHECK CONTACT POINT OF VALVE RELAY. 1) Connect battery to valve relay terminals No. 85 and No. 86. 2) Measure resistance between valve relay terminals. <i>Terminals</i> No. 30 — No. 87: | Is the resistance less than 0.5 Ω ? | Go to step 3. | Replace valve relay. |
| 3 | CHECK CONTACT POINT OF VALVE RELAY. Measure resistance between valve relay terminals. <i>Terminals</i> No. 30 — No. 87a: | Is the resistance more than 1 M Ω ? | Go to step 4. | Replace valve relay. |
| 4 | CHECK CONTACT POINT OF VALVE RELAY. 1) Disconnect battery from valve relay terminals. 2) Measure resistance between valve relay terminals. <i>Terminals</i> No. 30 — No. 87: | Is the resistance more than 1 M Ω ? | Go to step 5. | Replace valve relay. |
| 5 | CHECK CONTACT POINT OF VALVE RELAY. Measure resistance between valve relay terminals. <i>Terminals</i> No. 30 — No. 87a: | Is the resistance less than 0.5 Ω ? | Go to step 6. | Replace valve relay. |
| 6 | CHECK SHORT OF VALVE RELAY. Measure resistance between valve relay terminals. <i>Terminals</i> No. 86 — No. 87: No. 86 — No. 87a: | Is the resistance more than 1 M Ω ? | Go to step 7. | Replace valve relay. |
| 7 | CHECK POWER SUPPLY FOR VALVE RELAY. 1) Disconnect connector (F89) from relay box. 2) Turn ignition switch to ON. 3) Measure voltage between relay box connector and chassis ground. <i>Connector & terminal</i> (F89) No. 1 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 8. | Repair harness between battery and relay box connector. Check fuse No. 8. |
| 8 | CHECK OPEN CIRCUIT AND GROUND SHORT IN POWER SUPPLY CIRCUIT OF RELAY BOX. 1) Disconnect connector (VDC1) from VDCH/U. 2) Connect connector (F89) to relay box. 3) Turn ignition switch to ON. 4) Measure voltage of relay box. <i>Connector & terminal</i> Valve relay installing point No. 87 — Chassis ground: | Is the voltage between 10 and 15 V? | Go to step 9. | Replace relay box and check fuse No. 8. |

VDC-185

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|----------------|---|
| 9 | CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX. 1) Turn ignition switch to OFF. 2) Disconnect connector (F90) from relay box. 3) Measure resistance between relay box connector and valve relay installing point. Connector & terminal (VDC4) No. 5 — Valve relay installing point No. 85: (VDC4) No. 1 — Valve relay installing point No. 86: | Is the resistance less than 0.5 Ω ? | Go to step 10. | Replace relay box. |
| 10 | CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. Measure resistance between relay box connector and chassis ground. Connector & terminal (VDC4) No. 5 — Chassis ground: (VDC4) No. 1 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 11. | Replace relay box and check fuse SBF6. |
| 11 | CHECK OPEN CIRCUIT IN CONTROL SYSTEM HARNESS OF VALVE RELAY. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM connector and relay box connector. Connector & terminal (F87) No. 47 — (F90) No. 5: (F87) No. 27 — (F90) No. 1: | Is the resistance less than 0.5 Ω ? | Go to step 12. | Repair harness between VDCCM and relay box. |
| 12 | CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY. Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 47 — Chassis ground: (F87) No. 27 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 13. | Repair harness between VDCCM and relay box. |
| 13 | CHECK OPEN CIRCUIT IN CONTACT POINT CIRCUIT OF RELAY BOX. Measure resistance between VDCH/U connector and valve relay installing point. Connector & terminal (VDC1) No. 2 — Valve relay installing point No. 30: | Is the resistance less than 0.5 Ω ? | Go to step 14. | Replace relay box. |
| 14 | CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (VDC1) No. 2 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 15. | Replace relay box and check fuse No. 8. |
| 15 | CHECK RESISTANCE OF INLET AND CUT SOLENOID VALVES. 1) Disconnect connector from VDCH/U. 2) Measure resistance between VDCH/U connector terminals. Connector & terminal (VDC5) No. 8 — (VDC2) No. 2: (VDC5) No. 5 — (VDC2) No. 2: (VDC5) No. 6 — (VDC2) No. 2: (VDC5) No. 7 — (VDC2) No. 2: (VDC5) No. 9 — (VDC2) No. 2: (VDC5) No. 12 — (VDC2) No. 2: | Is the resistance between 8.04 and 9.04 Ω ? | Go to step 16. | Replace VDCH/U. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|-------------------|--|
| 16 | CHECK RESISTANCE OF OUTLET SOLENOID VALVE. Measure resistance between VDCH/U connector terminals. Connector & terminal (VDC5) No. 4 — (VDC2) No. 2: (VDC5) No. 1 — (VDC2) No. 2: (VDC5) No. 2 — (VDC2) No. 2: (VDC5) No. 3 — (VDC2) No. 2: (VDC5) No. 10 — (VDC2) No. 2: (VDC5) No. 11 — (VDC2) No. 2: | Is the resistance between 4.04 and 4.54 Ω ? | Go to step 17. | Replace VDCH/U. |
| 17 | CHECK GROUND SHORT OF SOLENOID VALVE. Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (VDC2) No. 2 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 18. | Replace VDCH/U and check all fuses. |
| 18 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 30 — Chassis ground: (F87) No. 24 — Chassis ground: (F87) No. 23 — Chassis ground: (F87) No. 31 — Chassis ground: (F87) No. 26 — Chassis ground: (F87) No. 25 — Chassis ground: (F87) No. 3 — Chassis ground: (F87) No. 51 — Chassis ground: (F87) No. 50 — Chassis ground: (F87) No. 4 — Chassis ground: (F87) No. 2 — Chassis ground: (F87) No. 29 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 19. | Repair harness between VDCH/U and VDCCM. |
| 19 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND VDCH/U. 1) Connect connector (F91) to VDCH/U. 2) Measure resistance between VDCCM connector and VDCH/U Connector & terminal (F87) No. 30 — (VDC2) No. 2: (F87) No. 24 — (VDC2) No. 2: (F87) No. 23 — (VDC2) No. 2: (F87) No. 31 — (VDC2) No. 2: (F87) No. 26 — (VDC2) No. 2: (F87) No. 25 — (VDC2) No. 2: | Is the resistance between 8.0 and 10.0 Ω ? | Go to step 20. | Repair harness/connector between VDCH/U and VDCCM. |
| 20 | CHECK HARNESS/CONNECTOR BETWEEN VDCCM AND VDCH/U. Measure resistance between VDCCM connector terminals. Connector & terminal (F87) No. 3 — (VDC2) No. 2: (F87) No. 51 — (VDC2) No. 2: (F87) No. 50 — (VDC2) No. 2: (F87) No. 4 — (VDC2) No. 2: (F87) No. 2 — (VDC2) No. 2: (F87) No. 29 — (VDC2) No. 2: | Is the resistance between 4.0 and 6.0 Ω ? | Go to step 21. | Repair harness/connector between VDCH/U and VDCCM. |
| 21 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector between VDCCM and VDCH/U? | Repair connector. | Go to step 22. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|---------------------------|
| 22 | CHECK VDCCM. 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 VDCCM. | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

VDC-189

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AL: TROUBLE CODE 51 VALVE RELAY ON FAILURE

S005504D63

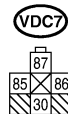
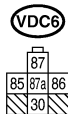
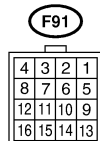
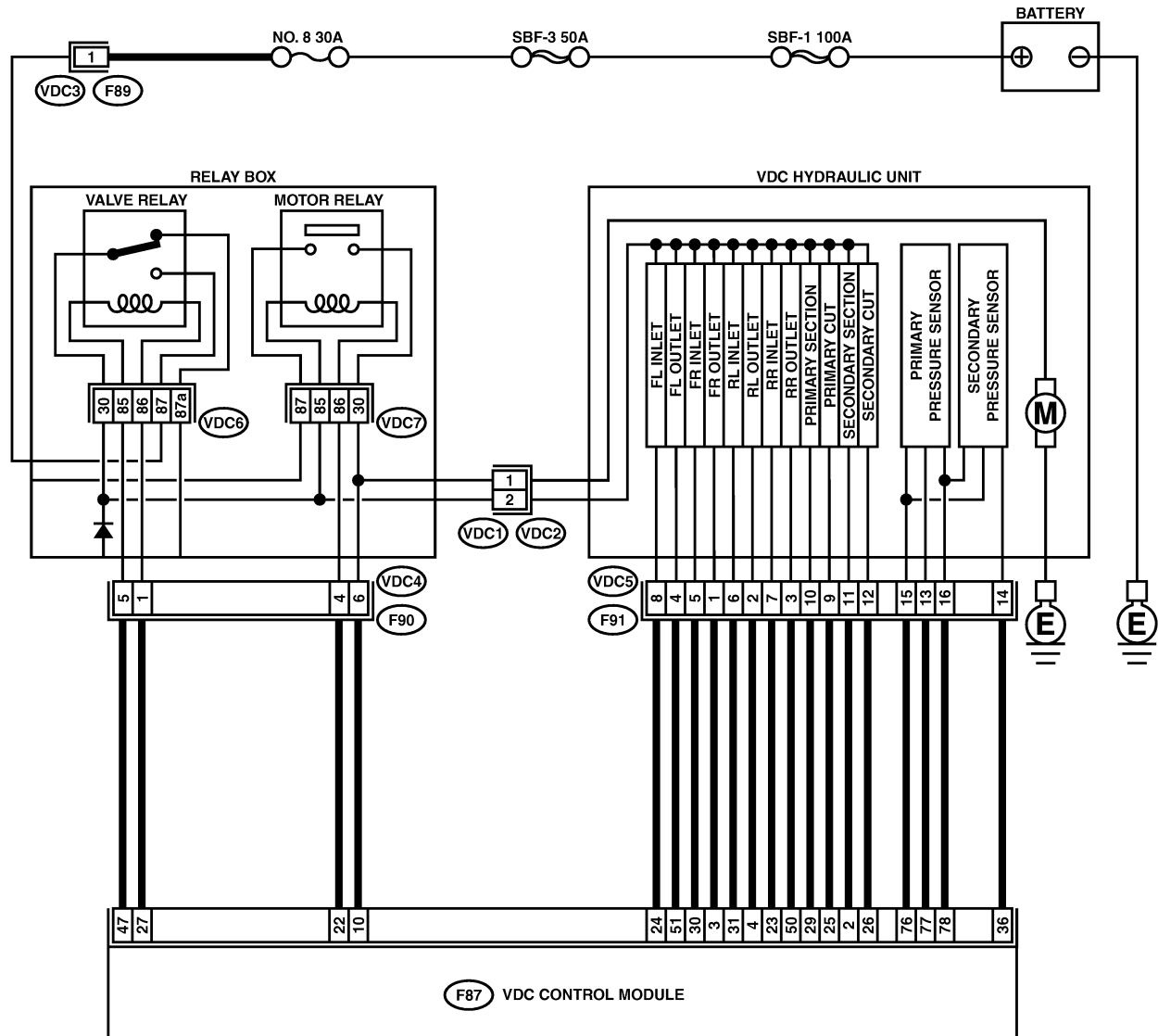
DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |

B4M2328

VDC-190

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---------------|---|
| 1 | CHECK CONTACT POINT OF VALVE RELAY. 1) Turn ignition switch to OFF. 2) Remove valve relay from relay box. 3) Connect battery to valve relay terminals No. 85 and No. 86. 4) Measure resistance between valve relay terminals. Terminals No. 30 — No. 87: | Is the resistance less than 0.5 Ω ? | Go to step 2. | Replace valve relay. |
| 2 | CHECK CONTACT POINT OF VALVE RELAY. Measure resistance between valve relay terminals. Terminals No. 30 — No. 87a: | Is the resistance more than 1 M Ω ? | Go to step 3. | Replace valve relay. |
| 3 | CHECK CONTACT POINT OF VALVE RELAY. 1) Disconnect battery from valve relay terminals. 2) Measure resistance between valve relay terminals. Terminals No. 30 — No. 87: | Is the resistance more than 1 M Ω ? | Go to step 4. | Replace valve relay. |
| 4 | CHECK CONTACT POINT OF VALVE RELAY. Measure resistance between valve relay terminals. Terminals No. 30 — No. 87a: | Is the resistance less than 0.5 Ω ? | Go to step 5. | Replace valve relay. |
| 5 | CHECK SHORT OF VALVE RELAY. Measure resistance between valve relay terminals. Terminals No. 86 — No. 87: No. 86 — No. 87a: | Is the resistance more than 1 M Ω ? | Go to step 6. | Replace valve relay. |
| 6 | CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. 1) Disconnect connector (F90) from relay box. 2) Measure voltage between relay box connector and chassis ground. Connector & terminal (VDC4) No. 5 (+) — Chassis ground (-): (VDC4) No. 1 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 7. | Replace relay box. Check fuse No. 8 and SBF3. |
| 7 | CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (VDC4) No. 5 (+) — Chassis ground (-): (VDC4) No. 1 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 8. | Replace relay box. Check fuse No. 8 and SBF3. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|-------------------------------|----------------|---|
| 8 | CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Disconnect connector from VDCH/U. 4) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 27 (+) — Chassis ground (-): (F87) No. 47 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 9. | Repair harness between VDCCM and relay box and check all fuses. |
| 9 | CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 27 (+) — Chassis ground (-): (F87) No. 47 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 10. | Repair harness between VDCCM and relay box and check all fuses. |
| 10 | CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. 1) Disconnect connector VDC1 from relay box. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (VDC1) No. 2 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 11. | Replace relay box. |
| 11 | CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (VDC1) No. 2 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 12. | Replace relay box. |
| 12 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Turn ignition switch to OFF. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (VDC2) No. 2 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 13. | Replace VDCH/U and check all fuses. |
| 13 | CHECK BATTERY SHORT OF SOLENOID VALVE. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (VDC2) No. 2 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 14. | Replace VDCH/U and check all fuses. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 14 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>(F87) No. 30 (+) — Chassis ground (-):</i> <i>(F87) No. 24 (+) — Chassis ground (-):</i> <i>(F87) No. 23 (+) — Chassis ground (-):</i> <i>(F87) No. 31 (+) — Chassis ground (-):</i> <i>(F87) No. 26 (+) — Chassis ground (-):</i> <i>(F87) No. 25 (+) — Chassis ground (-):</i> <i>(F87) No. 3 (+) — Chassis ground (-):</i> <i>(F87) No. 51 (+) — Chassis ground (-):</i> <i>(F87) No. 50 (+) — Chassis ground (-):</i> <i>(F87) No. 4 (+) — Chassis ground (-):</i> <i>(F87) No. 2 (+) — Chassis ground (-):</i> <i>(F87) No. 29 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 15. | Repair harness between VDCH/U and VDCCM and check all fuses. |
| 15 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. Connector & terminal <i>(F87) No. 30 (+) — Chassis ground (-):</i> <i>(F87) No. 24 (+) — Chassis ground (-):</i> <i>(F87) No. 23 (+) — Chassis ground (-):</i> <i>(F87) No. 31 (+) — Chassis ground (-):</i> <i>(F87) No. 26 (+) — Chassis ground (-):</i> <i>(F87) No. 25 (+) — Chassis ground (-):</i> <i>(F87) No. 3 (+) — Chassis ground (-):</i> <i>(F87) No. 51 (+) — Chassis ground (-):</i> <i>(F87) No. 50 (+) — Chassis ground (-):</i> <i>(F87) No. 4 (+) — Chassis ground (-):</i> <i>(F87) No. 2 (+) — Chassis ground (-):</i> <i>(F87) No. 29 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 16. | Repair harness between VDCH/U and VDCCM and check all fuses. |
| 16 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connector between VDCCM and VDCH/U? | Repair connector. | Go to step 17. |
| 17 | CHECK VDCCM. 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 VDCCM. | Go to step 18. |
| 18 | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

AM: TROUBLE CODE 52 MOTOR AND MOTOR RELAY OFF FAILURE S005504D66

DIAGNOSIS:

- Faulty motor relay
- Faulty harness connector

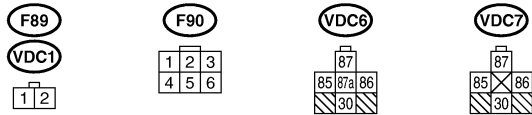
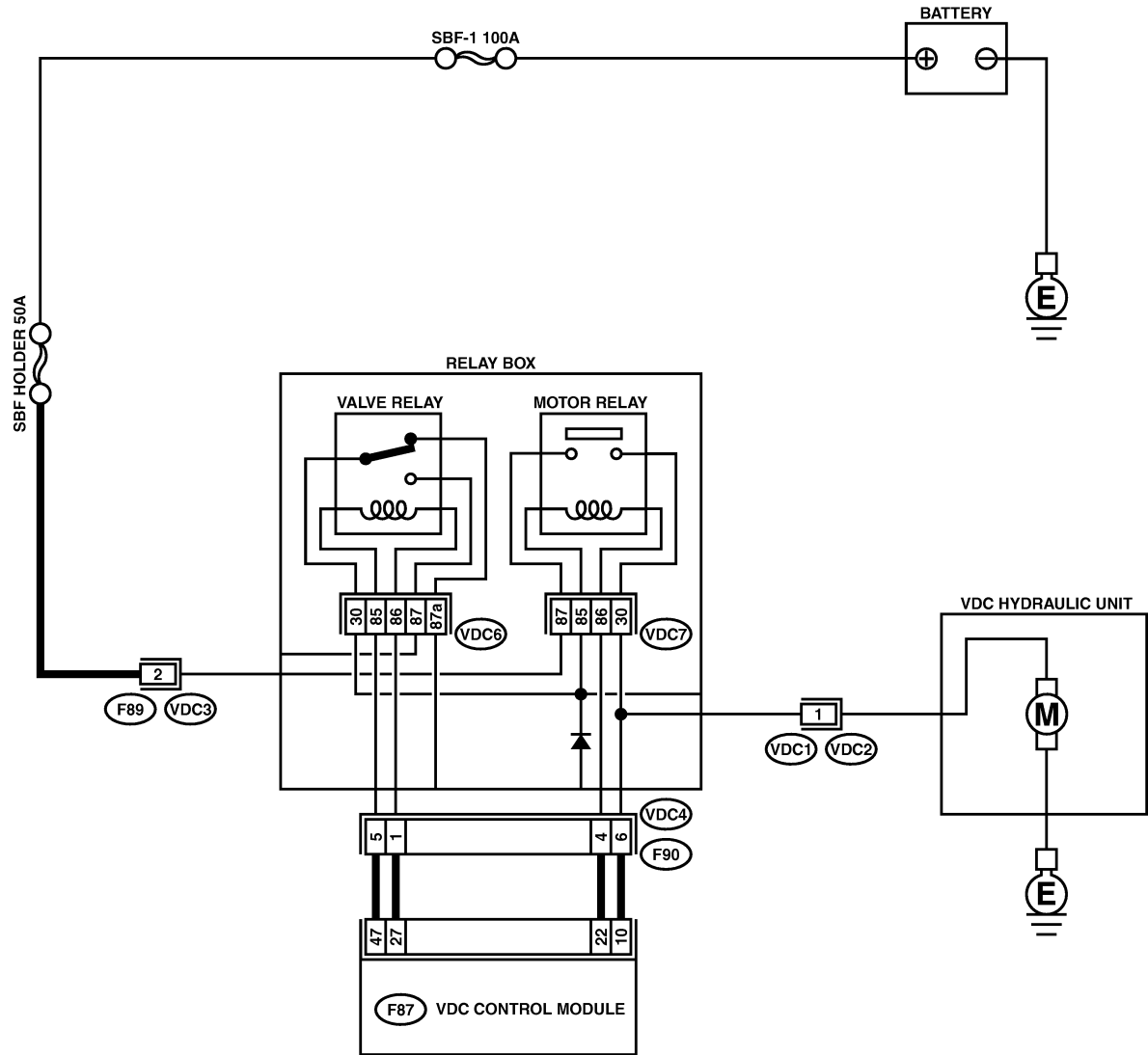
TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

B4M2329

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|-----------------------------------|---------------|--|
| 1 | CHECK CONTACT POINT OF MOTOR RELAY. 1) Turn ignition switch to OFF. 2) Remove motor relay from relay box. 3) Measure resistance between motor relay terminals. <i>Terminals</i> No. 30 — No. 87: | Is the resistance more than 1 MΩ? | Go to step 2. | Replace motor relay. |
| 2 | CHECK SHORT OF MOTOR RELAY. Measure resistance between motor relay terminals. <i>Terminals</i> No. 85 — No. 30: No. 85 — No. 87: | Is the resistance more than 1 MΩ? | Go to step 3. | Replace motor relay. |
| 3 | CHECK GROUND SHORT IN CIRCUIT OF RELAY BOX. 1) Disconnect connector (F90) from relay box. 2) Measure resistance between relay box connector unit and chassis ground. <i>Connector & terminal</i> (VDC4) No. 4 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 4. | Replace relay box. |
| 4 | CHECK BATTERY SHORT IN CIRCUIT OF RELAY BOX. Measure voltage between relay box connector and chassis ground. <i>Connector & terminal</i> (VDC4) No. 6 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 5. | Replace relay box. |
| 5 | CHECK BATTERY SHORT IN CIRCUIT OF RELAY BOX. 1) Turn ignition switch to ON. 2) Measure voltage between relay box connector and chassis ground. <i>Connector & terminal</i> (VDC4) No. 6 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 6. | Replace relay box. |
| 6 | CHECK GROUND SHORT IN HARNESS BETWEEN RELAY BOX AND VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM connector and chassis ground. <i>Connector & terminal</i> (F87) No. 22 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 7. | Repair harness between VDCCM and relay box. Check fuse SBF holder. |
| 7 | CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND VDCCM. Measure voltage between VDCCM connector and chassis ground. <i>Connector & terminal</i> (F87) No. 10 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 8. | Repair harness between VDCCM and relay box. |
| 8 | CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND VDCCM. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. <i>Connector & terminal</i> (F87) No. 10 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 9. | Repair harness between VDCCM and relay box. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|---------------------------|
| 9 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connector between VDCH/U, relay box and VDCCM? | Repair connector. | Go to step 10. |
| 10 | CHECK VDCCM. 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 VDCCM. | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AN: TROUBLE CODE 52 MOTOR AND MOTOR RELAY ON FAILURE S005504D67

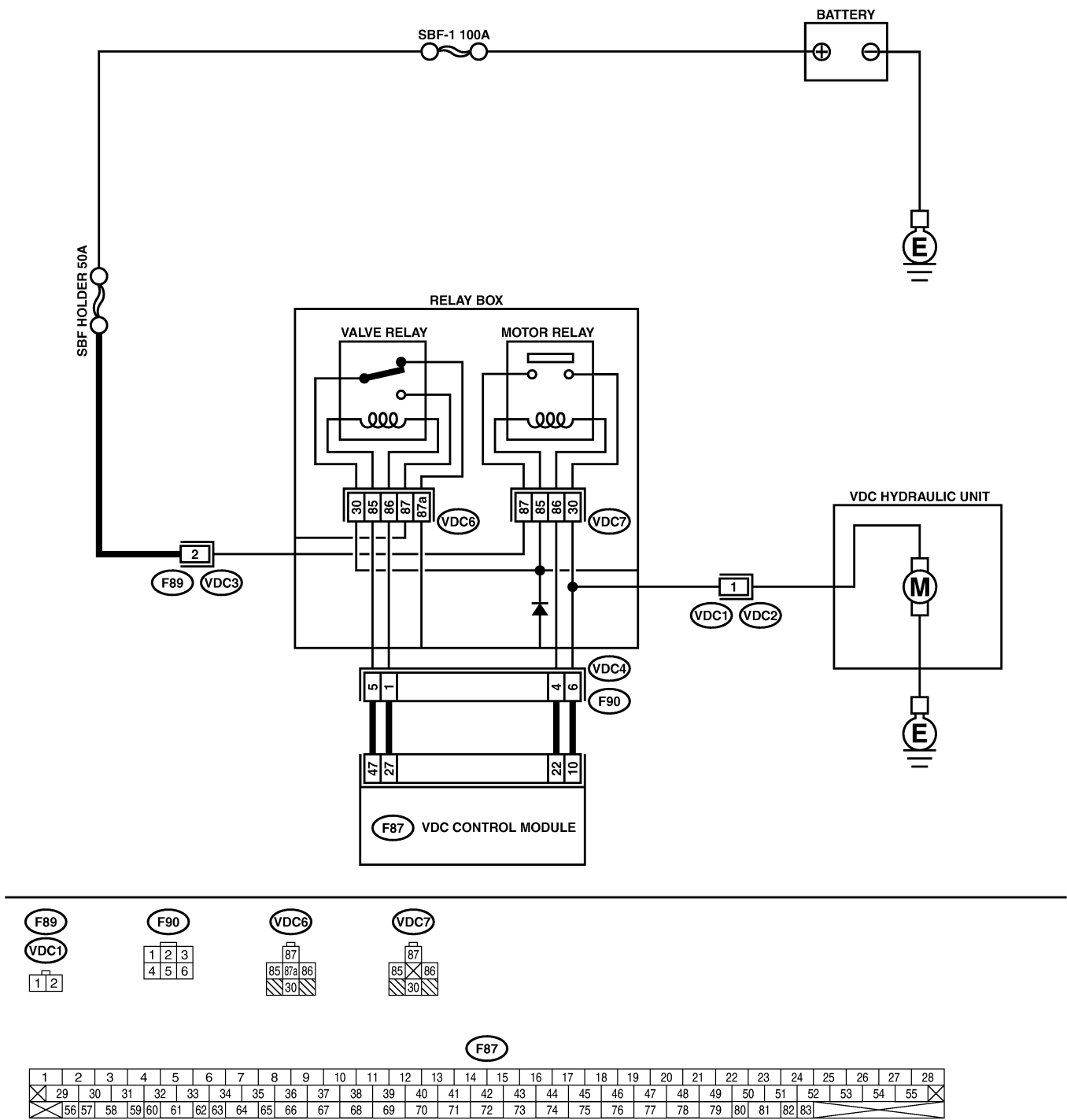
DIAGNOSIS:

- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2329

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---------------|--|
| 1 | CHECK RESISTANCE OF MOTOR RELAY. 1) Turn ignition switch to OFF. 2) Remove motor relay from relay box. 3) Measure resistance between motor relay terminals. <i>Terminals</i> No. 85 — No. 86: | Is the resistance between 70 and 90 Ω ? | Go to step 2. | Replace motor relay. |
| 2 | CHECK CONTACT POINT OF MOTOR RELAY. 1) Connect battery to motor relay terminals No. 85 and No. 86. 2) Measure resistance between motor relay terminals. <i>Terminals</i> No. 30 — No. 87: | Is the resistance less than 0.5 Ω ? | Go to step 3. | Replace motor relay. |
| 3 | CHECK SHORT OF MOTOR RELAY. Measure resistance between motor relay terminals. <i>Terminals</i> No. 85 — No. 30: No. 85 — No. 87: | Is the resistance more than 1 M Ω ? | Go to step 4. | Replace motor relay. |
| 4 | CHECK INPUT VOLTAGE OF RELAY BOX. 1) Disconnect connector (F89) from relay box. 2) Disconnect connector from VDCCM. 3) Turn ignition switch to ON. 4) Measure voltage between relay box connector and chassis ground. <i>Connector & terminal</i> (F89) No. 2 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 5. | Repair harness/connector between battery and relay box, and check fuse SBF holder. |
| 5 | CHECK INPUT VOLTAGE OF MOTOR RELAY. 1) Turn ignition switch to OFF. 2) Connect connector (F89) to relay box. 3) Turn ignition switch to ON. 4) Measure voltage between relay box and chassis ground. <i>Connector & terminal</i> Relay installing point No. 87 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 6. | Replace relay box. |
| 6 | CHECK OPEN CIRCUIT IN CONTACT POINT CIRCUIT OF RELAY BOX. 1) Turn ignition switch to OFF. 2) Disconnect connectors (VDC2, F90) from relay box. 3) Measure resistance between relay box connector unit and motor relay installing portion. <i>Connector & terminal</i> (VDC1) No. 1 — Motor relay installing portion No. 30: | Is the resistance less than 0.5 Ω ? | Go to step 7. | Replace relay box. |
| 7 | CHECK OPEN CIRCUIT IN MONITOR SYSTEM CIRCUIT OF RELAY BOX. Measure resistance between relay box connector and motor relay installing point. <i>Connector & terminal</i> (VDC4) No. 6 — Motor relay installing point No. 30: | Is the resistance less than 0.5 Ω ? | Go to step 8. | Replace relay box. |

VDC-200

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|----------------|--|
| 8 | CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX. Measure resistance between motor relay installing point and relay box connector. Connector & terminal (VDC4) No. 4 — Motor relay installing point No. 85: | Is the resistance less than 0.5 Ω ? | Go to step 9. | Replace relay box. |
| 9 | CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX. 1) Remove valve relay from relay box. 2) Measure resistance between motor relay installing point and valve relay installing point. Connector & terminal Motor relay installing point No. 86 — Valve relay installing point No. 30: | Is the resistance less than 0.5 Ω ? | Go to step 10. | Replace relay box. |
| 10 | CHECK GROUND SHORT IN CIRCUIT OF RELAY BOX. Measure resistance between relay box connector and chassis ground. Connector & terminal (VDC4) No. 4 — Chassis ground: (VDC4) No. 6 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 11. | Replace relay box. |
| 11 | CHECK BATTERY SHORT IN CIRCUIT OF RELAY BOX. Measure voltage between relay box connector and chassis ground. Connector & terminal (VDC4) No. 6 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 12. | Replace relay box. |
| 12 | CHECK BATTERY SHORT IN CIRCUIT OF RELAY BOX. 1) Turn ignition switch to ON. 2) Measure voltage between relay box connector and chassis ground. Connector & terminal (VDC4) No. 6 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 13. | Replace relay box. |
| 13 | CHECK OPEN CIRCUIT IN RELAY CONTROL SYSTEM HARNESS. Measure resistance between VDCCM connector and relay box connector. Connector & terminal (F87) No. 22 — (F90) No. 4: (F87) No. 10 — (F90) No. 6: | Is the resistance less than 0.5 Ω ? | Go to step 14. | Repair harness connector between VDCCM and relay box. |
| 14 | CHECK GROUND SHORT IN HARNESS BETWEEN RELAY BOX AND VDCCM. Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 22 — Chassis ground: (F87) No. 10 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 15. | Repair harness between VDCCM and relay box. Check fuse SBF holder. |
| 15 | CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND VDCCM. Measure voltage between VDCCM connector and chassis ground. Connector & terminal (F87) No. 10 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Go to step 16. | Repair harness between VDCCM and relay box. Check fuse SBF holder. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 16 | CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND VDCCM. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM connector and chassis ground. <i>Connector & terminal (F87) No. 10 (+) — Chassis ground (-):</i> | Is the voltage less than 1 V? | Go to step 17. | Repair harness between VDCCM and relay box. Check fuse SBF holder. |
| 17 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connector between VDCH/U, relay box and VDCCM? | Repair connector. | Go to step 18. |
| 18 | CHECK VDCCM. 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 VDCCM. | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AO: TROUBLE CODE 52 MOTOR MALFUNCTION S005504D68

DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

VDC (DIAGNOSTICS)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

00.5.31/68j/0vdc

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|-------------------|--|
| 1 | CHECK CONTACT POINT OF MOTOR RELAY. 1) Turn ignition switch to OFF. 2) Remove motor relay from relay box. 3) Connect battery to motor relay terminals No. 85 and No. 86. 4) Measure resistance between motor relay terminals. Terminals No. 30 — No. 87: | Is the resistance less than 0.5 Ω ? | Go to step 2. | Replace motor relay. |
| 2 | CHECK CONTACT POINT OF MOTOR RELAY. 1) Disconnect battery from motor relay terminals. 2) Measure resistance between motor relay terminals. Terminals No. 30 — No. 87: | Is the resistance more than 1 M Ω ? | Go to step 3. | Replace motor relay. |
| 3 | CHECK INPUT VOLTAGE OF RELAY BOX. 1) Disconnect connector (F89) from relay box. 2) Disconnect connector from VDCCM. 3) Turn ignition switch to ON. 4) Measure voltage between relay box connector and chassis ground. Connector & terminal (F89) No. 2 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 4. | Repair harness/connector between battery and relay box, and check fuse SBF holder. |
| 4 | CHECK INPUT VOLTAGE OF MOTOR RELAY. 1) Turn ignition switch to OFF. 2) Connect connector (F89) to relay box. 3) Turn ignition switch to ON. 4) Measure voltage between relay box and chassis ground. Connector & terminal Relay installing point No. 87 (+) — Chassis ground (-): | Is the voltage between 10 and 15 V? | Go to step 5. | Replace relay box. |
| 5 | CHECK CONDITION OF MOTOR GROUND. Tightening torque: 32\pm10 N·m (3.3\pm1.0 kgf·m, 24\pm7 ft·lb) | Is the motor ground terminal tightly clamped? | Go to step 6. | Tighten the clamp of motor ground terminal. |
| 6 | CHECK VDCCM MOTOR DRIVE TERMINAL. 1) Turn ignition switch OFF. 2) Remove VDC connector cover. <Ref. to VDC-17 VDCCM Connector Cover.> 3) Connect all connectors. 4) Install motor relay. 5) Operate the ABS check sequence. <Ref. to VDC-18 ABS Sequence Control.> 6) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 22 (+) — No. 1 (-): | Does the voltage drop from between 10 V and 13 V to less than 1.5 V, and rise to between 10 V and 13 V again when carrying out the check sequence? | Go to step 7. | Replace VDCCM. |
| 7 | CHECK MOTOR OPERATION. Operate the check sequence. <Ref. to VDC-21 VDC Sequence Control.> | Can motor revolution noise (buzz) be heard when carrying out the check sequence? | Go to step 8. | Replace VDCH/U. |
| 8 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connector between VDCH/U, relay box and VDCCM? | Repair connector. | Go to step 9. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|---------------------------|
| 9 | CHECK VDCCM. 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 VDCCM. | Go to step 10. |
| 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AP: TROUBLE CODE 71 STEERING ANGLE SENSOR OFFSET IS TOO BIG.

S005504D93

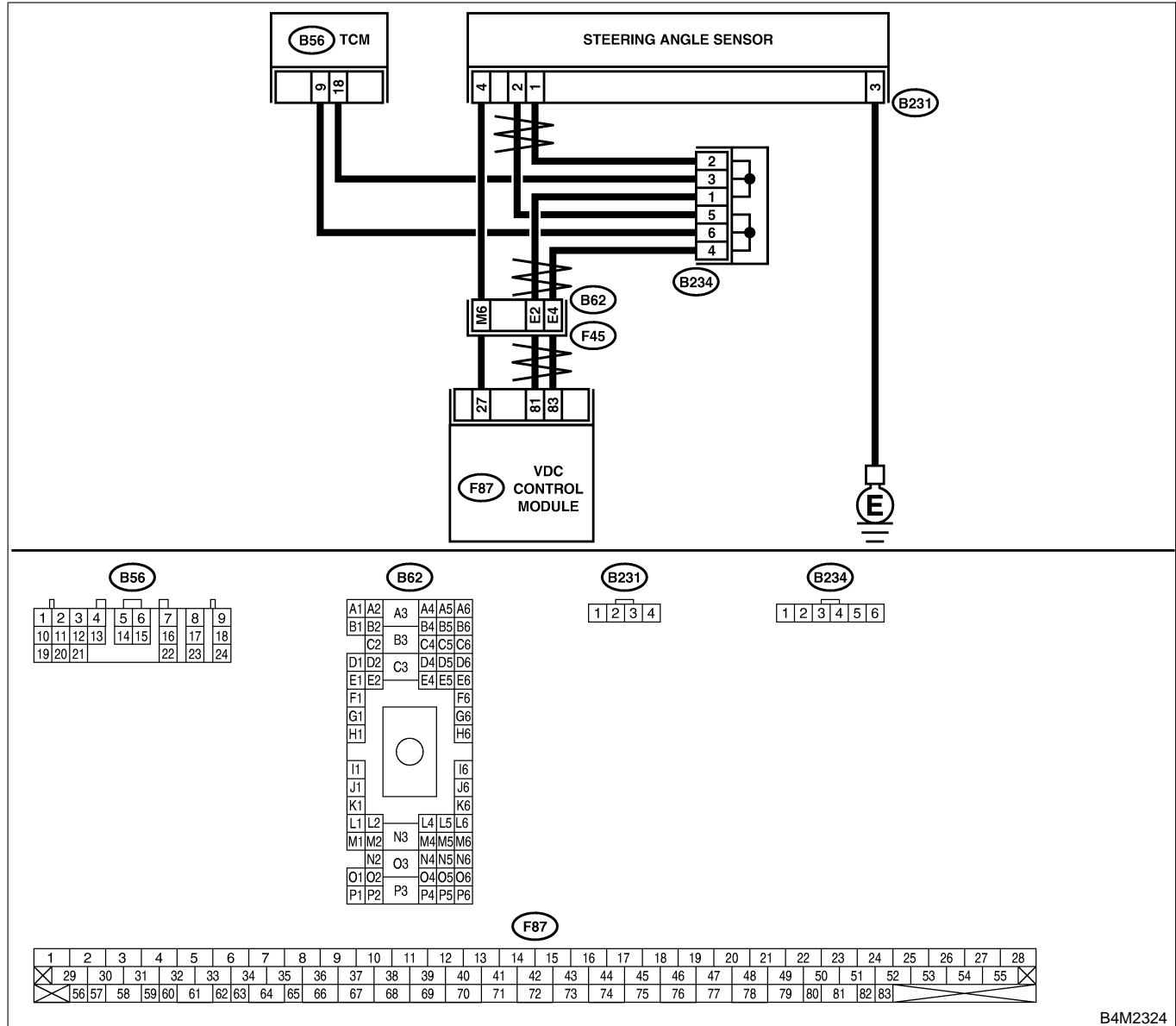
DIAGNOSIS:

- Faulty steering angle sensor

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2324

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 1 | CHECK THE STEERING WHEEL. 1) Drive the vehicle on a flat road. 2) Stop the vehicle in a straight line. 3) Check the angle of steering wheel. | Is the angle of steering wheel within 5°? | Go to step 2. | Perform centering alignment of steering wheel. |
| 2 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Go to step 3. |
| 3 | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

AQ: TROUBLE CODE 71 CHANGE RANGE OF STEERING ANGLE SENSOR IS TOO BIG. S005504D89

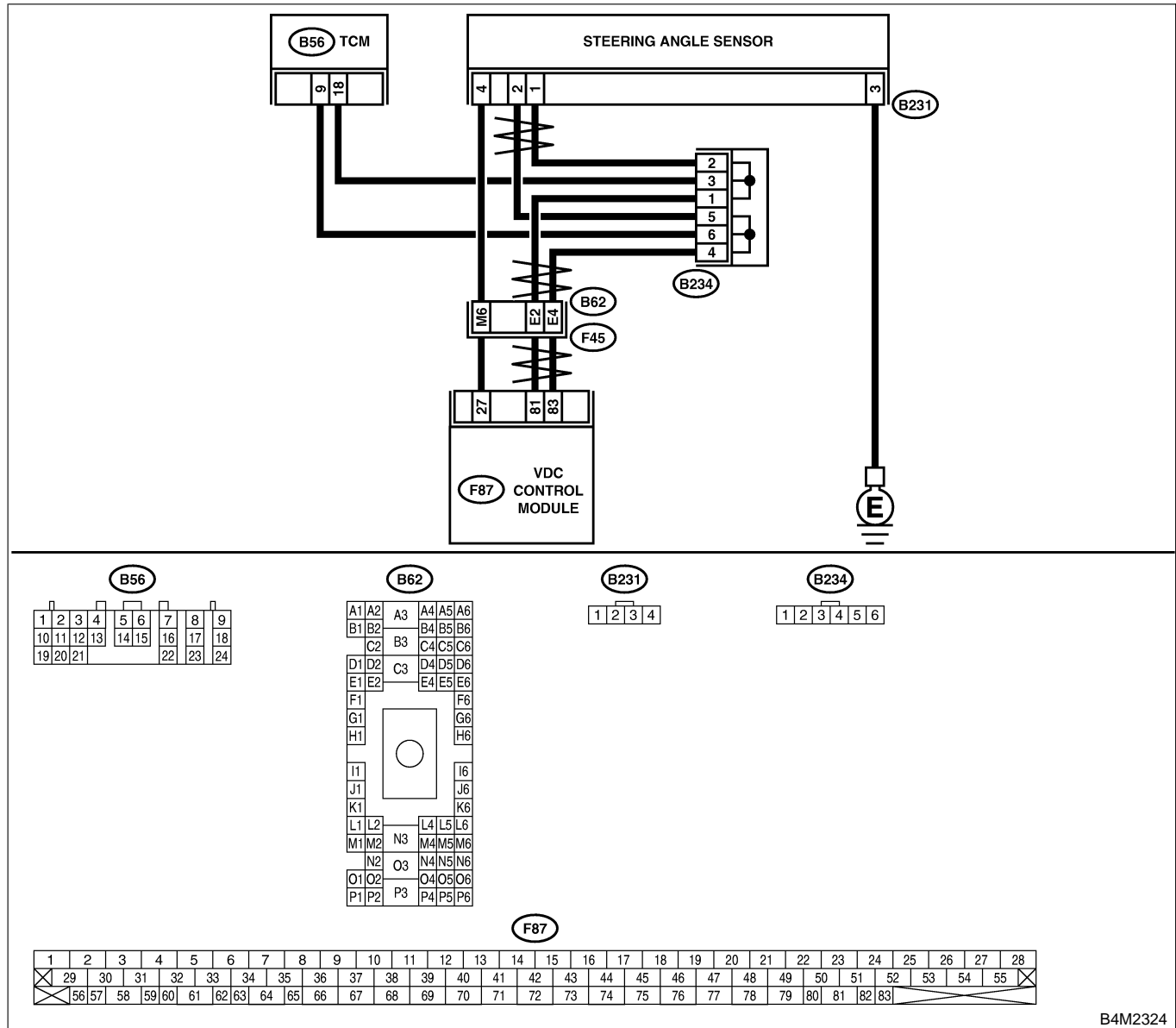
DIAGNOSIS:

- Faulty steering angle sensor

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2324

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|--|---------------------------|
| 1 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Go to step 2. |
| 2 | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

AR: TROUBLE CODE 71 STEERING ANGLE SENSOR MALFUNCTION

S005504D92

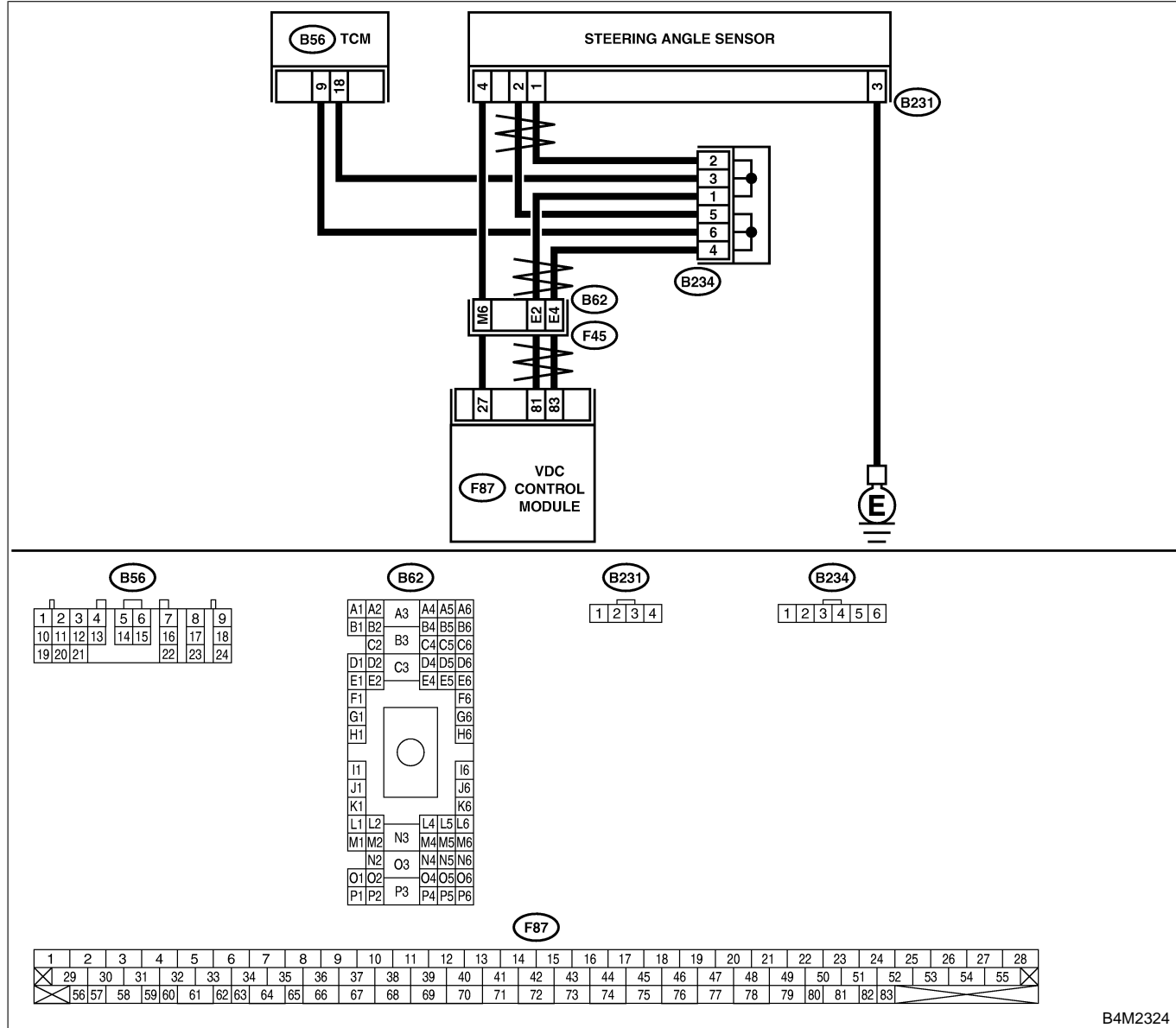
DIAGNOSIS:

- Faulty steering angle sensor

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2324

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--|--|
| 1 | CHECK THE STEERING WHEEL. 1) Drive the vehicle on a flat road. 2) Stop the vehicle in a straight line. 3) Check the angle of steering wheel. | Is the angle of steering wheel within 5°? | Go to step 2. | Perform centering alignment of steering. |
| 2 | CHECK OUTPUT OF STEERING ANGLE SENSOR USING SELECT MONITOR. 1) Select "Current data display & Save" on the select monitor. 2) Read steering angle sensor output on the select monitor display. | Does the steering angle sensor output (value) change on the monitor display when the steering wheel is turned in either direction? | Go to step 3. | Replace steering angle sensor. |
| 3 | CHECK RUNNING FIELD. Check if the vehicle was driven on banked road surfaces or sandy surfaces (not dirt road surfaces). | Was the vehicle driven on banked road surfaces or sandy surfaces (not dirt road surfaces)? | Driving on banked road surfaces or sandy surfaces (not dirt road surfaces) sometimes results in a VDCCM memory trouble code. | Go to step 4. |
| 4 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

AS: TROUBLE CODE 71 NO SIGNAL FROM STEERING ANGLE SENSOR

S005504D90

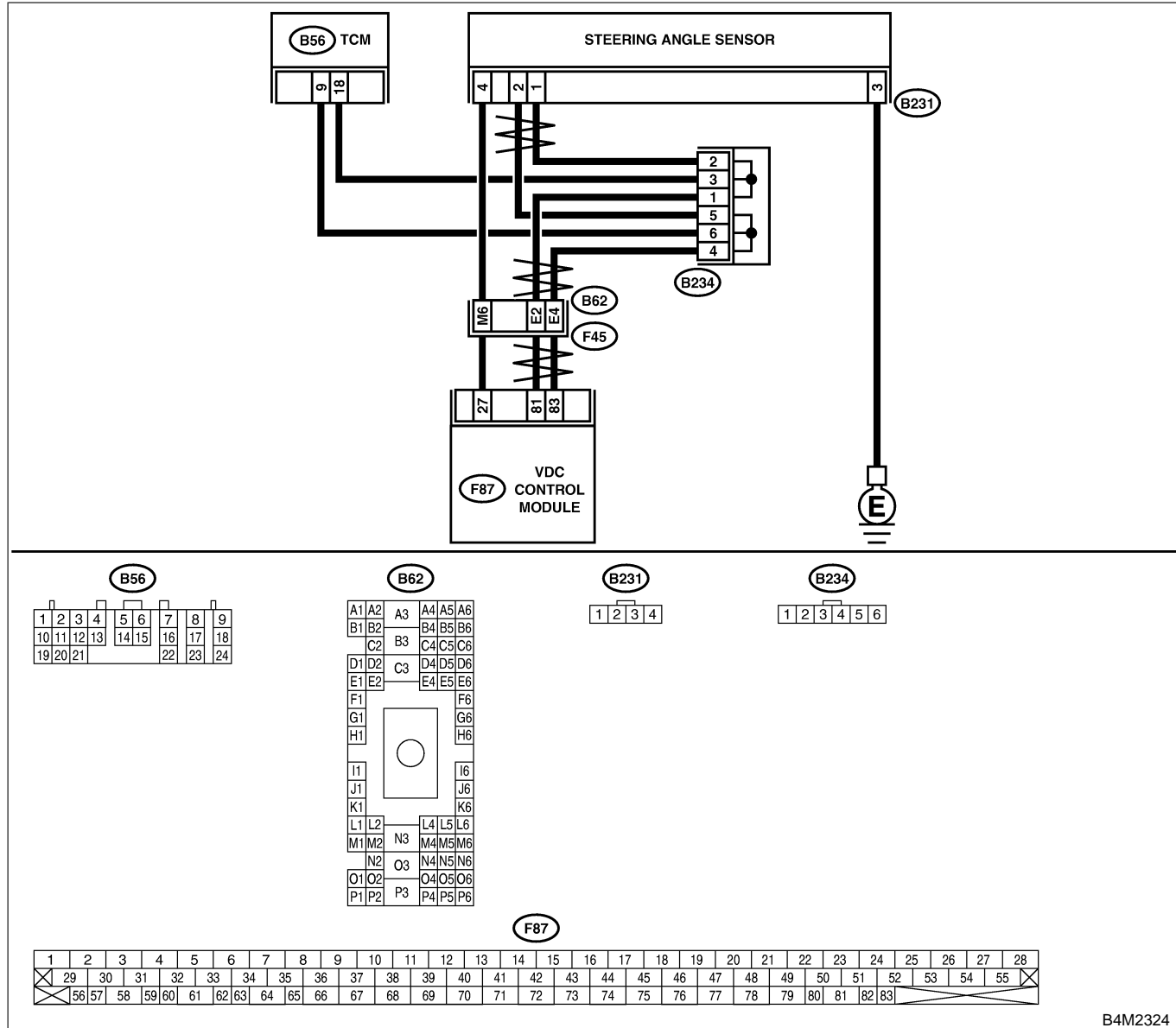
DIAGNOSIS:

- Faulty steering angle sensor

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2324

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|--|---|
| 1 | CHECK POWER SUPPLY OF STEERING ANGLE SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from steering angle sensor. 3) Turn ignition switch to ON. 4) Measure voltage between steering angle sensor and chassis ground. Connector & terminal (B231) No. 4 — Chassis ground: | Is the voltage between 10 and 15 V? | Go to step 4. | Go to step 2. |
| 2 | CHECK OUTPUT VOLTAGE OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover for VDCCM connector. <Ref. to VDC-21 VDC Sequence Control.> 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 27 — Chassis ground: | Is the voltage between 10 and 15 V? | Repair harness between yaw rate sensor and VDCCM. | Go to step 3. |
| 3 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in yaw rate sensor connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 4 | CHECK GROUND CIRCUIT OF STEERING ANGLE SENSOR. Measure resistance between steering sensor and chassis ground. Connector & terminal (B231) No. 3 — Chassis ground: | Is the resistance less than 0.5 Ω? | Go to step 5. | Repair steering angle sensor ground harness. |
| 5 | CHECK HARNESS OF STEERING ANGLE SENSOR. 1) Connect connector to steering angle sensor. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM connector terminals. Connector & terminal (F87) No. 81 — No. 83: | Is the resistance 120±6 Ω? | Repair harness between steering angle sensor and VDCCM. | Go to step 6. |
| 6 | CHECK STEERING ANGLE SENSOR. 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? | Go to step 8. | 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 VDCCM. 1) Turn ignition switch to OFF. 2) Replace steering angle sensor. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. | The original steering angle sensor has been faulty. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AT: TROUBLE CODE 72 ABNORMAL YAW RATE SENSOR OUTPUT

S005504D95

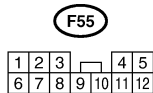
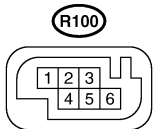
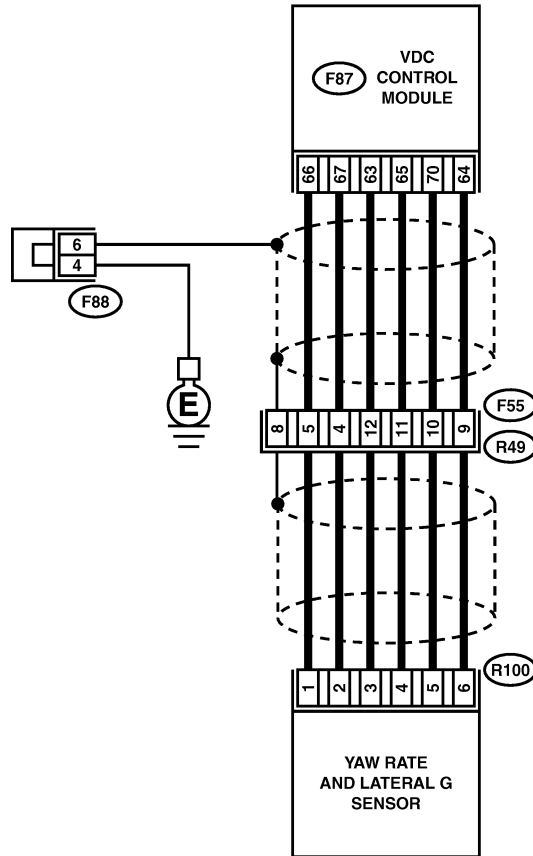
DIAGNOSIS:

- Faulty yaw rate sensor

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



F87

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 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 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

B4M2330

VDC-216

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|--|--|
| 1 | CHECK RUNNING FIELD. Check if the vehicle was driven on banked road surfaces or sandy surfaces (not dirt road surfaces). | Was the vehicle driven on banked road surfaces or sandy surfaces (not dirt road surfaces)? | Driving on banked road surfaces or sandy surfaces (not dirt road surfaces) sometimes results in a VDCCM memory trouble code. | Go to step 2. |
| 2 | CHECK INSTALLATION OF YAW RATE AND LATERAL G SENSOR. Check installation of yaw rate and lateral G sensor. | Is the yaw rate and lateral G sensor fixed securely? | Go to step 3. | Install yaw rate and lateral G sensor securely. |
| 3 | CHECK OUTPUT OF YAW RATE AND LATERAL G SENSOR USING SELECT MONITOR. 1) Drive the vehicle on a flat road. 2) Stop the vehicle in a straight line. 3) Select "Current data display & Save" on the select monitor. 4) Read yaw rate and lateral G sensor output on the select monitor display. | Is the yaw rate and lateral G sensor output on monitor display 0 ± 5.25 deg? | Go to step 4. | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |
| 4 | CHECK OUTPUT OF STEERING ANGLE SENSOR USING SELECT MONITOR. 1) Drive the vehicle on a flat road. 2) Stop the vehicle in a straight line. 3) Select "Current data display & Save" on the select monitor. 4) Read steering angle sensor output on the select monitor display. | Is the steering angle sensor output on monitor display $0 \pm 2.5^\circ$? | Go to step 5. | Perform centering alignment of steering wheel. |
| 5 | CHECK YAW RATE AND LATERAL G SENSOR. 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? | Go to step 6. | Go to step 7. |
| 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. |
| 7 | CHECK VDCCM. 1) Turn ignition switch to OFF. 2) Replace yaw rate and lateral G sensor. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. | The original yaw rate and lateral G sensor has been faulty. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AU: TROUBLE CODE 72 VOLTAGE INPUTTED TO YAW RATE SENSOR EXCEEDS SPECIFICATION. S005504D99

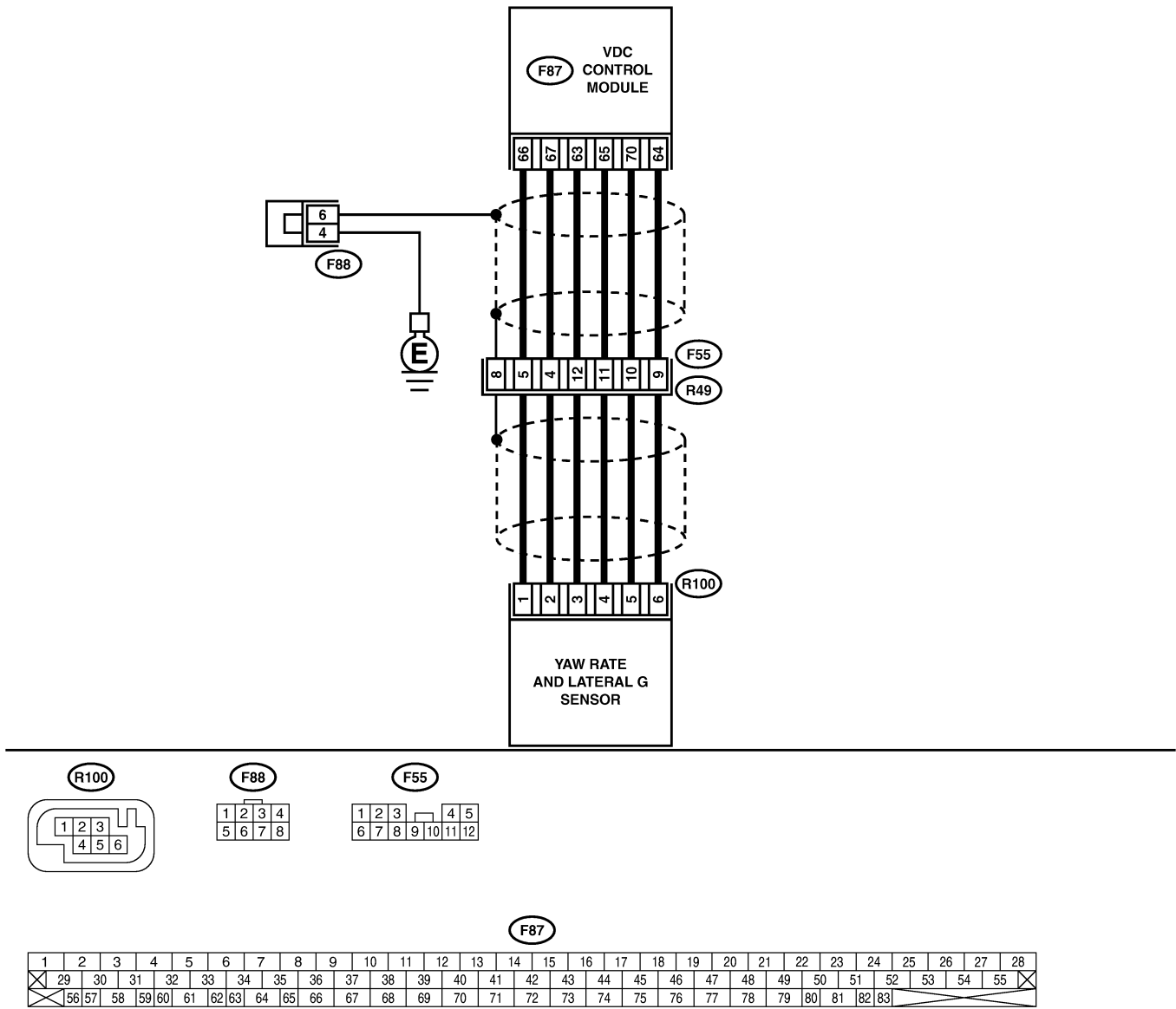
DIAGNOSIS:

- Faulty yaw rate sensor

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2330

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|--|---|
| 1 | CHECK POWER SUPPLY OF YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from yaw rate and lateral G sensor. 3) Turn ignition switch to ON. 4) Measure voltage between yaw rate and lateral G sensor and chassis ground. Connector & terminal (R100) No. 3 — Chassis ground: | Is the voltage between 10 and 15 V? | Go to step 4. | Go to step 2. |
| 2 | CHECK OUTPUT VOLTAGE OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover for VDCCM connector. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground: | Is the voltage between 10 and 15 V? | Repair harness between yaw rate and lateral G sensor and VDCCM. | Go to step 3. |
| 3 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in yaw rate and lateral G sensor connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 4 | CHECK HARNESS OF YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM and yaw rate and lateral G sensor. Connector & terminal (F87) No. 65 — (R100) No. 4: | Is the resistance less than 0.5 Ω ? | Go to step 5. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 5 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 65 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 6. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 6 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 65 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 7. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 7 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 65 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> | Repair harness between yaw rate and lateral G sensor and VDCCM. |

VDC-220

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

VDC-221

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AV: TROUBLE CODE 72 ABNORMAL YAW RATE SENSOR REFERENCE VOLTAGE S005504D96

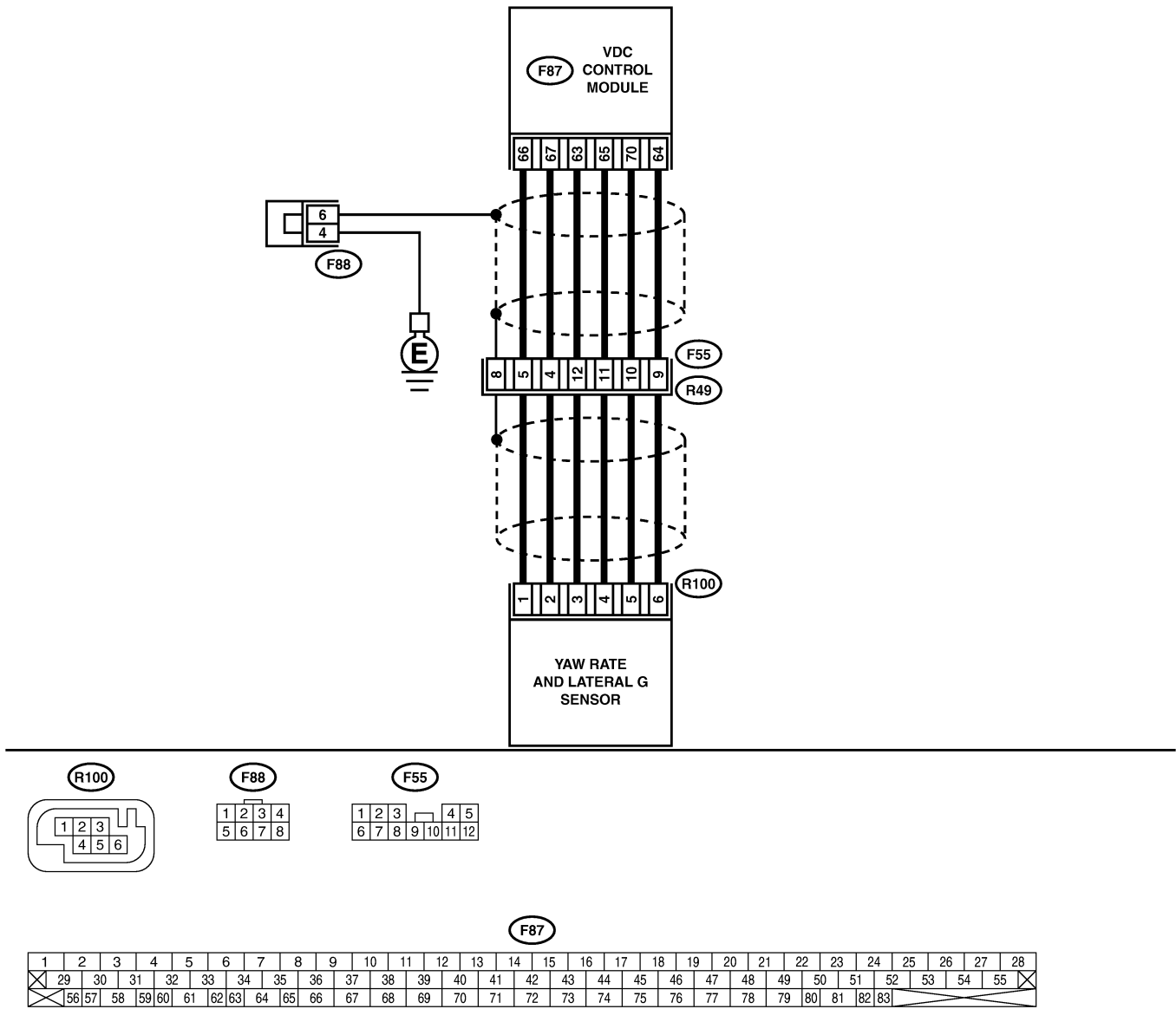
DIAGNOSIS:

- Faulty yaw rate sensor

TROUBLE SYMPTOM:

- VDC does not operate.

WIRING DIAGRAM:



B4M2330

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|---|--|
| 1 | CHECK POWER SUPPLY OF YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from yaw rate and lateral G sensor. 3) Turn ignition switch to ON. 4) Measure voltage between yaw rate and lateral G sensor and chassis ground. Connector & terminal (R100) No. 3 — Chassis ground: | Is the voltage between 10 and 15 V? | Go to step 4. | Go to step 2. |
| 2 | CHECK OUTPUT VOLTAGE OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover for VDCCM connector. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground: | Is the voltage between 10 and 15 V? | Repair harness between yaw rate and lateral G sensor and VDCCM. | Go to step 3. |
| 3 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in yaw rate and lateral G sensor connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 4 | CHECK HARNESS OF YAW RATE AND LATERAL G SENSOR. 1) Disconnect connector from VDCCM. 2) Measure resistance between VDCCM and yaw rate and lateral G sensor. Connector & terminal (F87) No. 66 — (R100) No. 1: | Is the resistance less than 0.5 Ω ? | Go to step 5. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 5 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 66 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 6. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 6 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 66 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 7. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 7 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 66 — Chassis ground: | Is the voltage less than 0.5 V? | Go to step 8. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 8 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch to OFF. 2) Install yaw rate and lateral G sensor to body. 3) Remove VDCCM connector cover. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect all connectors. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 66 (+) — No. 64 (-): | Is the voltage between 2.1 and 2.9 V? | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |

VDC-224

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

VDC-225

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AW: TROUBLE CODE 72 CHANGE RANGE OF YAW RATE SENSOR SIGNAL IS TOO BIG. S005504D97

DIAGNOSIS:

- Faulty yaw rate sensor

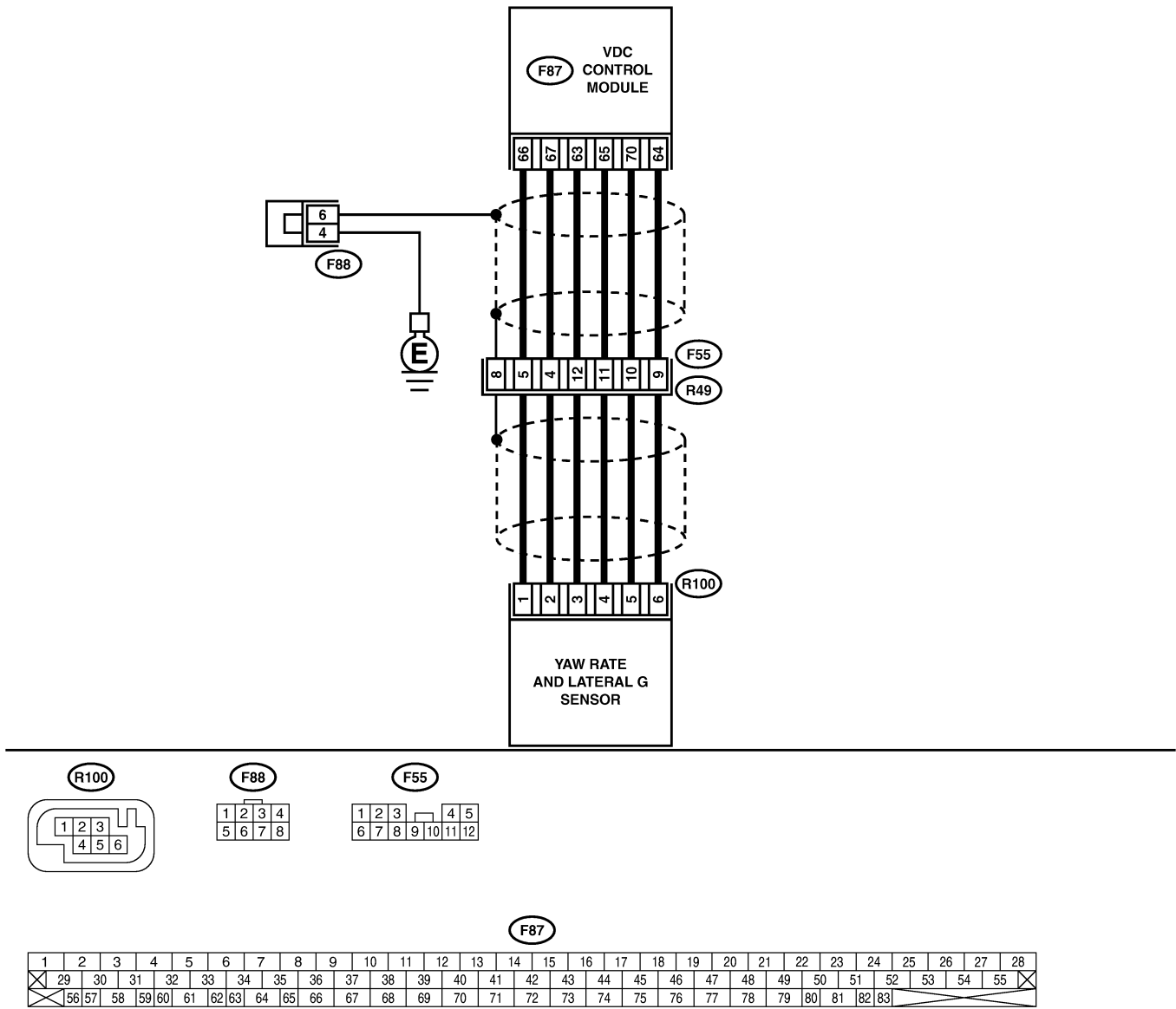
TROUBLE SYMPTOM:

- VDC does not operate.

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



B4M2330

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|---|
| 1 | CHECK RUNNING FIELD. | Was the vehicle driven on surfaces with holes or bumps at high speeds? | When driving on surfaces with holes or bumps at high speeds, VDCCM sometimes records trouble codes in memory. | Go to step 2. |
| 2 | CHECK INSTALLATION OF YAW RATE AND LATERAL G SENSOR. Check installation of yaw rate and lateral G sensor. | Is the yaw rate and lateral G sensor fixed securely? | Go to step 3. | Install yaw rate and lateral G sensor securely. |
| 3 | CHECK POWER SUPPLY OF YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from yaw rate and lateral G sensor. 3) Turn ignition switch to ON. 4) Measure voltage between yaw rate and lateral G sensor and chassis ground. Connector & terminal (R100) No. 3 — Chassis ground: | Is the voltage between 10 and 15 V? | Go to step 6. | Go to step 4. |
| 4 | CHECK OUTPUT VOLTAGE OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover for VDCCM connector. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground: | Is the voltage between 10 and 15 V? | Repair harness between yaw rate and lateral G sensor and VDCCM. | Go to step 5. |
| 5 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in yaw rate and lateral G sensor connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 6 | CHECK GROUND CIRCUIT OF YAW RATE AND LATERAL G SENSOR. Measure resistance between yaw rate and lateral G sensor and chassis ground. Connector & terminal (R100) No. 6 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Go to step 9. | Go to step 7. |
| 7 | CHECK GROUND CIRCUIT OF VDCCM. 1) Disconnect connector from VDCCM. 2) Remove cover from VDCCM connector. <Ref. to VDC-17 VDCCM Connector Cover.> 3) Connect connector to VDCCM. 4) Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 64 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Repair harness between yaw rate and lateral G sensor and VDCCM. | Go to step 8. |
| 8 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in VDCCM connector? | Repair or replace VDCCM connector. | Replace VDCCM. |

VDC-228

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 9 | CHECK HARNESS OF YAW RATE SENSOR. 1) Disconnect connector from VDCCM. 2) Measure resistance between VDCCM and yaw rate and lateral G sensor. Connector & terminal (F87) No. 65 — (R100) No. 4: (F87) No. 66 — (R100) No. 1: (F87) No. 67 — (R100) No. 2: | Is the resistance less than 0.5 Ω ? | Go to step 10. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 10 | CHECK GROUND SHORT OF HARNESS. Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 65 — Chassis ground: (F87) No. 66 — Chassis ground: (F87) No. 67 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 11. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 11 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 65 (+) — Chassis ground (-): (F87) No. 66 (+) — Chassis ground (-): (F87) No. 67 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 12. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 12 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCCM and chassis ground. Connector & terminal (F87) No. 65 — Chassis ground: (F87) No. 66 — Chassis ground: (F87) No. 67 — Chassis ground: | Is the voltage less than 0.5 V? | Go to step 13. | Repair harness between yaw rate and lateral G sensor and VDCCM. |
| 13 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch to OFF. 2) Install yaw rate and lateral G sensor to body. 3) Connect all connectors. 4) Turn ignition switch to ON. 5) Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (F87) No. 66 (+) — No. 64 (-): | Is the voltage between 2.1 and 2.9 V? | Replace VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

AX: TROUBLE CODE 73 LATERAL G SENSOR OFFSET IS TOO BIG. S005504E04

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 73. <Ref. VDC-230 TROUBLE CODE 73 EXCESSIVE LATERAL G SENSOR SIGNAL, Diagnostics Chart with Select Monitor.>

AY: TROUBLE CODE 73 ABNORMAL LATERAL G SENSOR OUTPUT S005504E01

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 73. <Ref. VDC-230 TROUBLE CODE 73 EXCESSIVE LATERAL G SENSOR SIGNAL, Diagnostics Chart with Select Monitor.>

AZ: TROUBLE CODE 73 CHANGE RANGE OF LATERAL G SENSOR IS TOO BIG. S005504E02

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 73. <Ref. VDC-230 TROUBLE CODE 73 EXCESSIVE LATERAL G SENSOR SIGNAL, Diagnostics Chart with Select Monitor.>

BA: TROUBLE CODE 73 EXCESSIVE LATERAL G SENSOR SIGNAL S005504E03

DIAGNOSIS:

- Faulty lateral G sensor

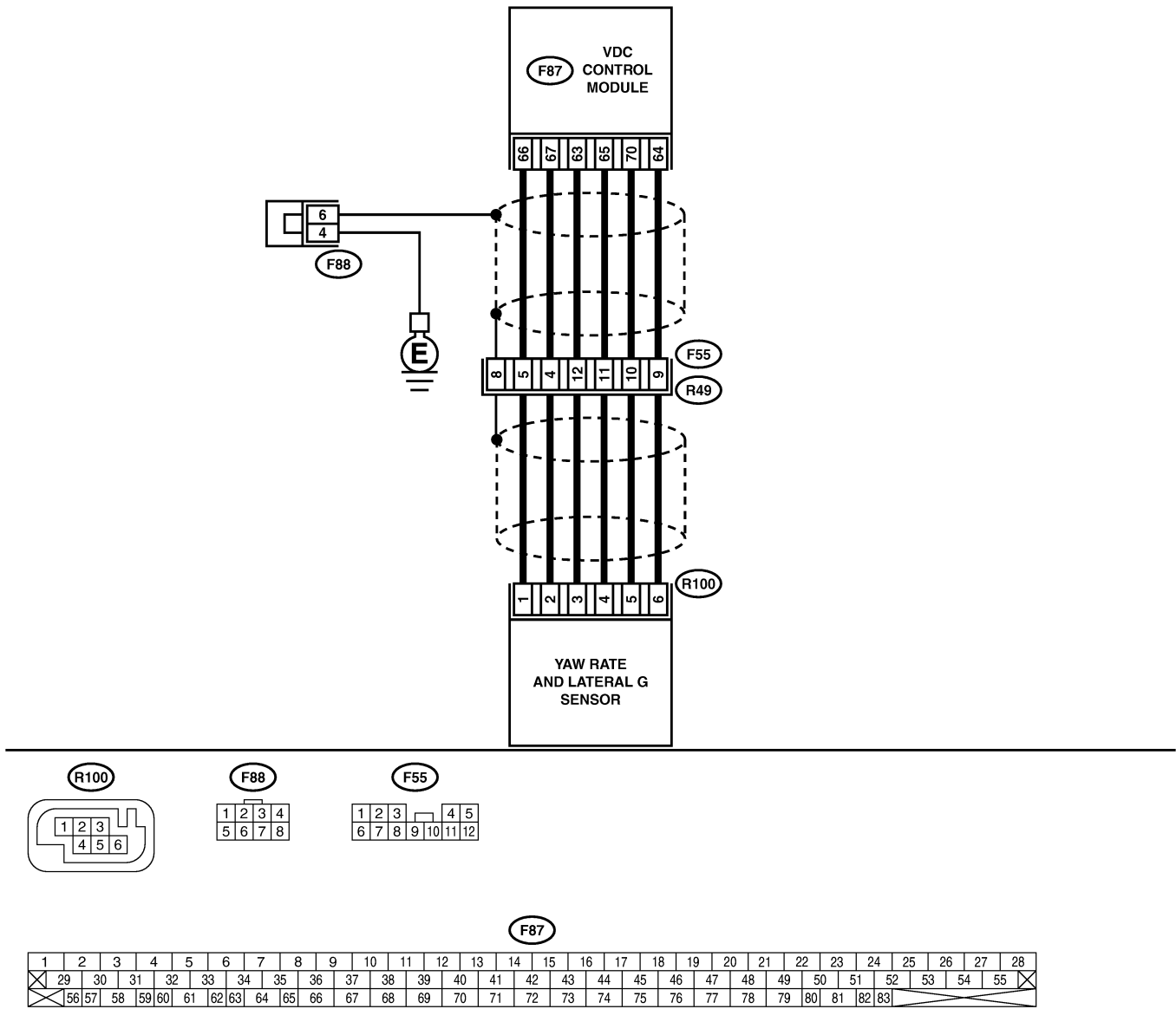
TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

WIRING DIAGRAM:



B4M2330

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|---|--|
| 1 | CHECK INSTALLATION OF YAW RATE AND LATERAL G SENSOR. Check installation of yaw rate and lateral G sensor. | Is the yaw rate and lateral G sensor fixed securely? | Go to step 2. | Install yaw rate and lateral G sensor securely. |
| 2 | CHECK OUTPUT OF LATERAL G SENSOR USING SELECT MONITOR. 1) Stop the vehicle on a flat road. 2) Select "Current data display & Save" on the select monitor. 3) Read yaw rate and lateral G sensor output on the select monitor display. | Is the yaw rate and lateral G sensor output on monitor display 2.5 ± 0.2 V? | Go to step 3. | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |
| 3 | CHECK POOR CONTACT IN CONNECTORS. Turn ignition switch to OFF. | Is there poor contact in connector between VDCCM and yaw rate and lateral G sensor? | Repair connector. | Go to step 4. |
| 4 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

BB: TROUBLE CODE 73 VOLTAGE INPUTTED TO LATERAL G SENSOR EXCEEDS SPECIFICATION. S005504E06

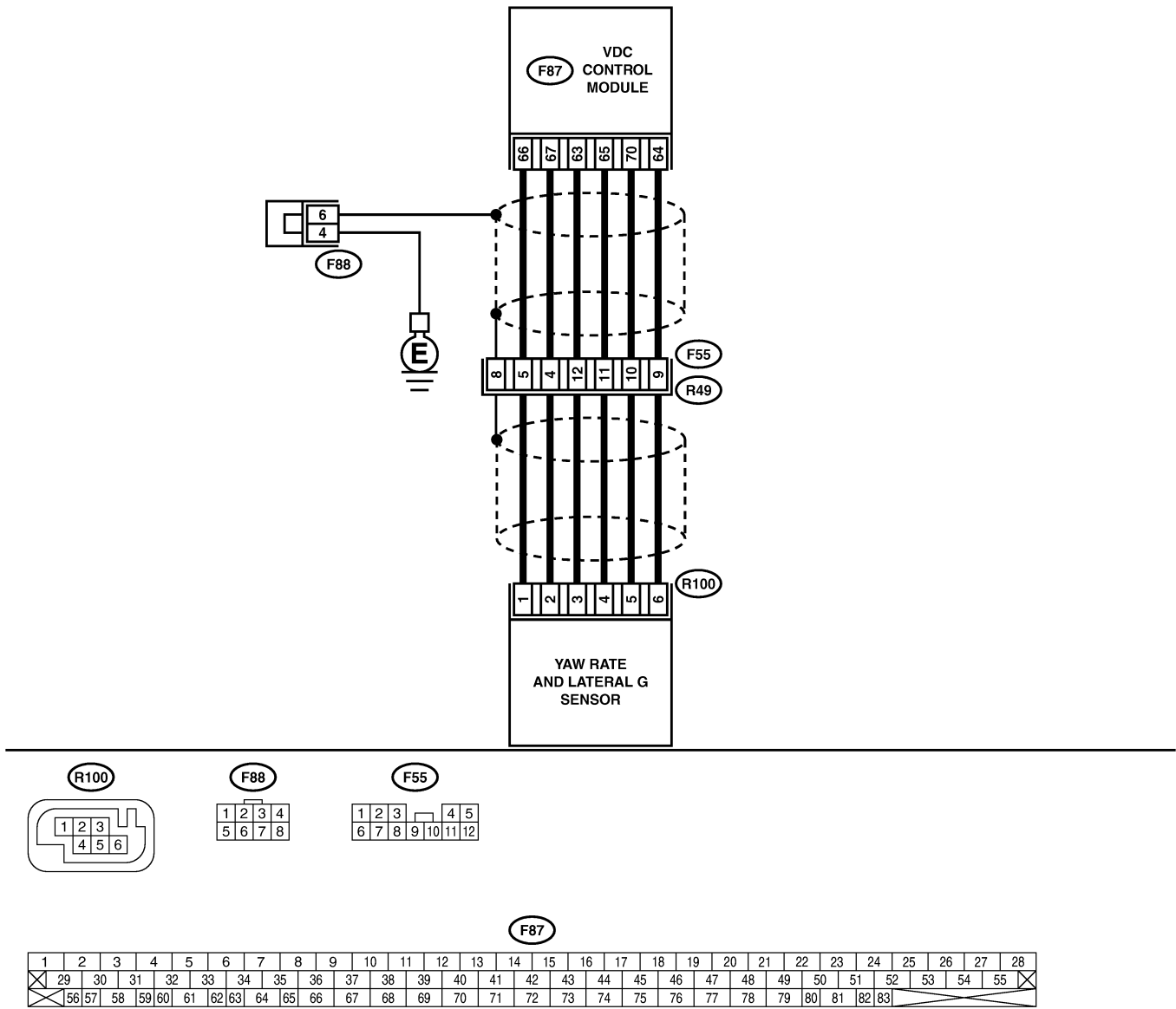
DIAGNOSIS:

- Faulty lateral G sensor

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2330

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|---|--|---|
| 1 | CHECK OUTPUT OF YAW RATE AND LATERAL G SENSOR USING SELECT MONITOR. 1) Stop the vehicle on a flat road. 2) Select "Current data display & Save" on the select monitor. 3) Read yaw rate and lateral G sensor output on the select monitor display. | Is the yaw rate and lateral G sensor output on monitor display 2.5 ± 0.2 V? | 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 VDCCM and yaw rate and lateral G sensor? | Repair connector. | Go to step 3. |
| 3 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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 YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch to OFF. 2) Remove console box. 3) Disconnect connector from yaw rate and lateral G sensor. 4) Turn ignition switch to ON. 5) Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 3 (+) — No. 6 (-): | Is the voltage between 10 and 15 V? | Go to step 6. | Repair harness/connector between yaw rate and lateral G sensor and VDCCM. |
| 6 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch to OFF. 2) Measure resistance between yaw rate and lateral G sensor terminals. Terminals No. 3 — No. 5: | Is the resistance between 4.3 and 4.9 k Ω ? | Go to step 7. | Replace yaw rate and lateral G sensor. |
| 7 | CHECK OPEN CIRCUIT IN YAW RATE AND LATERAL G SENSOR OUTPUT HARNESS AND GROUND HARNESS. 1) Connect connector to yaw rate and lateral G sensor. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCCM connector terminals. Connector & terminal (F87) No. 69 — No. 70: | Is the resistance between 4.3 and 4.9 k Ω ? | Go to step 8. | Repair harness/connector between yaw rate and lateral G sensor and VDCCM. |
| 8 | CHECK GROUND SHORT IN YAW RATE AND LATERAL G SENSOR HARNESS. 1) Disconnect connector from yaw rate and lateral G sensor. 2) Measure resistance between VDCCM connector and chassis ground. Connector & terminal (F87) No. 63 — Chassis ground: (F87) No. 70 — Chassis ground: (F87) No. 64 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 9. | Repair harness between yaw rate and lateral G sensor and VDCCM. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|---|--|
| 9 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch to OFF. 2) Remove yaw rate and lateral G sensor from vehicle. 3) Connect connector to yaw rate and lateral G sensor. 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 5 (+) — No. 6 (-): | Is the voltage between 2.3 and 2.7 V when yaw rate and lateral G sensor is horizontal? | Go to step 10. | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |
| 10 | CHECK YAW RATE AND LATERAL G SENSOR. Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 5 (+) — No. 6 (-): | Is the voltage between 3.3 and 3.7 V when yaw rate and lateral G sensor is horizontal, and is inclined 90° to the left in front of the sensor? | Go to step 11. | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |
| 11 | CHECK YAW RATE AND LATERAL G SENSOR. Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 5 (+) — No. 6 (-): | Is the voltage between 1.3 and 1.7 V when yaw rate and lateral G sensor is horizontal, and is inclined 90° to the right in front of the sensor? | Go to step 12. | Replace yaw rate and lateral G sensor. <Ref. to VDC-24 Yaw Rate and Lateral G Sensor.> |
| 12 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector between VDCCM and yaw rate and lateral G sensor? | Repair connector. | Go to step 13. |
| 13 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

BC: TROUBLE CODE 74 VOLTAGE INPUTTED TO PRESSURE SENSOR 1 EXCEEDS SPECIFICATION. (PRIMARY PRESSURE SENSOR) S005504E12

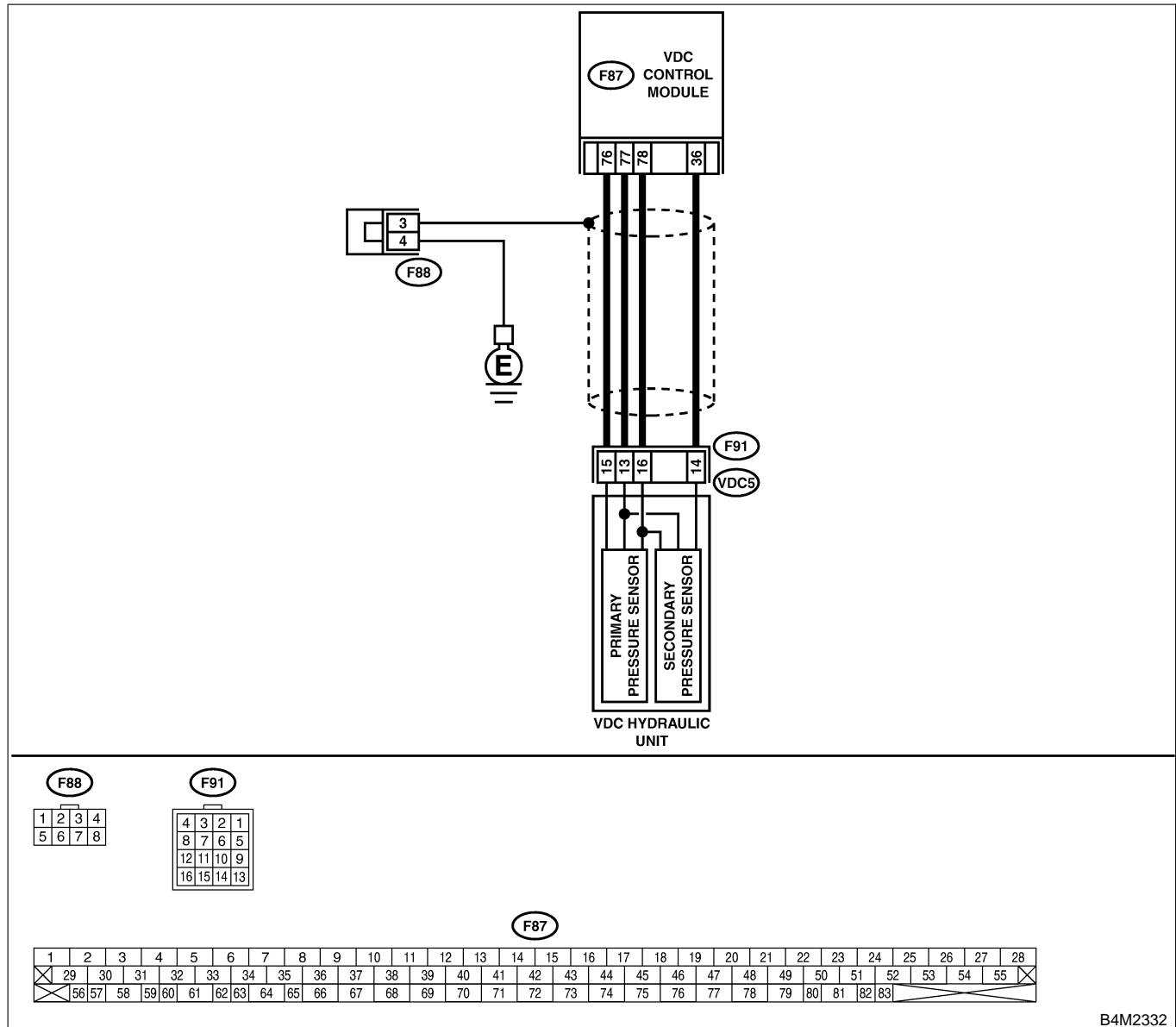
DIAGNOSIS:

- Faulty primary pressure sensor

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2332

VDC-238

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 1 | CHECK GROUND CIRCUIT OF PRESSURE SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector (F91) from VDCH/U. 3) Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 15 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Go to step 4. | Go to step 2. |
| 2 | CHECK GROUND CIRCUIT OF VDCCM. 1) Disconnect connector from VDCCM. 2) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 3) Connect connector to VDCCM. 4) Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 76 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Replace harness between VDCH/U and VDCCM. | Go to step 3. |
| 3 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in VDCCM connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 4 | CHECK POWER SUPPLY OF PRESSURE SENSOR. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector terminals. Connector & terminal (F91) No. 16 (+) — No. 15 (-): | Is the voltage between 4.75 and 5.25 V? | Go to step 7. | Go to step 5. |
| 5 | CHECK POWER SUPPLY OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 78 (+) — No. 76 (-): | Is the voltage between 4.75 and 5.25 V? | Repair harness between VDCH/U and VDCCM. | Go to step 6. |
| 6 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in VDCCM connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 7 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 8. | Repair harness between VDCH/U and VDCCM. |
| 8 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 9. | Repair harness between VDCH/U and VDCCM. |
| 9 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 10. | Repair harness between VDCH/U and VDCCM. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 10 | CHECK INPUT VOLTAGE OF PRESSURE SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Connect all connectors. 6) Turn ignition switch to ON. 7) Do not depress brake pedal. 8) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 77 (+) — No. 76 (-): | Is the voltage between 0.53 and 0.67 V? | Go to step 11. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 11 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector between VDCCM and pressure sensor? | Repair connector. | Go to step 12. |
| 12 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

BD: TROUBLE CODE 74 VOLTAGE INPUTTED TO PRESSURE SENSOR 2 EXCEEDS SPECIFICATION. (SECONDARY PRESSURE SENSOR)

S005504E13

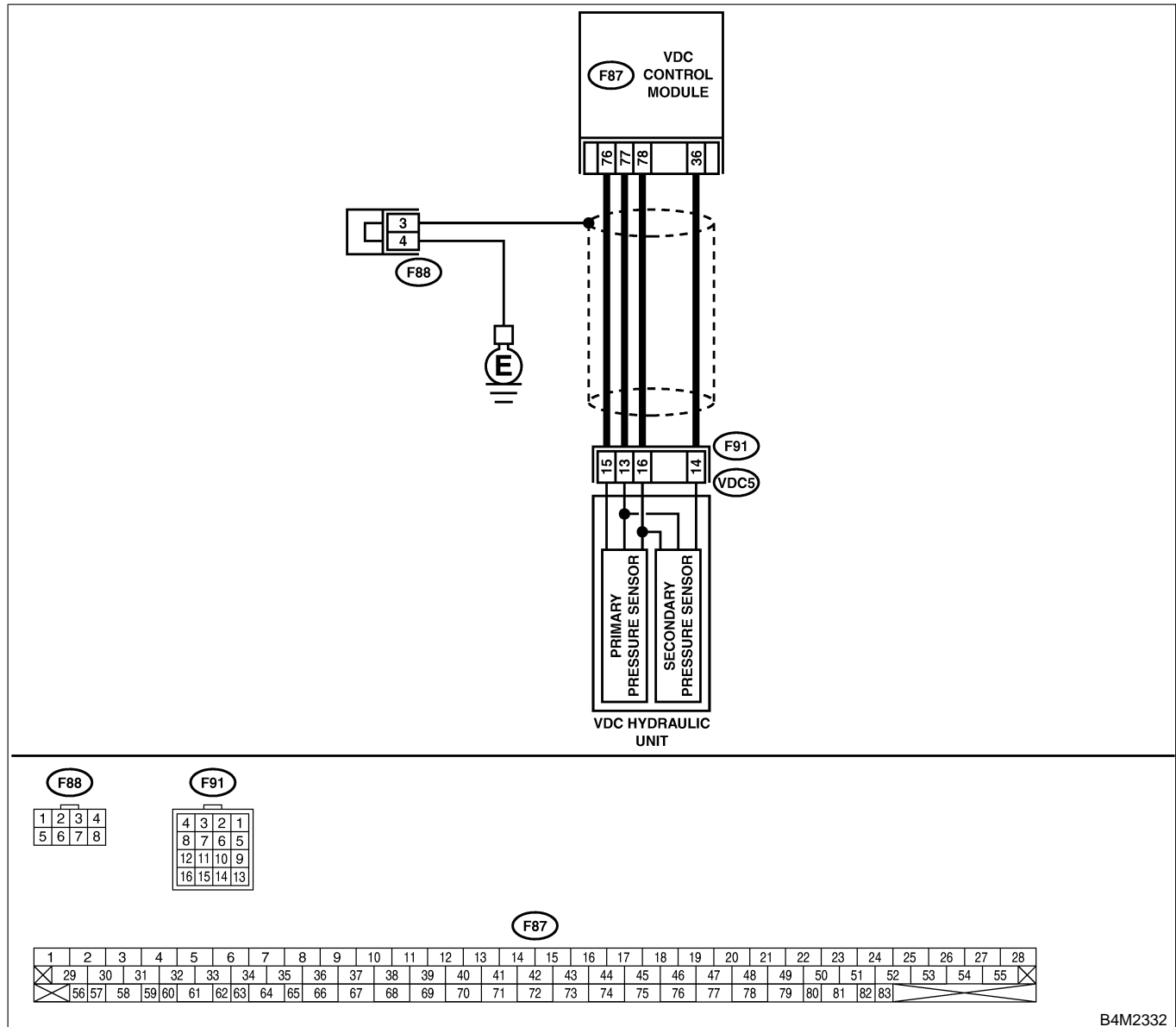
DIAGNOSIS:

- Faulty secondary pressure sensor

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



VDC-242

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 1 | CHECK GROUND CIRCUIT OF PRESSURE SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector (F91) from VDCH/U. 3) Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 15 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Go to step 4. | Go to step 2. |
| 2 | CHECK GROUND CIRCUIT OF VDCCM. 1) Disconnect connector from VDCCM. 2) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 3) Connect connector to VDCCM. 4) Measure resistance between VDCCM and chassis ground. Connector & terminal (F87) No. 76 — Chassis ground: | Is the resistance less than 0.5 Ω ? | Replace harness between VDCH/U and VDCCM. | Go to step 3. |
| 3 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in VDCCM connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 4 | CHECK POWER SUPPLY OF PRESSURE SENSOR. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector terminals. Connector & terminal (F91) No. 16 (+) — No. 15 (-): | Is the voltage between 4.75 and 5.25 V? | Go to step 7. | Go to step 5. |
| 5 | CHECK POWER SUPPLY OF VDCCM. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Turn ignition switch to ON. 6) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 78 (+) — No. 76 (-): | Is the voltage between 4.75 and 5.25 V? | Repair harness between VDCH/U and VDCCM. | Go to step 6. |
| 6 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in VDCCM connector? | Repair or replace VDCCM connector. | Replace VDCCM. |
| 7 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 14 — Chassis ground: | Is the resistance more than 1 M Ω ? | Go to step 8. | Repair harness between VDCH/U and VDCCM. |
| 8 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 14 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 9. | Repair harness between VDCH/U and VDCCM. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|--|--|---|--|
| 9 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 (+) — Chassis ground (-): (F91) No. 14 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 10. | Repair harness between VDCH/U and VDCCM. |
| 10 | CHECK INPUT VOLTAGE OF PRESSURE SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Connect all connectors. 6) Turn ignition switch to ON. 7) Do not depress brake pedal. 8) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 36 (+) — No. 76 (-): | Is the voltage between 0.53 and 0.67 V? | Go to step 11. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 11 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector between VDCCM and pressure sensor? | Repair connector. | Go to step 12. |
| 12 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

MEMO:

VDC-245

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

BE: TROUBLE CODE 74 PRESSURE SENSOR 1 OFFSET IS TOO BIG. (PRIMARY PRESSURE SENSOR) S005504E10

NOTE:

For diagnostic procedure, refer to TROUBLE CODE 74. <Ref. VDC-246 TROUBLE CODE 74 PRESSURE SENSOR 2 OFFSET IS TOO BIG. (SECONDARY PRESSURE SENSOR), Diagnostics Chart with Select Monitor.>

BF: TROUBLE CODE 74 PRESSURE SENSOR 2 OFFSET IS TOO BIG. (SECONDARY PRESSURE SENSOR) S005504E11

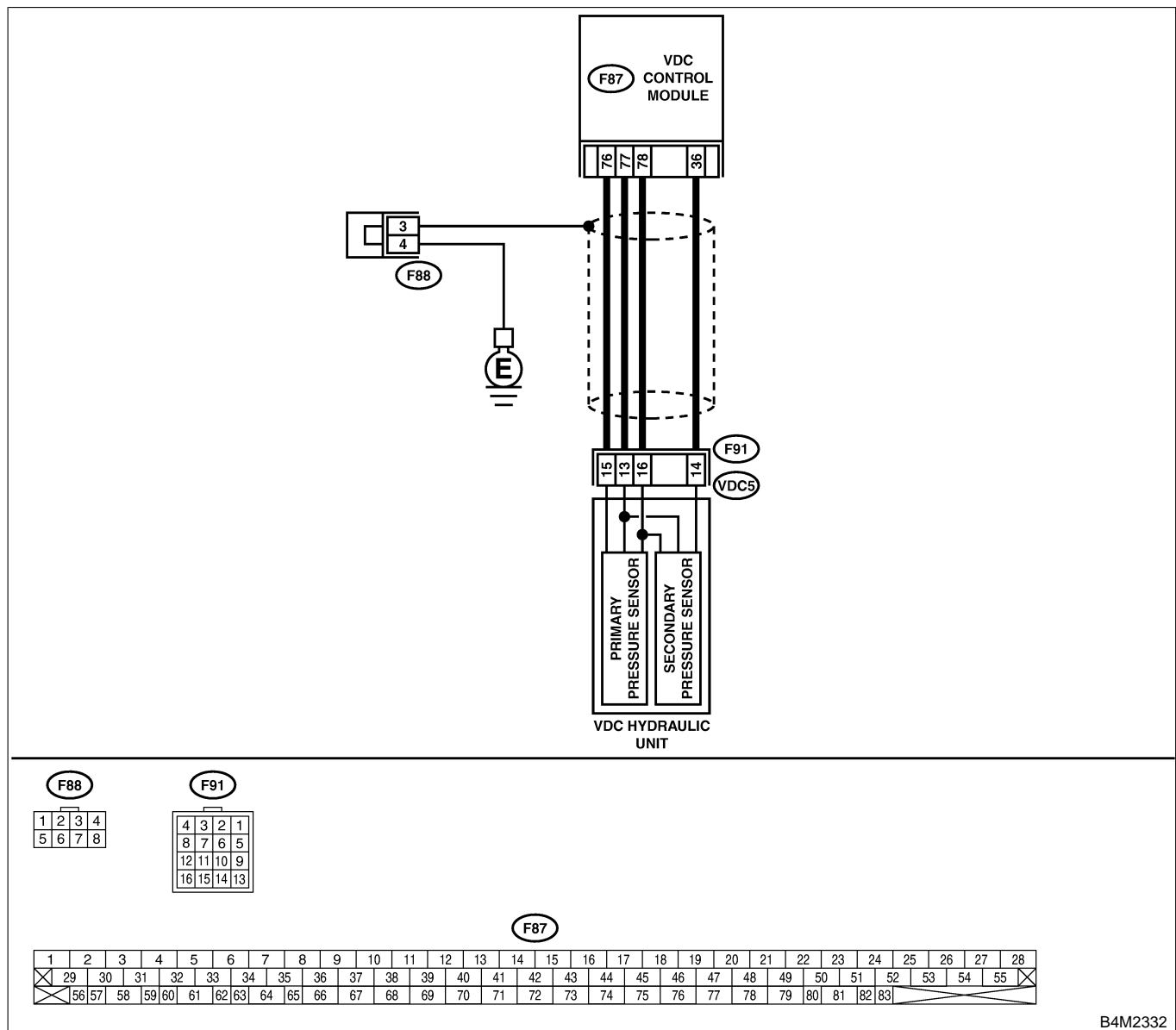
DIAGNOSIS:

- Faulty pressure sensor

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



B4M2332

VDC-246

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---|---|--|
| 1 | CHECK DRIVING TECHNIC. Check the driver's technic. | Are the accelerator and brake pedals depressed simultaneously while driving? | The VDC is normal. Erase the trouble code. NOTE: Driving the vehicle with both the accelerator pedal and brake pedal depressed may store a trouble code in the memory. | Go to step 2. |
| 2 | CHECK OUTPUT OF PRESSURE SENSOR USING SELECT MONITOR. 1) Select "Current data display & Save" on the select monitor. 2) Read pressure sensor output on the select monitor display. | Is the pressure sensor output on monitor display 0.6 ± 0.075 V with brake pedal released? | Go to step 3. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 3 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | 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. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

BG: TROUBLE CODE 74 DIFFERENTIAL PRESSURE OF PRESSURE SENSOR IS TOO BIG. S005504E09

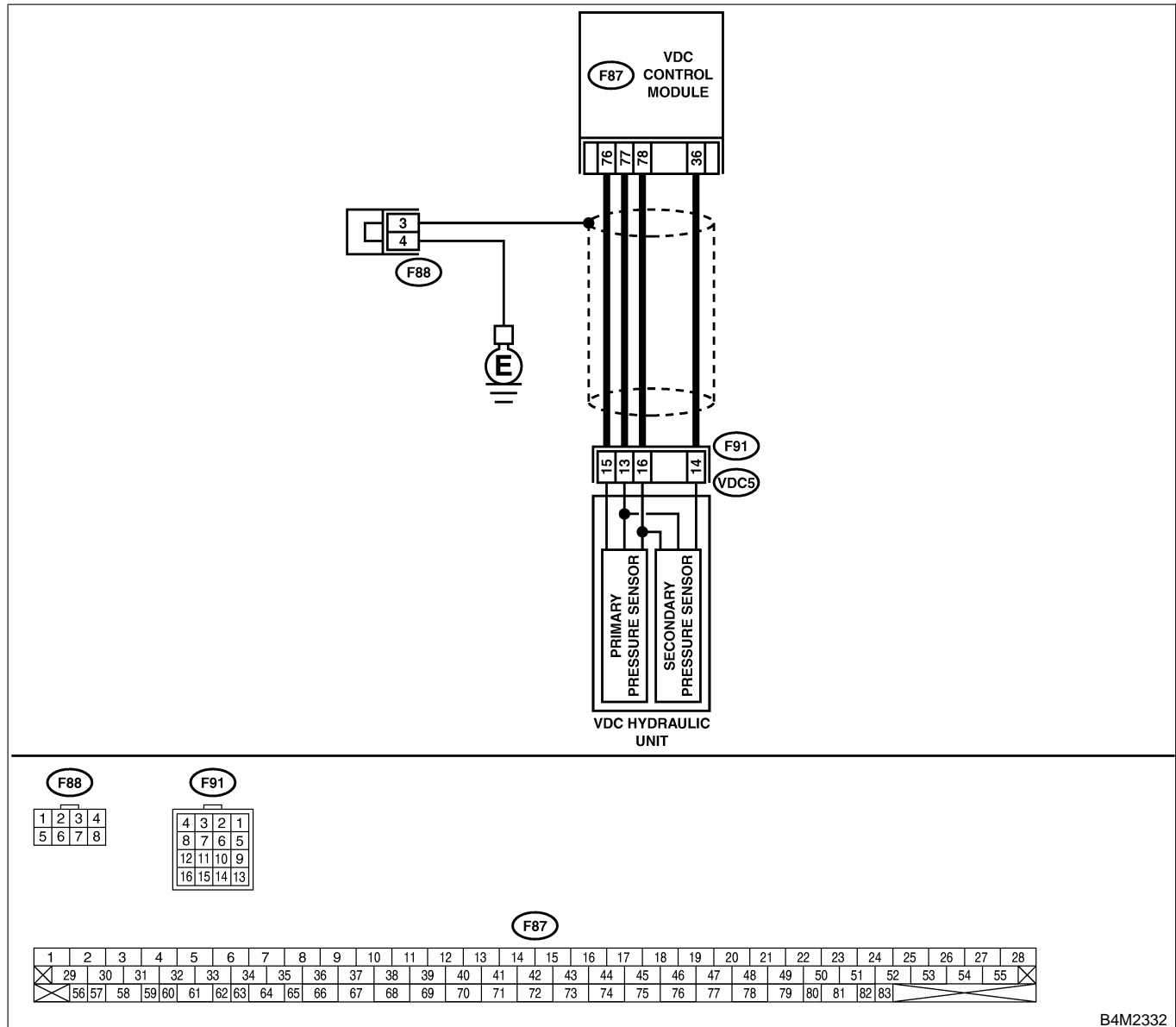
DIAGNOSIS:

- Faulty pressure sensor

TROUBLE SYMPTOM:

- ABS does not operate.
- VDC does not operate.

WIRING DIAGRAM:



VDC-248

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|--|---|--|
| 1 | CHECK GROUND SHORT OF HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Disconnect connector (F91) from VDCH/U. 4) Measure resistance between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 — Chassis ground: (F91) No. 14 — Chassis ground: | Is the resistance more than 1 MΩ? | Go to step 2. | Repair harness between VDCH/U and VDCCM. |
| 2 | CHECK BATTERY SHORT OF HARNESS. Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 (+) — Chassis ground (-): (F91) No. 14 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 3. | Repair harness between VDCH/U and VDCCM. |
| 3 | CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between VDCH/U connector and chassis ground. Connector & terminal (F91) No. 13 (+) — Chassis ground (-): (F91) No. 14 (+) — Chassis ground (-): | Is the voltage less than 0.5 V? | Go to step 4. | Repair harness between VDCH/U and VDCCM. |
| 4 | CHECK INPUT VOLTAGE OF PRESSURE SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from VDCCM. 3) Remove cover from VDCCM. <Ref. to VDC-17 VDCCM Connector Cover.> 4) Connect connector to VDCCM. 5) Connect all connectors. 6) Turn ignition switch to ON. 7) Do not depress brake pedal. 8) Measure voltage between VDCCM connector terminals. Connector & terminal (F87) No. 77 (+) — No. 76 (-): (F87) No. 36 (+) — No. 76 (-): | Is the voltage between 0.53 and 0.67 V? | Go to step 5. | Replace VDCH/U. <Ref. to VDC-13 Hydraulic Control Unit (H/U).> |
| 5 | CHECK BRAKE PEDAL STROKE. Measure the stroke between non-forced pedal position and forced pedal position with 50 kg (110 lb). | Is the stroke less than 95 mm (3.74 in)? | Go to step 6. | Perform bleeding from brake system. |
| 6 | CHECK INPUT VOLTAGE OF PRESSURE SENSOR. 1) Depress the brake pedal with 50 kg (110 lb). 2) Measure voltage between VDCCM connector terminals. Connector & terminal A (F87) No. 77 (+) — No. 76 (-): B (F87) No. 36 (+) — No. 76 (-): | Is the voltage between A and B less than 0.2 V? | Go to step 7. | Replace VDCH/U. |
| 7 | CHECK POOR CONTACT IN CONNECTORS. | Is there poor contact in connector between VDCCM and pressure sensor? | Repair connector. | Go to step 8. |
| 8 | CHECK VDCCM. 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 VDCCM. <Ref. to VDC-10 VDC Control Module (VDCCM).> | Go to step 9. |

DIAGNOSTICS CHART WITH SELECT MONITOR

VDC (DIAGNOSTICS)

| No. | Step | Check | Yes | No |
|-----|---|---------------------------------------|---|---------------------------|
| 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. |

16. General Diagnostic Table S005257

A: INSPECTION S005257A10

| Symptom | | Primary probable cause | Secondary probable cause |
|----------------------------|----------------------------|---|--|
| Poor braking effectiveness | Long braking distance | VDCH/U VDCCM Brake pads Air in brake line Tire specifications, wear and pressures Incorrect wiring or piping | Faulty ABS sensor or sensor gap Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation Proportioning valve Master cylinder Brake caliper Disc rotor Brake pipe Brake booster |
| | Wheel locks | VDCH/U VDCCM Faulty ABS sensor or sensor gap Incorrect wiring or piping | Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation Proportioning valve Brake caliper Brake pipe |
| | Brake dragging | VDCH/U VDCCM Faulty ABS sensor or sensor gap Master cylinder Brake caliper Parking brake Axle & wheels Brake pedal play | Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation Brake pads Brake pipe |
| | Long brake pedal stroke | Air in brake line Brake pedal play | VDCH/U Proportioning valve Master cylinder Brake caliper Brake pads Brake pipe Brake booster |
| | Vehicle pitching | VDCH/U VDCCM Uneven road Suspension play or fatigue (reduced damping) Incorrect wiring or piping | Faulty ABS sensor or sensor gap Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation |
| | Unstable or uneven braking | VDCH/U VDCCM Faulty ABS sensor or sensor gap Brake caliper Brake pads Uneven road Tire specifications, wear and pressures Incorrect wiring or piping | Faulty ABS sensor or sensor gap Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation Master cylinder Disc rotor Brake pipe Axle & wheels Crowned road or banked road Suspension play or fatigue (reduced damping) |

GENERAL DIAGNOSTIC TABLE

VDC (DIAGNOSTICS)

| Symptom | Primary probable cause | Secondary probable cause |
|---|---|--|
| Vibration and/or noise <ul style="list-style-type: none"> • During abrupt braking • During rapid acceleration • During slippery road driving | Excessive brake pedal vibration | Uneven road Incorrect wiring or piping VDCH/U Proportioning valve Brake booster Suspension play or fatigue (reduced damping) |
| | Noise from VDCH/U | VDCH/U (mount bushing) Faulty ABS sensor or sensor gap Brake pipe VDCCM Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation |
| | Noise from front of vehicle | VDCH/U (mount bushing) Faulty ABS sensor or sensor gap Master cylinder Brake caliper Brake pads Disc rotor Brake pipe Brake booster Suspension play or fatigue (reduced damping) Axle & wheels Tire specifications, wear and pressures |
| | Noise inside passenger compartment | VDCCM Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation |
| | Noise from rear of vehicle | Faulty ABS sensor or sensor gap Brake caliper Brake pads Disc rotor Parking brake Brake pipe Suspension play or fatigue (reduced damping) Axle & wheels Tire specifications, wear and pressures |
| Engine does not accelerate or engine stalls during rapid acceleration or on slippery roads. | VDCH/U VDCCM Faulty ABS sensor or sensor gap Master cylinder Brake caliper Parking brake Incorrect wiring or piping | Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation Brake pads Brake pipe |

GENERAL DIAGNOSTIC TABLE

VDC (DIAGNOSTICS)

| Symptom | | Primary probable cause | Secondary probable cause |
|--|---|---|---|
| Poor TCS's directional operation stability | Deviation in either left or right direction | VDCH/U VDCCM Faulty ABS sensor or sensor gap Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation Brake caliper Brake pads Wheel alignment Uneven road Crowned road or banked road Tire specifications, wear and pressures Incorrect wiring or piping | Proportioning valve Disc rotor Brake pipe Axle & wheels Suspension play or fatigue (reduced damping) |
| | Vehicle spin | VDCH/U VDCCM Faulty ABS sensor or sensor gap Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation Brake pads Tire specifications, wear and pressures Incorrect wiring or piping | Proportioning valve Brake caliper Brake pipe |
| Steering wheel drags during operation. | | VDCH/U VDCCM Faulty ABS sensor or sensor gap Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation Incorrect wiring or piping connections Power steering system | Brake caliper Brake pads Disc rotor Wheel alignment Uneven road Crowned road or banked road Suspension play or fatigue (reduced damping) Tire specifications, wear and pressures |
| VDC activates during ordinary driving. | | VDCH/U VDCCM Faulty ABS sensor or sensor gap Faulty steering angle sensor or improper neutral position Faulty yaw rate and lateral G sensor or improper installation Wheel alignment Uneven road Crowned road or banked road Suspension play or fatigue (reduced damping) Tire specifications, wear and pressures Incorrect wiring or piping Power steering system | |

GENERAL DIAGNOSTIC TABLE

VDC (DIAGNOSTICS)

MEMO:

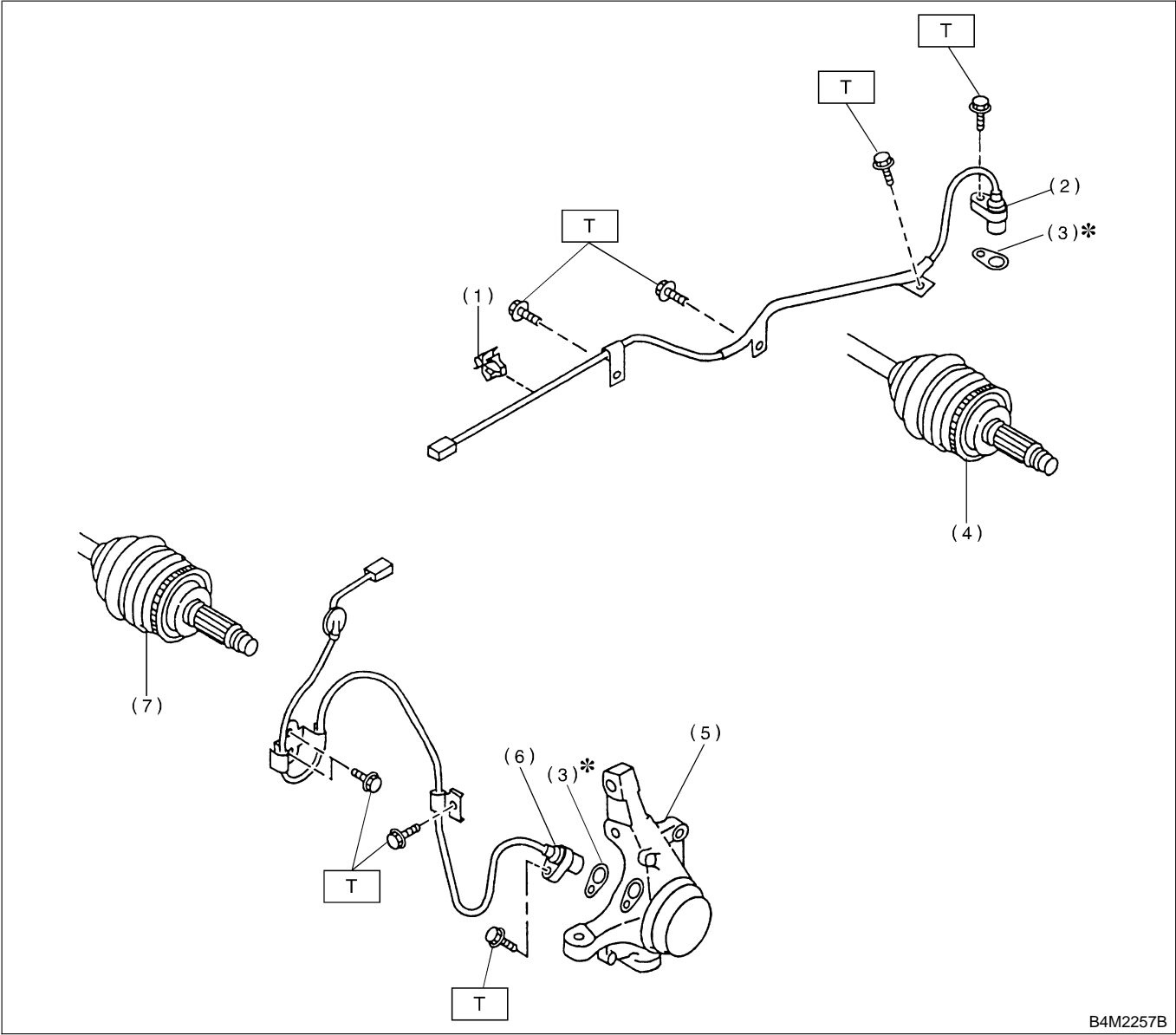
1. General Description S402001

A: SPECIFICATIONS S402001E49

| Item | | | Standard or remarks |
|----------------------------------|--------------------------|----------|-------------------------------------|
| ABS sensor | ABS sensor gap | Front | 0.3 — 0.8 mm (0.012 — 0.031 in) |
| | | Rear | 0.44 — 0.94 mm (0.0173 — 0.0370 in) |
| | ABS sensor resistance | | 1.25±0.25 kΩ |
| | Marks of the harness | Front LH | Brown |
| | | Front RH | Light blue |
| | | Rear LH | Yellow |
| | | Rear RH | White |
| Yaw rate and lateral G sensor | Lateral G sensor voltage | | 2.5±0.2 V |
| VDC hydraulic control unit marks | | | D2 |
| VDC control module marks | | | E1 |

B: COMPONENT S402001A05

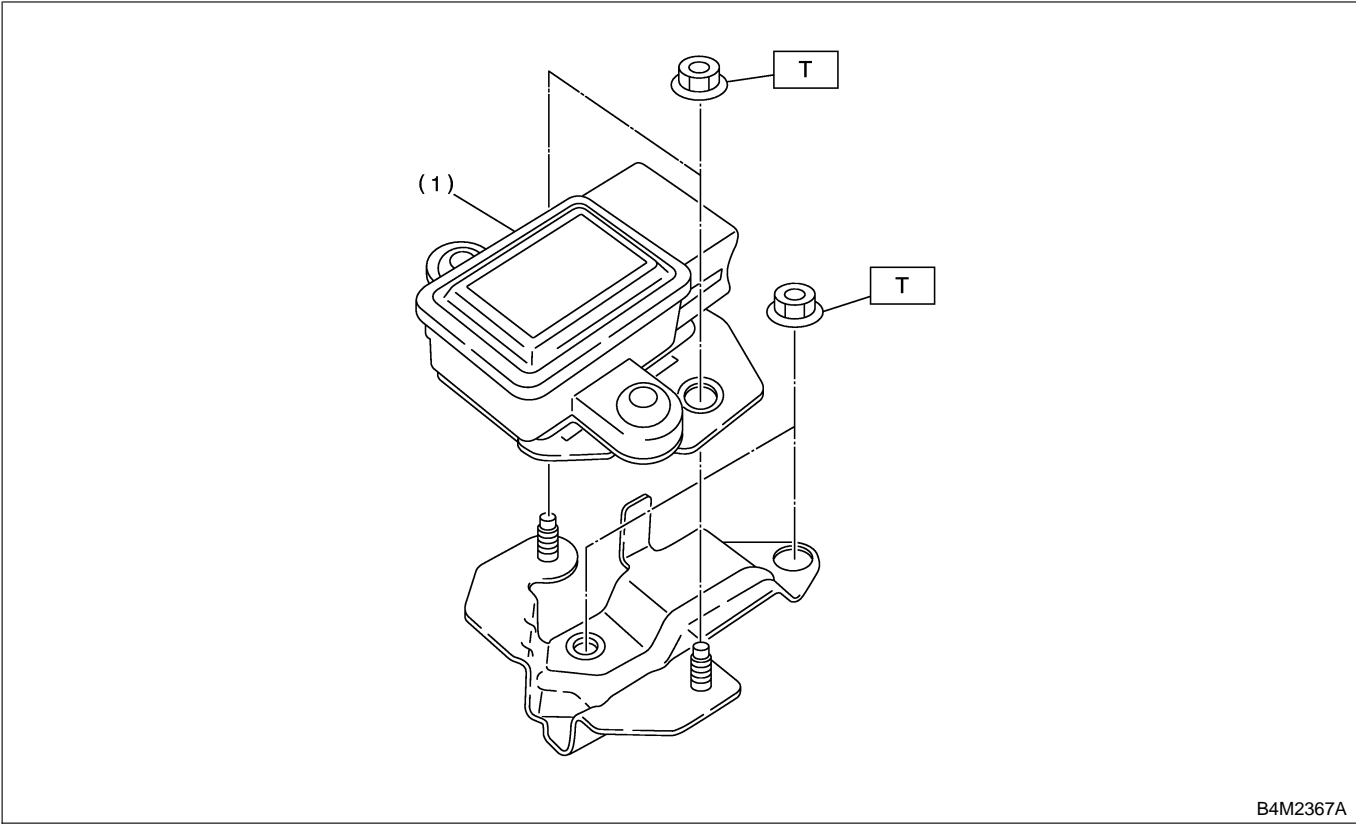
1. ABS SENSOR S402001A0501



- | | |
|-----------------------|------------------------|
| (1) Clip | (5) Housing |
| (2) Rear ABS sensor | (6) Front ABS sensor |
| (3) ABS spacer | (7) Tone wheel (Front) |
| (4) Tone wheel (Rear) | |

Tightening torque: N·m (kgf·m, ft·lb)
T: 32 (3.3, 24)

2. YAW RATE AND LATERAL G SENSOR S402001A0507

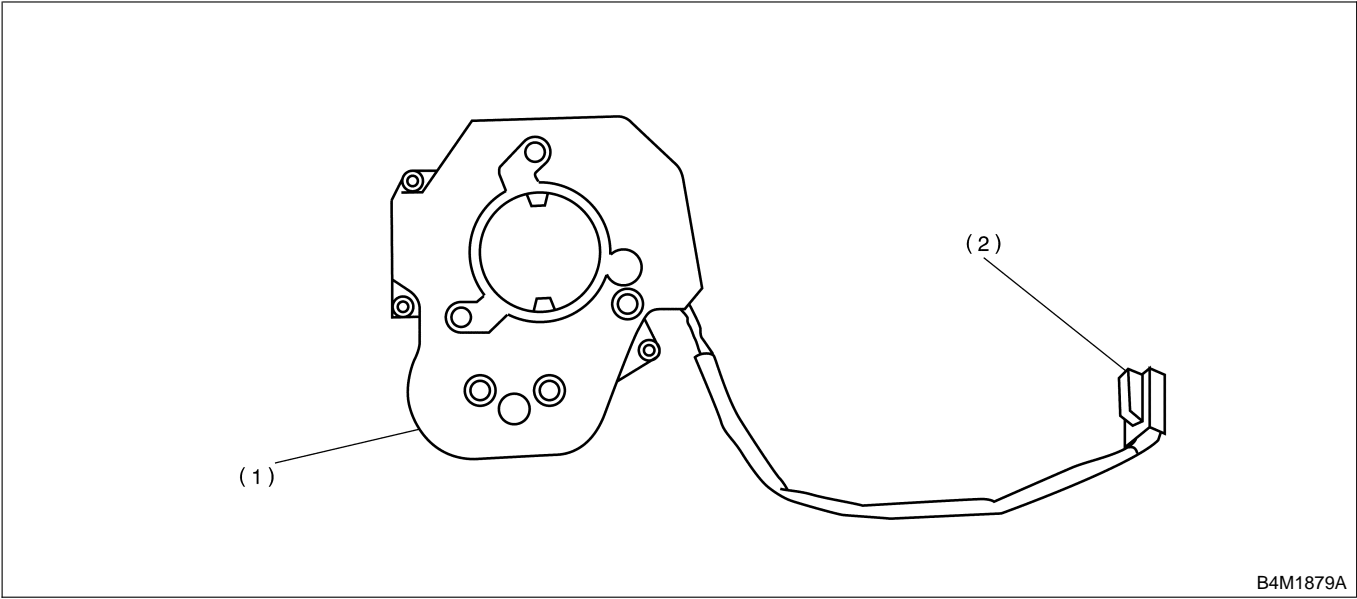


B4M2367A

(1) Yaw rate and lateral G sensor

Tightening torque: N·m (kgf-m, ft-lb)
T: 7.5 (0.76, 5.5)

3. STEERING ANGLE SENSOR S402001A0504

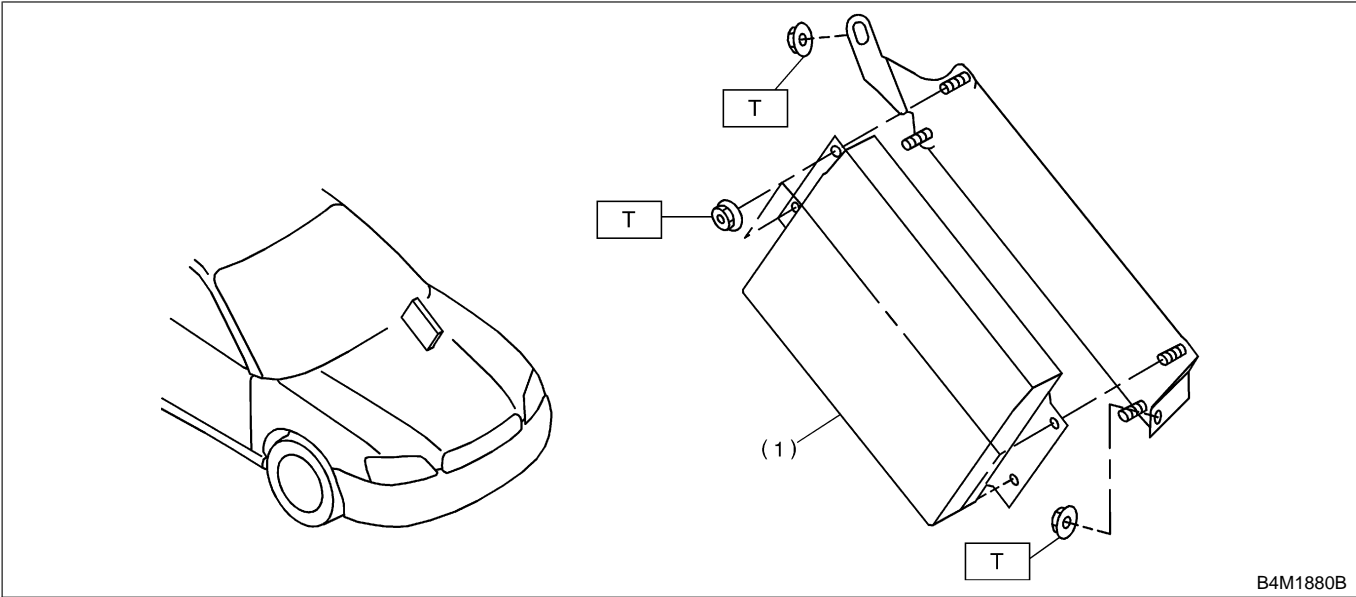


(1) Steering angle sensor

(2) Connector

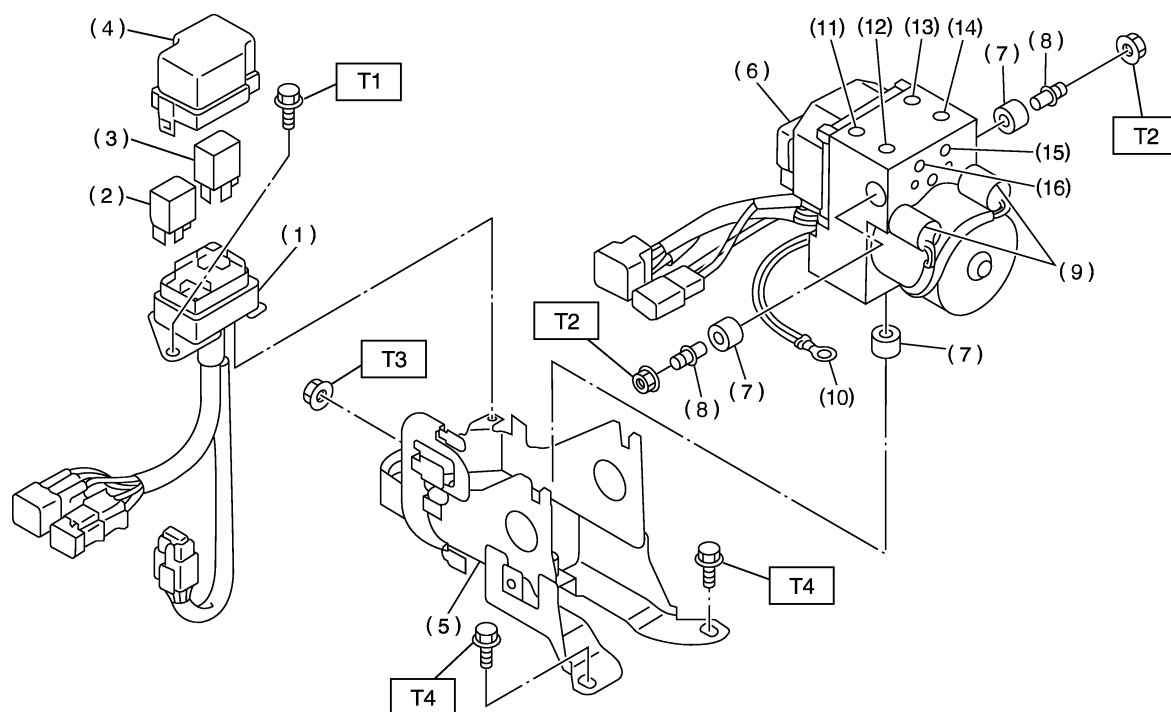
B4M1879A

4. VDC CONTROL MODULE (VDCCM) S402001A0505



(1) VDC control module

Tightening torque: N·m (kgf-m, ft-lb)
T: 7.5 (0.76, 5.5)

5. HYDRAULIC CONTROL UNIT (H/U) S402001A0506

B4M2461A

- | | |
|----------------------------|----------------------|
| (1) Relay box | (9) Pressure sensor |
| (2) Motor relay | (10) Ground terminal |
| (3) Valve relay | (11) Front-LH outlet |
| (4) Cap | (12) Secondary inlet |
| (5) Bracket | (13) Front-RH outlet |
| (6) Hydraulic control unit | (14) Primary inlet |
| (7) Damper | (15) Rear-LH outlet |
| (8) Stud bolt | (16) Rear-RH outlet |

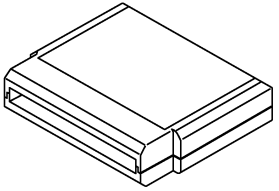

Tightening torque: N·m (kgf-m, ft-lb)**T1: 13 (1.3, 9.4)****T2: 18 (1.8, 13.0)****T3: 30 (3.1, 22.4)****T4: 33 (3.4, 24.6)**

C: CAUTION

S402001A03

- 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.
- 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.

D: PREPARATION TOOL S402001A17**1. SPECIAL TOOLS** S402001A1701

| ILLUSTRATION | TOOL NUMBER | DESCRIPTION | REMARKS |
|--|-------------|--------------------|--|
|  B2M3876 | 24082AA150 | CARTRIDGE | Troubleshooting for electrical systems. |
|  B2M3877 | 22771AA030 | SELECT MONITOR KIT | Troubleshooting for electrical systems. <ul style="list-style-type: none"> English: 22771AA030 (Without printer) German: 22771AA070 (Without printer) French: 22771AA080 (Without printer) Spanish: 22771AA090 (Without printer) |

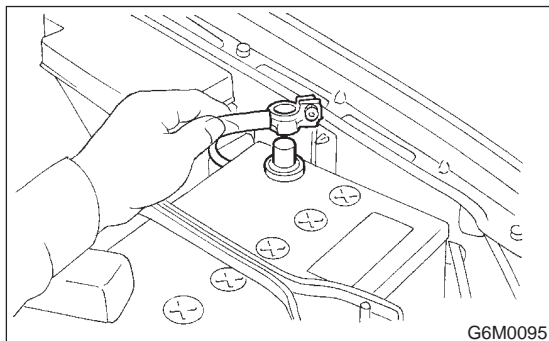
2. GENERAL PURPOSE TOOLS S402001A1702

| TOOL NAME | REMARKS |
|----------------|--|
| Circuit tester | Used for measuring resistance, voltage and ampere. |
| Pressure gauge | Used for measuring oil pressure. |
| Oscilloscope | Used for measuring sensor. |

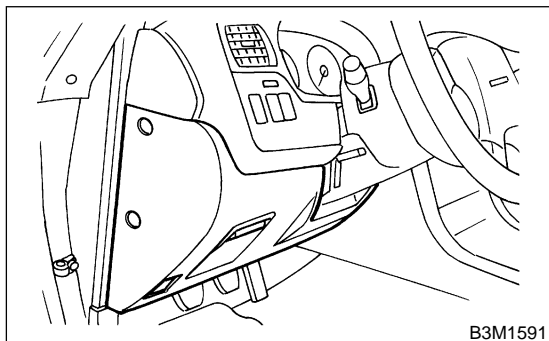
2. VDC Control Module (VDCCM) S402550

A: REMOVAL S402550A18

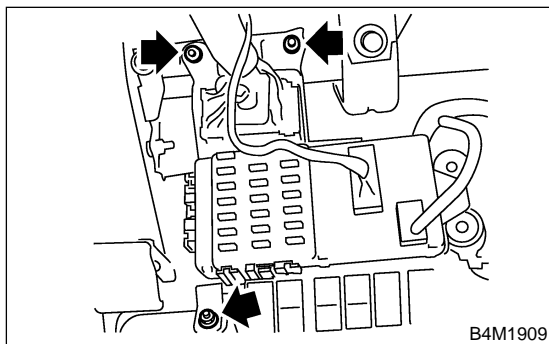
- 1) Disconnect battery ground cable.



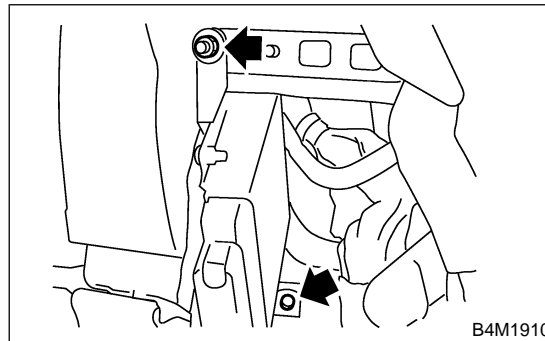
- 2) Remove lower cover of instrument panel and disconnect connectors on the back side of the cover.



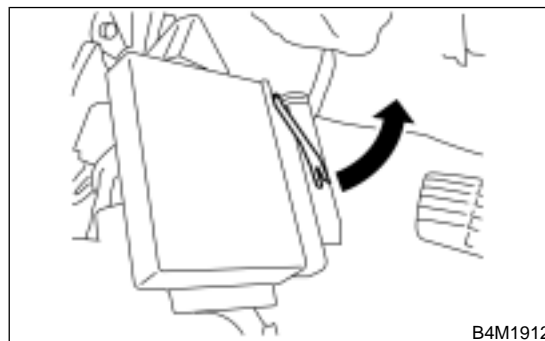
- 3) Remove three bolts which secure the fuse box onto body side, then move the fuse box aside.



- 4) Remove two bolts which install VDCCM onto body side bracket.



- 5) Disconnect connector from VDCCM by pulling up the securing holder.



- 6) Remove VDCCM.

B: INSTALLATION

S402550A11

Install in the reverse order of removal.

CAUTION:

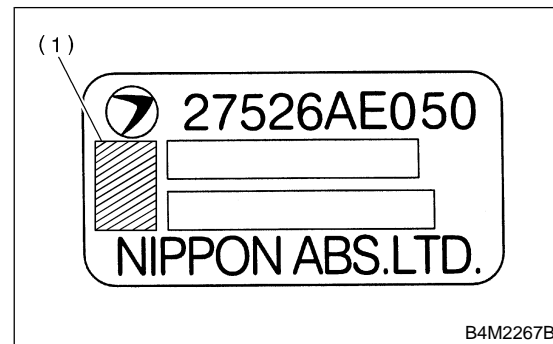
After completion of installation procedure, the following two position settings must be made.

- Steering angle sensor center positioning
 - Yaw rate and lateral G sensor 0 positioning
- These procedures are necessary for VDCCM to later recognize what position the vehicle is in. For procedures for the above two settings, <Ref. to VDC-12 ADJUSTMENT, VDC Control Module (VDCCM).>.

C: INSPECTION

S402550A10

Check the VDCCM identification mark.



(1) Specification mark

| Vehicle specifications | VDCCM identification mark |
|------------------------|---------------------------|
| Six cylinder engine | E1 |

D: ADJUSTMENT S402550A01

Always conduct steering angle sensor center positioning and yaw rate and lateral G sensor 0 positioning whenever you have replaced, removed or installed the following items.

- VDCCM
- Steering angle sensor
- Yaw rate and lateral G sensor
- Steering wheel parts (including airbag)
- Suspension parts
- Adjustment of wheel alignment

1. WITHOUT SUBARU SELECT MONITORS402550A0101

- 1) Park the vehicle in a straight ahead position on a horizontal surface.
- 2) Confirm the steering wheel center position. (If the center position is not accurate, adjust wheel alignment.)
- 3) Drive the vehicle approx. 10 km (6 MPH) preferably on a straight road, then turn ignition switch OFF. Then drive the vehicle approx. 10 km (6 MPH) again confirming that ABS and VDC warning lights do not go ON while vehicle is being driven. Also make sure there are no abnormalities of the VDC function or steering operation.

NOTE:

If it is not possible to drive the vehicle, use SUBARU SELECT MONITOR.

<Ref. to VDC-12 WITH SUBARU SELECT MONITOR, ADJUSTMENT, VDC Control Module (VDCCM).>

- 4) If there are any abnormalities found, conduct the procedure over again.

2. WITH SUBARU SELECT MONITORS402550A0102

- 1) Park the vehicle in a straight ahead position on a horizontal surface. (Engine running in gear position of P or N)
- 2) Confirm the steering wheel center position. (If the center position is not accurate, adjust wheel alignment.)
- 3) Set the SUBARU SELECT MONITOR on the vehicle and select "Set Mode Str.A.Sen.N & Lat.Gsen.0p" in "Function Check Sequence" display menu. (Follow the instructions in the display.)
- 4) Select "Current Data display & Save" in {Brake Control System} display menu and confirm if the steering angle sensor is indicated as "0 deg".
- 5) If the display does not indicate {0 deg}, conduct the procedure over again and make sure it indicates "0 deg".
- 6) Drive the vehicle approx. 10 minutes and confirm that ABS and VDC warning lights do not go ON while vehicle is being driven.

- 7) If there are any abnormalities in VDC function or steering operation found while vehicle is being driven, conduct the procedure over again.

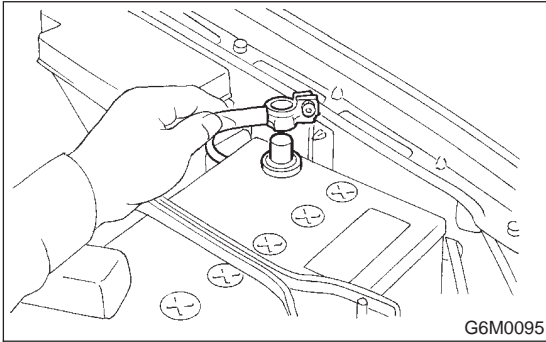
3. Hydraulic Control Unit (H/U)

S402551

A: REMOVAL S402551A18

1. HYDRAULIC UNIT (H/U) S402551A1801

- 1) Disconnect ground cable from battery.



G6M0095

- 2) Remove air intake duct from engine compartment to facilitate removal of hydraulic unit.
- 3) Disconnect connector from hydraulic unit.

CAUTION:

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

- 4) Unlock cable clip.
- 5) Disconnect brake pipes from hydraulic unit.

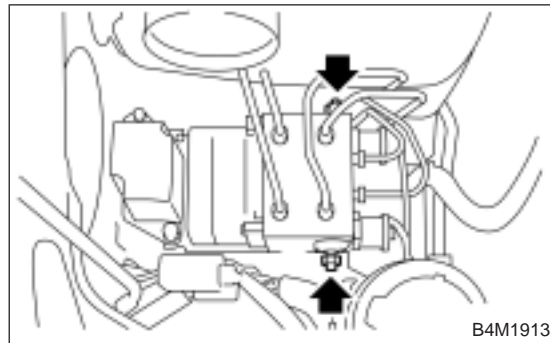
CAUTION:

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

- 6) Remove nuts and bolt which secure hydraulic unit bracket, and remove hydraulic unit from engine compartment.

CAUTION:

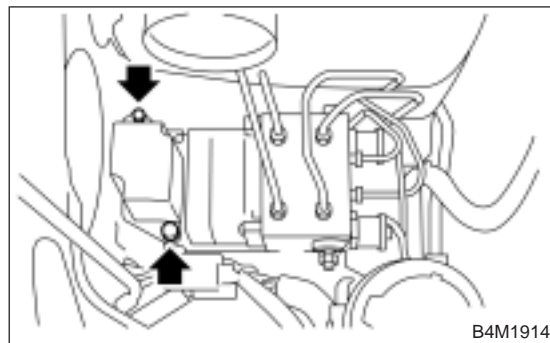
- Hydraulic unit cannot be disassembled. Do not attempt to loosen bolts and nuts.
- Do not drop or bump hydraulic unit.
- Do not turn the hydraulic unit upside down or place it on its side.
- Be careful to prevent foreign particles from getting into hydraulic unit.
- When a new hydraulic unit is installed, apply a coat of rust-preventive wax (Nippeco LT or GB) to bracket attaching bolt after tightening.
- Do not pull harness disconnecting harness connector.



B4M1913

2. RELAY BOX S402551A1802

- 1) Disconnect ground cable from battery.
- 2) Remove air intake duct from engine compartment to facilitate removal of relay box.
- 3) Disconnect connector from relay box.
- 4) Unlock cable clip.
- 5) Remove nuts which secure relay box, and remove relay box and connector bracket.



B4M1914

CAUTION:

Do not drop or bump relay box.

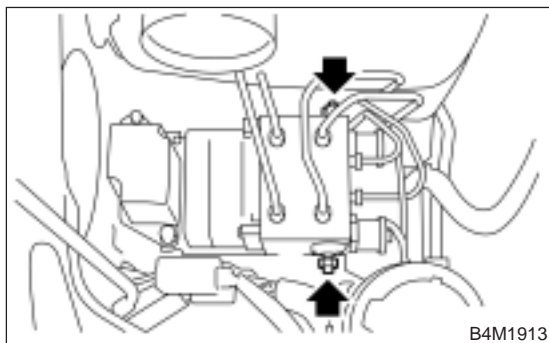
B: INSTALLATION

S402551A11

1. HYDRAULIC UNIT (H/U)

S402551A1101

- 1) Install hydraulic unit.



B4M1913

Tightening torque:

18 N·m (1.8 kgf-m, 13.0 ft-lb)

- 2) Connect hydraulic unit ground cable to body.

Tightening torque:

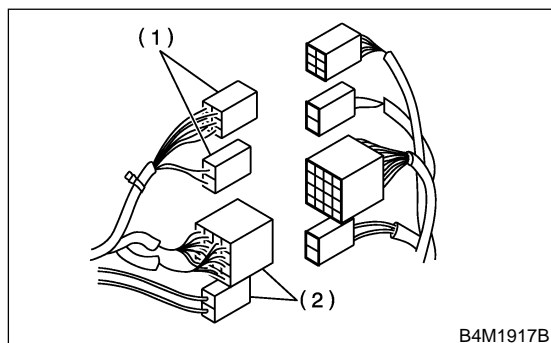
33 N·m (3.4 kgf-m, 25 ft-lb)

- 3) Connect brake pipes to their correct hydraulic unit connections.
- 4) Secure hydraulic unit connector to connector bracket.

CAUTION:

Align connector with mating receptacle.

- 5) Connect connector to hydraulic unit.



B4M1917B

- (1) Relay box connector
- (2) Hydraulic unit connector

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

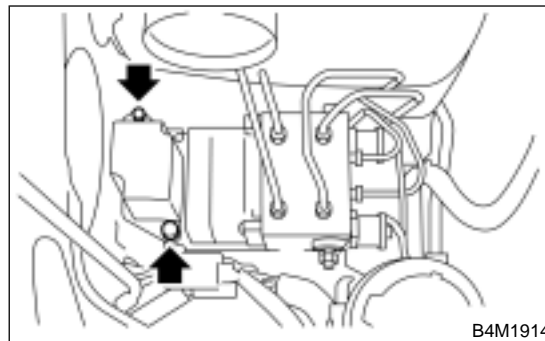
2. RELAY BOX

S402551A1102

- 1) Install relay box and connector bracket.

Tightening torque:

18 N·m (1.8 kgf-m, 13.0 ft-lb)



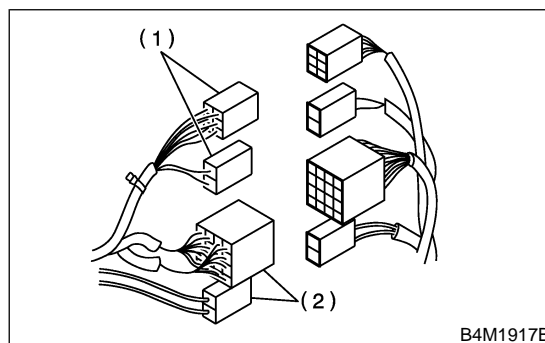
B4M1914

- 2) Secure relay box connector to connector bracket.

CAUTION:

Align connector with mating receptacle.

- 3) Connect connector to relay box.



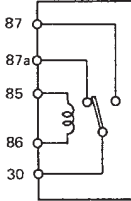
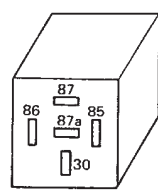
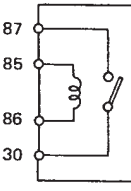
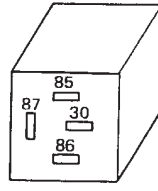
B4M1917B

- (1) Relay box connector
- (2) Hydraulic unit connector

- 4) Install air intake duct.
- 5) Connect ground cable to battery.

C: INSPECTION S402551A10

- 1) Check connected and fixed condition of connector.
- 2) Check valve relay and motor relay for discontinuity or short circuits.

| | Condition | Terminal number | Standard | Diagram | Terminal location |
|-------------|--|-----------------|-----------------|--|---|
| Valve relay | Turning off electricity. | 85 — 86 | 103±10 Ω |  |  |
| | | 30 — 87a | less than 0.5 Ω | | |
| | | 30 — 87 | more than 1 MΩ | | |
| | Turning on electricity between 85 and 86. (DC 12 V) | 30 — 87a | more than 1 MΩ | | |
| | | 30 — 87 | less than 0.5 Ω | | |
| | | | | G4M0456 | G4M0457 |
| Motor relay | Turning off electricity. | 85 — 86 | 80±10 Ω |  |  |
| | | 30 — 87 | more than 1 MΩ | | |
| | Turning on electricity between 85 and 86. (DC 12 V) | 30 — 87 | less than 0.5 Ω | | |
| | | | | | |

1. CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE

S402551A1001

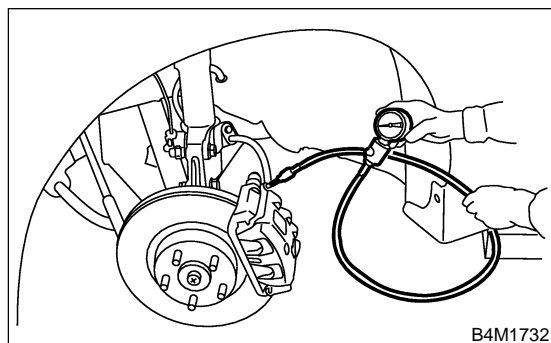
- 1) Lift-up vehicle and remove wheels.
- 2) Disconnect the air bleeder screws from the FL and FR caliper bodies.
- 3) Connect two pressure gauges to the FL and FR caliper bodies.

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 VDC-18 ABS Sequence Control.>

- 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 VDC-18 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

HYDRAULIC CONTROL UNIT (H/U)

VDC

decompression, holding, and compression.

15) Read values indicated on the pressure gauges and check if they meet the standard values.

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.

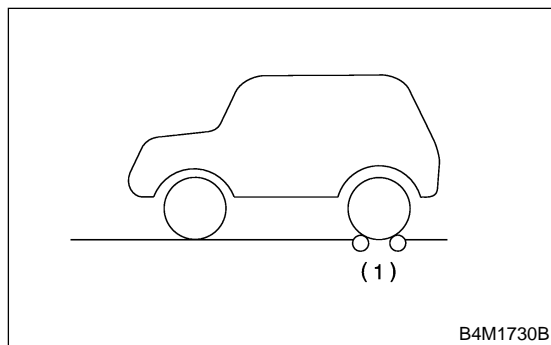
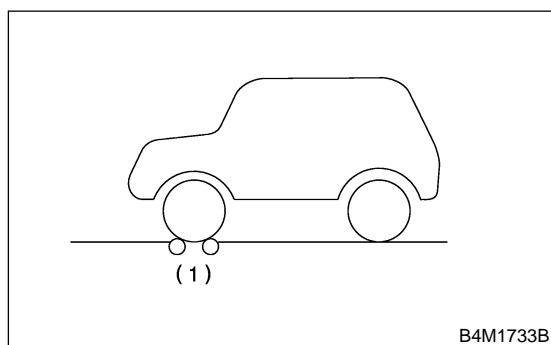
2. CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH BRAKE TESTER

S402551A1002

1) Prepare for operating ABS sequence control.

<Ref. to VDC-18 ABS Sequence Control.>

2) Set the front wheels or rear wheels on the brake tester and set the select lever's position at "neutral".



(1) Brake tester

3) Operate the brake tester.

4) Perform ABS sequence control.

<Ref. to VDC-18 ABS Sequence Control.>

5) When the hydraulic unit begins to work, 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.

6) 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 kg, 221 lb) | 981 N (100 kg, 221 lb) |
| When decompressed | 490 N (50 kg, 110 lb) or less | 490 N (50 kg, 110 lb) or less |
| When compressed | 981 N (100 kg, 221 lb) or more | 981 N (100 kg, 221 lb) or more |

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

3. CHECKING THE HYDRAULIC UNIT VDC OPERATION BY PRESSURE GAUGE

S402551A1003

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.

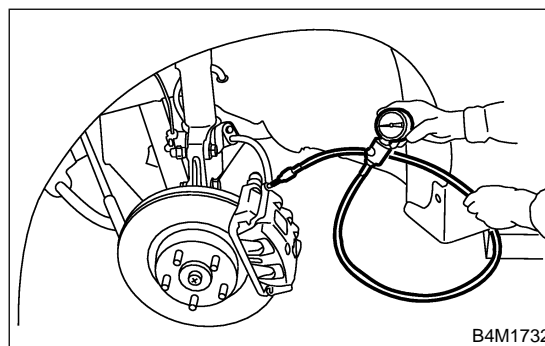
CAUTION:

- 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.

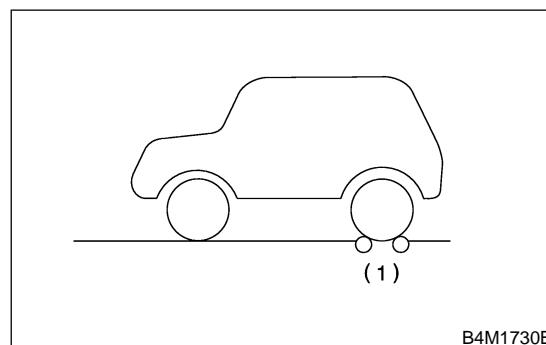
5) Perform VDC sequence control.

<Ref. to VDC-21 VDC Sequence Control.>

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 |
|-------------------|---|---|
| When compressed | 2,942 kPa (30 kg/cm ² , 427 psi) or more | 1,961 kPa (20 kg/cm ² , 284 psi) or more |
| When decompressed | 490 kPa (5 kg/cm ² , 71 psi) or less | 490 kPa (5 kg/cm ² , 71 psi) or less |



(1) Brake tester

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 VDC sequence control.

<Ref. to VDC-21 VDC 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.

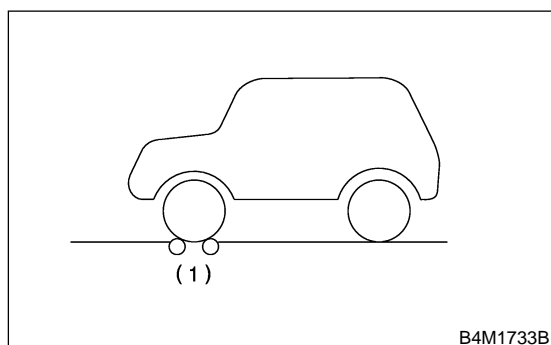
4. CHECKING THE HYDRAULIC UNIT VDC OPERATION WITH BRAKE TESTER

S402551A1004

1) Prepare for operating VDC sequence control.

<Ref. to VDC-21 VDC Sequence Control.>

2) Set the front wheels or rear wheels on the brake tester and set the select lever's position at "neutral".



(1) Brake tester

3) Operate the brake tester.

4) Perform ABS sequence control.

<Ref. to VDC-18 ABS Sequence Control.>

5) When the hydraulic unit begins to work, 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.

6) 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 |
|-------------------|--|--------------------------------------|
| When compressed | 1,961 N (200 kg, 441 lb) or more | 981 N (100 kg, 221 lb) or more |
| When decompressed | 490 N (50 kg, 110 lb) or less | 490 N (50 kg, 110 lb) or less |

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

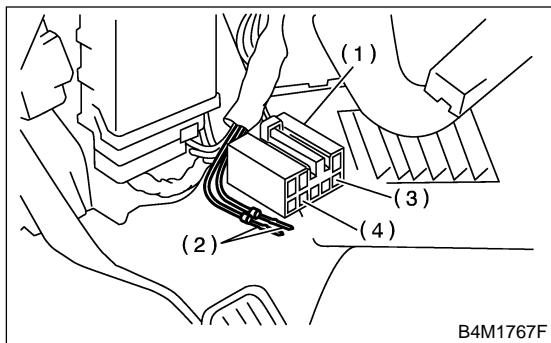
4. ABS Sequence Control S402187

A: OPERATION S402187A16

- 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 S402187A1601

- 1) Connect diagnosis terminals to terminals No. 5 and No. 8 of the diagnosis connector beside driver's seat heater unit.



- (1) Diagnosis connector
- (2) Diagnosis terminal
- (3) 8 terminal
- (4) 5 terminal

- 2) Set the speed of all wheels at 2.75 km/h (2 MPH) or less.
- 3) Turn ignition switch OFF.
- 4) Within 0.5 seconds after the ABS and VDC 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 S402187A1602

NOTE:

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

<Ref. to VDC-18 ABS SEQUENCE CONTROL WITH DIAGNOSIS CONNECTOR, OPERATION, ABS Sequence Control.>

- 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 "BRAKE CONTROL" 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 kg, 221 lb).

- (2) When using the pressure gauge, depress brake pedal so as to make the pressure gauge indicate 3,432 kPa (35 kg/cm², 498 psi).

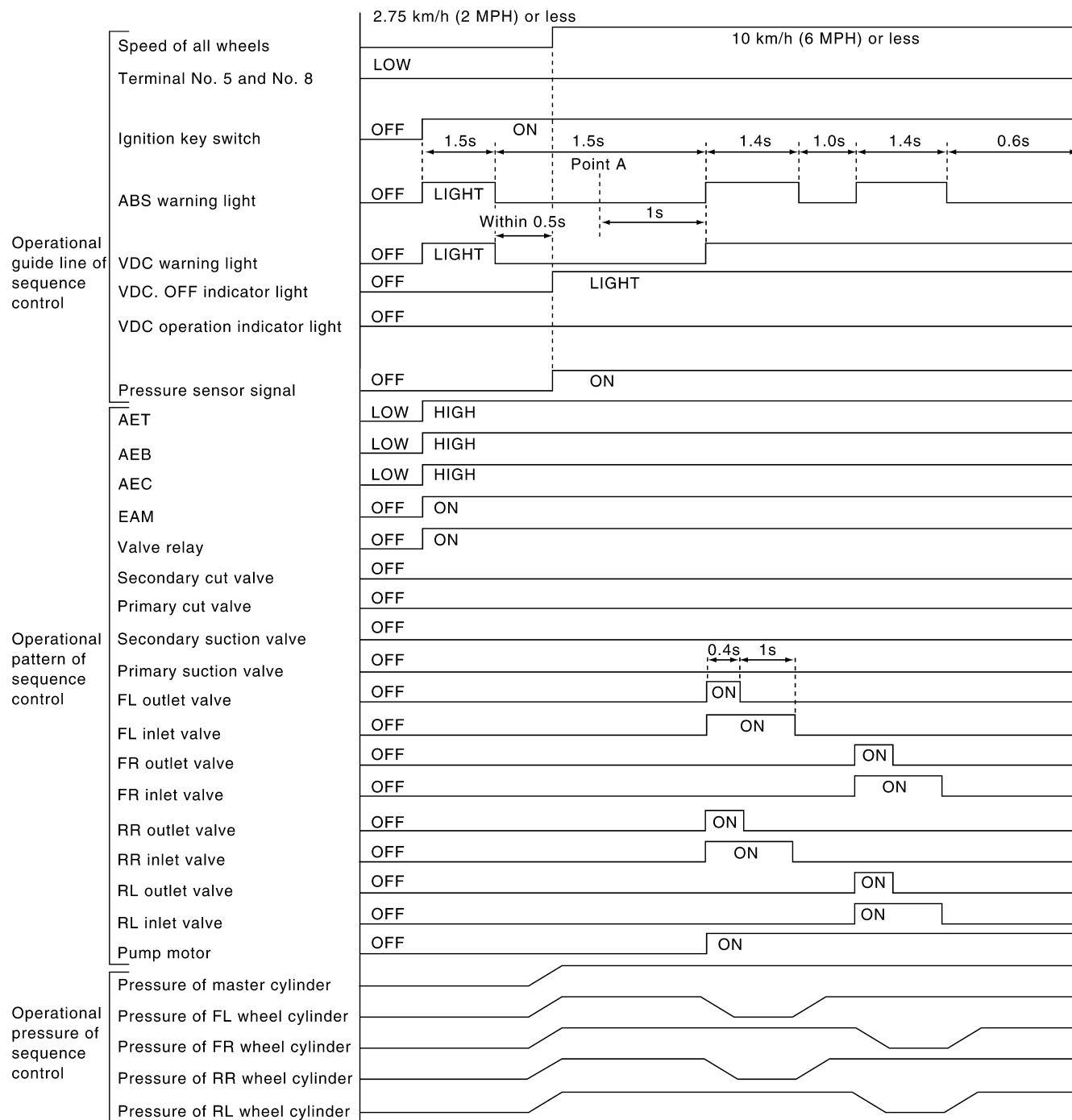
CAUTION:

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.

VDC

3. CONDITIONS FOR ABS SEQUENCE CONTROL S402187A1603



B4M1915A

NOTE:

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

B: SPECIFICATION S402187A22

1. CONDITIONS FOR COMPLETION OF ABS SEQUENCE CONTROL S402187A2201

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. 5 or No. 8 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.)

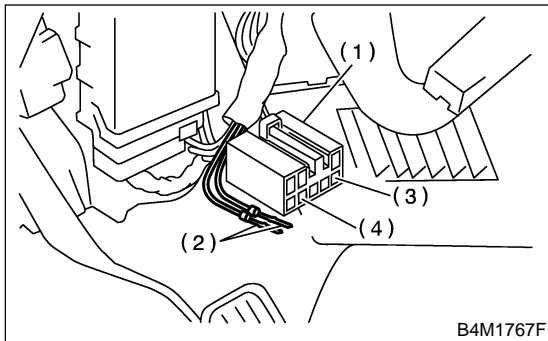
5. VDC Sequence Control S402195

A: OPERATION S402195A16

- 1) Under the VDC 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) VDC sequence control can be started by diagnosis connector or select monitor.

1. VDC SEQUENCE CONTROL WITH DIAGNOSIS CONNECTOR S402195A1601

- 1) Connect diagnosis terminals to terminals No. 5 and No. 8 of the diagnosis connector beside driver's seat heater unit.



- (1) Diagnosis connector
- (2) Diagnosis terminal
- (3) 8 terminal
- (4) 5 terminal

- 2) Set the speed of all wheels at 2.75 km/h (2 MPH) or less.
- 3) Turn ignition switch OFF.
- 4) Turn ignition switch ON and start engine immediately, confirming that ABS and VDC warning light goes ON and then OFF. After ABS and VDC warning light goes OFF, within 0.5 seconds depress the brake pedal once, then within 3 seconds depress the brake pedal twice more and release it.

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 operate.
 - If the VDC sequence control does not start, do the procedure over again.
- 5) After completion of VDC sequence control, turn ignition switch OFF.

2. VDC SEQUENCE CONTROL WITH SELECT MONITOR S402195A1602

NOTE:

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

<Ref. to VDC-21 VDC SEQUENCE CONTROL WITH DIAGNOSIS CONNECTOR, OPERATION, VDC Sequence Control.>

- 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 "BRAKE CONTROL" mode.
- 5) Select "VDC Check Mode" in {Function check sequence} menu to start 'VDC sequence control'.

CAUTION:

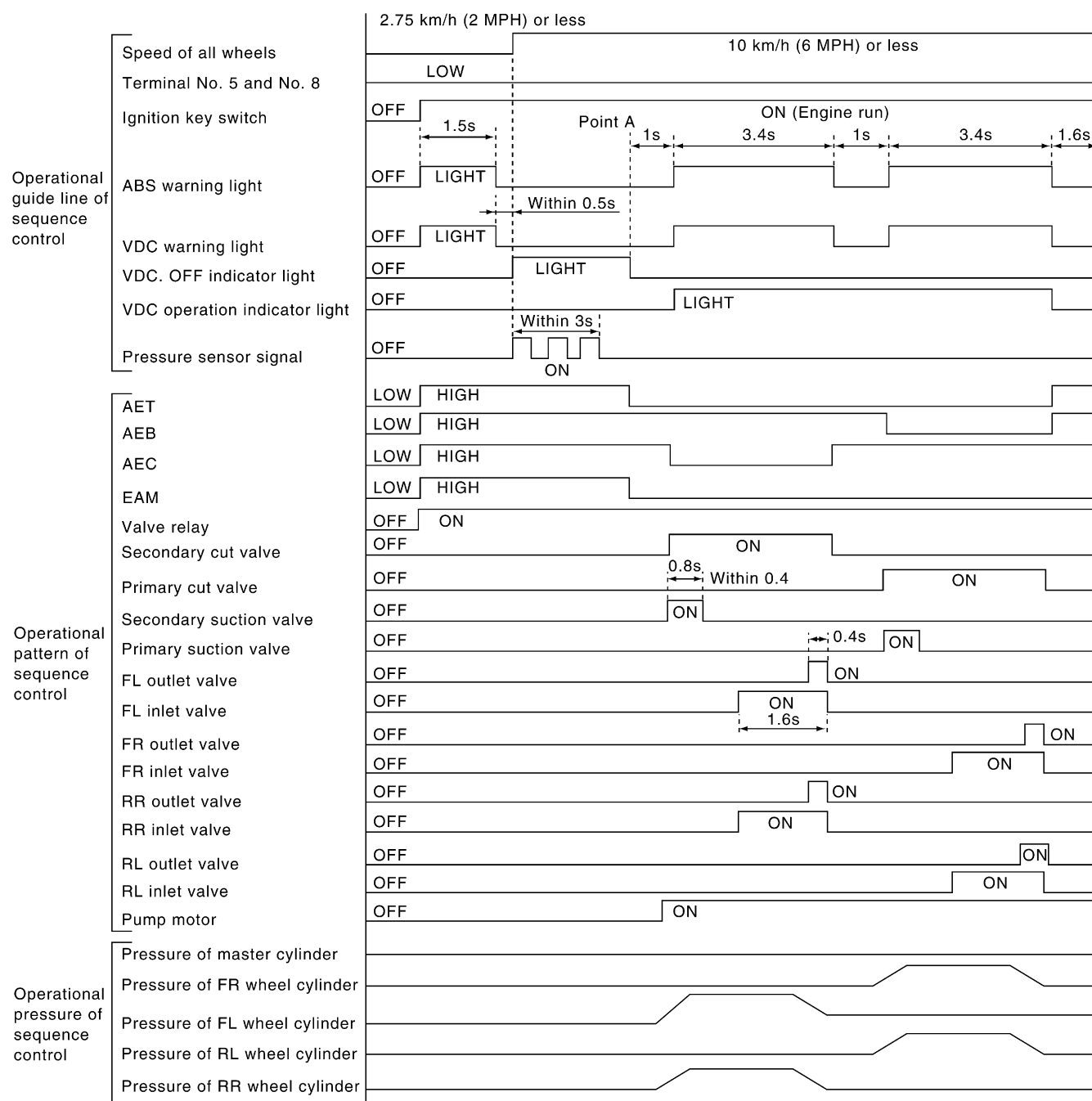
Do not depress the clutch pedal.

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

VDC SEQUENCE CONTROL

VDC

3. CONDITIONS FOR VDC SEQUENCE CONTROL S402195A1603



B4M1916A

NOTE:

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

B: SPECIFICATION S402195A22**1. CONDITIONS FOR COMPLETION OF VDC SEQUENCE CONTROL** S402195A2201

When the following conditions develop, the VDC sequence control stops and VDC 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. 5 or No. 8 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 VDC 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 VDC 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.)

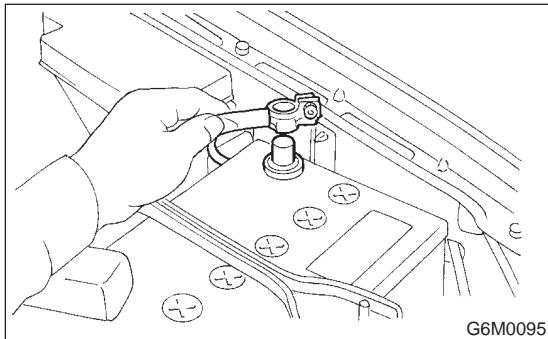
6. Yaw Rate and Lateral G Sensor

S402634

A: REMOVAL

S402634A18

- 1) Disconnect battery ground cable.

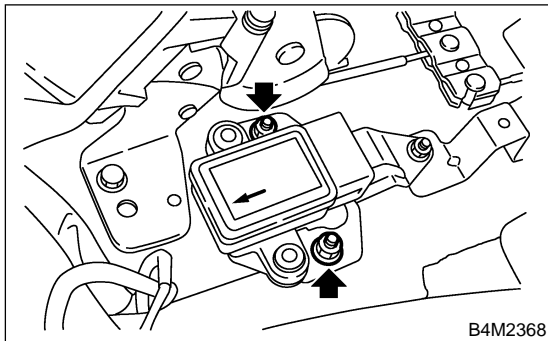


G6M0095

- 2) Remove console cover.
<Ref. to EI-36 Console Box.>
- 3) Disconnect connector from yaw rate and lateral G sensor.
- 4) Remove yaw rate and lateral G sensor.

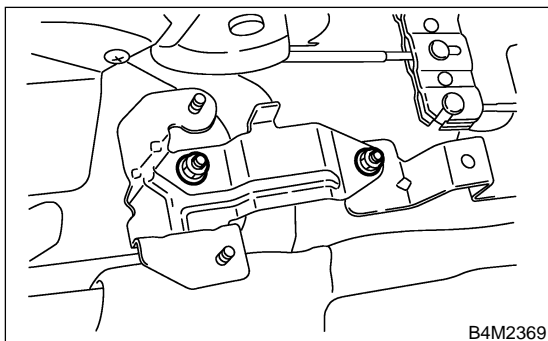
CAUTION:

Do not drop or bump yaw rate and lateral G sensor.



B4M2368

- 5) Remove bracket from body.



B4M2369

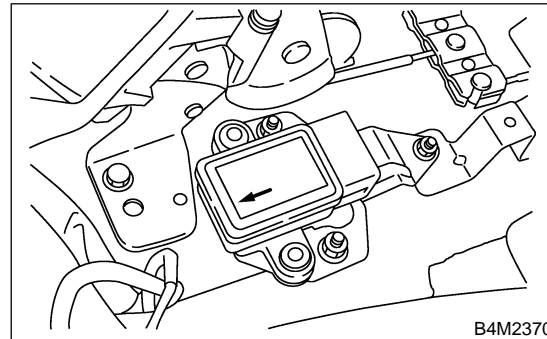
B: INSTALLATION

S402634A11

Install in the reverse order of removal.

NOTE:

Do not install yaw rate and lateral G sensor in the wrong direction. There is an arrow on the sensor showing which side faces the front of the vehicle.



B4M2370

CAUTION:

After completion of installation procedure, the following two position settings must be made.

- Steering angle sensor center positioning
 - Yaw rate and lateral G sensor 0 positioning
- These procedures are necessary for VDCCM to later recognize what position the vehicle is in. For procedures for the above two settings, <Ref. to VDC-12 ADJUSTMENT, VDC Control Module (VDCCM).>.

C: INSPECTION

S402634A10

1. LATERAL G SENSOR SIGNAL

S402634A1001

| 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 YAW RATE AND LATERAL G SENSOR. 1) Move the vehicle to a flat location. 2) Turn ignition switch to OFF. 3) Connect connector to yaw rate and lateral G sensor. 4) Turn ignition switch to ON. 5) Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 5 (+) — No. 6 (–) | Is the voltage 2.5 ± 0.2 V when yaw rate and lateral G sensor is horizontal? | Go to step 3. | Replace yaw rate and lateral G sensor. |
| 3 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Remove yaw rate and lateral G sensor from vehicle. 2) Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 5 (+) — No. 6 (–) NOTE: If the yaw rate and lateral G sensor is moved, the VDC (Yaw rate sensor) may be entered into the memory. | Is the voltage 3.5 ± 0.2 V when yaw rate and lateral G sensor is inclined left to 90° ? | Go to step 4. | Replace yaw rate and lateral G sensor. |
| 4 | CHECK YAW RATE AND LATERAL G SENSOR. Measure voltage between yaw rate and lateral G sensor connector terminals. Connector & terminal (R100) No. 5 (+) — No. 6 (–) NOTE: If the yaw rate and lateral G sensor is moved, the VDC (Yaw rate sensor) may be entered into the memory. | Is the voltage 1.5 ± 0.2 V when yaw rate and lateral G sensor is inclined right to 90° ? | Go to step 5. | Replace yaw rate and lateral G sensor. |
| 5 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Turn ignition switch to OFF. 2) Connect select monitor connector to data link connector. 3) Turn ignition switch to ON. 4) Turn select monitor into {BRAKE CONTROL} mode. 5) Set the display in the {Current Data Display & Save} mode. 6) Read the yaw rate and lateral G sensor output voltage. NOTE: If the yaw rate and lateral G sensor is moved, the VDC (Yaw rate sensor) may be entered into the memory. | Is the indicated reading 2.5 ± 0.2 V when the vehicle is in horizontal position? | Go to step 6. | Replace yaw rate and lateral G sensor. |

YAW RATE AND LATERAL G SENSOR

VDC

| No. | Step | Check | Yes | No |
|-----|---|---|--|--|
| 6 | CHECK YAW RATE AND LATERAL G SENSOR. 1) Remove console box. 2) Remove yaw rate and lateral G sensor from vehicle. (Do not disconnect connector.) 3) Read the select monitor display. NOTE: If the yaw rate and lateral G sensor is moved, the VDC (Yaw rate sensor) may be entered into the memory. | Is the indicated reading 3.5 ± 0.2 V when yaw rate and lateral G sensor is inclined left to 90° ? | Go to step 7. | Replace yaw rate and lateral G sensor. |
| 7 | CHECK YAW RATE AND LATERAL G SENSOR. Read the select monitor display. NOTE: If the yaw rate and lateral G sensor is moved, the VDC (Yaw rate sensor) may be entered into the memory. | Is the indicated reading 1.5 ± 0.2 V when yaw rate and lateral G sensor is inclined right to 90° ? | Yaw rate and lateral G sensor is normal. | Replace yaw rate and lateral G sensor. |

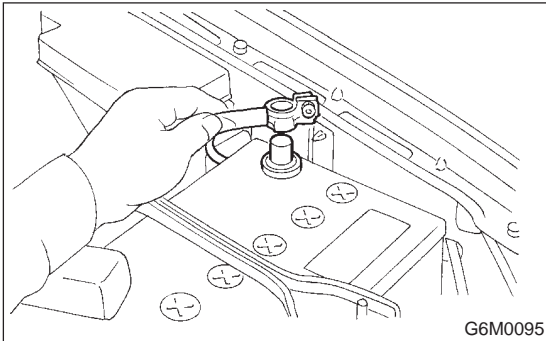
2. YAW RATE SENSOR SIGNAL S402634A1002

| No. | Step | Check | Yes | No |
|-----|---|---|--|--|
| 1 | CHECK YAW RATE AND LATERAL G SENSOR USING OSCILLOSCOPE. 1) Connect all connectors. 2) Set oscilloscope to TCM connector terminals. Positive probe; (R100) No. 4 Earth lead; (R100) No. 6 3) Start the engine. 4) Measure signal voltage indicated on oscilloscope. <Ref. to VDC-15 WAVE FORM, MEASUREMENT, Control Module I/O Signal.> | Is the voltage between 2.1 V and 2.9 V? | Go to step 2. | Replace yaw rate and lateral G sensor is normal. |
| 2 | CHECK YAW USING OSCILLOSCOPE. 1) Turn ignition switch to OFF. 2) Set oscilloscope to TCM connector terminals. Positive probe; (R100) No. 2 Earth lead; (R100) No. 6 3) Start the engine. 4) Measure signal voltage indicated on oscilloscope. <Ref. to VDC-15 WAVE FORM, MEASUREMENT, Control Module I/O Signal.> | Is the voltage 5 V? | Yaw rate and lateral G sensor is normal. | Replace yaw rate and lateral G sensor. |

7. Steering Angle Sensor S402197

A: REMOVAL S402197A18

- 1) Disconnect battery ground cable.



- 2) Remove airbag module.
<Ref. to AB-12 REMOVAL, Driver's Airbag Module.>

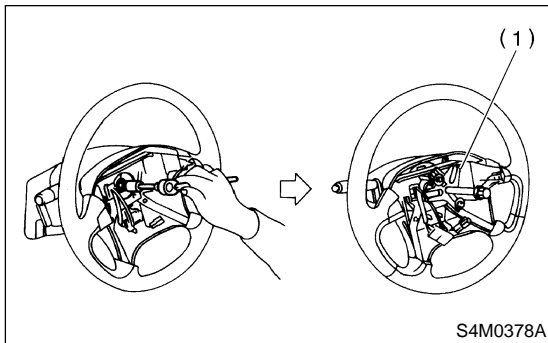
WARNING:

**Always refer to "Airbag System" before performing airbag module service (if so equipped).
<Ref. to AB-3 CAUTION, General Description.>**

- 3) Remove steering wheel nut, then draw out steering wheel from shaft using steering puller.

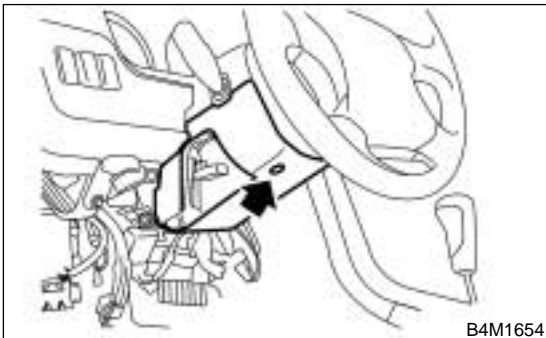
NOTE:

Steering wheel must be removed at the straight ahead position.



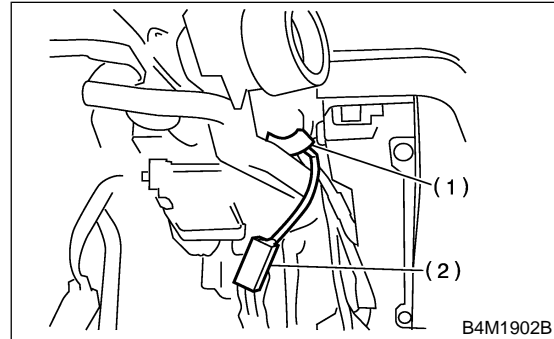
- (1) Steering puller

- 4) Remove the screw securing lower steering column cover.



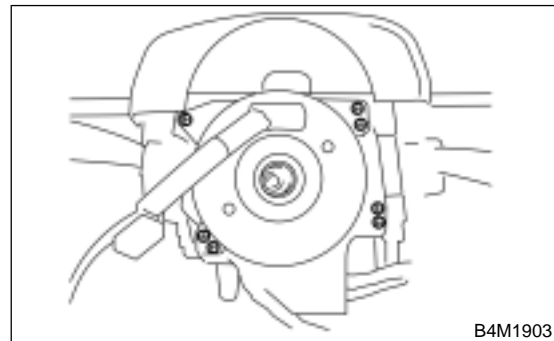
- 5) Remove two screws securing upper steering column cover.

- 6) Release the lock of harness band and disconnect connector of steering angle sensor.

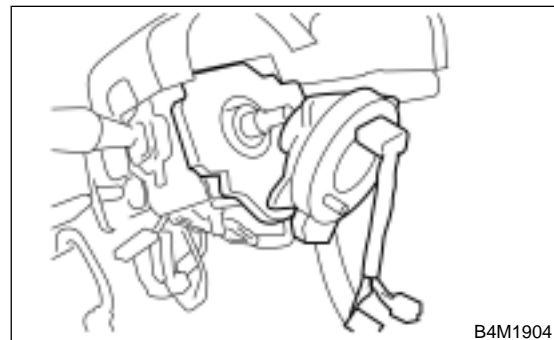


- (1) Harness connector
(2) Connector

- 7) Remove bolts which hold roll connector and steering angle sensor onto steering column.



- 8) Remove roll connector and steering angle sensor.



NOTE:

Do not turn steering angle sensor as it's center position has been recognized by VDCCM.

B: INSTALLATION S402197A11

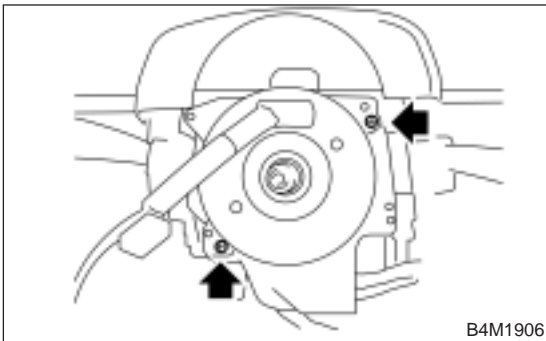
CAUTION:

Ensure that front wheels are set in straight forward direction.

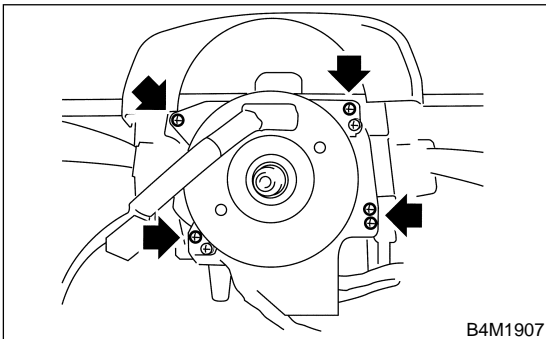
- 1) Place steering angle sensor on steering column, confirming that the sensor is positioned as in the figure.



- 2) Conduct centering of roll connector.
<Ref. to AB-22 INSTALLATION, Roll Connector.>
- 3) Place roll connector over steering angle sensor and tighten bolts which secure roll connector and steering angle sensor.



- 4) Tighten bolts which install roll connector and steering angle sensor onto steering column.



- 5) Set steering wheel to neutral and install it onto steering shaft.

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)

Column cover-to-steering wheel clearance:

2 — 4 mm (0.08 — 0.16 in)

CAUTION:

Insert roll connector guide pin into guide hole on lower end of surface of steering wheel to prevent damage. Draw out airbag system connector, horn connector and cruise control connectors from guide hole of steering wheel lower end.

- 6) Install airbag module to steering wheel.

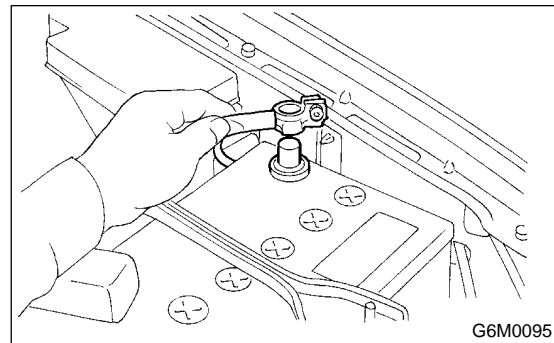
<Ref. to AB-13 INSTALLATION, Driver's Airbag Module.>

WARNING:

Always refer to "Airbag System" before performing the service operation.

<Ref. to AB-3 CAUTION, General Description.>

- 7) Connect battery ground cable.



CAUTION:

After completion of installation procedure, the following two position settings must be made.

- Steering angle sensor center positioning
- Yaw rate and lateral G sensor 0 positioning

These procedures are necessary for VDCCM to later recognize what position the vehicle is in. For procedures for the above two settings, <Ref. to VDC-12 ADJUSTMENT, VDC Control Module (VDCCM).>.

C: INSPECTION S402197A10

Refer to "VDC section" for inspection procedures of steering angle sensor.

<Ref. to VDC-110 TROUBLE CODE 71 ABNORMAL STEERING ANGLE SENSOR, Diagnostics Chart with Diagnosis Connector.>

8. Front ABS Sensor S402190

A: NOTE S402190A15

The ABS sensor installed on VDC equipped vehicles is the same as the one on ABS equipped vehicles; therefore, for removal, inspection and installation please refer to “ABS” section.

<Ref. to ABS-14 Front ABS Sensor.>

9. Rear ABS Sensor S402185

A: NOTE S402185A15

The ABS sensor installed on VDC equipped vehicles is the same as the one on ABS equipped vehicles; therefore, for removal, inspection and installation please refer to “ABS” section.

<Ref. to ABS-17 Rear ABS Sensor.>

10. Front Tone Wheel S402184

A: NOTE S402184A15

As front tone wheel is integrated with front drive shaft, refer to “DS section” for removal, installation, and inspection procedures.

<Ref. to DS-28 Front Drive Shaft.>

11. Rear Tone Wheel S402182

A: NOTE S402182A15

As rear tone wheel is integrated with rear drive shaft, refer to “DS section” for removal, installation, and inspection procedures.

<Ref. to DS-33 Rear Drive Shaft.>

REAR TONE WHEEL

VDC

MEMO: