4. Keyless Entry System

A: PRECAUTION

1. SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

Airbag system wiring harness is routed near the keyless entry control module.

CAUTION:
● All airbag system wiring harness and connectors are yellow. Do not use electrical test equipment on these circuits.
● Be careful not to damage airbag system wiring harness when servicing the keyless entry control module.

B: PRE-INSPECTION

1. POWER DOOR LOCK

4B11 : CHECK POWER DOOR LOCK.

Perform lock and unlock with door lock switch.

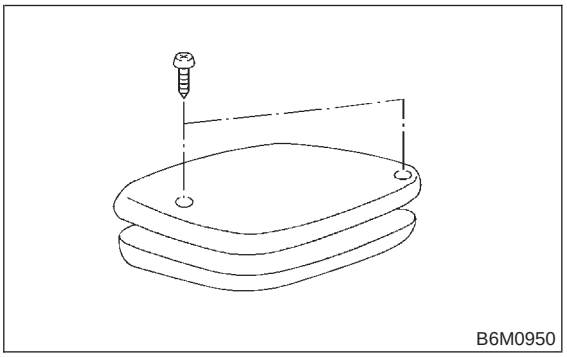
CHECK : ***Does the power door lock function normally?***
YES : Go to step **4B21**.
NO : Repair power door lock.

2. TRANSMITTER

4B21 : CHECK TRANSMITTER BATTERY.

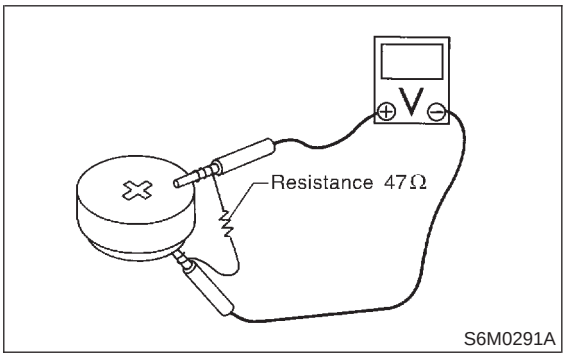
1) Remove battery from transmitter.

NOTE:
To prevent static electricity damage to transmitter printed circuit board, touch steel area of building with hand to discharge static electricity carried on body or clothes before disassembling transmitter.


B6M0950

2) Measure voltage battery.

NOTE:
● Battery discharge occurs during measurement. Complete measurement within 5 seconds.
● During battery voltage measurement, voltage falls more than 1.8 volts during 3 seconds period. Weak battery is indicated. Replace battery.



S6M0291A

CHECK : ***Is the voltage more than 2 V?***
YES : Go to step **4B22**.
NO : Replace transmitter battery. (Use CR2032 or equivalent.)

4B22 : CHECK LED OF TRANSMITTER.

1) Press either the LOCK/ARM or UNLOCK/DISARM button six times to synchronize with the keyless entry control module.
2) Press the LOCK/ARM button.

CHECK : ***Does the LED blink one time?***
YES : Go to step **4B23**.
NO : Replace transmitter.

4B23 : CHECK LED OF TRANSMITTER.

Keep the LOCK/ARM button pressed.

CHECK : ***Does the LED blink one time and then turn on?***
YES : Go to step **4B24**.
NO : Replace transmitter.

4B24 : CHECK LED OF TRANSMITTER.

Press the UNLOCK/DISARM button.

CHECK : ***Does the LED blink one time?***
YES : Go to step **4B25**.
NO : Replace transmitter.

4B25 : CHECK LED OF TRANSMITTER.

Keep the UNLOCK/DISARM button pressed.

CHECK : ***Does the LED blink two times?***
YES : Go to step **4B26**.
NO : Replace transmitter.

4B26 : CHECK POWER DOOR LOCK FUNCTION.

Perform lock and unlock function of power door lock with transmitter.

CHECK : ***Does it function normally?***
YES : Go to step **4B27**.
NO : Replace transmitter.

4B27 : CHECK ON/OFF SELECT HORN SIGNAL.

Press the LOCK/ARM or UNLOCK/DISARM button.

CHECK : ***Does the horn signal chirp?***
YES : Go to step **4B28**.
NO : Keep both LOCK/ARM and UNLOCK/DISARM buttons pressed for more than 1.5 seconds. Go to step **4B28**.

4B28 : CHECK ON/OFF SELECT HORN SIGNAL.

Keep both LOCK/ARM and UNLOCK/DISARM buttons pressed for more than 1.5 seconds.

CHECK : ***Does the horn signal chirp two times?***
YES : Go to step **4B29**.
NO : Replace transmitter.

4B29 : CHECK ON/OFF SELECT HORN SIGNAL.

Press LOCK/ARM or UNLOCK/DISARM button.

CHECK : ***Does the horn signal chirp?***
YES : Replace transmitter.
NO : Go to step **4B210**.

4B210 : CHECK ON/OFF SELECT HORN SIGNAL.

Keep both LOCK/ARM and UNLOCK/DISARM buttons pressed for more than 1.5 seconds.

CHECK : ***Does the horn signal chirp one time?***
YES : Go to step **4B211**.
NO : Replace transmitter.

4B211 : CHECK ON/OFF SELECT HORN SIGNAL.

Press LOCK/ARM and UNLOCK/DISARM button.

CHECK : ***Does the horn signal chirp?***
YES : Go to step **4B212**.
NO : Replace transmitter.

4B212 : CHECK FOR UNCHECKED TRANSMITTER.

Check for an unchecked transmitter.

CHECK : ***Does an unchecked transmitter exist?***

YES : Check for an unchecked transmitter. Go to step **4B21**.

NO : Go to step **4B31**.

3. FUSE

4B31 : CHECK FUSE.

Remove and visually check the fuse No. 3 (in fuse box).

CHECK : ***Is fuse No. 3 blown?***

YES : Replace fuse (15 A).

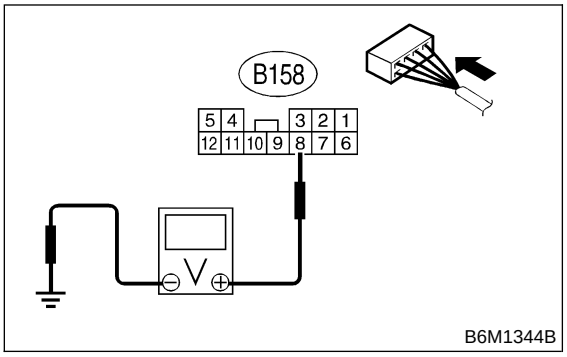
NO : Go to step **4B41**.

4. POWER SUPPLY CIRCUIT

4B41 : CHECK POWER SUPPLY CIRCUIT.

Measure voltage between fuse box connector (B158) and chassis ground.

Connector & terminal
(B158) No. 8 (+) — Chassis ground (−):

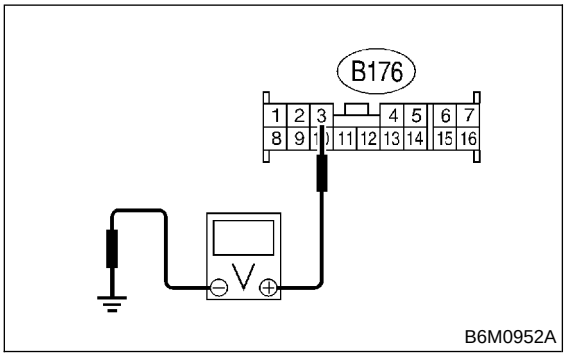


CHECK : ***Is the voltage more than 10 V?***
YES : Go to step **4B42**.
NO : Repair wiring harness between fuse box and battery.

4B42 : CHECK POWER SUPPLY CIRCUIT.

1) Disconnect connector from keyless entry control module.
2) Measure voltage between keyless entry control module connector (B176) and chassis ground.

Connector & terminal
(B176) No. 3 (+) — Chassis ground (−):



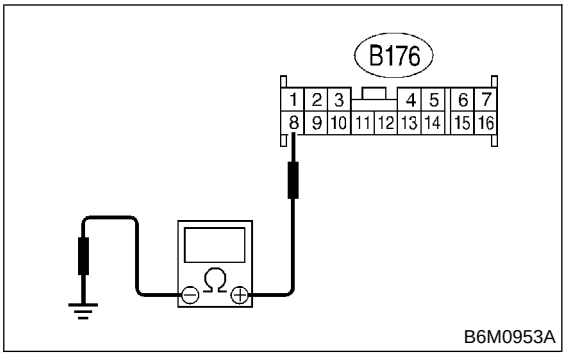
CHECK : ***Is the voltage more than 10 V?***
YES : Go to step **4B51**.
NO : Repair wiring harness between keyless entry control module and fuse box.

5. GROUND CIRCUIT

4B51 : CHECK GROUND CIRCUIT.

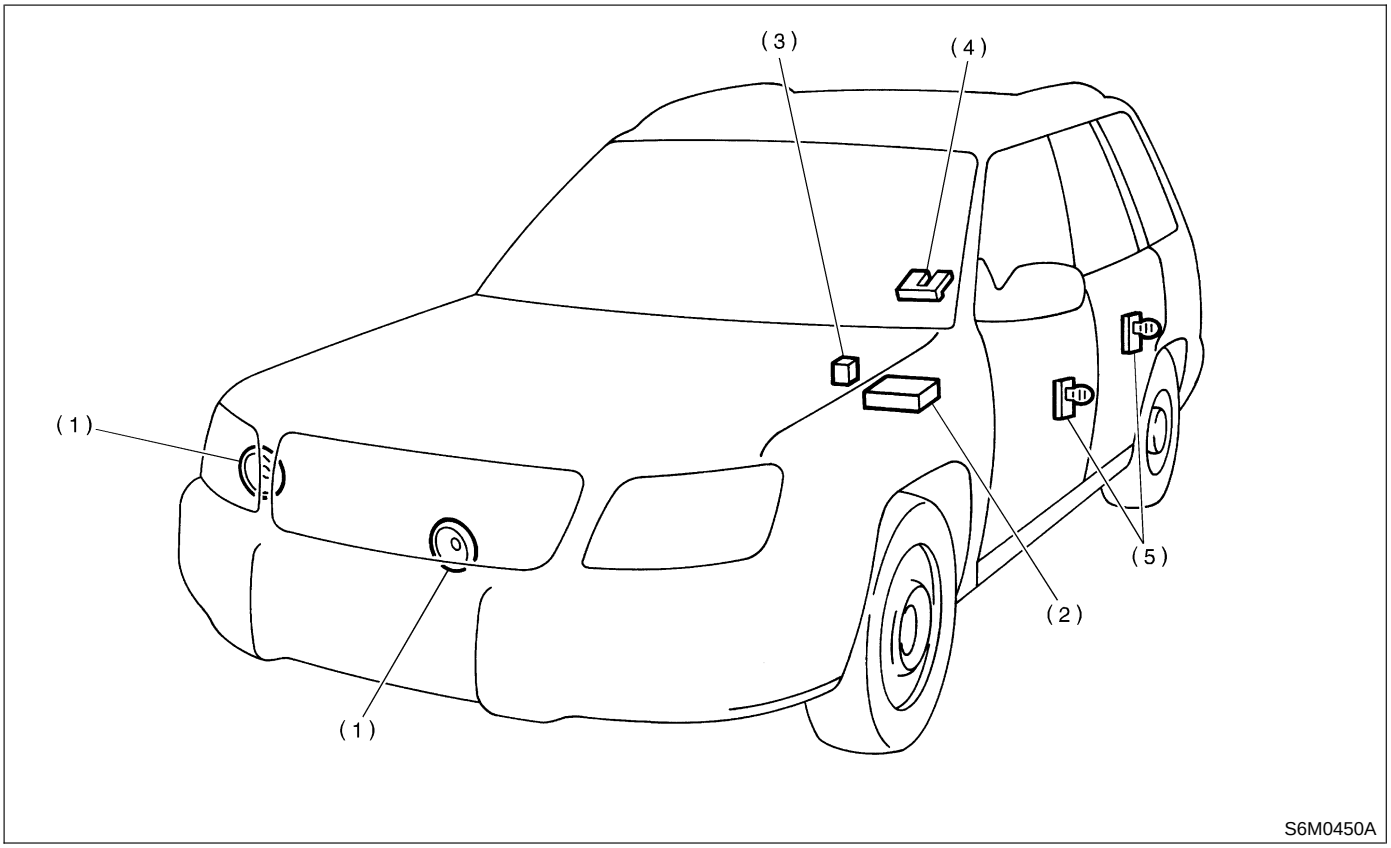
Measure resistance between keyless entry control module connector (B176) and chassis ground.

Connector & terminal
(B176) No. 8 (+) — Chassis ground (−):



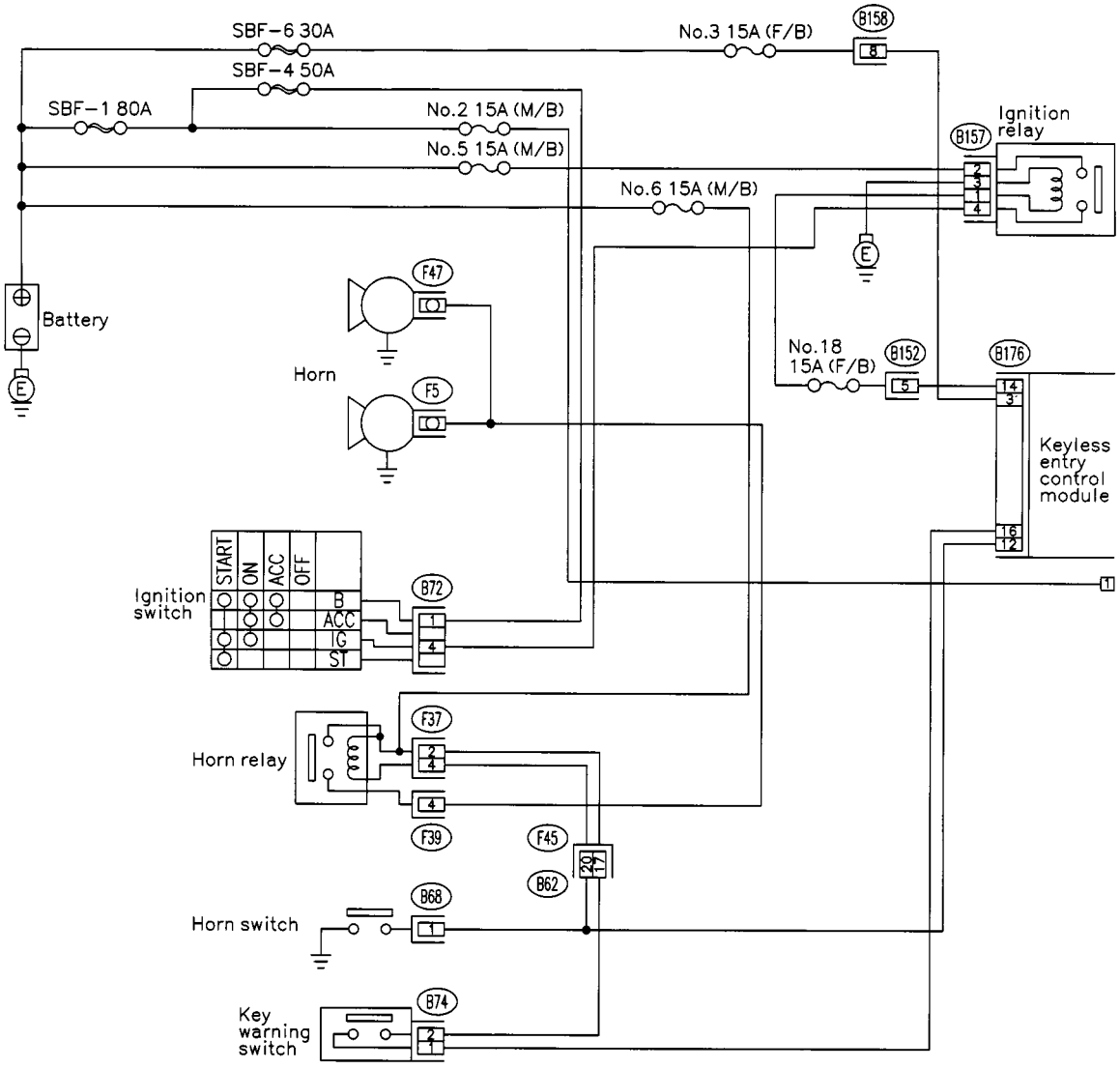
CHECK : ***Is the resistance less than 10 Ω?***
YES : Go to step **4F11**.
NO : Repair wiring harness between keyless entry control module and chassis ground.

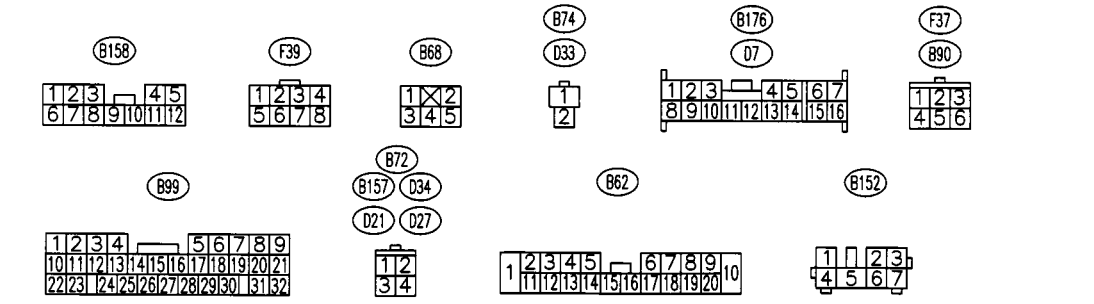
C: ELECTRICAL COMPONENTS LOCATION



(1) Horn
(2) Keyless entry control module
(3) Horn relay (in main fuse box)
(4) Rear gate latch switch
(5) Door switch

D: SCHEMATIC





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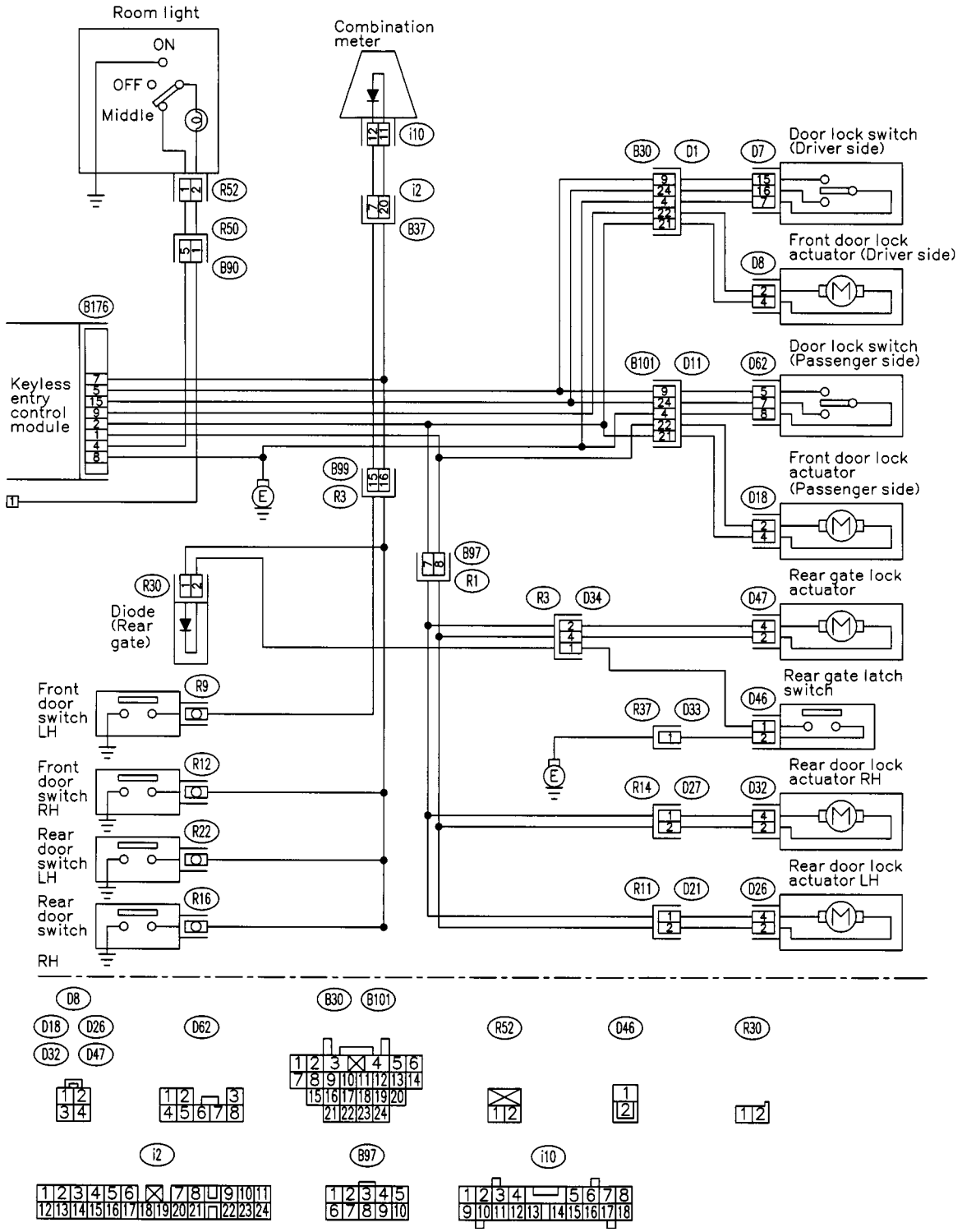
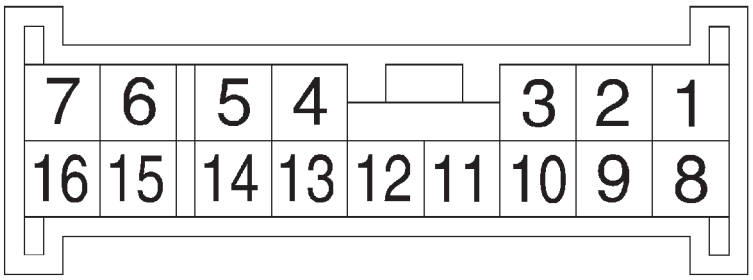

Room light
ON
OFF
Middle
Combination meter
i10
i2
B37
R52
R50
B90
B176
Keyless entry control module
B99
R3
E
B97
R1
R30
Diode (Rear gate)
R9
Front door switch LH
R12
Front door switch RH
R22
Rear door switch LH
R16
Rear door switch RH
B30
D1
D7
Door lock switch (Driver side)
D8
Front door lock actuator (Driver side)
B101
D11
D62
Door lock switch (Passenger side)
D18
Front door lock actuator (Passenger side)
D34
D47
Rear gate lock actuator
D46
Rear gate latch switch
R37
D33
R14
D27
D32
Rear door lock actuator RH
R11
D21
D26
Rear door lock actuator LH
D8
D18
D26
D32
D47
D62
B30
B101
R52
D46
R30
i2
B97
i10

S6M0452

E: CONTROL MODULE I/O SIGNAL



B6M0957

Content	Terminal No.	Measuring condition
Door and rear gate lock actuator (Except driver side)	1 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DISARM button two times.
Door and rear gate lock actuator	2 (OUTPUT)	Battery voltage is present when pressing the transmitter LOCK/ARM button one time.
Power supply (Back-up)	3	Battery voltage is constantly present.
• Room light • Rear gate latch switch	4 (OUTPUT)	• 0 V is present when pressing the transmitter UNLOCK/DISARM button one time. • Battery voltage is present when opening the rear gate.
Door lock switch	5 (INPUT)	0 V is present when operating the door lock switch.
Door switch	7 (INPUT)	Battery voltage is present when any door is open.
Ground	8	—
Door lock actuator (Driver side)	9 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DISARM button one time.
Security control module	10	—
Security control module	11	—
Horn relay	12 (OUTPUT)	0 V is present when pressing the transmitter UNLOCK/DISARM or LOCK/ARM button.
Security control module	13	—
Ignition switch (ON)	14 (INPUT)	Battery voltage is present when ignition switch is turned ON.
Door unlock switch	15 (INPUT)	0 V is present when operating the door lock switch.
Key warning switch	16 (INPUT)	Battery voltage is present when inserting the key into the ignition switch.

F: DIAGNOSTICS PROCEDURE

1. BASIC DIAGNOSTICS PROCEDURE

4F11 : CHECK KEYLESS ENTRY FUNCTION.

1) Perform pre-inspection.
<Ref. to 6-2 [T4B0].>
2) Remove ignition key from ignition switch.
3) Set the room light switch in the middle position.
4) Close all doors and the rear gate.
5) Press the LOCK/ARM button one time.

CHECK : ***Do all doors and rear gate lock normally?***
YES : Go to step **4F12**.
NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

4F12 : CHECK KEYLESS ENTRY FUNCTION.

Check if the horn signal chirps.

CHECK : ***Does the horn chirp one time?***
YES : Go to step **4F13**.
NO : Go to step **4F21**.

4F13 : CHECK KEYLESS ENTRY FUNCTION.

Press the UNLOCK/DISARM button one time.

CHECK : ***Does the driver's door unlock normally?***
YES : Go to step **4F14**.
NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

4F14 : CHECK KEYLESS ENTRY FUNCTION.

Check if the horn signal chirps.

CHECK : ***Does the horn chirp two times?***
YES : Go to step **4F15**.
NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

4F15 : CHECK KEYLESS ENTRY FUNCTION.

Check if the room light is turned on.

CHECK : ***Does the room light turn on for 30 seconds, and then turn off?***
YES : Go to step **4F16**.
NO : Go to step **4F31**.

4F16 : CHECK KEYLESS ENTRY FUNCTION.

1) Press the LOCK/ARM button one time.
2) Press the UNLOCK/DISARM button two times.

CHECK : ***Do all doors and rear gate unlock normally?***
YES : Go to step **4F17**.
NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

4F17 : CHECK KEYLESS ENTRY FUNCTION.

Keep the LOCK/ARM button pressed for more than 1.5 seconds.

CHECK : ***Does the horn sound for 30 seconds, and then turns off?***
YES : Go to step **4F18**.
NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

4F18 : CHECK KEYLESS ENTRY FUNCTION.

1) Keep the LOCK/ARM button pressed for more than 1.5 seconds.
2) Horn will sound, and then press the LOCK/ARM button.

CHECK : ***Does the horn turn off?***
YES : Go to step **4F19**.
NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

4F19 : CHECK KEYLESS ENTRY FUNCTION.

1) Keep the LOCK/ARM button pressed for more than 1.5 seconds.
2) Horn will sound, and then press the UNLOCK/DISARM button.

CHECK : ***Does the horn turn off?***
YES : Go to step **4F110**.
NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

4F110 : CHECK DOOR SWITCH FUNCTION.

Open the front left door.

CHECK : ***Does the room light turn on?***
YES : Go to step **4F111**.
NO : Go to step **4F41**.

4F111 : CHECK DOOR SWITCH FUNCTION.

1) Close the front left door.
2) Open the front right door.

CHECK : ***Does the room light turn on?***
YES : Go to step **4F112**.
NO : Go to step **4F41**.

4F112 : CHECK DOOR SWITCH FUNCTION.

1) Close the front right door.
2) Open the rear left door.

CHECK : ***Does the room light turn on?***
YES : Go to step **4F113**.
NO : Go to step **4F41**.

4F113 : CHECK DOOR SWITCH FUNCTION.

1) Close the rear left door.
2) Open the rear right door.

CHECK : ***Does the room light turn on?***
YES : Go to step **4F114**.
NO : Go to step **4F41**.

4F114 : PERFORM PROGRAMMING.

NOTE:
Finish operation from step 1) through 4) within 45 seconds.

1) Sit on the driver's seat and close all doors and the rear gate.
2) Open the driver's door.
3) Close the driver's door.
4) Turn the ignition switch from ON to LOCK ten times in rapid succession (within 15 seconds).

NOTE:
Do not start the engine at this time.

5) The horn chirps one time to indicate that the system has been in the programming mode.
6) Open the driver's door.
7) Close the driver's door.
8) Press any button on the transmitter that you wish to program into the system.
9) Horn will chirp two times to indicate that the transmitter has been programmed.

NOTE:
Any additional transmitter can also be programmed at this time. Repeat steps 6) through 9) for an additional transmitter.

10) Remove the ignition key from the ignition switch.
11) The horn will chirp three times to indicate that the system has exited the programming mode.
12) Check the keyless entry system properly operates by operating each transmitter.

CHECK : ***Does the transmitter operate normally?***
YES : Go to step **4F115**.
NO : Go to step **4F51**.

4F115 : CHECK IGNITION KEY SWITCH.

1) Insert the ignition key to the ignition switch (at LOCK position).
2) Perform lock and unlock with transmitter.

CHECK : ***Does the power door lock function normally?***
YES : Go to step **4F61**.
NO : End of basic diagnostics procedure.

2. DIAGNOSTICS ITEM 1

4F21 : SELECT HORN SIGNAL OPERATION.

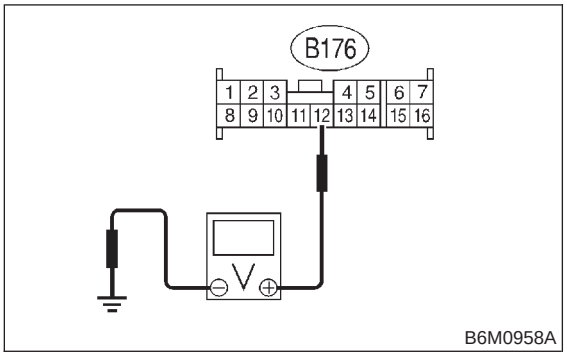
Keep both LOCK/ARM and UNLOCK/DISARM buttons pressed for more than 1.5 seconds.

CHECK : ***Does the horn chirp one time?***
YES : Go to step **4F22**.
NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

4F22 : CHECK HORN SIGNAL OUTPUT SIGNAL.

1) Disconnect connector from keyless entry control module.
2) Measure voltage between keyless entry control module connector (B176) and chassis ground.

Connector & terminal
(B176) No. 12 (+) — Chassis ground (−):

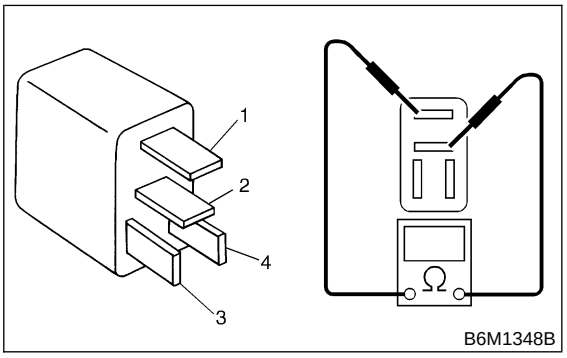


CHECK : ***Is the voltage more than 10 V?***
YES : Go to step **4F23**.
NO : Go to step **4F26**.

4F23 : CHECK HORN RELAY.

1) Remove horn relay from main fuse box.
2) Check continuity between horn relay terminals.

Terminals
No. 1 — No. 2:

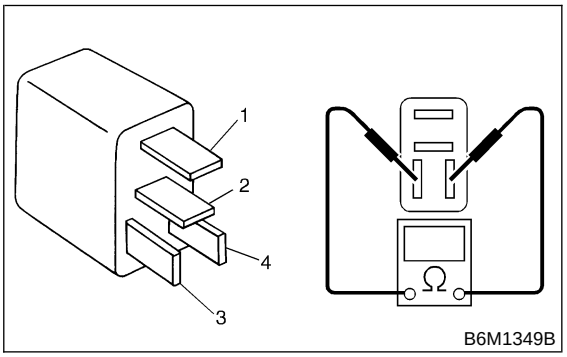


CHECK : ***Does continuity exist?***
YES : Replace horn relay.
NO : Go to step **4F24**.

4F24 : CHECK HORN RELAY.

Check continuity between horn relay terminals.

Terminals
No. 3 — No. 4:

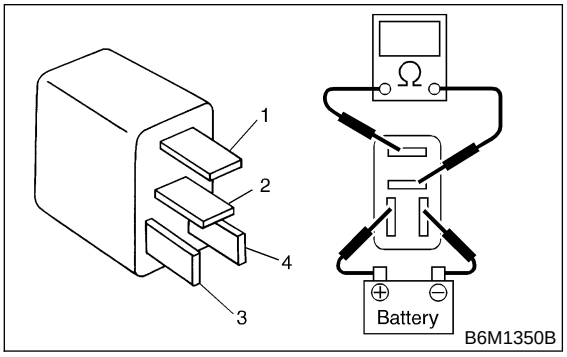


CHECK : ***Does continuity exist?***
YES : Go to step **4F25**.
NO : Replace horn relay.

4F25 : CHECK HORN RELAY.

1) Connect the battery to horn relay terminals No. 3 and No. 4.
2) Check continuity between horn relay terminals.

Terminals
No. 1 — No. 2:



CHECK : ***Does continuity exist?***
YES : Repair wiring harness of horn circuit.
NO : Replace horn relay.

4F26 : CHECK FUSE.

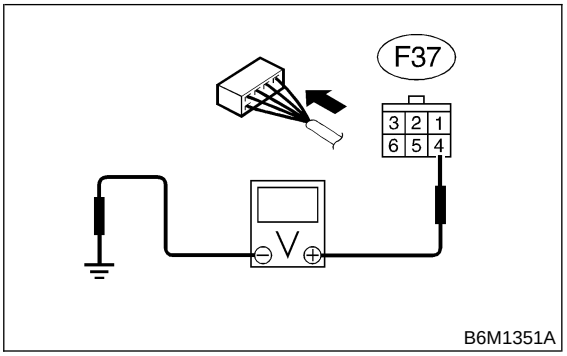
Remove and visually check the fuse No. 6 (in main fuse box).

CHECK : ***Is the fuse No. 6 blown?***
YES : Replace fuse (15 A).
NO : Go to step **4F27**.

4F27 : CHECK POWER SUPPLY FOR HORN RELAY.

1) Install horn relay to main fuse box.
2) Measure voltage between main fuse box connector (F37) and chassis ground.

Connector & terminal
(F37) No. 4 (+) — Chassis ground (−):

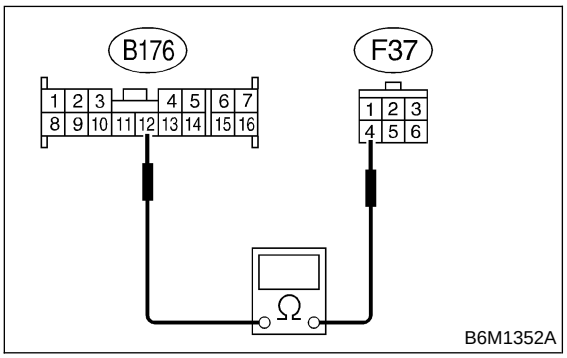


CHECK : ***Is the voltage more than 10 V?***
YES : Go to step **4F28**.
NO : Repair wiring harness between main fuse box and battery.

4F28 : CHECK RESISTANCE BETWEEN HORN RELAY AND KEYLESS ENTRY CONTROL MODULE.

1) Disconnect connector from main fuse box and keyless entry control module.
2) Measure resistance between keyless entry control module connector (B176) and main fuse box connector (F37).

Connector & terminal
(B176) No. 12 — (F37) No. 4:



CHECK : ***Is the resistance less than 10 Ω?***
YES : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>
NO : Repair wiring harness between main fuse box and keyless entry control module.

3. DIAGNOSTICS ITEM 2

4F31 : CHECK FUSE.

Remove and visually check the fuse No. 2 (in main fuse box).

CHECK : ***Is fuse No. 2 blown?***
YES : Replace fuse (15 A).
NO : Go to step **4F32**.

4F32 : CHECK ROOM LIGHT BULB.

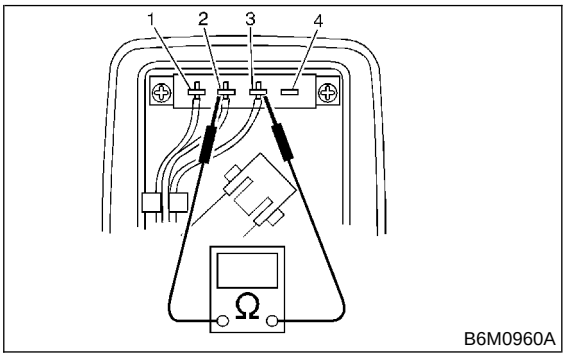
Remove and visually check the room light bulb.

CHECK : ***Is the bulb blown?***
YES : Replace bulb.
NO : Go to step **4F33**.

4F33 : CHECK ROOM LIGHT SWITCH.

1) Remove room light.
2) Measure resistance of room light switch terminal at the middle position.

Terminals
No. 2 — No. 3:

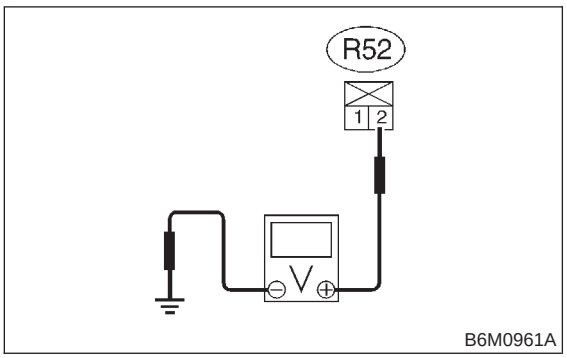


CHECK : ***Is the resistance less than 1 Ω?***
YES : Repair or replace room light.
NO : Go to step **4F34**.

4F34 : CHECK POWER SUPPLY FOR ROOM LIGHT.

1) Disconnect connector from room light.
2) Open any door.
3) Measure voltage between room light connector (R52) and chassis ground.

Connector & terminal
(R52) No. 2 (+) — Chassis ground (−):

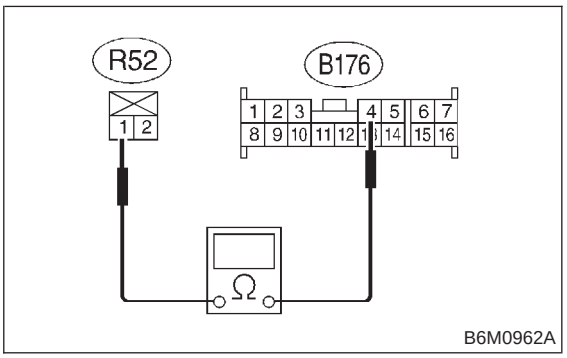


CHECK : ***Is the voltage more than 10 V?***
YES : Go to step **4F35**.
NO : Repair wiring harness between room light and battery.

4F35 : CHECK HARNESS CONNECTOR BETWEEN ROOM LIGHT AND KEYLESS ENTRY CONTROL MODULE.

1) Disconnect connector from keyless entry control module.
2) Measure resistance between room light connector (R52) and keyless entry control module connector (B176).

Connector & terminal
(R52) No. 1 — (B176) No.4:

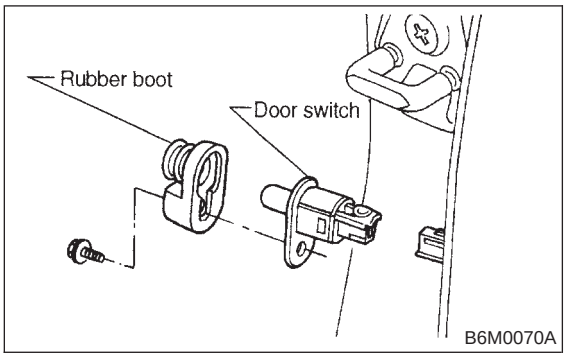


CHECK : ***Is the resistance less than 10 Ω?***
YES : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>
NO : Repair wiring harness between room light and keyless entry control module.

4. DIAGNOSTICS ITEM 3

4F41 : CHECK DOOR SWITCH.

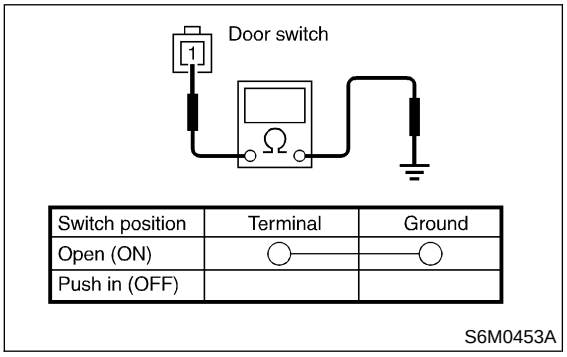
1) Remove door switch.



2) Move switch and check continuity between terminals of door switch.

Terminals

No. 1 — Chassis ground



Switch position	Terminal	Ground
Open (ON)	○	○
Push in (OFF)		

CHECK : ***Does any fault exist in the door switch?***

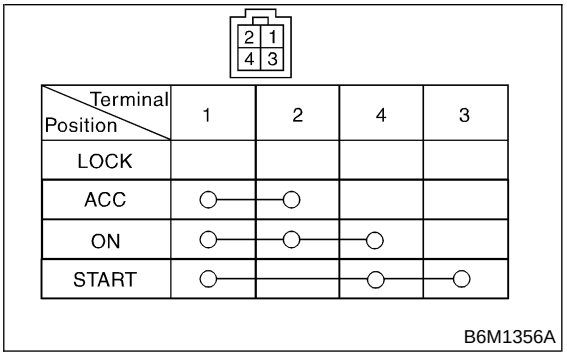
YES : Replace door switch.

NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

5. DIAGNOSTICS ITEM 4

4F51 : CHECK IGNITION SWITCH.

1) Remove ignition switch. <Ref. to 6-2 [W3A1].>
2) Turn ignition key to each position and check continuity between terminals of ignition switch connector.



Position \ Terminal	1	2	4	3
LOCK				
ACC	○	○		
ON	○	○	○	
START	○		○	○

CHECK : ***Is the ignition switch faulty?***

YES : Replace ignition switch. <Ref. to 6-2 [W3A1].>

NO : Replace keyless entry control module. <Ref. to 6-2 [W10A1].>

6. DIAGNOSTICS ITEM 5

4F61 : CHECK FUSE.

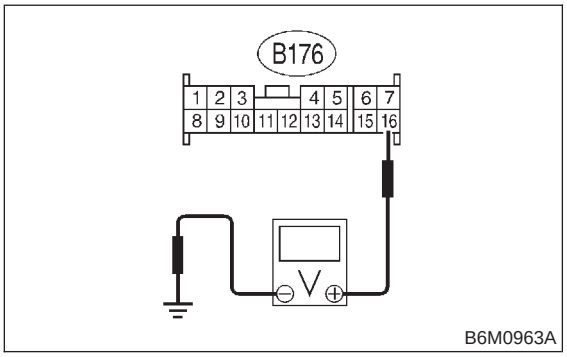
Remove and visually check the fuse No. 6 (in main fuse box).

CHECK : ***Is fuse No. 6 blown?***
YES : Replace fuse (15 A).
NO : Go to step **4F62**.

4F62 : CHECK KEYLESS ENTRY CONTROL MODULE.

1) Disconnect connector from keyless entry control module.
2) Insert the key to ignition switch (LOCK position).
3) Measure voltage between keyless entry control module connector (B176) and chassis ground.

Connector & terminal
(B176) No. 16 (+) — Chassis ground (−):

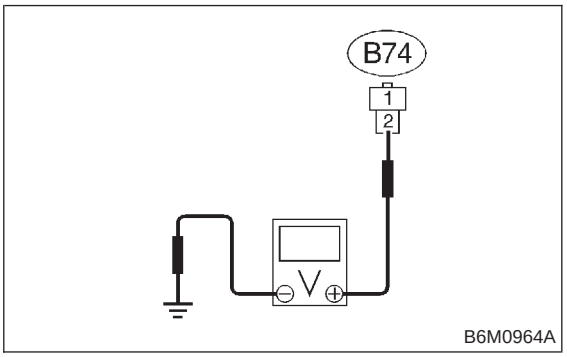


CHECK : ***Is the voltage more than 10 V?***
YES : Replace keyless entry control module. <Ref. to 6-2 [W10A0].>
NO : Go to step **4F63**.

4F63 : CHECK HARNESS CONNECTOR BETWEEN BATTERY AND KEY WARNING SWITCH.

1) Disconnect connector from key warning switch.
2) Measure voltage between key warning switch connector (B74) and chassis ground.

Connector & terminal
(B74) No. 2 (+) — Chassis ground (−):

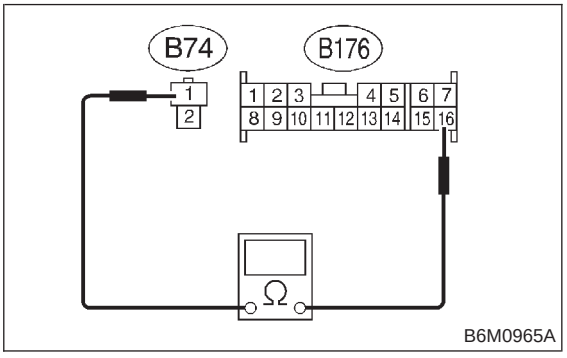


CHECK : ***Is the voltage more than 10 V?***
YES : Go to step **4F64**.
NO : Repair wiring harness between battery and key warning switch.

4F64 : CHECK HARNESS CONNECTOR BETWEEN KEY WARNING SWITCH AND KEYLESS ENTRY CONTROL MODULE.

Measure resistance between key warning switch connector (B74) and keyless entry control module connector (B176).

Connector & terminal
(B74) No. 1 — (B176) No. 16:



CHECK : ***Is the resistance less than 10 Ω?***
YES : Replace key warning switch.
NO : Repair wiring harness between key warning switch and keyless entry control module.