

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

OD(diag)

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Basic Diagnostic Procedure

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

1. Basic Diagnostic Procedure

A: PROCEDURE

Step	Check	Yes	No
1 CHECK WARNING LIGHT. Check whether the airbag warning light in the combination meter is lit.	Does the airbag warning light illuminate?	Go to step 2.	Perform the diagnosis according to phenomenon of the problem.
2 READ DTC. 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor to data link connector. 3) Turn the ignition switch to ON and run the Subaru Select Monitor. 4) Read the DTC. <Ref. to OD(diag)-12, OPERATION, Read Diagnostic Trouble Code (DTC).> NOTE: If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit. <Ref. to OD(diag)-11, INSPECTION, Subaru Select Monitor.> 5) Record all DTCs, time stamp and freeze frame data. NOTE: For time stamp, refer to "LAN SYSTEM". <Ref. to LAN(diag)-6, TIME STAMP, CAUTION, General Description.>	Is DTC displayed?	Go to step 3.	Go to "Airbag Warning Light Failure" <Ref. to AB(diag)-27, Airbag Warning Light Failure.>.
3 PERFORM DIAGNOSIS. 1) Determine the possible cause from "List of Diagnostic Trouble Code (DTC)" <Ref. to OD(diag)-18, List of Diagnostic Trouble Code (DTC).>. 2) Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". 3) Repair the trouble cause. 4) Perform the Clear Memory Mode. <Ref. to OD(diag)-14, Clear Memory Mode.> 5) Perform the Inspection Mode. <Ref. to OD(diag)-13, Inspection Mode.> 6) Read any other DTCs displayed.	Is DTC displayed?	Perform the procedure 1) to 5) in step 3.	Finish the diagnosis.

Check List for Interview

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

2. Check List for Interview

A: CHECK

Customer's name		Inspector's name	
Date vehicle brought in	/ /	Registration No.	
Odometer reading	km miles	V.I.N.	
Date problem occurred	/ /	Registration year	/ /
Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Others :		
Temperature	°C (°F)		
Road condition	☐ Flat road ☐ Uphill ☐ Downhill ☐ Gravel road ☐ Others :		
Vehicle operation	☐ Starting ☐ Idling ☐ Driving ☐ Constant speed ☐ Accelerating ☐ Decelerating ☐ Turning ☐ Others :		
Details of problem			
Airbag warning light operation	☐ Normal (After turning the ignition switch to ON, illuminates for 6 seconds then goes off.) ☐ Remains ON ☐ Remains OFF		
Passenger's airbag ON/OFF indicator does not operate.	☐ Normal (After turning the ignition switch to ON, illuminates for 6 seconds then goes off for 2 seconds; Lights ON (adult) or OFF (children/unoccupied).) ☐ Both remain ON ☐ Both remain OFF		
DTC output	☐ OK code ☐ DTC: (Code:)		

General Description

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

3. General Description

A: CAUTION

- 1) The occupant detection system (passenger seat only) control module and the occupant detection sensor are fixed to the seat cushion frame. Never remove the occupant detection control module or the occupant detection sensor from the seat cushion frame.
- 2) Do not replace the seat cushion pad and seat cushion cover alone. Always replace seat cushion & frame assembly as a set. The seat cushion pad, cushion frame, and seat cushion cover are adjusted as a set at the time of manufacture. If cushion pads and cushion frames are combined from those of other vehicles or other sets, the occupant detection system may not operate properly.
- 3) Never connect the battery in reverse polarity. Occupant detection system may be destroyed instantly.
- 4) Do not disconnect the battery terminals while the engine is running. A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as occupant detection control module.
- 5) Before disconnecting the connectors of each sensor and control module, be sure to turn the ignition switch to OFF and wait for 60 seconds or more. Occupant detection control module may be damaged.
- 6) Every occupant detection system-related part is a precision part. Do not drop them.

CAUTION:

- Do not use electrical test equipment on wiring harness and connector circuits of the airbag system.
- Be careful not to damage the airbag system wiring harness when servicing the occupant detection system.
- Refer to CAUTION in Airbag System when repairing the occupant detection system. <Ref. to AB-9, CAUTION, General Description.>

B: INSPECTION

Measure the battery voltage and check electrolyte.

Standard voltage:

12 V

Specific gravity:

1.260 or more

Fluid level:

Between the upper level and lower level

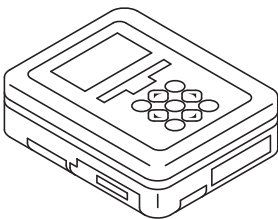
General Description

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

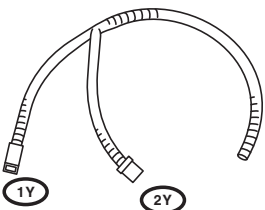
C: PREPARATION TOOL

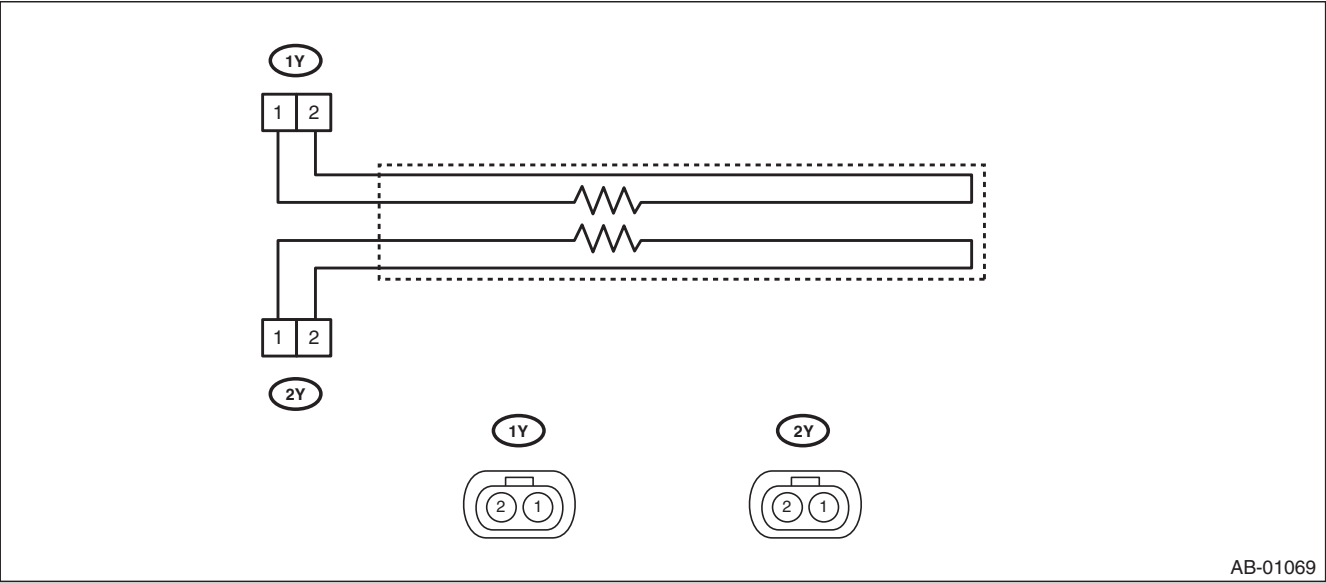
CAUTION:
To measure the voltage and resistance of airbag system and occupant detection system components, be sure to use the specified test harness.

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST1B022XU0	1B022XU0	SUBARU SELECT MONITOR III KIT	Used for troubleshooting the electrical system.

• TEST HARNESS Y

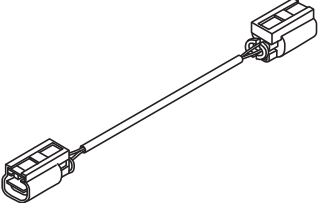
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AG040	98299AG040	TEST HARNESS Y	Used for troubleshooting seat belt buckle switch.

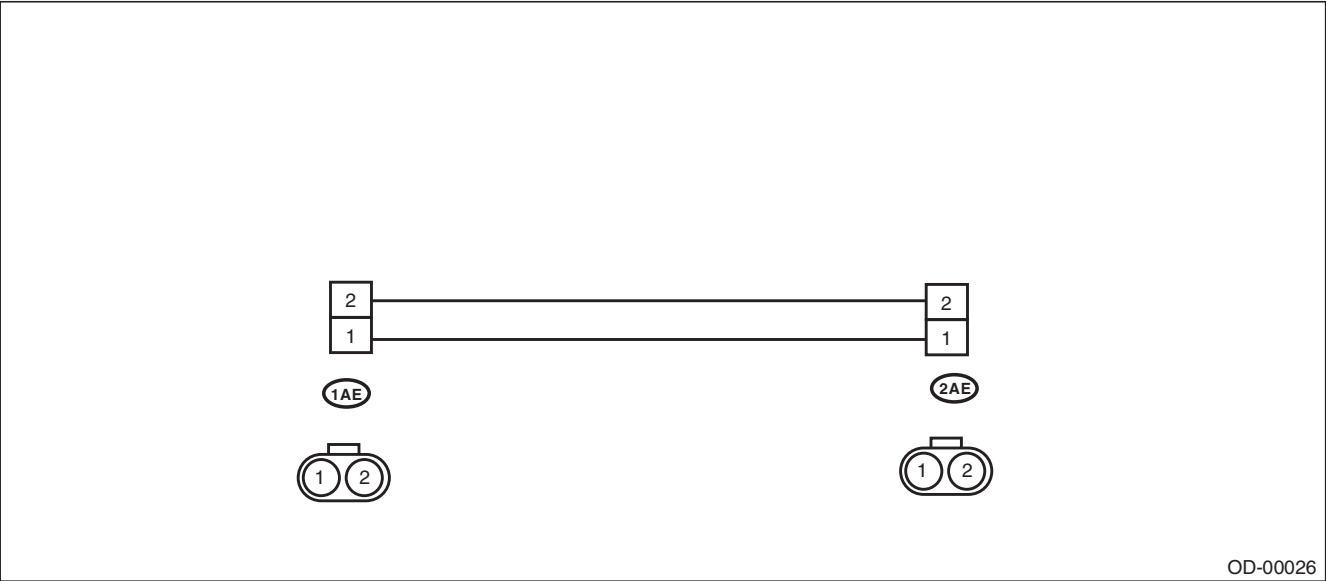


General Description

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

- TEST HARNESS AE

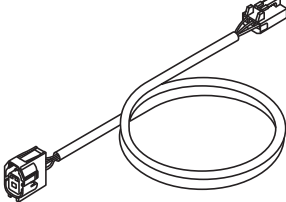
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299XA030	98299XA030	TEST HARNESS AE	TEST HARNESS Y adapter harness Used for troubleshooting seat belt buckle switch.

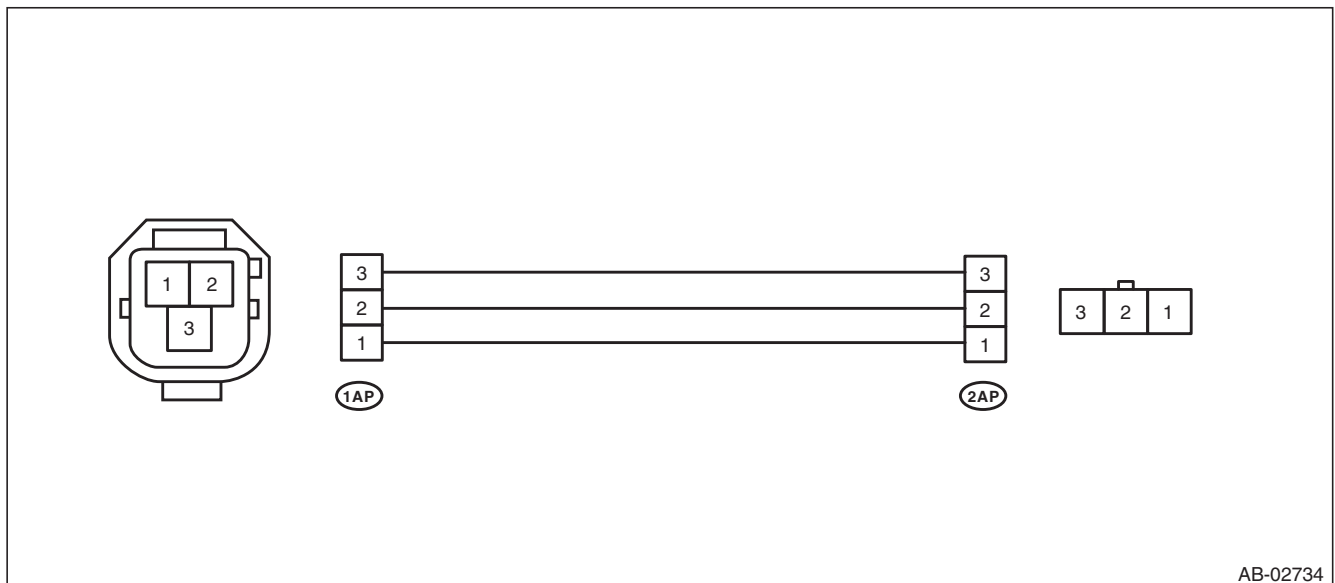


General Description

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

• TEST HARNESS AP

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299FJ030	98299FJ030	TEST HARNESS AP	Used when measuring voltage and resistance of occupant detection system.



2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

Electrical Component Location

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

4. Electrical Component Location

A: LOCATION



OD-00104

- (1) Occupant detection control module (3) Airbag ON/OFF indicator light (4) Buckle switch (passenger's seat)
- (2) Occupant detection sensor



Airbag Connector

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

5. Airbag Connector

A: PROCEDURE

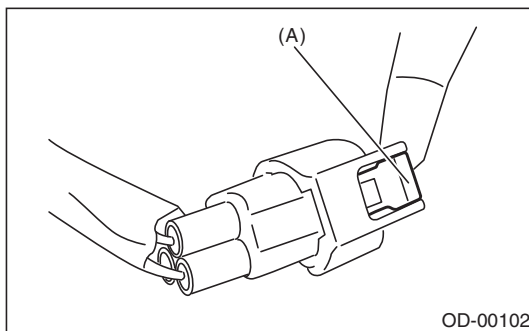
1. OCCUPANT DETECTION SYSTEM (BETWEEN AIRBAG REAR HARNESS AND SEAT HARNESS)

1) How to disconnect:

Press the lock arm (A) and disconnect the connector.

CAUTION:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.



2) How to connect:

Holding the connector, push it in securely until a clicking sound is heard.

CAUTION:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

2. AIRBAG CONTROL MODULE

Refer to Airbag System section. <Ref. to AB-19, AIRBAG CONTROL MODULE, PROCEDURE, Airbag Connector.>

3. BUCKLE SWITCH (PASSENGER'S SEAT)

Refer to Airbag System section. <Ref. to AB-27, BUCKLE SWITCH RH, PROCEDURE, Airbag Connector.>

Control Module I/O Signal

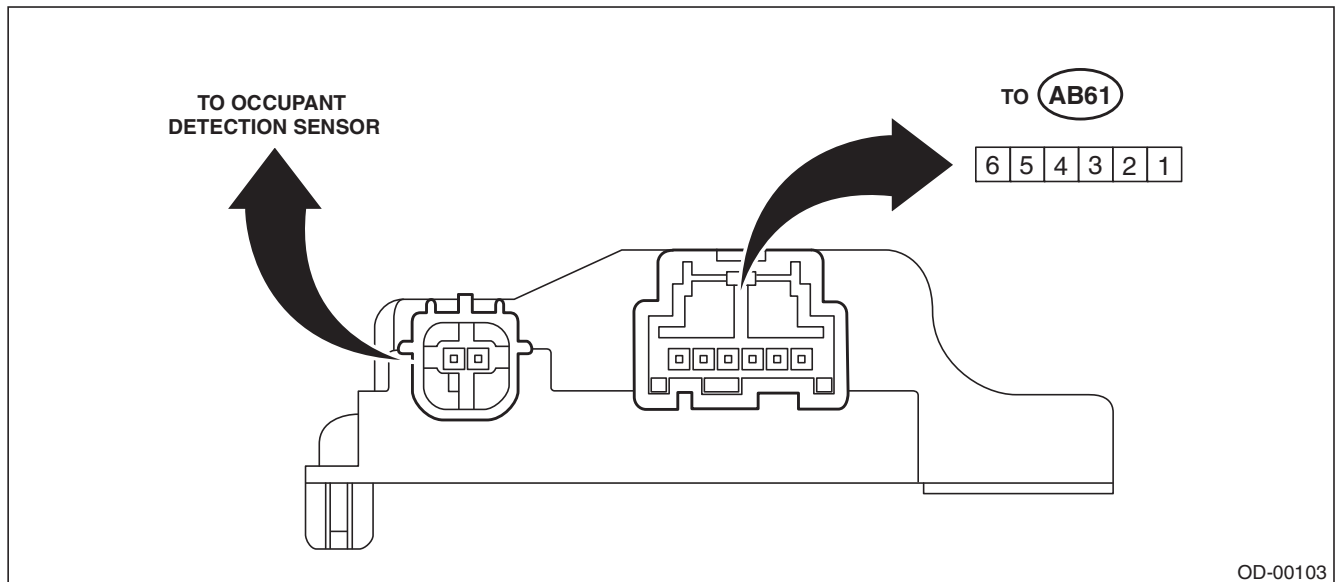
OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

6. Control Module I/O Signal

A: ELECTRICAL SPECIFICATION

CAUTION:

Never remove the occupant detection control module, occupant detection sensor or seat frame because they are integrated into one unit.



Terminal No.	Terminal name	Input/Output value	Note
1	Buckle switch (+)	0 — IG voltage	When buckle switch is ON
2	Buckle switch (—)	0 V	Switch ground
3	Not used	—	—
4	Airbag CM communication (—)	—	—
5	Airbag CM communication (+)	—	—
6	IG power supply	8 — 16 V	When IG switch is ON

NOTE:

Occupant detection sensor signal is unmeasurable.

B: WIRING DIAGRAM

Refer to the electrical wiring diagram. <Ref. to WI-307, WIRING DIAGRAM, Occupant Detection System.>

Subaru Select Monitor

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

7. Subaru Select Monitor

A: OPERATION

For detailed operation procedures, refer to the "PC application help for Subaru Select Monitor".

B: INSPECTION

1. COMMUNICATION FOR INITIALIZING THE AIRBAG SYSTEM IS IMPOSSIBLE

DETECTING CONDITION:

Defective harness connector

TROUBLE SYMPTOM:

Communication is impossible between the airbag control module and the Subaru Select Monitor.

NOTE:

Refer to "COMMUNICATION FOR INITIALIZING IMPOSSIBLE" in AIRBAG SYSTEM (DIAGNOSTICS).
<Ref. to AB(diag)-18, COMMUNICATION FOR INITIALIZING IMPOSSIBLE, INSPECTION, Subaru Select Monitor.>

2. COMMUNICATION FOR INITIALIZING ONLY THE OCCUPANT DETECTION SYSTEM IS IMPOSSIBLE

NOTE:

The occupant detection system communicates with the Subaru Select Monitor via the airbag control module.

DETECTING CONDITION:

Defective harness connector between airbag control module and occupant detection control module

TROUBLE SYMPTOM:

Communication is impossible between the airbag control module and the occupant detection control module. Perform the diagnosis from Step 2 in "DTC B1650 OCCUPANT CLASSIFICATION SYSTEM MALFUNCTION". <Ref. to OD(diag)-19, DTC B1650 OCCUPANT CLASSIFICATION SYSTEM MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>



Read Diagnostic Trouble Code (DTC)

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

8. Read Diagnostic Trouble Code (DTC)

A: OPERATION

Read out DTCs stored in the airbag control module and the occupant detection control module. For operation procedures, refer to the "PC application help for Subaru Select Monitor".

NOTE:

For details concerning DTCs, refer to the List of Diagnostic Trouble Code (Airbag system, Occupant detection system). <Ref. to AB(diag)-28, List of Diagnostic Trouble Code (DTC).> <Ref. to OD(diag)-18, List of Diagnostic Trouble Code (DTC).>



Inspection Mode

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

9. Inspection Mode

A: PROCEDURE

Recreate the circumstance by referring to the conditions described in the checklist.

Clear Memory Mode

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

10. Clear Memory Mode

A: OPERATION

For operation procedures, refer to the "PC application help for Subaru Select Monitor".

NOTE:

After repairing the occupant detection system, clear the DTCs stored in the airbag control module and the occupant detection control module.

Display of Status Information

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

11. Display of Status Information

A: OPERATION

Check the operating condition of each sensor in the event of malfunction in the seat belt buckle switch, or when the seat belt buckle switch has been replaced.

- 1) On «Main Menu» display, select {Each System Check}.
- 2) On «System Selection Menu» display, select {Airbag System}.
- 3) On «Airbag System» display, select {Current Data Display & Save}.

The following table is for support data.

Item	Display	Note
Trip Count	-	-
Count	-	-
Time Count	-	-
Belt Buckle Switch RH	Unbelted/Belted	“Belted” when passenger’s seat belt is fastened “Unbelted” when passenger’s seat belt is not fastened
Passenger Occupant Status	Occupied/Empty or CRS	“Occupied” when the occupant is present “Empty or CRS” when the seat is unoccupied or when child restraint seat is installed
Passenger Airbag Status	ON/OFF	“ON” when the passenger occupant status is “Occupied” “OFF” when the status is “Empty or CRS”

NOTE:

For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.



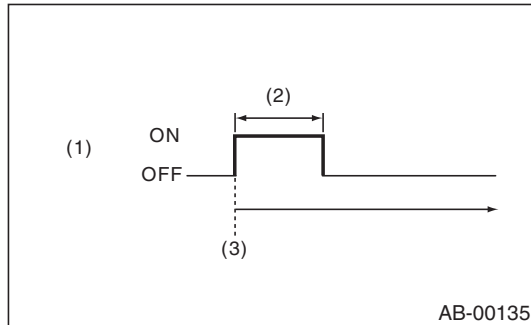
Airbag Warning Light Illumination Pattern

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

12. Airbag Warning Light Illumination Pattern

A: INSPECTION

Turn the ignition switch to ON, and confirm that the airbag warning light remains on for approx. 6 seconds and then goes off afterwards.



- (1) Airbag warning light
- (2) Approx. 6 sec.
- (3) Ignition switch ON

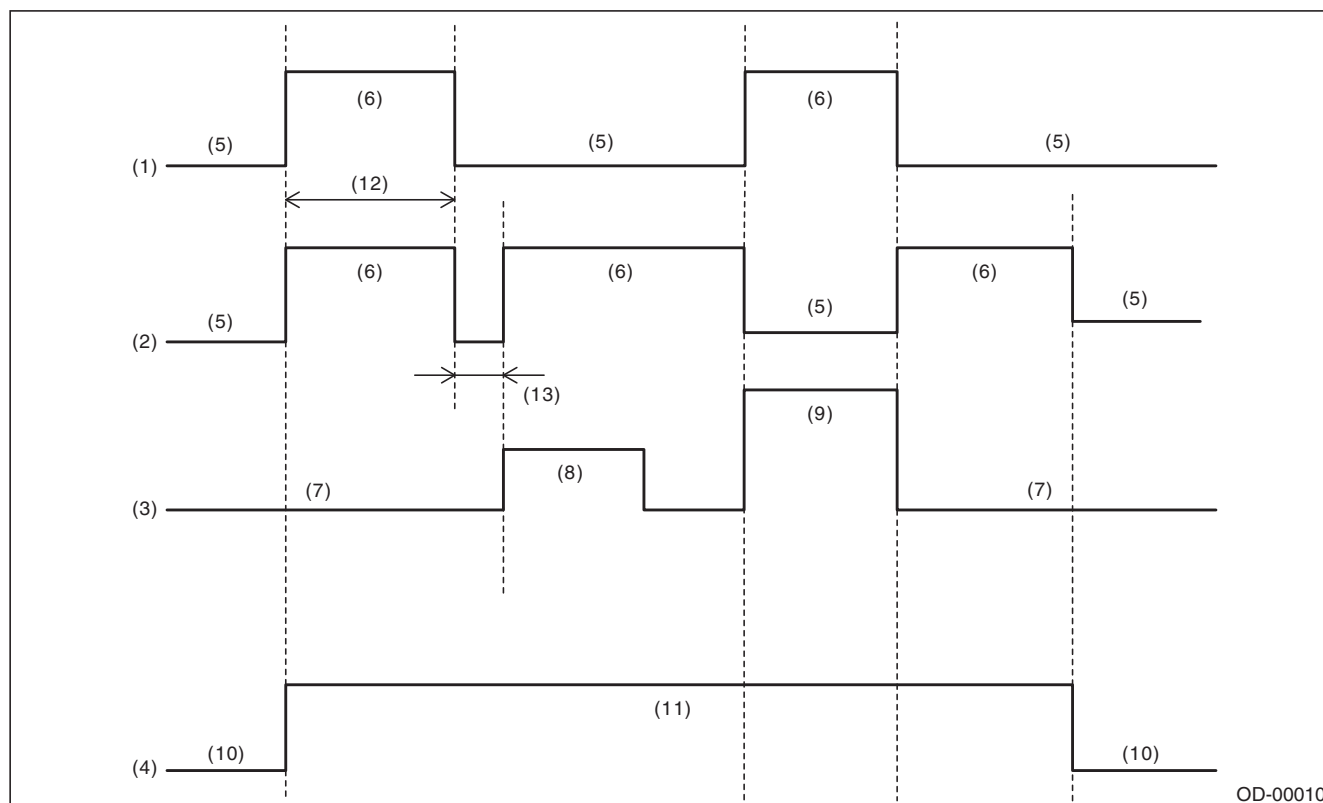


Passenger's Airbag ON/OFF Indicator Light Illumination Pattern

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

13.Passenger's Airbag ON/OFF Indicator Light Illumination Pattern

A: INSPECTION



- | | | |
|--|-------------------------|------------------------|
| (1) Passenger's airbag ON indicator light | (6) Light ON | (10) OFF |
| (2) Passenger's airbag OFF indicator light | (7) Empty | (11) ON |
| (3) Occupant seating | (8) Child seat + infant | (12) Approx. 6 seconds |
| (4) Ignition switch | (9) Adult | (13) Approx. 2 seconds |
| (5) Light OFF | | |

List of Diagnostic Trouble Code (DTC)

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

14. List of Diagnostic Trouble Code (DTC)

A: LIST

DTC	Item	Content of diagnosis	Reference
B1650	Occupant Classification System Malfunction	- Occupant detection sensor is faulty. - Occupant detection control module is faulty. - Occupant detection harness is faulty. - Fuse No. 25 is blown.	<Ref. to OD(diag)-19, DTC B1650 OCCUPANT CLASSIFICATION SYSTEM MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
B1655	Front Buckle Switch RH Failure	- Passenger's buckle switch circuit is open, shorted or shorted to ground. - Occupant detection system is faulty. - Occupant detection harness is faulty.	<Ref. to OD(diag)-21, DTC B1655 FRONT BUCKLE SWITCH RH FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
B1760	Sensor Mat Abnormal	- Occupant detection sensor is faulty. - Occupant detection sensor is open, shorted between terminals, shorted to power supply or shorted to ground. - Seat heater is open. - Occupant detection control module is faulty.	<Ref. to OD(diag)-22, DTC B1760 SENSOR MAT ABNORMAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
B1771	Buckle Switch Abnormal	- Passenger's buckle switch is faulty. - Passenger's buckle switch circuit is open, shorted or shorted to ground. - Occupant detection system is faulty. - Occupant detection harness is faulty.	<Ref. to OD(diag)-22, DTC B1771 BUCKLE SWITCH ABNORMAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
B1795	ECU Internal Circuit Fault	Occupant detection control module is faulty.	<Ref. to OD(diag)-22, DTC B1795 ECU INTERNAL CIRCUIT FAULT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

15. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

A: DTC B1650 OCCUPANT CLASSIFICATION SYSTEM MALFUNCTION

DTC DETECTING CONDITION:

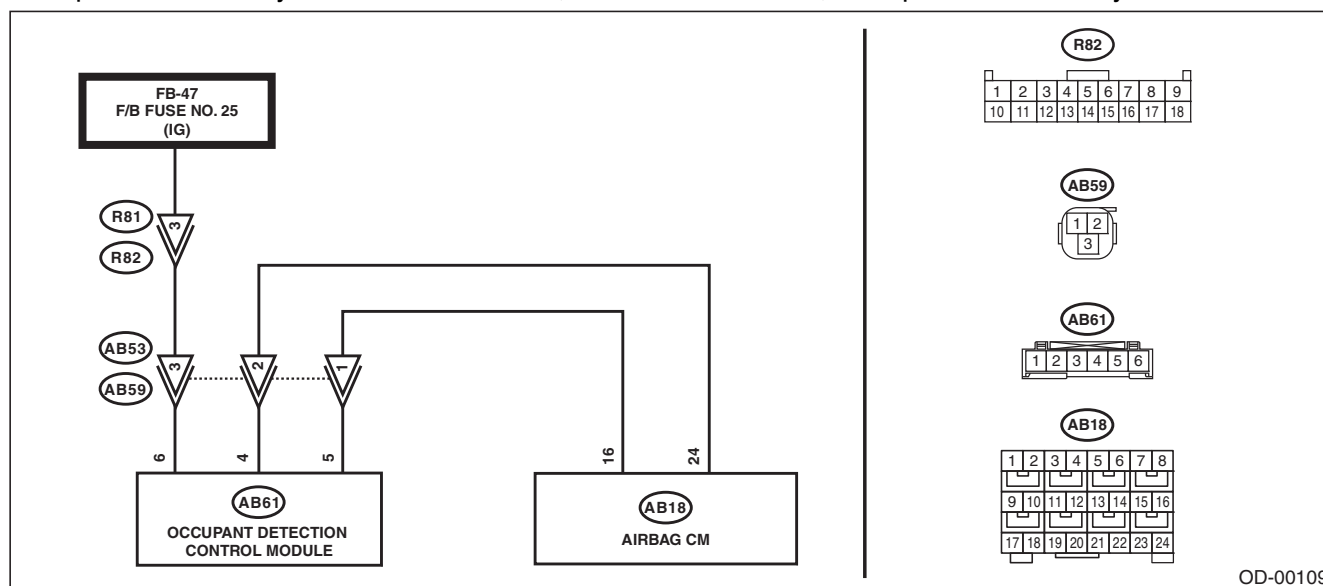
- Occupant detection sensor is faulty.
- Occupant detection control module is faulty.
- Occupant detection harness is faulty.
- Rear airbag harness is faulty.

CAUTION:

Before performing diagnosis, refer to "CAUTION" in "General Description". <Ref. to AB(diag)-4, CAUTION, General Description.>

WIRING DIAGRAM:

Occupant detection system <Ref. to WI-307, WIRING DIAGRAM, Occupant Detection System.>



Step	Check	Yes	No	
1	CHECK DTC. Read the DTC of the occupant detection system.	Is any of DTC B1760, B1761, B1771 and B1795 detected?	Perform the diagnosis according to DTC.	Go to step 2.
2	CHECK POOR CONTACT OF CONNECTORS. Check for poor contact of the connectors between the occupant detection control module and airbag control module.	Is there poor contact?	Reconnect the connector. If defective is not improved, replace the airbag rear harness along with the body harness or the occupant detection harness (seat harness).	Go to step 3.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

Step	Check	Yes	No
3 CHECK AIRBAG REAR HARNESS. 1) Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more. 2) Disconnect the connectors (AB59) and (AB53) under the passenger's seat. 3) Disconnect the connectors (AB6, AB17, AB18) from the airbag control module, and connect the connector (1AG) in the test harness AG to connectors (AB6, AB17, AB18). 4) Connect the connector (1AP) in the test harness AP to the connector (AB53). 5) Measure the resistance between connector (6AG) in the test harness AG and connector (2AP) in the test harness AP. <i>Connector & terminal</i> <i>(6AG) No. 9 — (2AP) No. 2:</i> <i>(6AG) No. 11 — (2AP) No. 1:</i>	Is the resistance less than 10 Ω ?	Go to step 4.	Replace the airbag rear harness along with body harness.
4 CHECK AIRBAG REAR HARNESS. Measure the resistance between connector (6AG) in the test harness AG and chassis ground. <i>Connector & terminal</i> <i>(6AG) No. 9 — Chassis ground:</i> <i>(6AG) No. 11 — Chassis ground:</i> <i>(6AG) No. 9 — (6AG) No. 11:</i>	Is the resistance 1 M Ω or more?	Go to step 5.	Replace the airbag rear harness along with body harness.
5 CHECK OCCUPANT DETECTION HARNESS. 1) Turn the ignition switch to ON. 2) Measure the voltage between connector (2AB) in the test harness AB and chassis ground. <i>Connector & terminal</i> <i>(2AP) No. 3 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Replace the occupant detection harness (seat harness). If defective is not improved, replace the occupant detection system (passenger's side cushion & frame assembly), and then the airbag control module in this order. <Ref. to SE-26, PASSENGER'S SEAT, DIS-ASSEMBLY, Front Seat.>	Check the battery voltage and fuse. If there is no fault, replace the airbag rear harness together with body harness.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

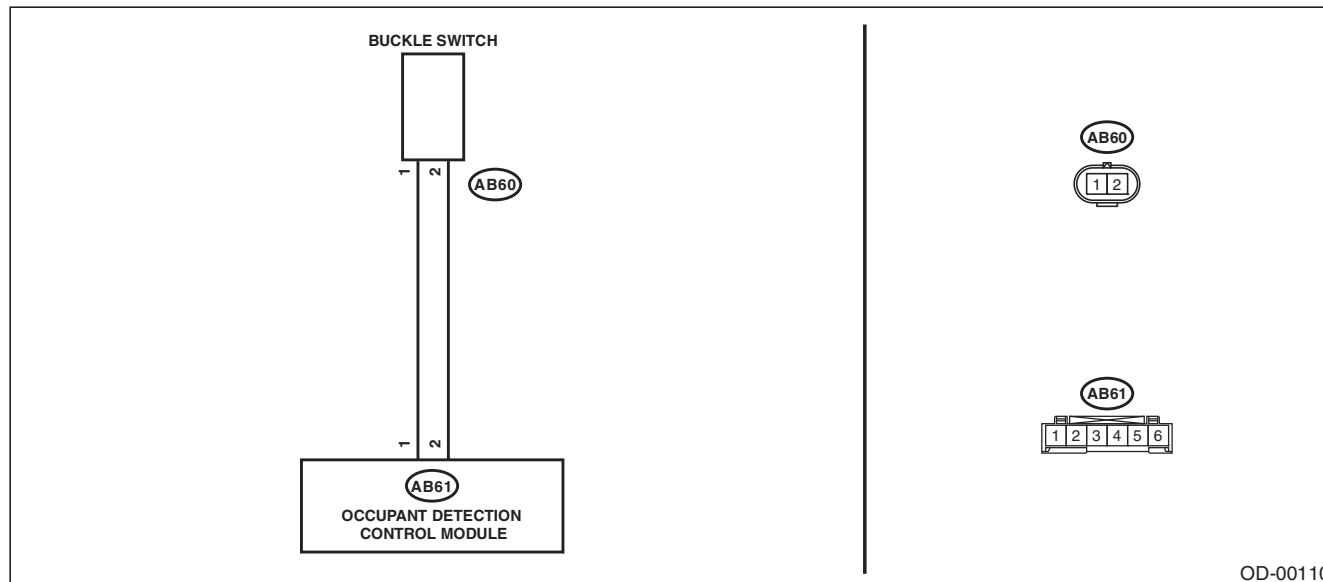
B: DTC B1655 FRONT BUCKLE SWITCH RH FAILURE

DTC DETECTING CONDITION:

- Passenger's buckle switch circuit is open, shorted or shorted to ground.
- Seat harness circuit is open, shorted or shorted to ground.
- Occupant detection control module is faulty.

WIRING DIAGRAM:

Occupant detection system <Ref. to WI-307, WIRING DIAGRAM, Occupant Detection System.>



	Step	Check	Yes	No
1	CHECK DTC. Read the DTC of the occupant detection system.	Is any of DTC B1760, B1761, B1771 and B1795 detected?	Perform the diagnosis according to DTC.	Go to step 2.
2	CHECK POOR CONTACT OF CONNECTORS. Check for poor contact of the connectors between the occupant detection control module and buckle switch.	Is there poor contact?	Reconnect the connector. If the fault is not fixed, replace the airbag harness.	Go to step 3.
3	CHECK BUCKLE SWITCH. 1) Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait for 60 seconds. 2) Disconnect the buckle switch connector (AB60). 3) Connect the test harness AE and test harness connector Y to buckle switch connector (AB60). 4) Connect the battery ground terminal and turn the ignition switch to ON.	Does the airbag warning light illuminate for 6 seconds and go off?	Replace the buckle switch. <Ref. to SB-15, SEAT BELT OUTER - FRONT, REMOVAL, Front Seat Belt.>	Check the seat harness, and if any fault is found, replace the seat harness. If the fault is not fixed, replace the occupant detection system (passenger's side cushion & frame assembly). <Ref. to SE-26, PASSENGER'S SEAT, DISASSEMBLY, Front Seat.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

OCCUPANT DETECTION SYSTEM (DIAGNOSTICS)

C: DTC B1760 SENSOR MAT ABNORMAL

DTC DETECTING CONDITION:

- Occupant detection sensor circuit is open, shorted between terminals, shorted to power supply or shorted to ground.
- Seat heater circuit is open.
- Occupant detection control module is faulty.

Step	Check	Yes	No
1 CHECK POOR CONTACT OF CONNECTORS. Check for poor contact of connectors between the occupant detection control module and the occupant detection sensor.	Is there poor contact of connector?	Reconnect the connector. If the fault is not fixed, replace the occupant detection harness or replace the occupant detection system (passenger's side cushion & frame assembly).	Replace the occupant detection system (passenger's & frame assembly). <Ref. to SE-26, PASSENGER'S SEAT, DISASSEMBLY, Front Seat.>

D: DTC B1771 BUCKLE SWITCH ABNORMAL

DTC DETECTING CONDITION:

- Passenger's seat buckle switch is faulty.
- Passenger's buckle switch circuit is open, shorted or shorted to ground.
- Occupant detection system is faulty.
- Occupant detection harness is faulty.

Perform the diagnosis from step 2 in "DTC B1655 FRONT BUCKLE SWITCH RH FAILURE". <Ref. to OD(diag)-21, DTC B1655 FRONT BUCKLE SWITCH RH FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

E: DTC B1795 ECU INTERNAL CIRCUIT FAULT

DTC DETECTING CONDITION:

Occupant detection control module is faulty.

When "DTC B1795 ECU INTERNAL CIRCUIT FAULT" is displayed, the occupant detection control module is faulty. Replace the occupant detection system (passenger's side cushion & frame assembly). <Ref. to SE-26, PASSENGER'S SEAT, DISASSEMBLY, Front Seat.>