

SUPPLEMENTAL RESTRAINT SYSTEM

■ Restraint System

■ Description

This vehicle adopts the occupant restraint system, which includes active and supplemental types. Active restraint system requires occupants to take some actions, such as fastening seat belt; while supplemental restraint system requires no actions from occupants.

■ Active Restraint System

- (1) Driver seat belt and front passenger seat belt.
- (2) Rear seat belt.

■ Supplemental Restraint System

- (1) Airbag system

■ Operation

Supplemental restraint system can improve the safety of occupants only when used in combination with seat belts. Occupants must fasten their seat belts in order to gain full protection from supplemental restraint system. Supplemental restraint system circuit is continuously monitored and controlled by SRS control module assembly. Airbag indicator on instrument cluster illuminates for approximately 6 seconds for a test each time ENGINE START STOP switch is turned to "ON". Airbag indicator goes off after the test is completed. If indicator comes on at any time other than test time, it indicates that there is a problem in supplemental restraint system circuit. Whether airbag deploys or not depends on the angle and severity of an impact. When vehicle is subjected to a severe collision, microprocessor of airbag module in supplemental restraint system sends signals to corresponding inflator units of airbags to deploy the airbags quickly, thus protecting occupants.

Caution

- Never expose airbag components directly to hot air or open flames.
- Never attempt to disassemble or repair airbag components.
- Removed airbags should be kept properly. Never put other objects on them. If triggered accidentally, it may cause personal injury.
- As a disposable component, the airbag must be replaced after deployment and avoid reusing it.
- Always dispose of vehicle together with airbags, or the airbags may be triggered accidentally to cause personal injury.

Warning

- Before removing airbag system components, disconnect the negative battery cable and wait for at least 90 seconds. Before servicing steering system, remove the driver airbag and spiral cable for safekeeping.
- If vehicle has been involved in a minor collision but the airbags do not deploy, always inspect airbag components.
- If airbags may be touched during servicing, remove the airbags as necessary and keep it properly before servicing.
- Never use airbag components from another vehicle. When replacing the airbag components, replace with new ones.
- If an airbag component is dropped or if there are any cracks, dents or other defects in the case, bracket or connector, replace the airbag component with a new one.
- Information labels are attached to the periphery of airbag components. Always follow the cautions and instructions on labels.

■ Configuration and Learning

Hint:

Perform ACM configuration data learning when replacing with a new module.

Use diagnostic tester to perform ACM configuration learning. For working flow, refer to diagnostic tester menu function and datastream of supplemental restraint system.

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Caution

- Write VIN code before writing in ACM configuration data.
- Be sure to switch EOL mode to normal mode before writing in ACM configuration data.

■ IMU Off-line Calibration

Hint:

Perform off-line calibration when replacing with a new module or IMU uncalibrated fault occurs. Use diagnostic tester to perform IMU off-line calibration. For working flow, refer to diagnostic tester menu function and datastream of supplemental restraint system.

Caution

- Be sure to switch EOL mode to normal mode before performing IMU off-line calibration.
- Be sure to exit EOL mode after calibration is completed. Otherwise, it may affect collision judgment and airbag cannot deploy even when collision occurs.

■ Writing VIN Code

Hint:

- It is necessary to write VIN code after replacing with a new module.
- Use diagnostic tester to perform VIN code writing. For working flow, refer to diagnostic tester menu function and datastream of supplemental restraint system.

■ EOL Mode Switching

Hint:

- EOL mode switching is used to assist IMU and configuration; After both learnings are finished, be sure to switch EOL mode to normal mode; Using diagnostic tester to perform EOL mode switching.

Caution

- Be sure to exit EOL mode after calibration is completed. Otherwise, it may affect collision judgment and airbag cannot deploy even when collision occurs.

■ Precautions During Usage

Airbag is passive safety system component. In order to actually protect the passengers in collision with airbag, users should follow the precautions related to airbag usage:

- Driver and passengers should use belt correctly. Correct belt usage can protect human body and reduce the personal injury in accidents.
- DO NOT add any additional units without permission that may interfere or damage belt pretensioner or airbag.
- DO NOT place any objects on steering wheel and front passenger side instrument panel, or these objects may cut into the inflated airbag or become trajectory to injure human body.
- DO NOT add or reversely place seat cover for seats with side airbag.
- Children that are under twelve are not allowed to sit in front seat. For vehicles equipped with passenger airbag, backward facing child seat is not allowed to use on front passenger seat.
- It's only allowed to install genuine spare parts.
- Only authorized personnel can remove the controller, wire harness and connector from SRS system.
- If airbag and belt pretensioner are deployed in accident, airbag controller and all wire harness with airbag connectors must be replaced together with airbag and belt.
- SRS system in all vehicles have been matched and verified and it's forbidden to change vehicle structure and SRS system. Random addition and modification of SRS system and wire harness will make SRS system operate abnormally, leading to airbag fault deployment and undeployment, which results in personal injury.
- Airbag manufacturer suggests that the airbag should be replaced after 10 years.

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■ Post-accident Repair and Inspection

(1) Post-accident components replacement of deployed airbag

- 1) SRS system components should be replaced immediately in accordance with the provisions in this manual after the airbag is deployed in an accident. After the airbag is deployed, there may be powder particles on airbag surface, which are primarily composed of chemical reaction product.

(2) Post-accident components replacement of seat belt

- 1) Some seat belts need to be replaced or recommended to be replaced if airbag is deployed in an accident:

Seat Belt	Replace or Not
Used limiting type belt in the event of an accident	It is necessary to replace it
Seat belt with pretensioner that must be exploded or has been exploded	It is necessary to replace it
Used common emergency lock type belt in the event of an accident	It is necessary to replace it
Height adjuster (the seat belt had been used in the event of an accident)	It is necessary to replace it

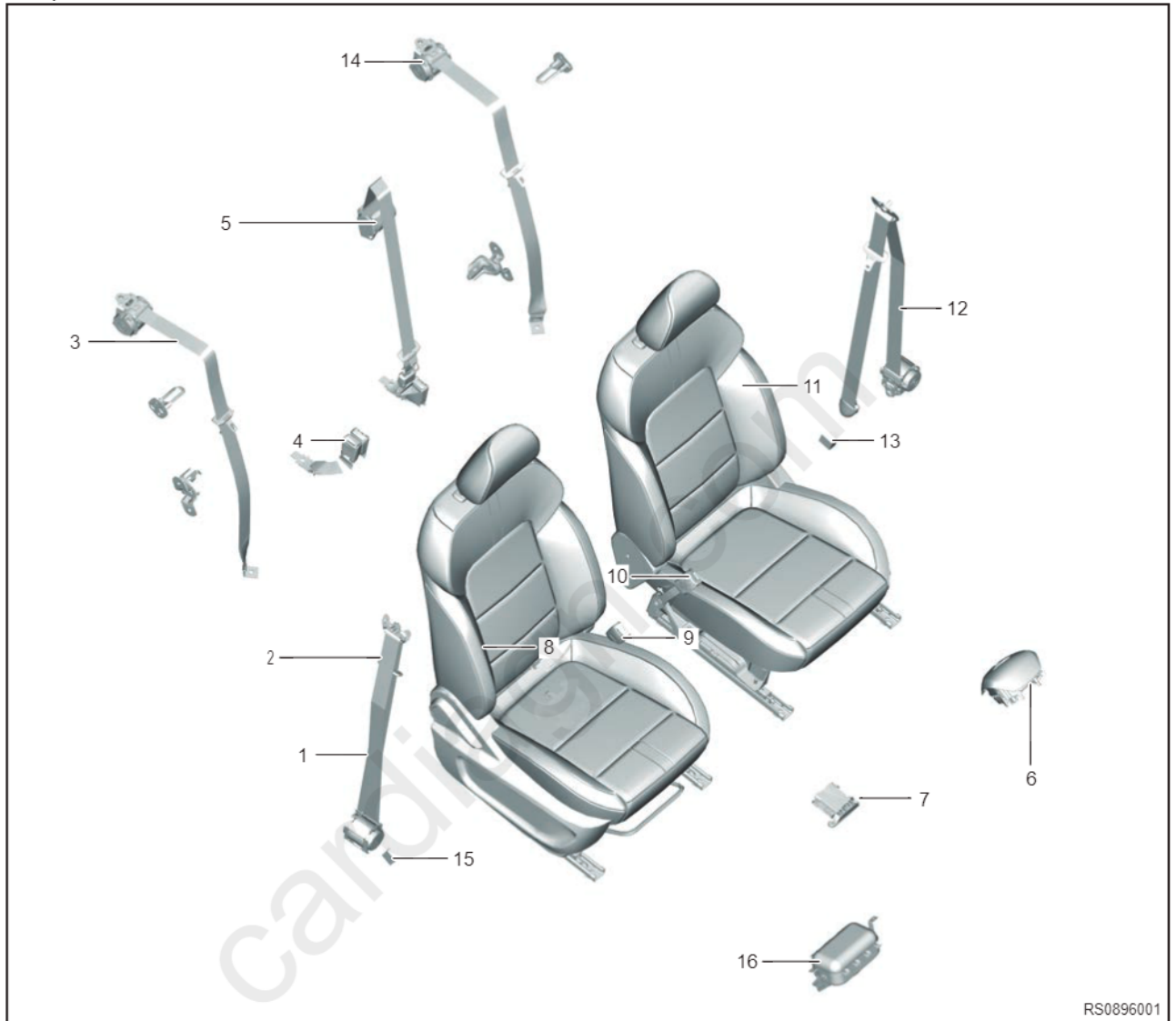
(3) Post-accident inspection of other components

- 1) No matter whether the airbag is deployed or not, specific inspection must be carried out after any collision. The steering column must be measured for dimension. Check the instrument panel and steering column cover for cracks or other damage, check the instrument panel support for deformation, bending, cracks or other damage and check the seat belt and installation fixing point.

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■ Restraint System Components and Configuration Difference

Restraint system mainly consists of airbag system and seat belt. The schematic diagram for main components is as follows:



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No.	Part Name	No.	Part Name
1	Front Right Seat Belt Assembly	9	Front Right Seat Belt Buckle
2	Height Adjuster	10	Front Left Seat Belt Buckle
3	Rear Right Seat Belt Assembly	11	Driver Side Seat Airbag Assembly
4	Seat Belt Buckle Assembly	12	Left Seat Belt Assembly
5	Rear Center Seat Belt Assembly	13	Front Left Collision Sensor
6	Driver Airbag Assembly	14	Rear Left Airbag Assembly

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No.	Part Name	No.	Part Name
7	Airbag Controller Assembly	15	Right Side Collision Sensor
8	Front Passenger Side Seat Airbag Assembly	16	Front Passenger Airbag Assembly

■ Restraint System Function Introduction

Airbag: The controller controls ignition circuit and ignites airbag (and belt pretensioner) reasonably to keep occupants at proper position in the cabin when accident occurs, thus protecting occupants.

- (1) Driver airbag/front passenger airbag
It's helpful to protect head and chest of driver and front passenger from being struck by components in vehicles.
- (2) Front airbag (if equipped)
It's helpful to protect chest and hip of front passenger.
- (3) Curtain shield airbag (if equipped)
It's helpful to protect head of passenger.
- (4) In M31T/M32T, the following types of belts are equipped together with common emergency lock type belt.

Emergency lock type belt.

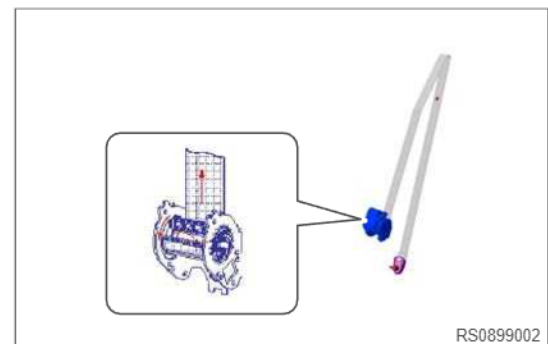
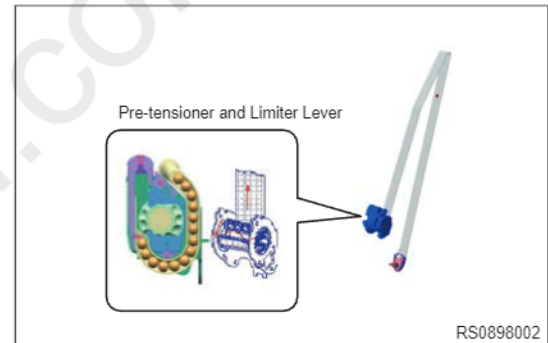
Reduce the pressure of belt on passengers, protect the occupants and prevent second collision.

Limiting type belt

Besides common emergency lock type belt, limiter lever is added. Reduce the pressure of belt on passengers, protect the occupants and prevent second collision.

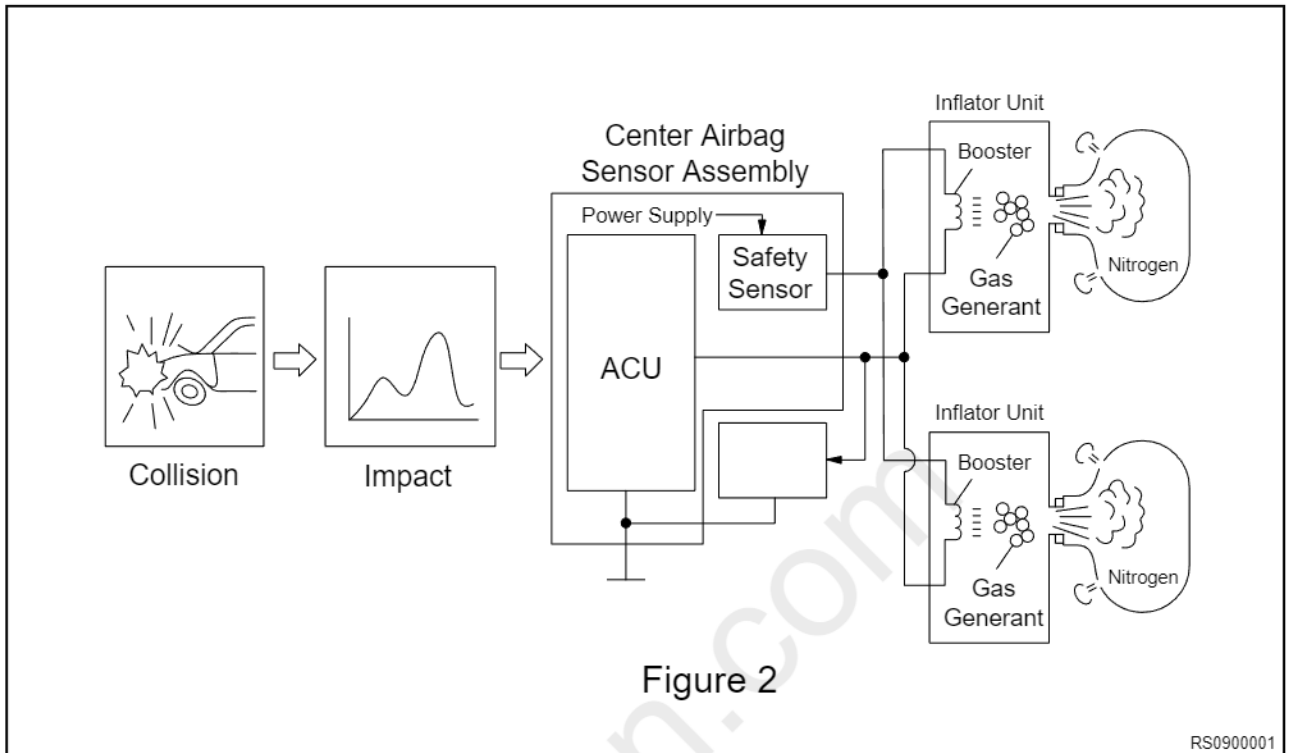
Limiting type belt with pretensioner.

Besides common emergency lock type belt, pretensioner and limiter lever are added, which tightens the belt, reduces the pressure of belt on passengers, protects the occupants and prevents second collision during deployment.



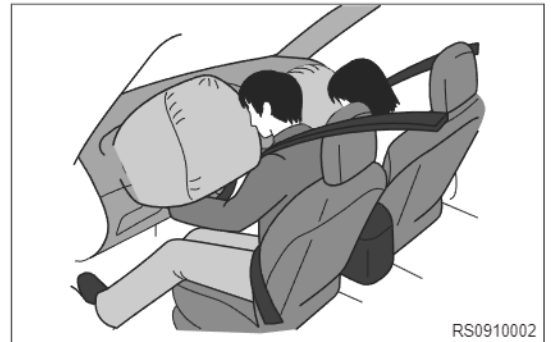
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■ Airbag Control System Operation



Operating Conditions Front collision

- Front collision is detected by the sensor in controller.
- Front collision ignition deployment circuit: driver and passenger front airbags, all seat belt with pretensioners.

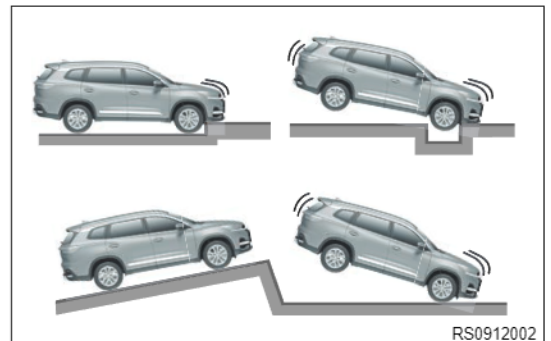


Side

- Side collision is detected by the side collision sensor in B-pillar and the Sensor in controller.
- Side collision ignition deployment circuit: Curtain shield airbag, seat airbag and seat belt with pretensioner on collision side.

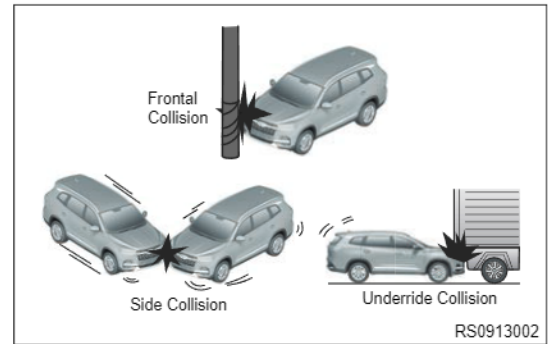
Other collisions

- If the bottom of vehicle is subjected to a severe impact, the driver airbag and front passenger airbag may also deploy as shown in illustration.

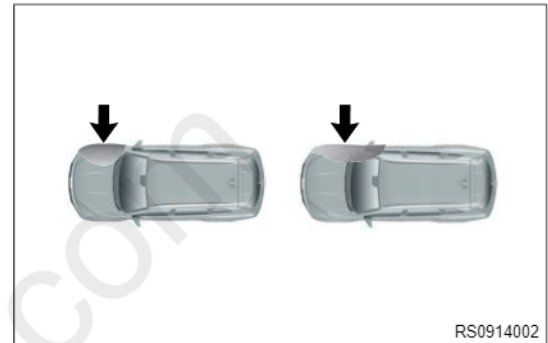


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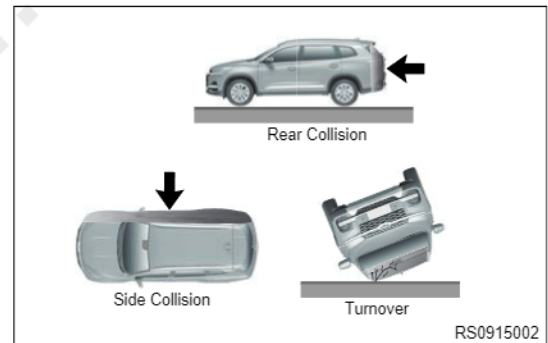
- As shown in illustration, if the vehicle goes under the bottom of truck etc. or involved in side collision, the driver airbag and front passenger airbag may not deploy.



- As shown in illustration, if a collision to the side of the vehicle body other than the passenger compartment, or the vehicle is subjected to a collision from the side at certain angles, the front side airbag and curtain shield airbag may not deploy.



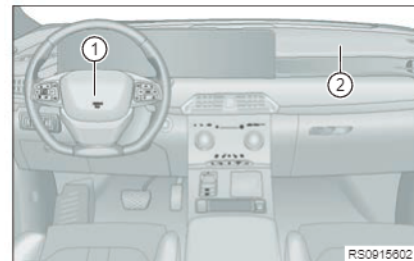
- The side airbag and curtain shield airbag will not generally deploy if the vehicle is involved in a front collision, rear collision or roll over.



■ Driver Front Airbag and Passenger Front Airbag

Driver front airbag is located on the steering wheel and integrated with the horn switch. Passenger front airbag is located above the glove box and inside the instrument panel upper body. As shown in illustration:

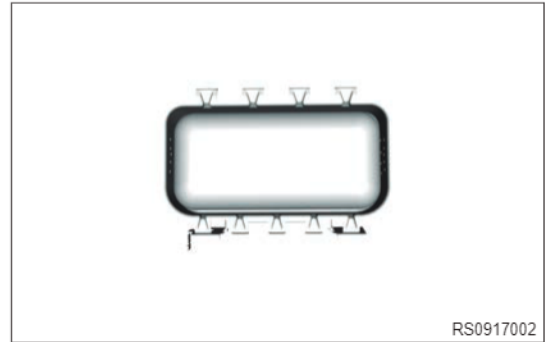
- (1) Position of driver front airbag.
- (2) Position of passenger front airbag.



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Passenger front airbag

Resistance value: $2.0 \pm 0.3 \Omega$, it's strictly forbidden to measure resistance with multimeter!



Driver front airbag

Resistance value: $2.0 \pm 0.3 \Omega$, it's strictly forbidden to measure resistance with multimeter!



■ Side Collision Sensor and Front Seat Belt Pretensioner

Seat belt pretensioner and side collision sensor is located under the B-pillar.

⚠ Caution

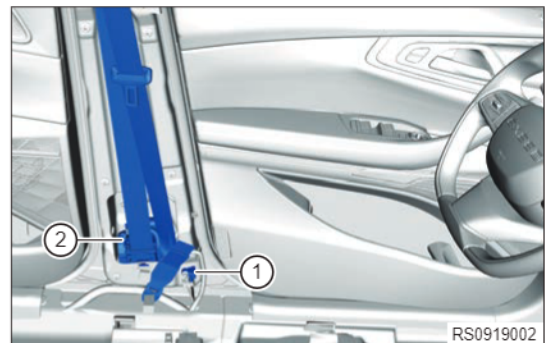
Seat belt pretensioner and side collision sensor positions on both sides are the same.

As shown in illustration:

(1) Side collision sensor (1)

(2) Seat belt pretensioner (2)

Resistance value is $2.0 \pm 0.3\Omega$, it's strictly forbidden to measure resistance with multimeter!



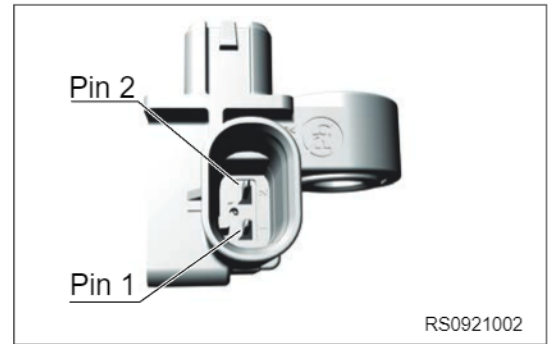
(3) Side collision sensor is used to detect the vehicle side collision signal.



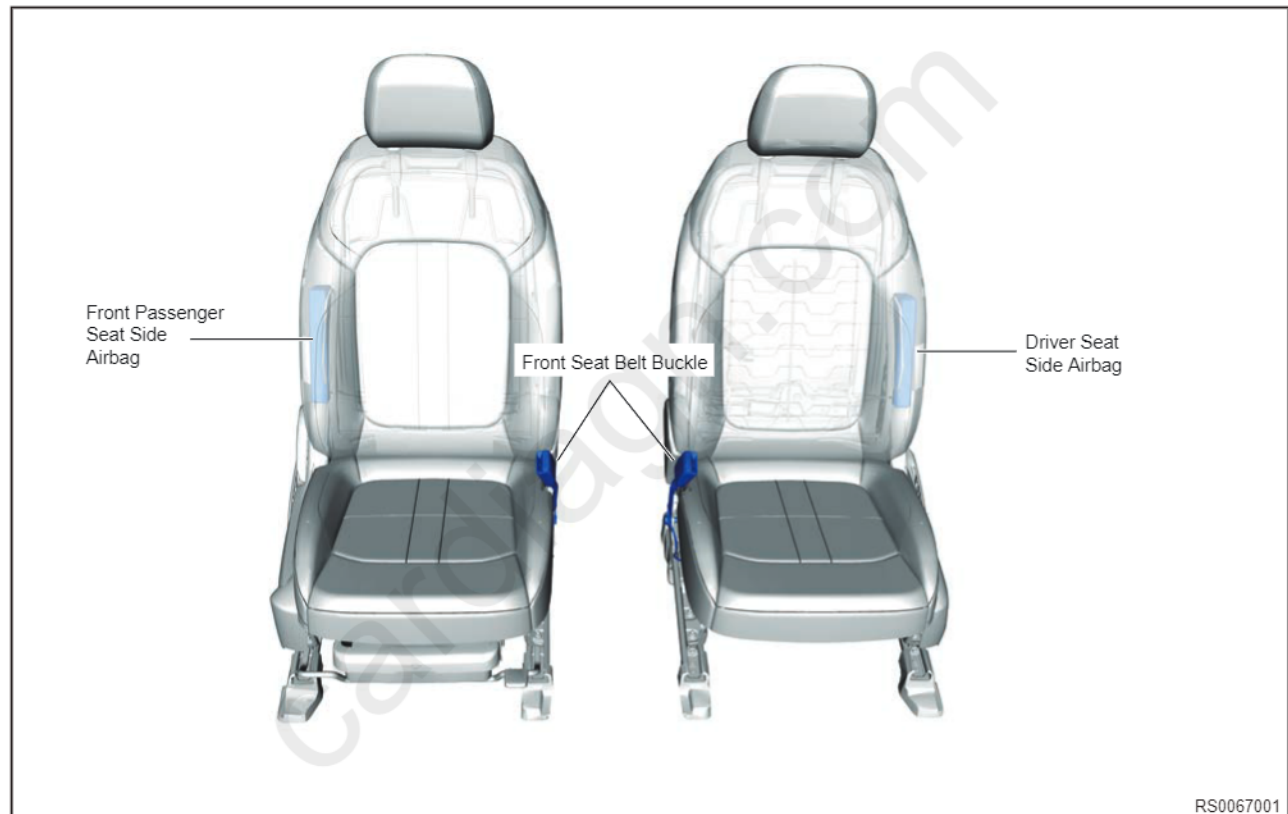
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Terminal list

- (1) Signal
- (2) Ground

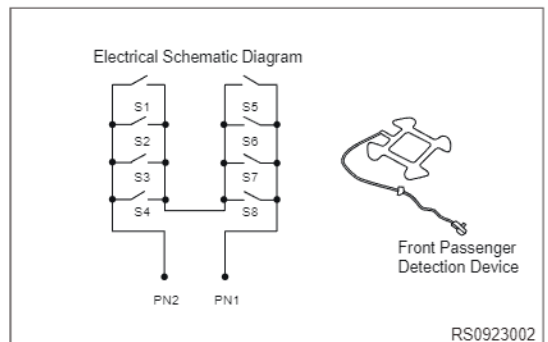


■ Front Passenger Side Airbag and Front Passenger Seat Belt Buckle



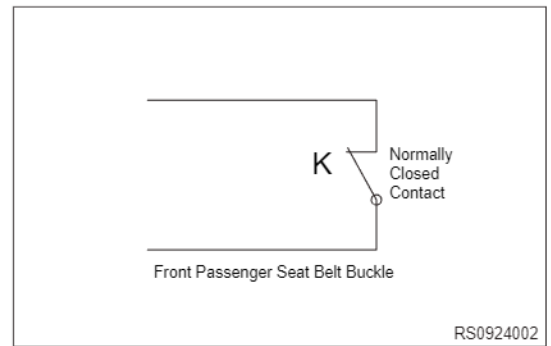
Airbag resistance on seat: $2.0 + 0.5 / -0.3\Omega$, it's strictly forbidden to measure resistance with multimeter!

- Front passenger detection device schematic diagram as shown in illustration: Passenger loading status: When detected external resistance is lower than 100Ω , it's judged that there is passenger. When resistance is higher than 400Ω , it's judged that there is no passenger.

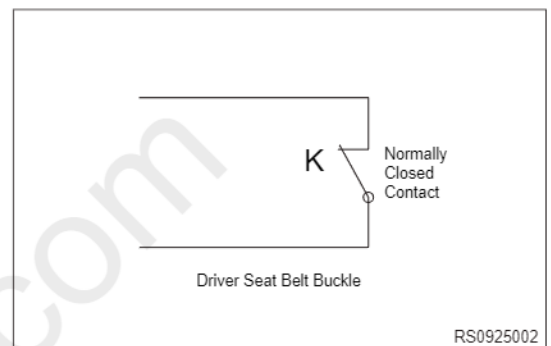


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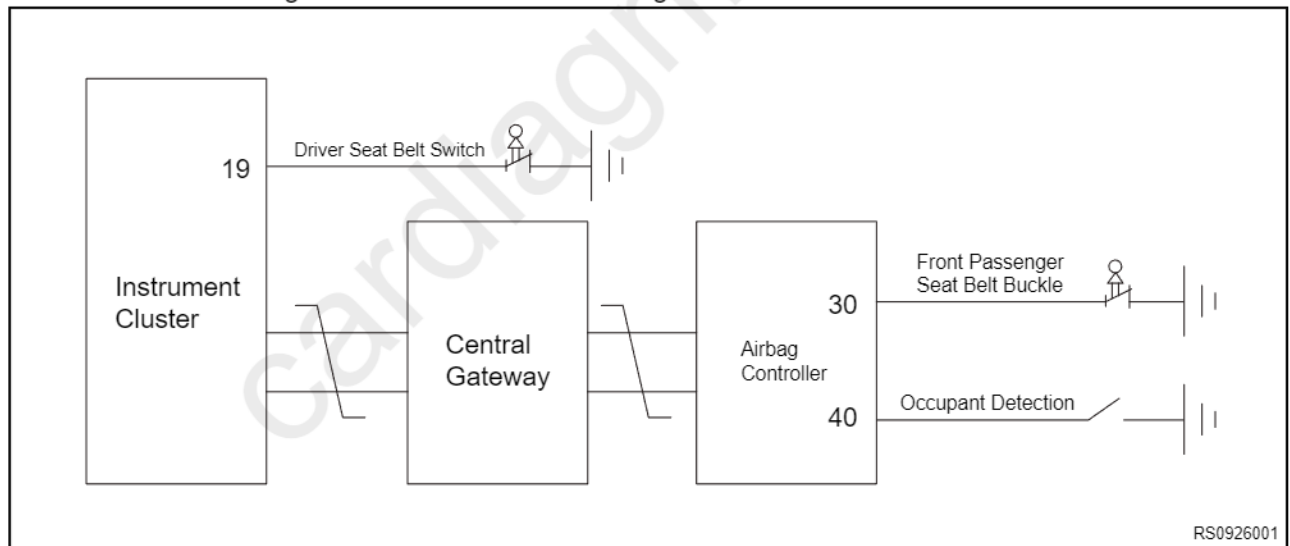
- Front passenger seat belt buckle schematic diagram is as shown in illustration. Front passenger seat belt buckle status: When detected external resistance is lower than $400\ \Omega$, it's judged that the seat belt is not fastened. When resistance is higher than $900\ \Omega$, it's judged that the seat belt is fastened.



- Driver seat belt buckle schematic diagram is as shown in illustration. The buckle is connected to the 19# terminal of instrument cluster. When ENGINE START STOP switch is ON, if the 19# terminal is high level / suspending, the driver seat belt warning in instrument cluster does not alarm; if the 19# terminal is low level, it will alarm.



Electrical schematic diagram related to seat belt warning is as follows:



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Warning strategy is as follows

When ENGINE START STOP switch is in ON position:

If the driver wears the seat belt, the driver seat belt warning light goes off; If the seat belt is not fastened, the driver seat belt warning symbol flashes, and the buzzer will sound when vehicle speed is ≥ 25 km/h, to remind the driver to wear the seat belt;

When ENGINE START STOP switch is in ON position:

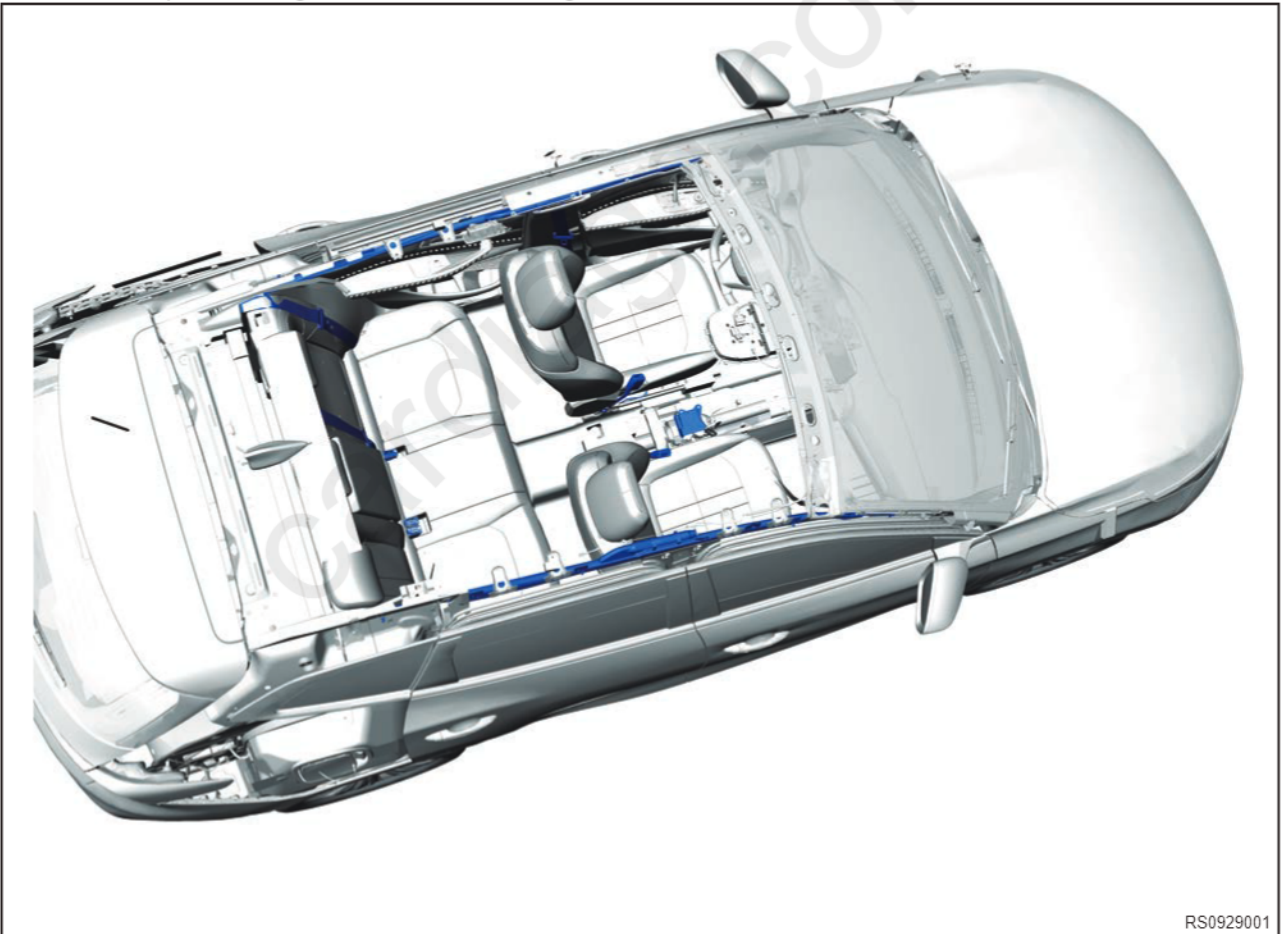
The passenger seat belt buckle switch detection and passenger detection device operate together to confirm the logic of front passenger seat belt reminder warning light.

If there is an adult on the seat (signal of the detection device), and the seat belt is not fastened, the passenger seat belt warning symbol flashes, and the buzzer will sound when vehicle speed is 25 km/h or more, to remind the passenger to wear the seat belt. If the seat belt is fastened, the alarm will stop.

When seat belt warning is operating:

If the seat belt is fastened, the alarm will stop.

Shift to R position or warning for 100 seconds has finished, the buzzer stops sounding and indication warning continues.



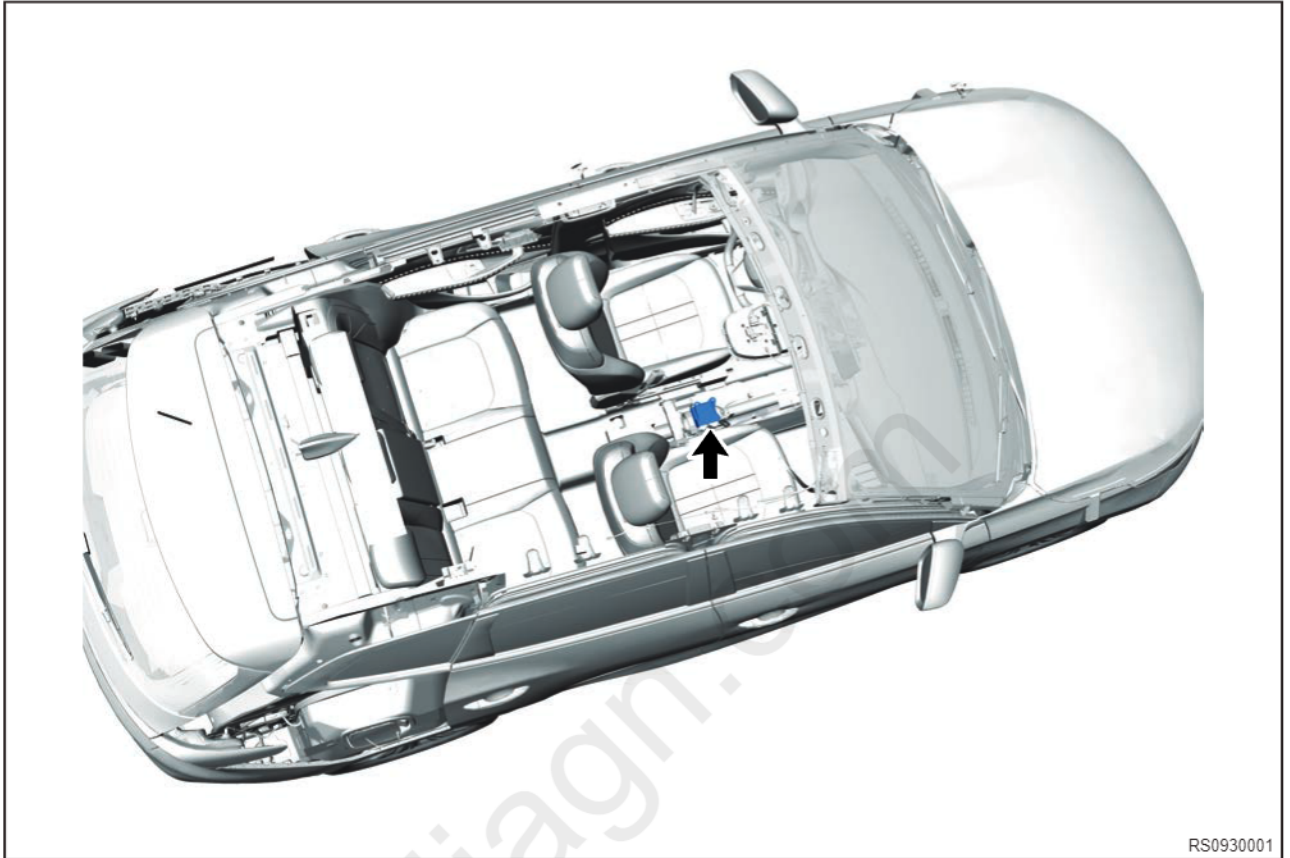
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Curtain shield airbag is mainly used to protect the head of passengers during side collision. The curtain shield airbag is installed in the inner side of roof and body quarter sheet metal, usually run through the front and rear, and it is controlled by the lateral acceleration sensor in the body. It will deploy when the lateral acceleration is greater than the calibrated threshold. Resistance value: $2.0 \pm 0.3 \Omega$, it's strictly forbidden to measure resistance with multimeter!

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■ Airbag System Controller

In general, airbag control module is installed in the center passage of vehicle.



- (1) Repair or replacement of damaged airbag control module must be performed by an authorized worker.
- (2) During the life of the airbag control module, the same airbag control module must always be installed on the vehicle where it was originally installed and not allowed to be used in other vehicles.
- (3) Airbag control module must be replaced after the airbag deploys.
- (4) The airbag control module and peripheral sensors have a high-precision structure, be sure to handle these components carefully. The components must be disposed if they fall to the ground.

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■ Rear Seat Belts



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⚠ Caution

- If the rear left seat belt assembly is preload limiting type belt, the resistance value is $2.15 \pm 0.35 \Omega$, it's strictly forbidden to measure resistance with multimeter!
- If the webbings on both sides of rear seat cannot be pulled out, it is necessary to make a preliminary judgment on the seat belt. If the seat belt is locked due to the sensitivity function of seat belt.
- Judgment method: Slowly contract the webbing for 10-15 mm, and then pull out it slowly. If the seat belt can be pulled out normally and there are no other problems, the seat belt is normal. If the webbing can not be pulled out, further testing of seat belt is required.

■ Supplemental Restraint System Composition

⚠ Caution

Supplemental restraint system consists of driver airbag, front passenger airbag, front side airbag (if equipped), curtain shield airbag (if equipped), SRS control module assembly, spiral cable, airbag malfunction indicator and wire harness etc.

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■ Driver Airbag

- (1) Driver airbag is installed in the steering wheel, which will inflate to protect driver in the event of a severe collision.

Driver airbag resistance value: $2.0 \pm 0.2 \Omega$

■ Front Passenger Airbag

- (1) Front passenger airbag is installed in the upper right side of instrument panel, which will inflate to protect front passenger in the event of a severe collision.

Front passenger airbag resistance value: $2.1 \pm 0.4 \Omega$

■ Front Side Airbag (If Equipped)

- (1) Front side airbag is installed in both sides of front seat, which will mitigate injury caused by side impact, and prevent the direct contact between torso and door panel, thus protecting front passenger safety effectively. It can protect the safety of front passenger effectively.

Front side airbag resistance value: $2.0 + 0.5 / - 0.3 \Omega$

■ Curtain Shield Airbag (If Equipped)

- (1) Curtain shield airbags are installed on both sides of roof, which will inflate to protect passenger in the event of a severe collision.

Curtain shield airbag resistance value: $2.0 \pm 0.3 \Omega$

■ SRS Control Module Assembly

- (1) SRS control module assembly has a built-in collision sensor, which is installed on the body floor of auxiliary fascia console assembly. It controls the inflation of airbag so as to protect driver and other occupants in the event of a severe collision.

■ Spiral Cable

- (1) It is used to connect driver airbag while ensuring that steering wheel has enough steering angle.

■ Airbag Malfunction Indicator

- (1) After ENGINE START STOP switch is turned to ON, if malfunction indicator goes off after coming on for approximately 6 seconds, it means that supplemental restraint system operates normally. If malfunction indicator does not come on, remains on or flashes, it means that supplemental restraint system has a problem and it is necessary to perform tests and repairs.

■ Left Side Collision Sensor (If Equipped)

- (1) The sensor transmits collision signals from left side to SRS module to control the airbag to inflate quickly, thus protecting people in vehicle.

Left side collision sensor resistance value: $2.0 \pm 0.3 \Omega$

■ Right Side Collision Sensor (If Equipped)

- (1) The sensor transmits collision signals from right side to SRS module to control the airbag to inflate quickly, thus protecting people in vehicle.

Right side collision sensor resistance value: $2.0 \pm 0.3 \Omega$

■ Wire Harness

- (1) It is yellow and used to connect elements of supplemental restraint system. The connector has a safety mechanism.

■ Airbag System Function

- (1) Airbag must work together with seat belt. It is not a substitute for seat belt. Driver and passengers should always fasten their seat belts when driving, and adjust the belts to a proper position according to their size.
- (2) Minor collision will not activate the airbag system. Airbags will quickly inflate to protect driver and front passenger only when severe collision occurs.

■ Seat Belt Pretensioner Compositions

- (1) Driver seat belt pretensioner

1) Driver seat belt pretensioner is located on driver seat belt retractor, which will retract driver seat belt to protect driver in the event of a severe collision.

- (2) Front passenger seat belt pretensioner

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- 1) Front passenger seat belt pretensioner is located on front passenger seat belt retractor, which will retract front passenger seat belt to protect front passenger in the event of a severe collision.
- (3) Seat belt pretensioner function
 - 1) At the moment of collision, the pretensioner retracts seat belt before occupant moves forward, and immediately restrains occupant onto the seat tightly, then locks seat belt to prevent occupant from leaning forward, thus protecting occupant safety.
 - 2) Seat belt pretensioner works with airbag. Once a frontal collision impact higher than specified value is detected, the seat belt with pretensioner will work together with airbag system to protect occupant safety.

■ Operating Conditions

The controller will send an ignition signal when sensor signal received by the controller exceeds the set value in an accident, the ignition circuit will explode.

- (1) Front collision
 - 1) Front collision is detected by the sensor in controller;
 - 2) Front collision ignition deployment circuit: driver and passenger front airbags, all seat belt with pretensioners;
- (2) Side collision
 - 1) Side collision is detected by the side collision sensor in B-pillar and the Sensor in controller.
 - 2) Side collision ignition deployment circuit: curtain shield airbag, seat airbag and seat belt with pretensioner on collision side;
- (3) Other collisions
 - 1) If the bottom of vehicle is subjected to a severe impact, the driver airbag and front passenger airbag may also deploy.
 - 2) If the vehicle goes under the bottom of truck etc. or involved in side collision, the driver airbag and front passenger airbag may not deploy.
 - 3) If a collision to the side of the vehicle body other than the passenger compartment, or the vehicle is subjected to a collision from the side at certain angles, the front side airbag and curtain shield airbag may not deploy.
 - 4) The side airbag and curtain shield airbag will not generally deploy if the vehicle is involved in a front collision, rear collision or roll over.

■ Specifications

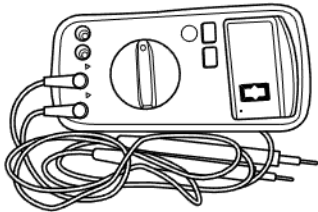
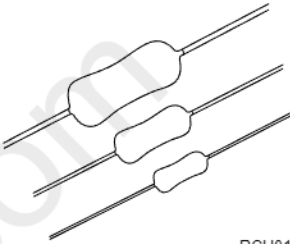
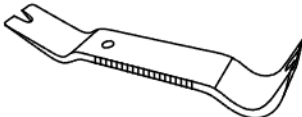
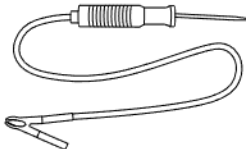
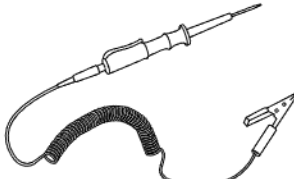
Torque Specification

Description	Torque (N•m)
Coupling Bolt Between Front Passenger Airbag Assembly and Instrument Panel Crossmember Assembly	23 ± 2
Coupling Bolt Between Curtain Shield Airbag Assembly and Body	10 ± 1
Coupling Bolt Between SRS Control Module Assembly and Body	8 ± 1.2

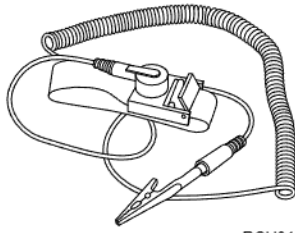
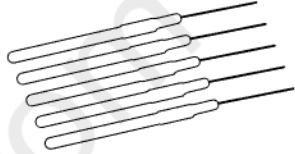
■ Operation

General Tools

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Tool Name	Tool Drawing
Digital Multimeter	 RCH000206
Resistor (2 Ω)	 RCH010006
Interior & Exterior Remover	 RCH002506
Bulb Test Light	 RCH010106
Diode Test Light	 RCH010206

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Tool Name	Tool Drawing
Static-proof Wrist Strap	 RCH010406
Wire Harness Terminal Service Tool	 RCH010506

■ Diagnostic Tester Menu Function and Datastream

Airbag system

- (1) Enter “ACM (Airbag Control Module)” .
- (2) Click “Version Information” .
- (3) Click “Read Datastream” .
 - 1) Click “IMU Off-line Calibration Status” .
 - 2) Click “EOL Mode” .
 - 3) Click “ACM Configuration Data” .
- (4) Click “Special Operation” .
 - 1) Click “IMU (Inertial Sensor) Calibration” .
 - 2) Click “Write ACM Configuration Data” .
 - i. Click “Save the Paste (Transfer Configuration Data in Old Controller to New Controller Quickly)” .
 - Click “Save Configuration Data in Old Controller” .
 - Click “Write Configuration Data from Old Controller into New Controller” .
 - 3) Click “Manual Writing” .

■ Diagnosis Contents

Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Suspected Area
Airbag system indicator remains on	Battery voltage is too low or too high
	Airbag module internal fault
	Instrument cluster airbag indicator fault

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	Poor contact in instrument cluster connector
	Airbag module power supply fuse open or poor contact
	Poor contact in airbag module connector
	Airbag circuit fault
Airbag assembly (resistance is too high or too low)	Airbag itself fault
	Connection fault between airbag and airbag module
	Airbag module fault

■ Diagnosis Procedure

Hint:

Use following procedures to troubleshoot the brake control system.

1	Vehicle brought to workshop
----------	------------------------------------

Next

2	Check battery voltage
----------	------------------------------

Check if battery voltage is normal.

OK

Standard voltage: Not less than 12 V.

Result

Result	Go to
OK	A
NG	B

B

Replace battery

A

3	Customer problem analysis
----------	----------------------------------

Next

4	Read DTCs
----------	------------------

Result

Result	Go to
DTC is output	A
No DTC	B

B

Perform repair according to Problem Symptoms Table

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A

5 Read DTCs (current DTC and history DTC)

Result

Result	Go to
Current DTC	A
History DTC	B

B

Troubleshoot according to Intermittent DTC Troubleshooting procedure

A

6 Repair according to Diagnostic Trouble Code (DTC) Chart

Next

7 Adjust, repair or replace

Next

8 Conduct test and confirm malfunction has been repaired

Next

End

■ DTC Confirmation Procedure

Confirm that battery voltage is normal before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software) to Data Link Connector (DLC).
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester to record and clear DTCs stored in supplemental restraint system.
- Turn the ENGINE START STOP switch to OFF and wait for several seconds.
- Turn ENGINE START STOP switch to ON, and then select Read DTC.
- If DTC is detected, it indicates current malfunction.
- If no DTC is detected, malfunction indicated by the DTC is intermittent.

■ Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Monitor diagnostic tester (the latest software) data that is related to this circuit.
- Wiggle related wire harnesses and connectors and observe if signal is interrupt in related circuit.
- If possible, try to duplicate the conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggle test.
- Look for broken, bent, protruded or corroded terminals.

SUPPLEMENTAL RESTRAINT SYSTEM

- Inspect airbag components and mounting areas for damage, foreign matter, etc. that will cause incorrect signals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

■ Ground Inspection

Ground points are very important to the proper operation of circuits. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit operates. Circuits are very sensitive to proper grounding. A loose or corroded ground can seriously affect the control circuit. Check the ground points as follows:

- (1) Remove ground bolt or nut.
- (2) Check all contact surfaces for tarnish, dirt and rust, etc.
- (3) Clean as necessary to ensure that contact is in good condition.
- (4) Reinstall ground bolt or nut securely.
- (5) Check if any additional accessories interfere with ground circuit.
- (6) If several wire harnesses are crimped into one ground terminal, check for proper crimp condition. Make sure that all wire harnesses are clean and securely fastened while providing a proper ground path.

■ Preparations before Dealing with Airbag System Wire Harness Malfunction

- (1) Read and record the system DTC
- (2) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable for at least 1 minute so that the airbag controller has enough time to discharge.
- (3) Prevent electric static discharge, such as static-proof wrist strap.
- (4) To prevent the ignition element from igniting accidentally during wire harness measurement, it is necessary to disengage all elements connected to wire harness, such as airbag, module, sensor etc. before measuring.

■ Airbag System Malfunction Repair Completion Inspection

- (1) Turn ENGINE START STOP switch to OFF and disconnect the negative battery cable (if is the connected);
- (2) Connect each wire harness connector of airbag system;
- (3) Connect negative battery cable;
- (4) Start the vehicle, operate the electrical system, turn on the electrical equipment as much as possible (- blower, rear defroster, headlight, audio, etc.). If all the following requirements are met, the airbag system is normal, otherwise it should be checked and repaired again:
 - 1) ENGINE START STOP switch is ON, system performs self-check, airbag warning light comes on. Warning light goes off when self-check is completed.
 - 2) Connect the diagnostic tester, read the DTC and observe the datastream. Use the simulation method if necessary. Test the vehicle in the malfunction conditions described by customer, check if the malfunction is no longer duplicate and no other DTCs are produced.
 - 3) If equipped with front passenger detection device, the front passenger seat belt warning light should operate normally; (Check method: A person sits on the front passenger seat and does not wear the seat belt, the light comes on and goes off after the seat belt is fastened.)
 - 4) Clear history DTC (if exists)

■ Disposal of Airbag

Airbag deploys (in vehicle).

- (1) It is necessary to deploy the airbag before disposing. If the vehicle is scrapped and disassembled, the airbag may deploy in vehicle.
 - 1) Preventive procedure of airbag deployment

SUPPLEMENTAL RESTRAINT SYSTEM

Caution

To prevent injury when deploying the airbag in vehicle, please refer to following prevention methods:

- Remove all movable objects or loose parts within airbag deployment range before the airbag is deployed.
- The airbag is deployed only in the reserved airbag deployment area with door closed and side window opened.
- The airbag is deployed only in the reserved airbag deployment area (site), the technicians must stand at least 10 meters in front of the vehicle.
- Do not load voltage before all preparations have been completed.
- Cool down the airbag at least 30 minutes before handling the deployed airbag.
- Please wear gloves and safety glasses during disposal process.
- If airbag deployment is failed, wait at least 5 minutes after disconnecting the voltage, and then you can approach the vehicle.

2) Prevention methods of deployment procedure

i. Inside deployment prevention methods

- Disconnect the negative and positive battery cables and move the battery 10 meters away from the vehicle.
- Prepare two additional wire harnesses at least 10 meters long for each one and special connector for connecting the spiral cable (clock spring). Peel off the 13 mm insulation coat at the end of wire harness. Connect the connector at one end and another end to twist as shown in illustration.
- Place the twisted end next to the battery for airbag deployment, but do not connect it to battery at this time.
- Remove driver side lower instrument panel from steering column. When connecting the lower part of steering column to SRS wire harness connector of spiral cable, connect the connector in figure 10.
- Clean the site.
- Disengage the twisted end of the wire harness next to the battery for airbag deployment.
- One wire harness contacts with negative battery and another one contacts with positive battery, the airbag will deploy at this time.
- Deploy the passenger side airbag module using the same procedure.
- Handle the deployed airbag with correct prevention methods. Refer to “Handling Procedure for Deployed Airbag” in this manual.

ii. Outside deployment prevention methods

- Install the airbag set to the tire with rim with airbag front surface faced up, and the space for wire and connector is reserved to prevent the deployment from being destroyed.
- Prepare two additional wire harnesses at least 10 meters long for each one and special connector for connecting airbag set. Peel off the 13 mm insulation coat at the end of wire harness. Connect the connector at one end as shown in illustration.
- Place the twisted end next to the battery for airbag deployment, but do not connect it to battery at this time.
- Stack 4 old tires without rims on the wheel installed with airbag set, and secure all the tires in 4 different positions with rope.
- Clean the site.
- Disengage the twisted end of the wire harness next to the battery for airbag deployment.
- One wire harness contacts with negative battery and another one contacts with positive battery, the airbag will deploy at this time.
- Deploy the passenger side airbag module using the same procedure.

SUPPLEMENTAL RESTRAINT SYSTEM

- Handle the deployed airbag with correct prevention methods. Refer to “Handling Procedure for Deployed Airbag Set” in this manual.

Handling procedure for deployed airbag set

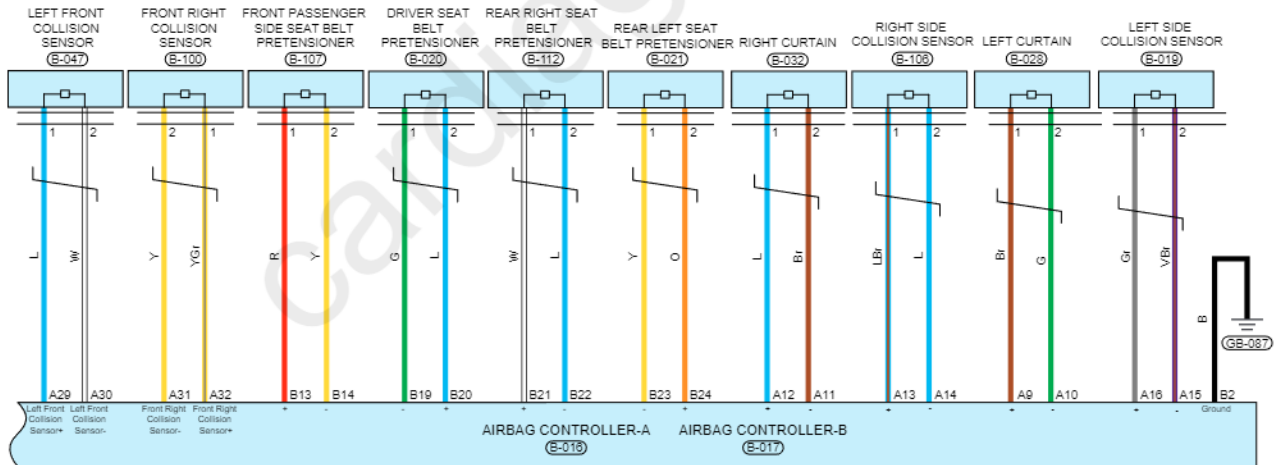
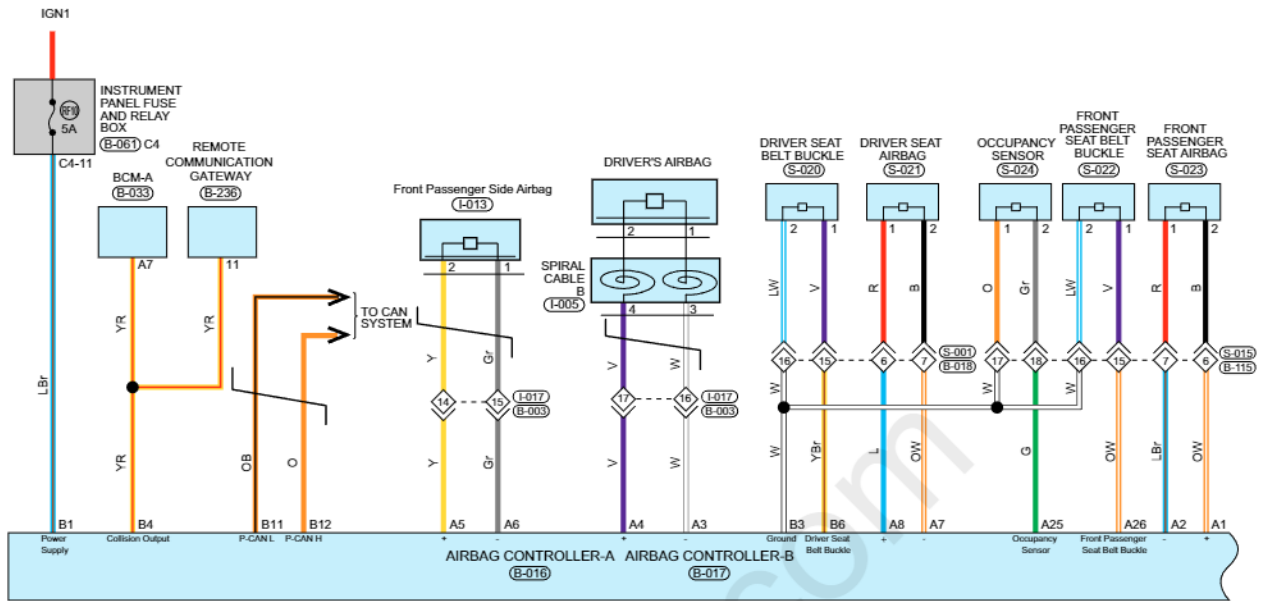
- (2) Place the deployed airbag in a solid plastic bag.
- (3) Be sure to seal the plastic bag tightly.
- (4) Wash both hands carefully after handling the deployed airbag.
- (5) Although above protection measures are taken, if the irritant substance attaches to the eyes or skin, flush it with a large amount of water immediately.

Caution

- There may be powder particles on airbag surface, which is primarily composed of chemical reaction product (used to lubricate bag when inflating).
- There may be substance which can irritate eyes or skin attached to the deployed airbag, so please wear gloves and safety glasses during disposal process.
- After the airbag deploys, the temperature on airbag module metal surface is very high. To avoid any injury or fire, please keep the deployed airbag module far away from any combustible materials,
- Do not pour water or oil on the airbag after the airbag deploys and handle it after cooling for 30 minutes.

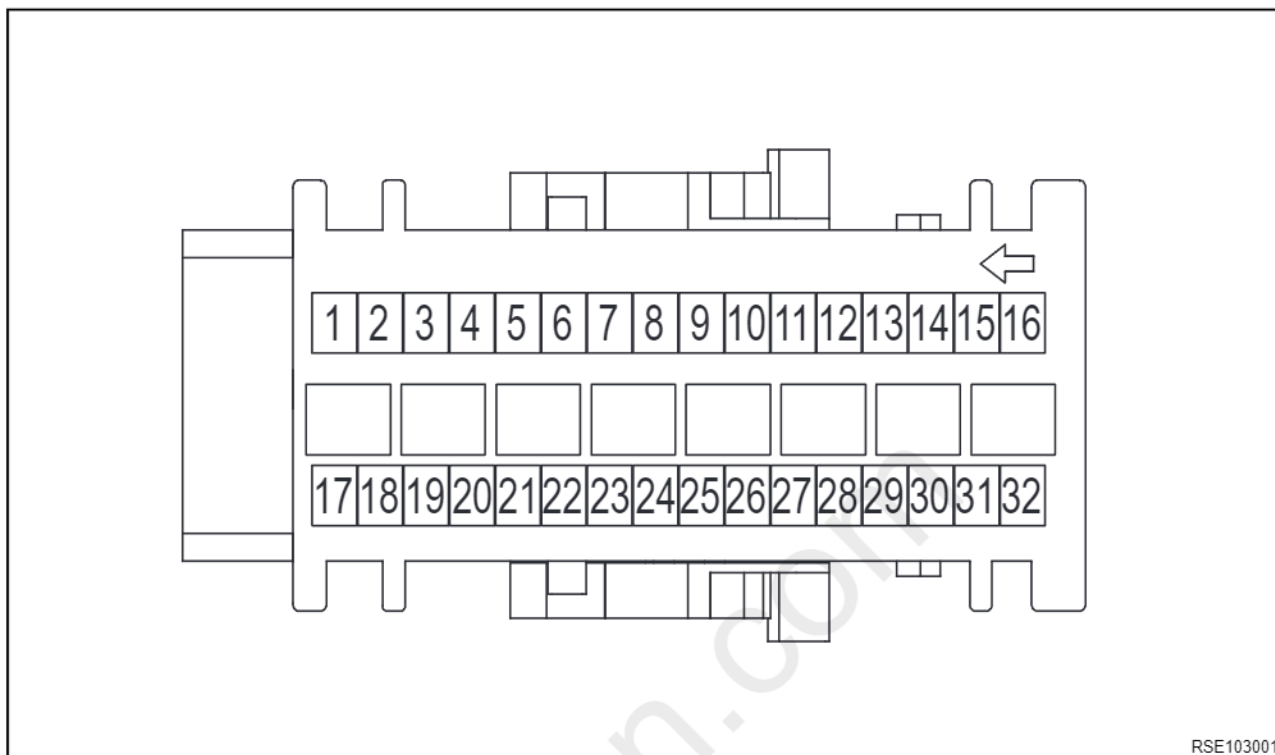
SUPPLEMENTAL RESTRAINT SYSTEM

Airbag Circuit Diagram



SUPPLEMENTAL RESTRAINT SYSTEM

■ SRS Control Module Assembly Terminal List

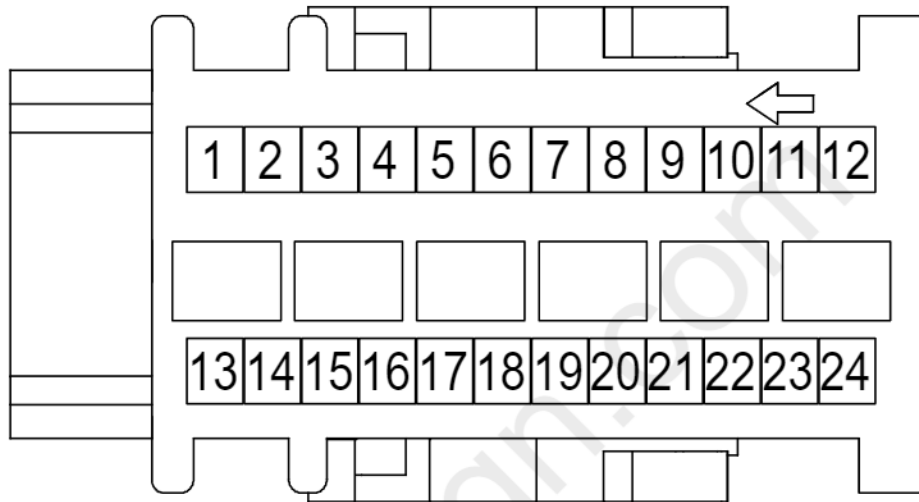


RSE103001

Terminal No.	Description	Terminal No.	Description
A1	Front Right Side Airbag (+)	A17	—
A2	Front Right Side Airbag (-)	A18	—
A3	Driver Airbag (One Stage) (-)	A19	—
A4	Driver Airbag (One Stage) (+)	A20	—
A5	Front Passenger Airbag (One Stage) (+)	A21	—
A6	Front Passenger Airbag (One Stage) (-)	A22	Rear Right Lock Striker
A7	Front Left Airbag (-)	A23	Rear Middle Lock Striker
A8	Front Left Airbag (+)	A24	Rear Left Lock Striker
A9	Left (Front + Rear) Side Curtain Shield Airbag (+)	A25	Front Passenger Seat Occupancy Sensor
A10	Left (Front + Rear) Side Curtain Shield Airbag (-)	A26	Front Passenger Buckle
A11	Right (Front + Rear) Side Curtain Shield Airbag (-)	A27	—
A12	Right (Front + Rear) Side Curtain Shield Airbag (+)	A28	—
A13	Right Side Collision Sensor (+)	A29	Front Left Collision Sensor (+)

SUPPLEMENTAL RESTRAINT SYSTEM

Terminal No.	Description	Terminal No.	Description
A14	Right Side Collision Sensor (-)	A30	Front Left Collision Sensor (-)
A15	Left Side Collision Sensor (-)	A31	Front Right Collision Sensor (-)
A16	Left Side Collision Sensor (+)	A32	Front Right Collision Sensor (+)



RSE104001

Terminal No.	Description	Terminal No.	Description
B1	Ignition	B13	Passenger Pretensioner (+)
B2	Ground	B14	Passenger Pretensioner (-)
B3	Ground (DCS)	B15	—
B4	Collision Output	B16	—
B5	—	B17	—
B6	Driver Seat Belt Buckle	B18	—
B7	—	B19	Driver Pretensioner (-)
B8	—	B20	Driver Pretensioner (+)
B9	—	B21	2nd Row Right Pretensioner (+)
B10	—	B22	2nd Row Right Pretensioner (-)
B11	CAN-L	B23	2nd Row Left Pretensioner (-)
B12	CAN-H	B24	2nd Row Left Pretensioner (+)

SUPPLEMENTAL RESTRAINT SYSTEM

■ DTC Diagnosis

■ Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition
B000111	Driver/Left Front Airbag Squib Short to GND
B000112	Driver/Left Front Airbag Squib Short to Power Line
B000113	Driver/Left Front Airbag Squib High Resistance
B000119	Driver/Left Front Airbag Squib Cross-connect
B00011A	Driver/Left Front Airbag Squib Low Resistance
B000195	Driver/Left Front Airbag Squib Configured Fault
B001011	Passenger/Right Front Airbag Squib Short to GND
B001012	Passenger/Right Front Airbag Squib Short to Power Line
B001013	Passenger/Right Front Airbag Squib High Resistance
B001019	Passenger/Right Front Airbag Squib Cross-connect
B00101A	Passenger/Right Front Airbag Squib Low Resistance
B001095	Passenger/Right Front Airbag Squib Configured Fault
B002011	Driver/Left Side Airbag Squib Short to GND
B002012	Driver/Left Side Airbag Squib Short to Power Line
B002013	Driver/Left Side Airbag Squib High Resistance
B002019	Driver/Left Side Airbag Squib Cross-connect
B00201A	Driver/Left Side Airbag Squib Low Resistance
B002095	Driver/Left Side Airbag Squib Configured Fault
B002111	Driver/Left Curtain Airbag Squib Short to GND
B002112	Driver/Left Curtain Airbag Squib Short to Power Line
B002113	Driver/Left Curtain Airbag Squib High Resistance
B002119	Driver/Left Curtain Airbag Squib Cross-connect
B00211A	Driver/Left Curtain Airbag Squib Low Resistance
B002195	Driver/Left Curtain Airbag Squib Configured Fault
B002811	Passenger/Right Side Airbag Squib Short to GND
B002812	Passenger/Right Side Airbag Squib Short to Power Line
B002813	Passenger/Right Side Airbag Squib High Resistance
B002819	Passenger/Right Side Airbag Squib Cross-connect Fault
B00281A	Passenger/Right Side Airbag Squib Low Resistance
B002895	Passenger/Right Side Airbag Squib Configured Fault

SUPPLEMENTAL RESTRAINT SYSTEM

DTC	DTC Definition
B002911	Passenger/Right Curtain Airbag Squib Short to GND
B002912	Passenger/Right Curtain Airbag Squib Short to Power Line
B002913	Passenger/Right Curtain Airbag Squib High Resistance
B002919	Passenger/Right Curtain Airbag Squib Cross-connect
B00291A	Passenger/Right Curtain Airbag Squib Low Resistance
B002995	Passenger/Right Curtain Airbag Squib Configured Fault
B005011	Driver Seatbelt Buckle Short to Ground
B005012	Driver Seatbelt Buckle Short to Power Line
B005013	Driver Seatbelt Buckle Open Circuit
B00501D	Driver Seatbelt Buckle Meas High/Meas Low/Bad Sensor
B005212	Front Passenger Seatbelt Buckle Short to Power Line
B005312	Second Row Left Seatbelt Sensor Short to Power Line
B005412	Second Row Center Seatbelt Sensor Short to Power Line
B005512	Second Row Right Seatbelt Sensor Short to Power Line
B007011	Driver/Left Pretensioner Squib Short to GND
B007012	Driver/Left Pretensioner Squib Short to Power Line
B007013	Driver/Left Pretensioner Squib High Resistance
B007019	Driver/Left Pretensioner Squib Cross-connect
B00701A	Driver/Left Pretensioner Squib Low Resistance
B007095	Driver/Left Pretensioner Squib Configured Fault
B007211	Passenger/Right Pretensioner Squib Short to GND
B007212	Passenger/Right Pretensioner Squib Short to Power Line
B007213	Passenger/Right Pretensioner Squib High Resistance
B007219	Passenger/Right Pretensioner Squib Cross-connect Fault
B00721A	Passenger/Right Pretensioner Squib Low Resistance
B007295	Passenger/Right Pretensioner Squib Configured Fault
B007311	2nd Row Passenger/Left Rear Pretensioner Squib Short to GND
B007312	2nd Row Passenger/Left Rear Pretensioner Squib Short to Power Line
B007313	2nd Row Passenger/Left Rear Pretensioner Squib High Resistance
B007319	2nd Row Passenger/Left Rear Pretensioner Squib Cross-connect
B00731A	2nd Row Passenger/Left Rear Pretensioner Squib Low Resistance
B007395	2nd Row Passenger/Left Rear Pretensioner Squib Configured Fault

SUPPLEMENTAL RESTRAINT SYSTEM

DTC	DTC Definition
B007511	2nd Row Passenger/Right Rear Pretensioner Squib Short to GND
B007512	2nd Row Passenger/Right Rear Pretensioner Squib Short to Power Line
B007513	2nd Row Passenger/Right Rear Pretensioner Squib High Resistance
B007519	2nd row Passenger/Right Rear Pretensioner Squib Cross-connect
B00751A	2nd Row Passenger/Right Rear Pretensioner Squib Low Resistance
B007595	2nd Row Passenger/Right Rear Pretensioner Squib Configured Fault
B009011	Front Left Impact Sensor Short to GND
B009013	Front Left Impact Sensor Open
B009049	Front Left Impact Sensor Internal Fault
B009055	Front Left Impact Sensor Configured Fault
B009087	Front Left Impact Sensor Communication Fault
B009111	Left B-pillar Impact Sensor Short to GND
B009113	Left B-pillar Impact Sensor Open
B009149	Left B-pillar Impact Sensor Internal Fault
B009155	Left B-pillar Impact Sensor Configured Fault
B009187	Left B-pillar Impact Sensor Communication Fault
B009511	Front Right Impact Sensor Short to GND
B009513	Front Right Impact sensor Open
B009549	Front Right Impact Sensor Internal Fault
B009555	Front Right Impact Sensor Configured Fault
B009587	Front Right Impact Sensor communication Fault
B009611	Right B-pillar Impact Sensor Short to GND
B009613	Right B-pillar Impact Sensor Open
B009649	Right B-pillar Impact Sensor Internal Error
B009655	Right B-pillar Impact Sensor Configured Error
B009687	Right B-pillar Impact Sensor Communication Error
B00C012	Front Passenger Occupant Sensor Short to Power Line
B00D2F0	Module is in Supplier Manufacturing Mode
B127017	ECU Supply Voltage High
B127116	ECU Supply Voltage Low
B12E049	ACM Internal Error
B12E196	Airbag or Pretenioner Deployed When Front Crash Detect

SUPPLEMENTAL RESTRAINT SYSTEM

DTC	DTC Definition
B12E296	Airbag or Pretenioner Deployed When Side Crash Detect
B12E396	Airbag or Pretenioner Deployed When Rear Crash Detect
B12E500	Disposal Command Record - Performed Scrap Deployment
B12E654	IMU Calibration Missing
B12E692	IMU Calibration Fail
B12E795	Configuration Parameters Missing
B12E895	ECU in Configuration Mode
U010000	Lost Communication with EMS
U010100	Lost Communication with TCU
U012200	Lost Communication with ESC
U014000	Lost Communication with BCM
U015500	Lost Communication with IPC
U021200	Lost Communication with SCM
U024800	Lost Communication with PEPS
U040181	Invalid DLC Received from EMS
U040186	Invalid Data Received from EMS
U040281	Invalid DLC Received from TCU
U040286	Invalid Data Received from TCU
U041681	Invalid DLC Received from ESC
U041686	Invalid Data Received from ESC
U042281	Invalid DLC Received from BCM
U042286	Invalid Data Received from BCM
U042381	Invalid DLC Received from IPC
U042386	Invalid Data Received from IPC
U042681	Invalid DLC Received from PEPS
U042686	Invalid Data Received from PEPS
U042981	Invalid DLC Received from SCM
U042986	Invalid Data Received from SCM
U127288	CAN Bus Off

DTC	B127017	ECU Supply Voltage High
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DTC	B127116	ECU Supply Voltage Low
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SUPPLEMENTAL RESTRAINT SYSTEM

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B127017	Power Supply Voltage	Malfunction indicator ON	Excessive low vehicle power supply voltage
B127116			Excessive high vehicle power supply voltage

- Possible cause for “High Voltage” malfunction: unstable power supply, sudden invalid load;
- Possible cause for “Low Voltage” malfunction: unstable power supply, poor contact;

⚠ Caution

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1 Check system voltage.

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Start engine, and use voltage band of multimeter to check if battery voltage is normal. (Rated voltage: Not less than 12 V)
Operating voltage

Multimeter Connection	Condition	Operating Voltage
Battery (+) - Battery (-)	ENGINE START STOP switch “ON”	Not less than 12 V

OK

System voltage is normal

Next

For inspection, refer to “Airbag system malfunction repair completion inspection” .

2 Check fuse

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check for continuity of fuse RF10 (5A) in instrument panel fuse and relay box with a multimeter.

OK

Fuse is not blown.

Result

Result	Go to
OK	A
NG	B

B

Replace fuse

SUPPLEMENTAL RESTRAINT SYSTEM

A

3 Check airbag module power supply

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .
Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Turn ENGINE START STOP switch to OFF and connect the negative battery cable.
- (b) Turn ENGINE START STOP switch to ON and use a digital multimeter to measure voltage of power supply. If the voltage is as required, make tests with test lamp made of vehicle bulbs. Bright test lamp indicates that power supply is sufficient, and dim test lamp indicates that power supply is insufficient and poor contact of wire harness may occur.

Specified Condition

Multimeter Connection	Condition	Specified Condition
B-017 (1) - Ground	ENGINE START STOP switch ON	Not less than 12 V

Result

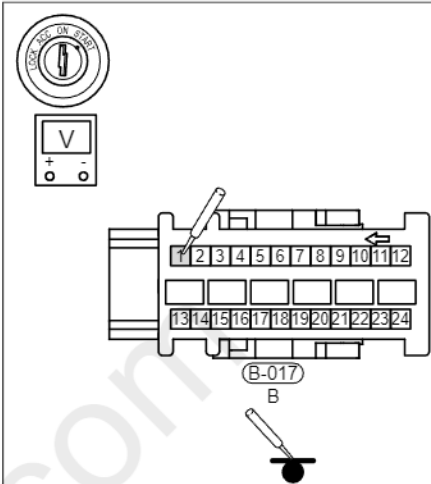
Go to
OK
NG

OK

Airbag power supply is normal

Next

Check airbag module power supply



RS0154102

Next

4 Check airbag module ground

SUPPLEMENTAL RESTRAINT SYSTEM

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .
Use circuit diagram as a guide to perform the following inspection procedures:

- Turn ENGINE START STOP switch to OFF.
- Disconnect the component connectors (measurement value is incorrect with power on, and power off is necessary)
- Use ohm band of multimeter to check for continuity between B-017(2) and ground.

Specified Condition

Multimeter Connection	Condition	Specified Condition
B-017 (2) - Ground	ENGINE START STOP switch “OFF”	$\leq 1 \Omega$

OK

Airbag module ground is normal

Result

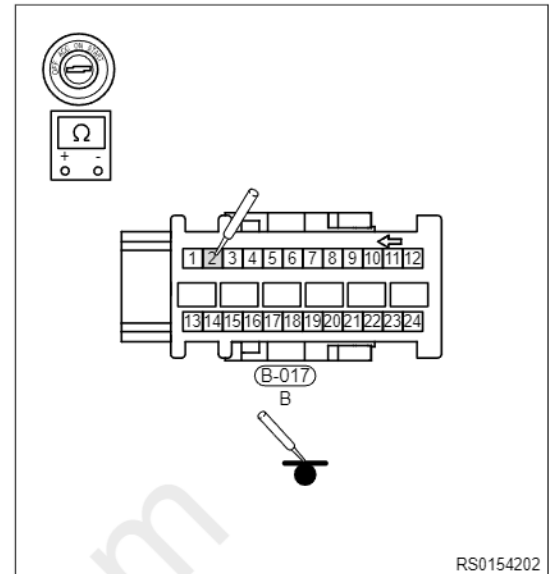
Result	Go to
OK	A
NG	B

A

Airbag module ground is normal

B

Check or repair airbag module ground



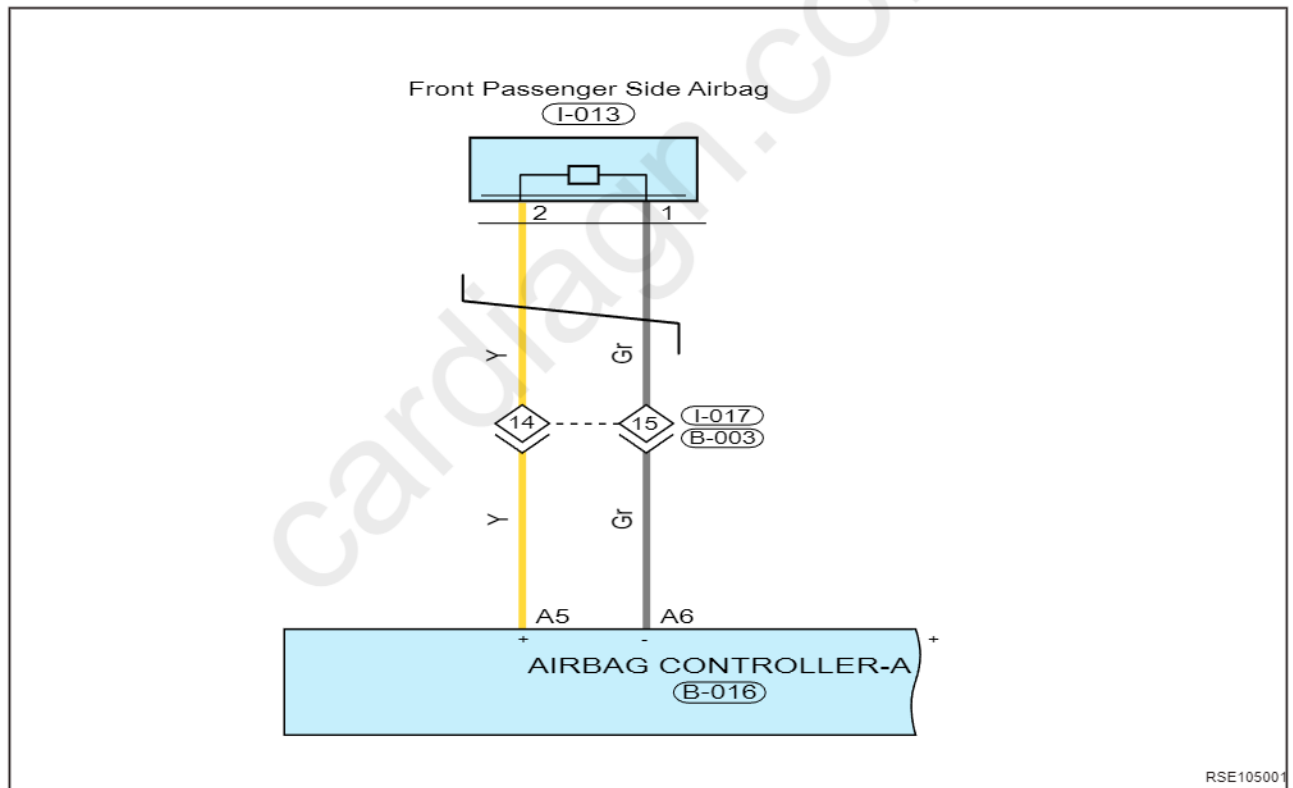
RS0154202

DTC	B000112	Driver/Left Front Airbag Squib Short to Power Line
DTC	B001012	Passenger/Right Front Airbag Squib Short to Power Line
DTC	B002012	Driver/Left Side Airbag Squib Short to Power Line
DTC	B002112	Driver/Left Curtain Airbag Squib Short to Power Line
DTC	B002812	Passenger/Right Side Airbag Squib Short to Power Line
DTC	B002912	Passenger/Right Curtain Airbag Squib Short to Power Line
DTC	B005012	Driver Seatbelt Buckle Short to Power Line
DTC	B005013	Driver Seatbelt Buckle Open Circuit
DTC	B00501D	Driver Seatbelt Buckle Meas High/Meas Low/Bad Sensor
DTC	B005212	Front Passenger Seatbelt Buckle Short to Power Line

SUPPLEMENTAL RESTRAINT SYSTEM

DTC	B005312	Second Row Left Seatbelt Sensor Short to Power Line
DTC	B005412	Second Row Center Seatbelt Sensor Short to Power Line
DTC	B005512	Second Row Right Seatbelt Sensor Short to Power Line
DTC	B007012	Driver/Left Pretensioner Squib Short to Power Line
DTC	B007212	Passenger/Right Pretensioner Squib Short to Power Line
DTC	B007312	2nd Row Passenger/Left Rear Pretensioner Squib Short to Power Line
DTC	B007512	2nd Row Passenger/Right Rear Pretensioner Squib Short to Power Line

■ Circuit Diagram



■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B000112	Driver/Left Front Airbag Squib Short to Power Line	Malfunction indicator ON	It's generally a short to voltage or power supply in wire harness
B001011	Passenger/Right Front Airbag Squib Short to Power Line		
B002012	Driver/Left Side Airbag Squib Short to Power Line		

SUPPLEMENTAL RESTRAINT SYSTEM

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B002112	Driver/Left Curtain Airbag Squib Short to Power Line		
B002812	Passenger/Right Side Airbag Squib Short to Power Line		
B002912	Passenger/Right Curtain Airbag Squib Short to Power Line		
B005012	Driver Seatbelt Buckle Short to Power Line		
B005013	Driver Seatbelt Buckle Open Circuit		
B00501D	Driver Seatbelt Buckle Meas High/Meas Low/Bad Sensor		
B005212	Front Passenger Seatbelt Buckle Short to Power Line		
B005312	Second Row Left Seatbelt Sensor Short to Power Line		
B005412	Second Row Center Seatbelt Sensor Short to Power Line		
B005512	Second Row Right Seatbelt Sensor Short to Power Line		
B007012	Driver/Left Pretensioner Squib Short to Power Line		
B007212	Passenger/Right Pretensioner Squib Short to Power Line		
B007312	2nd Row Passenger/Left Rear Pretensioner Squib Short to Power Line		
B007512	2nd Row Passenger/Right Rear Pretensioner Squib Short to Power Line		

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .

Caution

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Warning

For similar malfunctions of other modules in airbag system, it's also allowable to refer to “Passenger Airbag Short to Power Supply” for troubleshooting.

- An activation prevention mechanism is built in airbag system connector. When connector is disconnected, this mechanism cuts off circuit by bringing short spring plate into contact with terminals, thus insulating the circuit from external power sources to prevent accidental airbag activation.
- To release activation prevention mechanism, insert a piece of paper with the same thickness as male terminal between terminals and short spring plate to disconnect the connection.

1

Check for short to power supply in passenger airbag

SUPPLEMENTAL RESTRAINT SYSTEM

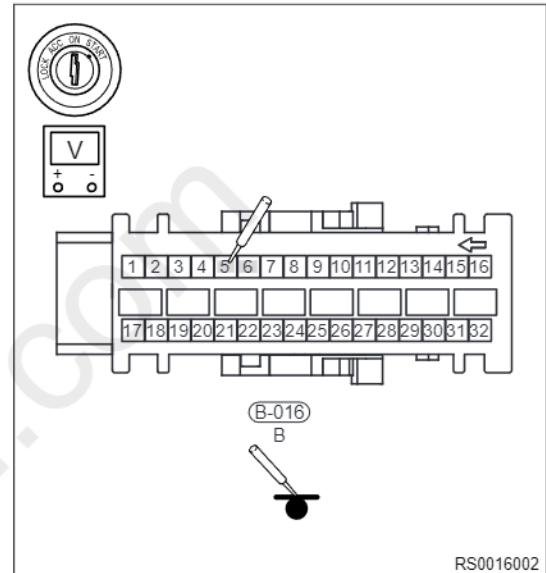
- Check sensor connectors, controller connectors for corrosion, poor contact, displacement and repair it if any symptom occurs.
- Check for continuity of sensor wire harness and replace wire harness if open circuit malfunction occurs.
- Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable and wait for at least 90 seconds.
- Disconnect airbag module connector and passenger airbag connector.
- Turn ENGINE START STOP switch to ON and make all accessories operate.
- Using voltage band of multimeter, detect B-016 (5) - ground and B-016 (6) - ground separately.

Specified Condition

Multimeter Connection	Condition	Specified Condition
B-016 (5) - Ground	ENGINE START STOP switch ON	0 V
B-016 (6) - Ground	ENGINE START STOP switch ON	0 V

Result

Go to
OK
NG



OK

refer to "Airbag system malfunction repair completion inspection" .

NG

Repair or replace wire harness shorted to power supply or voltage.

DTC	B000111	Driver/Left Front Airbag Squib Short to GND
DTC	B001011	Passenger/Right Front Airbag Squib Short to GND
DTC	B002011	Driver/Left Side Airbag Squib Short to GND
DTC	B002111	Driver/Left Curtain Airbag Squib Short to GND
DTC	B002811	Passenger/Right Side Airbag Squib Short to GND
DTC	B002911	Passenger/Right Curtain Airbag Squib Short to GND
DTC	B005011	Driver Seatbelt Buckle Short to Ground
DTC	B007011	Driver/Left Pretensioner Squib Short to GND

SUPPLEMENTAL RESTRAINT SYSTEM

DTC	B007211	Passenger/Right Pretensioner Squib Short to GND
DTC	B007311	2nd Row Passenger/Left Rear Pretensioner Squib Short to GND
DTC	B007511	2nd Row Passenger/Right Rear Pretensioner Squib Short to GND
DTC	B009011	Front Left Impact Sensor Short to GND
DTC	B009111	Left B-pillar Impact Sensor Short to GND
DTC	B009511	Front Right Impact Sensor Short to GND
DTC	B009611	Right B-pillar Impact Sensor Short to GND

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B000111	Driver/Left Front Airbag Squib Short to GND	Malfunction indicator ON	It's generally a short to ground in circuit
B001011	Passenger/Right Front Airbag Squib Short to GND		
B002011	Driver/Left Side Airbag Squib Short to GND		
B002111	Driver/Left Curtain Airbag Squib Short to GND		
B002811	Passenger/Right Side Airbag Squib Short to GND		
B002911	Passenger/Right Curtain Airbag Squib Short to GND		
B005011	Driver Seatbelt Buckle Short to Ground		
B007011	Driver/Left Pretensioner Squib Short to GND		
B007211	Passenger/Right Pretensioner Squib Short to GND		
B007311	2nd Row Passenger/Left Rear Pretensioner Squib Short to GND		
B007511	2nd Row Passenger/Right Rear Pretensioner Squib Short to GND		
B009011	Front Left Impact Sensor Short to GND		
B009111	Left B-pillar Impact Sensor Short to GND		
B009511	Front Right Impact Sensor Short to GND		

SUPPLEMENTAL RESTRAINT SYSTEM

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B009611	Right B-pillar Impact Sensor Short to GND		

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .

⚠ Caution

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

⚠ Warning

For similar malfunctions of other modules in airbag system, it's also allowable to refer to “Passenger Airbag Short to Ground Malfunction” for troubleshooting.

Hint:

- An activation prevention mechanism is built in airbag system connector. When connector is disconnected, this mechanism cuts off circuit by bringing short spring plate into contact with terminals, thus insulating the circuit from external power sources to prevent accidental airbag activation.
- To release activation prevention mechanism, insert a piece of paper with the same thickness as male terminal between terminals and short spring plate to disconnect the connection.

1 Check for short to ground in passenger airbag

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .

Use circuit diagram as a guide to perform the following inspection procedures:

- Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable and wait for at least 90 seconds.
- Disconnect airbag module connector and driver frontal airbag connector.
- Using ohm band of multimeter, check for continuity between B-016 (5) and ground, and B-016 (6) and ground separately.

Specified Condition

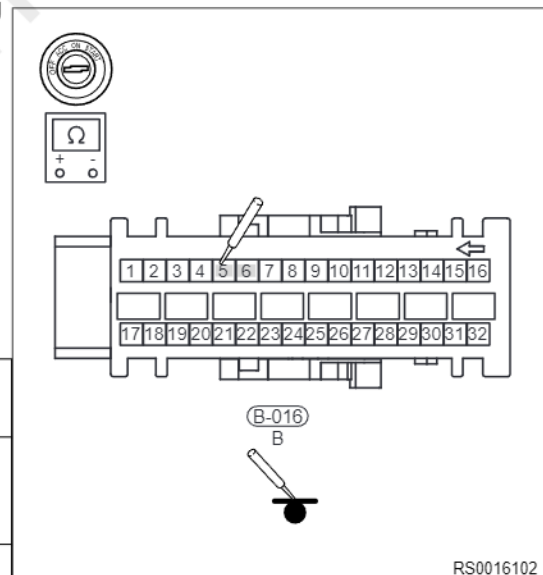
Multimeter Connection	Condition	Specified Condition
B-016 (5) - Ground	ENGINE START STOP switch “OFF”	∞
B-016 (6) - Ground	ENGINE START STOP switch “OFF”	∞

Result

Go to
OK
NG

OK

refer to “Airbag system malfunction repair completion inspection” .



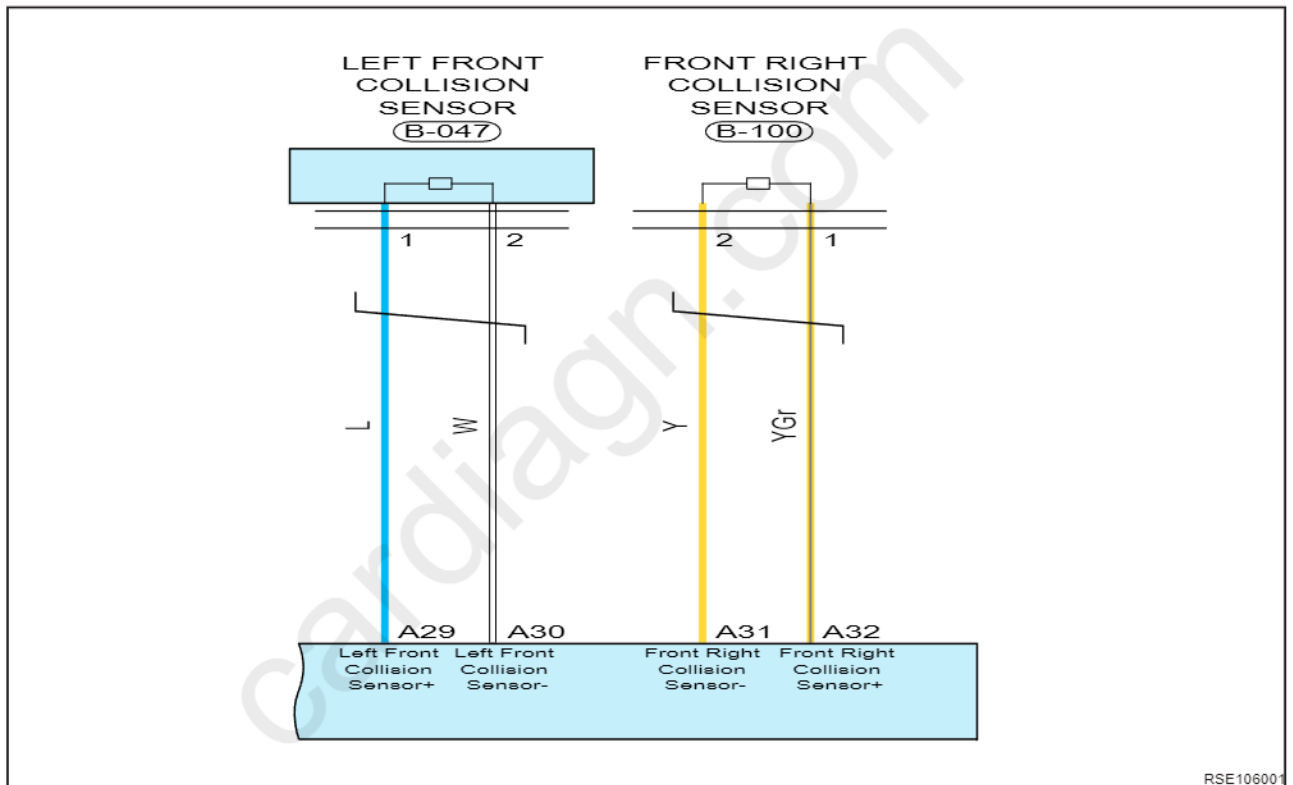
SUPPLEMENTAL RESTRAINT SYSTEM

NG

Repair or replace wire harness or connector of passenger airbag that is short to ground

DTC	B009013	Front Left Impact Sensor Open
DTC	B009113	Left B-pillar Impact Sensor Open
DTC	B009513	Front Right Impact sensor Open
DTC	B009613	Right B-pillar Impact Sensor Open

■ Circuit Diagram



RSE106001

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B009013	Front Left Impact Sensor Open	Malfunction indicator ON	It's generally a open or poor contact in wire harness
B009113	Left B-pillar Impact Sensor Open		
B009513	Front Right Impact sensor Open		
B009613	Right B-pillar Impact Sensor Open		

For preparations, refer to "Preparations before dealing with airbag system wire harness malfunction" .

⚠ Caution

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

SUPPLEMENTAL RESTRAINT SYSTEM

⚠ Warning

For similar malfunctions of other modules in airbag system, it's also allowable to refer to "Right B-pillar Collision Sensor Open" for troubleshooting.

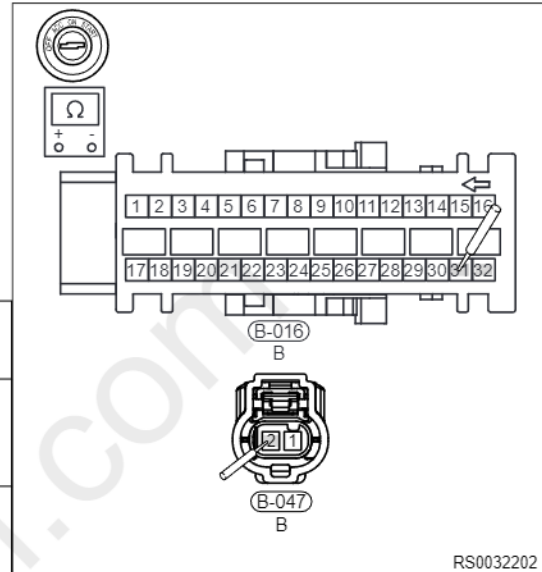
1 Left side collision sensor circuit is open

Use circuit diagram as a guide to perform the following inspection procedures:

- Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable and wait for at least 90 seconds.
- Disconnect airbag module connector and left side collision sensor connector.
- Using ohm band of multimeter, check for continuity between B-016 (31) and B-100 (2), B-016 (32) and B-100 (1) separately.

Specified Condition

Multimeter Connection	Condition	Specified Condition
B-016 (31) - B-100 (2)	ENGINE START STOP switch "OFF"	$\leq 1 \Omega$
B-016 (32) - B-100 (1)	ENGINE START STOP switch "OFF"	$\leq 1 \Omega$



Result

Go to
OK
NG

OK

For inspection, refer to "Airbag system malfunction repair completion inspection" and replace the sensor if wire harness is not malfunctioning

Repair or replace opened wire harness or connector

DTC	B00011A	Driver/Left Front Airbag Squib Low Resistance
DTC	B00101A	Passenger/Right Front Airbag Squib Low Resistance
DTC	B00201A	Driver/Left Side Airbag Squib Low Resistance
DTC	B00211A	Driver/Left Curtain Airbag Squib Low Resistance
DTC	B00281A	Passenger/Right Side Airbag Squib Low Resistance

SUPPLEMENTAL RESTRAINT SYSTEM

DTC	B00291A	Passenger/Right Curtain Airbag Squib Low Resistance
DTC	B00701A	Driver/Left Pretensioner Squib Low Resistance
DTC	B00721A	Passenger/Right Pretensioner Squib Low Resistance
DTC	B00731A	2nd Row Passenger/Left Rear Pretensioner Squib Low Resistance
DTC	B00751A	2nd Row Passenger/Right Rear Pretensioner Squib Low Resistance

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B00011A	Driver/Left Front Airbag Squib Low Resistance	Malfunction indicator ON	It' s generally damage to ignition element or short to wire harness
B00101A	Passenger/Right Front Airbag Squib Low Resistance		
B00201A	Driver/Left Side Airbag Squib Low Resistance		
B00211A	Driver/Left Curtain Airbag Squib Low Resistance		
B00281A	Passenger/Right Side Airbag Squib Low Resistance		
B00291A	Passenger/Right Curtain Airbag Squib Low Resistance		
B00701A	Driver/Left Pretensioner Squib Low Resistance		
B00721A	Passenger/Right Pretensioner Squib Low Resistance		
B00731A	2nd Row Passenger/Left Rear Pretensioner Squib Low Resistance		
B00751A	2nd Row Passenger/Right Rear Pretensioner Squib Low Resistance		

Caution

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information. Hint:

Hint:

For similar malfunctions of other modules in airbag system, it' s also allowable to refer to “Low Passenger Airbag Resistance Value” for troubleshooting.

SUPPLEMENTAL RESTRAINT SYSTEM

Hint:

- An activation prevention mechanism is built in airbag system connector. When connector is disconnected, this mechanism cuts off circuit by bringing short spring plate into contact with terminals, thus insulating the circuit from external power sources to prevent accidental airbag activation.
- To release activation prevention mechanism, insert a piece of paper with the same thickness as male terminal between terminals and short spring plate to disconnect the connection.
-

1 Check airbag itself for damage

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Disconnect the airbag connector.
- (b) Connect the battery and turn on diagnostic tester to check if original DTC turns to “high resistance” .

Result

Go to
OK
NG

OK

Replace damaged airbag assembly

NG

2 Check both cables for short to each other.

Hint:

- An activation prevention mechanism is built in airbag system connector. When connector is disconnected, this mechanism cuts off circuit by bringing short spring plate into contact with terminals, thus insulating the circuit from external power sources to prevent accidental airbag activation.
- To release activation prevention mechanism, insert a piece of paper with the same thickness as male terminal between terminals and short spring plate to disconnect the connection.

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .
Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable and wait for at least 90 seconds.
- (b) Disconnect the airbag module connector.
- (c) Using ohm band of multimeter, check for continuity between B-016 (5) and B-017 (6).

SUPPLEMENTAL RESTRAINT SYSTEM

Standard Condition

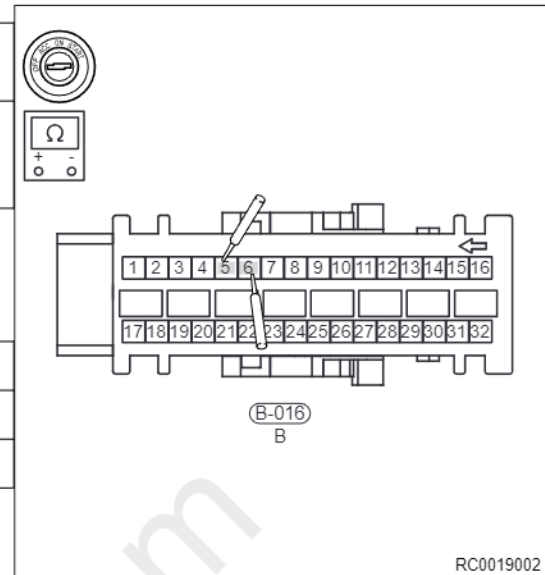
Multimeter Connection	Condition	Standard Condition
B-016 (5) - B-016 (6)	ENGINE START STOP switch "OFF"	∞

OK

For inspection, refer to "Airbag system malfunction repair completion inspection".

Result

Go to
OK
NG



OK

For inspection, refer to "Airbag system malfunction repair completion inspection".

NG

Repair or replace wire harness and connector.

DTC	B000113	Driver/Left Front Airbag Squib High Resistance
DTC	B001013	Passenger/Right Front Airbag Squib High Resistance
DTC	B002013	Driver/Left Side Airbag Squib High Resistance
DTC	B002113	Driver/Left Curtain Airbag Squib High Resistance
DTC	B002813	Passenger/Right Side Airbag Squib High Resistance
DTC	B002913	Passenger/Right Curtain Airbag Squib High Resistance
DTC	B007013	Driver/Left Pretensioner Squib High Resistance
DTC	B007213	Passenger/Right Pretensioner Squib High Resistance
DTC	B007313	2nd Row Passenger/Left Rear Pretensioner Squib High Resistance
DTC	B007513	2nd Row Passenger/Right Rear Pretensioner Squib High Resistance

SUPPLEMENTAL RESTRAINT SYSTEM

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B000113	Driver/Left Front Airbag Squib High Resistance	Malfunction indicator ON	It' s generally damage to ignition element or open in wire harness
B001013	Passenger/Right Front Airbag Squib High Resistance		
B002013	Driver/Left Side Airbag Squib High Resistance		
B002113	Driver/Left Curtain Airbag Squib High Resistance		
B002813	Passenger/Right Side Airbag Squib High Resistance		
B002913	Passenger/Right Curtain Airbag Squib High Resistance		
B007013	Driver/Left Pretensioner Squib High Resistance		
B007213	Passenger/Right Pretensioner Squib High Resistance		
B007313	2nd Row Passenger/Left Rear Pretensioner Squib High Resistance		
B007513	2nd Row Passenger/Right Rear Pretensioner Squib High Resistance		

⚠ Caution

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Hint:

For similar malfunctions of other modules in airbag system, it' s also allowable to refer to "High Passenger Airbag Resistance Value" for troubleshooting.

- An activation prevention mechanism is built in airbag system connector. When connector is disconnected, this mechanism cuts off circuit by bringing short spring plate into contact with terminals, thus insulating the circuit from external power sources to prevent accidental airbag activation.
- To release activation prevention mechanism, insert a piece of paper with the same thickness as male terminal between terminals and short spring plate to disconnect the connection.

1

Check if ignition element is damaged

SUPPLEMENTAL RESTRAINT SYSTEM

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Use 2 Ω resistance or bulb about 55 W to substitute airbag or tensioner indicated by DTC.
- (b) Connect wire harness connector on the end of airbag module.
- (c) Connect the battery and diagnostic tester and read the previous DTC.

Warning

It's normal for other DTC occurrence currently as other airbag or sensor is not connected.

OK

Airbag is damaged and needs to be replaced.

Result

Go to
OK
NG

OK

Replace damaged airbag

NG

2

Check connecting wire for open circuit

Hint:

- An activation prevention mechanism is built in airbag system connector. When connector is disconnected, this mechanism cuts off circuit by bringing short spring plate into contact with terminals, thus insulating the circuit from external power sources to prevent accidental airbag activation.
- To release activation prevention mechanism, insert a piece of paper with the same thickness as male terminal between terminals and short spring plate to disconnect the connection.

SUPPLEMENTAL RESTRAINT SYSTEM

For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .
Use circuit diagram as a guide to perform the following inspection procedures:

- Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable and wait for at least 90 seconds.
- Disconnect airbag module connector and passenger airbag connector.
- Using ohm band of multimeter, check for continuity between B-016 (5) and I-013 (1), and B-016 (6) and I-013 (2) separately.

Standard Condition

Multimeter Connection	Condition	Standard Condition
B-016 (5) - I-013 (1)	ENGINE START STOP switch “OFF”	$\leq 1 \Omega$
B-016 (11) - I-013 (2)	ENGINE START STOP switch “OFF”	$\leq 1 \Omega$

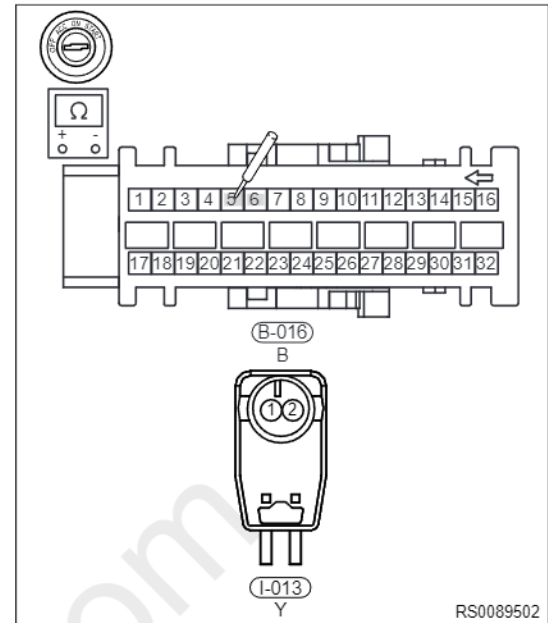
OK

For inspection, refer to “Airbag system malfunction repair completion inspection” .

Result

Go to
OK
NG

OK	For inspection, refer to “Airbag system malfunction repair completion inspection” .
NG	Repair or replace opened wire harness or connector



RS0089502

DTC	B12E196	Airbag or Pretensioner Deployed When Front Crash Detect
DTC	B12E296	Airbag or Pretensioner Deployed When Side Crash Detect
DTC	B12E396	Airbag or Pretensioner Deployed When Rear Crash Detect
DTC	B12E500	Disposal Command Record - Performed Scrap Deployment

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B12E196	Airbag or Pretensioner Deployed When Front Crash Detect	Malfunction indicator ON	Collision occurs and signals exceed door threshold and the controller ignites ignition device
B12E296	Airbag or Pretensioner Deployed When Side Crash Detect		
B12E396	Airbag or Pretensioner Deployed When Rear Crash Detect		

SUPPLEMENTAL RESTRAINT SYSTEM

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B12E500	Disposal Command Record - Performed Scrap Deployment		

Hint:

- For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .
- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

⚠ Caution

- When DTCs above occur, it's necessary to replace the controller, deployed airbag or tensioner and collision sensor on collision side. For disposed airbag treatment, please refer to airbag disposal section.

DTC	B000195	Driver/Left Front Airbag Squib Configured Fault
DTC	B001095	Passenger/Right Front Airbag Squib Configured Fault
DTC	B002095	Driver/Left Side Airbag Squib Configured Fault
DTC	B002195	Driver/Left Curtain Airbag Squib Configured Fault
DTC	B002895	Passenger/Right Side Airbag Squib Configured Fault
DTC	B002995	Passenger/Right Curtain Airbag Squib Configured Fault
DTC	B007095	Driver/Left Pretensioner Squib Configured Fault
DTC	B007295	Passenger/Right Pretensioner Squib Configured Fault
DTC	B007395	2nd Row Passenger/Left Rear Pretensioner Squib Configured Fault
DTC	B007595	2nd Row Passenger/Right Rear Pretensioner Squib Configured Fault
DTC	B009055	Front Left Impact Sensor Configured Fault
DTC	B009155	Left B-pillar Impact Sensor Configured Fault
DTC	B009555	Front Right Impact Sensor Configured Fault
DTC	B009655	Right B-pillar Impact Sensor Configured Error

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B000195	Driver/Left Front Airbag Squib Configured Fault	Malfunction indicator ON	Configuration error or element damaged

SUPPLEMENTAL RESTRAINT SYSTEM

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B001095	Passenger/Right Front Airbag Squib Configured Fault		
B002095	Driver/Left Side Airbag Squib Configured Fault		
B002195	Driver/Left Curtain Airbag Squib Configured Fault		
B002895	Passenger/Right Side Airbag Squib Configured Fault		
B002995	Passenger/Right Curtain Airbag Squib Configured Fault		
B007095	Driver/Left Pretensioner Squib Configured Fault		
B007295	Passenger/Right Pretensioner Squib Configured Fault		
B007395	2nd Row Passenger/Left Rear Pretensioner Squib Configured Fault		
B007595	2nd Row Passenger/Right Rear Pretensioner Squib Configured Fault		
B009055	Front Left Impact Sensor Configured Fault		
B009155	Left B-pillar Impact Sensor Configured Fault		
B009555	Front Right Impact Sensor Configured Fault		
B009655	Right B-pillar Impact Sensor Configured Error		

Warning

Trouble cause: Configuration error or element is damaged.

1	Check configuration data
----------	---------------------------------

- For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .
- Perform configuration learning again or replace it with correct element.

Result

Result	Go to
OK	A

A 

For inspection, refer to “Airbag system malfunction repair completion inspection”

SUPPLEMENTAL RESTRAINT SYSTEM

DTC	B009049	Front Left Impact Sensor Internal Fault
DTC	B009087	Front Left Impact Sensor Communication Fault
DTC	B009149	Left B-pillar Impact Sensor Internal Fault
DTC	B009187	Left B-pillar Impact Sensor Communication Fault
DTC	B009549	Front Right Impact Sensor Internal Fault
DTC	B009587	Front Right Impact Sensor communication Fault
DTC	B009649	Right B-pillar Impact Sensor Internal Error
DTC	B009687	Right B-pillar Impact Sensor Communication Error

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B009049	Front Left Impact Sensor Internal Fault	Malfunction indicator ON	Acceleration sensor type is wrong or the element is damaged
B009087	Front Left Impact Sensor Communication Fault		
B009149	Left B-pillar Impact Sensor Internal Fault		
B009187	Left B-pillar Impact Sensor Communication Fault		
B009549	Front Right Impact Sensor Internal Fault		
B009587	Front Right Impact Sensor communication Fault		
B009649	Right B-pillar Impact Sensor Internal Error		
B009687	Right B-pillar Impact Sensor Communication Error		

Warning

Trouble cause: Acceleration sensor type is wrong or the element is damaged.

1	Check side collision sensor
---	-----------------------------

SUPPLEMENTAL RESTRAINT SYSTEM

(a) For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .

(b) Replace it with element of correct function and type.

Result

Result	Go to
OK	A

A

For inspection, refer to “Airbag system malfunction repair completion inspection”

DTC	B12E049	ACM Internal Error
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■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B12E049	ACM Internal Error	Malfunction indicator ON	Controller is damaged

 **Warning**

Possible cause for malfunction: Controller is damaged

1	Check controller
---	------------------

(a) For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .

(b) Replace the controller.

 **Warning**

Prevent electric static discharge, such as static-proof wrist strap.

Result

Result	Go to
OK	A

A

For inspection, refer to “Airbag system malfunction repair completion inspection”

DTC	B000119	Driver/Left Front Airbag Squib Cross-connect
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DTC	B001019	Passenger/Right Front Airbag Squib Cross-connect
-----	---------	--

DTC	B002019	Driver/Left Side Airbag Squib Cross-connect
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DTC	B002119	Driver/Left Curtain Airbag Squib Cross-connect
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DTC	B002819	Passenger/Right Side Airbag Squib Cross-connect Fault
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SUPPLEMENTAL RESTRAINT SYSTEM

DTC	B002919	Passenger/Right Curtain Airbag Squib Cross-connect
DTC	B007019	Driver/Left Pretensioner Squib Cross-connect
DTC	B007219	Passenger/Right Pretensioner Squib Cross-connect Fault
DTC	B007319	2nd Row Passenger/Left Rear Pretensioner Squib Cross-connect
DTC	B007519	2nd row Passenger/Right Rear Pretensioner Squib Cross-connect

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B000119	Driver/Left Front Airbag Squib Cross-connect	Malfunction indicator ON	Connector is damaged or open
B001019	Passenger/Right Front Airbag Squib Cross-connect		
B002019	Driver/Left Side Airbag Squib Cross-connect		
B002119	Driver/Left Curtain Airbag Squib Cross-connect		
B002819	Passenger/Right Side Airbag Squib Cross-connect Fault		
B002919	Passenger/Right Curtain Airbag Squib Cross-connect		
B007019	Driver/Left Pretensioner Squib Cross-connect		
B007219	Passenger/Right Pretensioner Squib Cross-connect Fault		
B007319	2nd Row Passenger/Left Rear Pretensioner Squib Cross-connect		
B007519	2nd row Passenger/Right Rear Pretensioner Squib Cross-connect		

Warning

Possible cause for malfunction: Connector is damaged or open circuit

1	Check for connector state or open in circuit
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SUPPLEMENTAL RESTRAINT SYSTEM

- (a) For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .
- (b) Check state of corresponding connector. There should be no damage, poor connection or open circuit, etc.; Measure and check if there is open circuit, misalign etc. between airbag module connector and element connector.

Result

Result	Go to
OK	A

A	For inspection, refer to “Airbag system malfunction repair completion inspection” .
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DTC	B00D2F0	Module is in Supplier Manufacturing Mode
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DTC	B12E895	ECU in Configuration Mode
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■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B00D2F0	Module is in Supplier Manufacturing Mode	Malfunction indicator ON	Module does not change to normal mode
B12E895	ECU in Configuration Mode		

⚠ Warning

Possible cause for malfunction: Module does not change to normal mode

1	Module changes to normal mode
---	-------------------------------

- (a) For preparations, refer to “Preparations before dealing with airbag system wire harness malfunction” .
- (b) Change module to normal mode with diagnostic tester.

Result

Result	Go to
OK	A

A	For inspection, refer to “Airbag system malfunction repair completion inspection” .
----------	---

DTC	B12E654	IMU Calibration Missing
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DTC	B12E692	IMU Calibration Fail
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DTC	B12E795	Configuration Parameters Missing
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SUPPLEMENTAL RESTRAINT SYSTEM

■ Description

DTC No.	DTC Definition	DTC Set Condition	Possible Cause
B12E654	IMU Calibration Missing	Malfunction indicator ON	EOL calibration is not performed or calibration conditions are not met
B12E692	IMU Calibration Fail		
B12E795	Configuration Parameters Missing		

⚠ Warning

Possible cause for malfunction: EOL calibration is not performed or calibration conditions are not met.

1	Static calibration condition
---	------------------------------

- (a) Error in module installation angle is $\leq \pm 5^\circ$;
- (b) Maximum tilting angle in longitudinal and lateral directions is $\pm 0.57^\circ$ (1%) for the tester used for IMU off-line calibration;
- (c) Vehicle speed is less than 5 kph;
- (d) Vehicle needs to be supported with tires of proper pressure;
- (e) Steering wheel should be in straight ahead position;
- (f) Vehicle load is normal;
- (g) Only driver sits on the driver position;
- (h) Low fuel in tank;
- (i) Keep vehicle at constant speed;
- (j) No acceleration during the procedure;
- (k) Power supply mode shall be in ON instead of start position.
 - (i) For preparations, refer to "Preparations before dealing with airbag system wire harness malfunction" .
 - (ii) Using diagnostic tester to perform EOL calibration.

Result

Result	Go to
OK	A

A

For inspection, refer to "Airbag system malfunction repair completion inspection" .

DTC	U010000	Lost Communication with EMS
DTC	U010100	Lost Communication with TCU
DTC	U012200	Lost Communication with ESC
DTC	U014000	Lost Communication with BCM
DTC	U015500	Lost Communication with IPC
DTC	U021200	Lost Communication with SCM
DTC	U024800	Lost Communication with PEPS

SUPPLEMENTAL RESTRAINT SYSTEM

■ Description

⚠ Warning

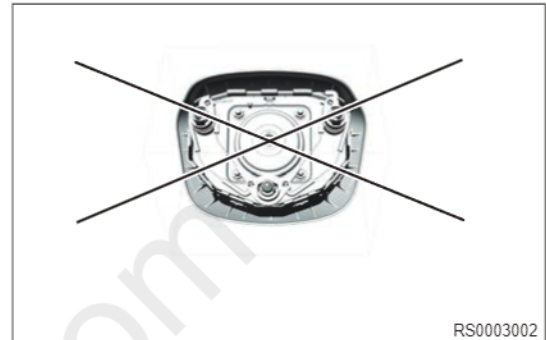
Possible cause for malfunction: CAN bus or controller indicated by DTC is faulty. Diagnostic method: Refer to CAN Malfunction Diagnosis

■ Driver Airbag Assembly

■ On-vehicle Inspection

Hint:

Be sure to follow correct procedures to remove and install driver airbag assembly.



Hint:

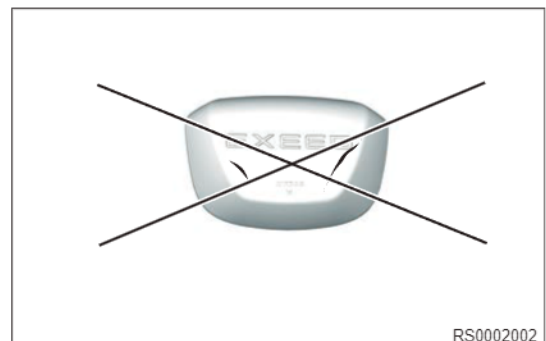
If driver airbag assembly contact plate is deformed, never repair it. Always replace it with a new one. There should not be any contact between driver airbag assembly and steering wheel, and keep an uniform clearance all around, when installing new driver airbag assembly onto the steering wheel.

⚠ Caution

- Handle airbag assembly and airbag control module assembly carefully, and never tap or strike them fiercely.
- Removal, inspection and installation of airbag system must meet relevant requirements and specifications, and never perform operation casually.
- Removed airbag should be kept properly with facing up. Store the airbag in a place with enough spare space to prevent accidental airbag deployment.

- (1) Check the driver airbag assembly (vehicle is not involved in a collision and airbag is not deployed).
 - 1) Perform the diagnosis system inspection.
 - 2) Perform visual inspection with the driver airbag assembly installed on vehicle:
Check for cuts, cracks or discoloration on the outer surface and grooved portion of driver airbag assembly.
If any defect above is found, replace the driver airbag assembly with a new one.
- (2) Check the driver airbag assembly (vehicle is involved in a collision and airbag is not deployed).
 - 1) Perform the diagnosis system inspection.
 - 2) Perform visual inspection with the driver airbag assembly removed from vehicle.

Check wire harnesses for cuts and cracks, and if connectors are chipped.
Check steering wheel for deformation.



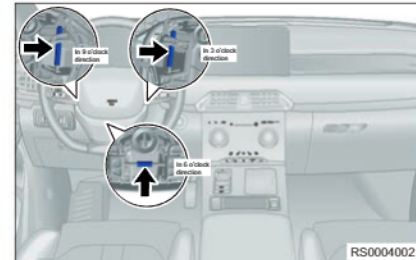
SUPPLEMENTAL RESTRAINT SYSTEM

■ Removal

⚠ Warning

- Wait at least 90 seconds after disconnecting the negative battery cable to disable supplementary restraint system.
- **DO NOT** damage the airbag wire harness when handling airbag assembly wire harness connector.
- **DO NOT** pull the airbag wire harness when removing driver airbag assembly.
- **DAB** installation and repairing must be performed with power off, and it's strictly forbidden to install, remove and rework **DAB** on any production line with power on. **DAB** replacement and repairing must be performed with power off. Within 30s of vehicle stalling or fused removed (refer to Technology Instruction for Wire Harness System Assembly), sufficient power to deploy airbag is still remained inside airbag controller, so it's necessary to perform repairing after 30s since the power of airbag controller is cut off.
- In order to avoid DTC, never energize airbag system before connecting all airbag system components (-including **DAB**) and performing diagnostic inspection;
- Keep space in area for storing **DAB** to prevent accidental deployment of **DAB**. If there is no deployment space, accidental deployment of **DAB** may injure human body or damage the vehicle.
- If **DAB** falls down from a position higher than 1 m, please do not reuse it and insulate it.
- Handle **DAB** carefully, and never tap or strike it fiercely.
- **Assembly, detection and removal of DAB must meet relevant requirements and specifications, and never perform operation casually.**

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the driver airbag assembly.
 - 1) Position the front wheels straight ahead.
 - 2) Using a slotted screwdriver, remove **DAB** in sequence through 3 removal holes in locations of 3 o'clock, 9 o'clock and 6 o'clock on steering wheel. Insert the screwdriver into removal hole of 3 o'clock position on steering wheel in removal direction and push it further lightly when reaching to snap spring until a "click" sound is heard, which means that the clip is detached, and the corresponding side of airbag will be bounced up. Then perform removal in 9 o'clock direction with the same method as above. Finally perform removal in 6 o'clock direction, and then take up the whole **DAB** module from steering wheel lightly with both hands.
 - 3) Disconnect the airbag connectors (arrow).
 - 4) Remove the airbag assembly.



SUPPLEMENTAL RESTRAINT SYSTEM

■ Installation

⚠ Caution

- Confirm that label part number in DAB and configuration card part number in vehicle matches before assembly.
- Then check DAB cover plate surface for trimming, residual, air vent, scratches, galling etc.; it's also forbidden for defects such as inclusion and dents etc. Peel off a bar code after inspection and attach it to record card in vehicle.

Install the DAB after completing the steering wheel;

- Make sure that the ignition key cylinder is in OFF state during installation and never install it with power on;
- Make sure that all connectors are securely connected and the wire harness is fixed in the set slot before pressing DAB into steering wheel;
- After installing the DAB, airbag light is normal after the power is turned on, ensure that the horn pressing function is normal;
- Press periphery and center part of DAB cover with palms to make sure that the pressing operation is smooth without sluggish.

■ Front Passenger Airbag Assembly

■ On-vehicle Inspection

⚠ Warning

- Be sure to follow correct procedures to remove and install front passenger airbag assembly.

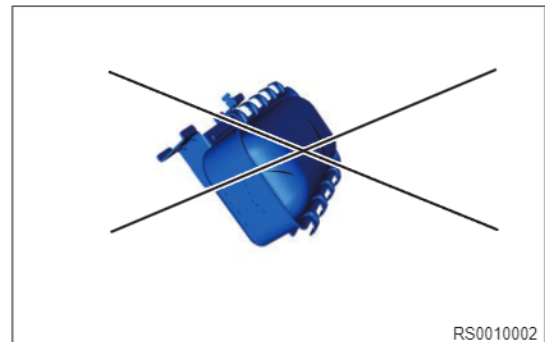
- (1) Check the front passenger airbag assembly (vehicle is involved in a collision, but airbag is not deployed).

- 1) Perform the diagnosis system inspection.
- 2) Perform visual inspection with front passenger airbag assembly removed from vehicle.

Check for cuts, cracks or wear on front passenger airbag assembly.

Check for cracks or other damage on connector.

Check instrument panel or instrument panel crossmember assembly for deformation or damage. If any defect above is found, replace front passenger airbag assembly with a new one.



■ Removal

⚠ Warning

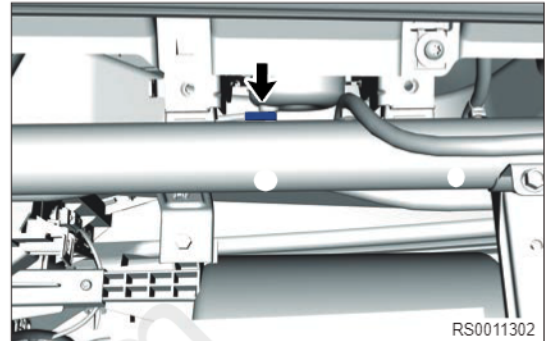
- Handle airbag assembly and airbag control module assembly carefully, and never tap or strike them fiercely.
- Removal, inspection and installation of airbag system must meet relevant requirements and specifications, and never perform operation casually.
- Removed airbag should be kept properly with face up. Store the airbag in a place with enough spare space to prevent accidental airbag deployment.

⚠ Caution

- Wait at least 90 seconds after disconnecting the negative battery cable to disable supplementary restraint system.

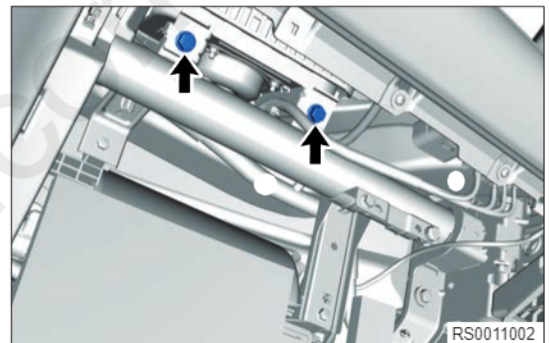
SUPPLEMENTAL RESTRAINT SYSTEM

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the instrument panel assembly.
- (4) Remove the front passenger airbag assembly.
 - 1) Remove the front passenger airbag assembly wire harness connector assembly (arrow).

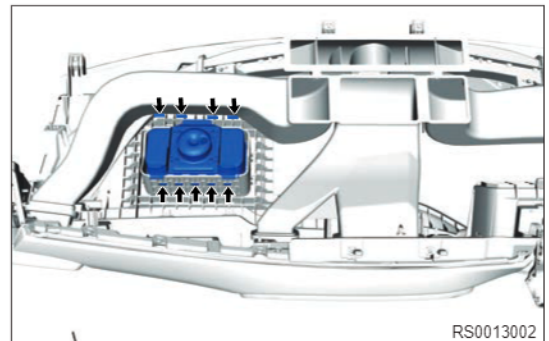


- 2) Remove 2 coupling bolts (arrow) between front passenger airbag assembly and instrument panel crossmember assembly.

Tightening torque: 23 ± 2 N·m



- 3) Using a flat tip screwdriver wrapped with protective tape, slightly pry fixing claws (arrow) around front passenger airbag assembly mounting bracket to separate it from instrument panel body assembly.



- 4) Remove the front passenger airbag assembly.

SUPPLEMENTAL RESTRAINT SYSTEM

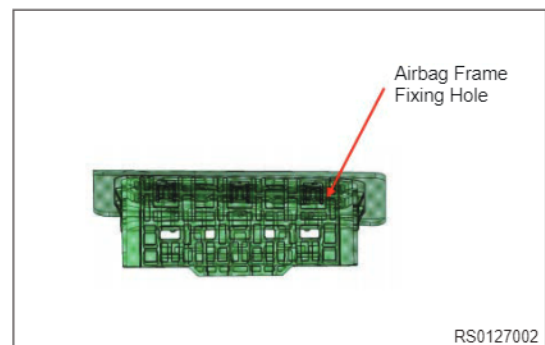
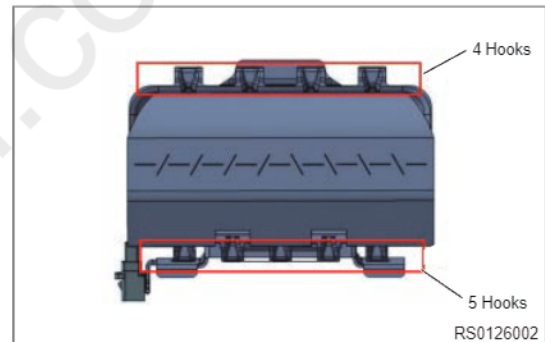
■ Installation

Warning

- Before installing tightening bolts, always make sure that airbag wire harness is not held down or stuck. Adjust if necessary and install it in place.
- Make sure to tighten fixing bolts to specified torque during installation.
- When installing front passenger airbag assembly, first slide the hook on one side into locating hole in airbag box, and then press in hook on the other side firmly, making sure that hooks on both sides enter the corresponding locating holes correctly.
- Always keep vehicle power off during installation. It is forbidden to install the front passenger airbag assembly with vehicle power on.
- Check SRS warning light after installation, and make sure that supplemental restraint system operates normally.

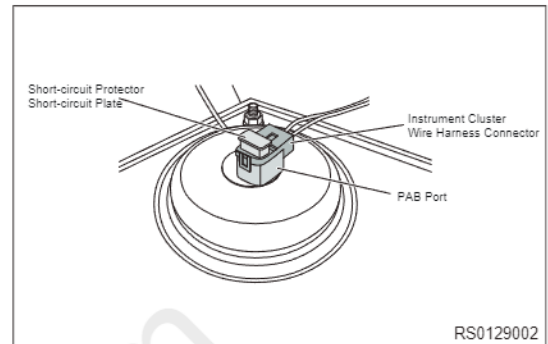
Detailed description and technology requirements during assembly

- (1) Inspect and confirm that parts surface should be free of chips and damages and labels and bar codes should be intact and clear before assembly; Peel off one bar code after inspection and attach it to record card in vehicle;
- (2) PAB should be installed firstly to instrument panel upper body. Place PAB entirely into airbag bracket on back side of instrument panel upper body. First hang 4 hooks into fixing holes in airbag frame, then press 5 hooks on the other side firmly into bracket holes and make sure that hooks on both sides have been put into the corresponding fixing holes.



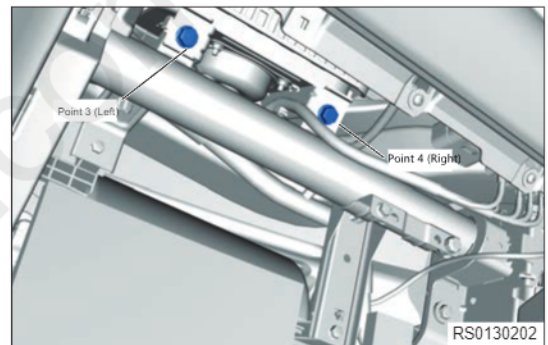
SUPPLEMENTAL RESTRAINT SYSTEM

- (3) After putting instrument panel body into packing machine, insert instrument cluster wire harness connector into PAB generator port while keeping the connector fitting flatly with the generator. And press down short-circuit plate to keep its upper surface be flush with connector surface on wire harness end, which indicates that it is installed in place. PAB port has failure-proof function and it's forbidden to connect forcibly;



- (4) After installing instrument panel body, pre-tighten 2 bolts of PAB to CCB bracket in glove box port. Tighten point 3 on left side, then tighten point 4 on right side and finally tightens bolts with installing tools according to set torque value.

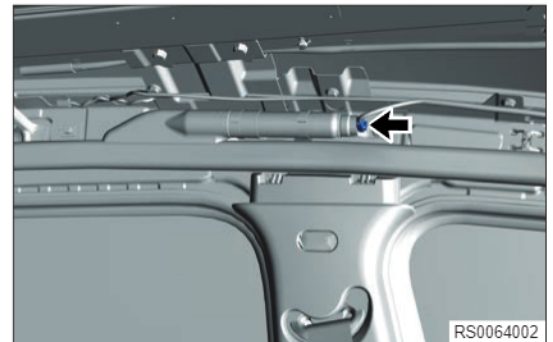
Tightening torque: $23 \pm 2 \text{ N}\cdot\text{m}$



■ Removal and Installation of Side Curtain Shield Airbag (CAB) (Use same removal/installation procedures for left and right sides)

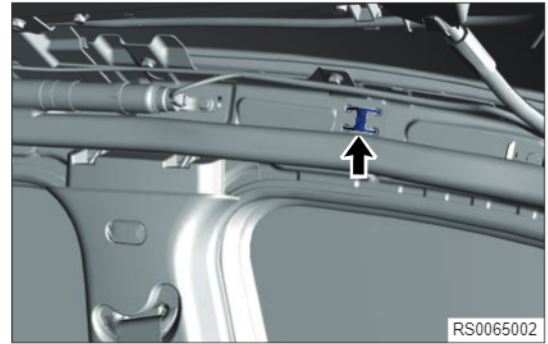
Removal (Take left side as an example)

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable and wait for 90 seconds.
- (3) Remove the roof.
- (4) Remove the left curtain shield airbag. (Using same procedure for left and right sides)
 - 1) Unplug the curtain shield airbag connector (arrow).



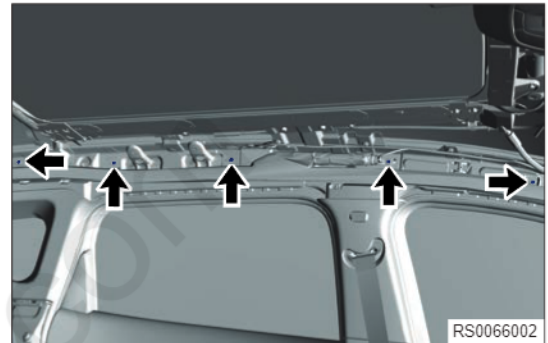
SUPPLEMENTAL RESTRAINT SYSTEM

- 2) Using a flat screwdriver, pry out clip (arrow).

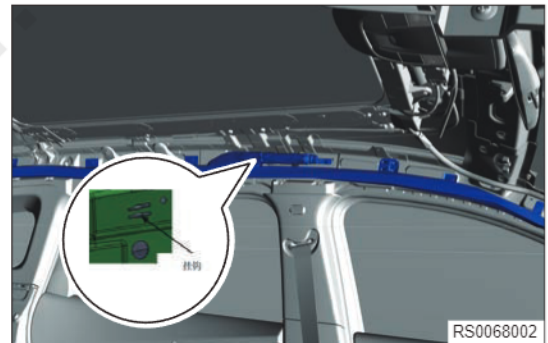


- 3) Remove 5 fixing bolts (arrows) from curtain shield airbag.

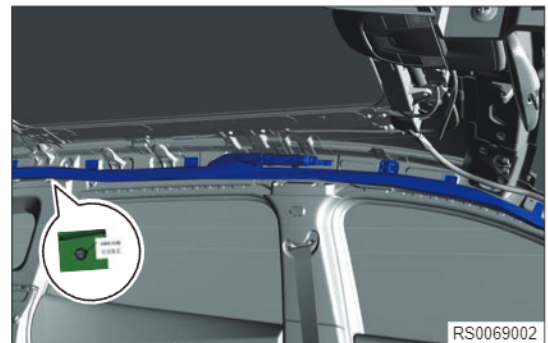
Tightening torque: $9 \pm 1 \text{ N}\cdot\text{m}$



- 4) Pull out generator mounting bracket hook from mounting hole of vehicle body.



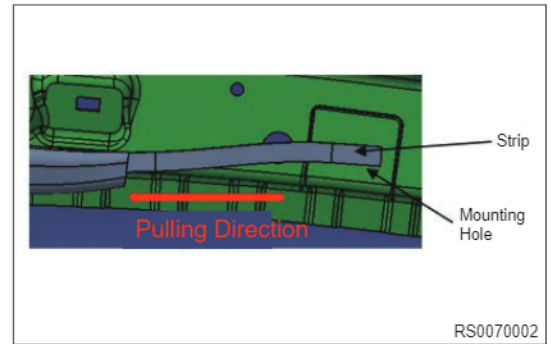
- 5) Detach the screw.



- 6) Remove the fixing clip.

SUPPLEMENTAL RESTRAINT SYSTEM

7) Remove end of strap from sheet metal hole.



8) Remove the left curtain shield airbag assembly.

■ **Installation (Use same procedures for left and right sides)**

Caution

- It is essential to check if protecting bag stitching of air bag is in lower part of air bag during assembly.
- Air bag on each armrest installation bracket should be in lower part of armrest bracket. If air bag covers armrest installation bracket, it's necessary to adjust air bag to lower part of the bracket with hands.
- Always keep vehicle power off during installation. It is forbidden to install the airbag controller assembly with vehicle power on.
- Air bag on C pillar guide bracket should be in upper part of guide bracket. After assembling air bag clip, it's necessary to adjust air bag to upper part of C pillar guide bracket with hands.
- During assembly, insert locating pin of the sensor into waist-shaped locating hole.
- Check that airbag components surface should be free of damages before assembly and labels and bar codes should be intact and clear; it's also necessary to check that CAB installation area on vehicle body should be free of rags, sharp corners, welding spatters etc.
- Be sure to follow correct procedures to remove and install side curtain shield airbag.
- Check that airbag components surface should be free of damages before assembly and labels and bar codes should be intact and clear; it's also necessary to check that CAB installation area on vehicle body should be free of rags, sharp corners, welding spatters etc.; peel off one bar code after the checking and attach it to record card in vehicle.

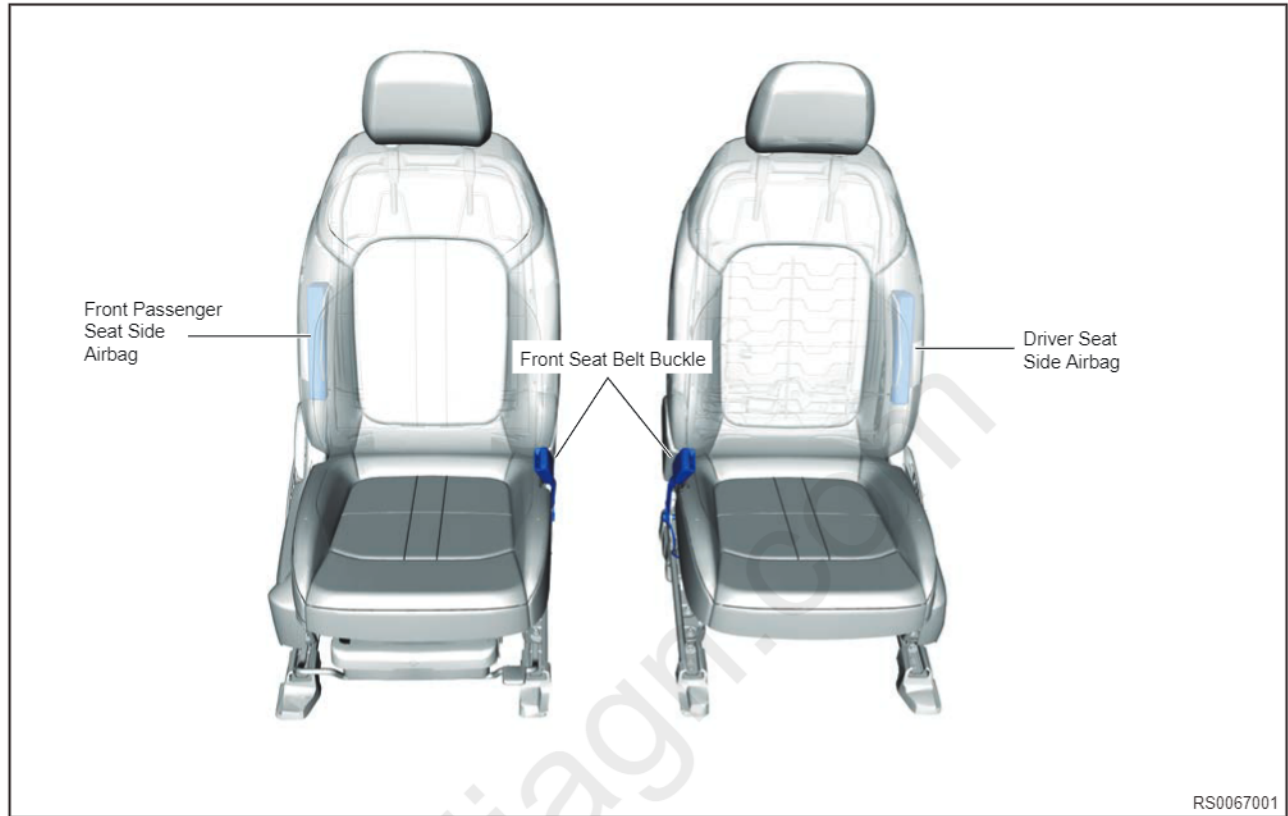
Installation is in the reverse order of removal.

SUPPLEMENTAL RESTRAINT SYSTEM

■ Front Seat Side Airbag

■ Description

Installation positions of front seat side airbag, front seat belt buckle



RS0067001

⚠ Caution

- Resistance of seat airbag: $2.0 + 0.5 / -0.3 \Omega$, it's strictly forbidden to measure resistance with multimeter.
- Front passenger side airbag is non-removable and must be removed together with seat assembly.
- Passenger loading status: When detected external resistance is lower than 100Ω , it's judged that there is passenger. When resistance is higher than 400Ω , it's judged that there is no passenger.

■ Spiral Cable (Integrated in SCM Module)

■ Removal

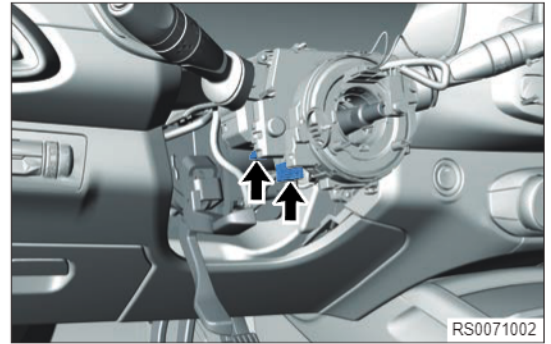
⚠ Caution

- Wait at least 90 seconds after disconnecting the negative battery cable to disable supplementary restraint system.

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Position the front wheels straight ahead.
- (4) Remove the driver airbag.
- (5) Remove the steering wheel assembly.
- (6) Remove the combination switch cover assembly.
- (7) Remove the spiral cable.

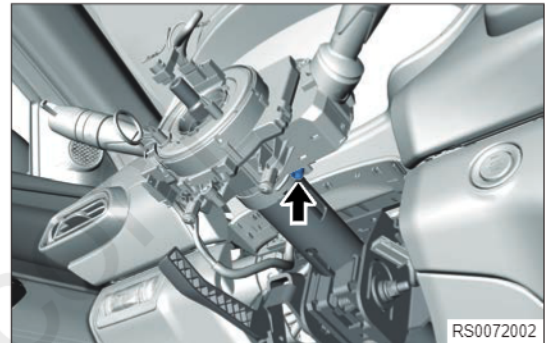
SUPPLEMENTAL RESTRAINT SYSTEM

- 1) Disconnect the steering column connectors (arrow).

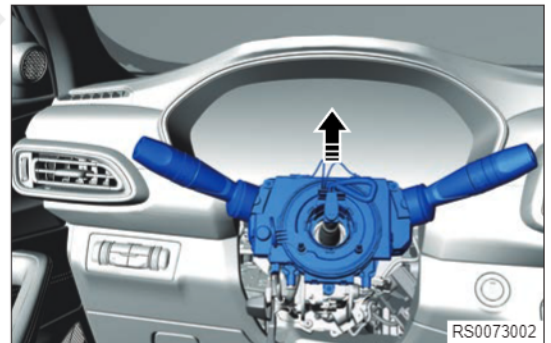


- 2) Release fixing screw (arrow) of spiral cable fixing snap spring.

Tightening torque: $6 \pm 0.5 \text{ N}\cdot\text{m}$



- 3) Remove spiral cable from steering column in direction of arrow.



■ Inspection

Hint:

- An activation prevention mechanism is built in airbag system connector. When connector is disconnected, this mechanism cuts off circuit by bringing short spring plate into contact with terminals, thus insulating the circuit from external power sources to prevent accidental airbag activation.
- To release activation prevention mechanism, insert a piece of paper with the same thickness as male terminal between terminals and short spring plate to disconnect the connection.

■ Installation

Hint:

Always install spiral cable correctly according to matchmarks on spiral cable and steering column (fully turn spiral cable in a direction slowly, then turn it in the opposite direction until yellow ball appears in transparent neutral window and arrow marks align with each other), otherwise the spiral cable may be damaged.

SUPPLEMENTAL RESTRAINT SYSTEM

⚠ Caution

- Always install spiral cable correctly according to specified operating instructions.
- **DO NOT** rotate the spiral cable over specified turns to prevent it from breaking.
- Be sure to install fixing claws in place when installing spiral cable.
- Check that horn operates normally after installation.
- Check SRS warning light after installation, and make sure that supplemental restraint system operates normally.

Installation is in the reverse order of removal.

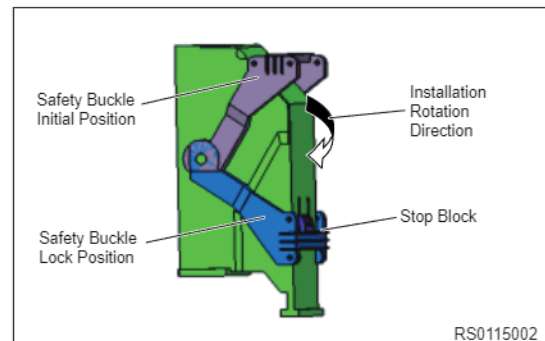
■ Airbag System Controller

■ Removal

Warning/Caution/Hint

⚠ Warning

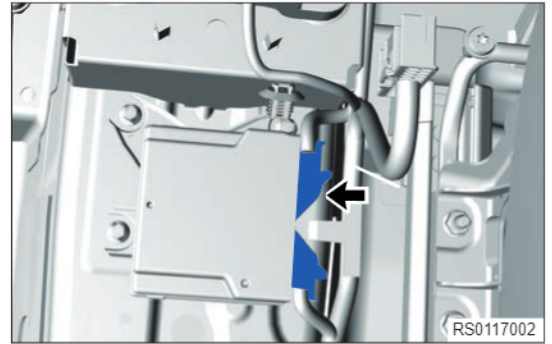
- Be sure to follow correct procedures to remove and install airbag system controller.
- Inspect and confirm that part number in ACU label matches with configuration card part number in vehicle; parts surface should be free of chips and labels and bar codes should be intact and clear before assembly; Peel off one bar code after inspection and attach it to record card in vehicle;
- Aligning 3 installation holes of ACU with vehicle body projection welding nut hole. Pre-tighten the bolts and tighten 3 bolts to specified torque with a tool;
 - Insert wire harness connector into ACU port:
Rotate fuse clip from initial position to final lock position following installation rotation direction and make sure that fuse clip goes over stop block. Generally a “click” sound will be heard, which indicates that fuse clip has been clamped into place. Make sure that fuse clip is in initial position before installation. ACU port has failure-proof function, which causes impossible inserting with incorrect configuration, so never assemble it forcibly.
- Peel off the entire bar code and attach it to record card in vehicle for relevant information tracing.
- Handle ACU carefully and it's strictly forbidden to tap and crash it fiercely.
- There should be no other objects between ACU installation plane and ACU and ACU must be installed directly on body panel.
- When installing and tightening bolts of ACU, make sure that start button is in OFF and it's forbidden to install it with power on.



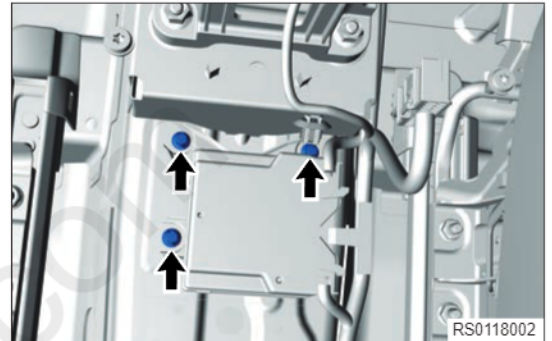
- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable and wait for 90 seconds.
- (3) Remove the auxiliary fascia console assembly.
- (4) Remove the airbag controller assembly.

SUPPLEMENTAL RESTRAINT SYSTEM

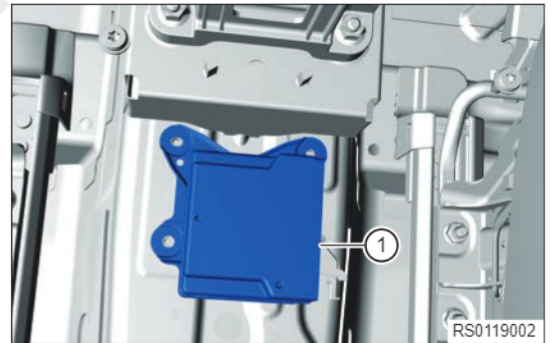
- 1) Disconnect the airbag controller wire harness connector (arrow).



- 2) Remove 3 fixing bolts (arrow) from airbag controller.
Tightening torque: 8 ± 1.2 N·m



- 3) Remove the airbag controller assembly (1).



■ Installation

Warning

- Before installing tightening bolts, always make sure that airbag wire harness is not held down or stuck. Adjust if necessary and install it in place.
- Make sure to tighten fixing bolts to specified torque during installation.
- Always keep vehicle power off during installation. It is forbidden to install the airbag controller assembly with vehicle power on.
- Check SRS warning light after installation, and make sure that supplemental restraint system operates normally.
- Always perform yaw rate sensor calibration when replacing airbag control module or there is related malfunction on airbag.
- Perform IMU off-line calibration when replacing airbag control module with a new one or malfunction of no IMU calibration occurs.

Installation is in the reverse order of removal.

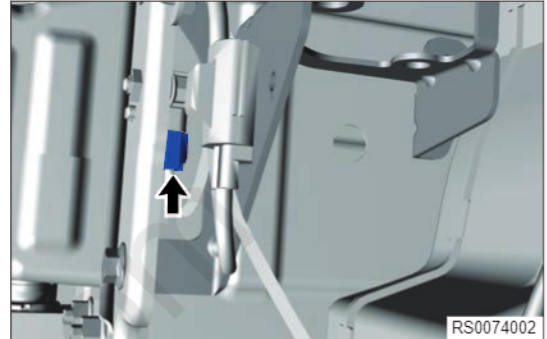
SUPPLEMENTAL RESTRAINT SYSTEM

■ Removal and Installation of Frontal Collision Sensor (Use same installation procedures for left and right sides)

■ Removal (Take left side as an example)

Warning/Caution/Hint

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable and wait for 90 seconds.
- (3) Remove the front wheel house protector assembly.
- (4) Remove the frontal collision sensor.
 - 1) Disconnect the frontal collision sensor connector (arrow).

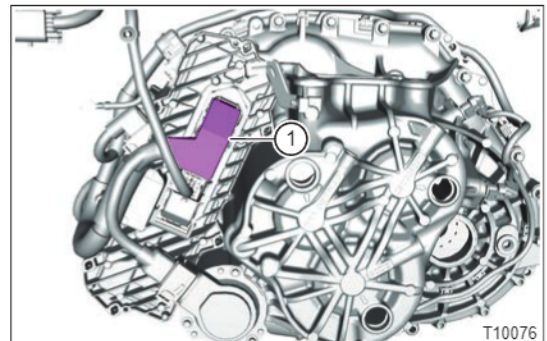


- 2) Remove 1 fixing bolt (arrow) from frontal collision sensor.

Tightening torque: $8 \pm 1.2 \text{ N}\cdot\text{m}$



- 3) Remove the frontal collision sensor (1).



■ Installation

⚠ Warning

- Before installing tightening bolts, always make sure that airbag wire harness is not held down or stuck. Adjust if necessary and install it in place.
- Make sure to tighten fixing bolts to specified torque during installation.
- Always keep vehicle power off during installation. It is forbidden to install the airbag controller assembly with vehicle power on.
- Check SRS warning light after installation, and make sure that supplemental restraint system operates normally.

SUPPLEMENTAL RESTRAINT SYSTEM

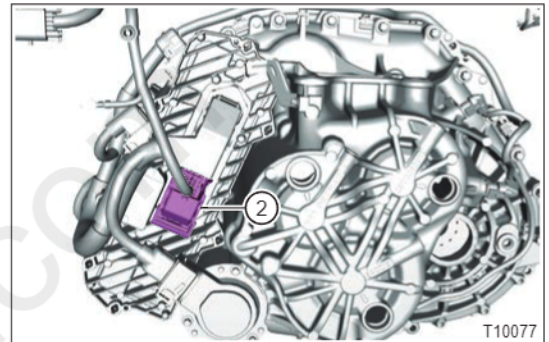
Installation is in the reverse order of removal.

■ **Removal and Installation of Side Collision Sensor (Use same installation procedures for left and right sides)**

■ **Removal (Take left side as an example)**

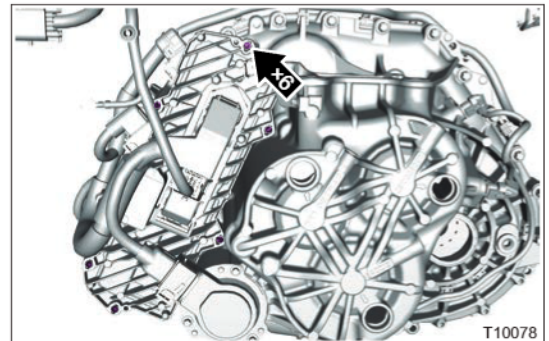
Warning/Caution/Hint

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable and wait for 90 seconds.
- (3) Remove the B-pillar lower protector assembly.
- (4) Remove the side collision sensor.
 - 1) Disconnect the side collision sensor connector (arrow).

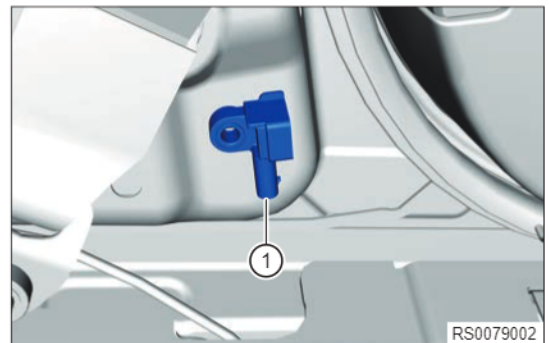


- 2) Remove 1 fixing bolt (arrow) from side collision sensor.

Tightening torque: 9 ± 1 N·m



- 3) Remove the side collision sensor (1).



SUPPLEMENTAL RESTRAINT SYSTEM

■ Installation

⚠ Warning

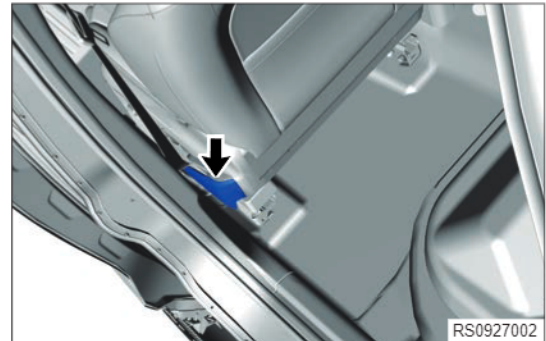
- Before installing tightening bolts, always make sure that airbag wire harness is not held down or stuck. Adjust if necessary and install it in place.
- Make sure to tighten fixing bolts to specified torque during installation.
- Always keep vehicle power off during installation. It is forbidden to install the airbag controller assembly with vehicle power on.
- Check SRS warning light after installation, and make sure that supplemental restraint system operates normally.

Installation is in the reverse order of removal.

■ Front Seat Belt Assembly

■ Removal

- Be sure to wear safety equipment to prevent accidents, when removing front seat belt assembly.
 - Appropriate force should be applied, when removing front seat belt assembly. Be careful not to operate roughly.
 - Try to prevent interior from being scratched, when removing front seat belt assembly.
- (1) Turn off all electrical equipment and ENGINE START STOP switch.
 - (2) Disconnect the negative battery cable.
 - (3) Remove the front doorsill light.
 - (4) Remove the front doorsill pressure plate assembly.
 - (5) Remove the front left door opening weatherstrip.
 - (6) Remove the rear doorsill pressure plate assembly.
 - (7) Remove the rear left door opening weatherstrip.
 - (8) Remove the front left seat belt assembly.
 - 1) Using an interior crow plate, carefully pry off side panel trim cover (arrow) near lower left part of seat.



- 2) Remove 1 fixing bolt (arrow) from seat belt lower end plate.

Tightening torque: 50 ± 5 N·m

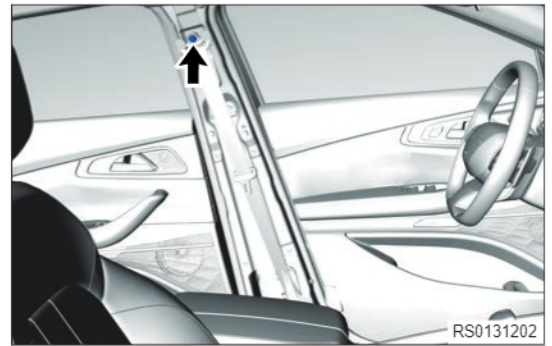


- 3) Remove the B-pillar lower protector.
- 4) Remove the B-pillar upper protector

SUPPLEMENTAL RESTRAINT SYSTEM

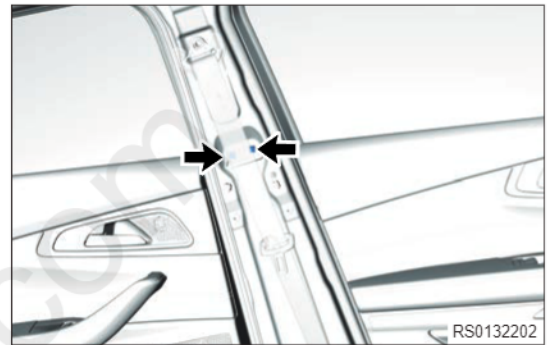
- 5) Remove 1 fixing bolt (arrow) from guide ring.

Tightening torque: 50 ± 5 N·m

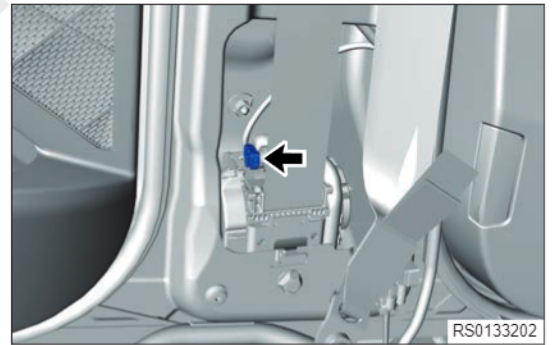


- 6) Remove 2 fixing screws (arrow) from fork bracket.

Tightening torque: 8 ± 1 N·m

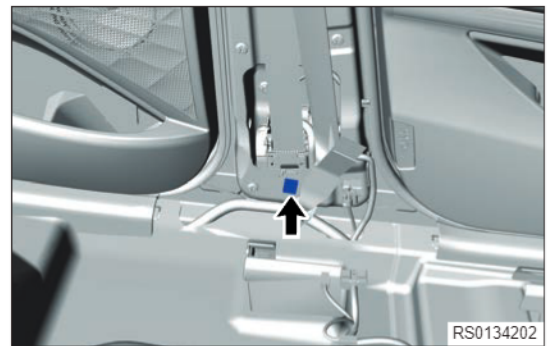


- 7) Disconnect the retractor connector (arrow).



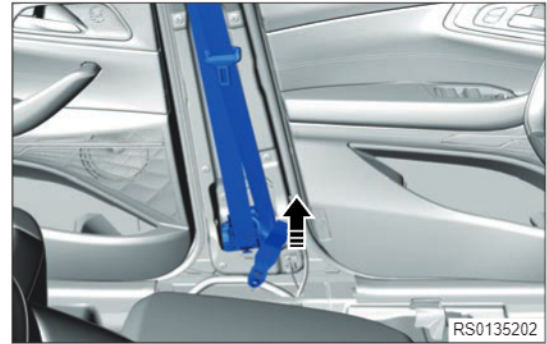
- 8) Remove 1 fixing bolt (arrow) from retractor.

Tightening torque: 50 ± 5 N·m



SUPPLEMENTAL RESTRAINT SYSTEM

- 9) Disengage T type hook of retractor from slot on retractor mounting board of B pillar metal sheet in direction of arrow.



- 10) Remove the front left seat belt assembly.

■ Rear Seat Belt Assembly

■ Removal

Hint:

- Use same procedures for right and left sides.
- Procedures listed below are for left side.

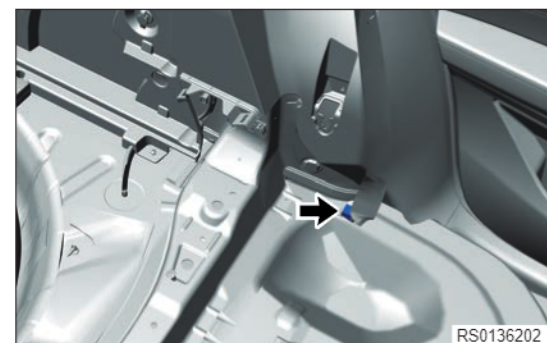
⚠ Caution

- Be sure to wear safety equipment to prevent accidents, when removing rear seat belt assembly.
- Appropriate force should be applied, when removing the rear seat belt assembly. Be careful not to operate roughly.
- Try to prevent interior from being scratched, when removing rear seat belt assembly.

- (1) Turn off all electrical equipment and the ignition switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the rear seat cushion assembly.
- (4) Remove the covering curtain assembly.
- (5) Remove the luggage compartment carpet assembly.
- (6) Remove the spare tire cover plate assembly.
- (7) Remove the luggage compartment protector assembly.
- (8) Remove the back doorsill pressure plate assembly.
- (9) Remove the rear seat belt assembly.

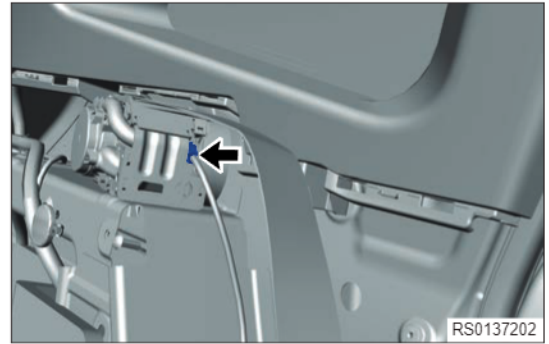
- 1) Remove fixing bolt (arrow) from rear left seat belt lower end plate.

Tightening torque: 50 ± 5 N·m



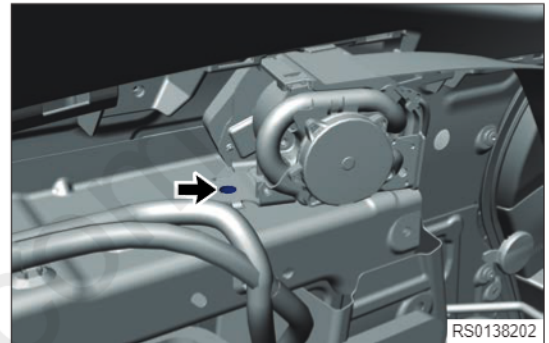
SUPPLEMENTAL RESTRAINT SYSTEM

- 2) Disconnect the retractor connector (arrow).

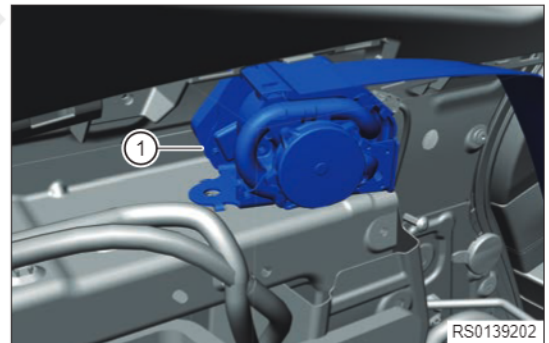


- 3) Remove 1 fixing bolt (arrow) from retractor.

Tightening torque: 50 ± 5 N·m



- 4) Disengage T type hook on retractor from groove of C-pillar mounting board, and remove rear seat belt assembly (1).



■ Installation

⚠ Caution

- Keep seat belt assembly clean without oil attached and check seat belt assembly for damage, when installing rear seat belt assembly.
- Be sure to tighten all fixing bolts and fixing screws according to specified torque, when installing rear seat belt assembly.
- Be sure to perform assembly of vehicle in accordance with BOM strictly. It is not allowed to replace the parts assembly without permission.
- During assembly of vehicle, tighten parts with specified torque in list strictly.
- It is not allowed to replace the components of parts assembly without permission, such as bolt, washer etc.
- If the parts assembly is accidentally dropped during handling and installation, please check the plastic parts of parts assembly (such as retractor) for cracks. If there is crack, insulate and dispose it after packaging and marking to prevent accidental injury.
- It is necessary to check whether the seat belt is in good condition before installing it; Pull the webbing and lock the buckle after assembling to ensure that the webbing can be extended and retracted smoothly, the buckle can be locked and unlocked normally. Make sure that there are no objects (such as tools, etc.) can scratch the webbing during assembly of seat belt.

SUPPLEMENTAL RESTRAINT SYSTEM

■ Front Seat Belt Buckle Assembly

■ Removal

Hint:

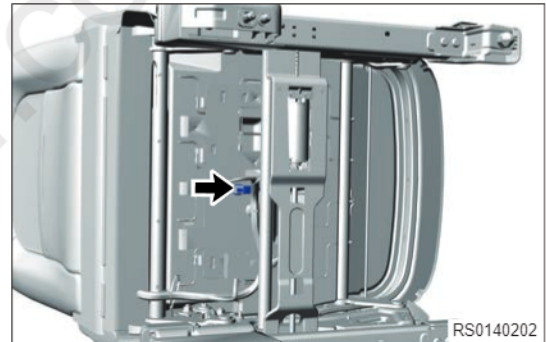
- Use same procedures for front passenger seat belt buckle assembly and driver seat belt buckle assembly.
- Procedures listed below are for driver seat belt buckle assembly.

Caution

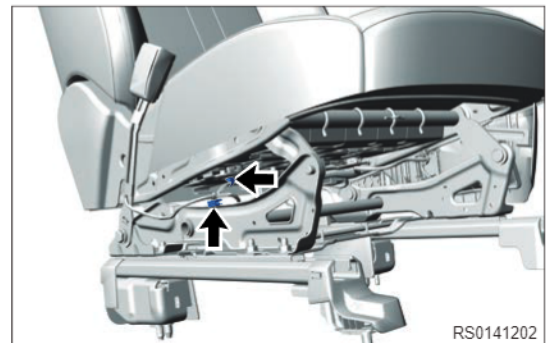
- **Be sure to wear safety equipment to prevent accidents, when removing front seat belt buckle assembly.**
- **Try to prevent interior from being scratched, when removing front seat belt buckle assembly.**
- **Try to prevent wire harness and connector from being damaged, when removing front seat belt buckle assembly.**

- (1) Turn off all electrical equipment and the ignition switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the front seat assembly.
- (4) Remove the driver seat belt buckle assembly.

- 1) Disengage the seat belt buckle wire harness connector (arrow) from bottom part of seat.

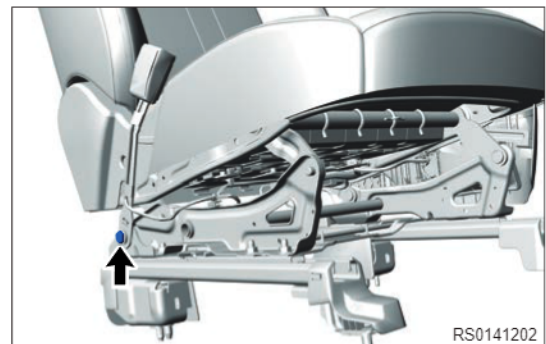


- 2) Disengage the seat belt wire harness clips (arrow) from bottom part of seat.



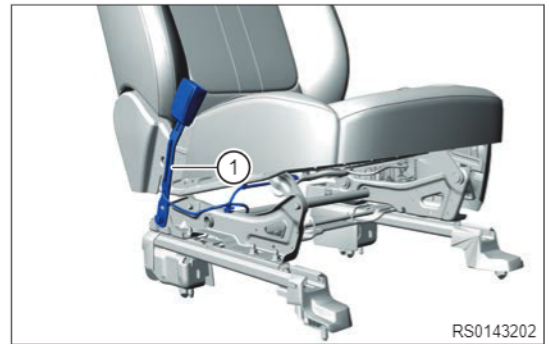
- 3) Remove fixing bolt from seat belt buckle (arrow).

Tightening torque: 45 ± 5 N·m



SUPPLEMENTAL RESTRAINT SYSTEM

- 4) Remove the driver seat belt buckle assembly (1).



■ Installation

⚠ Warning

- (1) Be sure to tighten all fixing bolts according to specified torque, when installing front seat belt buckle assembly.
- (2) Install connectors in place, when installing front seat belt buckle assembly.

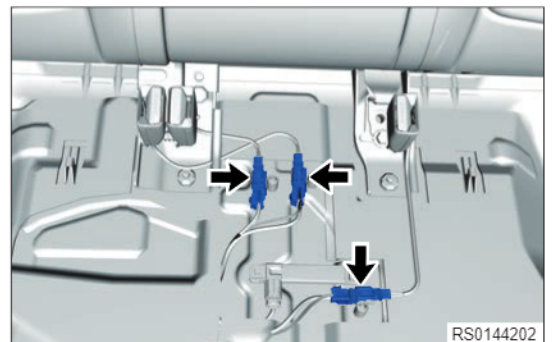
■ Single-buckle and Double-buckle Assembly

■ Removal

⚠ Caution

- (1) Be sure to wear necessary safety equipment to prevent accidents, when removing single-buckle and double-buckle assembly.
- (2) Try to prevent interior from being scratched, when removing single-buckle and double-buckle assembly.

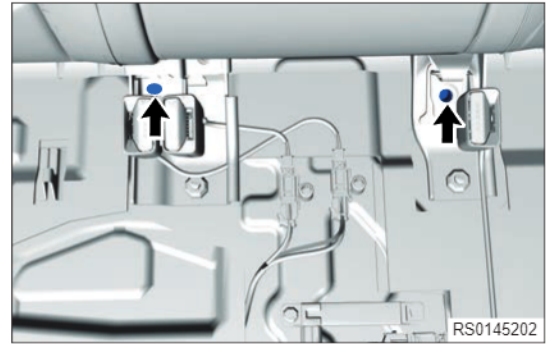
- (1) Turn off all electrical equipment and the ignition switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the rear seat cushion assembly.
- (4) Remove the single-buckle and double-buckle assembly.
 - 1) Disconnect single-buckle and double-buckle assembly connectors (arrow).



SUPPLEMENTAL RESTRAINT SYSTEM

- 2) Remove 2 fixing bolts (arrow) from single-buckle and double-buckle.

Tightening torque: $60 \pm 3 \text{ N}\cdot\text{m}$



- 3) Remove the single-buckle and double-buckle assembly.

■ Installation

Warning

- **Be sure to tighten fixing bolts to specified torque, when installing single-buckle and double-buckle assembly.**
- **Pay attention to the installation positions of double-buckle assembly and rear small buckle lock assembly during assembly. For details, refer to installation illustration. Installation position must be correct.**