

SLIDING ROOF

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شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



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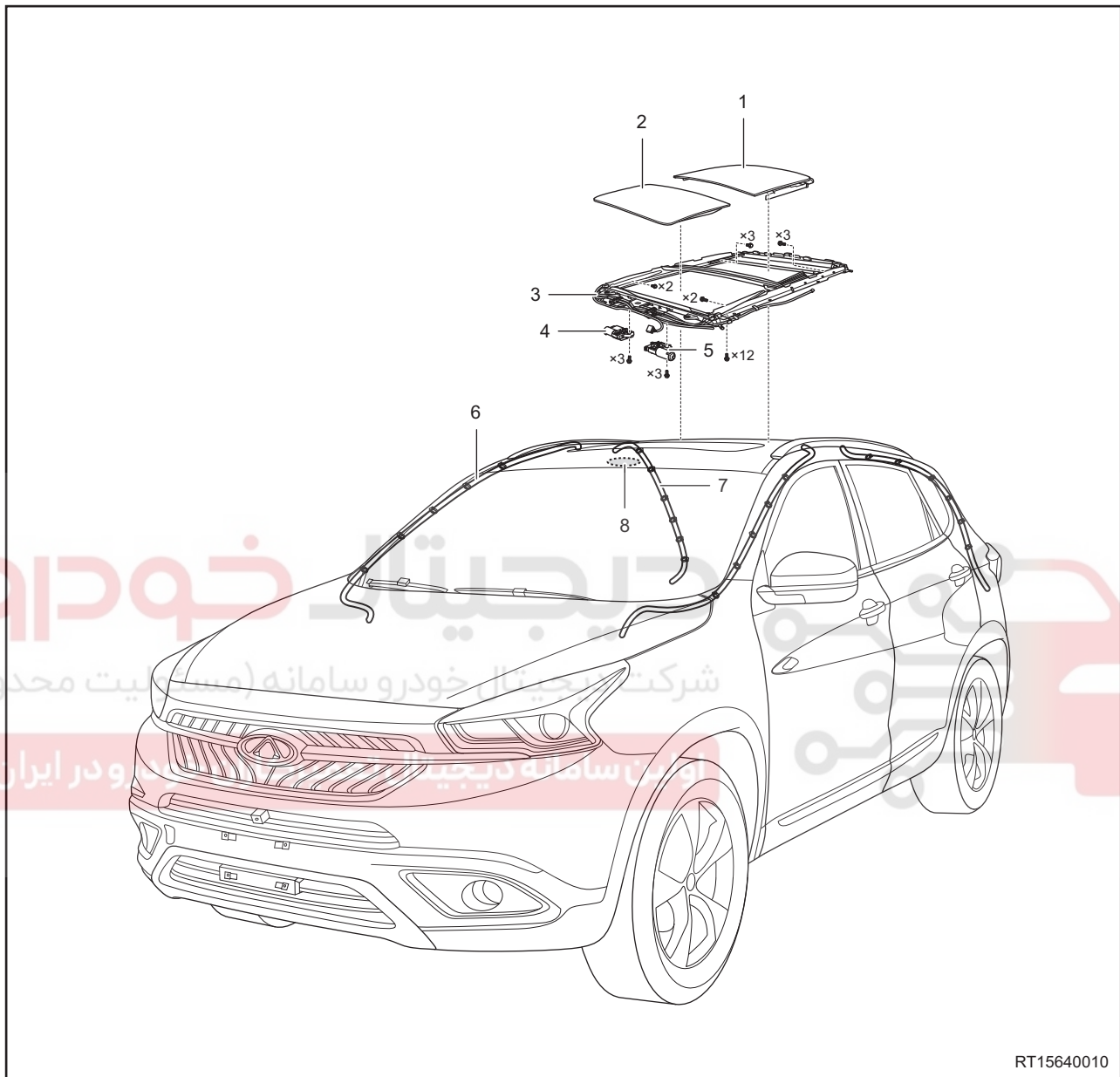
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GENERAL INFORMATION

Description



1 - Sliding Roof Rear Glass Assembly	2 - Sliding Roof Front Glass Assembly
3 - Sliding Roof Mounting Bracket	4 - Sunshade Motor Assembly
5 - Sliding Roof Glass Motor Assembly	6 - Sliding Roof Front Drain Hose
7 - Sliding Roof Rear Drain Hose	8 - Sliding Roof Switch Assembly

Panoramic roof for this model consists of sliding roof switch, sliding roof glass, power sunshade, sliding roof motor, sunshade motor, sliding roof module and sliding roof drain hoses.

Basic Function Introduction

Auto Mode

Automatic glass level opening, automatic glass level closing, automatic glass tilt opening, automatic glass tilt closing, automatic sunshade level opening, automatic sunshade level closing.

Inching (Manual) Mode

Glass level inching opening, glass level inching closing, sunshade level inching opening, sunshade level inching closing.

Jam Protection Reversal Distance

1. If jam protection occurs in sliding roof between 4 and 200 mm, glass/sunshade will return to the position at 250 mm. For position outside of 200 mm, glass/sunshade may return by 50 mm, but it cannot beyond the full open position.
2. Tilt direction: reverse to tilt height.

Logical Function Introduction

Manual Mode for Glass

Under manual mode, press glass Open/Close button, to manually open/close the glass. When releasing the sliding roof switch after glass reaches to proper position, glass will stay at the current position.

When glass is at any position between fully closed and comfort position, glass moves to opening direction and stops at comfort position finally after pressing the Open button. If continues to open, release the button and press it again.

Manual Mode for Sunshade

Under manual mode, press sunshade Open/Close button, to manually open/close the sunshade. When releasing the sunshade switch after sunshade reaches to proper position, sunshade will stay at the current position.

When sunshade is at any position between fully closed and mid position, sunshade moves to opening direction and stops at mid position finally after pressing the Open button. If continues to open, release the button and press it again.

When sunshade is at any position between fully open and mid position, sunshade moves to closing direction and stops at mid position finally after pressing the Close button. If continues to close, release the button and press it again.

Auto Mode for Glass

Under auto mode, press glass Open/Close button, to automatically open/close the glass;

If glass is at close position, glass will tilt to maximum angle automatically when inching the glass Close button.

If glass is at maximum tilt angle, glass will close automatically when pressing the glass Open button.

If glass is at close position, glass will open to comfort position automatically when pressing the glass Open button, and it will run to fully open position after pressing the Open button again.

If glass is at open position, glass will close automatically when pressing the glass Close button.

Auto Mode for Sunshade

Under auto mode, press sunshade Open/Close button, to automatically open/close the sunshade;

If sunshade is at fully closed position, sunshade will run to mid position automatically when pressing the sunshade Open button, and it will run to fully open position after pressing the the sunshade Open button again.

If sunshade is at fully open position, sunshade will run to mid position automatically when pressing the sunshade Close button, and it will run to fully closed position after pressing the the sunshade Close button again.

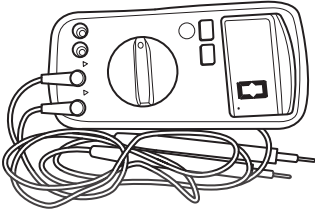
Specifications

Torque Specifications

Description	Torque (N·m)
Sliding Roof Switch Assembly Fixing Screw	2 ± 0.5
Sliding Roof Glass Fixing Bolt	5 ± 1
Sliding Roof Bracket Fixing Bolt	9 ± 1.5

Tool

General Tool

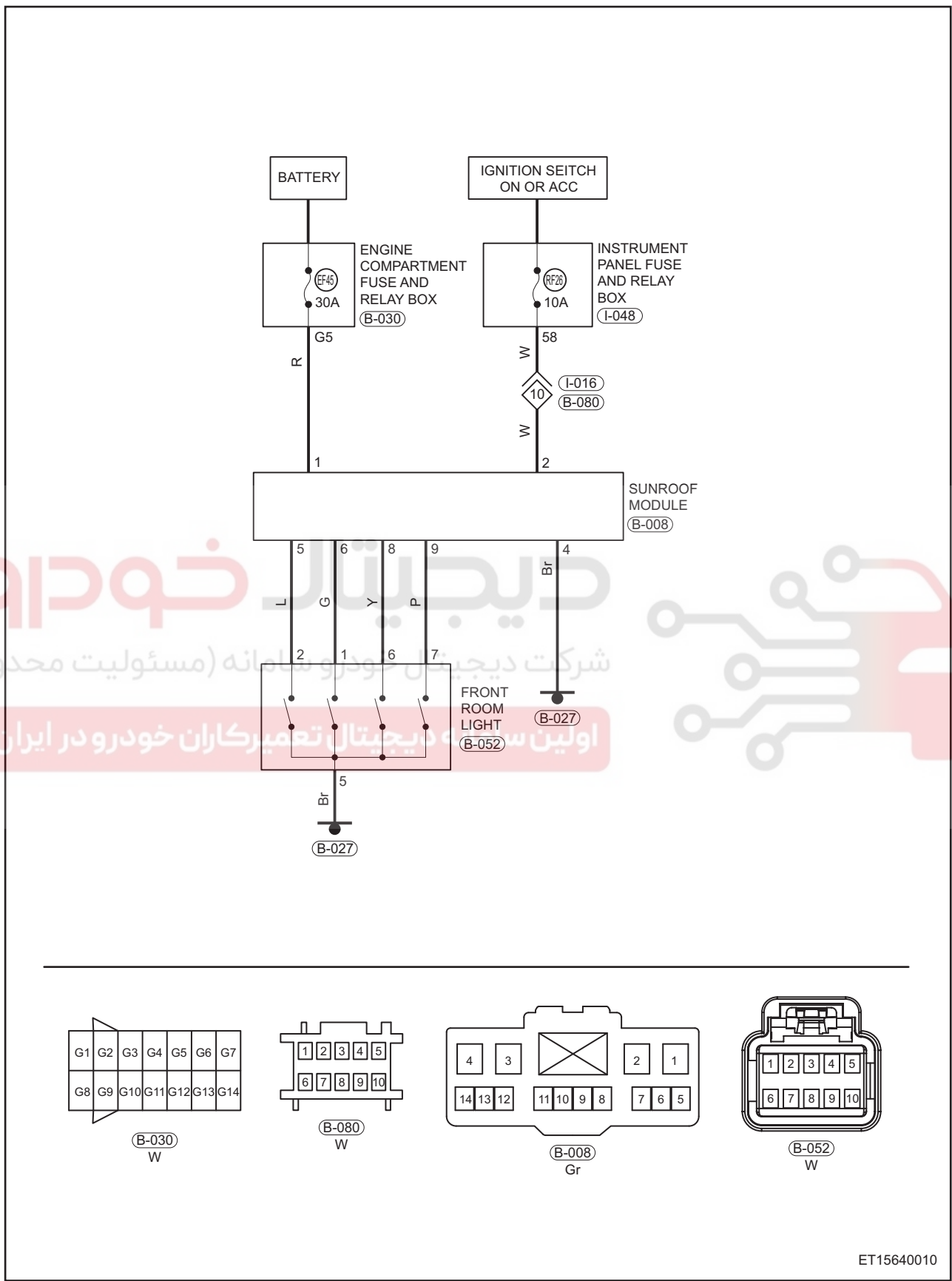
Digital Multimeter	 <p>RCH0000002</p>
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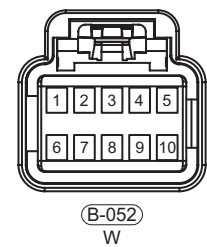
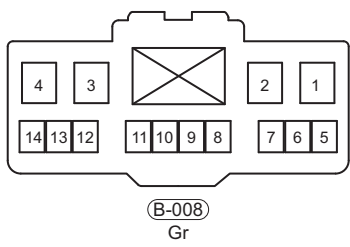
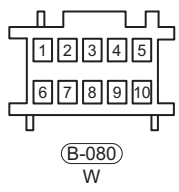
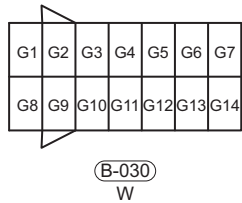
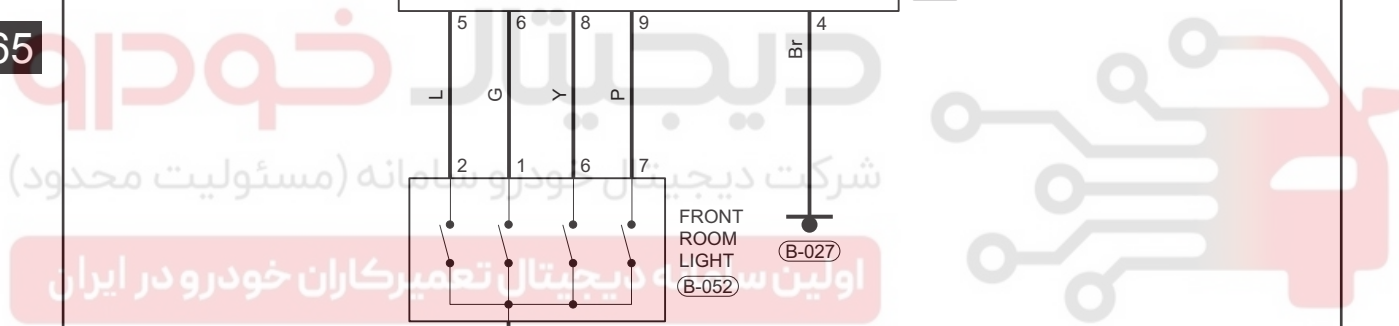
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Circuit Diagram



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DIAGNOSIS & TESTING

Sliding Roof Learning

Sliding roof or sunshade initial position losing

Definition: Sliding roof or sunshade cannot be opened, closed normally or closed to a normal position, and initial movement for sliding roof or sunshade cannot be performed. When there is such problem in sliding roof or sunshade, movement process for sliding roof or sunshade will be disordered, that is, sliding roof or sunshade loses the initial position.

Problem Symptom

1. Sliding roof cannot be closed and opened completely or tilted. Shuddering may occur during the process from tilt to close.
2. When opening or closing sliding roof or sunshade, it cannot reach to initial set position.
3. A function that pressing the button once to automatically open and close sliding roof or sunshade cannot be performed.
4. Sliding roof or sunshade operation cannot be controlled by sliding roof module.

Solution Method

For specific details, perform repairs according to following steps. Make sure that power supply shall not be shut off during operation; and confirm that no hard objects (various obstacles) that block running of sliding mechanism are in sliding roof rail and sunshade rail.

Glass reinitialization:

1. Perform ON -> OFF -> ON operations for IGN within 5 seconds;
2. Within 3 seconds after first operation, press and hold Close button (manual close and automatic close mode are available), then glass will reach the tilt position and a "click" sound is heard;
3. If the Close button is pressed and held all along after stuck, glass will perform operations below in order: tilt close -> full open -> full close; sunshade stops running after the process is finished, then release the button;
4. Initialization is finished.

Sunshade reinitialization:

1. Perform ON -> OFF -> ON operations for IGN within 5 seconds;
2. Within 3 seconds after first operation, press and hold Close button (manual close and automatic close mode are available), then sunshade will reach the fully closed position and a "click" sound is heard;
3. If the Close button is pressed and held all along after stuck, sunshade will perform operations below in order: full open -> full close; sliding roof stops running after the process is finished, then release the button;
4. Initialization is finished.

CAUTION

- After replacing sliding roof motor, sunshade motor, sliding roof module, sliding roof assembly or if entire vehicle power is cut off, perform sliding roof and sunshade initialization procedures.

Problem Symptoms Repair Procedures

Problem	Cause	Repair Operation Method	
Water leakage	Sliding roof weatherstrip is damaged	Replace the sliding roof weatherstrip	
	Sliding roof drain hose is clogged or folded	Check condition of drain hose	
	Distance between sliding roof glass and roof hole is too large, or glass height is poor	Adjust relative position of glass	
Loud wind noise with sliding roof open	Distance between sliding roof glass and roof hole is too large, glass height is poor or spoiler is invalid	Adjust relative poor position of glass	
Sliding roof or sunshade starts or runs abnormally	Poor wire, fuse or ground wire	Check wire, fuse or ground wire	
	Sliding roof control unit, sliding roof motor and sunshade fault	Check and replace sliding roof control unit and sliding roof motor or sunshade motor	
	Sunshade moves away from rail	Adjust sunshade again	
	Foreign matter in rail	Check and remove the foreign matter	
Incorrect starting	Sunshade moves away from rail or rail is rubbed after trim strip is damaged	Readjust and install sunshade, and reinstall trim strip (replace damaged parts at the same time)	
	Jam protection function operates abnormally	Check if area between body and spoiler is crashed, tight spring is loose, check and remove foreign matter in rail	
	Sliding roof switch fault	Replace the sliding roof switch	
	Sunshade motor fault	Replace the motor	
	Sliding roof glass motor fault	Replace the motor	
	Sliding roof module fault	Replace the sliding roof module	
	Noise with starting and running	Sunshade or sliding roof moves away from rail or running is blocked after trim strip is damaged	Readjust and install sunshade or sliding roof; reinstall trim strip (replace damaged parts at the same time)
		Sliding roof or sunshade rail is lack of grease	Apply grease to rail regularly
Collision between drain hose and body		Stick buffer sponge around drain hose	
Collision between roof cover and sliding roof frame		Reinstall and secure roof cover and sliding roof bracket	
Distance between sliding roof glass and roof hole is too large, or height is poor		Readjust glass height and relative position	

HINT:

- Turn engine switch to OFF and then to ON for 3 consecutive times, then start to learn.
- If initial positions for sliding roof and sunshade are lost, learn the sunshade first, and then learn the sliding roof glass.

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ON-VEHICLE SERVICE

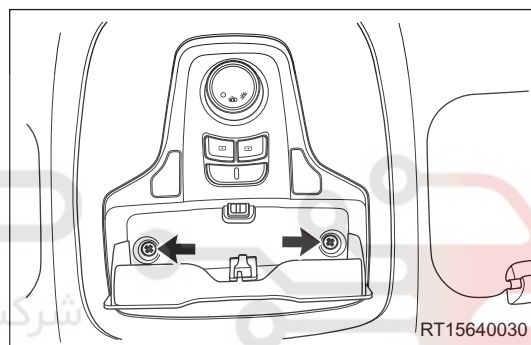
Sliding Roof Switch Assembly

Removal

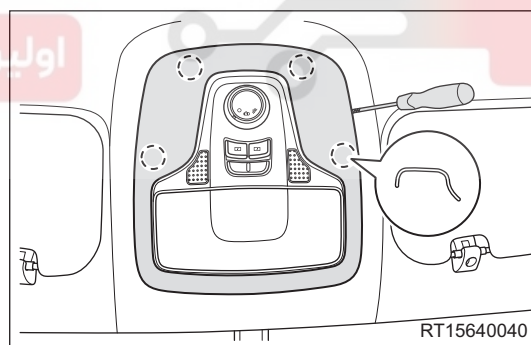
CAUTION

- Be sure to wear safety equipment to prevent accidents, when removing sliding roof switch assembly.
- Try to prevent interior from being scratched during operation, when removing sliding roof switch assembly.

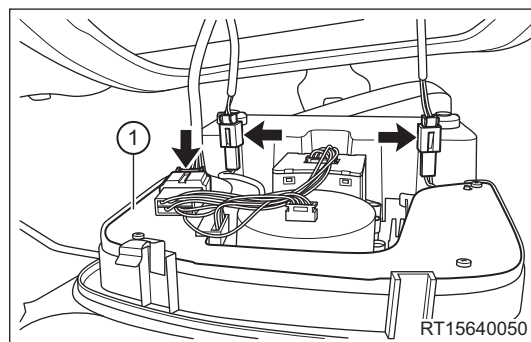
1. Turn off all electrical equipment and turn engine switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the sliding roof switch assembly (See page 64-29).
 - a. Open glasses box on dome light switch assembly, and remove 2 fixing screws (arrow).
(Tightening torque: $2 \pm 0.5 \text{ N}\cdot\text{m}$)



- b. Using a flat screwdriver wrapped with protective tape, pry off fixing clips from interior dome light.



- c. Disconnect each wire harness connector (arrow) from interior dome light.
- d. Remove the interior dome light assembly (1).



Installation

Installation is in the reverse order of removal.

Sliding Roof Glass

Removal

CAUTION

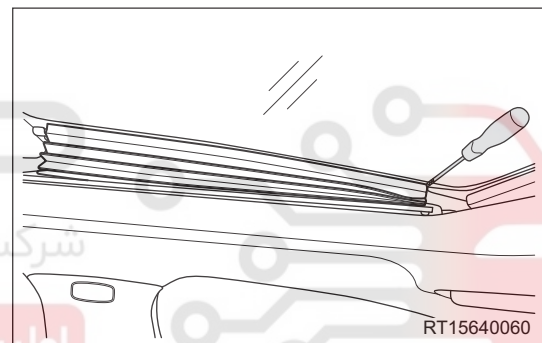
- Be sure to wear safety equipment to prevent accidents, when removing sliding roof glass.
- Appropriate force should be applied when removing sliding roof glass. Be careful not to operate roughly, to avoid damage to sliding roof glass.

HINT:

- Before removing sliding roof front glass, press sliding roof switch first, open sunshade to proper position and adjust sliding roof glass to maximum tilt state.
- Open sunshade to maximum position when removing sliding roof rear glass.

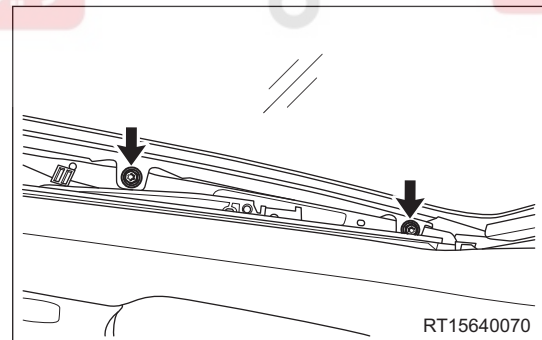
1. Turn off all electrical equipment and turn engine switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the sliding roof front glass.

- a. Using an interior crow plate, pry off dust boot from sliding roof front glass rail (use same removal procedure for right side).



- b. Remove 2 fixing bolts (arrow) from left side of sliding roof front glass (use same removal procedure for right side).

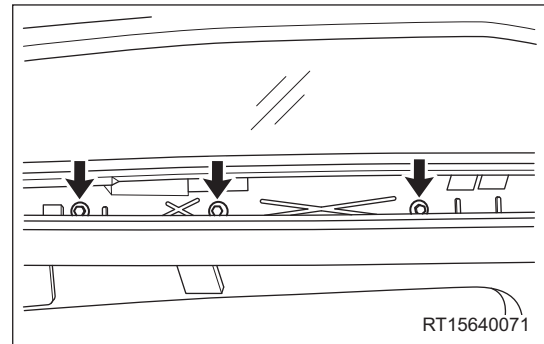
(Tightening torque: $9 \pm 1.5 \text{ N}\cdot\text{m}$)



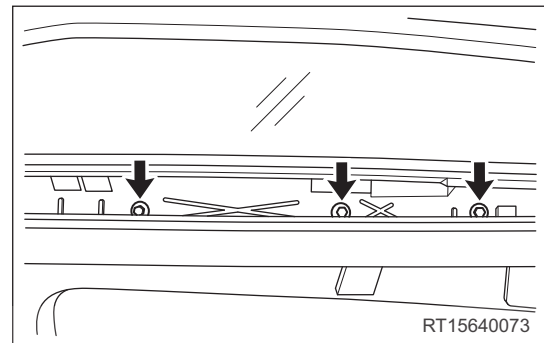
- c. Remove the sliding roof front glass.

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4. Remove the sliding roof rear glass.
- a. Remove 3 fixing bolts (arrow) from left side of sliding roof rear glass.
(Tightening torque: $9 \pm 1.5 \text{ N}\cdot\text{m}$)



- b. Remove 3 fixing bolts (arrow) from right side of sliding roof rear glass.
(Tightening torque: $9 \pm 1.5 \text{ N}\cdot\text{m}$)



- c. Remove the sliding roof rear glass.

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Installation

Installation is in the reverse order of removal.

CAUTION

- Tolerance of mating flatness between sliding roof front glass and roof cover is $-1.5 \text{ } 0/-2.0$ (roof cover is measuring basis).
- Tolerance of flatness between front glass and rear glass is $0.5 \text{ } 0/-2.0$ (sliding roof front glass is measuring basis).

Sliding Roof Glass Motor

Removal

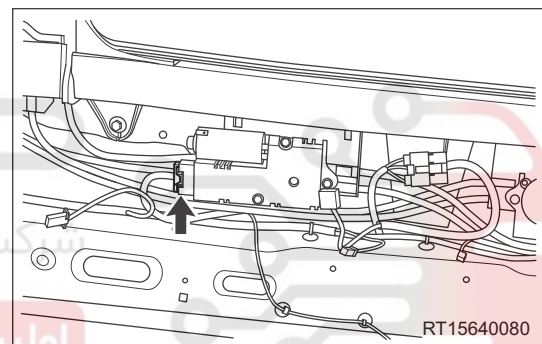
HINT:

Close sliding roof glass completely before removal; sliding roof glass motor and sliding roof module are integrated, and cannot be disassembled.

CAUTION

- Be sure to wear safety equipment to prevent accidents, when removing sliding roof glass motor.
- Appropriate force should be applied, when removing sliding roof glass motor. Be careful not to operate roughly.

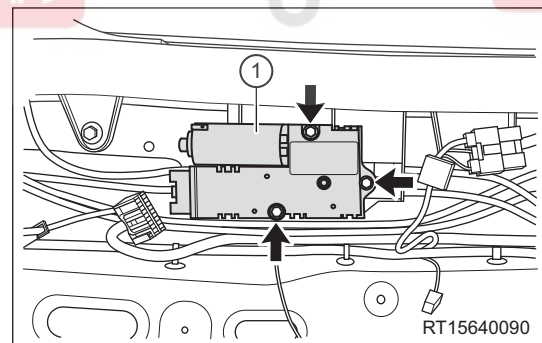
1. Turn off all electrical equipment and turn engine switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the roof assembly (See page 64-29).
4. Remove the sliding roof glass motor.
 - a. Disconnect wire harness connector (arrow) from sliding roof glass motor assembly.



- b. Remove 3 fixing screws (arrow) from sliding roof glass motor assembly.

(Tightening torque: 5 ± 1 N·m)

- c. Remove the sliding roof glass motor assembly (1).



Installation

Installation is in the reverse order of removal.

CAUTION

- After sliding roof glass motor is installed, there should be no abnormal noise and resistance when opening and closing the sliding roof.

Sunshade Motor

Removal

HINT:

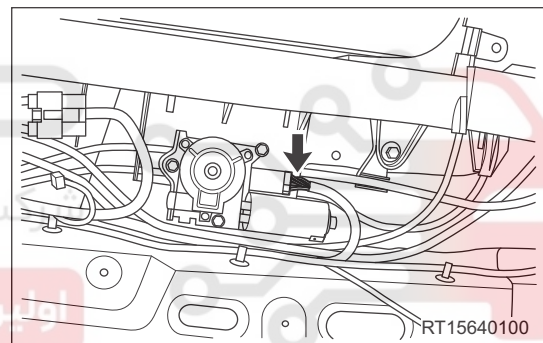
Before sunshade motor is removed, open sunshade to the maximum position and adjust sliding roof glass to proper position.

CAUTION

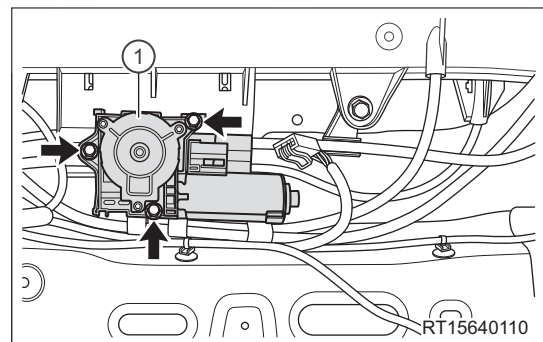
- Be sure to wear safety equipment to prevent accidents, when removing sliding roof sunshade motor assembly.
- Try to prevent sliding roof sunshade assembly from being scratched or damaged, when removing sliding roof sunshade motor assembly.

1. Turn off all electrical equipment and turn engine switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the roof assembly (See page 64-29).
4. Remove the sunshade motor.

- a. Disconnect sunshade motor wire harness connector (arrow).



- b. Remove 3 fixing screws (arrow) from sunshade motor. (Tightening torque: 5 ± 1 N·m)
- c. Remove the sunshade motor assembly (1).



Installation

Installation is in the reverse order of removal.

CAUTION

- After sunshade motor is installed, there should be no abnormal noise and resistance when opening and closing the sunshade.

Sliding Roof Drain Hose

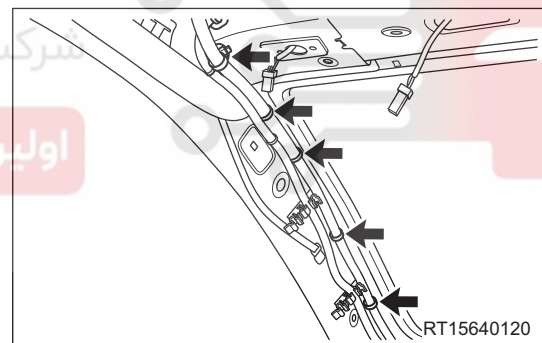
Removal

CAUTION

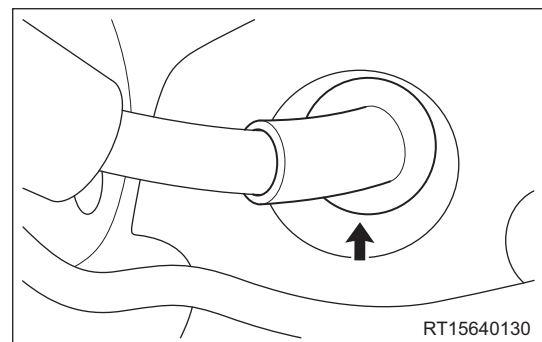
- Be sure to wear safety equipment to prevent accidents, when removing sliding roof drain hose.
- Try to prevent interior from being scratched during operation, when removing sliding roof drain hose.

HINT:

- Use same procedures for right and left sides.
 - Procedures listed below are for left side.
1. Turn off all electrical equipment and turn engine switch to OFF.
 2. Disconnect the negative battery cable.
 3. Remove the roof assembly (See page 64-29).
 4. Remove the instrument panel assembly (See page 60-14).
 5. Remove the left A-pillar upper protector assembly (See page 64-17).
 6. Remove the left C-pillar upper protector assembly (See page 64-24).
 7. Remove the left C-pillar lower protector assembly (See page 64-22).
 8. Remove the luggage compartment carpet (See page 64-33).
 9. Remove the sliding roof front drain hose assembly.
 - a. Using an interior crow plate, pry off fixing clips (arrow) from sliding roof front drain hose.

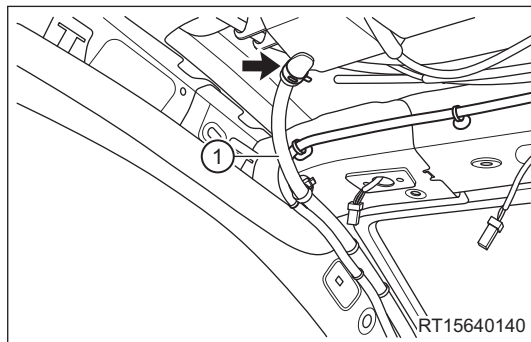


- b. Detach lower part of sliding roof front drain hose from fixing sponge (arrow).



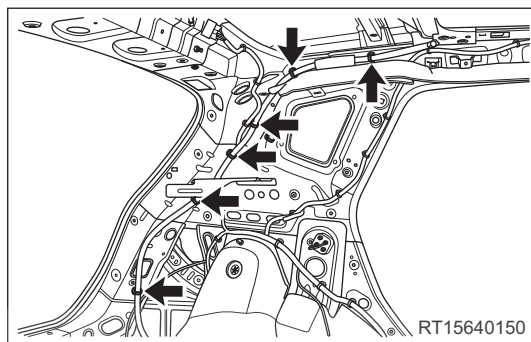
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- c. Loosen fixing clamp (arrow) from sliding roof front drain hose.
- d. Remove the sliding roof front drain hose (1).



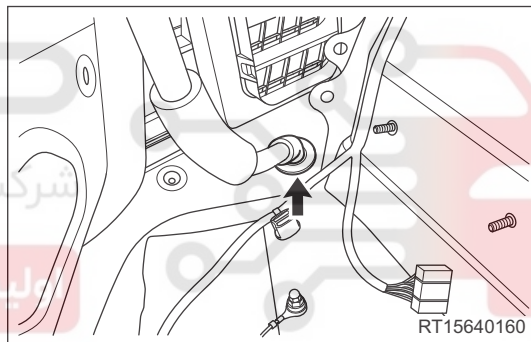
10. Remove the sliding roof rear drain hose assembly.

- a. Using an interior crow plate, pry off fixing clips (arrow) from sliding roof rear drain hose.

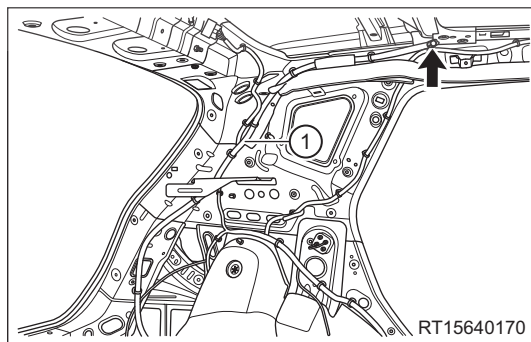


- b. Detach lower part of sliding roof rear drain hose from fixing sponge (arrow).

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- c. Loosen fixing clamp (arrow) from sliding roof rear drain hose.
- d. Remove the sliding roof rear drain hose (1).



Installation

Installation is in the reverse order of removal.

Sliding Roof Fixing Bracket

Removal

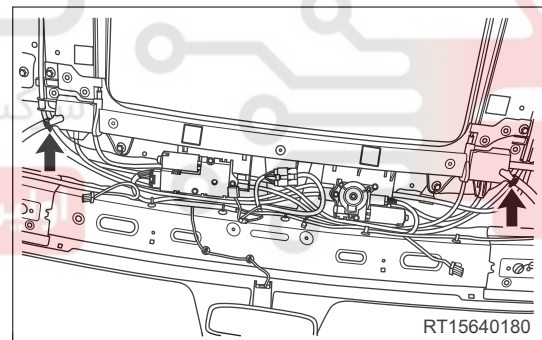
⚠ WARNING

- When removing sliding roof fixing bracket, an assistant is needed to hold it. During operation, prevent the sliding roof fixing bracket from dropping, which may cause an accident.

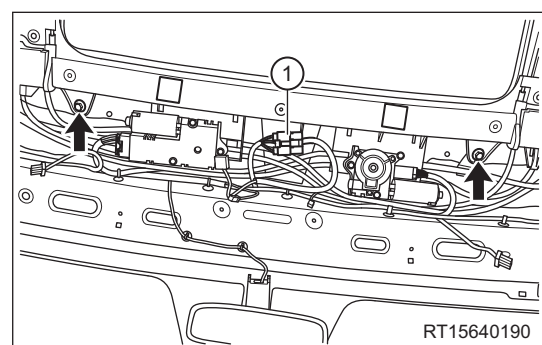
👁 CAUTION

- Be sure to wear safety equipment to prevent accidents, when removing sliding roof fixing bracket.
- Try to prevent interior from being scratched during operation, when removing sliding roof fixing bracket.

- Turn off all electrical equipment and turn engine switch to OFF.
- Disconnect the negative battery cable.
- Remove the roof assembly (See page 64-29).
- Remove the interior dome light assembly (See page 64-29).
- Remove the sliding roof fixing bracket assembly.
 - Loosen fixing clamps (arrow) from sliding roof front drain hose.

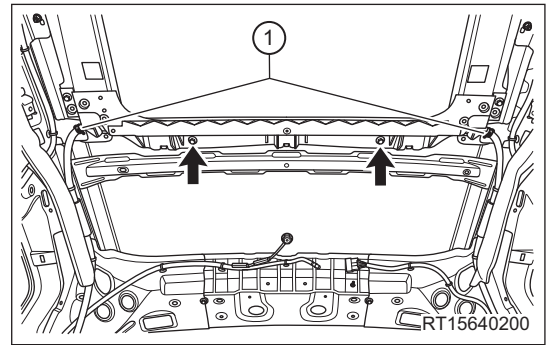


- Disconnect the sliding roof module wire harness connector (1).
- Remove 2 fixing bolts (arrow) between front end of sliding roof fixing bracket and roof. (Tightening torque: $9 \pm 1.5 \text{ N}\cdot\text{m}$)

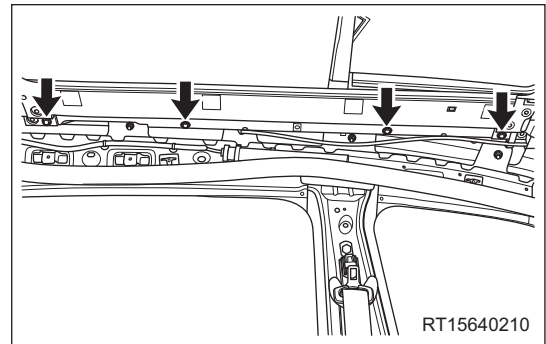


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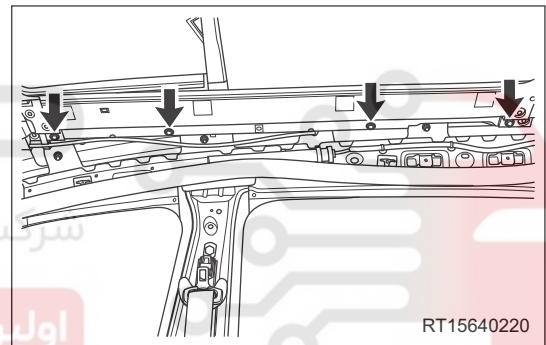
d. Loosen the sliding roof glass rear drain hose fixing clamps (1) and the 2 fixing bolts (arrow) between rear end of sliding roof fixing bracket and roof.



e. Remove 4 fixing bolts (arrow) between left side of sliding roof fixing bracket and roof.



f. Remove 4 fixing bolts (arrow) between right side of sliding roof fixing bracket and roof.



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g. Remove the sliding roof fixing bracket assembly.

Installation

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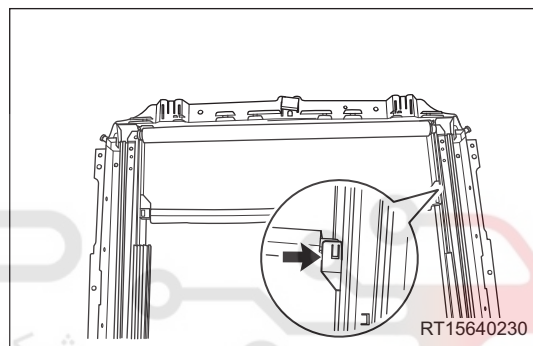
Sunshade

Removal

CAUTION

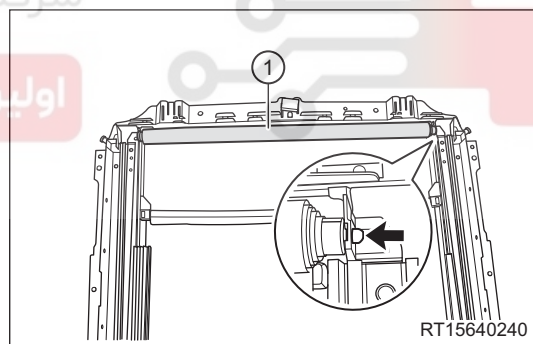
- Be sure to wear safety equipment to prevent accidents, when removing sunshade.
- Try to prevent interior from being scratched during operation, when removing sliding roof fixing bracket.

1. Turn off all electrical equipment and turn engine switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the sliding roof mounting bracket assembly.
4. Remove the sliding roof rear glass.
5. Remove the sunshade assembly.
 - a. Using a screwdriver wrapped with protective tape, pry off fixing clip (arrow) from sunshade rail.



- b. Using an interior crow plate, pry off holder (arrow) with sunshade rotated for a distance.

- c. Remove the sunshade assembly (1).



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