

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

SR 

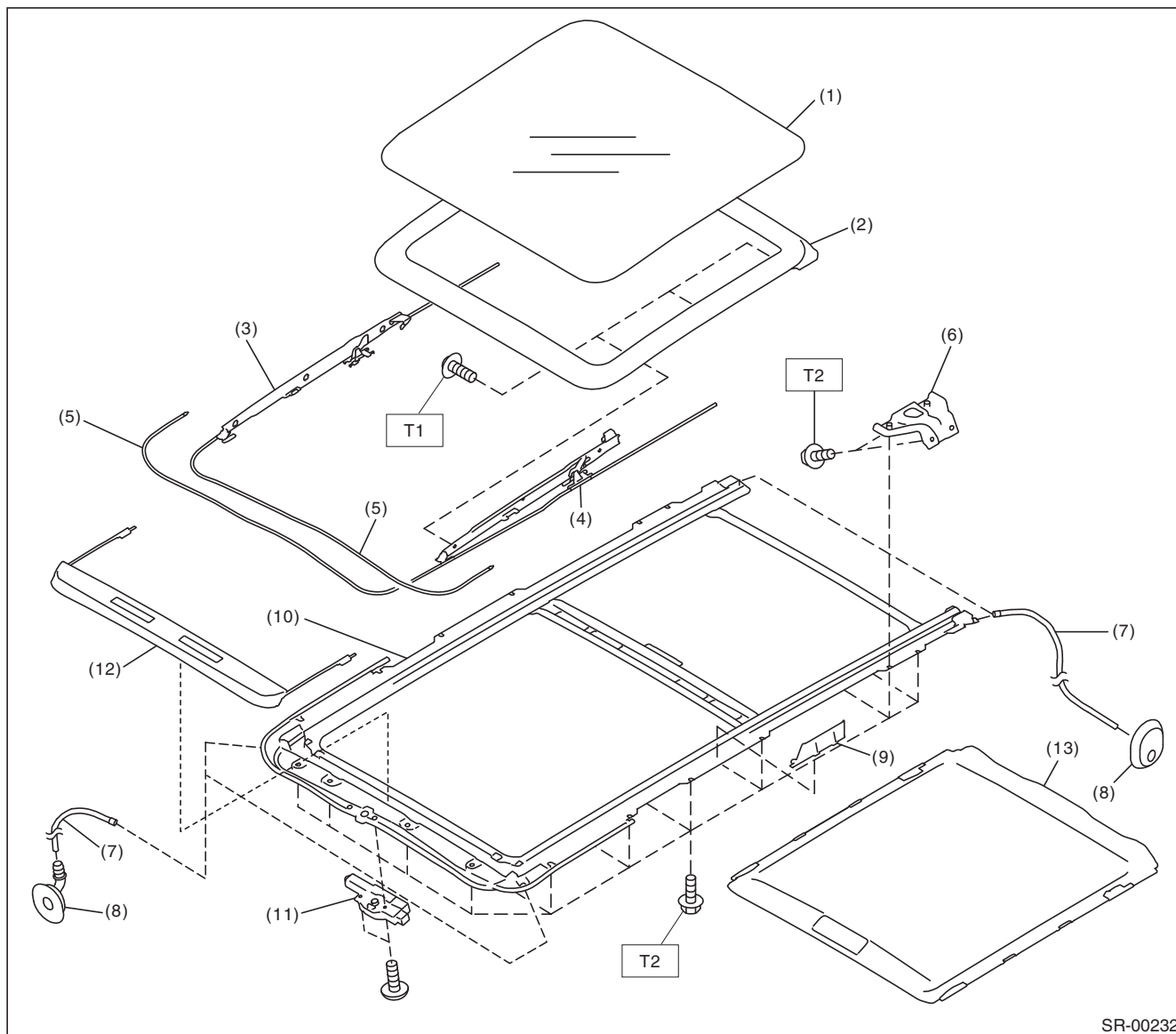
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General Description

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

1. General Description

A: COMPONENT



- | | |
|---------------------------------|-------------------------------|
| (1) Lid ASSY - sunroof | (7) Drain tube - sunroof |
| (2) Weather strip | (8) Grommet - drain tube |
| (3) Mechanism ASSY - sunroof RH | (9) Cover - sunroof |
| (4) Mechanism ASSY - sunroof LH | (10) Rail ASSY - sunroof |
| (5) Cable ASSY | (11) Motor ASSY - sunroof |
| (6) Bracket - sunroof | (12) Deflector ASSY - sunroof |

- (13) Sunshade ASSY

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

T1: 4.5 (0.46, 3.3)

T2: 6 (0.61, 4.4)

General Description

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B: CAUTION

- Before disassembling or reassembling parts, always disconnect the battery ground cable from battery. When replacing the audio, control module and other parts provided with memory functions, record the memory contents before disconnecting the battery ground cable. Otherwise, the memory is cleared.
- Reassemble the parts in the reverse order of disassembly unless otherwise indicated.
- Adjust parts to the given specifications.
- Connect the connectors securely during reassembly.
- After reassembly, make sure that the each component operates normally.

C: PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance and voltage.
Hexagon wrench	Used for forcibly driving the motor assembly - sunroof. Width across flat 4 mm (0.16 in)
TORX® T25	Used for removing and installing the lid assembly - sunroof.

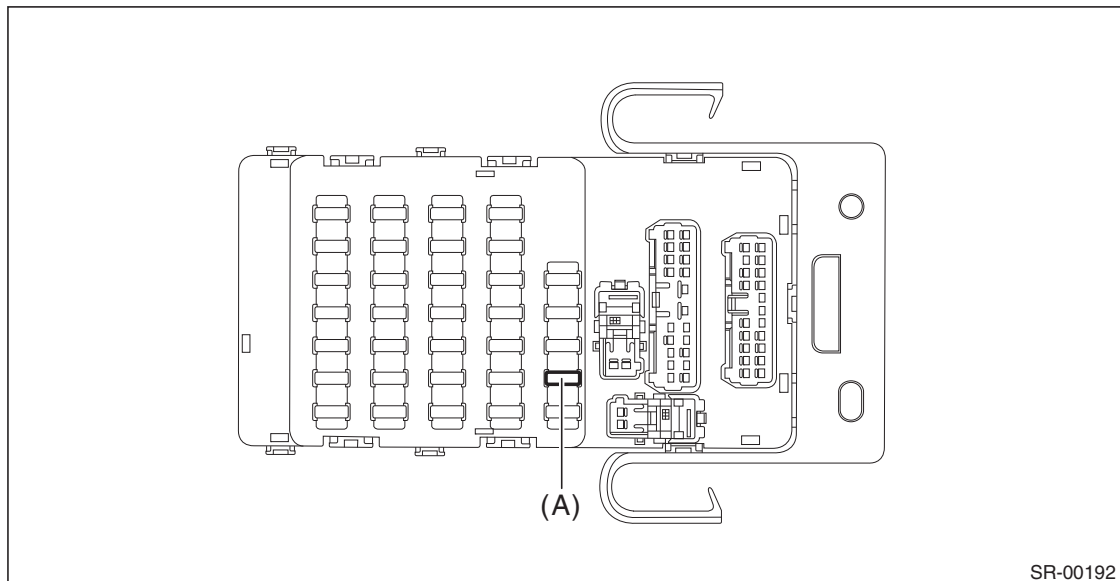


Relay and Fuse

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

2. Relay and Fuse

A: LOCATION



Relay & fuse box	Fuse 10A (IG 2)	(A)
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NOTE:

For other related fuses, refer to the wiring diagram. <Ref. to WI-24, Power Supply Circuit.>

B: INSPECTION

1. CHECK FUSE

- 1) Remove the fuse and check visually.
- 2) If the fuse is blown out, replace the fuse.

Sunroof Control System

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

3. Sunroof Control System

A: WIRING DIAGRAM

Refer to "Sunroof Control System" in the wiring diagram. <Ref. to WI-406, WIRING DIAGRAM, Sunroof Control System.>

B: INSPECTION

Symptoms	Inspection steps
Water leakage	1. Check the roof panel and the lid assembly - sunroof for improper or poor sealing. 2. Check the drain tube - sunroof for clogging. 3. Check the joints of the rail assembly - sunroof for improper sealing and for proper installation to the body.
Booming noise, wind noise and other noise	1. Check the lid assembly - sunroof and the roof panel for improper clearance. 2. Check the sunshade assembly and the trim panel - roof assembly for improper clearance.
Abnormal motor noise	1. Check installing part of motor for looseness. 2. Check gears and bearings for wear. 3. Check cable assembly for wear. 4. Check cable pipe for deformities.
Failure of sunroof (Motor operates properly.)	1. Check guide rail for foreign particles. 2. Check guide rail for improper installation. 3. Check parts for mutual interference. 4. Check cable slider for improper clinching. 5. Check cable assembly for improper installation.
Motor does not rotate or rotate improperly.	1. Check fuse for blown out. 2. Check switch for improper function. 3. Check motor assembly for incorrect terminal voltage. 4. Check the relay for improper operation. 5. Check harness for open or short and terminals for poor connections.
Incorrect reverse operation of the lid assembly - sunroof	Check guide rail for foreign particles.

- Incorrect reverse operation of the lid assembly - sunroof while driving on rough road

The lid assembly - sunroof has auto-reverse function. When a force that exceeds a certain amount of load is applied to the lid assembly - sunroof, the glass lid moves in the reverse direction and then stops.

Therefore, if you operate (open or close) the lid assembly - sunroof while driving on rough road, the vibration may be judged as a force and the lid may incorrectly move in the reverse direction.

When the incorrect reverse operation is occurred repeatedly, perform inspection around the sunroof frame. If there are no problems, perform the initialization operation with following procedure.

Sunroof Control System

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

C: OPERATION

1. INITIALIZE OPERATION

CAUTION:

During initialization, perform the position learning and the sliding learning. Sliding learning mode can not be initiated unless the position learning is performed.

NOTE:

When initialize operation is performed, it is necessary to press the switch repeatedly as it operates for only at the moment when the switch is pressed, even when the switch is held down.

- Position learning

1) Position the lid assembly - sunroof at the full close position, and press and hold the close switch for ten seconds.

2) The motion shifts to the inching operation when the close switch is pressed continuously to the full close position. After the lid fully opens, it returns to the full close position and then stops.

3) Release the close switch to finish the position learning.

- Sliding learning

4) Within four seconds after the position learning is finished, press and hold the close switch again.

5) The lid assembly - sunroof moves to the full close position, full open position, and the full close position successively, and stops at the full close position.

6) Release the close switch and turn the IG to OFF to finish the initializing.

D: NOTE

For operation procedures of each component of the sunroof control system, refer to the respective section.

- Glass lid: <Ref. to SR-7, Glass Lid.>
- Sunroof assembly: <Ref. to SR-11, Sunroof Assembly.>
- Sunroof motor: <Ref. to SR-16, Sunroof Motor.>
- Sunroof switch: <Ref. to SR-19, Sunroof Switch.>
- Sunshade: <Ref. to SR-22, Sunshade.>



Glass Lid

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

4. Glass Lid

A: REMOVAL

1. GLASS LID

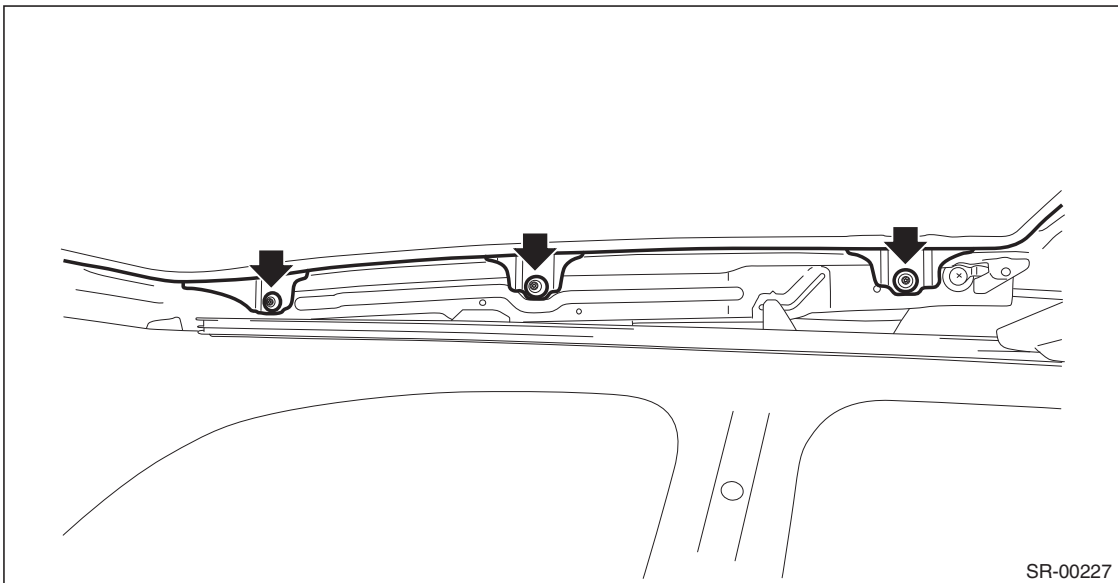
- 1) Completely close the lid assembly - sunroof, and open the sunshade assembly.
- 2) Remove the TORX® bolt, and then remove the lid assembly - sunroof.

CAUTION:

Be careful not to damage the lid assembly - sunroof.

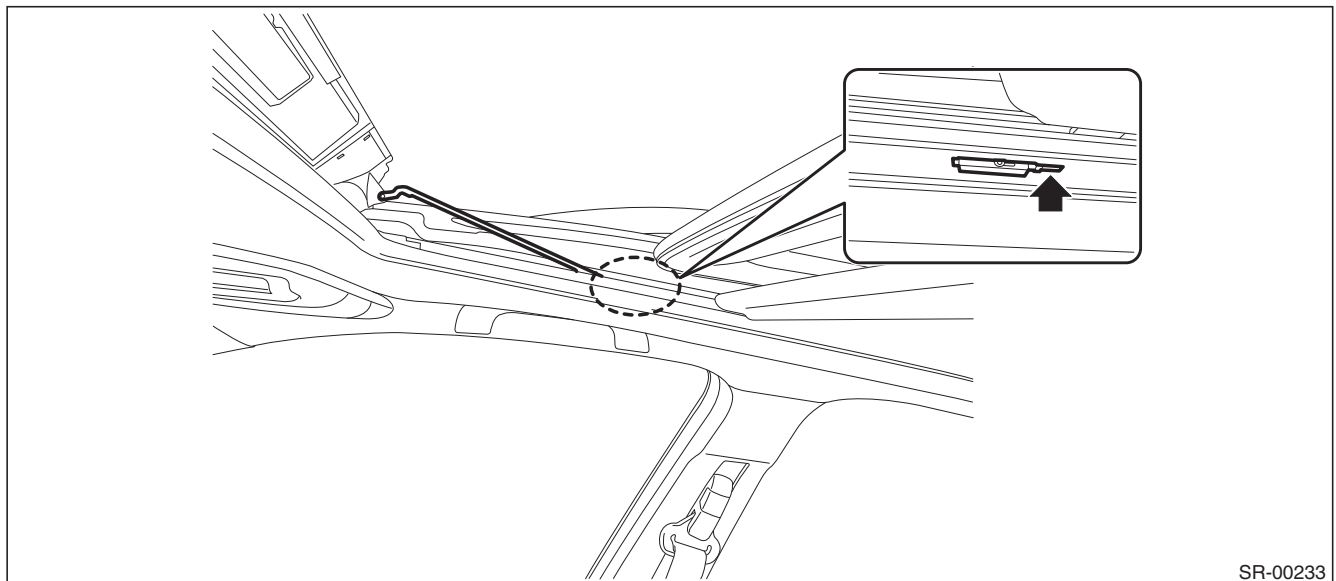
Preparation tool:

TORX® T25



2. DEFLECTOR ASSEMBLY

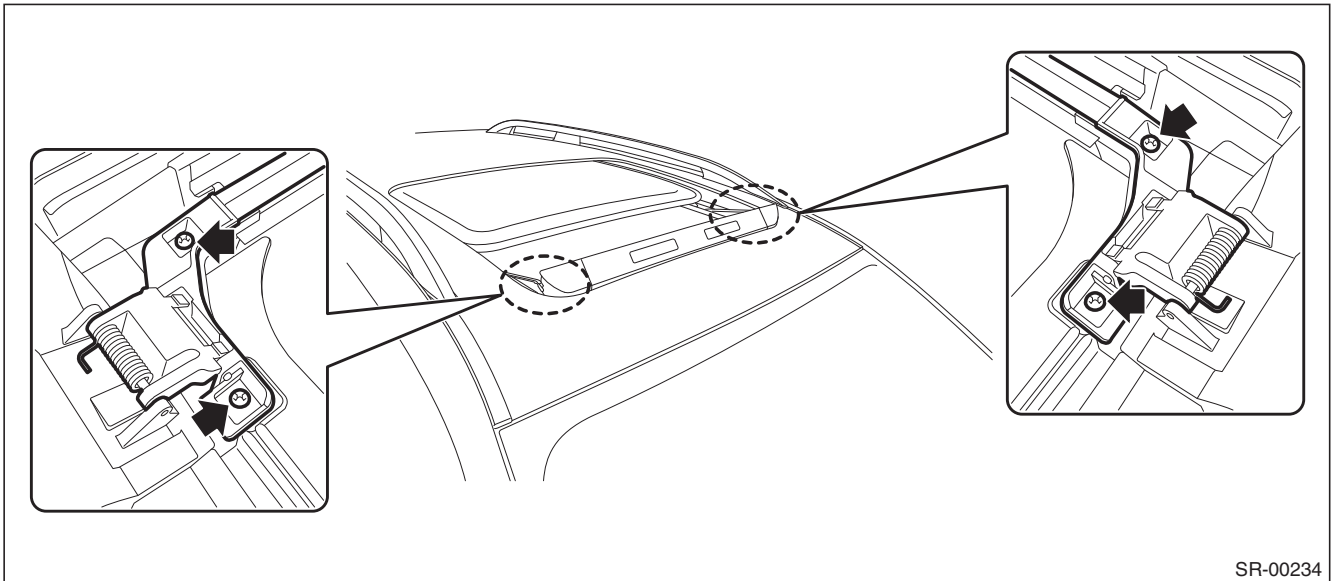
- 1) Completely open the lid assembly - sunroof.
- 2) Remove the lid molding - sunroof.
- 3) Remove the deflector assembly - sunroof.
 - (1) Remove the clip from the rail assembly - sunroof.



Glass Lid

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(2) Remove the screw from the rail assembly - sunroof and then remove the deflector assembly - sunroof.



B: INSTALLATION

1. GLASS LID

Install each part in the reverse order of removal.

CAUTION:

- Tighten the lid assembly - sunroof after the surface level gap is adjusted.
- If an excessive force is applied on the glass retainer, the glass may be broken. Evenly tighten the lid assembly - sunroof mounting bolt.

Tightening torque:

Refer to "COMPONENT" of "General Description". <Ref. to SR-2, COMPONENT, General Description.>

2. DEFLECTOR

1) Install each part in the reverse order of removal.

Glass Lid

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

C: ADJUSTMENT

Adjust the height of the lid assembly - sunroof and the roof panel.

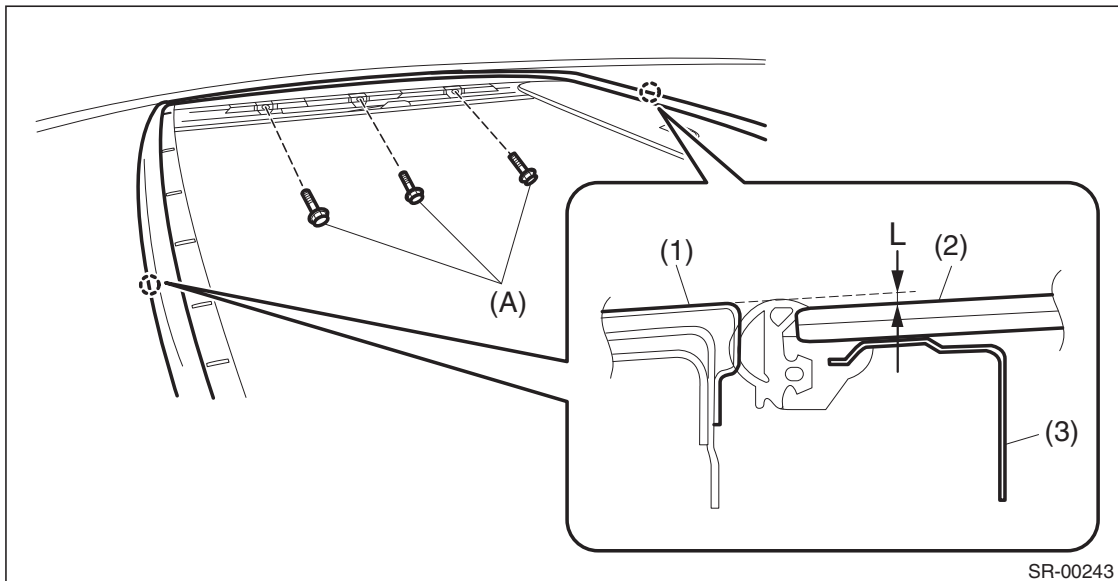
- Loosen the lid assembly - sunroof mounting bolts (A), and then adjust the height by moving the lid assembly - sunroof side.

CAUTION:

- Tighten the lid assembly - sunroof after the surface level gap is adjusted.
- If an excessive force is applied on the glass retainer, the glass may be broken. Evenly tighten the lid assembly - sunroof mounting bolt.

Lid assembly - sunroof height difference L:

Lid assembly - sunroof to Roof panel: 0 ± 1.0 mm (0 ± 0.04 in)



(1) Roof panel

(2) Lid ASSY - sunroof

(3) Glass retainer

Glass Lid

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D: FORCED DRIVE

If the lid assembly - sunroof does not operate or the motor assembly is not supplied with power, move the lid assembly - sunroof using the hexagon wrench.

Preparation tool:

Hexagon wrench: width across flat 4 mm (0.16 in)

CAUTION:

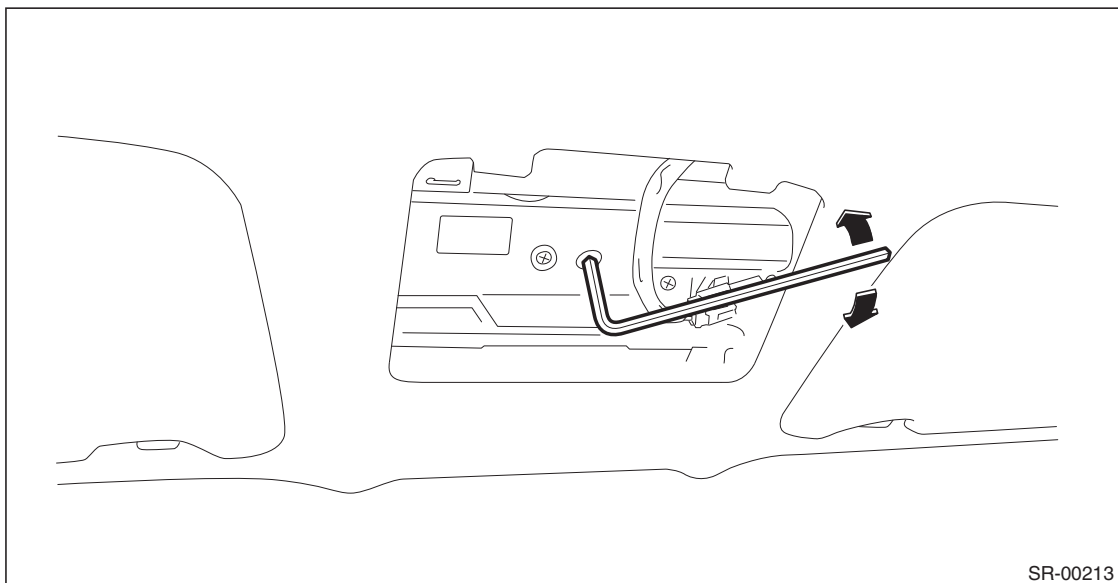
After a forced operation, make sure to perform an initialize operation. <Ref. to SR-6, INITIALIZE OPERATION, OPERATION, Sunroof Control System.>

- 1) Remove the light assembly - map. <Ref. to LI-62, REMOVAL, Spot Map Light.>
- 2) Insert the hexagon wrench securely until it touches the motor shaft end.
- 3) Turn the hexagon wrench, and move the lid assembly - sunroof.

- Turning right, the lid assembly - sunroof opens.
- Turning left, the lid assembly - sunroof closes.

CAUTION:

Be careful not to damage the adjacent parts with the rod end when moving the lid assembly - sunroof with the hexagon wrench.



Sunroof Assembly

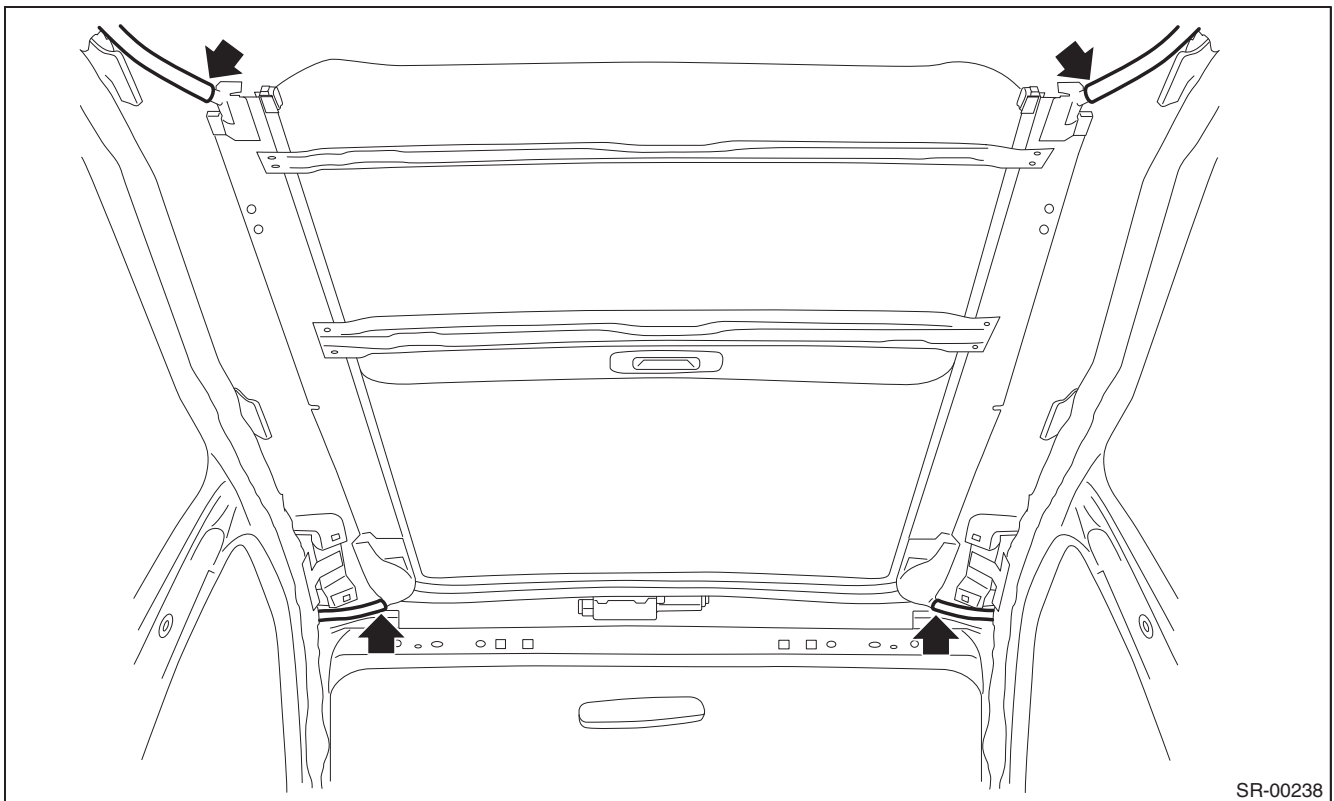
SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

5. Sunroof Assembly

A: REMOVAL

CAUTION:

- Refer to “CAUTION” of “General Description” before handling the airbag module. <Ref. to AB-9, CAUTION, General Description.>
 - When removing the clip, use great care not to damage the trim panel - roof assembly.
- 1) Completely close the lid assembly - sunroof, and open the sunshade assembly.
 - 2) Disconnect the ground cable from battery and wait for at least 60 seconds before starting work.
 - 3) Remove the trim panel - roof assembly. <Ref. to EI-109, REMOVAL, Roof Trim.>
 - 4) Disconnect the harness connector of the motor assembly.
 - 5) Remove the curtain airbag. <Ref. to AB-73, REMOVAL, Curtain Airbag Module.>
 - 6) Remove the rail assembly.
 - (1) Remove the drain tube - sunroof.

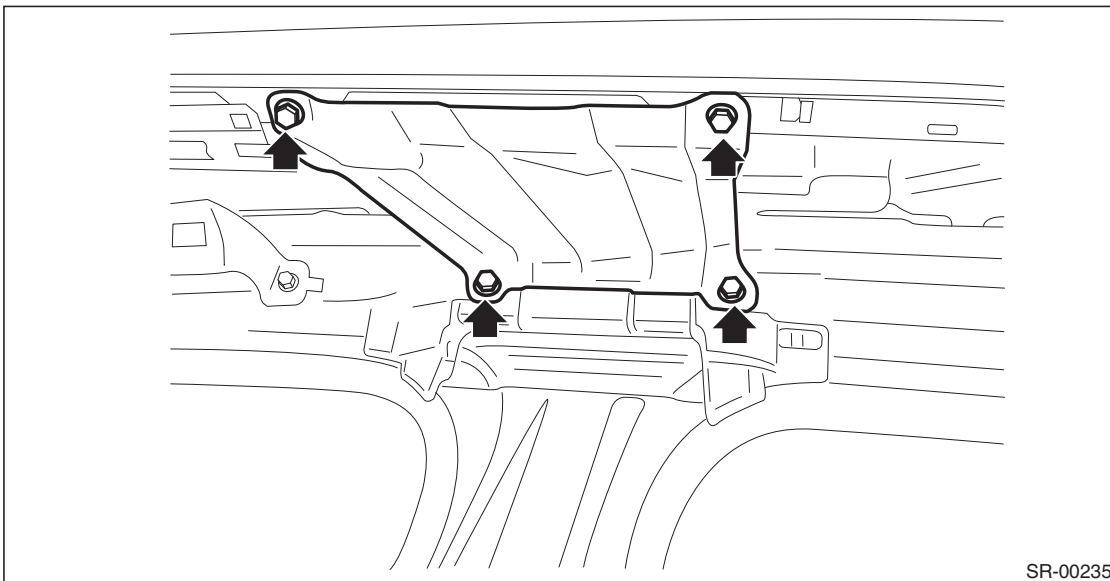


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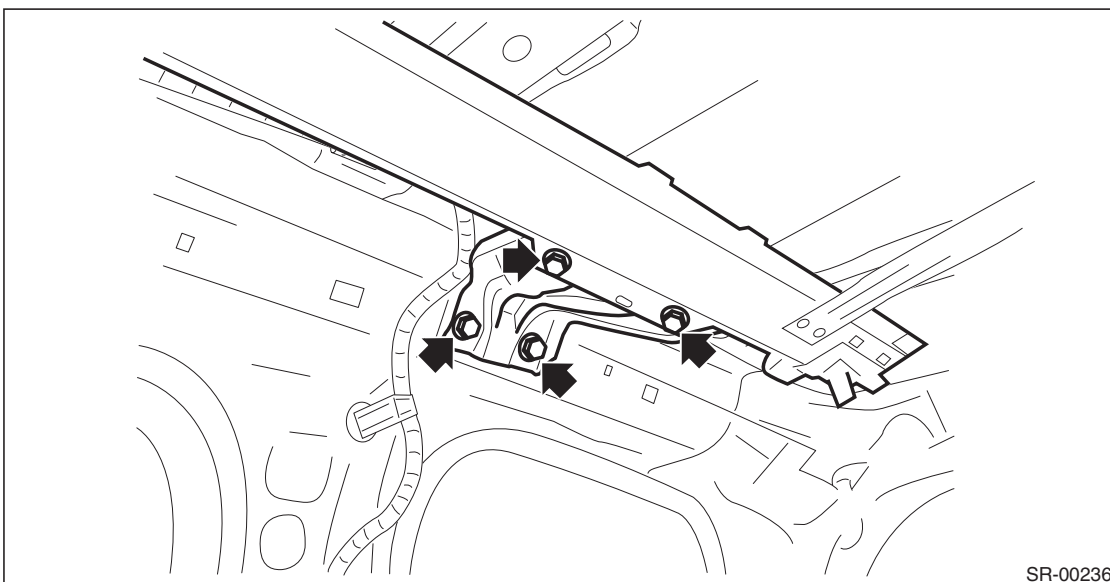
Sunroof Assembly

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

- (2) Remove the bolts, and then remove the cover - sunroof.



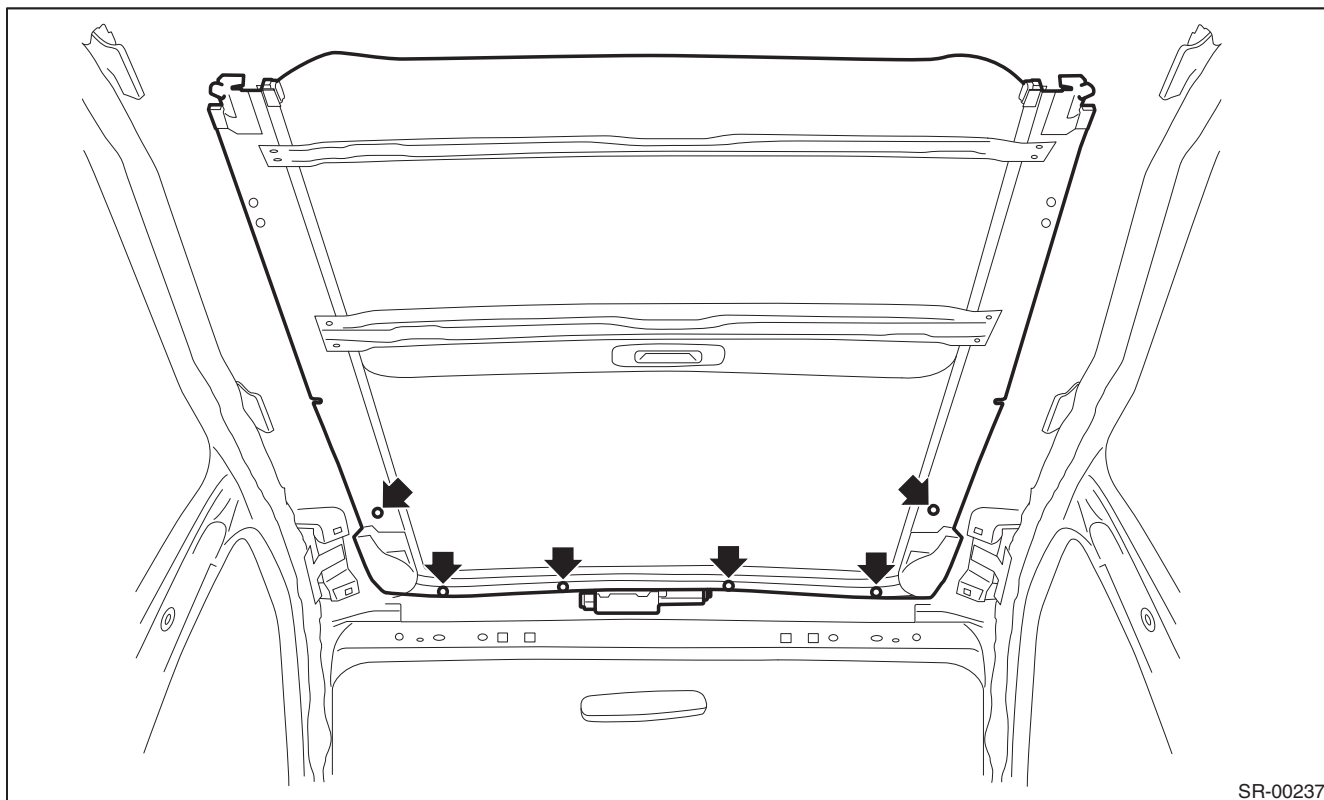
- (3) Remove the bolts, and then remove the bracket - sunroof.



Sunroof Assembly

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

(4) Remove the bolts, then remove the rail assembly.



Sunroof Assembly

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

B: INSTALLATION

CAUTION:

Be careful not to snag the harness.

Install each part in the reverse order of removal.

Tightening torque:

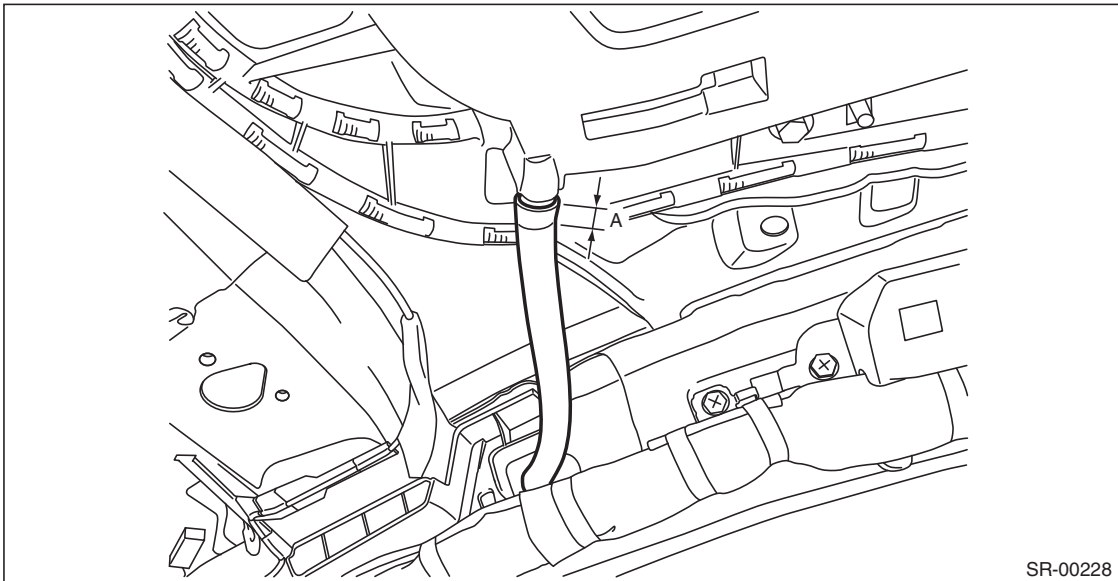
Refer to "COMPONENT" of "General Description". <Ref. to SR-2, COMPONENT, General Description.>

NOTE:

- Be sure to connect the harness connector.
- When installing the drain tube - sunroof, insert it securely into drain pipe.

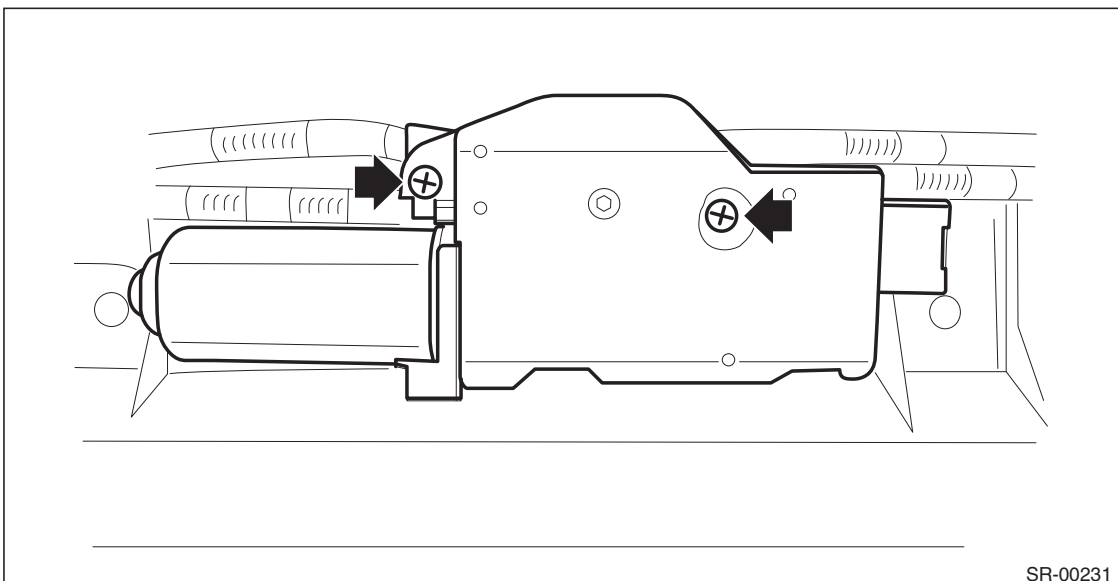
Length A:

15 mm (0.59 in) or more



C: DISASSEMBLY

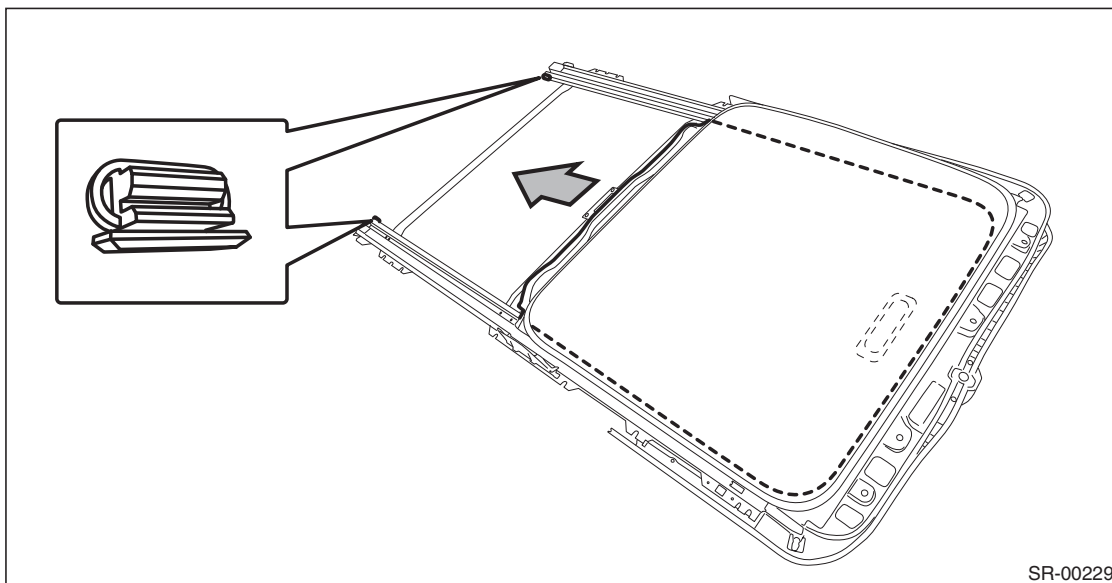
- 1) Remove the screw and remove the sunroof motor.



Sunroof Assembly

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

- 2) Remove the stopper rubber and pull out the sunshade assembly from the rail assembly - sunroof.



D: ASSEMBLY

Install each part in the reverse order of removal.



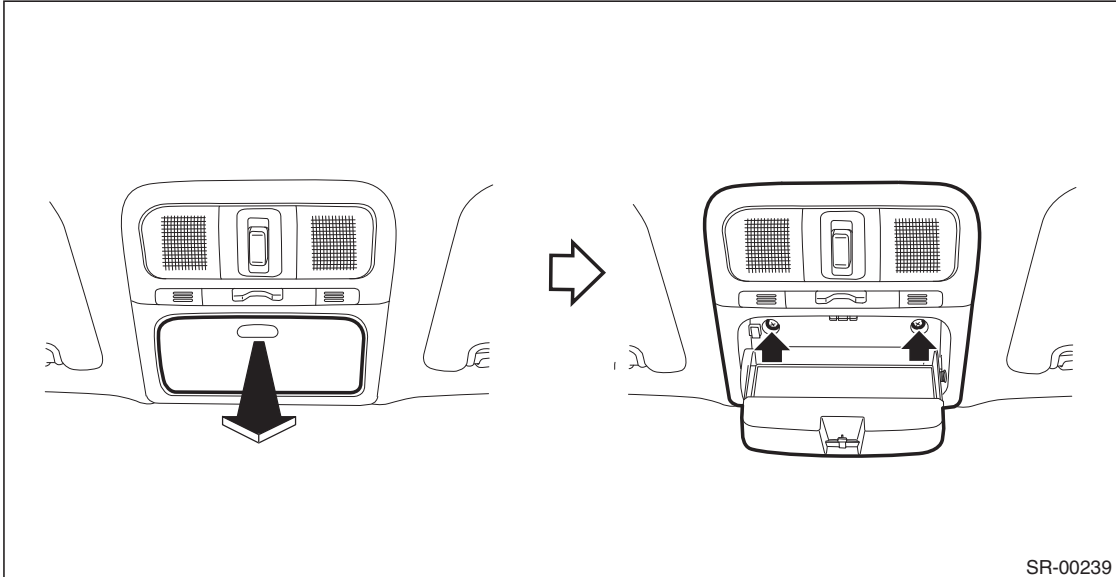
Sunroof Motor

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

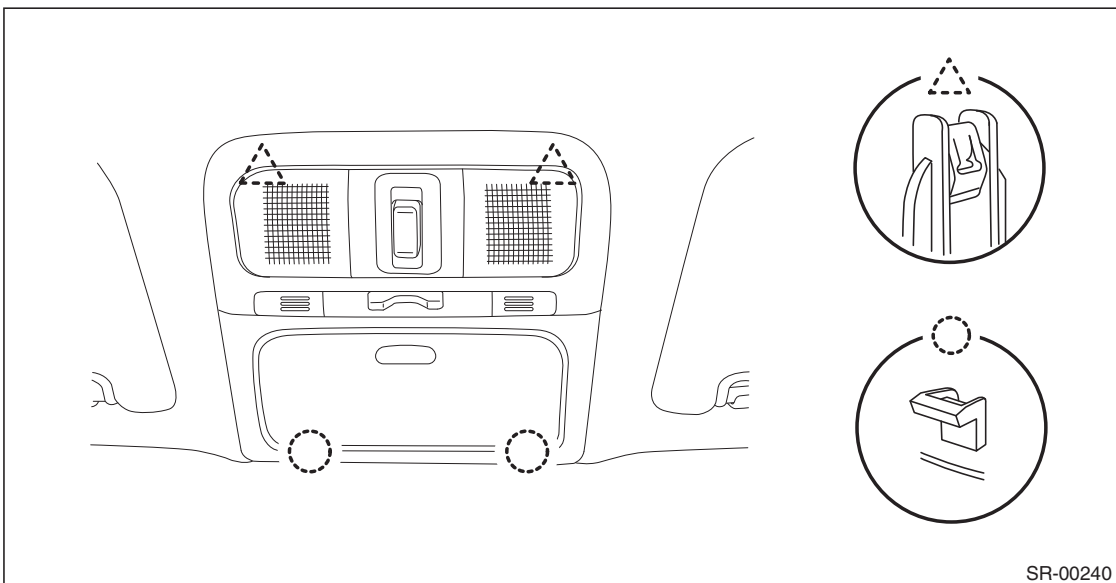
6. Sunroof Motor

A: REMOVAL

- 1) Completely close the lid assembly - sunroof.
- 2) Disconnect the ground cable from battery.
- 3) Remove the light assembly - map. (Models without EyeSight)
 - (1) Remove the screws.



- (2) Release the clips and pull out the light assembly - map to disconnect the connectors.



- 4) Remove the stereo camera cover. (Models with EyeSight) <Ref. to ES-11, REMOVAL, Stereo Camera.>

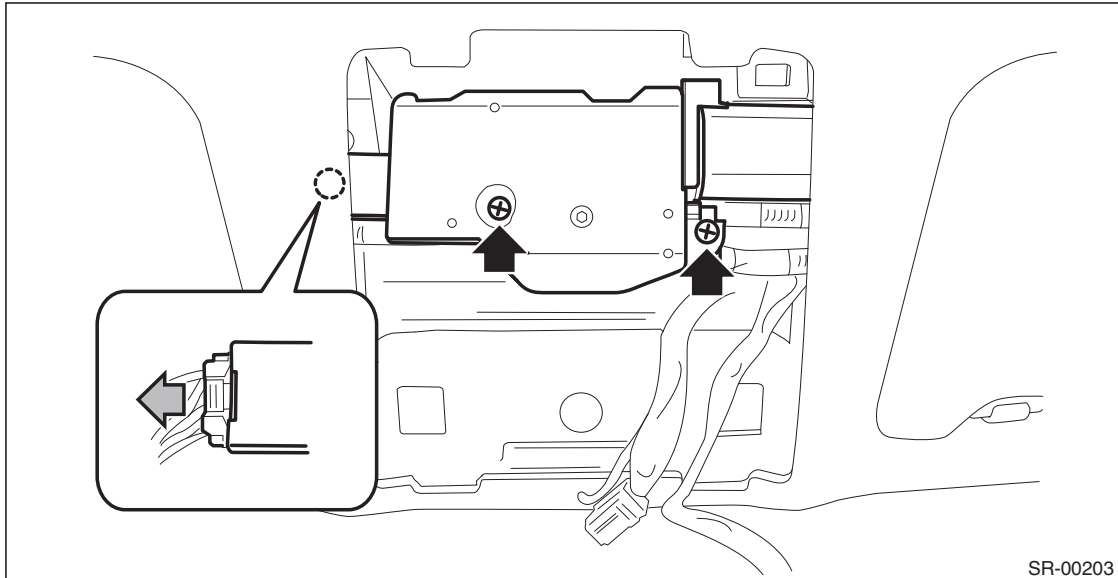
Sunroof Motor

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

- 5) Remove the motor assembly - sunroof.
 - (1) Disconnect the harness connector.
 - (2) Remove the screws and remove the motor assembly - sunroof.

CAUTION:

When removing the motor assembly - sunroof, secure the cable assembly so that it does not move.



B: INSTALLATION

CAUTION:

- When installing the motor assembly - sunroof, be careful not to move the cable assembly.
- For installation of the stereo camera cover, refer to “INSTALLATION”, “Stereo Camera Cover” in the “EyeSight” section and observe the precautions for installation. <Ref. to ES-15, INSTALLATION, Stereo Camera.>

- 1) Install the motor assembly - sunroof.
- 2) Install the light assembly - map. (Models without EyeSight)
- 3) Install the stereo camera cover. (Models with EyeSight) <Ref. to ES-15, INSTALLATION, Stereo Camera.>
- 4) Connect the battery ground terminal.
- 5) Perform the initialize operation. <Ref. to SR-6, INITIALIZE OPERATION, OPERATION, Sunroof Control System.>
- 6) Check the operation of sunroof by following the table below.

Operation	Switch position
(1) Lid assembly - sunroof closes completely.	Close
(2) Lid assembly - sunroof opens 507 mm (19.96 in) away from completely closed position.	Open
(3) Lid assembly - sunroof opens completely.	Open
(4) Lid assembly - sunroof closes completely.	Close

Sunroof Motor

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

C: INSPECTION

Check the auto-reverse mechanism.

CAUTION:

Do not place objects in the way to check the auto-reverse mechanism.

- 1) Open the lid assembly - sunroof.
- 2) Forcefully push the lid assembly - sunroof in the opening direction during auto-closing, and check if the window auto-reverse mechanism operates properly.

NOTE:

If the auto function is cancelled, perform the initialize operation. <Ref. to SR-6, INITIALIZE OPERATION, OPERATION, Sunroof Control System.>

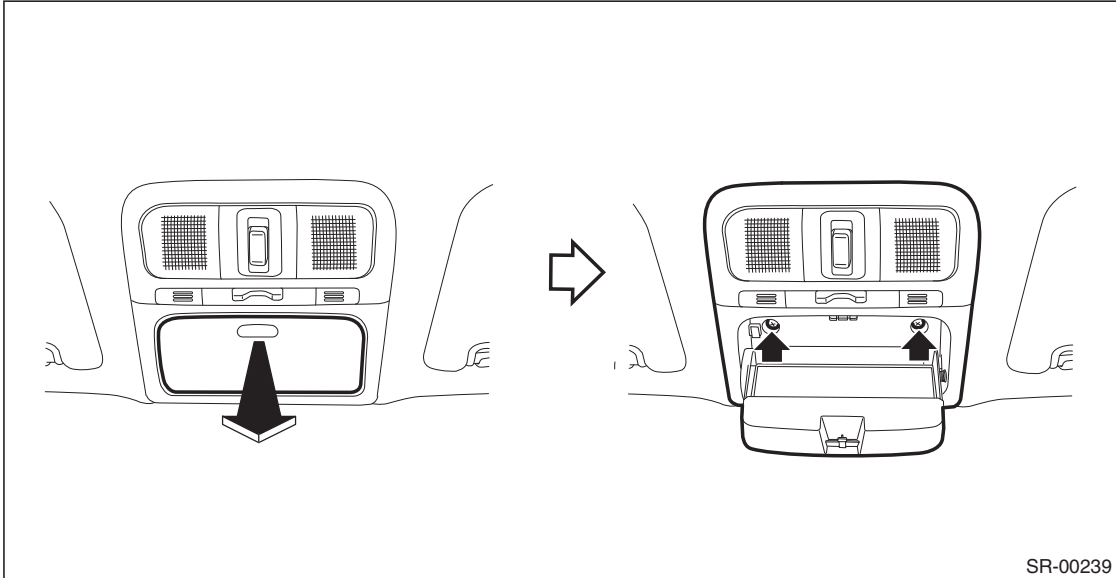
Sunroof Switch

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

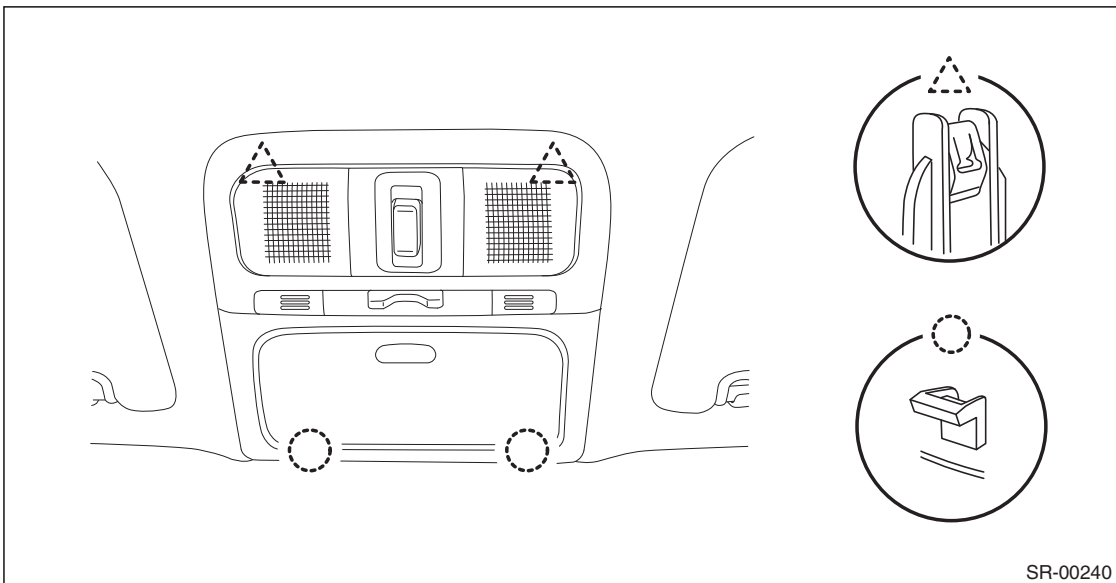
7. Sunroof Switch

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the light assembly - map. (Models without EyeSight)
 - (1) Remove the screws.



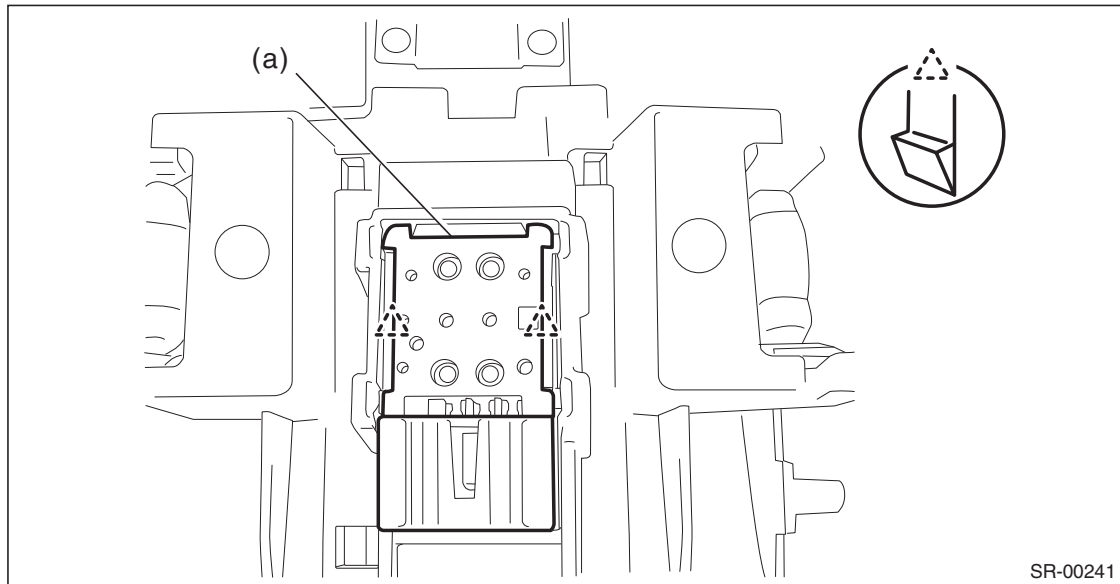
- (2) Release the clips and pull out the light assembly - map to disconnect the connectors.



Sunroof Switch

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

- 3) Remove the stereo camera cover. (Models with EyeSight) <Ref. to ES-11, REMOVAL, Stereo Camera.>
- 4) Release the claws and remove the sunroof switch (a) from the light assembly - map.



B: INSTALLATION

CAUTION:

For installation of the stereo camera cover, refer to "INSTALLATION", "Stereo Camera Cover" in the "EyeSight" section and observe the precautions for installation. <Ref. to ES-15, INSTALLATION, Stereo Camera.>

Install each part in the reverse order of removal.

Sunroof Switch

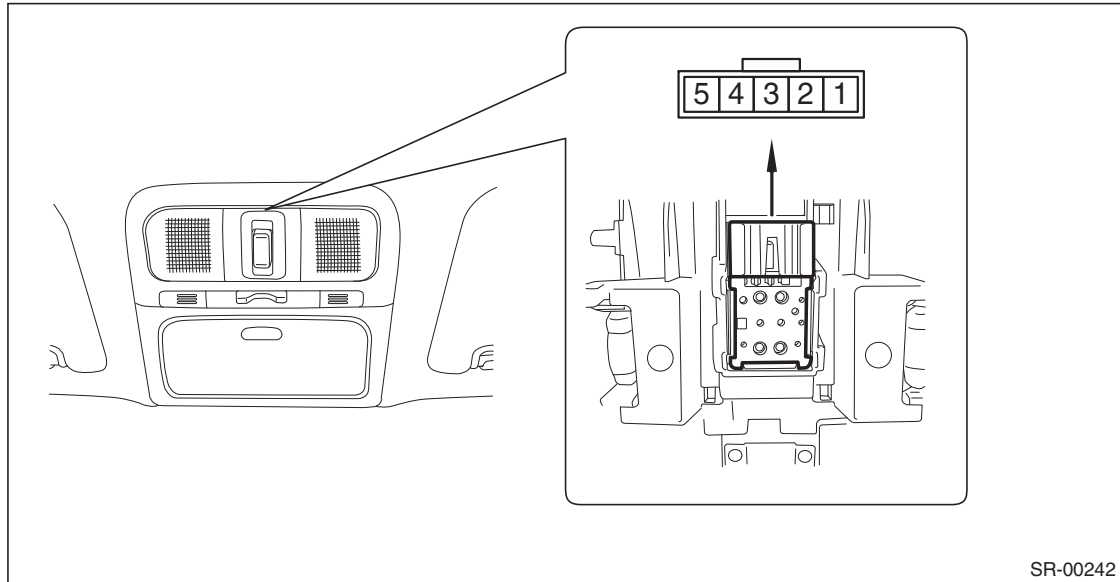
SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

C: INSPECTION

- 1) Remove the sunroof switch. <Ref. to SR-21, INSPECTION, Sunroof Switch.>
- 2) Check the resistance between sunroof switch terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard	Connector No.
1 — 3	Open	Less than 1 Ω	R128
4 — 3	Close	Less than 1 Ω	

- 3) Replace the sunroof switch if the inspection result is not within the standard value.

Sunshade

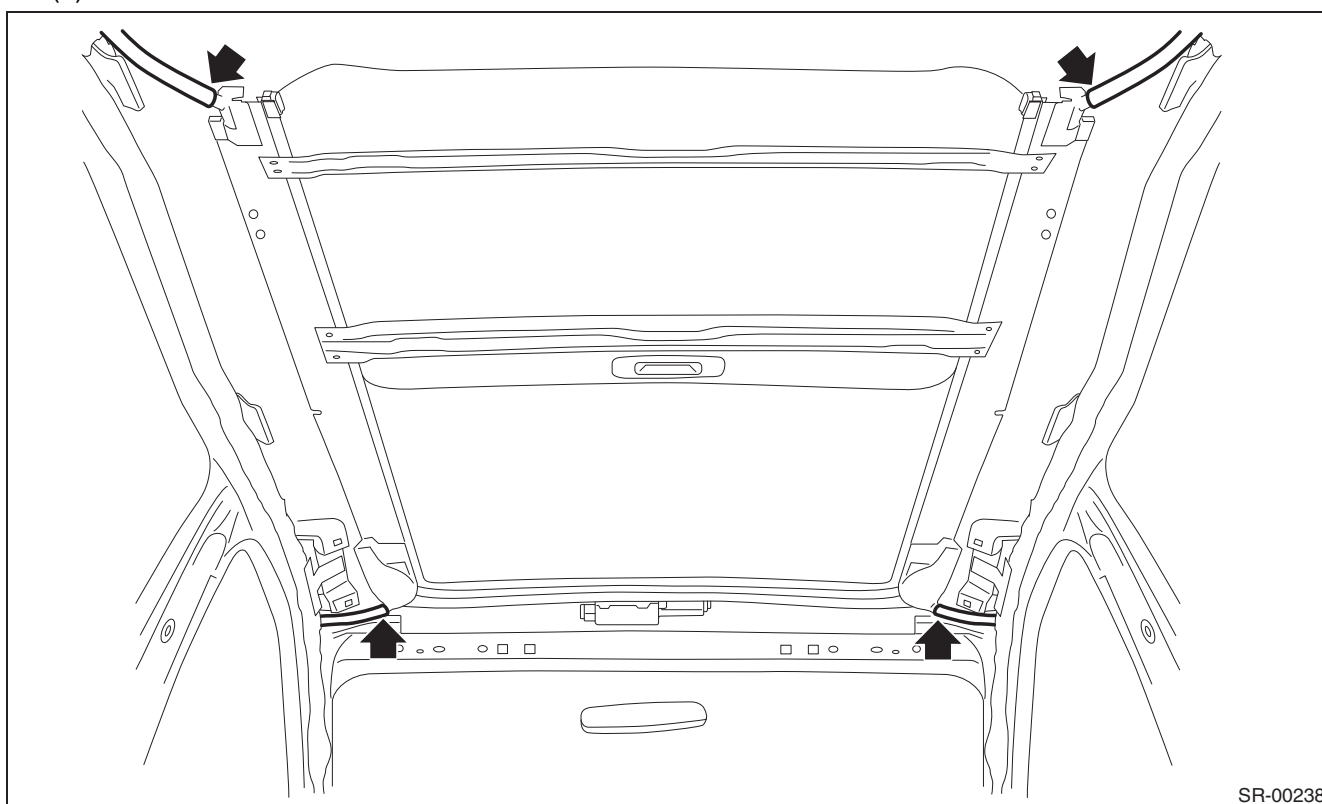
SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

8. Sunshade

A: REMOVAL

CAUTION:

- Refer to “CAUTION” of “General Description” before handling the airbag module. <Ref. to AB-9, CAUTION, General Description.>
 - When removing the clip, use great care not to damage the trim panel - roof assembly.
- 1) Completely close the lid assembly - sunroof, and open the sunshade assembly.
 - 2) Disconnect the ground cable from battery and wait for at least 60 seconds before starting work.
 - 3) Remove the trim panel - roof assembly. <Ref. to EI-109, REMOVAL, Roof Trim.>
 - 4) Disconnect the harness connector of the motor assembly - sun roof.
 - 5) Remove the curtain airbag. <Ref. to EI-109, REMOVAL, Roof Trim.>
 - 6) Remove the rail assembly - sunroof.
 - (1) Remove the drain tube - sunroof.

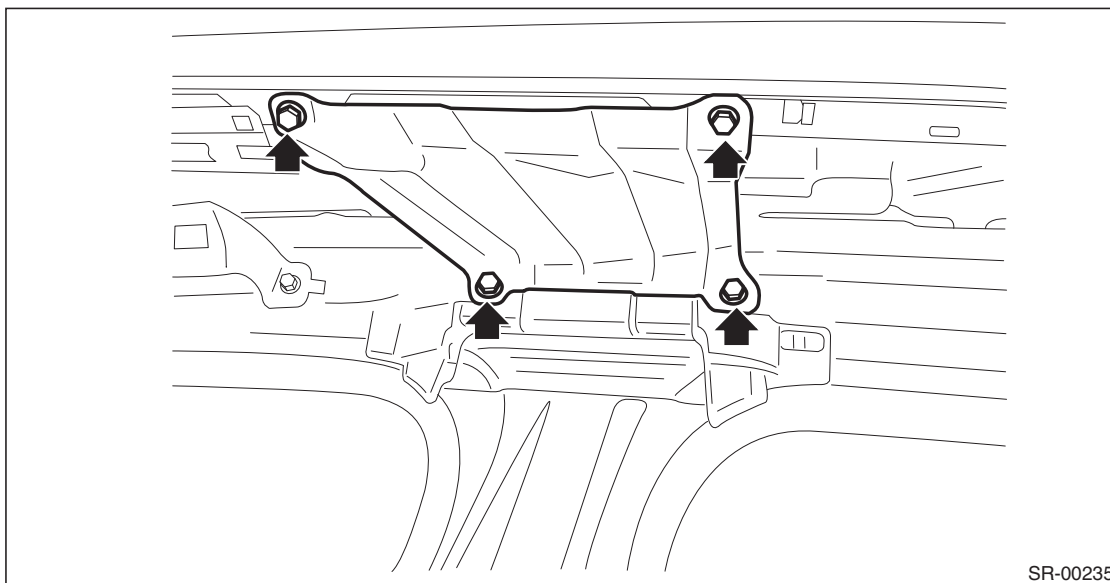


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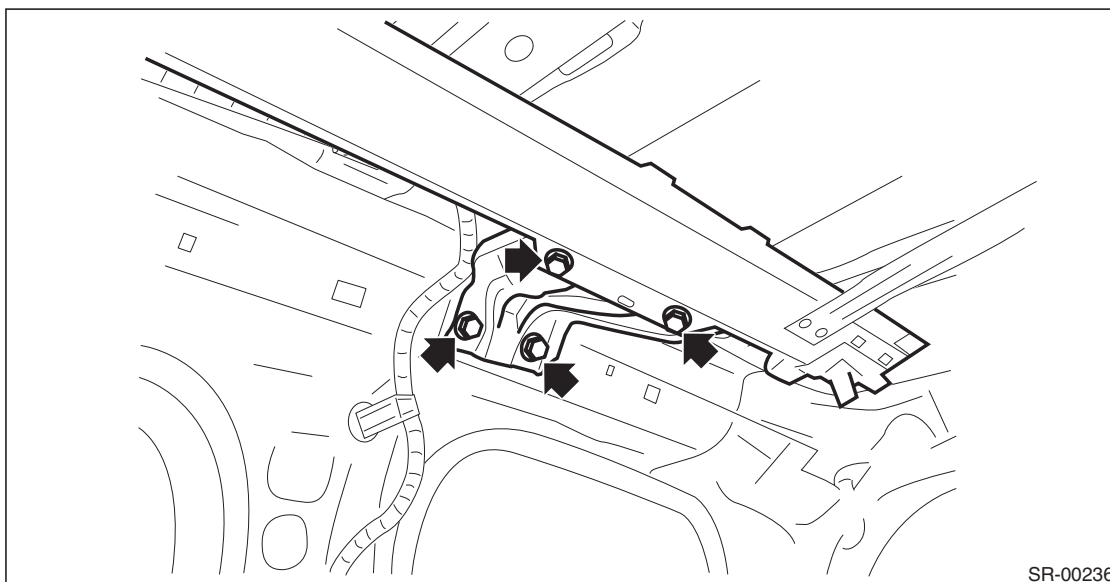
Sunshade

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

- (2) Remove the bolts, and then remove the cover - sunroof.



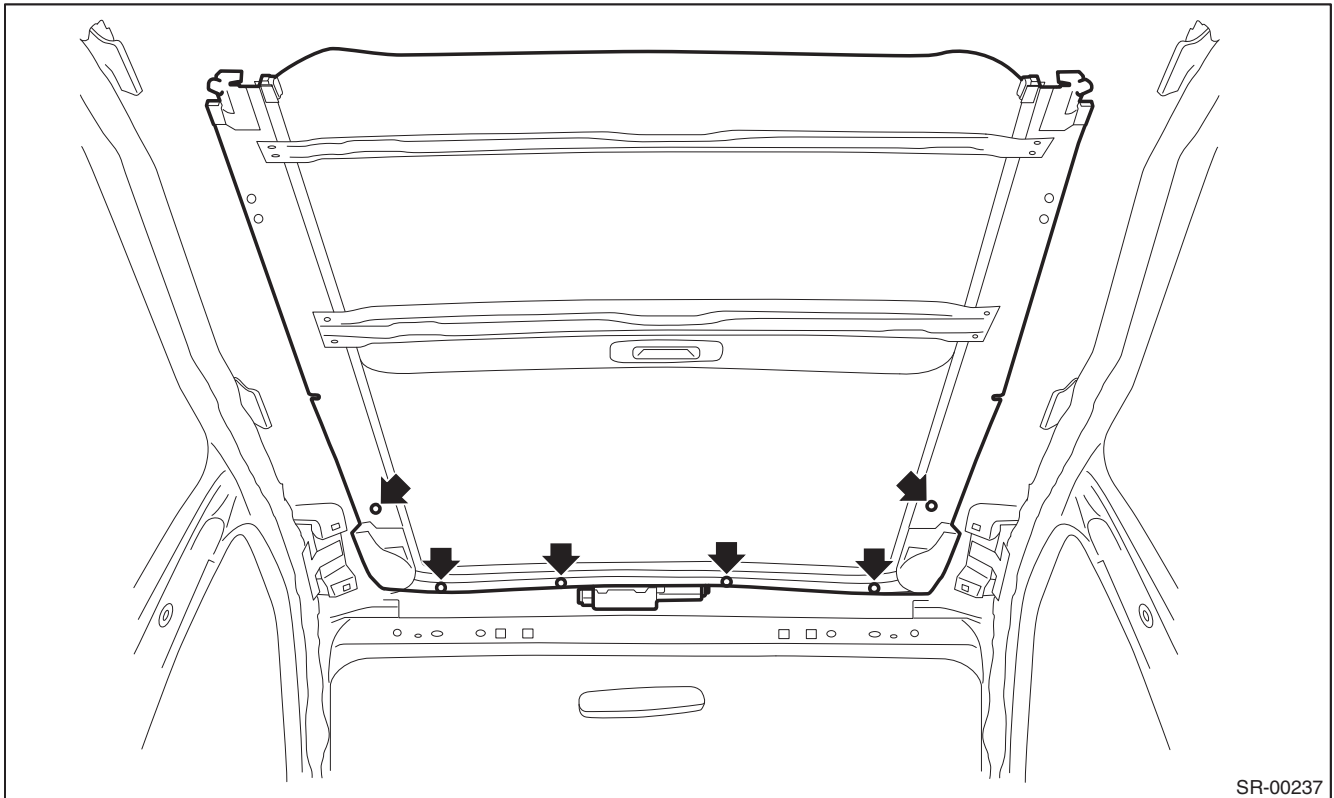
- (3) Remove the bolts, and then remove the bracket - sunroof.



Sunshade

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

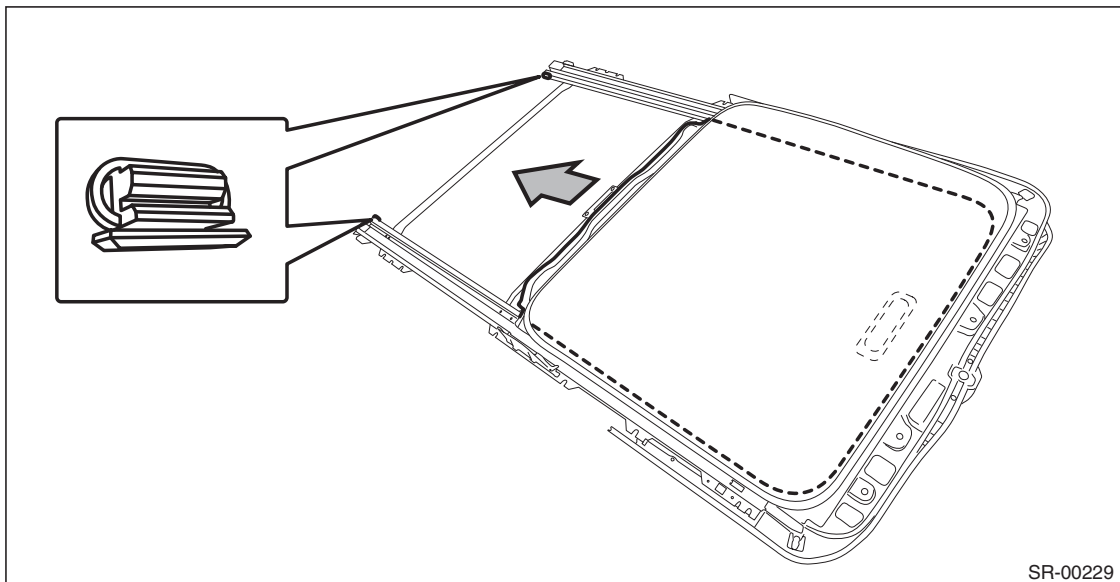
- (4) Remove the bolt, and then remove the rail assembly - sunroof.



CAUTION:

Be careful not to damage the sunshade assembly.

- 7) Remove the stopper rubber and pull out the sunshade assembly from the rail assembly - sunroof.



B: INSTALLATION

Install each part in the reverse order of removal.

Tightening torque:

Refer to "COMPONENT" of "General Description". <Ref. to SR-2, COMPONENT, General Description.>

Sunshade

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

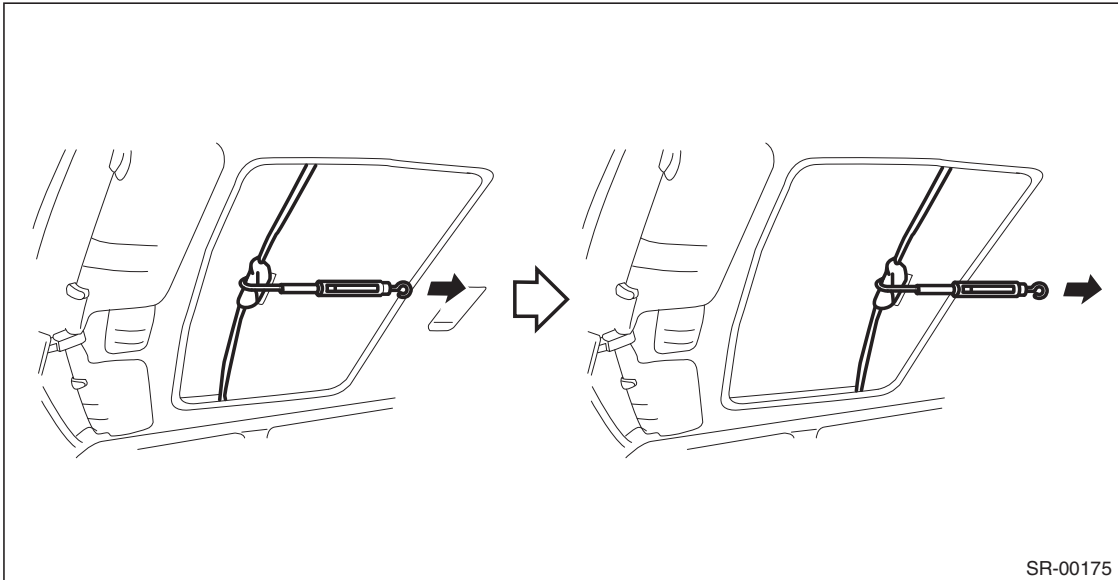
C: INSPECTION

1. MOVING LOAD OF SUNSHADE ASSEMBLY

- 1) Attach a spring scale together with a cloth to the edge of sunshade assembly.
- 2) Pull the spring scale to check the moving load of the sunshade assembly.

Moving load of sunshade assembly:

9.8 — 25 N (1.00 — 2.55 kgf, 2.2 — 5.6 lbf)



NOTE:

Moving load is larger at the beginning of pulling a spring scale, so take a spring scale reading while the sunshade assembly is sliding smoothly.

- 3) If the inspection result exceeds the standard, check the sunshade assembly or the rail assembly - sunroof for improper installation, and replace if necessary.

Sunshade

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)
