

SLIDING ROOF SYSTEM

PRECAUTION

NOTICE:
When disconnecting the cable from the negative (-) battery terminal, initialize the following system(s) after the cable is reconnected.

System Name	See procedure
Power Window Control System (with Jam Protection Function)	IN-23
Sliding Roof System	

RF-2

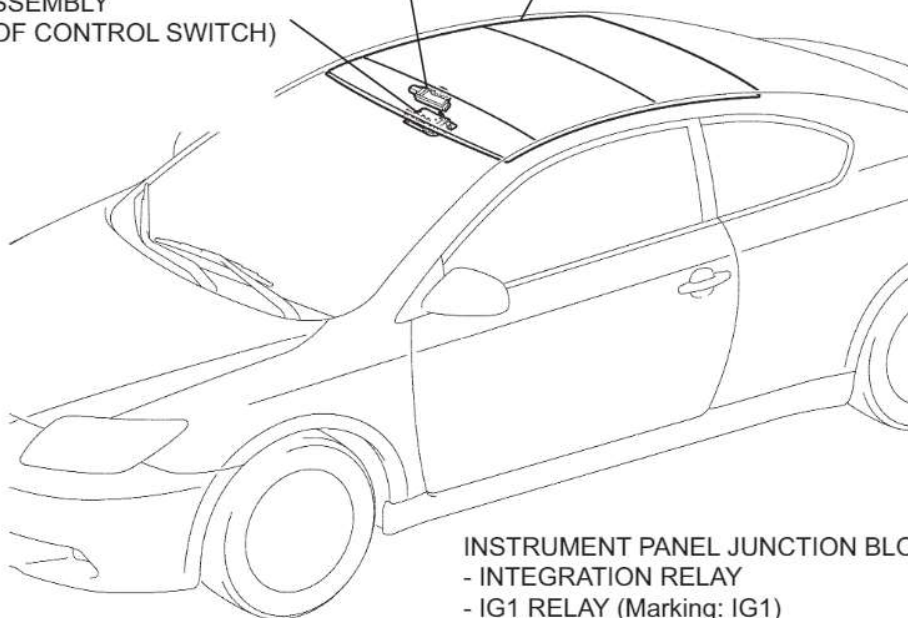
SLIDING ROOF – SLIDING ROOF SYSTEM

PARTS LOCATION

SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY
(SLIDING ROOF CONTROL ECU)

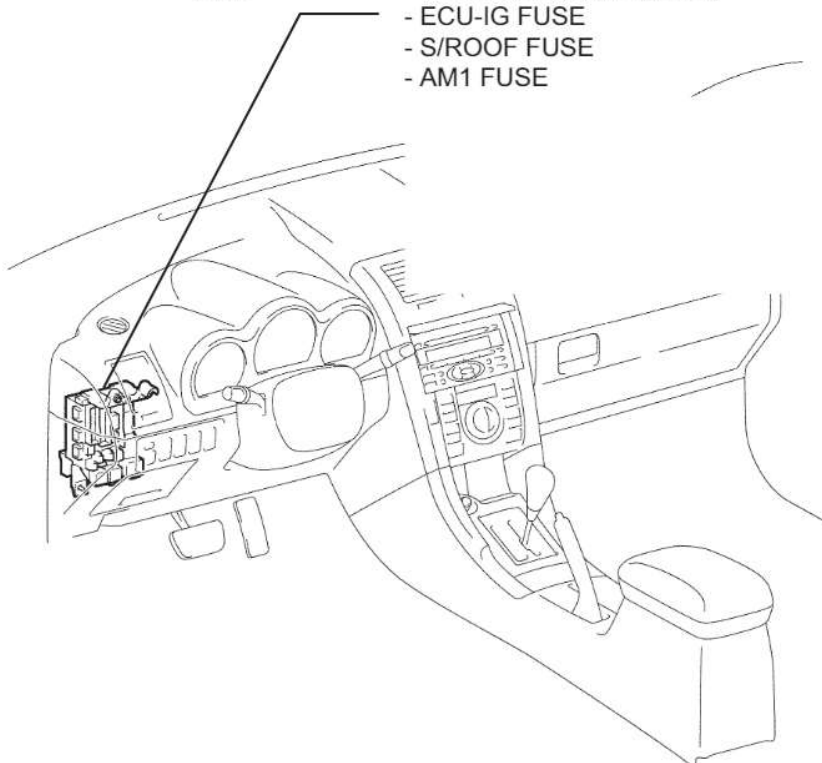
SLIDING ROOF HOUSING SUB-ASSEMBLY

MAP LAMP ASSEMBLY
(SLIDING ROOF CONTROL SWITCH)



INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

- INTEGRATION RELAY
- IG1 RELAY (Marking: IG1)
- ECU-IG FUSE
- S/ROOF FUSE
- AM1 FUSE



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INITIALIZATION

1. RESET SLIDING ROOF DRIVE GEAR (MOTOR)

NOTICE:

The drive gear (motor) must be reset (pulse sensor's location must be set) when one of the following occurs: 1) the battery cable has been disconnected from the negative (-) battery terminal, 2) the drive gear connector is connected /disconnected, or 3) the sliding roof is replaced or installed / removed. If the drive gear is not reset, the AUTO function will not operate.

(a) The sliding roof AUTO operation and the jam protection function may not operate normally if the battery cable is disconnected / reconnected, the battery replaced or recharged. Initialize the sliding roof system using the method below.

(1) Turn the ignition switch ON.

(2) Press the CLOSE switch to activate the close operation. Fully close the roof and continue to press the CLOSE switch for approximately 2 seconds. When the sliding roof control ECU initialization is finished, the roof will automatically open and stop a few millimeters from the fully open position.

HINT:

If the battery cable is disconnected, the sliding roof control ECU may not detect the position of the roof glass. If the sliding roof AUTO operation is still disabled even after the drive gear has been initialized, the Hall IC may be malfunctioning. The Hall IC is built into the drive gear and detects the roof glass position.

If the result is not as specified, replace the drive gear assembly (sliding roof control ECU).

2. INSPECT SLIDING ROOF FUNCTION (See page RF-4)

HINT:

- If the jam protection function is not operating, reset the drive gear.
- If the AUTO operation function and jam protection function do not operate after the drive gear has been reset, replace the drive gear assembly (sliding roof control ECU).

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SLIDING ROOF – SLIDING ROOF SYSTEM

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help determine the cause of the problem symptom. The potential cause of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

Sliding Roof System

Symptom	Suspected Area	See page
Sliding roof does not operate	1. ECU-IG fuse	-
	2. S/ROOF fuse	-
	3. AM1 fuse	-
	4. IG1 relay	-
	5. Sliding roof control switch	RF-19
	6. Sliding roof drive gear sub-assembly	RF-4
	7. Wire harness	-
	8. Faulty sliding of sliding roof	-
Sliding roof operation is abnormal	1. Sliding roof control switch	RF-19
	2. Sliding roof drive gear sub-assembly	RF-4
	3. Wire harness	-
Sliding roof system stops operation halfway even when no foreign object is in motor	1. Sliding roof control switch	RF-19
	2. Sliding roof drive gear sub-assembly	RF-4
	3. Wire harness	-
	4. Sliding roof drive gear sub-assembly (must be reset)	RF-4
Sliding roof does not operate after turning ignition switch OFF	1. Instrument panel J/B assembly integration relay	RF-4
	2. Wire harness	-
AUTO function is inoperative	1. Sliding roof drive gear sub-assembly (must be reset)	RF-4
	2. Sliding roof drive gear sub-assembly (sliding roof control ECU)	RF-4
Jam protection function is inoperative	1. Sliding roof drive gear sub-assembly (must be reset)	RF-4
	2. Sliding roof drive gear sub-assembly (sliding roof control ECU)	RF-4

RF

ON-VEHICLE INSPECTION

NOTICE:

The drive gear (motor) must be reset (pulse sensor's location must be set) when: one of the following occurs: 1) the battery cable has been disconnected from the negative (-) battery terminal, 2) the drive gear connector is connected / disconnected, or 3) the sliding roof is replaced or installed / removed.

If the drive gear is not reset, the AUTO function will not operate.

1. CHECK AUTO SLIDE-OPEN FUNCTION

- (a) Turn the ignition switch ON.
- (b) Press the sliding roof control OPEN switch for 0.3 seconds or more. Check the OPEN operation of the No. 1 and No. 2 roof glasses.
 - (1) When the switch is pressed, check that: 1) the No. 2 glass tilts upward, 2) the No. 1 glass tilts upward at the same time the No. 2 glass slides open, and 3) the No. 2 glass stops 50 mm (1.97 in.) from the fully open position.
 - (2) When the switch is pressed again, check that the No. 2 glass slides to the fully open position.

2. CHECK MANUAL CLOSE FUNCTION

- (a) Check the CLOSE operation of the No. 1 and No. 2 roof glass.
 - (1) Turn the ignition switch ON.
 - (2) While pressing and holding down the sliding roof control CLOSE switch, check that the No. 2 glass slides to just before the fully closed position.
 - (3) When the switch is pressed again, check that the No. 1 glass tilts downward at the same time the No. 2 glass slides to the fully closed position.

3. CHECK SLIDING ROOF OPERATION FUNCTION AFTER IGNITION SWITCH IS TURN OFF

- (a) Turn the ignition switch from ON to OFF.
- (b) The sliding roof's AUTO operation function should be available for 43 seconds. However, if one of the front doors is opened during AUTO operation, the sliding roof should stop its operation immediately.
- (c) Wait for 43 seconds after the ignition switch is turned OFF. Then, both the AUTO and manual operation functions should not be available anymore.
- (d) With one of the front doors open, turn the ignition switch OFF. If an object is caught between the sliding roof and vehicle body and the sliding roof's jam protection function is triggered, the sliding roof should reverse its movement and stop at the fully open position.

RF

4. CHECK JAM PROTECTION FUNCTION

HINT:
When the sliding roof AUTO CLOSE and MANUAL CLOSE operation is being used (ignition switch ON or within 43 seconds of turning ignition switch OFF), the jam protection function helps prevent objects from being caught between the vehicle body and the roof glass.

- CAUTION:**
- Do not use a part of your body, for example your hand, or any object to check the jam protection function. Do not allow anything to become caught in the sliding roof during this procedure.
 - The jam protection function may not operate with an object that is less than 5 mm (0.20 in.) in width.

(a) When the sliding roof CLOSE operation is being performed and an object is caught between the vehicle body and the roof glass, the roof glass should open a distance of 200 mm (7.87 in.) from the point of contact with the object, or open fully if 200 mm (7.87 in.) of opening distance is not available.

5. CHECK FAIL-SAFE FUNCTION

(a) If the sliding roof's jam protection function is triggered and, afterward, the sliding roof cannot be fully closed due to a malfunctioning sliding roof or a malfunctioning actuator, press and hold the CLOSE switch for at least 10 seconds. This will disable the jam protection function and the sliding roof can then be closed.

- CAUTION:**
Be careful when closing the sliding roof glass No. 1 and No. 2 at this time.

HINT:

- Before checking the fail-safe function, make sure that there is nothing that is triggering the jam protection function.
- Pressing the CLOSE switch for 10 seconds will clear the sliding roof control ECU memory of the sliding roof's fully closed position, which disables the jam protection function.

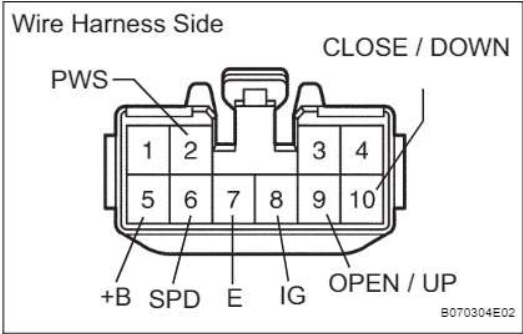
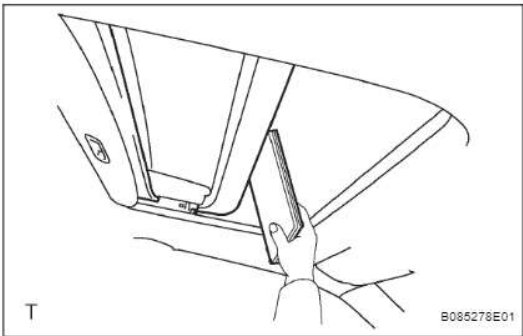
6. CHECK SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY

(a) Disconnect the drive gear wire harness connector.

(1) Measure the voltage of the wire harness side connector.

Standard voltage

Tester Connection	Condition	Specified Condition
5 (+B) - 7 (E)	Always	10 to 14 V
2 (PWS) - 7 (E)	Ignition switch OFF	0 V
2 (PWS) - 7 (E)	Ignition switch ON	10 to 14 V
8 (IG) - 7 (E)	Ignition switch OFF	0 V
8 (IG) - 7 (E)	Ignition switch ON	10 to 14 V



SLIDING ROOF – SLIDING ROOF SYSTEM**RF-7**

- (2) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
9 (OPEN / UP) - 7 (E)	Sliding roof control switch ON	Below 1 Ω
10 (CLOSE / DOWN) - 7 (E)	Sliding roof control switch ON	Below 1 Ω

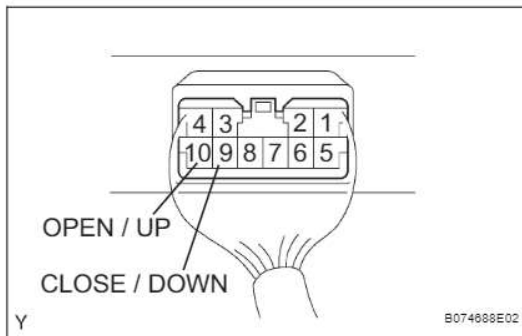
If the result is not as specified, there may be a malfunction on the wire harness side.

- (b) Reconnect the drive gear wire harness connector.
 (c) Initialize the drive gear assembly (See page [RF-3](#)).
 (d) Measure the voltage of the connector.

Standard voltage

Tester Connection	Condition	Specified Condition
9 (OPEN / UP) - Body ground	Ignition switch ON and OPEN switch OFF	10 to 14 V
9 (OPEN / UP) - Body ground	Ignition switch ON and OPEN switch ON	0 V
10 (CLOSE / DOWN) - Body ground	Ignition switch ON and CLOSE switch OFF	10 to 14 V
10 (CLOSE / DOWN) - Body ground	Ignition switch ON and CLOSE switch ON	0 V

If the result is not as specified, replace the drive gear sub-assembly (sliding roof control ECU).

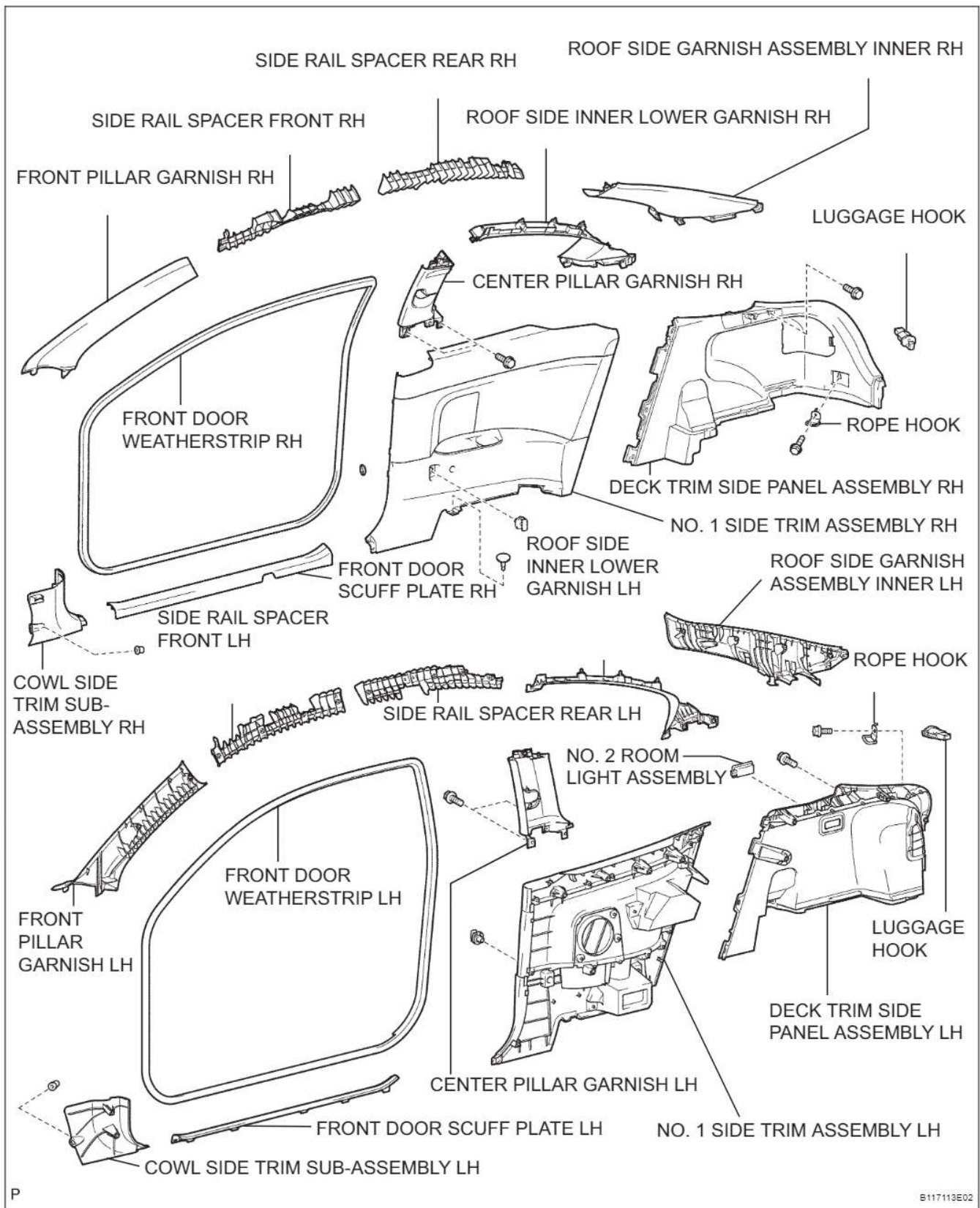
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RF-8

SLIDING ROOF – SLIDING ROOF HOUSING

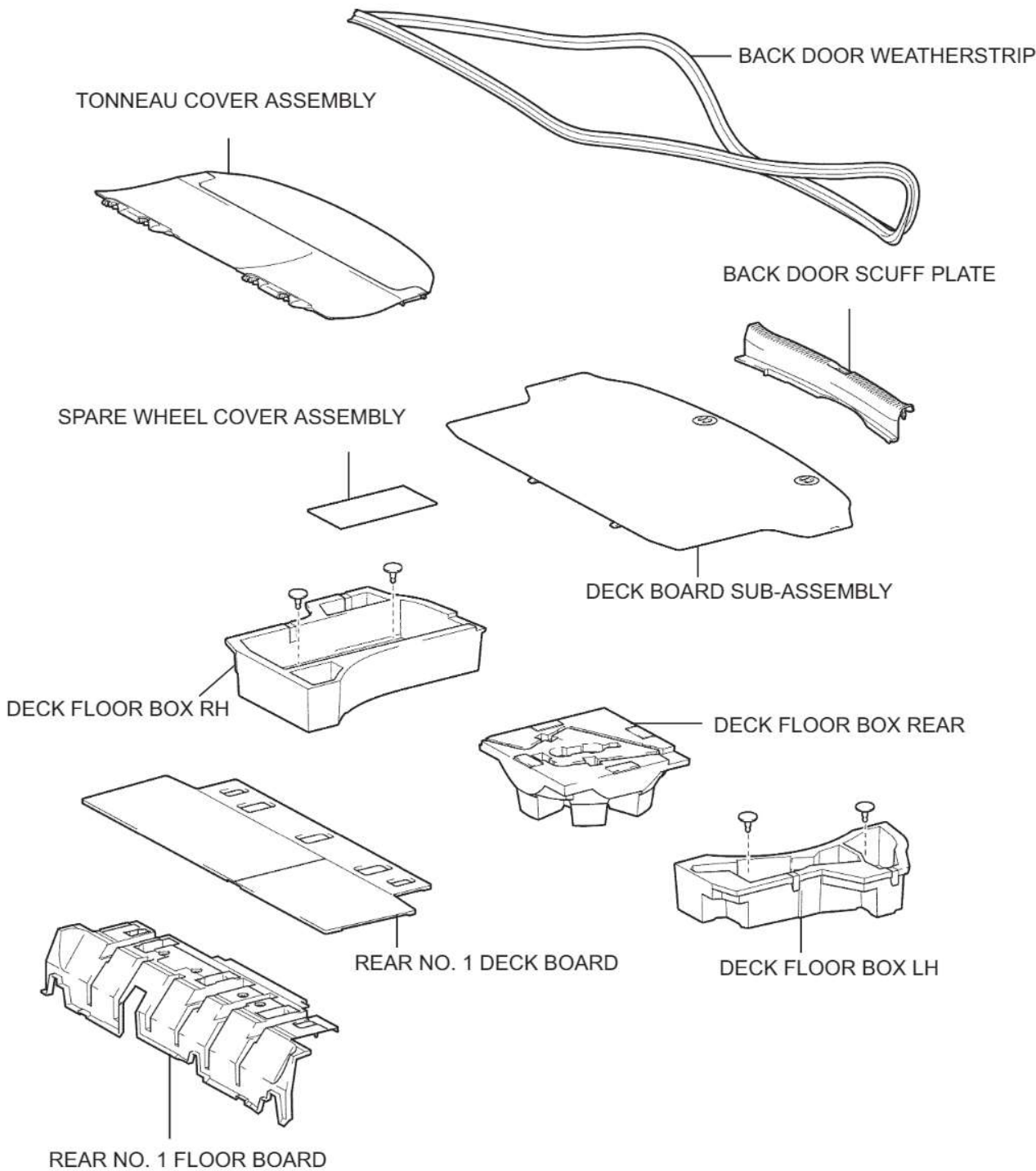
SLIDING ROOF HOUSING

COMPONENTS



SLIDING ROOF – SLIDING ROOF HOUSING

RF-9



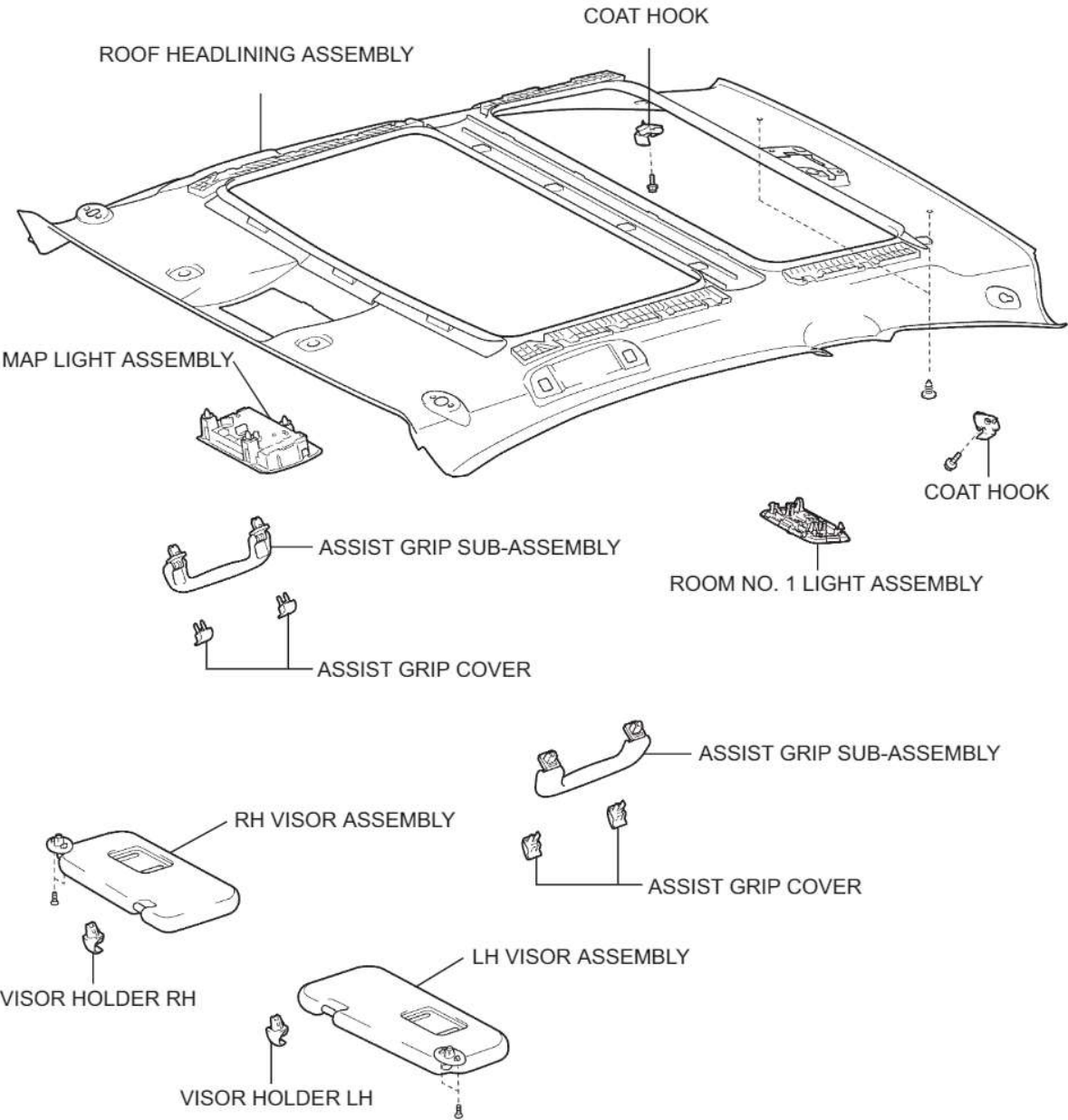
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RF-10

SLIDING ROOF – SLIDING ROOF HOUSING



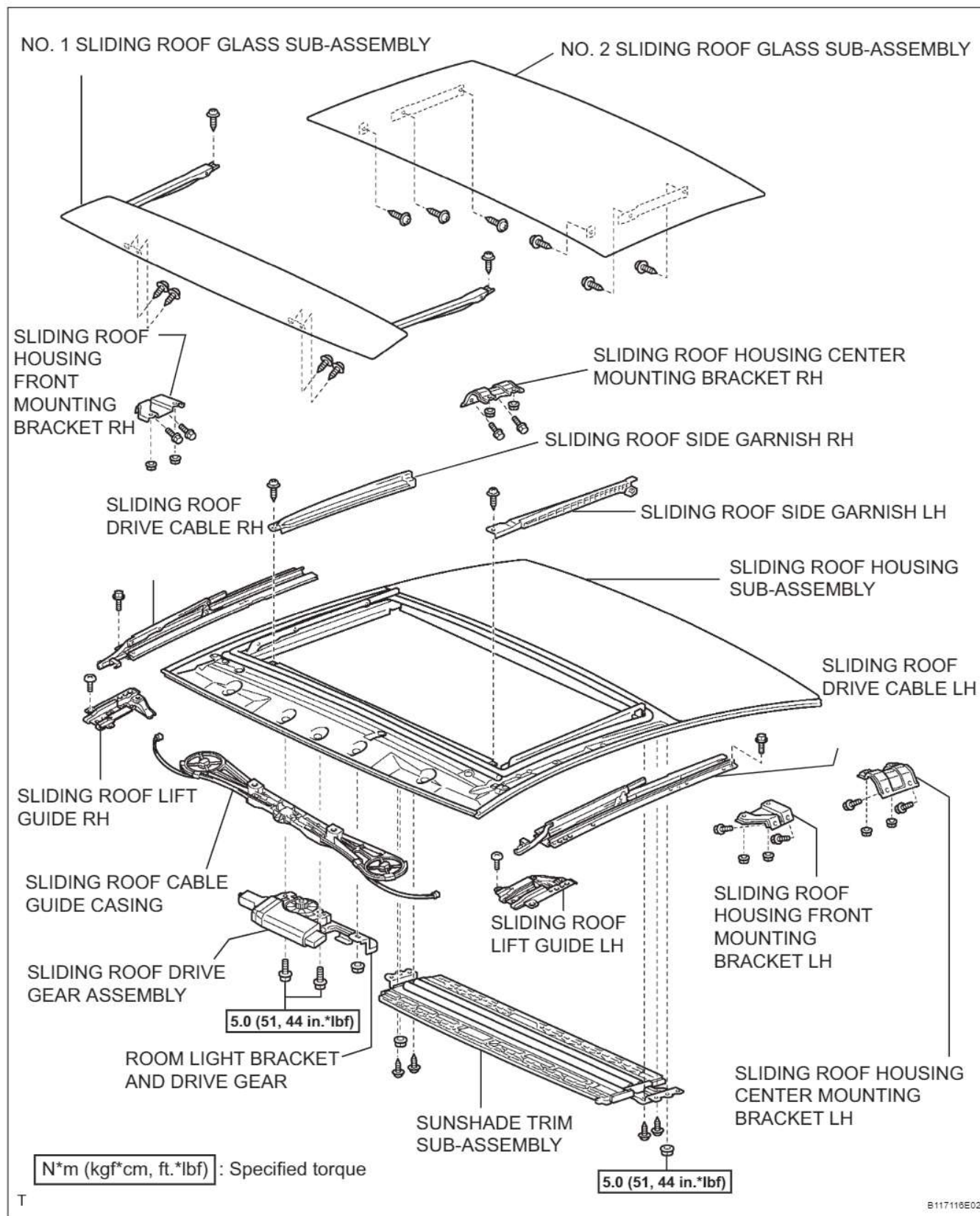
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SLIDING ROOF – SLIDING ROOF HOUSING

RF-11



RF

RF-12

SLIDING ROOF – SLIDING ROOF HOUSING

REMOVAL

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

2. **REMOVE ROOF HEADLINING ASSEMBLY**

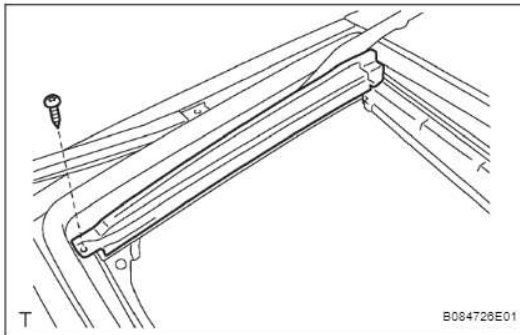
- (a) Remove the roof headlining (see page [IR-8](#)).

HINT:

After removing the roof headlining, connect the battery and sliding roof control switch.

3. **REMOVE SLIDING ROOF SIDE GARNISH LH**

- (a) Fully open the roof glass.
- (b) Using a T25 "torx" driver, remove the screw and garnish.



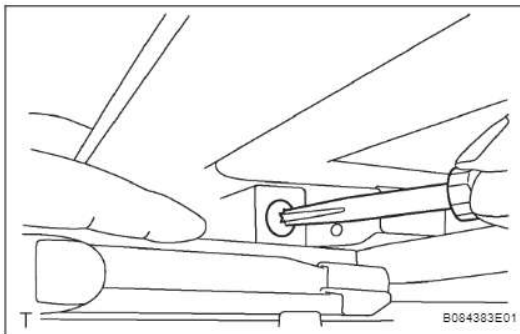
4. **REMOVE SLIDING ROOF SIDE GARNISH RH**

HINT:

Use the same procedures described for the LH side.

5. **REMOVE NO. 2 SLIDING ROOF GLASS SUB-ASSEMBLY**

- (a) Remove the 2 screws.

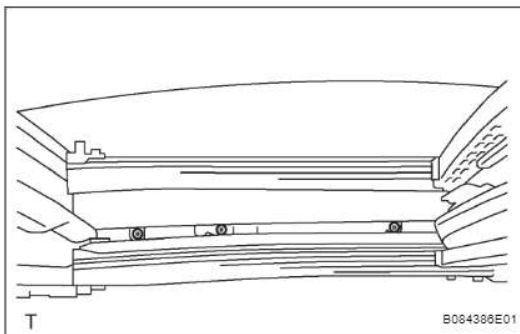


- (b) Fully close the roof glass and remove the 4 screws on the center and rear side of the glass. Then remove the roof glass.

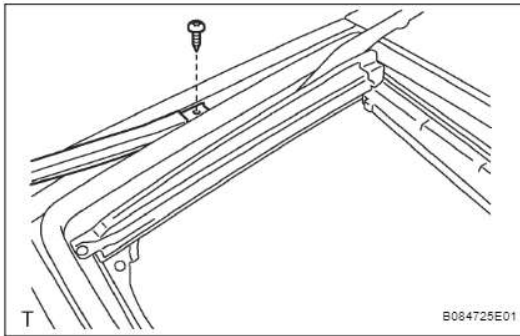
- (c) After removing the roof glass, disconnect the cable from the negative (-) battery terminal and the sliding roof control switch.

CAUTION:

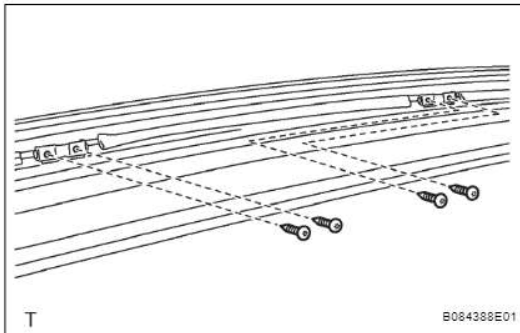
If the battery cable and sliding roof control switch are connected and the jam protection function has not been initialized, be careful whenever performing work between the roof glass and frame.



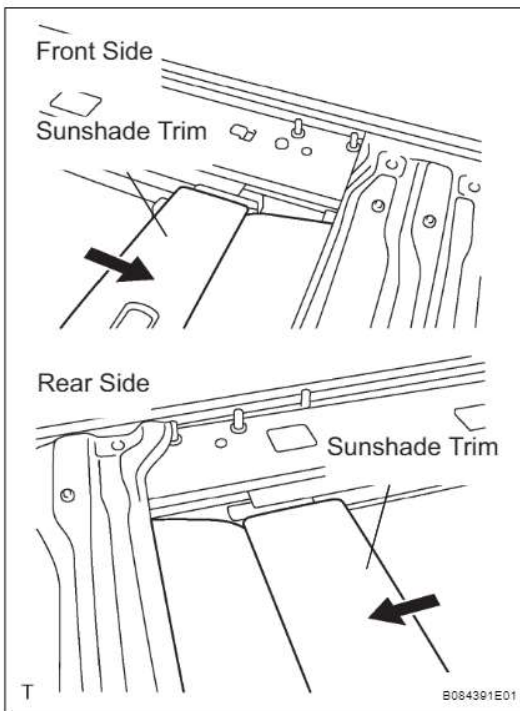
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SLIDING ROOF – SLIDING ROOF HOUSING**RF-13****6. REMOVE NO. 1 SLIDING ROOF GLASS SUB-ASSEMBLY**

(a) Using a T25 "torx" driver, remove the 2 screws.



(b) Remove the 4 screws and glass.

**7. REMOVE SUNSHADE TRIM SUB-ASSEMBLY**

(a) Remove the 2 nuts.

(b) Using a T25 "torx" driver, remove the 4 screws.

(c) Slide the front side sunshade trim backward and remove it.

(d) Slide the rear side sunshade trim forward and remove it.

8. REMOVE SLIDING ROOF HOUSING FRONT MOUNTING BRACKET LH

(a) Remove the 2 bolts, 2 nuts and bracket.

9. REMOVE SLIDING ROOF HOUSING FRONT MOUNTING BRACKET RH

(a) Remove the 2 bolts, 2 nuts and bracket.

10. REMOVE SLIDING ROOF HOUSING CENTER MOUNTING BRACKET LH

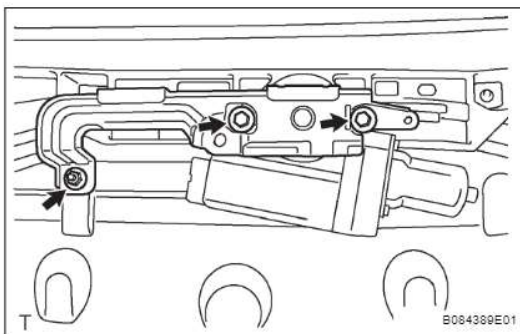
(a) Remove the 2 bolts, 2 nuts and bracket.

11. REMOVE SLIDING ROOF HOUSING CENTER MOUNTING BRACKET RH

(a) Remove the 2 bolts, 2 nuts and bracket.

12. REMOVE ROOM LIGHT SWITCH BASE

(a) Remove the 2 bolts, nut and bracket from the drive gear.

13. REMOVE SLIDING ROOF DRIVE GEAR ASSEMBLY**RF**

RF-14

SLIDING ROOF – SLIDING ROOF HOUSING

14. REMOVE DRIVE CABLE AND DRIVE CABLE GUIDE CASING

- (a) Remove the 12 nuts and the drive cable and guide casing.

NOTICE:

Be careful not to twist or damage the drive cable and guide casing during removal.

15. REMOVE SLIDING ROOF DRIVE CABLE LH

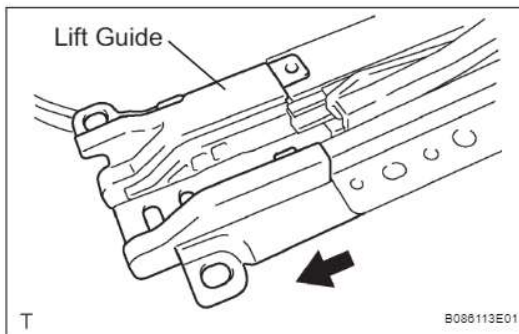
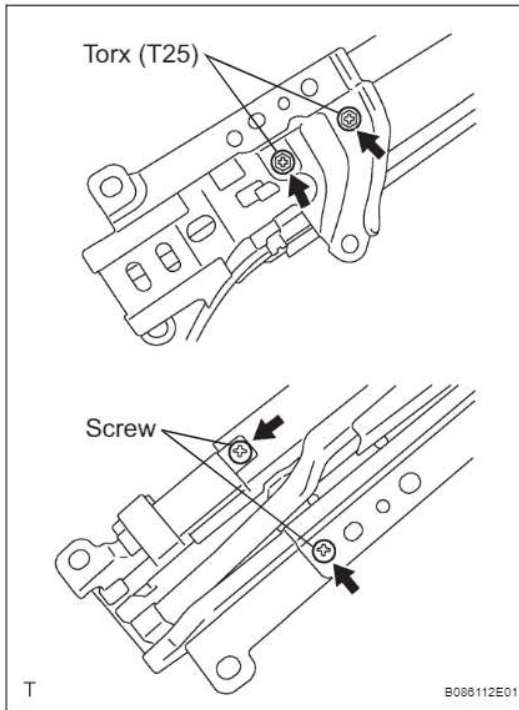
- (a) Using a T25 "torx" driver, remove the 2 screws.
 (b) Remove the 2 screws.
 (c) Disconnect the drive cable from the lift guide. Slide the drive cable toward the rear of the vehicle and remove it.

NOTICE:

When removing the drive cable, be careful not to damage the side airbag, wire harness and other nearby parts.

16. REMOVE SLIDING ROOF DRIVE CABLE RH**HINT:**

Use the same procedures described for the LH side.

17. REMOVE SLIDING ROOF CABLE GUIDE CASING**18. REMOVE SLIDING ROOF LIFT GUIDE LH**

- (a) Slide the lift guide forward and remove it.

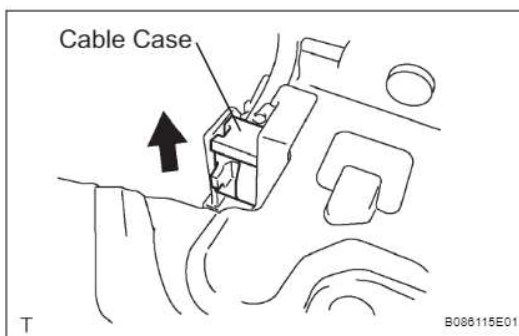
- (b) Disconnect the cable case's connector from the lift guide as shown in the illustration.

19. REMOVE SLIDING ROOF LIFT GUIDE RH**HINT:**

Use the same procedures described for the LH side.

20. REMOVE WINDSHIELD MOULDING OUTSIDE**HINT:**

- The roof panel cannot be removed / replaced by itself because the windshield glass and roof panel are built into the moulding. First, the moulding must be removed. Then the roof panel can be replaced.
- Refer to the windshield glass section for more detailed instructions (See page [WS-56](#)).



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SLIDING ROOF – SLIDING ROOF HOUSING**RF-15****21. REMOVE SLIDING ROOF HOUSING SUB-ASSEMBLY**

- (a) Remove the 16 nuts and panel.

NOTICE:

- When removing the panel, be careful not to damage the vehicle.
- Perform this step with 2 or more persons.

RF

RF-16

SLIDING ROOF – SLIDING ROOF HOUSING

INSTALLATION

HINT:

- The installation procedures are the removal procedures in reverse order. However, only installation procedures requiring additional information are included.
- A bolt without a torque specification is shown in the standard bolt chart (See page [WS-58](#)).

1. INSTALL DRIVE CABLE AND DRIVE CABLE GUIDE CASING

- Install the drive cable and guide casing to the roof panel with the 12 nuts.

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

2. INSTALL SLIDING ROOF HOUSING SUB-ASSEMBLY

- Install the housing with the 16 nuts.
- When installing the panel to the vehicle, first install the panel's center front and center rear alignment bolts to the vehicle's front and rear alignment bolt installation points, as shown in the illustration.
- Check that the alignment bolts are firmly installed.

NOTICE:

When bolts are not firmly installed, water leaks and malfunctions will occur.

- Install the panel with the 16 nuts.

3. ADJUST FULLY CLOSED POSITION

- Using a screwdriver, slide the sliding roof drive cable to align the matchmarks.

HINT:

Tape the screwdriver tip before use.

4. INSTALL ROOM LIGHT BRACKET AND DRIVE GEAR

- Install the drive gear and bracket with the 2 bolts and nut.

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

5. INSTALL SUNSHADE TRIM SUB-ASSEMBLY

- Install the trim with the 2 nuts and 4 screws.

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

6. INSTALL SLIDING ROOF HOUSING FRONT MOUNTING BRACKET LH

7. INSTALL SLIDING ROOF HOUSING FRONT MOUNTING BRACKET RH

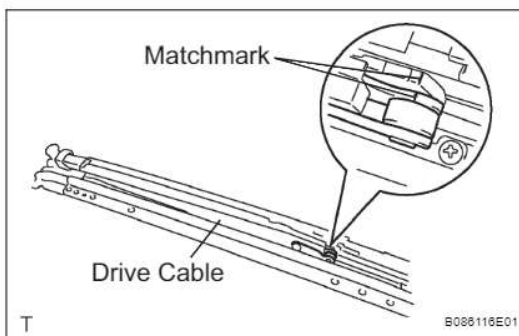
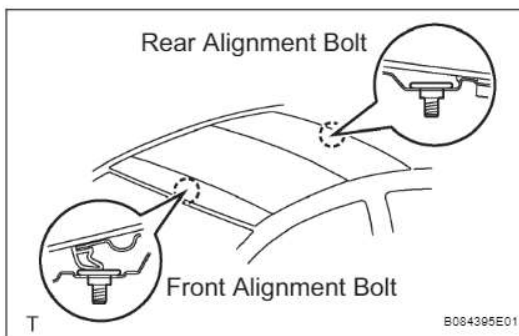
8. INSTALL SLIDING ROOF HOUSING CENTER MOUNTING BRACKET LH

9. INSTALL SLIDING ROOF HOUSING CENTER MOUNTING BRACKET RH

10. INSTALL SLIDING ROOF GLASS SUB-ASSEMBLY (NO. 1, NO. 2)

- Install the No. 1 roof glass.

- Using a "torx" driver, install the roof glass with the 6 screws.

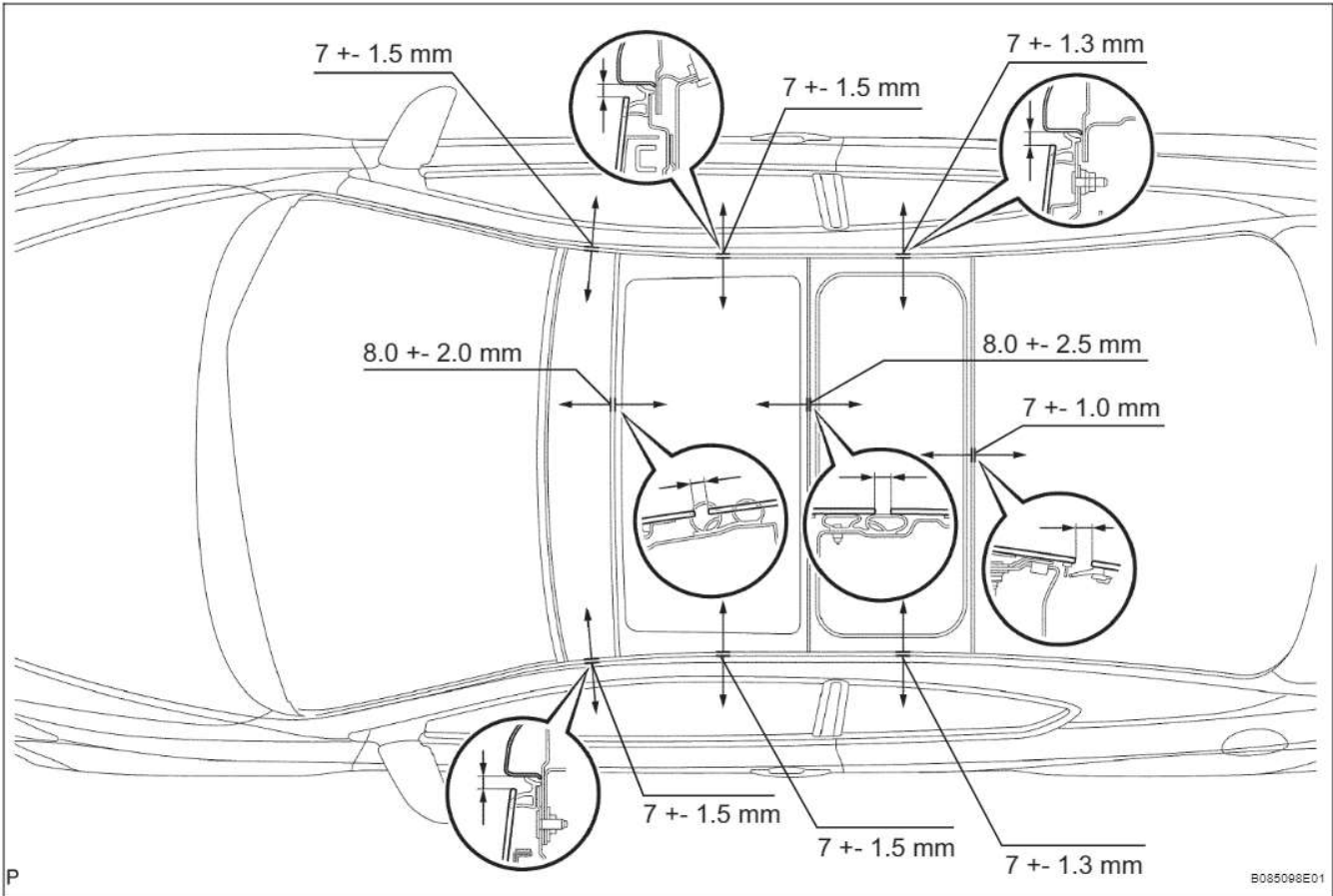


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- (b) Install the No. 2 roof glass.
- (1) Using a "torx" driver, install the 4 screws.

(2) Connect the battery and sliding roof control switch. Fully open the glass and install the 2 screws on the front side of the glass.

11. ADJUST SLIDING ROOF GLASS SUB-ASSEMBLY
(NO. 1, NO. 2, HOUSING PANEL)



- (a) Adjust the No. 3 housing panel.
- (1) The housing panel does not have adjusting screws. Instead, change the position of the housing panel assembly so that the position of the housing panel is within the standard values shown in the illustration.

Standard measurement

Item	Specified Condition
Front end	8.0 +/- 2.5 mm (0.314 +/- 0.098 in.)
Rear end	7.0 +/- 1.0 mm (0.276 +/- 0.039 in.)
Side end	7.0 +/- 1.3 mm (0.276 +/- 0.051 in.)

- (2) When finished adjusting the roof housing, install the roof housing's 16 nuts and the mount bracket's 8 bolts and 8 nuts.

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SLIDING ROOF – SLIDING ROOF HOUSING

(b) Adjust the No. 1 roof glass.

- (1) Adjust the position of the roof glass so that it is within the standard values shown in the illustration.

Standard measurement

Item	Specified Condition
Rear end	8.0 +/- 2.0 mm (0.314 +/- 0.079 in.)
Side end	7.0 +/- 1.5 mm (0.276 +/- 0.059 in.)

- (2) When finished adjusting the roof glass, install the 4 screws on the front side of the glass.

- (3) Using a "torx" driver, install the 2 screws.

(c) Adjust the No. 2 roof glass.

- (1) Adjust the position of the roof glass so that it is within the standard values shown in the illustration.

Standard measurement

Item	Specified Condition
Front end	8.0 +/- 2.0 mm (0.314 +/- 0.079 in.)
Rear end	8.0 +/- 2.5mm (0.314 +/- 0.098 in.)
Side end	7.0 +/- 1.5 mm (0.276 +/- 0.059 in.)

- (2) When finished adjusting roof glass, using a "torx" driver, install the 4 screws.

- (3) Connect the cable to the negative (-) battery terminal and connect the sliding roof control switch. Fully open the glass and install the 2 screws on the front side of the glass.

NOTICE:

- When the roof glass is fully open, disconnect the battery cable and sliding roof control switch.
- If the battery cable and sliding roof control switch are connected and the jam protection function has not been initialized, be careful whenever performing work between the roof glass and frame.

12. CHECK FOR WATER LEAKS

If a leak is found, readjust the sliding roof.

13. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**14. PERFORM INITIALIZATION**

- (a) Perform initialization (see page [IN-23](#)).

NOTICE:

Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.

SLIDING ROOF – SLIDING ROOF HOUSING**RF-19****15. CHECK SRS WARNING LIGHT**

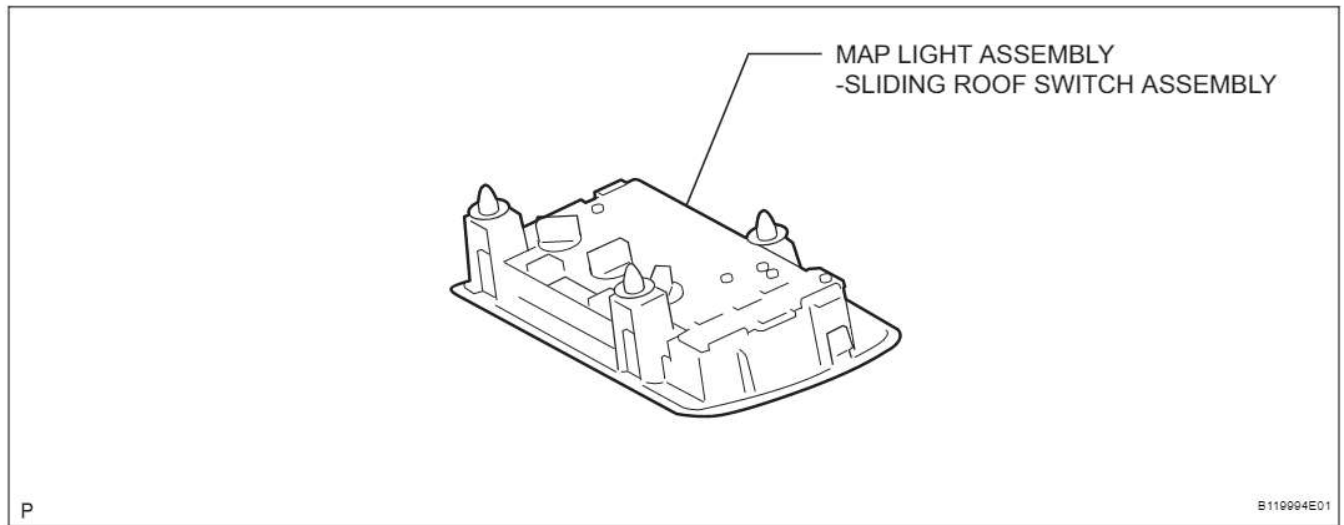
(a) Check the SRS warning light (see page [RS-11](#)).

16. INITIALIZE SLIDING ROOF GEAR

(a) Initialize sliding roof gear (see page [RF-3](#)).

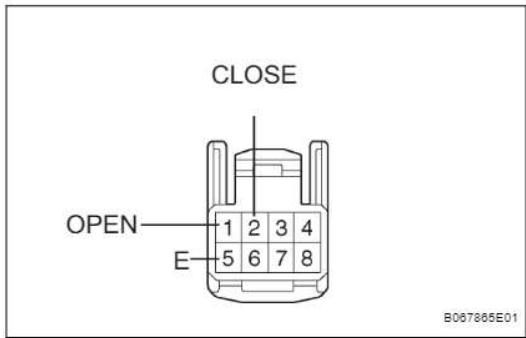
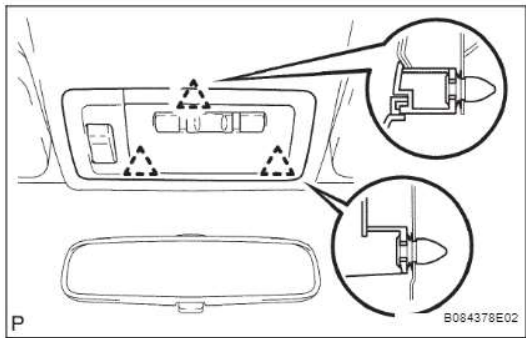
RF

SLIDING ROOF SWITCH ASSEMBLY COMPONENTS



REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY
TERMINAL
CAUTION:
Wait at least 90 seconds after disconnecting the
cable from the negative (-) battery terminal to
prevent airbag and seat belt pretensioner activation.
2. REMOVE MAP LIGHT ASSEMBLY
(a) Using a clip remover, detach the 3 clips and remove
the light.
(b) Disconnect the map light connector.



INSPECTION

1. INSPECT MAP LIGHT ASSEMBLY
(a) Measure the resistance of the switch.
Standard resistance

Tester Connection	Switch Condition	Specified Condition
1 (OPE) - 5 (E)	OPEN	Below 1 Ω
2 (CLOSE) - 5 (E)	CLOSE	Below 1 Ω
1 (OPEN) - 5 (E)	OFF	10 kΩ or higher
2 (CLOSE) - 5 (E)	OFF	10 kΩ or higher

If the result is not as specified, replace the map light
assembly.

INSTALLATION

1. INSTALL MAP LIGHT ASSEMBLY
(a) Connect the map light connector.
(b) Attach the 3 clips to install the light.
2. CONNECT CABLE TO NEGATIVE BATTERY
TERMINAL
3. PERFORM INITIALIZATION
(a) Perform initialization (see page [IN-23](#)).
NOTICE:
Certain systems need to be initialized after
disconnecting and reconnecting the cable from
the negative (-) battery terminal.
4. CHECK SRS WARNING LIGHT
(a) Check the SRS warning light (see page [RS-11](#)).

