

2009 Toyota Highlander Limited

2009 ACCESSORIES & EQUIPMENT Sliding Roof - Highlander

2009 ACCESSORIES & EQUIPMENT

Sliding Roof - Highlander

SLIDING ROOF SYSTEM

PRECAUTION

1. PRECAUTION FOR DISCONNECTING THE BATTERY CABLE

NOTE: When disconnecting the battery negative (-) terminal, initialize the following systems after the terminal is reconnected:

SYSTEM PROCEDURE CHART

System Name	See Procedure
Power Back Door System	<u>INITIALIZATION</u>

2. IGNITION SWITCH EXPRESSIONS

HINT:

The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this section.

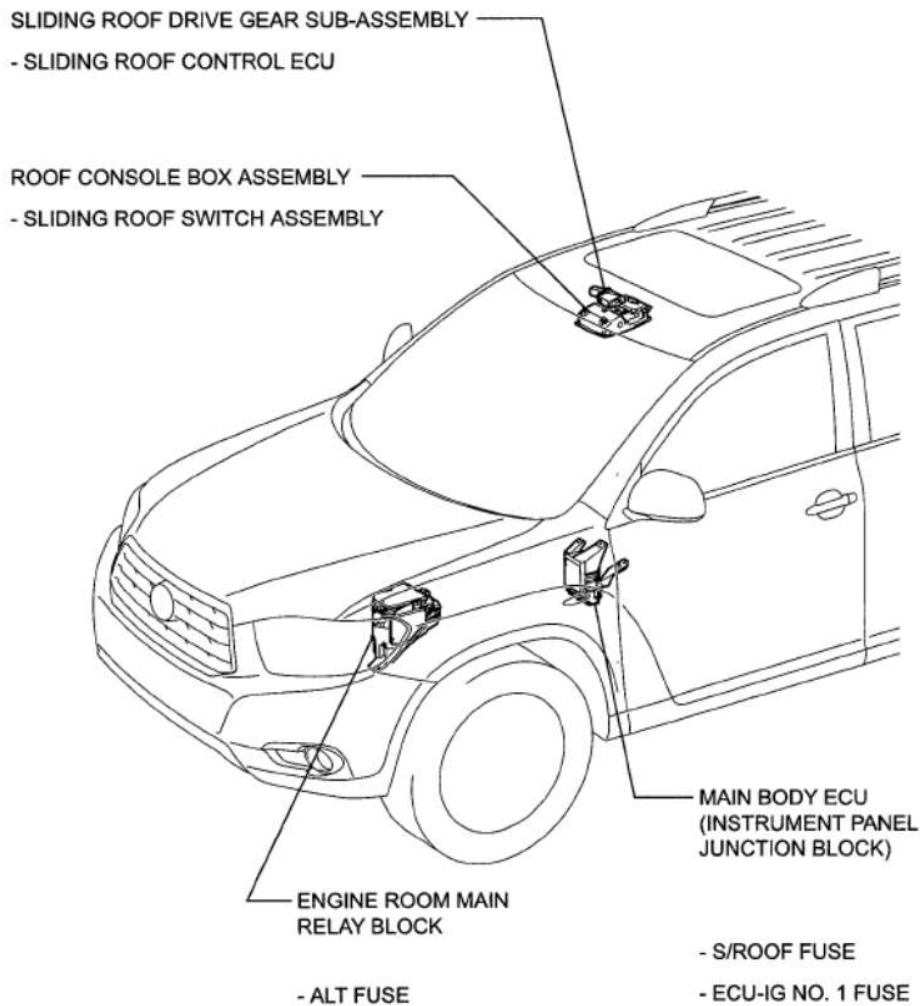
SWITCH REFERENCE CHART

Expression	Ignition Switch (position)	Engine Switch (condition)
Ignition Switch off	LOCK	Off
Ignition Switch on (IG)	ON	On (IG)
Ignition Switch on (ACC)	ACC	On (ACC)
Engine Start	START	Start

PARTS LOCATION

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B174033E01

Fig. 1: Identifying Sliding Roof System Parts Location
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

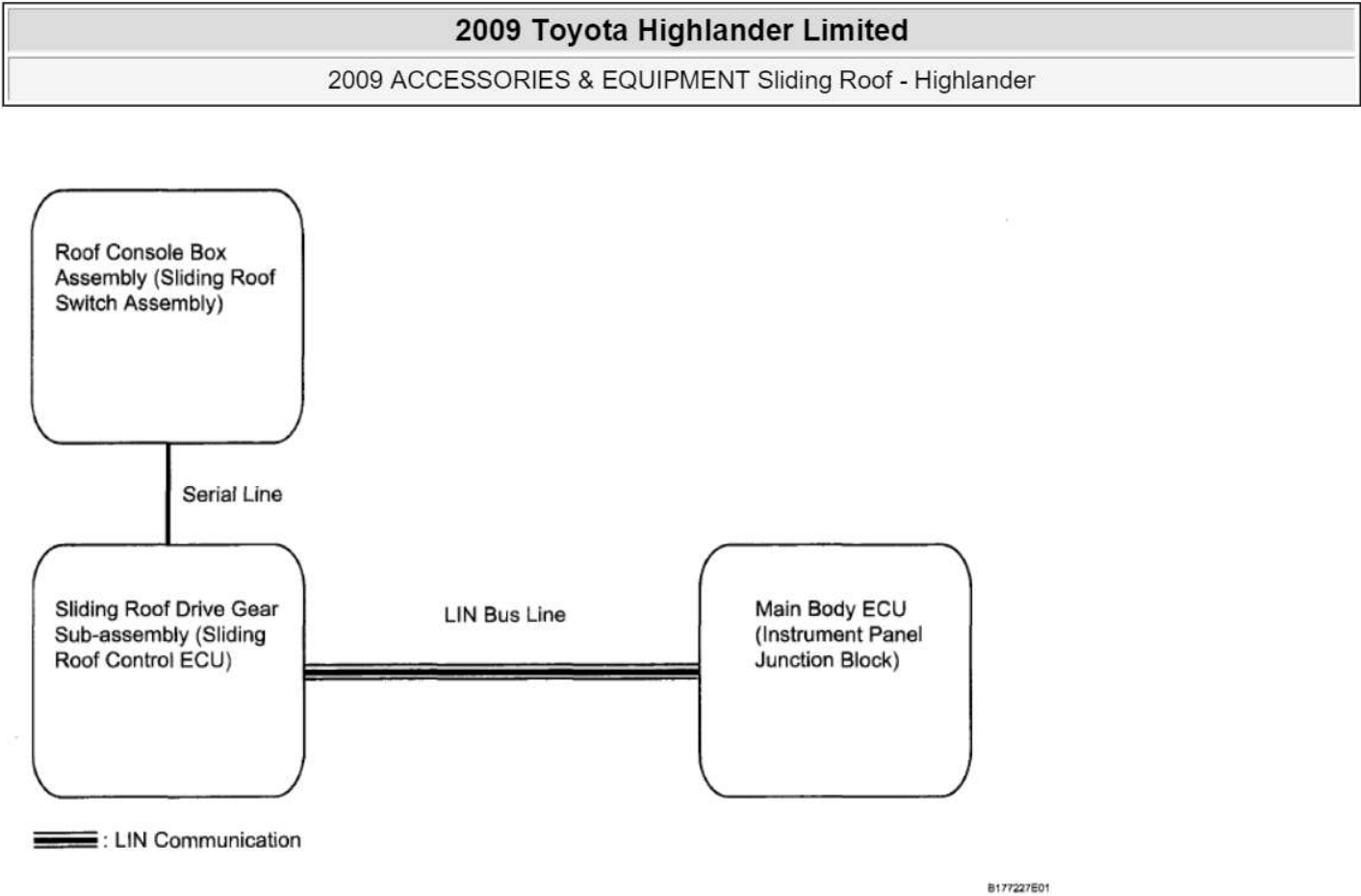


Fig. 2: Sliding Roof System Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Communication table

COMMUNICATION CHART

Sender	Receiver	Signal	Line
Main Body ECU	Sliding Roof Control ECU	Key-off sliding roof operation signal	LIN
Sliding Roof Control ECU	Main Body ECU	Warning buzzer signal	LIN

SYSTEM DESCRIPTION

1. GENERAL

This system has the following functions: manual slide open and close; manual tilt up and down; key off operation.

2. FUNCTION OF MAIN COMPONENT

FUNCTION OF MAIN COMPONENT

Component	Outline
Sliding Roof Drive Gear Sub-assembly (Sliding roof control ECU)	Sliding roof control ECU controls sliding roof motor to rotate forward and backward, which tilts or slides sliding roof glass.
Roof Console Box Assembly (Sliding	Output of operation signals from built-in sliding roof switch to

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roof switch assembly)	sliding roof control ECU is handled by roof console box assembly.
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3. SYSTEM OPERATION

The sliding roof has the following features:

SLIDING ROOF FUNCTION CHART

Function	Outline
Manual slide open and close	This function causes sliding roof to open (or close) when OPEN/CLOSE switch is pressed for a maximum of 0.3 seconds. Sliding roof stops as soon as the switch is released.
Auto slide open	This function causes sliding roof to fully open when OPEN switch is pressed for a minimum of 0.3 seconds.
Manual tilt up and down	This function causes sliding roof to tilt up (or tilt down) when UP/DOWN switch is pressed for a maximum of 0.3 seconds.
Auto tilt up	This function enables sliding roof to tilt up when UP switch is pressed for a minimum of 0.3 seconds.
Jam protection	The jam protection function automatically stops sliding roof, or stops sliding roof and makes it open halfway (or fully tilted up) if a foreign object gets jammed in sliding roof during close operation (or tilt down operation).
Key off operation	Key off operation function makes it possible to operate sliding roof for approximately 43 seconds after ignition switch is turned off, if front doors are not opened.
Sliding roof open warning	When the ignition switch is turned from on (IG) to off and the driver's side door is opened when the sliding roof is open, the sliding roof control ECU sounds the buzzer in the combination meter assembly. Then, a warning message appears on the multi-information display.

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedures to troubleshoot the sliding roof system.
- *: Use Techstream.

1. VEHICLE BROUGHT TO WORKSHOP

2. INSPECT BATTERY VOLTAGE

Standard voltage:

11 to 14 V

If the voltage is below 11V, recharge or replace the battery before proceeding to the next step.

3. INSPECT COMMUNICATION FUNCTION OF MULTIPLEX COMMUNICATION SYSTEM

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(LIN)*

- a. Using Techstream, check if the multiplex communication system is functioning normally.

Result

RESULT CHART

Result	Proceed to
LIN DTC is not output	A
LIN DTC is output	B

B: Go to LIN COMMUNICATION SYSTEM MP-17

A: Go to next step

4. CHECK FOR DTC*

- a. Delete the DTCs (See **DTC CHECK/CLEAR**).
- b. Recheck for DTCs (See **DTC CHECK/CLEAR**).

HINT:

If DTCs are detected frequently, replace the ECU.

OK:

DTC is not output.

NG: Go to **DIAGNOSTIC TROUBLE CODE CHART**

OK: Go to next step

5. PROBLEM SYMPTOMS TABLE

Result

RESULT CHART

Result	Proceed to
Fault is not listed in problem symptoms table	A
Fault is listed in problem symptoms table	B

B: Go to step 8

A: Go to next step

6. OVERALL ANALYSIS AND TROUBLESHOOTING*

1. Data List/Active Test (See **DATA LIST/ACTIVE TEST**)

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2. Terminals of ECU (See **TERMINALS OF ECU**)
3. On-vehicle Inspection (See **ON-VEHICLE INSPECTION**)
7. **ADJUST, REPAIR OR REPLACE**
8. **CONFIRMATION TEST**

NEXT: END

INITIALIZATION

1. INITIALIZE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY

NOTE: Be sure to initialize the sliding roof drive gear (pulse sensor) after adjusting the sliding roof glass position or removing and installing components. Without initialization, there may be a malfunction in the sliding roof auto operation, or key-off operation. If any of the following conditions occurs during initialization procedure, initialization will fail.

- The ignition switch is turned off.
- Communication is cut off.
- Another switch is turned on during initialization.
- Vehicle speed is 5 km/h (3 mph) or more.
- The vehicle experiences a strong vibration during initialization, such as the slamming of a door.

a. Initialization

HINT:

According to the following chart, proceed to the appropriate initialization procedure.

SLIDING ROOF CONDITION CHART

Sliding Roof Condition	Proceed to
The sliding roof AUTO function does not operate.	[A]
The sliding roof AUTO function	[B]
Although the sliding roof AUTO function operates, the roof glass stops moving or starts moving in the opposite direction while tilting downward.	[B]
Although the sliding roof AUTO function operates, the roof glass stops moving or starts moving in the opposite direction while sliding closed.	[C]

1. [A] The sliding roof AUTO function does not operate.
 1. Turn the ignition switch on (IG). *1
 2. Fully close the sliding roof.

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3. Press and hold the sliding roof switch (TILT UP side) until the following movement finishes: Tilt up --> stationary state for at least 1 second --> tilt down --> slide open --> slide close.

NOTE: Press and hold the sliding roof switch (TILT UP side) until step *2 is complete. If the switch is released before step *2 is complete, restart from step *1.

4. Confirm that the roof glass is stopped at the fully closed position and initialization is completed. *2
2. [B] Although the sliding roof AUTO function operates, the roof glass stops moving or starts moving in the opposite direction while tilting downward.
 1. Turn the ignition switch on (IG). *1
 2. Press and hold the sliding roof switch (TILT UP side) until the sliding roof stops.
 3. After the sliding roof stops, release the switch.
 4. Press and hold the sliding roof switch (TILT UP side) for more than 10 seconds until the following movement finishes: Tilt up --> stationary state for at least 1 second --> tilt down --> slide open --> slide close.

NOTE: Press and hold the sliding roof switch (TILT UP side) until step *2 is complete. If the switch is released before step *2 is complete, restart from step *1.

5. Confirm that the roof glass is stopped at the fully closed position and initialization is complete. *2
6. Confirm that the sliding roof can be normally operated with the AUTO function.
3. [C] Although the sliding roof AUTO function operates, the roof glass stops moving or starts moving in the opposite direction while sliding closed.
 1. Turn the ignition switch on (IG). *1
 2. Press and hold sliding roof switch (TILT UP side) until the following movement finishes: Slide close --> roof glass stops moving or starts moving in the opposite direction --> stationary for at least 10 seconds --> slide close.

NOTE: Press and hold sliding roof switch (TILT UP side) until step *2 is complete. If the switch is released before step *2 is complete, restart from step *1.

3. After the sliding roof has stopped at the fully closed position, release the switch. *2
4. Follow the initialization procedure described in [A] (The sliding roof AUTO function does not function.)

PROBLEM SYMPTOMS TABLE

HINT:

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Use the table below to help determine the cause of the problem symptom. The potential causes 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.

Inspect the fuses and relays related to this system before inspecting the suspected areas below.

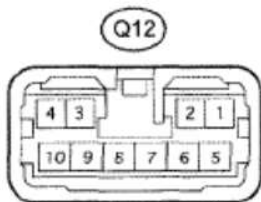
Sliding Roof System

SLIDING ROOF SYSTEM SYMPTOM CHART

Symptom	Suspected Area	Refer to
Sliding function and tilt function do not operate	Sliding Roof does not Move by Operating Sliding Roof Control Switch	<u>SLIDING ROOF DOES NOT MOVE BY OPERATING SLIDING ROOF CONTROL SWITCH</u>
Either sliding function or tilt function does not operate	Sliding Roof does not Move by Operating Sliding Roof Control Switch	<u>SLIDING ROOF DOES NOT MOVE BY OPERATING SLIDING ROOF CONTROL SWITCH</u>

TERMINALS OF ECU

1. CHECK SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU)



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Fig. 3: Identifying Sliding Roof Control ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Disconnect the Q12 ECU connector.
- b. Measure the resistance and voltage according to the value(s) in the table below.

TERMINAL DESCRIPTION SPECIFIED CONDITION CHART

Terminal No. (Symbols)	Wiring Color	Terminal Description	Condition	Specified Condition
Q12-1 (B) - Q12-2 (E)	B - W-B	+B power supply	Always	10 to 14 V
Q12-5 (IG) - Q12-2 (E)	Y - W-B	Ignition switch power supply	Ignition switch off	Below 1 V
Q12-5 (IG) - Q12-2 (E)	Y - W-B	Ignition switch power supply	Ignition switch on (IG)	10 to 14 V

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Q12-7 (OPN) - Q12-2 (E)	V - W-B	Sliding roof motor open	OPEN switch OFF	10 kohms or higher
Q12-7 (OPN) - Q12-2 (E)	V - W-B	Sliding roof motor open	OPEN switch ON	Below 1 ohms
Q12-9 (CLS) - Q12-2 (E)	W - W-B	Sliding roof motor closed	CLOSE switch OFF	10 kohms or higher
Q12-9 (CLS) - Q12-2 (E)	W - W-B	Sliding roof motor closed	CLOSE switch ON	Below 1 ohms
Q12-10 (UP) - Q12-2 (E)	BR - W-B	Sliding roof motor up	UP switch OFF	10 kohms or higher
Q12-10 (UP) - Q12-2 (E)	BR - W-B	Sliding roof motor up	UP switch ON	Below 1 ohms
Q12-8 (DWN) - Q12-2 (E)	P - W-B	Sliding roof motor down	DOWN switch OFF	10 kohms or higher
Q12-8 (DWN) - Q12-2 (E)	P - W-B	Sliding roof motor down	DOWN switch ON	Below 1 ohms
Q12-2 (E) - Body ground	W-B - Body ground	Ground	Always	Below 1 ohms

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

- c. Reconnect the Q12 ECU connector.
- d. Measure the voltage according to the value (s) in the table below.

TERMINAL DESCRIPTION SPECIFIED CONDITION CHART

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
Q12-7 (OPN) - Q12-2 (E)	V - W-B	Sliding roof motor open	Ignition switch on (IG), sliding roof closed, OPEN switch OFF	Below 1 V
Q12-7 (OPN) - Q12-2 (E)	V - W-B	Sliding roof motor open	Ignition switch on (IG), sliding roof closed, OPEN switch ON	10 to 14 V
Q12-9 (CLS) - Q12-2 (E)	W - W-B	Sliding roof motor closed	Ignition switch on (IG), sliding roof open, CLOSE switch OFF	Below 1 V
Q12-9 (CLS) - Q12-2 (E)	W - W-B	Sliding roof motor closed	Ignition switch on (IG), sliding roof open, CLOSE switch ON	10 to 14 V
Q12-10 (UP) - Q12-2 (E)	BR - W-B	Sliding roof motor up	Ignition switch on (IG), sliding roof tilted downward, UP switch OFF	Below 1 V
Q12-10 (UP) - Q12-2 (E)	BR - W-B	Sliding roof motor up	Ignition switch on (IG), sliding roof tilted downward, UP switch ON	10 to 14 V
Q12-8 (DWN) - Q12-2 (E)	P - W-B	Sliding roof motor down	Ignition switch on (IG), sliding roof tilted upward, DOWN switch OFF	Below 1 V
Q12-8 (DWN) - Q12-2 (E)	P - W-B	Sliding roof motor down	Ignition switch on (IG), sliding roof tilted upward, DOWN switch ON	10 to 14 V

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If the result is not as specified, the ECU may have a malfunction.

DIAGNOSIS SYSTEM**1. DESCRIPTION**

- a. The sliding roof control ECU controls the vehicle's sliding roof system functions, sliding roof system data and Diagnostic Trouble Code (DTC) can be read through the vehicle's Data Link Connector 3 (DLC3).

When the system seems to be malfunctioning, use Techstream to check for malfunctions and perform repairs.

2. CHECK DLC3

- a. Check the DLC3 (See **DTC CHECK/CLEAR**).

3. INSPECT BATTERY VOLTAGE

- a. Measure the battery voltage.

Standard voltage:

11 to 14 V

If the voltage is below 11V, recharge or replace the battery before proceeding to the next step.

DTC CHECK/CLEAR**1. CHECK DTC**

- a. Connect Techstream to the DLC3.
- b. Turn the ignition switch on (IG).
- c. Read the DTCs by following the directions on the tester screen.

HINT:

Refer to the Techstream operator's manual for further details.

2. CLEAR DTC

- a. Connect Techstream to the DLC3.
- b. Turn the ignition switch on (IG).
- c. Erase the DTCs by following the directions on the tester screen.

HINT:

Refer to the Techstream operator's manual for further details.

DATA LIST/ACTIVE TEST

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1. READ DATA LIST

HINT:

Using the Techstream's Data List allows switch, sensor, actuator and other item values to be read without removing any parts. Reading the Data List early in troubleshooting is one way to save time.

- a. Connect Techstream to the DLC3.
- b. Turn the ignition switch on (IG).
- c. Read the Data List according to the display on the tester.

Slide roof:

TESTER DISPLAY NORMAL CONDITION CHART

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Open Switch	Slide switch open signal/ON or OFF	ON: OPEN switch is pressed. OFF: OPEN switch is not pressed.	-
Close Switch	Slide switch close signal/ON or OFF	ON: CLOSE switch is pressed. OFF: CLOSE switch is not pressed.	-
Up Switch	Tilt switch up signal/ON or OFF	ON: UP switch is pressed. OFF: UP switch is not pressed.	-
Down Switch	Tilt switch down signal/ON or OFF	ON: DOWN switch is pressed. OFF: DOWN switch is not pressed.	-
Hall IC1 Pulse	Sliding roof operation signal/LO or HI	LO: Sliding roof motor is not operating. HI: Sliding roof motor is operating.	-
Hall IC1 Status	Sliding roof operation signal/NORMAL or LOCK	NORMAL: Sliding roof motor is operating. LOCK: Sliding roof motor is not operating.	-
Hall IC2 Pulse	Sliding roof operation signal/LO or HI	LO: Sliding roof motor is not operating. HI: Sliding roof motor is operating.	-
Hall IC2 Status	Sliding roof operation signal/NORMAL or LOCK	NORMAL: Sliding roof motor is operating. LOCK: Sliding roof motor is not operating.	-
Ignition (Direct Signal)	Ignition switch signal/ON or OFF	ON: Ignition switch on (IG) OFF: Ignition switch off	-

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Ignition (MPX)	Ignition switch signal (MPX signal)/ON or OFF	ON: Ignition switch on (IG) OFF: Ignition switch off	-
Door Courtesy	Driver's door courtesy light switch signal/ON or OFF	ON: Driver's side door is open. OFF: Driver's side door is closed.	-
Key Off Permission	Key-OFF sliding roof operation permit signal (Current)/ON or OFF	ON: Driver's side door is not closed within 45 sec. after ignition switch is turned off. OFF: Any status except "ON" status	-
Open Switch Failure (Past)	Open switch failure signal (Past)/ Fail or Not Fail	Fail: Sliding roof open signal failure (Past) Not Fail: Sliding roof open signal not fail (Past)	-
Close Switch Failure (Past)	Close switch failure signal (Past)/ Fail or Not Fail	Fail: Sliding roof close signal failure (Past) Not Fail: Sliding roof close signal not fail (Past)	-
Up Switch Failure (Past)	Up switch failure signal (Past)/ Fail or Not Fail	Fail: Sliding roof tilt up signal failure (Past) Not Fail: Sliding roof tilt up signal not fail (Past)	-
Down Switch Failure (Past)	Down switch failure signal (Past)/ Fail or Not Fail	Fail: Sliding roof tilt down signal failure (Past) Not Fail: Sliding roof tilt down signal not fail (Past)	-
Open Switch Failure (Current)	Open switch failure signal (Current)/Fail or Not Fail	Fail: Sliding roof open signal failure (Current) Not Fail: Sliding roof open signal not fail (Current)	-
Close Switch Failure (Current)	Close switch failure signal (Current)/Fail or Not Fail	Fail: Sliding roof close signal failure (Current) Not Fail: Sliding roof close signal not fail (Current)	-
Up Switch Failure (Current)	Up switch failure signal (Current)/ Fail or Not Fail	Fail: Sliding roof tilt up signal failure (Current) Not Fail: Sliding roof tilt up signal not fail (Current)	-
Down Switch Failure (Current)	Down switch failure signal (Current)/Fail or Not Fail	Fail: Sliding roof tilt down signal failure (Current) Not Fail: Sliding roof tilt down signal not fail (Current)	-
Number of Trouble code	Number of trouble code	Number of trouble code	-

2. PERFORM ACTIVE TEST

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HINT:

Performing Techstream's Active Test allows relay, VSV, actuator and other items to be operated without removing any parts. Performing the Active Test early in troubleshooting is one way to save time. The Data List can be displayed during the Active Test.

- a. Connect Techstream to the DLC3.
- b. Turn the ignition switch on (IG).
- c. Perform the Active Test according to the display on the tester.

Slide Roof:

TESTER DISPLAY CONTROL RANGE CHART

Tester Display	Test Part	Control Range	Diagnostic Note
Slide Roof	Operate sliding roof SLIDE CLOSE/TILT UP	Clos/Up: Sliding roof SLIDE CLOSE or TILT UP operation occurs. OFF: Sliding roof is not operating	-
Slide Roof	Operate sliding roof SLIDE OPEN/TILT DOWN	Opn/Dwn: Sliding roof SLIDE OPEN or TILT DOWN operation occurs OFF: Sliding roof is not operating	-

DIAGNOSTIC TROUBLE CODE CHART

If any trouble code is displayed during DTC check, check the circuit corresponding to the code in the table below. Proceed to the page given for the circuit.

Sliding Roof System

DIAGNOSTIC TROUBLE CODE CHART - SLIDING ROOF SYSTEM

DTC Code	Detection Item	Trouble Area
<u>B2341</u>	Sensor (Motor) Failure	1. Sliding roof drive gear sub-assembly (Sliding roof control ECU) 2. Roof console box assembly (Sliding roof switch assembly) 3. Wire harness
<u>B2342</u>	Switch Failure	1. Sliding roof drive gear sub-assembly (Sliding roof control ECU) 2. Roof console box assembly (Sliding roof switch assembly)

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		3. Wire harness
<u>B2343</u>	Position Initialization Incomplete	1. Sliding roof drive gear sub-assembly (Sliding roof control ECU) 2. Roof console box assembly (Sliding roof switch assembly) 3. Wire harness
<u>B2344</u>	Position Failure	1. Sliding roof drive gear sub-assembly (Sliding roof control ECU) 2. Roof console box assembly (Sliding roof switch assembly) 3. Wire harness

ON-VEHICLE INSPECTION**1. CHECK AUTO OPERATION**

- Turn the ignition switch on (IG).
- When the roof glass is fully closed, press the OPEN switch for 0.3 seconds or more. Check that the roof glass automatically slides until it is fully opened.
- When the roof glass is fully closed, press the UP switch for 0.3 seconds or more. Check that the roof glass automatically tilts until it is fully tilted upward.
- When the auto operation is operating, check that pressing any personal light switch stops the roof glass operation.

HINT:

When pressing the switch for 0.3 seconds or less, the roof glass moves but auto operation does not operate.

2. CHECK SLIDING ROOF OPERATION AFTER IGNITION SWITCH IS TURNED OFF

- Turn the ignition switch from on (IG) to off, and check that the sliding roof operates. Then open and close the driver's side door once, and check that the sliding roof does not operate.
- Turn the ignition switch from on (IG) to off and wait for approximately 43 seconds. Check that the sliding roof does not operate.
- Operate the auto (SLIDE OPEN or TILT UP) operation. While the roof glass is in motion, turn the ignition switch from on (IG) to off.

3. CHECK CHECK JAM PROTECTION FUNCTION CAUTION

CAUTION: • Do not use a part of your body, for example, your hand, to

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check the jam protection.

- Do not allow anything to become caught in the sliding roof by accident in this procedure.
- Perform the inspection from the inside of the vehicle.

NOTE:

- Do not use hard objects such as a hammer, to avoid damage to the roof.
 - If the jam protection does not operate, reset the sliding roof drive gear sub-assembly (motor).
- a. When the sliding roof operation is operating and an object is caught between the vehicle body and glass, check that the roof glass opens 218 mm (8.58 in.) from the point of contact with the object, or opens fully if there is not an opening distance of 218 mm (8.58 in.).

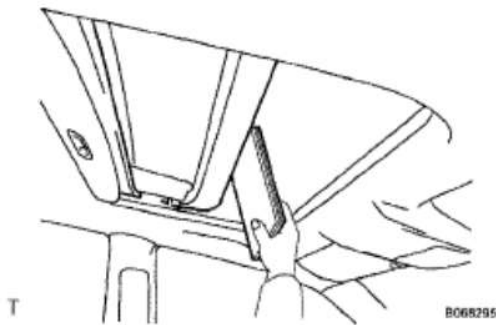


Fig. 4: Checking Jam Protection Function

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. When the TILT UP/DOWN function is operating, and an object is caught between the vehicle body and the roof glass, check that the sliding roof tilts up fully.

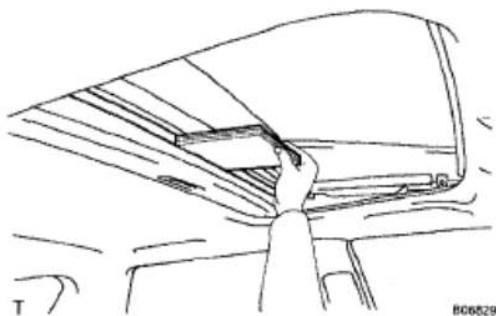


Fig. 5: Checking TILT UP/DOWN Function

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DTC B2341 SENSOR (MOTOR) FAILURE; DTC B2344 POSITION FAILURE

DESCRIPTION

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When the sliding roof drive gear sub-assembly (sliding roof control ECU) detects malfunctions in the motor, and the sliding roof operation is stopped, DTC B2341 is output. When the sliding roof drive gear sub-assembly (sliding roof control ECU) detects malfunctions in the gear, and the sliding roof operation is stopped, DTC B2344 is output.

DTC DETECTION CONDITION CHART

DTC No.	DTC Detection Condition	Trouble Area
B2341	Sensor (motor) failure	- Sliding roof drive gear sub-assembly (sliding roof control ECU) - Roof console box assembly (sliding roof switch assembly) - Wire harness
B2344	Position failure	- Sliding roof drive gear sub-assembly (sliding roof control ECU) - Roof console box assembly (sliding roof switch assembly) - Wire harness

WIRING DIAGRAM

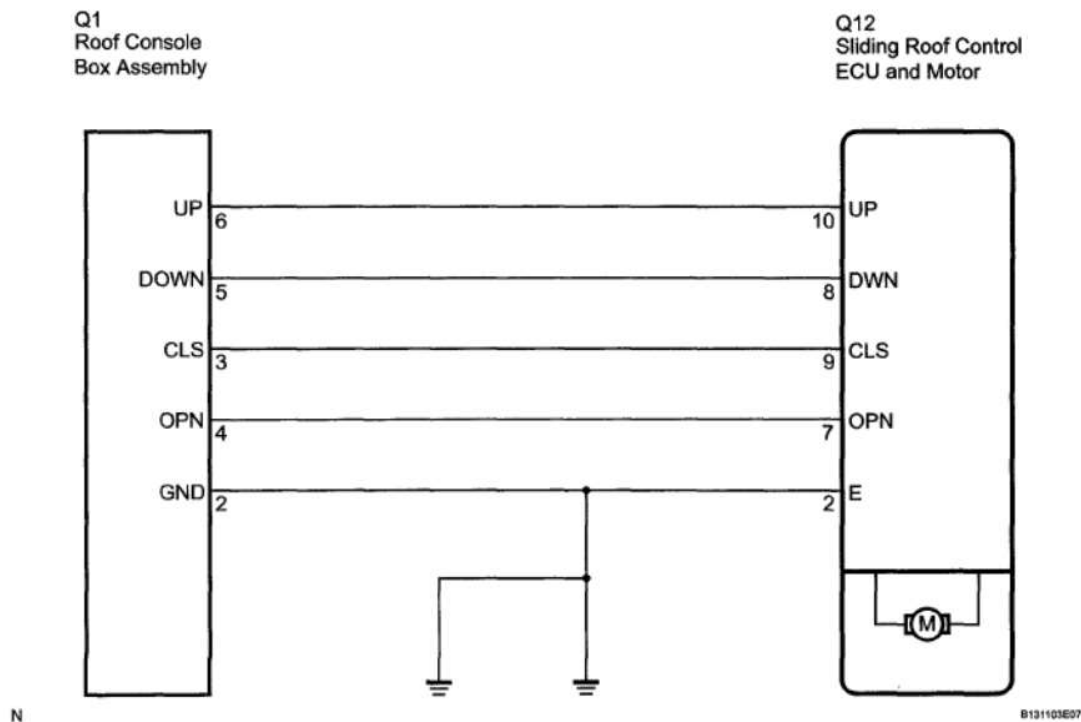


Fig. 6: Sensor (Motor) Failure - Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

2009 Toyota Highlander Limited**2009 ACCESSORIES & EQUIPMENT Sliding Roof - Highlander****1. CHECK SLIDING ROOF FUNCTION**

- a. Check the auto operation with the OPEN and UP switches (See **DIAGNOSTIC TROUBLE CODE CHART**).

OK:

Auto operation operates normally with OPEN and UP switches.

NG: Go to step 3

OK: Go to next step

2. RECHECK FOR DTC

- a. Delete the DTCs (See **DTC CHECK/CLEAR**).
- b. Recheck for DTCs (See **DTC CHECK/CLEAR**).

HINT:

If DTCs are detected frequently, replace the ECU.

OK:

DTC is not output.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See **REMOVAL)**

OK: END

3. INITIALIZE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU)

- a. Check that the sliding roof drive gear sub-assembly (sliding roof control ECU) can be initialized (See **INITIALIZATION**).

OK:

Sliding roof drive gear sub-assembly (sliding roof control ECU) can be initialized.

NG: Go to step 6

OK: Go to next step

4. CHECK SLIDING ROOF FUNCTION

- a. Check the auto operation with the OPEN and UP switches (See **DIAGNOSTIC TROUBLE CODE CHART**).

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OK:

Auto operation operates normally with OPEN and UP switches.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)

OK: Go to next step

5. RECHECK FOR DTC

- a. Delete the DTCs (See DTC CHECK/CLEAR).
- b. Recheck for DTCs (See DTC CHECK/CLEAR).

HINT:

If DTCs are detected frequently, replace the ECU.

OK:

DTC is not output.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)

OK: END

6. INSPECT ROOF CONSOLE BOX ASSEMBLY (SLIDING ROOF SWITCH ASSEMBLY)

- a. Remove the roof console box assembly.
- b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

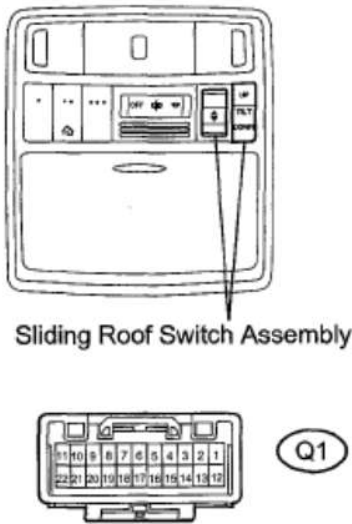
Tester Connection	Switch Condition	Specified Condition
Q1-3 (CLS) - Q1-2 (GND)	CLOSE	Below 100 ohms
Q1-4 (OPN) - Q1-2 (GND)	OPEN	Below 100 ohms
Q1-5 (DOWN) - Q1-2 (GND)	DOWN	Below 100 ohms
Q1-6 (UP) - Q1-2 (GND)	UP	Below 100 ohms
Q1-3 (CLS) - Q1-2 (GND)	OPEN	1 kohms or higher
Q1-4 (OPN) - Q1-2 (GND)	CLOSE	1 kohms or higher
Q1-5 (DOWN) - Q1-2 (GND)	UP	1 kohms or higher
Q1-6 (UP) - Q1-2 (GND)	DOWN	1 kohms or higher

NG: REPLACE ROOF CONSOLE BOX ASSEMBLY (SLIDING ROOF SWITCH ASSEMBLY) (See REMOVAL)

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Component without harness connected:
(Roof Console Box Assembly)



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Fig. 7: Identifying Roof Console Box Assembly Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

7. **CHECK WIRE HARNESS (SLIDING ROOF CONTROL ECU - ROOF CONSOLE BOX ASSEMBLY)**
- a. Disconnect the Q12 and Q1 connectors.
 - b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

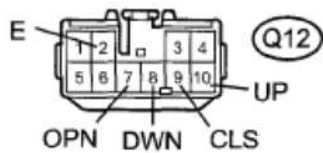
Tester Connection	Condition	Specified Condition
Q12-2 (E) - Q1-2 (GND)	Always	Below 1 ohms
Q12-7 (OPN) - Q1-4 (OPN)	Always	Below 1 ohms
Q12-8 (DWN) - Q1-5 (DOWN)	Always	Below 1 ohms
Q12-9 (CLS) - Q1-3 (CLS)	Always	Below 1 ohms
Q12-10 (UP) - Q1-6 (UP)	Always	Below 1 ohms
Q1-3 (CLS) - Body ground	Always	10 kohms or higher
Q1-4 (OPN) - Body ground	Always	10 kohms or higher
Q1-2 (GND) - Body ground	Always	Below 1 ohms
Q1-5 (DOWN) - Body ground	Always	10 kohms or higher
Q1-6 (UP) - Body ground	Always	10 kohms or higher

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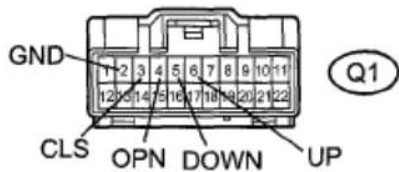
2009 ACCESSORIES & EQUIPMENT Sliding Roof - Highlander

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

Front view of wire harness connector:
(to Sliding Roof Control ECU)



Front view of wire harness connector:
(to Roof Console Box Assembly)



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Fig. 8: Identifying Sliding Roof Control ECU And Roof Console Box Assembly Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See **REMOVAL**)

DTC B2342 SWITCH FAILURE

DESCRIPTION

This DTC is output when the sliding roof drive gear sub-assembly (sliding roof control ECU) detects that the OPEN, CLOSE, UP or DOWN switch in the roof console box assembly (sliding roof switch assembly) is stuck for 30 seconds or more.

DTC DETECTION CONDITION CHART

DTC No.	DTC Detection Condition	Trouble Area
B2342	Sliding roof drive gear sub-assembly (sliding roof control ECU) detects OPEN, CLOSE, UP or DOWN switch in roof console box assembly (sliding roof switch assembly) is stuck for 30 seconds or more	- Sliding roof drive gear sub-assembly (sliding roof control ECU) - Roof console box assembly (sliding roof switch assembly)

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- Wire harness

WIRING DIAGRAM

Refer to **DTC B2341** .

INSPECTION PROCEDURE

1. READ VALUE USING TECHSTREAM (SLIDE OPEN AND TILT UP SWITCH)

- a. Use the DATA LIST to check if the sliding roof switch assembly is functioning properly.

Slide Roof

TESTER DISPLAY NORMAL CONDITION CHART

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Open Switch	Slide switch open signal/ON or OFF	ON: OPEN switch is pressed. OFF: OPEN switch is not pressed.	-
Close Switch	Slide switch close signal/ON or OFF	ON: CLOSE switch is pressed. OFF: CLOSE switch is not pressed.	-
Up Switch	Tilt switch up signal/ON or OFF	ON: UP switch is pressed. OFF: UP switch is not pressed.	-
Down Switch	Tilt switch down signal/ON or OFF	ON: DOWN switch is pressed. OFF: DOWN switch is not pressed.	-

OK:

Techstream displays as shown in the table according to the operation of each switch.

NG: Go to step 4

OK: Go to next step

2. CHECK SLIDING ROOF FUNCTION

- a. Check the auto operation with the OPEN and UP switches (See **DIAGNOSTIC TROUBLE CODE CHART**).

OK:

Auto operation operates normally with OPEN and UP switches.

NG: Go to step 8

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OK: Go to next step

3. RECHECK FOR DTC

- a. Delete the DTCs (See **DTC CHECK/CLEAR**).
- b. Recheck for DTCs (See **DTC CHECK/CLEAR**).

HINT:

If DTCs are detected frequently, replace the ECU.

OK:

DTC is not output.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See **REMOVAL**)

OK: END

4. INSPECT ROOF CONSOLE BOX ASSEMBLY (SLIDING ROOF SWITCH ASSEMBLY)

- a. Remove the roof console box assembly.
- b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

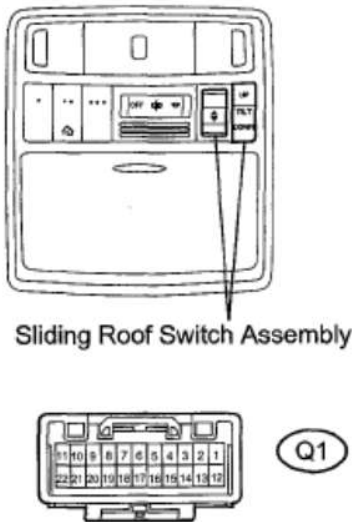
Tester Connection	Switch Condition	Specified Condition
Q1-3 (CLS) - Q1-2 (GND)	CLOSE	Below 100 ohms
Q1-4 (OPN) - Q1-2 (GND)	OPEN	Below 100 ohms
Q1-5 (DOWN) - Q1-2 (GND)	DOWN	Below 100 ohms
Q1-6 (UP) - Q1-2 (GND)	UP	Below 100 ohms
Q1-3 (CLS) - Q1-2 (GND)	OPEN	1 kohms or higher
Q1-4 (OPN) - Q1-2 (GND)	CLOSE	1 kohms or higher
Q1-5 (DOWN) - Q1-2 (GND)	UP	1 kohms or higher
Q1-6 (UP) - Q1-2 (GND)	DOWN	1 kohms or higher

NG: Go to step 6

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Component without harness connected:
(Roof Console Box Assembly)



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Fig. 9: Identifying Roof Console Box Assembly Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

5. **CHECK WIRE HARNESS (SLIDING ROOF CONTROL ECU - ROOF CONSOLE BOX ASSEMBLY)**
- a. Disconnect the Q12 and Q1 connectors.
 - b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

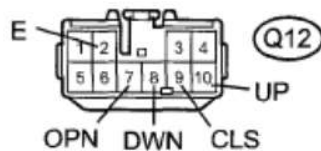
Tester Connection	Condition	Specified Condition
Q12-2 (E) - Q1-2 (GND)	Always	Below 1 ohms
Q12-7 (OPN) - Q1-4 (OPN)	Always	Below 1 ohms
Q12-8 (DWN) - Q1-5 (DOWN)	Always	Below 1 ohms
Q12-9 (CLS) - Q1-3 (CLS)	Always	Below 1 ohms
Q12-10 (UP) - Q1-6 (UP)	Always	Below 1 ohms
Q1-3 (CLS) - Body ground	Always	10 kohms or higher
Q1-4 (OPN) - Body ground	Always	10 kohms or higher
Q1-2 (GND) - Body ground	Always	Below 1 ohms
Q1-5 (DOWN) - Body ground	Always	10 kohms or higher
Q1-6 (UP) - Body ground	Always	10 kohms or higher

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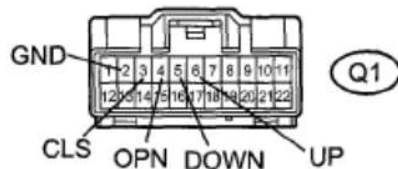
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NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

Front view of wire harness connector:
(to Sliding Roof Control ECU)



Front view of wire harness connector:
(to Roof Console Box Assembly)



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Fig. 10: Identifying Sliding Roof Control ECU And Roof Console Box Assembly Connector Terminals

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)

6. REPLACE ROOF CONSOLE BOX ASSEMBLY (SLIDING ROOF SWITCH ASSEMBLY)

- Temporarily replace the roof console box assembly (sliding roof switch assembly) with a new one or normally functioning one (See DIAGNOSTIC TROUBLE CODE CHART).
- Perform the initialization (See INITIALIZATION)

7. RECHECK FOR DTC

- Delete the DTCs (See DTC CHECK/CLEAR).
- Recheck for DTCs (See DTC CHECK/CLEAR).

HINT:

If DTCs are detected frequently, replace the ECU.

OK:

DTC is not output.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF

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CONTROL ECU) (See REMOVAL)

OK: END

8. INITIALIZE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU)

- a. Check that the sliding roof drive gear sub-assembly (sliding roof control ECU) can be initialized (See INITIALIZATION).

OK:

Sliding roof drive gear sub-assembly (sliding roof control ECU) can be initialized.

NG: Go to step 11

OK: Go to next step

9. CHECK SLIDING ROOF FUNCTION

- a. Check the auto operation with the OPEN and UP switches (See DIAGNOSTIC TROUBLE CODE CHART).

OK:

Auto operation operates normally with OPEN and UP switches.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)

OK: Go to next step

10. RECHECK FOR DTC

- a. Delete the DTCs (See DTC CHECK/CLEAR).
- b. Recheck for DTCs (See DTC CHECK/CLEAR).

HINT:

If DTCs are detected frequently, replace the ECU.

OK:

DTC is not output.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)

OK: END

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11. CHECK WIRE HARNESS (SLIDING ROOF CONTROL ECU - ROOF CONSOLE BOX ASSEMBLY)

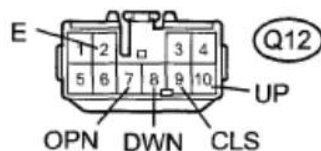
- a. Disconnect the Q12 and Q1 connectors.
- b. Measure the resistance according to the value (s) in the table below.

Standard resistance

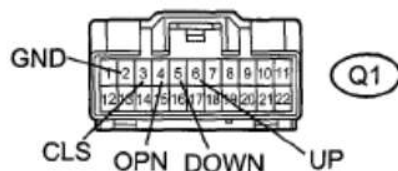
TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
Q12-2 (E) - Q1-2 (GND)	Always	Below 1 ohms
Q12-7 (OPN) - Q1-4 (OPN)	Always	Below 1 ohms
Q12-8 (DWN) - Q1-5 (DOWN)	Always	Below 1 ohms
Q12-9 (CLS) - Q1-3 (CLS)	Always	Below 1 ohms
Q12-10 (UP) - Q1-6 (UP)	Always	Below 1 ohms
Q1-3 (CLS) - Body ground	Always	10 kohms or higher
Q1-4 (OPN) - Body ground	Always	10 kohms or higher
Q1-2 (GND) - Body ground	Always	Below 1 ohms
Q1-5 (DOWN) - Body ground	Always	10 kohms or higher
Q1-6 (UP) - Body ground	Always	10 kohms or higher

Front view of wire harness connector:
(to Sliding Roof Control ECU)



Front view of wire harness connector:
(to Roof Console Box Assembly)



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Fig. 11: Identifying Sliding Roof Control ECU And Roof Console Box Assembly Connector Terminals

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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NG: REPAIR OR REPLACE HARNESS OR CONNECTOR**OK: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)****DTC B2343 POSITION INITIALIZATION INCOMPLETE****DESCRIPTION**

This DTC is output when the sliding roof drive gear sub-assembly (sliding roof control ECU) has not been initialized.

DTC DETECTION CONDITION CHART

DTC No.	DTC Detection Condition	Trouble Area
B2343	Sliding roof drive gear sub-assembly (sliding roof control ECU) has not been initialized	• Sliding roof drive gear sub-assembly (sliding roof control ECU) • Roof console box assembly (sliding roof switch assembly) • Wire harness

WIRING DIAGRAM

Refer to **DTC B2341** .

INSPECTION PROCEDURE**1. INITIALIZE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU)**

- a. Check that the sliding roof drive gear sub-assembly (sliding roof control ECU) can be initialized (See **INITIALIZATION**).

OK:**Sliding roof drive gear sub-assembly (sliding roof control ECU) can be initialized.****NG: Go to step 4****OK: Go to next step****2. CHECK SLIDING ROOF FUNCTION**

- a. Check the auto operation with the OPEN and UP switches (See **DIAGNOSTIC TROUBLE CODE CHART**).

OK:

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Auto operation operates normally with OPEN and UP switches.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)

OK: Go to next step

3. RECHECK FOR DTC

- a. Delete the DTCs (See DTC CHECK/CLEAR).
- b. Recheck for DTCs (See DTC CHECK/CLEAR).

HINT:

If DTCs are detected frequently, replace the ECU.

OK:

DTC is not output.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)

OK: END

4. INSPECT ROOF CONSOLE BOX ASSEMBLY (SLIDING ROOF SWITCH ASSEMBLY)

- a. Remove the roof console box assembly.
- b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

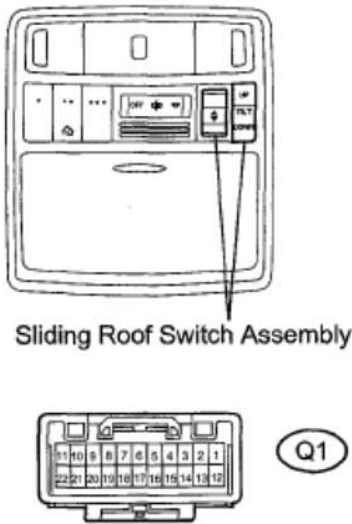
Tester Connection	Switch Position	Specified Condition
Q1-3 (CLS) - Q1-2 (GND)	CLOSE	Below 100 ohms
Q1-4 (OPN) - Q1-2 (GND)	OPEN	Below 100 ohms
Q1-5 (DOWN) - Q1-2 (GND)	DOWN	Below 100 ohms
Q1-6 (UP) - Q1-2 (GND)	UP	Below 100 ohms
Q1-3 (CLS) - Q1-2 (GND)	OPEN	1 kohms or higher
Q1-4 (OPN) - Q1-2 (GND)	CLOSE	1 kohms or higher
Q1-5 (DOWN) - Q1-2 (GND)	UP	1 kohms or higher
Q1-6 (UP) - Q1-2 (GND)	DOWN	1 kohms or higher

NG: REPLACE ROOF CONSOLE BOX ASSEMBLY (SLIDING ROOF SWITCH ASSEMBLY) (See REMOVAL)

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Component without harness connected:
(Roof Console Box Assembly)



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Fig. 12: Identifying Roof Console Box Assembly Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: SLIDING ROOF - SLIDING ROOF SYSTEM

5. **CHECK WIRE HARNESS (SLIDING ROOF CONTROL ECU - ROOF CONSOLE BOX ASSEMBLY)**
- a. Disconnect the Q12 and Q1 connectors.
 - b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

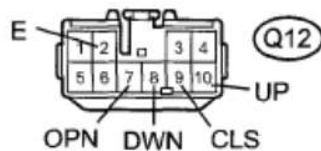
Tester Connection	Condition	Specified Condition
Q12-2 (E) - Q1-2 (GND)	Always	Below 1 ohms
Q12-7 (OPN) - Q1-4 (OPN)	Always	Below 1 ohms
Q.12-8 (DWN) - Q1-5 (DOWN)	Always	Below 1 ohms
Q12-9 (CLS) - Q1-3 (CLS)	Always	Below 1 ohms
Q12-10 (UP) - Q1-6 (UP)	Always	Below 1 ohms
Q1-3 (CLS) - Body ground	Always	10 kohms or higher
Q1-4 (OPN) - Body ground	Always	10 kohms or higher
Q1-2 (GND) - Body ground	Always	Below 1 ohms
Q1-5 (DOWN) - Body ground	Always	10 kohms or higher
Q1-6 (UP) - Body ground	Always	10 kohms or higher

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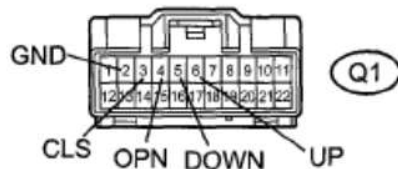
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NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

Front view of wire harness connector:
(to Sliding Roof Control ECU)



Front view of wire harness connector:
(to Roof Console Box Assembly)



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Fig. 13: Identifying Sliding Roof Control ECU And Roof Console Box Assembly Connector Terminals

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)

SLIDING ROOF DOES NOT MOVE BY OPERATING SLIDING ROOF CONTROL SWITCH

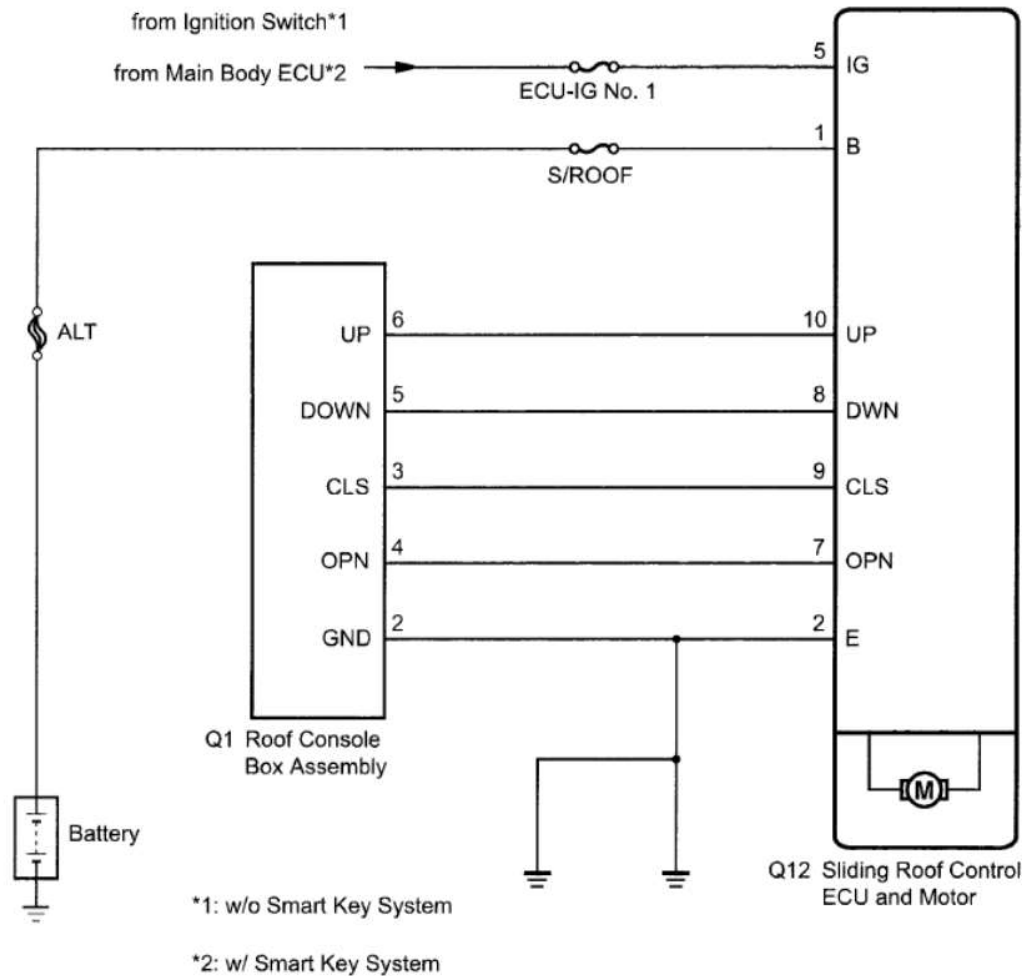
DESCRIPTION

The sliding roof system uses a LIN communication protocol on the multiplex communication system. Inspect the communication system by following **HOW TO PROCEED WITH TROUBLESHOOTING** to ensure that there are no problems with the multiplex communication system before troubleshooting the sliding roof system. The sliding roof system prohibits the AUTO UP function if the jam protection function malfunctions. Check that there are no DTCs output before troubleshooting the sliding roof system. If any sliding roof system DTCs are output, perform troubleshooting on the output DTCs first.

WIRING DIAGRAM

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B174032E04

Fig. 14: Sliding Roof Does Not Move By Operating Sliding Roof Control Switch - Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. INSPECT FUSE (ALT, S/ROOF, ECU-IG NO. 1)

- Remove the ALT fuse from the engine room main relay block.
- Remove the S/ROOF and ECU-IG No. 1 fuses from the instrument panel junction block.
- Measure the resistance of the fuses.

Standard resistance:

Below 1 ohms

NG: REPLACE FUSE

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OK: Go to next step

2. CHECK WIRE HARNESS (SLIDING ROOF CONTROL ECU - BATTERY AND BODY GROUND)

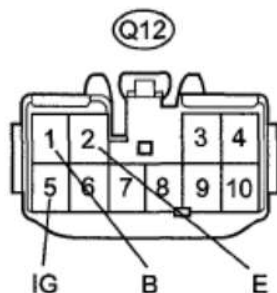
- a. Disconnect the Q12 connector.
- b. Measure the voltage and resistance according to the value (s) in the table below.

Standard voltage

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
Q12-1 (B) - Body ground	Always	10 to 14 V
Q12-5 (IG) - Body ground	Ignition switch on (IG)	10 to 14 V
Q12-5 (IG) - Body ground	Ignition switch off	Below 1 V

**Front view of wire harness connector:
(to Sliding Roof Control ECU)**



8130117E14

Fig. 15: Identifying Sliding Roof Control ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
Q12-2 (E) - Body ground	Always	Below 1 ohms

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

3. PERFORM ACTIVE TEST BY TECHSTREAM (SLIDING ROOF OPERATION)

- a. Select the ACTIVE TEST, use the Techstream to generate a control command, and then check that

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the sliding roof slides open/close and tilts up/down (See **DATA LIST/ACTIVE TEST**).

Slide Roof:

TESTER DISPLAY CONTROL RANGE CHART

Tester Display	Test Part	Control Range	Diagnostic Note
Slide Roof	Operate sliding roof SLIDE CLOSE/TILT UP	Clos/Up: Sliding roof SLIDE CLOSE or TILT UP operation occurs. OFF: Sliding roof Is not operating.	-
Slide Roof	Operate sliding roof SLIDE OPEN/TILT DOWN	Opn/Dwn: Sliding roof SLIDE OPEN or TILT DOWN operation occurs. OFF: Sliding roof is not operating.	-

OK:

Sliding roof operates normally.

NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See **REMOVAL**)

OK: Go to next step

4. READ VALUE USING TECHSTREAM (SLIDING ROOF CONTROL ECU)

- a. Use the DATA LIST to check if the sliding roof switch assembly is functioning properly (See **DATA LIST/ACTIVE TEST**).

Slide Roof:

TESTER DISPLAY NORMAL CONDITION CHART

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Hall IC1 Pulse	Sliding roof operation signal/LO or HI	LO: Sliding roof motor is not operating. HI: Sliding roof motor is operating.	-
Hall IC1 Status	Sliding roof operation signal/NORMAL or LOCK	NORMAL: Sliding roof motor is operating. LOCK: Sliding roof motor is not operating.	-
Hall IC2 Pulse	Sliding roof operation signal/LO or HI	LO: Sliding roof motor is not operating. HI: Sliding roof motor is operating.	-
Hall IC2	Sliding roof operation	NORMAL: Sliding roof motor is operating.	

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Status	signal/NORMAL or LOCK	LOCK: Sliding roof motor is not operating.	-
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NG: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See **REMOVAL**)

OK: Go to next step

5. READ VALUE USING TECHSTREAM (SLIDING ROOF SWITCH ASSEMBLY)

- a. Use the DATA LIST to check if the sliding roof switch assembly is functioning properly (See **DATA LIST/ACTIVE TEST**).

Slide Roof:

TESTER DISPLAY NORMAL CONDITION CHART

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Open Switch	Slide switch open signal/ON or OFF	ON: OPEN switch is pressed. OFF: OPEN switch is not pressed.	-
Close Switch	Slide switch close signal/ON or OFF	ON: CLOSE switch is pressed. OFF: CLOSE switch is not pressed.	-
Up Switch	Tilt switch up signal/ON or OFF	ON: UP switch is pressed. OFF: UP switch is not pressed.	-
Down Switch	Tilt switch down signal/ON or OFF	ON: DOWN switch is pressed. OFF: DOWN switch is not pressed.	-

OK:

Techstream displays as shown in the table according to the operation of each switch.

NG: Go to step 6

OK: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See **REMOVAL**)

6. INSPECT ROOF CONSOLE BOX ASSEMBLY (SLIDING ROOF SWITCH ASSEMBLY)

- a. Remove the roof console box assembly.
- b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

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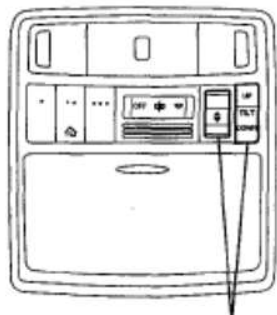
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Tester Connection	Switch Condition	Specified Condition
Q1-3 (CLS) - Q1-2 (GND)	CLOSE	Below 100 ohms
Q1-4 (OPN) - Q1-2 (GND)	OPEN	Below 100 ohms
Q1-5 (DOWN) - Q1-2 (GND)	DOWN	Below 100 ohms
Q1-6 (UP) - Q1-2 (GND)	UP	Below 100 ohms
Q1-3 (CLS) - Q1-2 (GND)	OPEN	1 kohms or higher
Q1-4 (OPN) - Q1-2 (GND)	CLOSE	1 kohms or higher
Q1-5 (DOWN) - Q1-2 (GND)	UP	1 kohms or higher
Q1-6 (UP) - Q1-2 (GND)	DOWN	1 kohms or higher

NG: REPLACE ROOF CONSOLE BOX ASSEMBLY (SLIDING ROOF SWITCH ASSEMBLY) (See **REMOVAL**)

Component without harness connected:
(Roof Console Box Assembly)



Sliding Roof Switch Assembly



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Fig. 16: Identifying Roof Console Box Assembly Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

7. CHECK WIRE HARNESS (SLIDING ROOF CONTROL ECU - ROOF CONSOLE BOX ASSEMBLY)

- a. Remove the Q12 and Q1 connectors.
- b. Measure the resistance according to the value (s) in the table below.

Standard resistance

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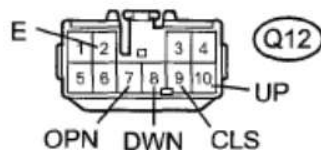
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TESTER CONNECTION SPECIFIED CONDITION CHART

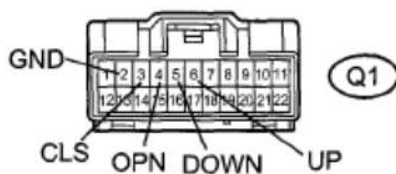
Tester Connection	Switch Condition	Specified Condition
Q12-2 (E) - Q1-2 (GND)	Always	Below 1 ohms
Q12-7 (OPN) - Q1-4 (OPN)	Always	Below 1 ohms
Q12-8 (DWN) - Q1-5 (DOWN)	Always	Below 1 ohms
Q12-9 (CLS) - Q1-3 (CLS)	Always	Below 1 ohms
Q12-10 (UP) - Q1-6 (UP)	Always	Below 1 ohms
Q1-3 (CLS) - Body ground	Always	10 kohms or higher
Q1-4 (OPN) - Body ground	Always	10 kohms or higher
Q1-2 (GND) - Body ground	Always	Below 1 ohms
Q1-5 (DOWN) - Body ground	Always	10 kohms or higher
Q1-6 (UP) - Body ground	Always	10 kohms or higher

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

Front view of wire harness connector:
(to Sliding Roof Control ECU)



Front view of wire harness connector:
(to Roof Console Box Assembly)



H

B174G31E02

Fig. 17: Identifying Sliding Roof Control ECU And Roof Console Box Assembly Connector Terminals

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF CONTROL ECU) (See REMOVAL)

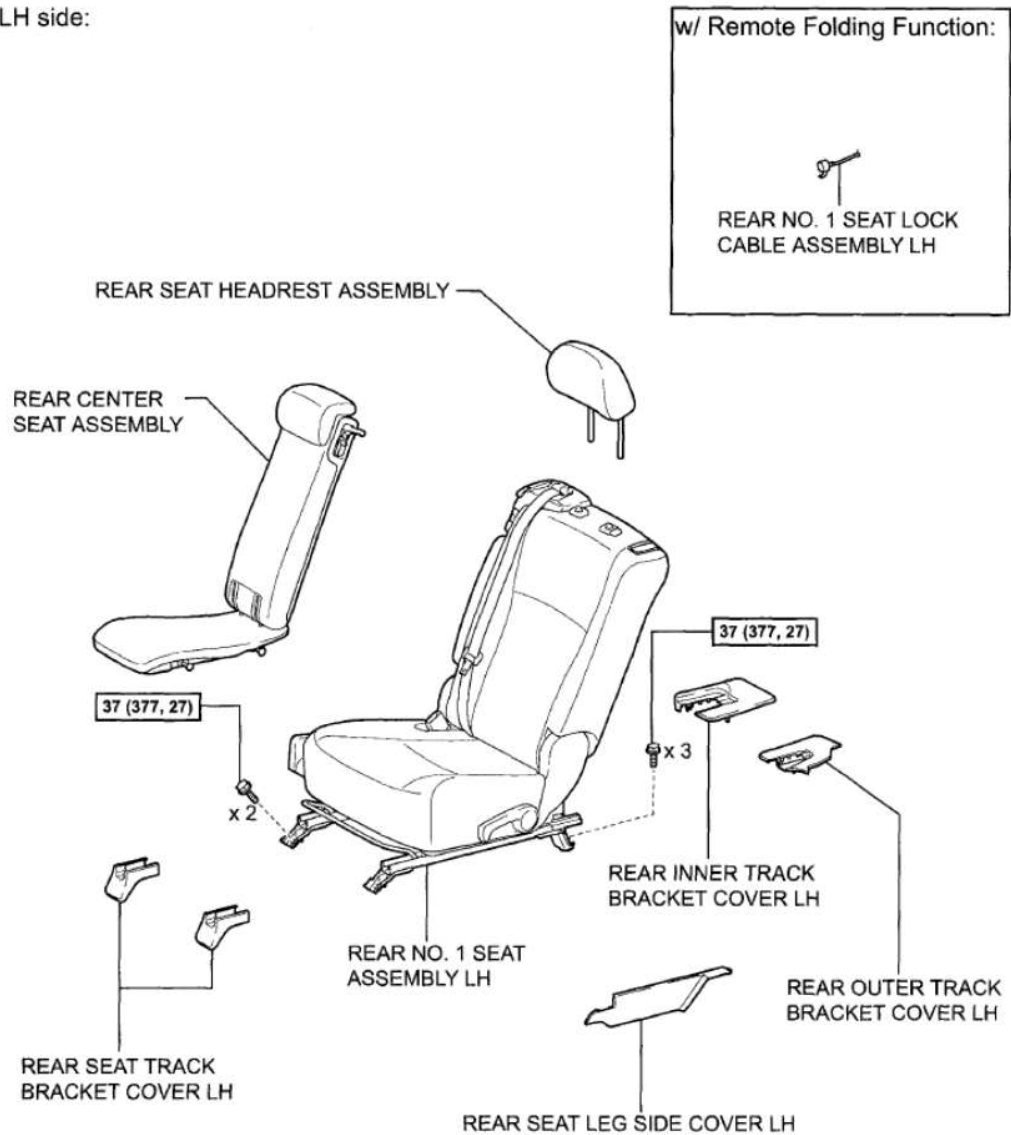
SLIDING ROOF HOUSING

COMPONENTS

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for LH side:



[N*m (kgf*cm, ft.*lbf)]: Specified torque

P B172866E04

Fig. 18: Identifying Sliding Roof Housing Components With Torque Specifications (1 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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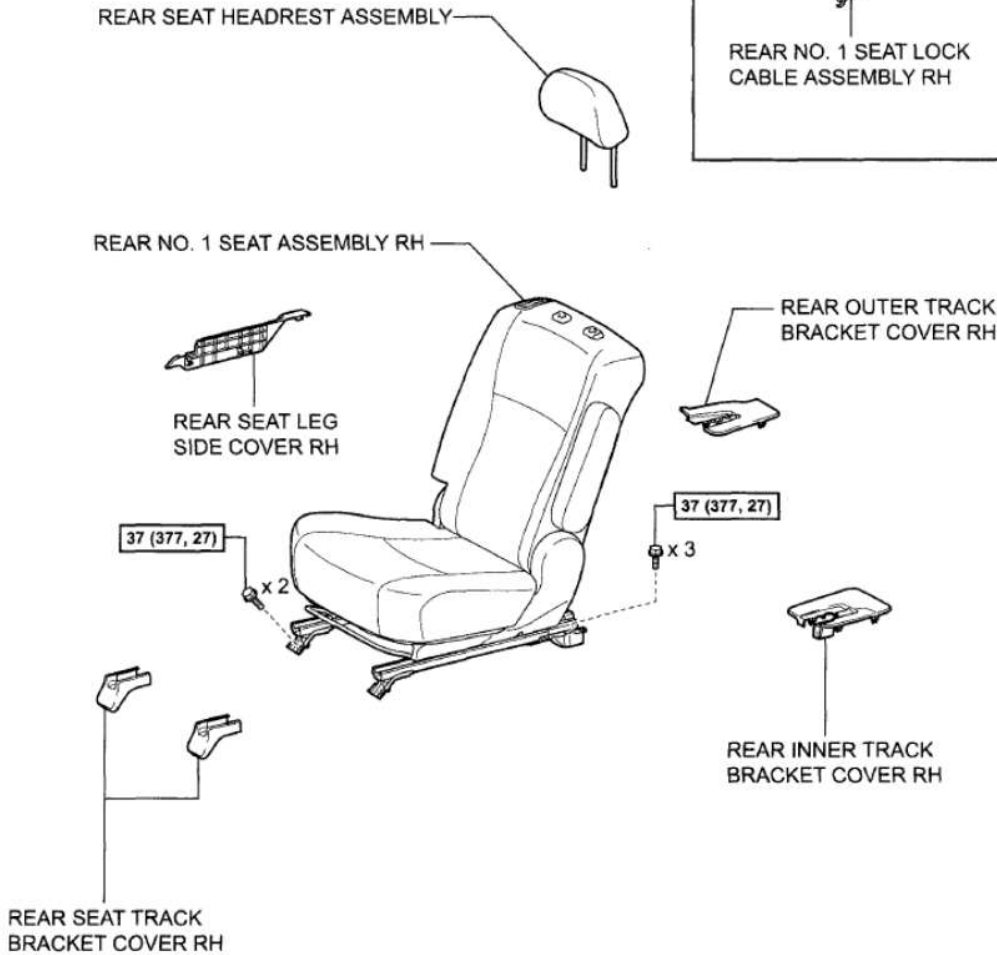
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for RH side:

w/ Remote Folding Function:



REAR NO. 1 SEAT LOCK
CABLE ASSEMBLY RH



N*m (kgf*cm, ft.*lbf): Specified torque

P B172889E03

Fig. 19: Identifying Sliding Roof Housing Components With Torque Specifications (2 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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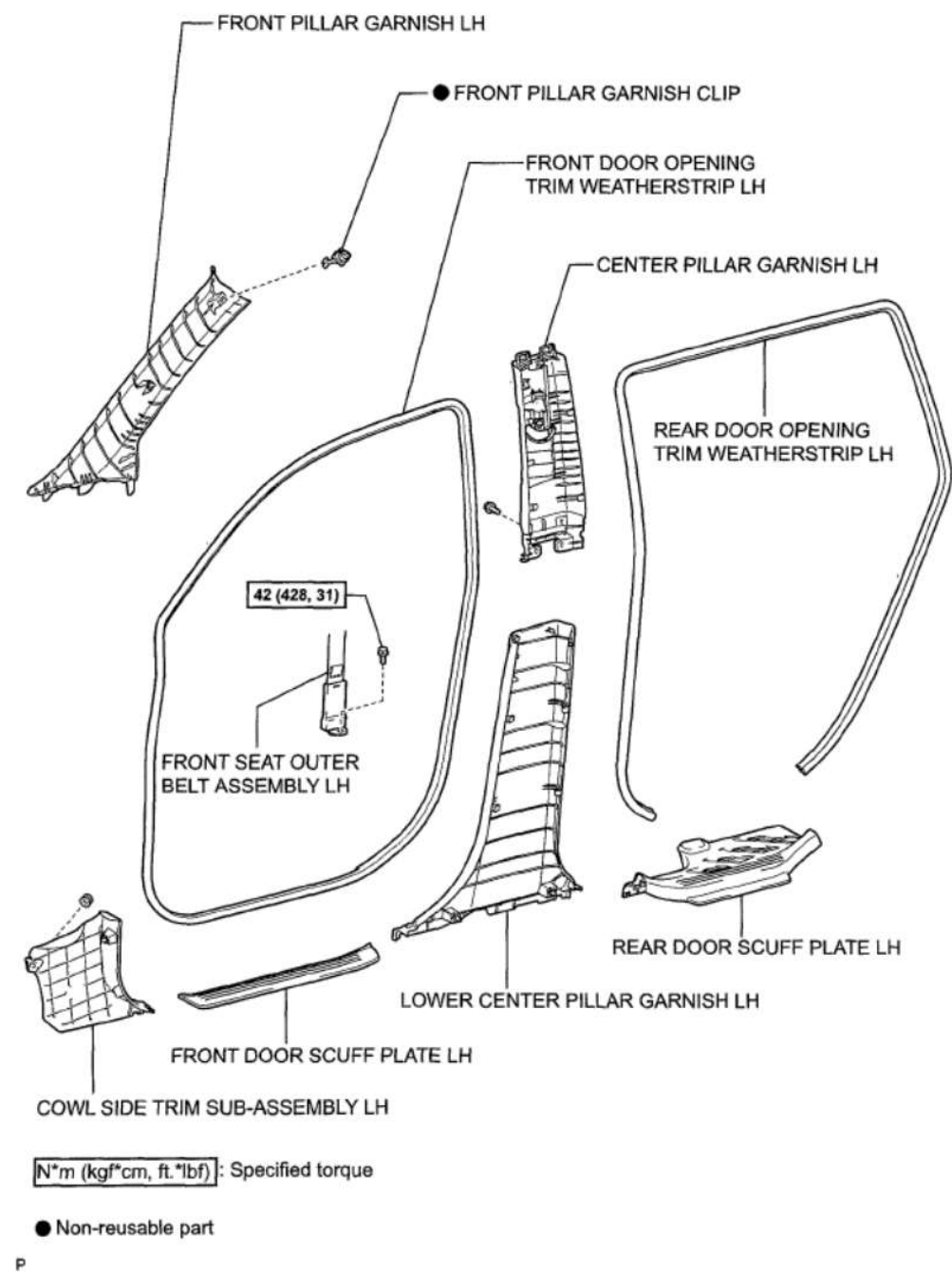


Fig. 20: Identifying Sliding Roof Housing Components With Torque Specifications (3 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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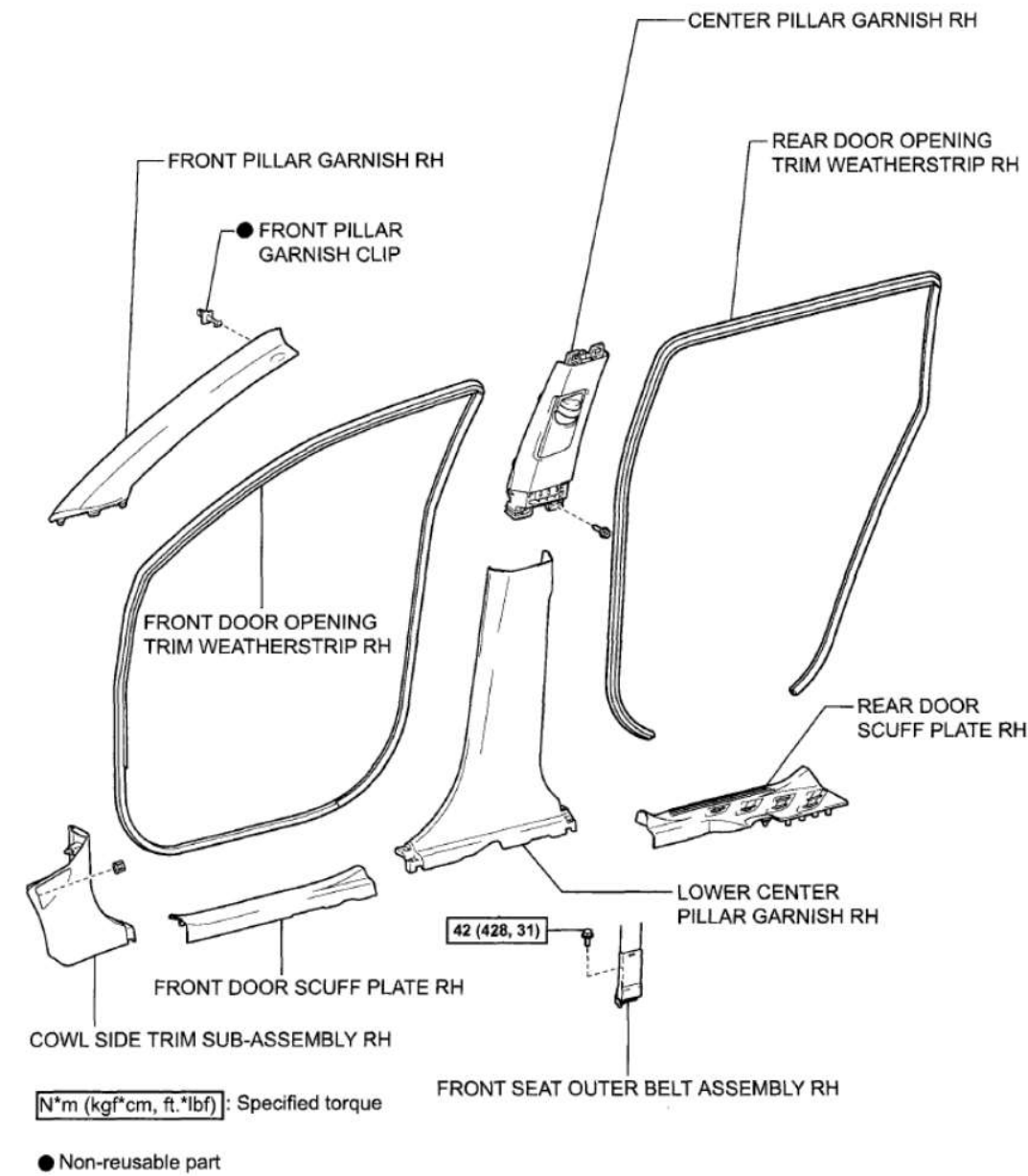
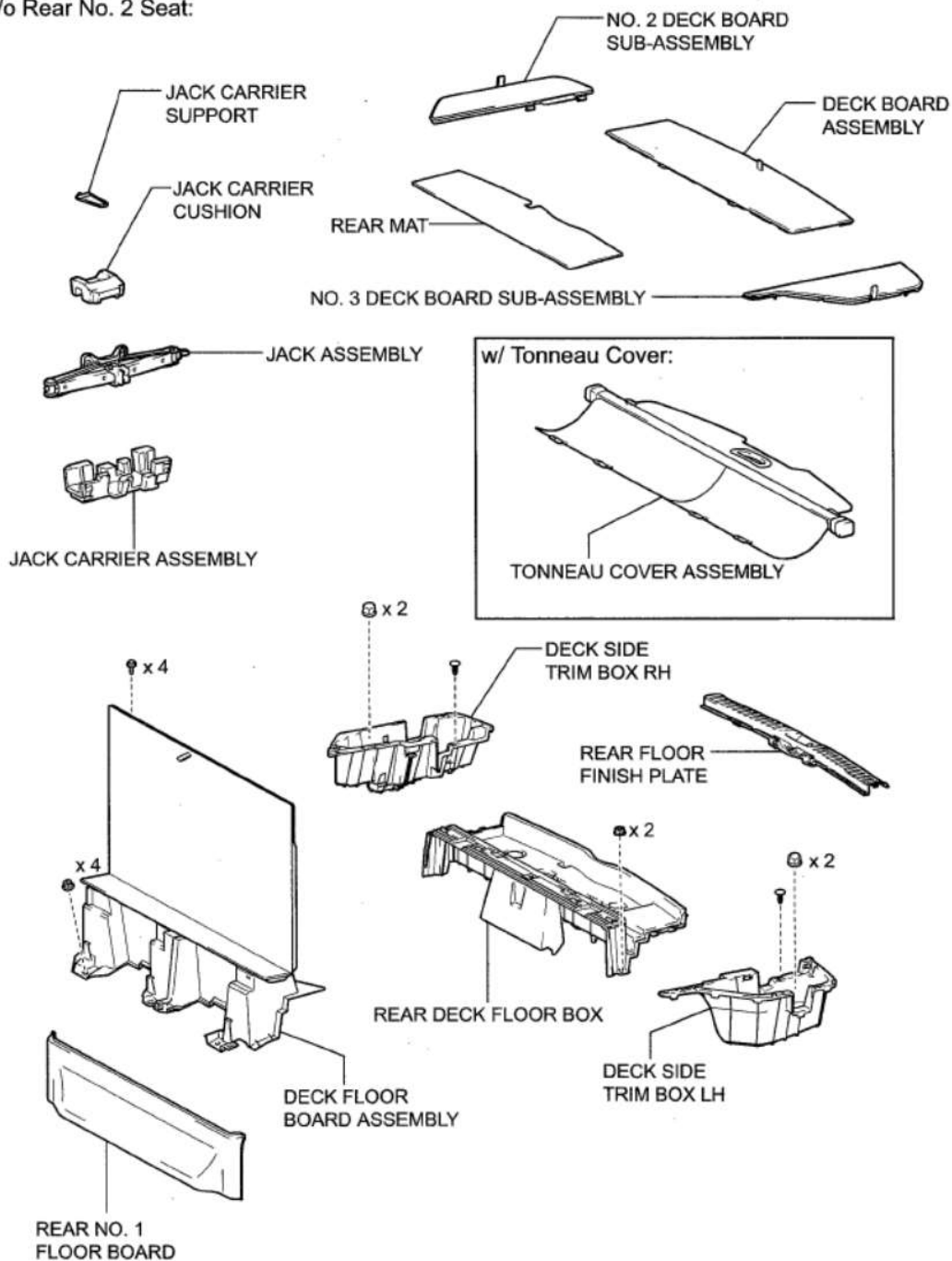


Fig. 21: Identifying Sliding Roof Housing Components With Torque Specifications (4 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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w/o Rear No. 2 Seat:



P

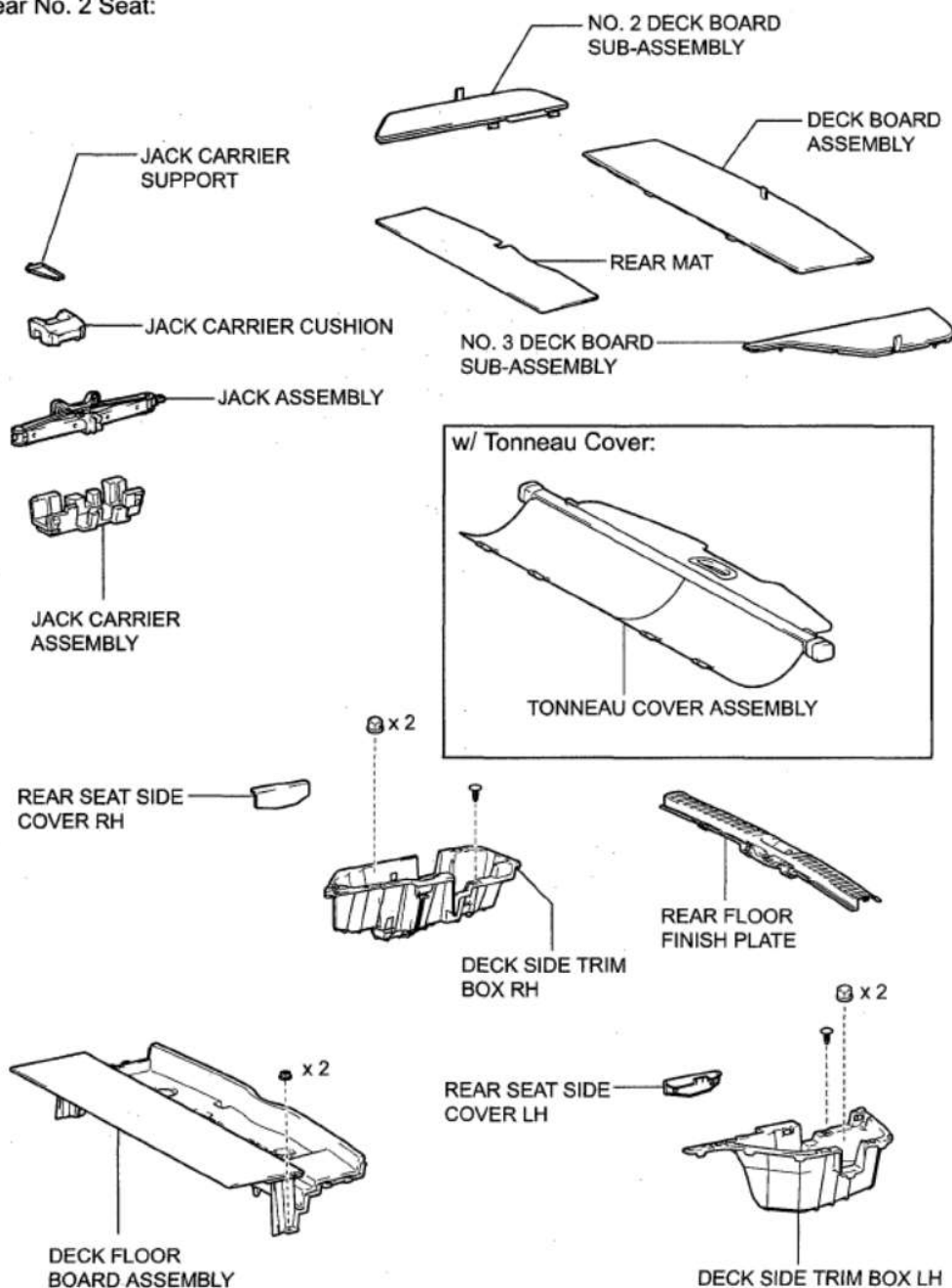
B178663E01

Fig. 22: Identifying Sliding Roof Housing Components With Torque Specifications (5 Of 15)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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w/ Rear No. 2 Seat:



P

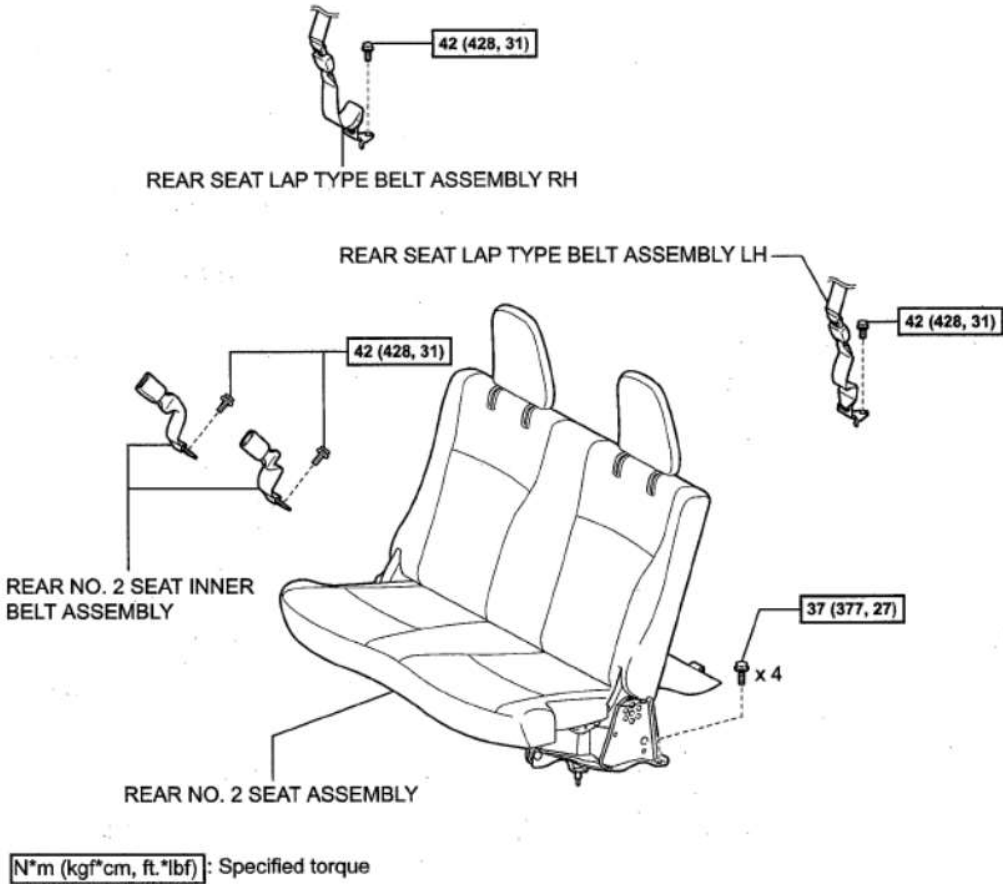
B178060E01

Fig. 23: Identifying Sliding Roof Housing Components With Torque Specifications (6 Of 15)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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w/ Rear No. 2 Seat:



P B170871E01

Fig. 24: Identifying Sliding Roof Housing Components With Torque Specifications (7 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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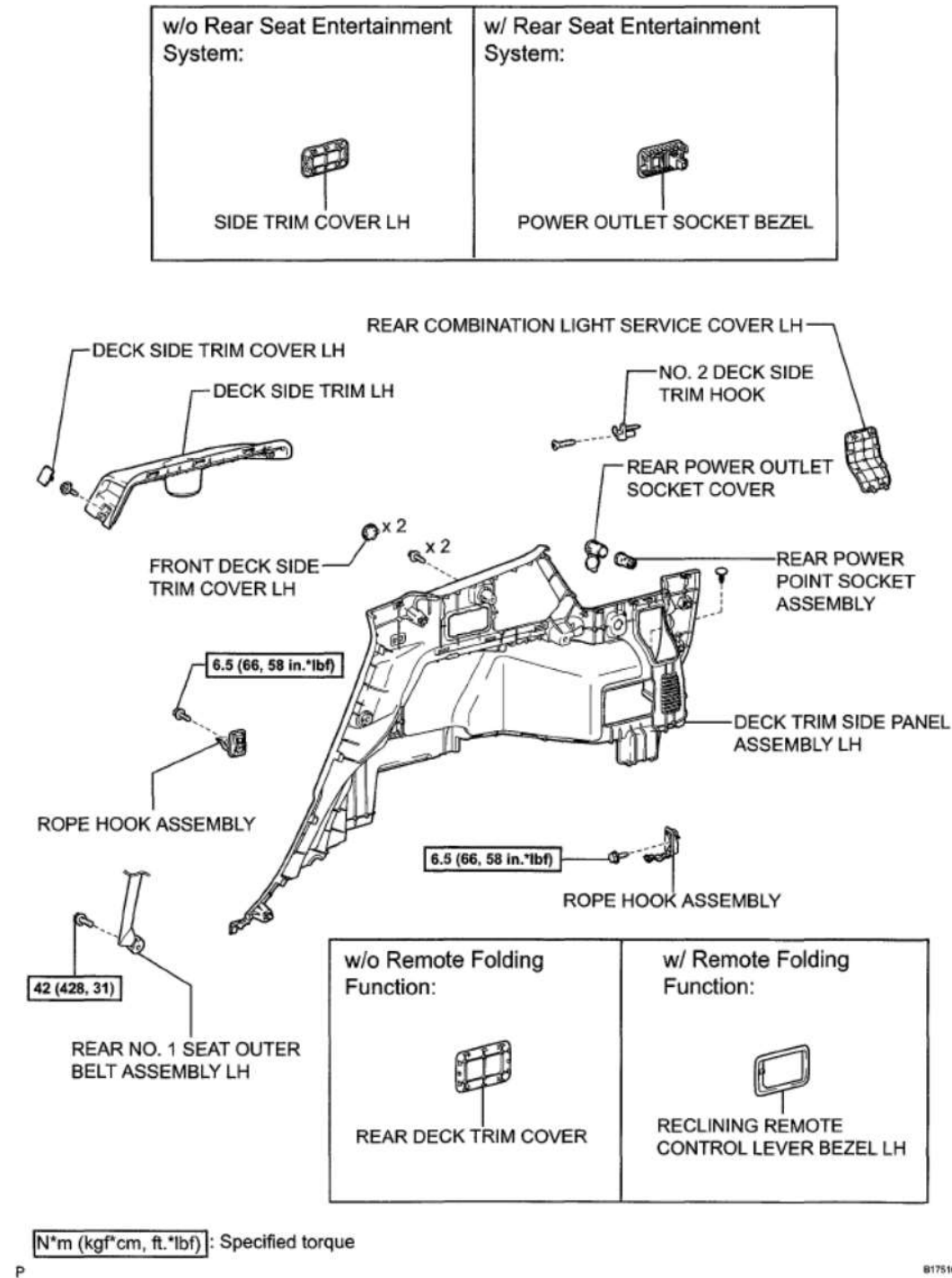
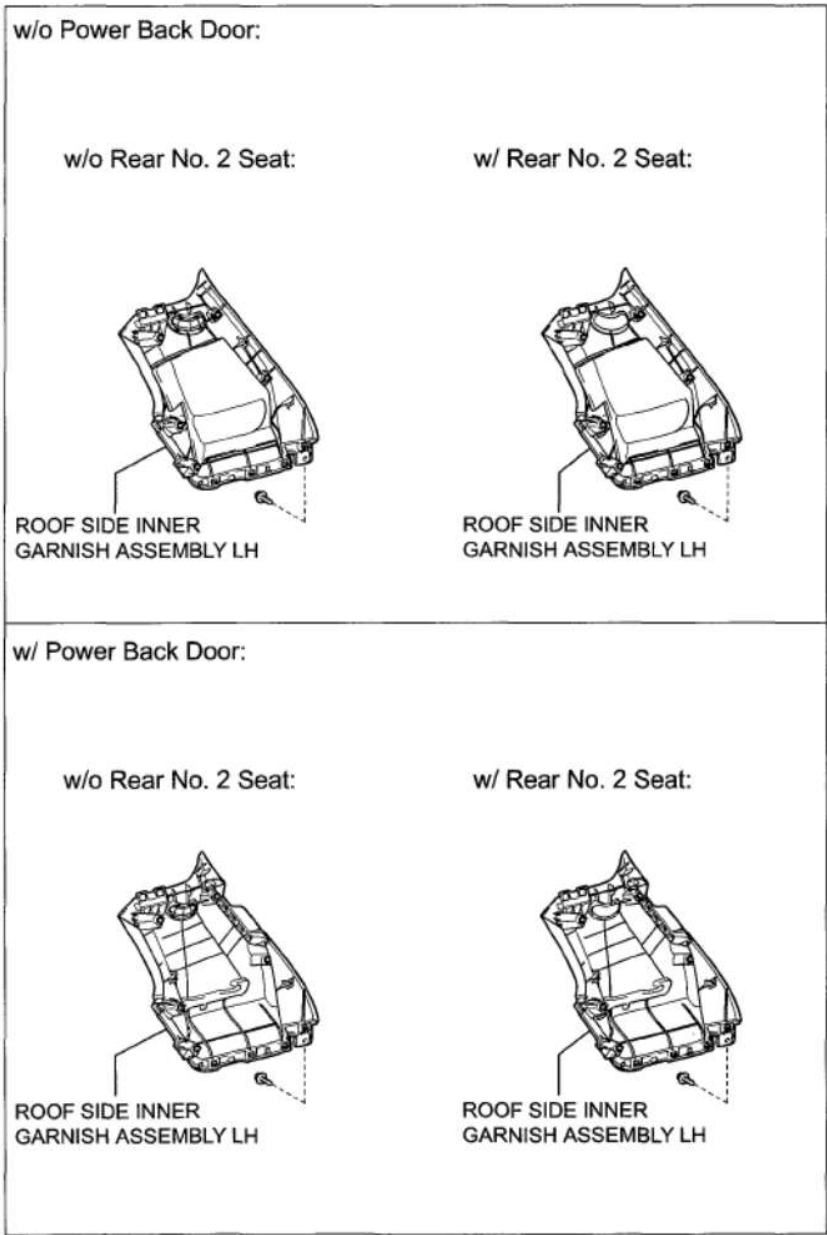


Fig. 25: Identifying Sliding Roof Housing Components With Torque Specifications (8 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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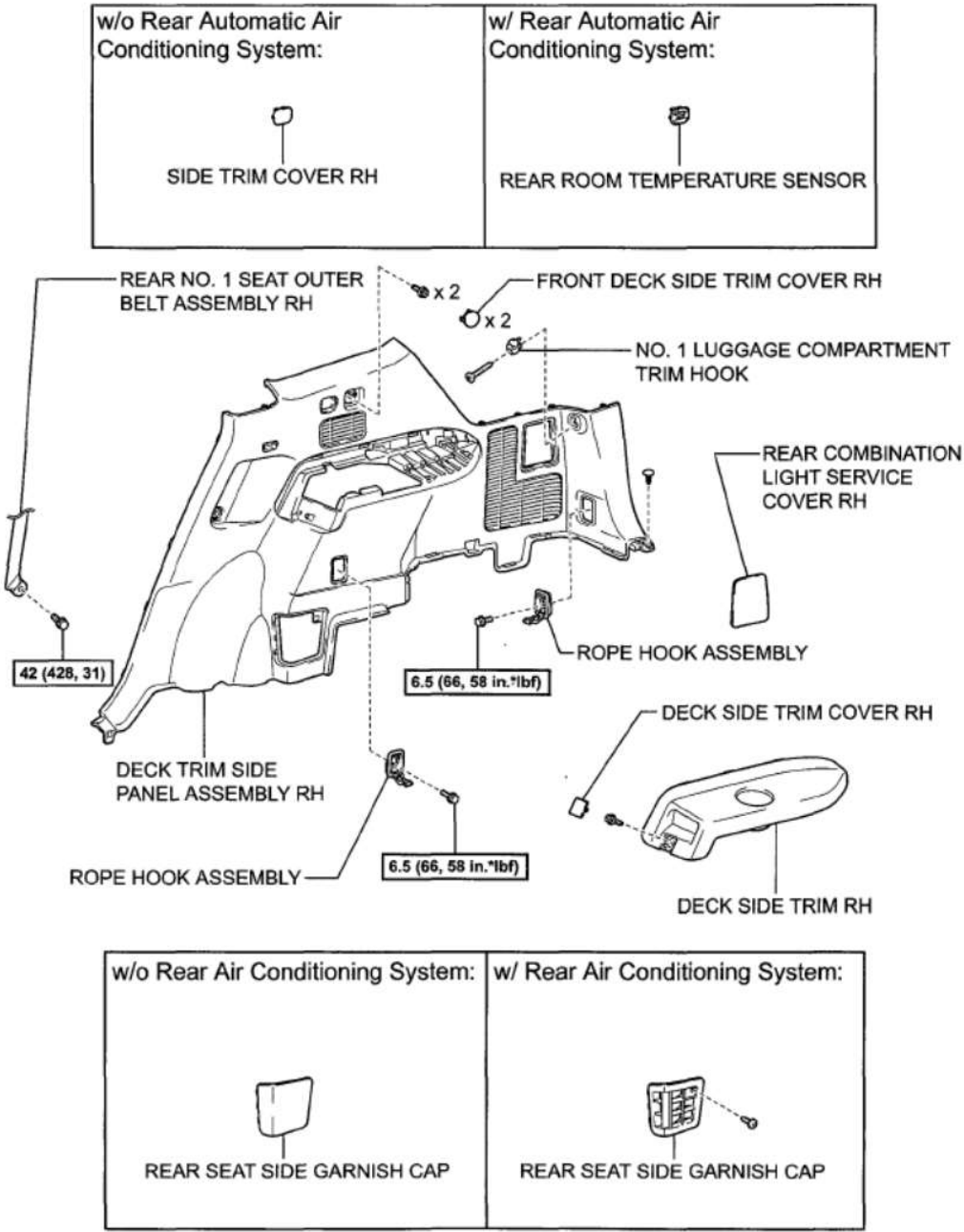
P

B173209E01

Fig. 26: Identifying Sliding Roof Housing Components (9 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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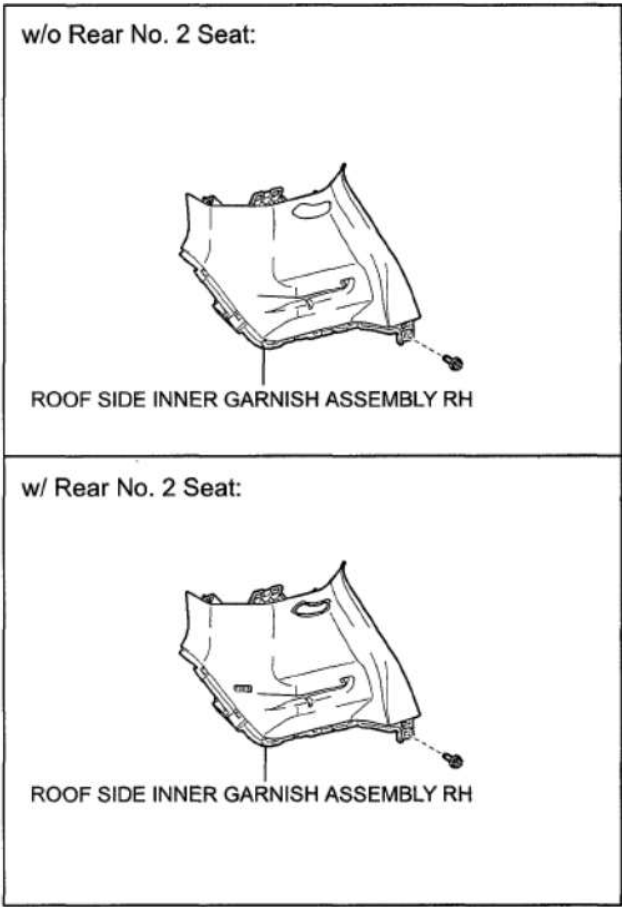
N*m (kgf*cm, ft.*lbf) : Specified torque

P B170941E02

Fig. 27: Identifying Sliding Roof Housing Components With Torque Specifications (10 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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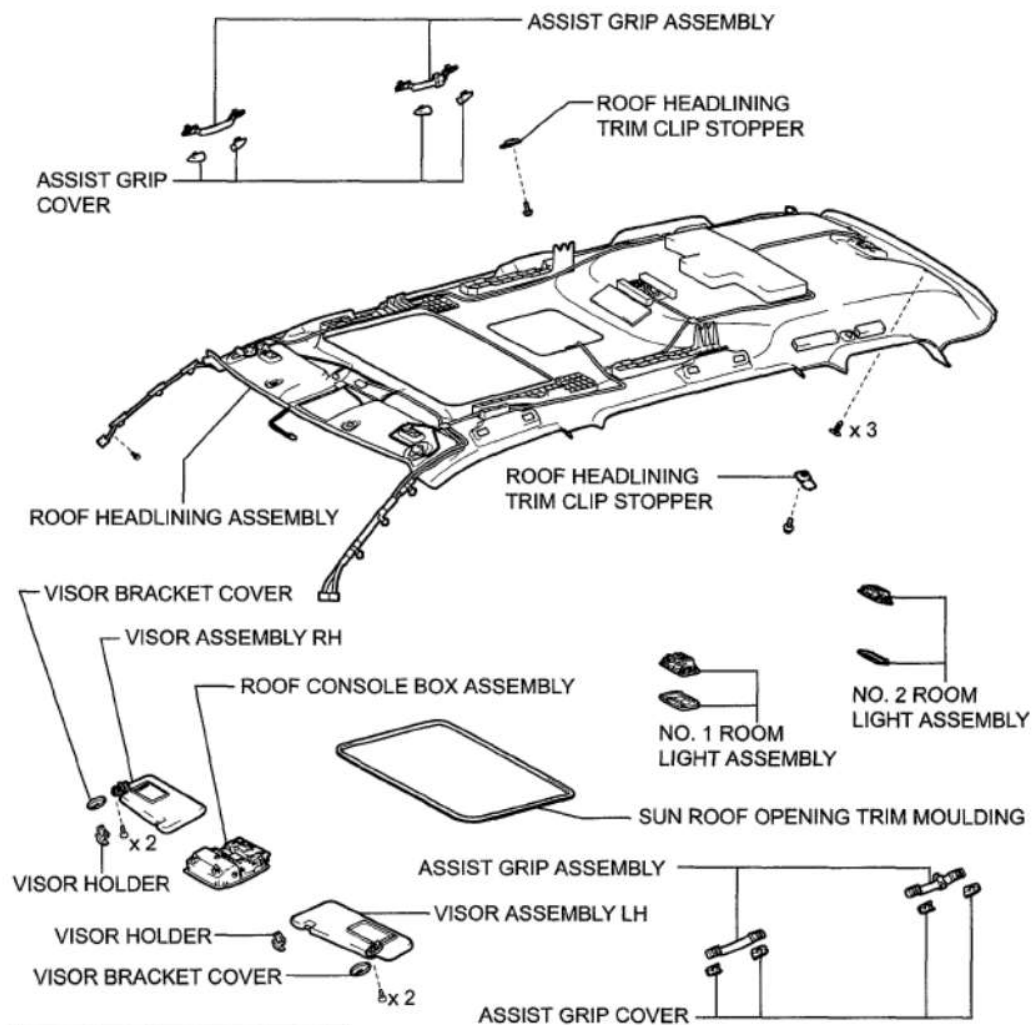
P B173221E01

Fig. 28: Identifying Sliding Roof Housing Components (11 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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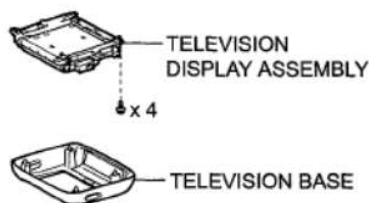
w/ Sliding Roof :



w/ EC Mirror:



w/ Rear Seat Entertainment System:



P

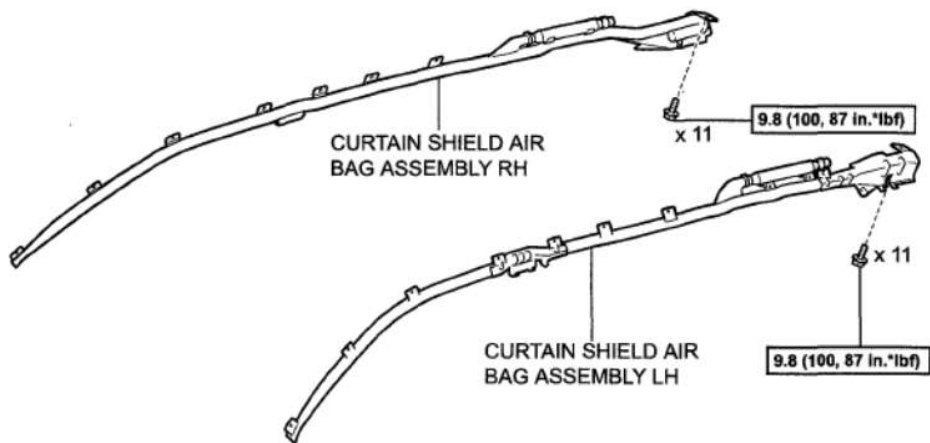
B173210E01

Fig. 29: Identifying Sliding Roof Housing Components (12 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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w/ Curtain Shield Air Bag:



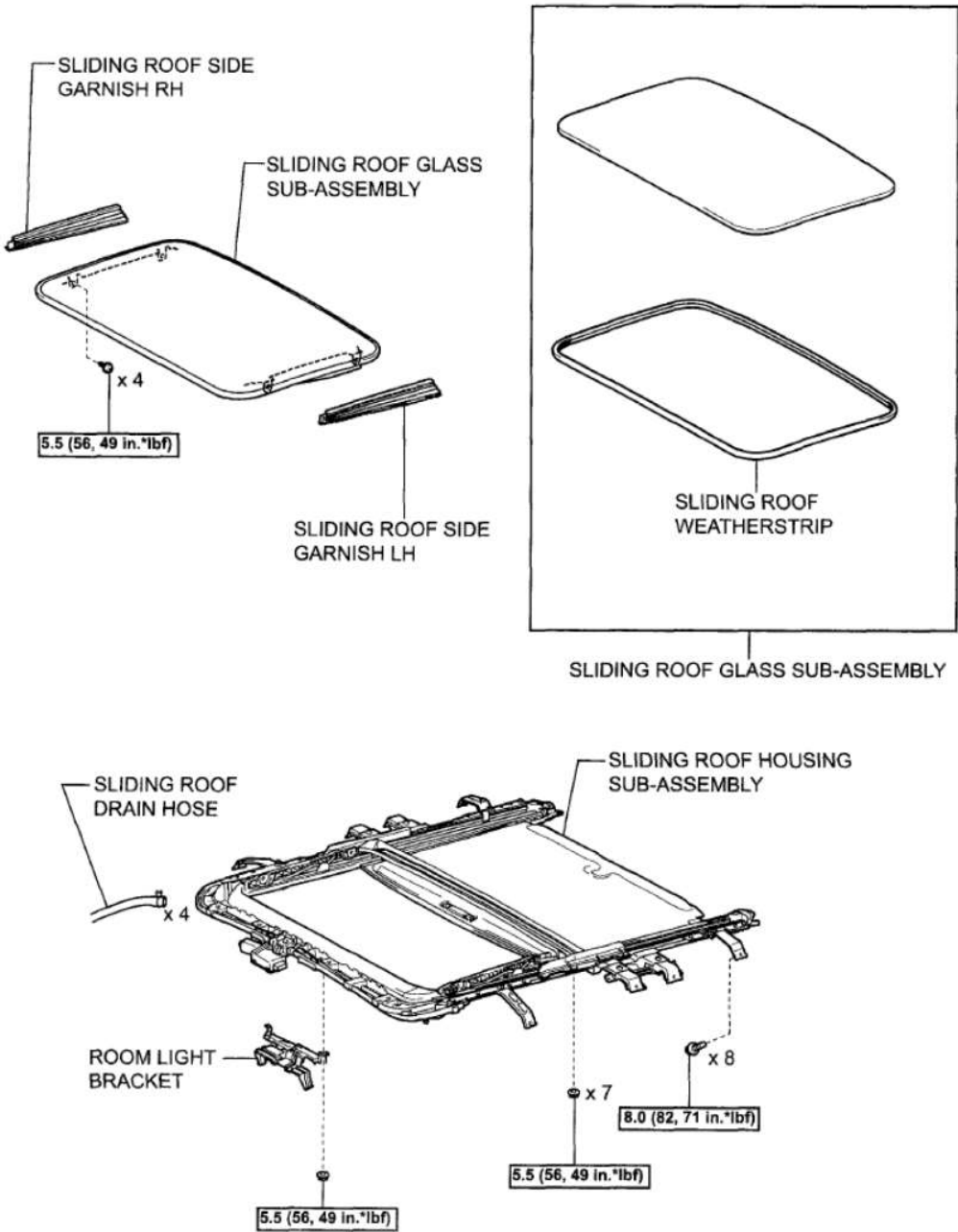
N*m (kgf*cm, ft.*lbf) : Specified torque

P 8173677ED1

Fig. 30: Identifying Sliding Roof Housing Components With Torque Specifications (13 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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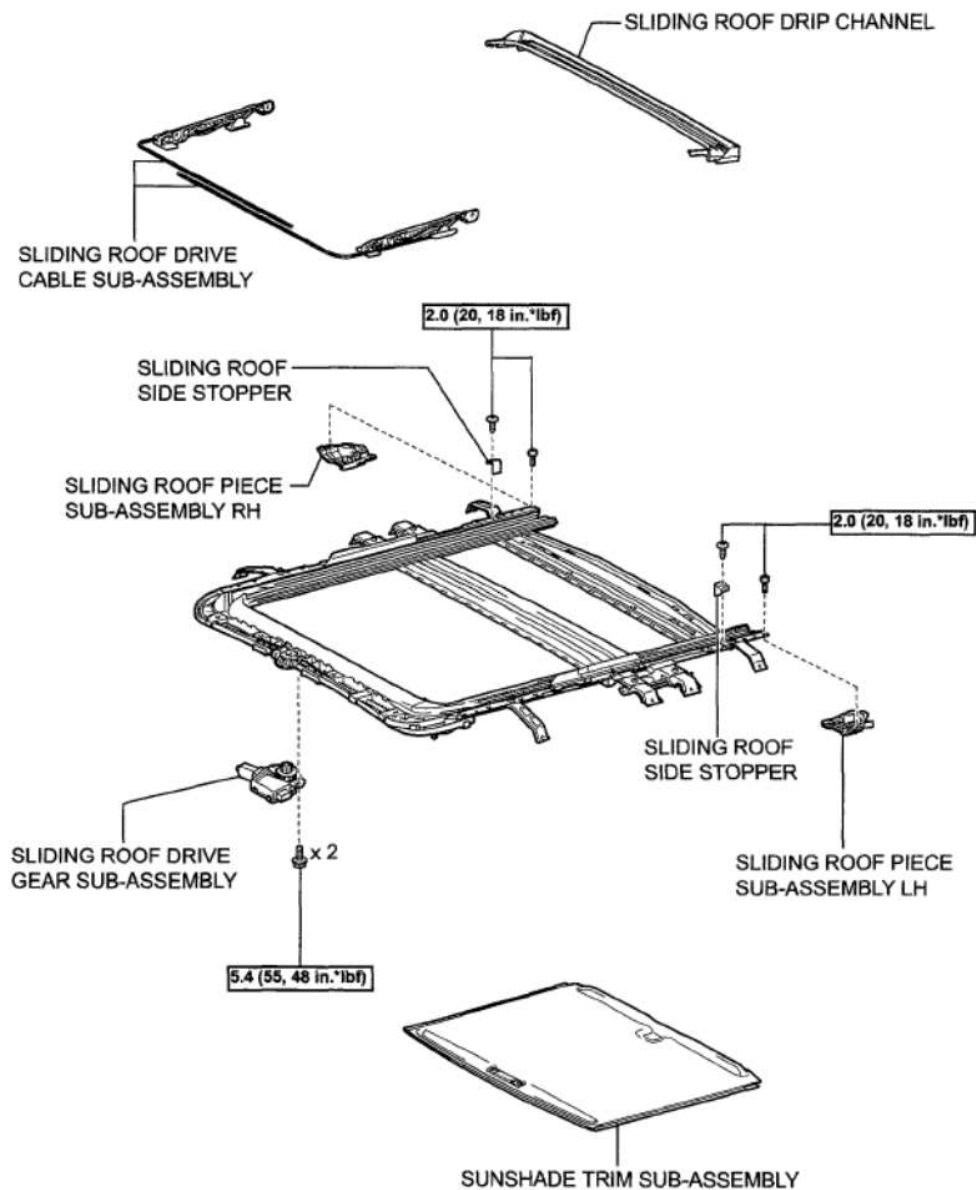
[N*m (kgf*cm, ft.*lbf)]: Specified torque

P B173096E01

Fig. 31: Identifying Sliding Roof Housing Components With Torque Specifications (14 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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[N*m (kgf*cm, ft.*lbf)]: Specified torque

P

B173068E01

Fig. 32: Identifying Sliding Roof Housing Components With Torque Specifications (15 Of 15)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION: Wait for 90 seconds after disconnecting the terminal to prevent

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airbag deployment (See AIRBAG SYSTEM).

NOTE: When disconnecting the cable, some systems need to be initialized after the cable is reconnected (See INITIALIZATION).

2. REMOVE REAR CENTER SEAT ASSEMBLY
3. REMOVE REAR SEAT HEADREST ASSEMBLY (for LH Side) (See REMOVAL)
4. REMOVE REAR SEAT TRACK BRACKET COVER LH (See REMOVAL)
5. REMOVE REAR OUTER TRACK BRACKET COVER LH (See REMOVAL)
6. REMOVE REAR INNER TRACK BRACKET COVER LH (See REMOVAL)
7. REMOVE REAR SEAT LEG SIDE COVER LH (See REMOVAL)
8. DISCONNECT REAR NO. 1 SEAT LOCK CABLE ASSEMBLY LH (w/ Remote Folding Function) (See REMOVAL)
9. REMOVE REAR NO. 1 SEAT ASSEMBLY LH (See DISASSEMBLY)
10. REMOVE REAR SEAT HEADREST ASSEMBLY (for RH Side) (See REMOVAL)
11. REMOVE REAR SEAT TRACK BRACKET COVER RH (See REMOVAL)
12. REMOVE REAR OUTER TRACK BRACKET COVER RH (See REMOVAL)
13. REMOVE REAR INNER TRACK BRACKET COVER RH (See REMOVAL)
14. REMOVE REAR SEAT LEG SIDE COVER RH (See REMOVAL)
15. DISCONNECT REAR NO. 1 SEAT LOCK CABLE ASSEMBLY RH (w/ Remote Folding Function)

HINT:

Use the same procedure for the RH side and the LH side.

16. REMOVE REAR NO. 1 SEAT ASSEMBLY RH (See DISASSEMBLY)
17. REMOVE FRONT DOOR SCUFF PLATE LH (See REMOVAL)
18. REMOVE COWL SIDE TRIM SUB-ASSEMBLY LH (See REMOVAL)
19. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH (See REMOVAL)
20. REMOVE FRONT PILLAR GARNISH LH (See REMOVAL)
21. REMOVE REAR DOOR SCUFF PLATE LH (See REMOVAL)
22. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH (See REMOVAL)
23. REMOVE LOWER CENTER PILLAR GARNISH LH (See REMOVAL)
24. DISCONNECT FRONT SEAT OUTER BELT ASSEMBLY LH (See REMOVAL)
25. REMOVE CENTER PILLAR GARNISH LH (See REMOVAL)
26. REMOVE FRONT DOOR SCUFF PLATE RH (See REMOVAL)
27. REMOVE COWL SIDE TRIM SUB-ASSEMBLY RH (See REMOVAL)
28. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH (See REMOVAL)
29. REMOVE FRONT PILLAR GARNISH RH (See REMOVAL)

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- 30. **REMOVE REAR DOOR SCUFF PLATE RH** (See REMOVAL)
- 31. **REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH** (See REMOVAL)
- 32. **REMOVE LOWER CENTER PILLAR GARNISH RH** (See REMOVAL)
- 33. **DISCONNECT FRONT SEAT OUTER BELT ASSEMBLY RH**

HINT:

Use the same procedure for the RH side and the LH side.

- 34. **REMOVE CENTER PILLAR GARNISH RH** (See REMOVAL)
- 35. **REMOVE DECK BOARD ASSEMBLY** (See REMOVAL)
- 36. **REMOVE NO. 3 DECK BOARD SUB-ASSEMBLY** (See REMOVAL)
- 37. **REMOVE NO. 2 DECK BOARD SUB-ASSEMBLY** (See REMOVAL)
- 38. **REMOVE TONNEAU COVER ASSEMBLY** (w/ Tonneau Cover)
- 39. **REMOVE REAR NO. 1 FLOOR BOARD** (w/o Rear No. 2 Seat) (See REMOVAL)
- 40. **REMOVE REAR SEAT SIDE COVER LH** (w/ Rear No. 2 Seat) (See REMOVAL)
- 41. **REMOVE DECK SIDE TRIM BOX LH** (See REMOVAL)
- 42. **REMOVE REAR SEAT SIDE COVER RH** (w/ Rear No. 2 Seat) (See REMOVAL)
- 43. **REMOVE JACK CARRIER SUPPORT**
- 44. **REMOVE JACK CARRIER CUSHION** (See REMOVAL)
- 45. **REMOVE JACK ASSEMBLY** (See REMOVAL)
- 46. **REMOVE JACK CARRIER ASSEMBLY** (See REMOVAL)
- 47. **REMOVE DECK SIDE TRIM BOX RH** (See REMOVAL)
- 48. **REMOVE DECK FLOOR BOARD ASSEMBLY** (w/o Rear No. 2 Seat) (See REMOVAL)
- 49. **REMOVE REAR MAT** (See REMOVAL)
- 50. **REMOVE DECK FLOOR BOARD ASSEMBLY** (w/ Rear No. 2 Seat) (See REMOVAL)
- 51. **REMOVE REAR DECK FLOOR BOX** (w/o Rear No. 2 Seat) (See REMOVAL)
- 52. **REMOVE REAR NO. 2 SEAT INNER BELT ASSEMBLY** (w/ Rear No. 2 Seat) (See INSTALLATION)
- 53. **DISCONNECT REAR SEAT LAP TYPE BELT ASSEMBLY LH** (w/ Rear No. 2 Seat) (See REMOVAL)
- 54. **DISCONNECT REAR SEAT LAP TYPE BELT ASSEMBLY RH** (w/ Rear No. 2 Seat) (See REMOVAL)
- 55. **REMOVE REAR NO. 2 SEAT ASSEMBLY** (w/ Rear No. 2 Seat) (See DISASSEMBLY)
- 56. **REMOVE REAR FLOOR FINISH PLATE** (See REMOVAL)
- 57. **REMOVE DECK SIDE TRIM COVER LH** (See REMOVAL)
- 58. **REMOVE DECK SIDE TRIM LH** (See REMOVAL)
- 59. **REMOVE SIDE TRIM COVER LH** (w/o Rear Seat Entertainment System) (See REMOVAL)
- 60. **REMOVE POWER OUTLET SOCKET BEZEL** (w/ Rear Seat Entertainment System) (See REMOVAL)

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61. REMOVE REAR COMBINATION LIGHT SERVICE COVER LH (See REMOVAL)
62. REMOVE REAR POWER POINT SOCKET ASSEMBLY (See REAR POWER OUTLET SOCKET)
63. REMOVE REAR POWER OUTLET SOCKET COVER (See INSTALLATION)
64. REMOVE REAR DECK TRIM COVER (w/o Remote Folding Function) (See REMOVAL)
65. REMOVE RECLINING REMOTE CONTROL LEVER BEZEL LH (w/ Remote Folding Function) (See REMOVAL)
66. REMOVE ROPE HOOK ASSEMBLY (for LH Side) (See REMOVAL)
67. REMOVE NO. 2 DECK SIDE TRIM HOOK (See REMOVAL)
68. REMOVE FRONT DECK SIDE TRIM COVER LH (See REMOVAL)
69. DISCONNECT REAR NO. 1 SEAT OUTER BELT ASSEMBLY LH (See REMOVAL)
70. REMOVE DECK TRIM SIDE PANEL ASSEMBLY LH (See REMOVAL)
71. REMOVE QUARTER PILLAR GARNISH LH (See REMOVAL)
72. REMOVE ROOF SIDE INNER GARNISH ASSEMBLY LH (w/o Power Back Door) (See REMOVAL)
73. REMOVE ROOF SIDE INNER GARNISH ASSEMBLY LH (w/ Power Back Door) (See REMOVAL)
74. REMOVE REAR SEAT SIDE GARNISH CAP (w/o Rear Air Conditioning System) (See REMOVAL)
75. REMOVE REAR SEAT SIDE GARNISH CAP (w/ Rear Air Conditioning System) (See REMOVAL)
76. REMOVE DECK SIDE TRIM COVER RH (See REMOVAL)
77. REMOVE DECK SIDE TRIM RH (See REMOVAL)
78. REMOVE SIDE TRIM COVER RH (w/o Rear Automatic Air Conditioning System) (See REMOVAL)
79. REMOVE REAR ROOM TEMPERATURE SENSOR (w/ Rear Automatic Air Conditioning System) (See ROOM TEMPERATURE SENSOR (FOR REAR))
80. REMOVE REAR COMBINATION LIGHT SERVICE COVER RH (See REMOVAL)
81. REMOVE ROPE HOOK ASSEMBLY (for RH Side) (See REMOVAL)
82. REMOVE NO. 1 LUGGAGE COMPARTMENT TRIM HOOK (See REMOVAL)
83. REMOVE FRONT DECK SIDE TRIM COVER RH (See REMOVAL)
84. DISCONNECT REAR NO. 1 SEAT OUTER BELT ASSEMBLY RH

HINT:

Use the same procedure for the RH side and the LH side.

85. REMOVE DECK TRIM SIDE PANEL ASSEMBLY RH (See REMOVAL)
86. REMOVE QUARTER PILLAR GARNISH RH (See REMOVAL)
87. REMOVE ROOF SIDE INNER GARNISH ASSEMBLY RH (w/o Rear No. 2 Seat) (See REMOVAL)

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88. **REMOVE ROOF SIDE INNER GARNISH ASSEMBLY RH (w/ Rear No. 2 Seat) (See REMOVAL)**
89. **REMOVE ROOF CONSOLE BOX ASSEMBLY (See REMOVAL)**
90. **REMOVE VISOR BRACKET COVER (for LH Side) (See REMOVAL)**
91. **REMOVE VISOR ASSEMBLY LH (See REMOVAL)**
92. **REMOVE VISOR BRACKET COVER (for RH Side) (See REMOVAL)**
93. **REMOVE VISOR ASSEMBLY RH (See REMOVAL)**
94. **REMOVE INNER REAR VIEW MIRROR STAY HOLDER COVER (w/ EC Mirror) (See REMOVAL)**
95. **REMOVE NO. 1 ROOM LIGHT ASSEMBLY (for Standard) (See REMOVAL)**
96. **REMOVE NO. 1 ROOM LIGHT ASSEMBLY (for Independent Type) (See REMOVAL)**
97. **REMOVE NO. 2 ROOM LIGHT ASSEMBLY (See REMOVAL)**
98. **REMOVE TELEVISION BASE (w/ Rear Seat Entertainment System) (See TELEVISION DISPLAY)**
99. **REMOVE TELEVISION DISPLAY ASSEMBLY (w/ Rear Seat Entertainment System) (See TELEVISION DISPLAY)**
100. **REMOVE ASSIST GRIP ASSEMBLY (See REMOVAL)**
101. **REMOVE ROOF HEADLINING TRIM CLIP STOPPER (See REMOVAL)**
102. **REMOVE SUN ROOF OPENING TRIM MOULDING**
103. **REMOVE VISOR HOLDER (See REMOVAL)**
104. **REMOVE ROOF HEADLINING ASSEMBLY (See REMOVAL)**
105. **REMOVE CURTAIN SHIELD AIR BAG ASSEMBLY LH (w/ Curtain Shield Airbag) (See INSTALLATION)**
106. **REMOVE CURTAIN SHIELD AIR BAG ASSEMBLY RH (w/ Curtain Shield Airbag)**

HINT:

Use the same procedure for the RH side and the LH side.

107. **REMOVE SLIDING ROOF SIDE GARNISH LH**
 - a. Disengage the 5 claws and remove the sliding roof side garnish LH.
108. **REMOVE SLIDING ROOF SIDE GARNISH RH**

HINT:

Use the same procedure for the RH side and the LH side.

109. **REMOVE SLIDING ROOF GLASS SUB-ASSEMBLY**
 - a. Using a T25 "TORX" driver, remove the 4 screws and sliding roof glass sub-assembly.

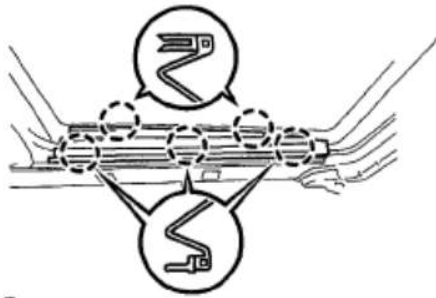
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Fig. 33: Identifying Sliding Roof Side Garnish LH With Claws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

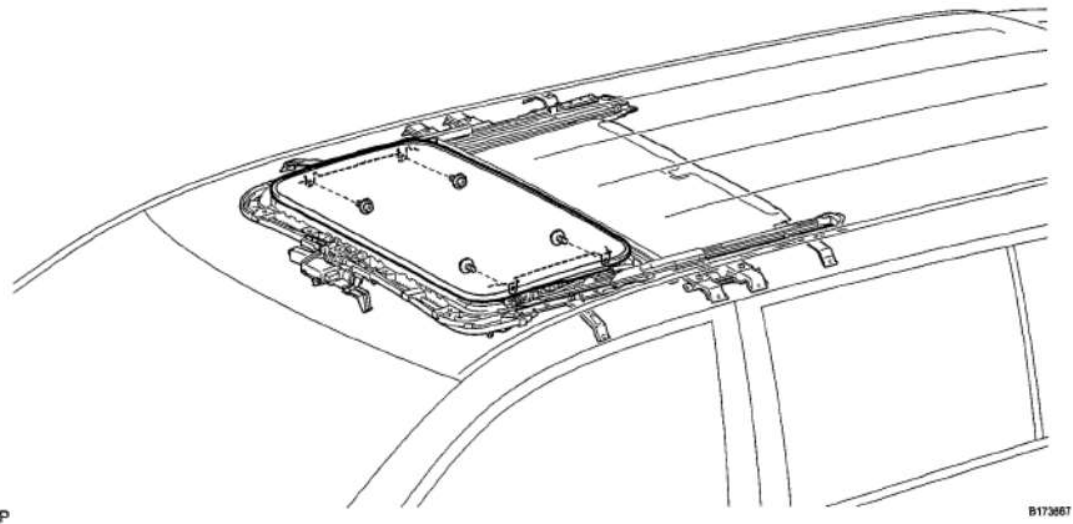


Fig. 34: Identifying Sliding Roof Glass Sub-Assembly With Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

110. REMOVE SLIDING ROOF HOUSING SUB-ASSEMBLY

- a. Remove the nut.
- b. Disengage the claw and remove the room light bracket.
- c. Disconnect the 4 sliding roof drain hoses.

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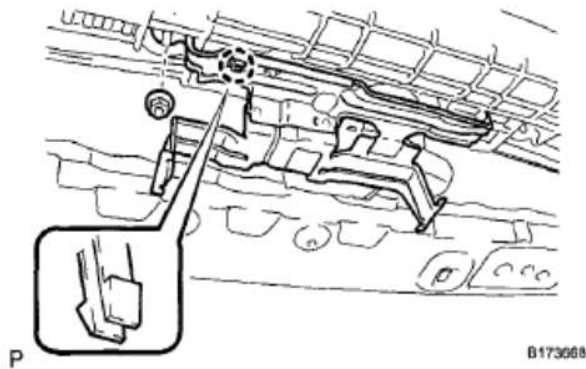


Fig. 35: Identifying Sliding Roof Housing Sub-Assembly With Claw And Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the 8 bolts, 7 nuts, and sliding roof housing sub-assembly.

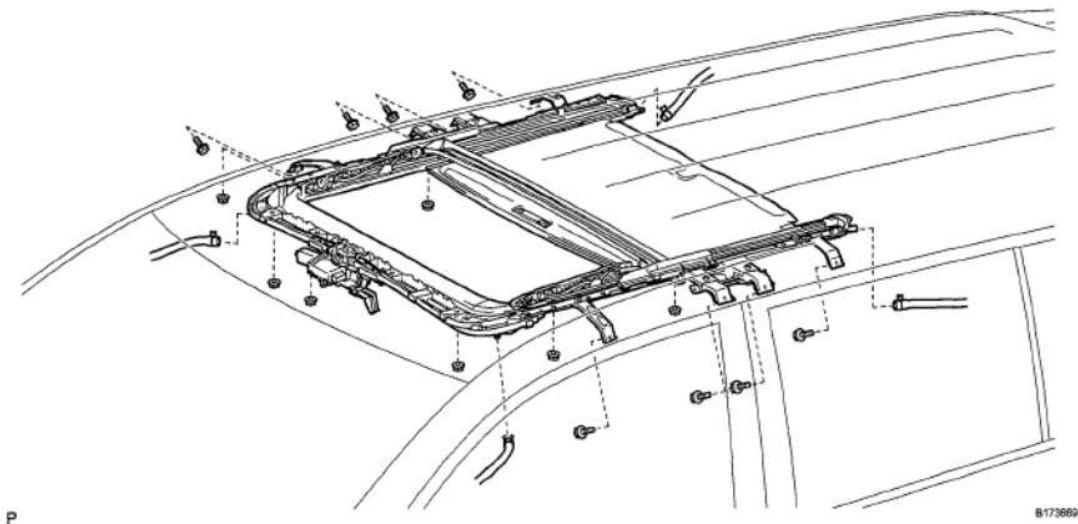


Fig. 36: Identifying Sliding Roof Housing Sub-Assembly With Bolts And Nuts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

111. REMOVE SLIDING ROOF WEATHERSTRIP

- a. Remove the sliding roof weatherstrip from the sliding roof glass sub-assembly.

DISASSEMBLY

1. REMOVE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY

- a. Remove the 2 bolts and sliding roof drive gear sub-assembly.

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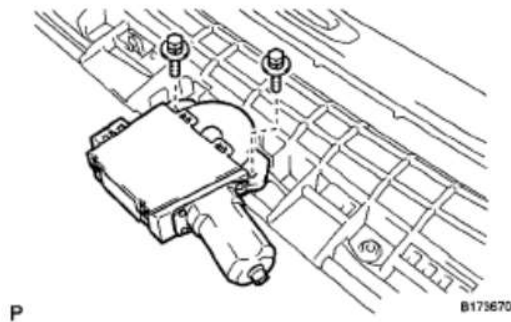


Fig. 37: Identifying Sliding Roof Drive Gear Sub-Assembly With Bolts
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE SUNSHADE TRIM SUB-ASSEMBLY

- a. Remove the screw and sliding roof piece sub-assembly LH.

HINT:

Use the same procedure for the RH side and the LH side.

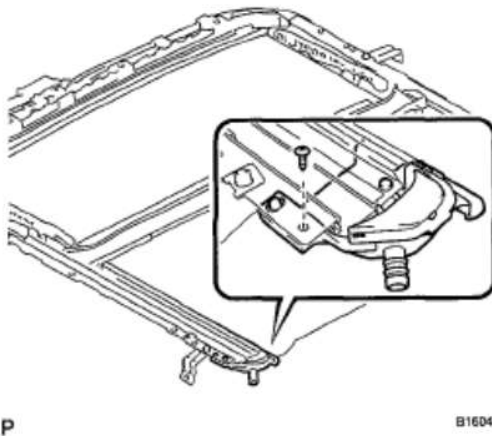


Fig. 38: Identifying Sliding Roof Piece Sub-Assembly LH With Screw
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

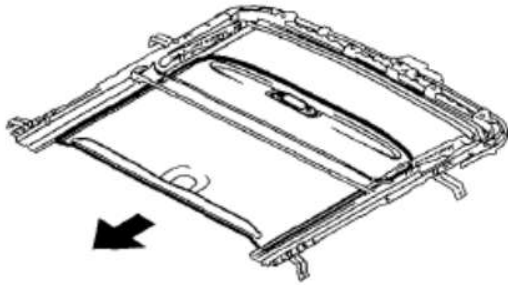
- b. Slide and remove the sunshade trim sub-assembly.

3. REMOVE SLIDING ROOF DRIVE CABLE SUB-ASSEMBLY

NOTE: Disassemble the sliding roof drive cable sub-assembly only when replacing it.

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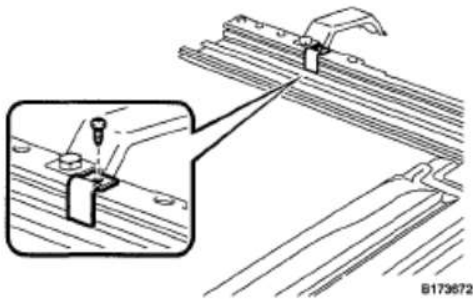
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Fig. 39: Removing Sunshade Trim Sub-Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Remove the screw and sliding roof side stopper.

HINT:

Use the same procedure for the RH side and the LH side.



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Fig. 40: Identifying Sliding Roof Side Stopper Screw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a screwdriver, disengage the 2 claws. Then slide the sliding roof drip channel rearward to remove it.

HINT:

Tape the screwdriver tip before use.

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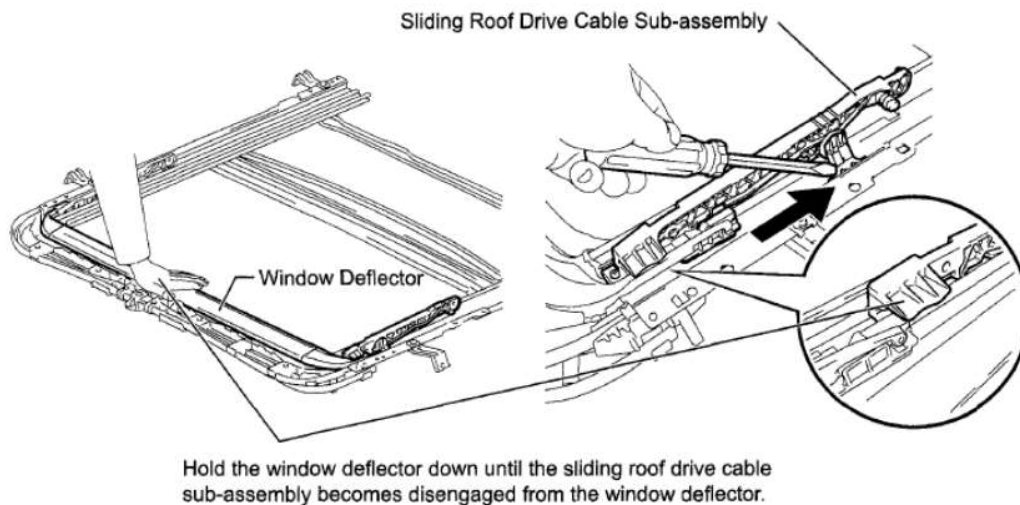
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Fig. 41: Sliding Sliding Roof Drip Channel

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a screwdriver, slide the sliding roof drive cable sub-assembly in the direction indicated by the arrow in the illustration to remove it.



Hold the window deflector down until the sliding roof drive cable sub-assembly becomes disengaged from the window deflector.

Fig. 42: Sliding Sliding Roof Drive Cable Sub-Assembly

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

1. INSTALL SLIDING ROOF DRIVE CABLE SUB-ASSEMBLY

- a. Insert the sliding roof drive cable.
- b. Align the sliding roof drive cable with the guide on the sliding roof housing and slide the cable in the direction indicated by the arrow in the illustration.

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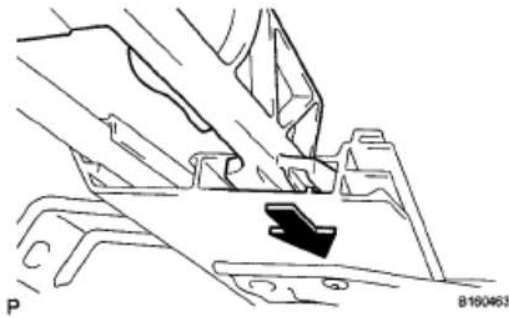


Fig. 43: Installing Sliding Roof Drive Cable Sub-Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a screwdriver, slide the sliding roof drive cable sub-assembly in the direction indicated by the arrow in the illustration to install it.

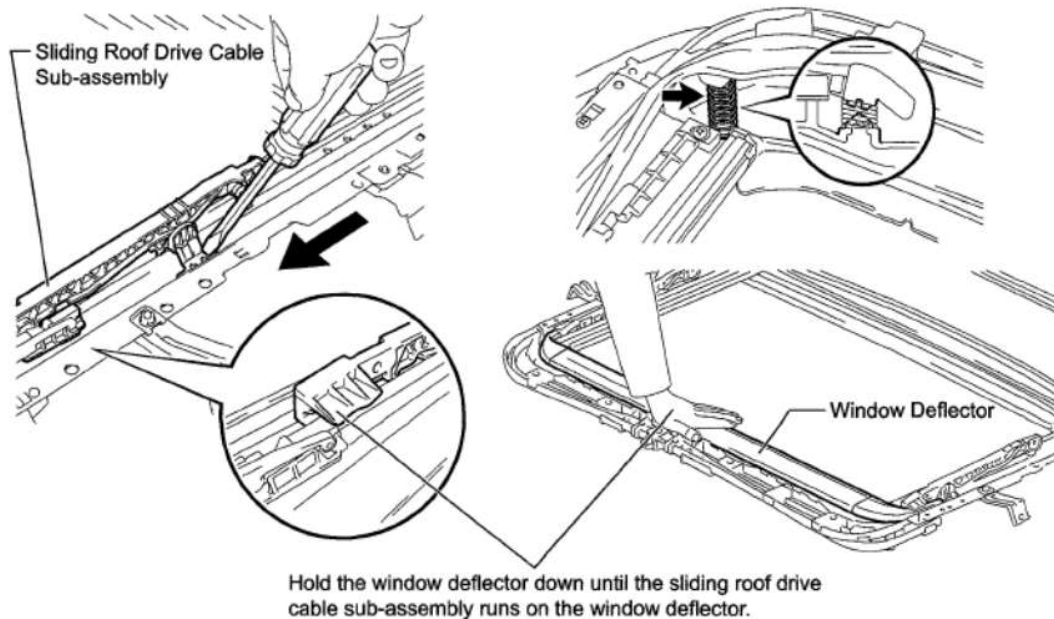


Fig. 44: Sliding Sliding Roof Drive Cable Sub-Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Make sure that the spring indicated by the arrow in the illustration is securely installed.

- d. Engage the 2 claws and install the sliding roof drip channel.

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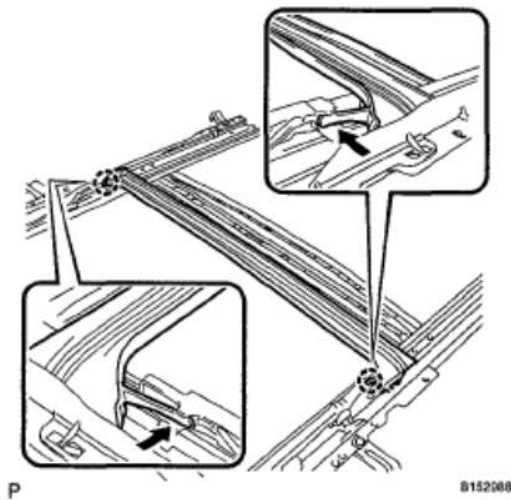


Fig. 45: Installing Sliding Roof Drip Channel With Claws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Install the sliding roof side stopper with the screw.

Torque: 2.0 N*m (20 kgf*cm, 18 in.*lbf)

HINT:

Use the same procedure for the RH side and the LH side.

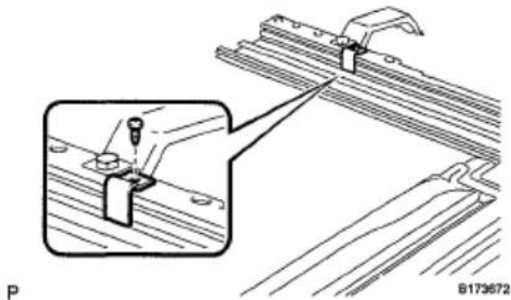


Fig. 46: Identifying Sliding Roof Side Stopper Screw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. ADJUST FULLY CLOSED POSITION

- a. Using a screwdriver, slide the sliding roof drive cable sub-assembly in either direction indicated by the arrows in the illustration and alignment marks.

HINT:

Tape the screwdriver tip before use.

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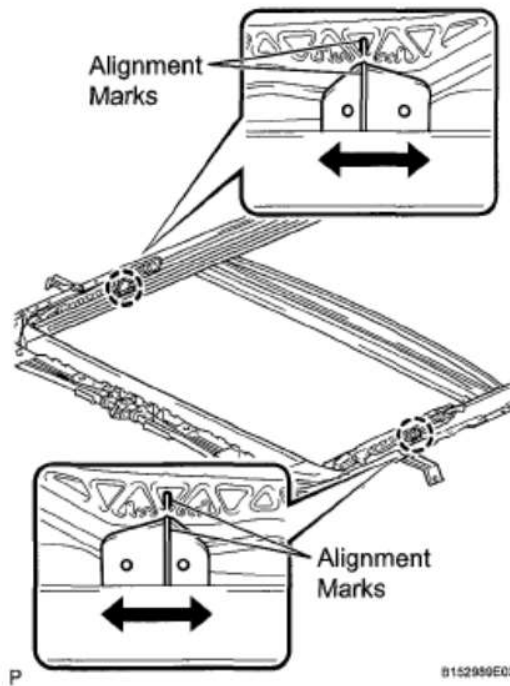


Fig. 47: Identifying Marks Alignment Adjustment
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL SUNSHADE TRIM SUB-ASSEMBLY

- a. Insert the sunshade trim into the sliding roof housing sub-assembly.

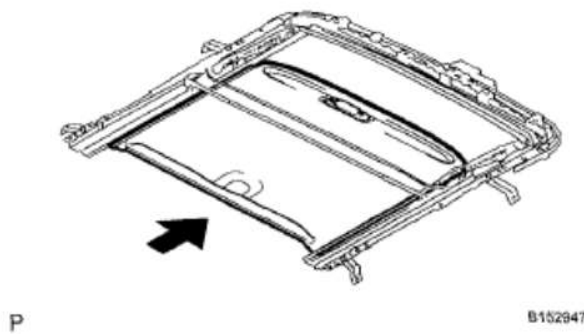


Fig. 48: Inserting Sunshade Trim Into Sliding Roof Housing Sub-Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Align the sliding roof piece sub-assembly LH with the guide on the sliding roof housing to temporarily install it.

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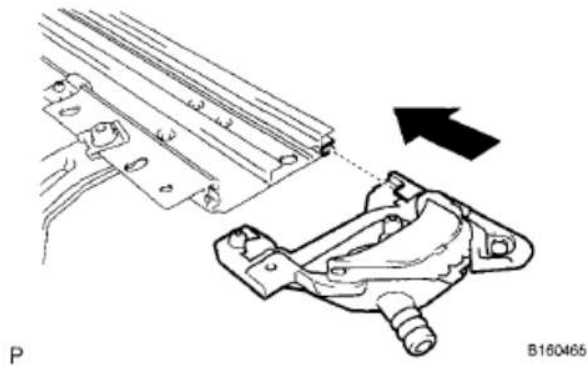


Fig. 49: Installing Sliding Roof Piece Sub-Assembly LH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the sliding roof piece sub-assembly LH with the screw.

Torque: 2.0 N*m (20 kgf*cm, 18 in.*lbf)

HINT:

Use the same procedure for the RH side and the LH side.

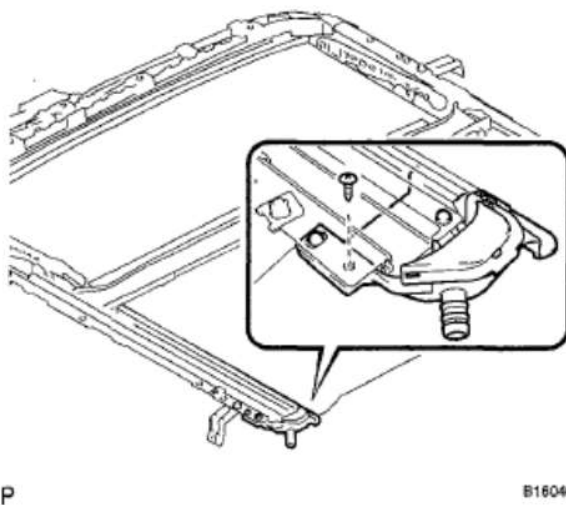


Fig. 50: Identifying Sliding Roof Piece Sub-Assembly LH With Screw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSTALL SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY

- a. Install the sliding roof drive gear sub-assembly with the 2 bolts.

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

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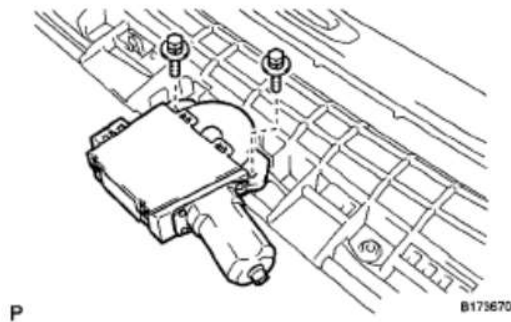


Fig. 51: Identifying Sliding Roof Drive Gear Sub-Assembly With Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL SLIDING ROOF WEATHERSTRIP

- a. Install the sliding roof weatherstrip as follows:
 1. Position the joint of the weatherstrip at the rear center.
 2. Align the marks on the weatherstrip with the middle marks at the corners of the sliding roof panel and install the weatherstrip.
 3. Install the lip of the weatherstrip firmly.

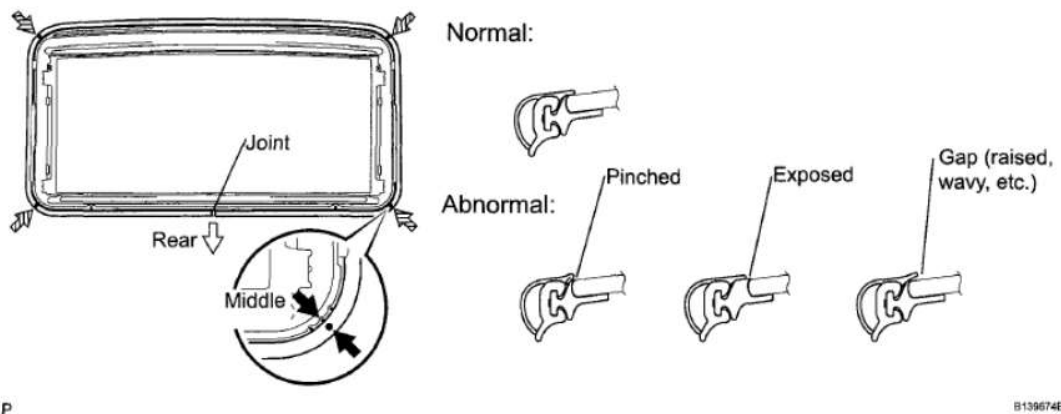


Fig. 52: Locating Middle Marks On Corners Of Sliding Roof Panel
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL SLIDING ROOF HOUSING SUB-ASSEMBLY

- a. Install the sliding roof housing sub-assembly with the 7 nuts.

Torque: 5.5 N*m (56 kgf*cm, 49 in.*lbf)

- b. Install the 8 bolts.

Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)

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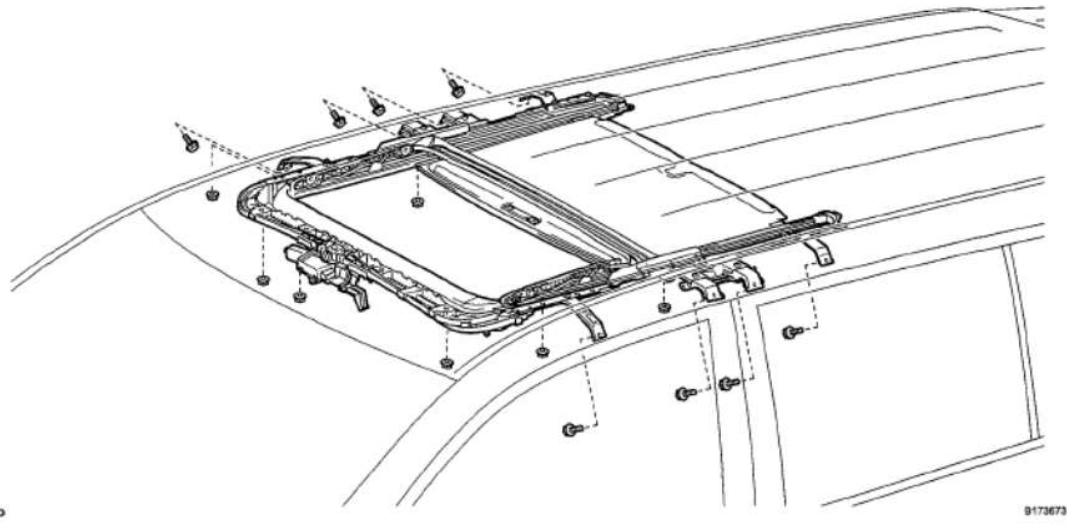


Fig. 53: Identifying Sliding Roof Housing Sub-Assembly With Nuts And Bolts
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Engage the claw.
- d. Install the room light bracket with the nut.

Torque: 5.5 N*m (56 kgf*cm, 49 in.*lbf)

- e. Connect the 4 sliding roof drain hoses.

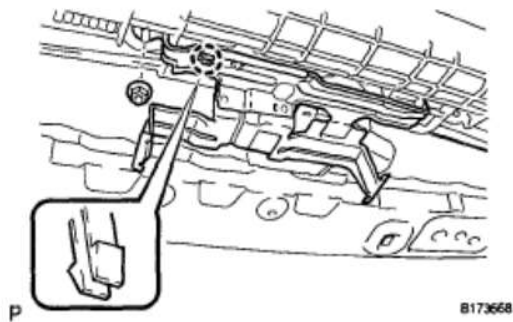


Fig. 54: Identifying Room Light Bracket With Nut And Claw
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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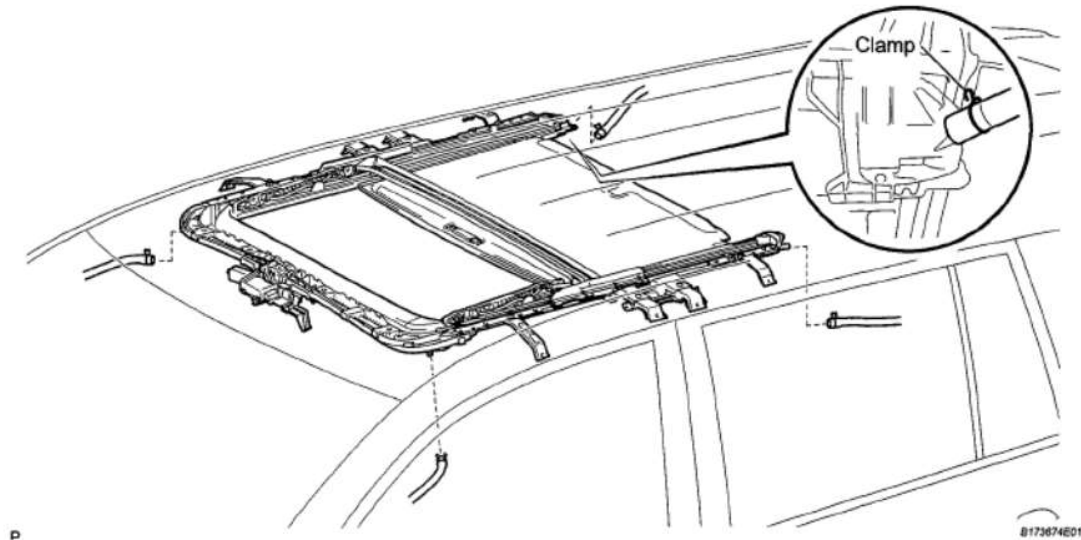


Fig. 55: Identifying Sliding Roof Drain Hoses And Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be sure to install the drain hoses properly to prevent entry of water.

f. Connect each clamp.

3. INSTALL SLIDING ROOF GLASS SUB-ASSEMBLY

- a. Using a T25 "TORX" driver, temporarily install the sliding roof glass sub-assembly with the 4 screws.

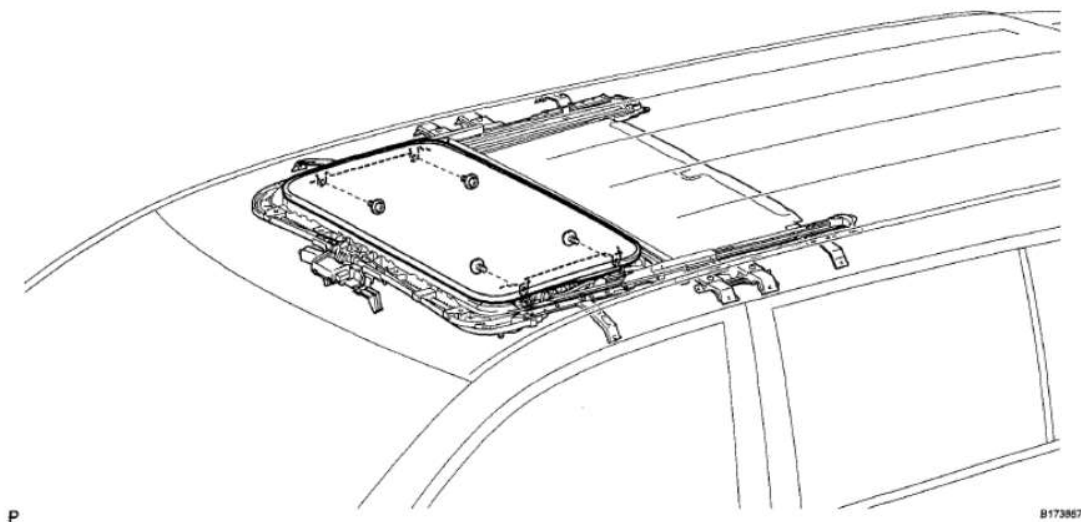


Fig. 56: Identifying Sliding Roof Glass Sub-Assembly With Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Perform a level check.

1. Check the difference in level for "a" between the roof panel and the upper surface of the

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weatherstrip when the sliding roof glass is fully closed.

Standard

AREA MEASUREMENT CHART

Area	Measurement
A-A	0 + 1.0 mm (0 + 0.039 in.) 0 - 2.0 mm (0 - 0.079 in.)
B-B	0 + 2.0 mm (0 + 0.079 in.) 0-1.0 mm (0 - 0.039 in.)
C-C	0 + 1.5 mm (0 + 0.059 in.) 0-1.5 mm (0 - 0.059 in.)
D-D	0 + 1.5 mm (0 + 0.059 in.) 0-1.0 mm (0 - 0.039 in.)

HINT:

"+" represents the condition that the glass is above the panel level. "-" represents the condition that the glass is below the panel level.

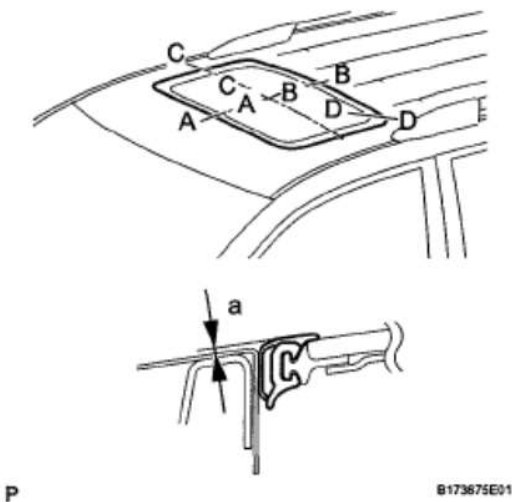


Fig. 57: Checking Difference Between Roof Panel And Upper Surface Of Weatherstrip
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Perform a gap check.
 - 1. Check the gap between the roof panel and roof glass.

NOTE: The gap must be even all around.

- d. After adjusting the sliding roof glass, using a T25 "TORX" driver, install the sliding roof glass sub-assembly with the 4 screws.

Torque: 5.5 N*m (56 kgf*cm, 49 in.*lbf)

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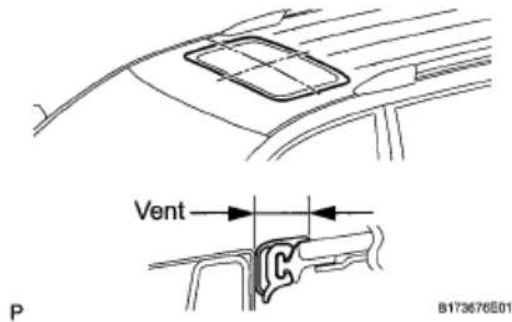


Fig. 58: Checking Gap Between Roof Panel And Roof Glass
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSPECT WATER LEAK

- After adjusting the sliding roof glass sub-assembly, inspect for water leaks.
- If there are any leaks, readjust the sliding roof glass sub-assembly.

5. INSTALL SLIDING ROOF SIDE GARNISH LH

- Engage the 5 claws and install the sliding roof side garnish LH.

6. INSTALL SLIDING ROOF SIDE GARNISH RH

HINT:

Use the same procedure for the RH side and the LH side.

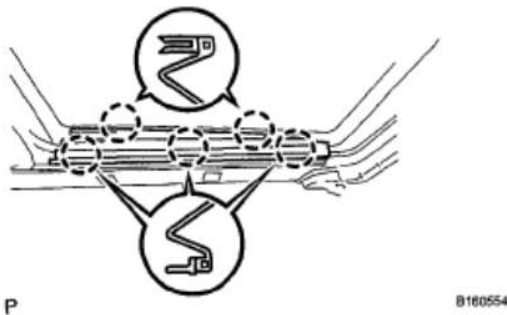


Fig. 59: Identifying Sliding Roof Side Garnish LH With Claws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. INSTALL CURTAIN SHIELD AIR BAG ASSEMBLY LH (w/ Curtain Shield Airbag) (See INSTALLATION)

8. INSTALL CURTAIN SHIELD AIR BAG ASSEMBLY RH (w/ Curtain Shield Airbag)

HINT:

Use the same procedure for the RH side and the LH side.

9. INSTALL ROOF HEADLINING ASSEMBLY (See INSTALLATION)

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10. **INSTALL VISOR HOLDER** (See INSTALLATION)
11. **INSTALL SUN ROOF OPENING TRIM MOULDING** (See INSTALLATION)
12. **INSTALL ROOF HEADLINING TRIM CLIP STOPPER** (See INSTALLATION)
13. **INSTALL ASSIST GRIP ASSEMBLY** (See INSTALLATION)
14. **INSTALL TELEVISION DISPLAY ASSEMBLY (w/ Rear Seat Entertainment System)** (See INSTALLATION)
15. **INSTALL TELEVISION BASE (w/ Rear Seat Entertainment System)** (See INSTALLATION)
16. **INSTALL NO. 2 ROOM LIGHT ASSEMBLY** (See INSTALLATION)
17. **INSTALL NO. 1 ROOM LIGHT ASSEMBLY (for Standard)** (See INSTALLATION)
18. **INSTALL NO. 1 ROOM LIGHT ASSEMBLY (for Independent Type)** (See INSTALLATION)
19. **INSTALL INNER REAR VIEW MIRROR STAY HOLDER COVER (w/ EC Mirror)** (See INSTALLATION)
20. **INSTALL VISOR ASSEMBLY LH** (See INSTALLATION)
21. **INSTALL VISOR BRACKET COVER (for LH Side)** (See INSTALLATION)
22. **INSTALL VISOR ASSEMBLY RH** (See INSTALLATION)
23. **INSTALL VISOR BRACKET COVER (for RH Side)** (See INSTALLATION)
24. **INSTALL ROOF CONSOLE BOX ASSEMBLY** (See INSTALLATION)
25. **INSTALL ROOF SIDE INNER GARNISH ASSEMBLY LH (w/o Power Back Door)** (See INSTALLATION)
26. **INSTALL ROOF SIDE INNER GARNISH ASSEMBLY LH (w/ Power Back Door)** (See INSTALLATION)
27. **INSTALL QUARTER PILLAR GARNISH LH** (See INSTALLATION)
28. **INSTALL DECK TRIM SIDE PANEL ASSEMBLY LH** (See INSTALLATION)
29. **CONNECT REAR NO. 1 SEAT OUTER BELT ASSEMBLY LH** (See INSTALLATION)
30. **INSTALL FRONT DECK SIDE TRIM COVER LH** (See INSTALLATION)
31. **INSTALL NO. 2 DECK SIDE TRIM HOOK** (See INSTALLATION)
32. **INSTALL ROPE HOOK ASSEMBLY (for LH Side)** (See INSTALLATION)
33. **INSTALL REAR DECK TRIM COVER (w/o Remote Folding Function)** (See INSTALLATION)
34. **INSTALL RECLINING REMOTE CONTROL LEVER BEZEL LH (w/ Remote Folding Function)** (See INSTALLATION)
35. **INSTALL REAR POWER OUTLET SOCKET COVER** (See INSTALLATION)
36. **INSTALL REAR POWER POINT SOCKET ASSEMBLY** (See INSTALLATION)
37. **INSTALL REAR COMBINATION LIGHT SERVICE COVER LH** (See INSTALLATION)
38. **INSTALL SIDE TRIM COVER LH (w/o Rear Seat Entertainment System)** (See INSTALLATION)
39. **INSTALL POWER OUTLET SOCKET BEZEL (w/ Rear Seat Entertainment System)** (See INSTALLATION)
40. **INSTALL DECK SIDE TRIM LH** (See INSTALLATION)
41. **INSTALL DECK SIDE TRIM COVER LH** (See INSTALLATION)

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- 42. **INSTALL ROOF SIDE INNER GARNISH ASSEMBLY RH (w/o Rear No. 2 Seat) (See INSTALLATION)**
- 43. **INSTALL ROOF SIDE INNER GARNISH ASSEMBLY RH (w/ Rear No. 2 Seat) (See INSTALLATION)**
- 44. **INSTALL QUARTER PILLAR GARNISH RH (See INSTALLATION)**
- 45. **INSTALL DECK TRIM SIDE PANEL ASSEMBLY RH (See INSTALLATION)**
- 46. **CONNECT REAR NO. 1 SEAT OUTER BELT ASSEMBLY RH**

HINT:

Use the same procedure for the RH side and the LH side.

- 47. **INSTALL FRONT DECK SIDE TRIM COVER RH (See INSTALLATION)**
- 48. **INSTALL NO. 1 LUGGAGE COMPARTMENT TRIM HOOK (See INSTALLATION)**
- 49. **INSTALL ROPE HOOK ASSEMBLY (for RH Side) (See INSTALLATION)**
- 50. **INSTALL REAR COMBINATION LIGHT SERVICE COVER RH (See INSTALLATION)**
- 51. **INSTALL REAR ROOM TEMPERATURE SENSOR (w/ Rear Automatic Air Conditioning System) (See INSPECTION)**
- 52. **INSTALL SIDE TRIM COVER RH (w/o Rear Automatic Air Conditioning System) (See INSTALLATION)**
- 53. **INSTALL DECK SIDE TRIM RH (See INSTALLATION)**
- 54. **INSTALL DECK SIDE TRIM COVER RH (See INSTALLATION)**
- 55. **INSTALL REAR SEAT SIDE GARNISH CAP (w/o Rear Air Conditioning System) (See INSTALLATION)**
- 56. **INSTALL REAR SEAT SIDE GARNISH CAP (w/ Rear Air Conditioning System) (See INSTALLATION)**
- 57. **INSTALL REAR FLOOR FINISH PLATE (See INSTALLATION)**
- 58. **INSTALL REAR NO. 2 SEAT ASSEMBLY (w/ Rear No. 2 Seat) (See INSTALLATION)**
- 59. **CONNECT REAR SEAT LAP TYPE BELT ASSEMBLY LH (w/ Rear No. 2 Seat) (See INSTALLATION)**
- 60. **CONNECT REAR SEAT LAP TYPE BELT ASSEMBLY RH (w/ Rear No. 2 Seat) (See INSTALLATION)**
- 61. **INSTALL REAR NO. 2 SEAT INNER BELT ASSEMBLY (w/ Rear No. 2 Seat) (See INSTALLATION)**
- 62. **INSTALL REAR DECK FLOOR BOX (w/o Rear No. 2 Seat) (See INSTALLATION)**
- 63. **INSTALL DECK FLOOR BOARD ASSEMBLY (w/o Rear No. 2 Seat) (See INSTALLATION)**
- 64. **INSTALL REAR MAT (See INSTALLATION)**
- 65. **INSTALL DECK FLOOR BOARD ASSEMBLY (w/ Rear No. 2 Seat) (See INSTALLATION)**
- 66. **INSTALL DECK SIDE TRIM BOX LH (See INSTALLATION)**
- 67. **INSTALL REAR SEAT SIDE COVER LH (w/ Rear No. 2 Seat) (See INSTALLATION)**
- 68. **INSTALL DECK SIDE TRIM BOX RH (See INSTALLATION)**

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69. **INSTALL JACK CARRIER ASSEMBLY** (See INSTALLATION)
70. **INSTALL JACK ASSEMBLY** (See INSTALLATION)
71. **INSTALL JACK CARRIER CUSHION** (See INSTALLATION)
72. **INSTALL JACK CARRIER SUPPORT**
73. **INSTALL REAR SEAT SIDE COVER RH (w/ Rear No. 2 Seat)** (See INSTALLATION)
74. **INSTALL REAR NO. 1 FLOOR BOARD (w/o Rear No. 2 Seat)** (See INSTALLATION)
75. **INSTALL TONNEAU COVER ASSEMBLY (w/ Tonneau Cover)** (See INSTALLATION)
76. **INSTALL NO. 2 DECK BOARD SUB-ASSEMBLY** (See INSTALLATION)
77. **INSTALL NO. 3 DECK BOARD SUB-ASSEMBLY** (See INSTALLATION)
78. **INSTALL DECK BOARD ASSEMBLY** (See INSTALLATION)
79. **INSTALL CENTER PILLAR GARNISH LH** (See INSTALLATION)
80. **CONNECT FRONT SEAT OUTER BELT ASSEMBLY LH** (See INSTALLATION)
81. **INSTALL LOWER CENTER PILLAR GARNISH LH** (See INSTALLATION)
82. **INSTALL REAR DOOR OPENING TRIM WEATHERSTRIP LH** (See INSTALLATION)
83. **INSTALL REAR DOOR SCUFF PLATE LH** (See INSTALLATION)
84. **INSTALL FRONT DOOR OPENING TRIM WEATHERSTRIP LH** (See INSTALLATION)
85. **INSTALL COWL SIDE TRIM SUB-ASSEMBLY LH** (See INSTALLATION)
86. **INSTALL FRONT PILLAR GARNISH LH** (See INSTALLATION)
87. **INSTALL FRONT DOOR SCUFF PLATE LH** (See INSTALLATION)
88. **INSTALL CENTER PILLAR GARNISH RH** (See INSTALLATION)
89. **CONNECT FRONT SEAT OUTER BELT ASSEMBLY RH**

HINT:

Use the same procedure for the RH side and the LH side.

90. **INSTALL LOWER CENTER PILLAR GARNISH RH** (See INSTALLATION)
91. **INSTALL REAR DOOR OPENING TRIM WEATHERSTRIP RH** (See INSTALLATION)
92. **INSTALL REAR DOOR SCUFF PLATE RH** (See INSTALLATION)
93. **INSTALL FRONT DOOR OPENING TRIM WEATHERSTRIP RH** (See INSTALLATION)
94. **INSTALL FRONT DOOR SCUFF PLATE RH** (See INSTALLATION)
95. **INSTALL COWL SIDE TRIM SUB-ASSEMBLY RH** (See INSTALLATION)
96. **INSTALL FRONT PILLAR GARNISH RH** (See INSTALLATION)
97. **INSTALL REAR NO. 1 SEAT ASSEMBLY LH** (See INSTALLATION)
98. **CONNECT REAR NO. 1 SEAT LOCK CABLE ASSEMBLY LH (w/ Remote Folding Function)** (See INSTALLATION)
99. **INSPECT REAR SEAT SLIDE ADJUSTER LOCK (for LH Side)** (See INSTALLATION)
100. **INSTALL REAR SEAT LEG SIDE COVER LH** (See INSTALLATION)
101. **INSTALL REAR INNER TRACK BRACKET COVER LH** (See INSTALLATION)

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- 102. **INSTALL REAR OUTER TRACK BRACKET COVER LH** (See INSTALLATION)
- 103. **INSTALL REAR SEAT TRACK BRACKET COVER LH** (See INSTALLATION)
- 104. **INSTALL REAR SEAT HEADREST ASSEMBLY (for LH Side)** (See INSTALLATION)
- 105. **INSTALL REAR CENTER SEAT ASSEMBLY**
- 106. **INSTALL REAR NO. 1 SEAT ASSEMBLY RH** (See INSTALLATION)
- 107. **CONNECT REAR NO. 1 SEAT LOCK CABLE ASSEMBLY RH (w/ Remote Folding Function)**

HINT:

Use the same procedure for the RH side and the LH side.

- 108. **INSPECT REAR SEAT SLIDE ADJUSTER LOCK (for RH Side)** (See INSTALLATION)
- 109. **INSTALL REAR SEAT LEG SIDE COVER RH** (See INSTALLATION)
- 110. **INSTALL REAR INNER TRACK BRACKET COVER RH** (See INSTALLATION)
- 111. **INSTALL REAR OUTER TRACK BRACKET COVER RH** (See INSTALLATION)
- 112. **INSTALL REAR SEAT TRACK BRACKET COVER RH** (See INSTALLATION)
- 113. **INSTALL REAR SEAT HEADREST ASSEMBLY (for RH Side)** (See INSTALLATION)
- 114. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**

NOTE: When disconnecting the cable, some systems need to be initialized after the cable is reconnected (See INITIALIZATION).

- 115. **RESET SLIDING ROOF DRIVE GEAR ASSEMBLY**

(See INITIALIZATION)

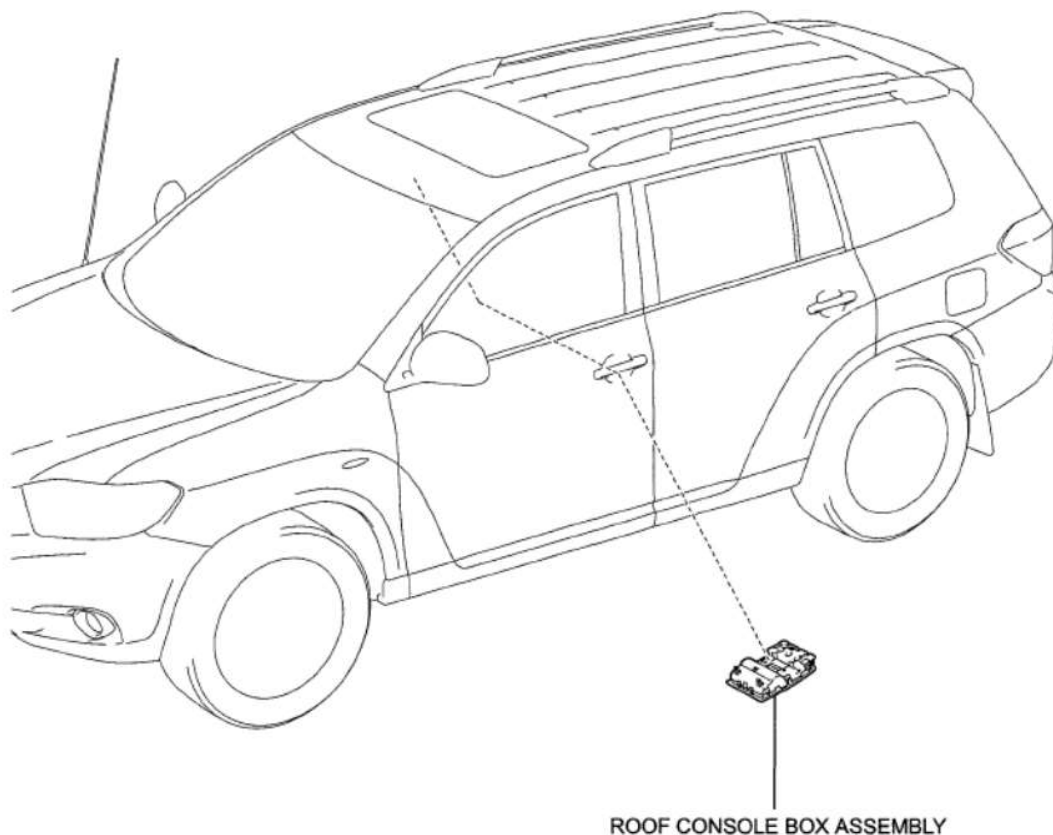
- 116. **INSPECT SLIDING ROOF SYSTEM** (See DIAGNOSTIC TROUBLE CODE CHART)
- 117. **INSPECT SRS WARNING LIGHT**

(See DIAGNOSIS SYSTEM)

SLIDING ROOF SWITCH ASSEMBLY**COMPONENTS**

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Fig. 60: Identifying Sliding Roof Switch Assembly Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

1. INSPECT ROOF CONSOLE BOX ASSEMBLY

- Remove the roof console box assembly.
- Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Switch Condition	Specified Condition
Q1-3 (CLS) - Q1-2 (GND)	CLOSE	Below 100 ohms
Q1-4 (OPN) - Q1-2 (GND)	OPEN	Below 100 ohms
Q1-5 (DOWN) - Q1-2 (GND)	DOWN	Below 100 ohms
Q1-6 (UP) - Q1-2 (GND)	UP	Below 100 ohms

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Q1-3 (CLS) - Q1-2 (GND)	OPEN	1 kohms or higher
Q1-4 (OPN) - Q1-2 (GND)	CLOSE	1 kohms or higher
Q1-5 (DOWN) - Q1-2 (GND)	UP	1 kohms or higher
Q1-6 (UP) - Q1-2 (GND)	DOWN	1 kohms or higher

If the result is not as specified, replace the roof console box assembly.

Component without harness connected:
(Roof Console Box Assembly)

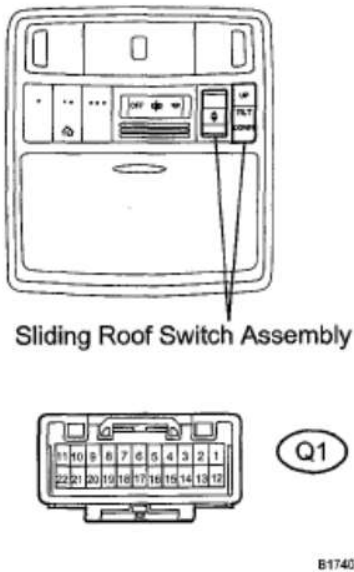


Fig. 61: Identifying Roof Console Box Assembly Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE ROOF CONSOLE BOX ASSEMBLY (See REMOVAL)

INSTALLATION

1. INSTALL ROOF CONSOLE BOX ASSEMBLY (See INSTALLATION)