

# SLIDING ROOF SYSTEM

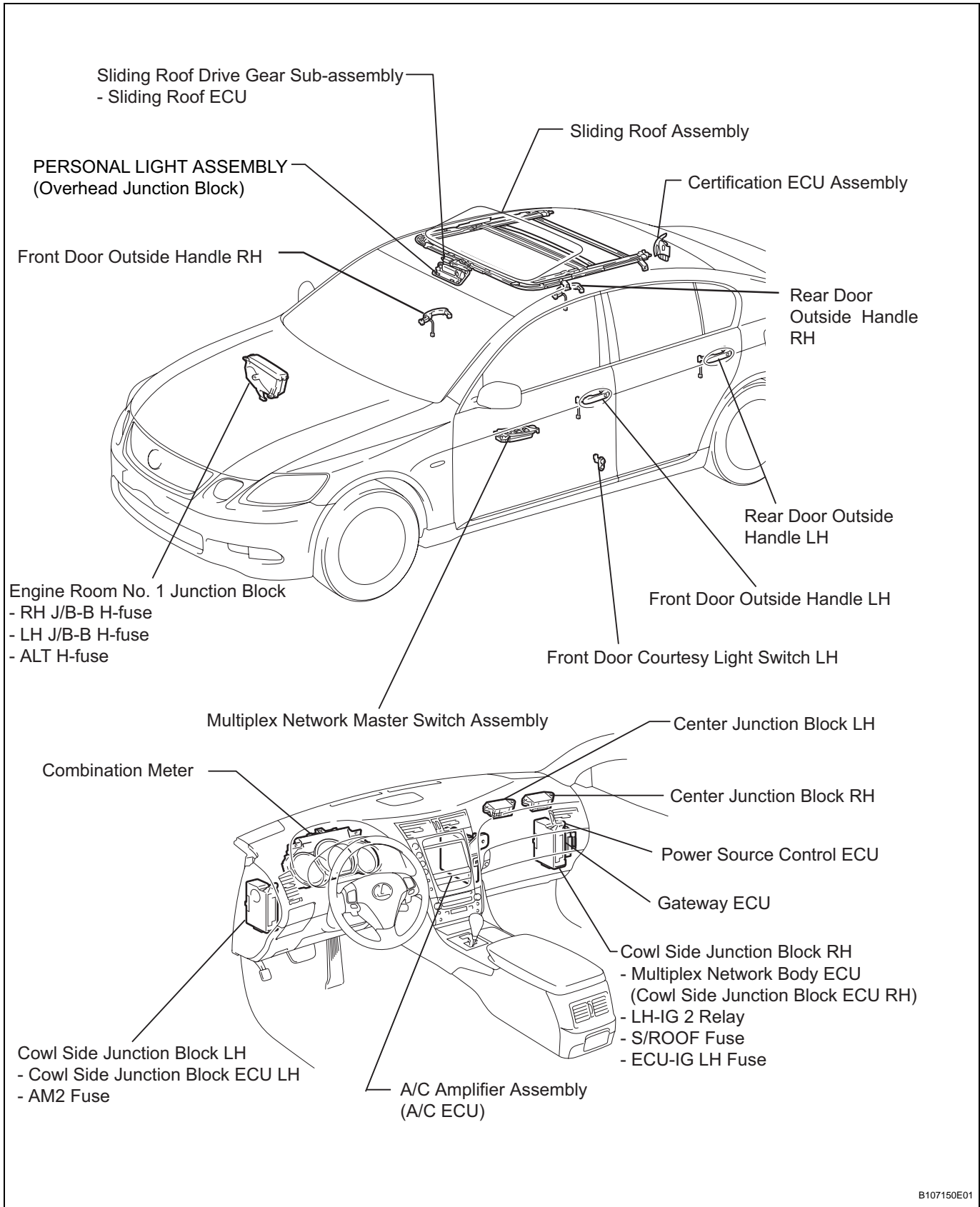
## PRECAUTION

### NOTICE:

When disconnecting the cable from the negative (-) battery terminal, initialize the following systems after the cable is reconnected.

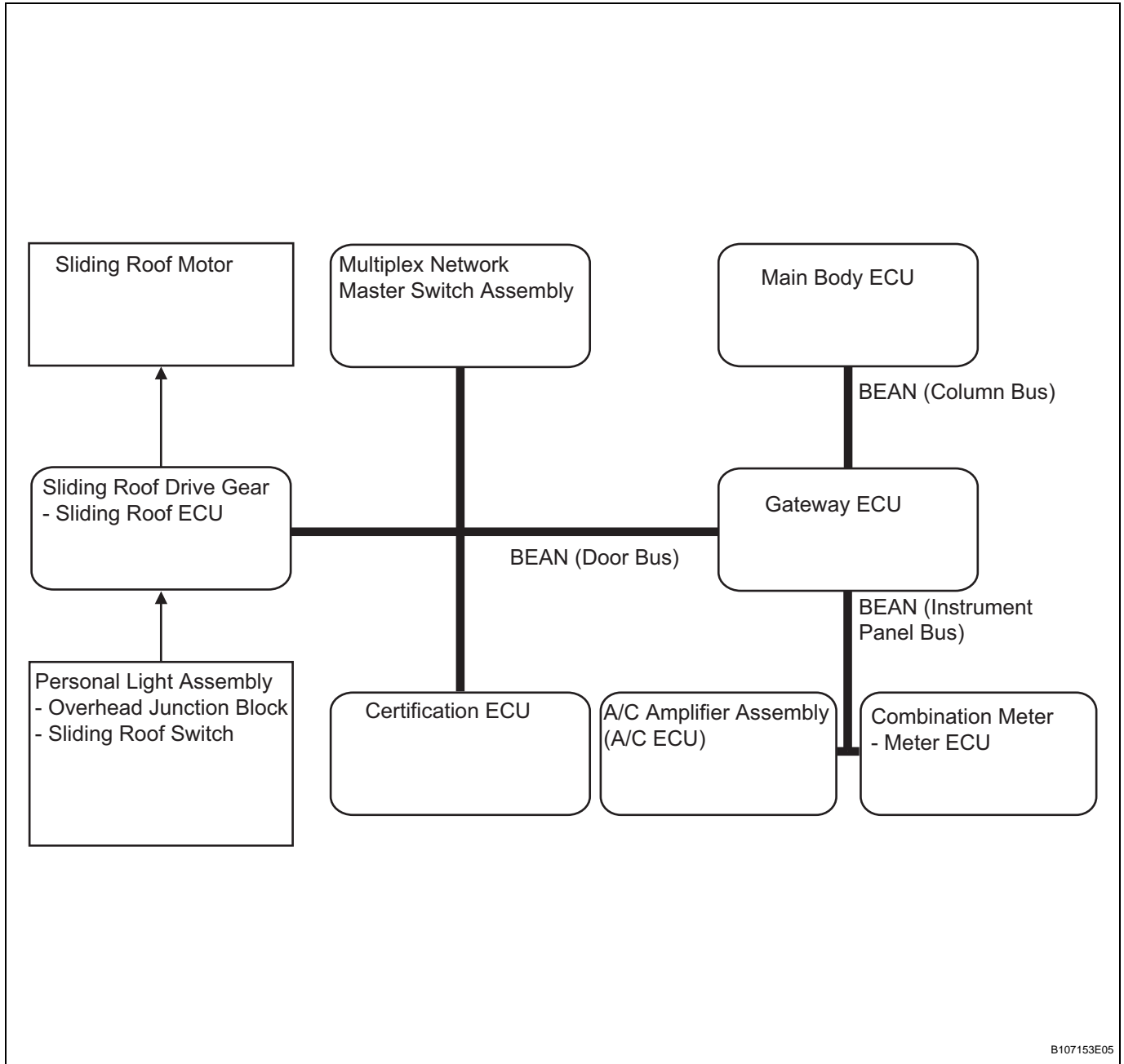
System Name	See procedure
Power Window Control System	<a href="#">IN-37</a>
Intuitive Parking Assist System	
Variable Gear Ratio Steering System	

# PARTS LOCATION



**RF**

# SYSTEM DIAGRAM



RF

B107153E05

**Communication table**

Sender	Receiver	Signal	Line
Sliding Roof ECU	Meter ECU	Warning Buzzer Signal	BEAN
Sliding Roof ECU	Meter ECU	Sliding roof TILT UP warning signal	BEAN
Sliding Roof ECU	Meter ECU	Sliding roof SLIDE OPEN warning signal	BEAN
Certification ECU	Sliding Roof ECU	Wireless operation signal	BEAN
Multiplex Network Master Switch ECU	Sliding Roof ECU	Key-linked sliding roof operation signal	BEAN
Multiplex Network Master Switch ECU	Sliding Roof ECU	Power window operation signal	BEAN
Main Body ECU	Sliding Roof ECU	Key-off operation signal	BEAN
Main Body ECU	Sliding Roof ECU	Doors status signal	BEAN

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Sender	Receiver	Signal	Line
Main Body ECU	Sliding Roof ECU	Security signal	BEAN
A/C Amplifier Assembly (A/C ECU)	Sliding Roof ECU	Outside temperature data signal	BEAN
Meter ECU	Sliding Roof ECU	Vehicle speed signal	BEAN

## SYSTEM DESCRIPTION

### 1. GENERAL

This system has the following functions: manual slide open and close; auto slide open and close; manual tilt up and down; jam protection; key off operation; key-linked open and close; and transmitter-linked open and close.

### 2. FUNCTION OF MAIN COMPONENT

Component	Outline
Sliding roof drive gear sub-assembly (Sliding roof ECU)	Sliding roof ECU controls sliding roof motor to rotate forward and backward, which tilts or slides sliding roof glass.
Overhead Junction Block	Output of operation signals from built-in sliding roof switch to sliding roof ECU are handled by overhead junction block.

### 3. SYSTEM OPERATION

The sliding roof has the following features.

Function	Outline
Manual slide open and close	This function causes sliding roof to open (or close) when SLIDE OPEN switch (or SLIDE CLOSE switch) is pressed for a maximum of 0.3 seconds. Sliding roof stops as soon as switch is released.
Auto slide open and close	This function causes sliding roof to be fully opened (or closed) when SLIDE OPEN switch (or SLIDE CLOSE 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 TILT UP switch (or TILT DOWN switch ) is pressed for a maximum of 0.3 seconds.
Auto tilt up and down	This function enables sliding roof to tilt up (or down) when TILT UP switch (or TILT DOWN switch) is pressed for a minimum of 0.3 seconds.
Jam protection	The jam protection function automatically stops sliding roof and makes it open halfway (or fully tilted up) if a foreign object gets jammed in sliding roof during auto close operation (or auto tilt down operation).
Key off operation	Key off operation function makes it possible to operate sliding roof for approximately 45 seconds after engine switch is turned off, if front doors are not opened.
Key-linked open and close	When key is not in vehicle, driver side door key is locked, and key inserted into driver side door key cylinder is turned and maintained in lock position for 3 seconds or more, sliding roof ECU activates sliding roof motor to close sliding roof while key is turned. Similarly, when driver side door is unlocked and key in driver side door is turned and maintained in unlock position for 3 seconds or more, sliding roof ECU activates sliding roof motor to open sliding roof.
Transmitter-linked open	When cowl side junction block RH ECU receives an unlock signal from key continuously for 3 seconds or more, sliding roof ECU activates sliding roof motor to open sliding roof.

## HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use these procedures to troubleshoot the sliding roof system.
- \*: Use the intelligent tester.

**1 VEHICLE BROUGHT TO WORKSHOP**

**NEXT**

**2 INSPECT BATTERY VOLTAGE**

**Standard voltage:**

**11 to 14 V**

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

**NEXT**

**3 INSPECT COMMUNICATION FUNCTION OF MULTIPLEX COMMUNICATION SYSTEM (BEAN)\***

(a) Using the intelligent tester, check if the Multiplex Communication System (MPX) is functioning normally.

**Result**

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

**B**

**Go to MULTIPLEX COMMUNICATION SYSTEM**

**A**

**4 PROBLEM SYMPTOMS TABLE**

**Result**

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

**B**

**Go to step 6**

**A**

**5 OVERALL ANALYSIS AND TROUBLESHOOTING\***

1. Data List / Active Test (See page [RF-12](#))

2. Terminals of ECU (See page [RF-10](#))
3. Operation Check (See page [RF-6](#))

NEXT

**6** ADJUST, REPAIR OR REPLACE

NEXT

**7** CONFIRMATION TEST

NEXT

END

## OPERATION CHECK

### 1. CHECK AUTO OPERATION

- (a) Turn the engine switch on (IG).
- (b) When the roof glass is fully closed, press the SLIDE OPEN switch for 0.3 seconds or more. Check that the roof glass automatically slides until it is fully opened.
- (c) When the roof glass is fully open, press the SLIDE CLOSE switch for 0.3 seconds or more. Check that the roof glass automatically slides until it is fully closed.
- (d) When the roof glass is fully closed, press the TILT UP switch for 0.3 seconds or more. Check that the roof glass automatically tilts until it is fully tilted upward.
- (e) When the roof glass is fully open, press the TILT DOWN switch for 0.3 seconds or more. Check that the roof glass automatically tilts until it is fully tilted downward.
- (f) 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 ENGINE SWITCH IS TURNED OFF

- (a) Turn the engine switch from on (IG) to off, and check that the sliding roof operates. Then open and close the driver side door once, and check that the sliding roof does not operate.
- (b) Turn the engine switch from on (IG) to off and wait for approximately 45 seconds. Check that the sliding roof does not operate.
- (c) Operate the auto (SLIDE OPEN / CLOSE or TILT UP / DOWN) operation. While the roof glass is in motion, turn the engine switch from on (IG) to off. Check that the auto operation continues until the roof glass opens or closes fully.

### 3. CHECK JAM PROTECTION FUNCTION

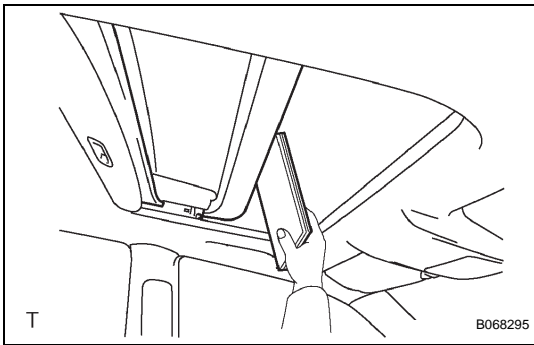
**CAUTION:**

- Do not use a part of your body, for example, your hand, to 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.

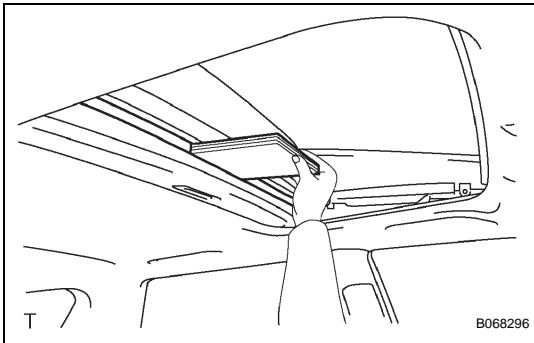
**NOTICE:**

- 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 (motor).





- (a) When the sliding roof auto operation is operating and an object is caught between the vehicle body and glass, check that the roof glass opens a distance of 218 mm (8.58 in.) from the point of contact with the object, or opens fully if an opening distance of 218 mm (8.58 in.) is not available.



- (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.

#### 4. CHECK TRANSMITTER-LINKED OPERATION FUNCTION

##### HINT:

The sliding roof's wireless operation can be customized to perform either the sliding roof sliding operation or tilting operation.

- (a) Close all the doors.
- (b) Hold down the transmitter's UNLOCK switch for approximately 3 seconds or more and check that the SLIDE OPEN / TILT UP operation occurs. Also, when the UNLOCK switch is released, check that the roof glass stops moving.

#### 5. CHECK KEY-LINKED OPERATION FUNCTION (DRIVER'S DOOR ONLY)

##### HINT:

The sliding roof's key-linked operation can be customized to perform either the sliding roof sliding operation or tilting operation.

- (a) Insert the key into the driver side door's key lock cylinder, and turn the key to the UNLOCK position for approximately 3 seconds or more. Check that the sliding roof starts moving (SLIDE OPEN / TILT UP operation). Then release the key and check that the sliding roof stops moving.
- (b) Insert the key into the driver side door's key lock cylinder, and turn the key to the LOCK position for approximately 3 seconds or more. Check that the sliding roof starts moving (SLIDE CLOSE / TILT DOWN operation). Then release the key and check that the sliding roof stops moving.

## CUSTOMIZE PARAMETERS

### CUSTOMIZING FUNCTION WITH INTELLIGENT TESTER (REFERENCE)

#### HINT:

The following items can be customized.

#### NOTICE:

- When the customer requests a change in a function, first make sure that the function can be customized.
- Be sure to make a note of the current settings before customizing.
- When troubleshooting a function, first make sure that the function is set to the default setting.

#### Sliding roof ECU

Display (Item)	Default	Contents	Setting
OPEN/DOOR KEY (Door key related OPEN)	ON	Function to manually open sliding roof linked with power window if holding driver side door key for 1.5 seconds or more to unlock position when engine switch is off	ON / OFF
CLOSE/DOOR KEY (Door key related CLOSE)	ON	Function to manually close sliding roof linked with power window if holding driver side door key for 1.5 seconds or more to lock position when engine switch is off	ON / OFF
OPEN/WIRELESS (Wireless key related OPEN)	ON	Function to manually open sliding roof linked with power window if pressing transmitter UNLOCK switch for 1.5 seconds or more when engine switch is off	ON / OFF
DOOR KEY OPER (Door key related operation)	SLIDE	Function to select tilt up or slide open of manual sliding roof operation linked with power window Activate by holding driver side door key for 1.5 seconds or more to unlock position when engine switch is off	TILT / SLIDE
WIRELESS OPER (Wireless key related operation)	SLIDE	Function to select tilt up or slide open of manual sliding roof operation linked with power window Activate by pressing on transmitter UNLOCK switch for 1.5 seconds or more when engine switch is off	TILT / SLIDE

## INITIALIZATION

### 1. RESET SLIDING ROOF SYSTEM

#### NOTICE:

When replacing the sliding roof drive gear or sliding roof related parts, the sliding roof drive gear requires initialization. If a reset is not executed, the following functions do not operate: auto operation, jam protection function, key off operation, key linked open and close, and transmitter-linked open and close.

- (a) Turn the engine switch on (IG).
- (b) If the sliding roof is opened, close it fully.
- (c) Push the SLIDE CLOSE switch or the TILT UP switch on the personal light, making the sliding roof operation as follows:  
Tilt up → Approximately 1 second → tilt down → slide open → slide close
- (d) Sliding roof stops at the fully closed position.
- (e) Finish the initialization.
- (f) Check that the operation works normally with AUTO operation.

#### NOTICE:

If the following conditions occur while operating, initialization will fail.

- Engine switch is turned off.
- Pushed switch is released while sliding roof is operating.
- Vehicle speed is 5 km/h (3 mph) or higher.
- Battery of sliding roof ECU is 1 V or higher.
- Communication is cut off.

#### HINT:

- If the sliding roof cannot fully close or its position has become misaligned, perform the initialization again.
- If the sliding roof TILT UP switch or SLIDE CLOSE switch is pressed and held until the roof glass has either stopped moving or started moving in the opposite direction, and then the switch is held for another 10 seconds or more, perform the initialization again.
- If the AUTO operation function and jam protection function do not operate after the drive gear has been reset, replace the sliding roof drive gear (sliding roof ECU).

## PROBLEM SYMPTOMS TABLE

### HINT:

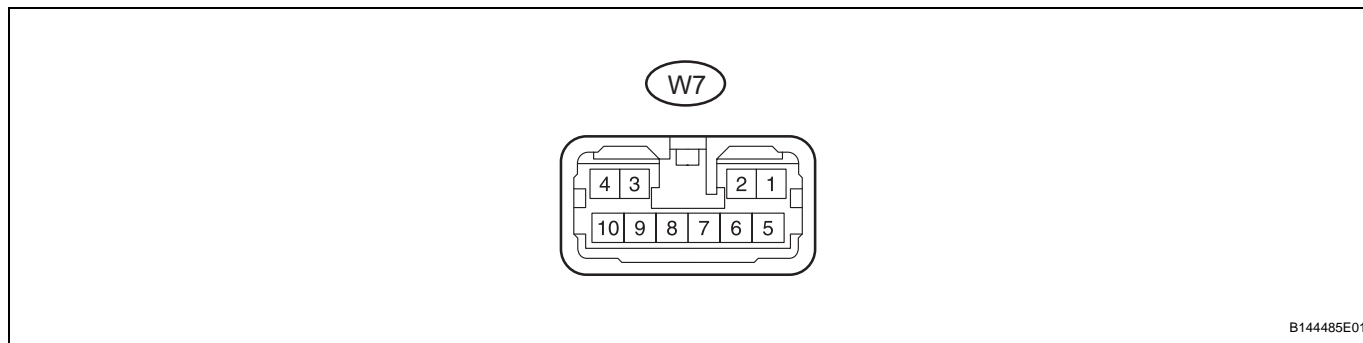
Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

### Sliding roof system

Symptom	Suspected Area	See page
Only sliding roof control system does not operate at all	Sliding roof ECU power source circuit	<a href="#">RF-18</a>
Only sliding roof TILT or SLIDE operation does not operate	Sliding roof control switch circuit	<a href="#">RF-14</a>
Wireless door lock operation does not operate	Sliding roof drive gear sub-assembly	-
	Wireless door control system	<a href="#">RF-4</a>
Key-linked and wireless operations do not operate	Sliding roof drive gear sub-assembly	-
	Power window control system	<a href="#">RF-4</a>

## TERMINALS OF ECU

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



B144485E01

- (a) Disconnect the W7 ECU connector.
- (b) Measure the resistance and voltage of the wire harness side connector.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
B (W7-5) - E (W7-7)	L - W-B	+B Power supply	Always	10 to 14 V
IG (W7-6) - E (W7-7)	V - W-B	Engine switch power supply	Engine switch off	Below 1 V
IG (W7-6) - E (W7-7)	V - W-B	Engine switch power supply	Engine switch on (IG)	10 to 14 V
OPN (W7-9) - E (W7-7)	B - W-B	Sliding roof motor open	SLIDE OPEN switch OFF	10 kΩ or higher
OPN (W7-9) - E (W7-7)	B - W-B	Sliding roof motor open	SLIDE OPEN switch ON	Below 1 Ω
CLS (W7-8) - E (W7-7)	SB - W-B	Sliding roof motor close	SLIDE CLOSE switch OFF	10 kΩ or higher
CLS (W7-8) - E (W7-7)	SB - W-B	Sliding roof motor close	SLIDE CLOSE switch ON	Below 1 Ω
UP (W7-3) - E (W7-7)	O - W-B	Sliding roof motor up	TILT UP switch OFF	10 kΩ or higher
UP (W7-3) - E (W7-7)	O - W-B	Sliding roof motor up	TILT UP switch ON	Below 1 Ω
DWN (W7-4) - E (W7-7)	L - W-B	Sliding roof motor down	TILT DOWN switch OFF	10 kΩ or higher
DWN (W7-4) - E (W7-7)	L - W-B	Sliding roof motor down	TILT DOWN switch ON	Below 1 Ω
E (W7-7) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

- (c) Reconnect the W7 ECU connector.
- (d) Measure the voltage of the connector.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
OPN (W7-9) - E (W7-7)	B - W-B	Sliding roof motor open	Engine switch on (IG), sliding roof closed, SLIDE OPEN switch OFF	Below 1 V
OPN (W7-9) - E (W7-7)	B - W-B	Sliding roof motor open	Engine switch on (IG), sliding roof closed, SLIDE OPEN switch ON	10 to 14 V
CLS (W7-8) - E (W7-7)	SB - W-B	Sliding roof motor close	Engine switch on (IG), sliding roof open, SLIDE CLOSE switch OFF	Below 1 V
CLS (W7-8) - E (W7-7)	SB - W-B	Sliding roof motor close	Engine switch on (IG), sliding roof open, SLIDE CLOSE switch ON	10 to 14 V
UP (W7-3) - E (W7-7)	O - W-B	Sliding roof motor up	Engine switch on (IG), sliding roof tilted downward, TILT UP switch OFF	Below 1 V

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Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
UP (W7-3) - E (W7-7)	O - W-B	Sliding roof motor up	Engine switch on (IG), sliding roof tilted downward, TILT UP switch ON	10 to 14 V
DWN (W7-4) - E (W7-7)	L - W-B	Sliding roof motor down	Engine switch on (IG), sliding roof tilted upward, TILT DOWN switch OFF	Below 1 V
DWN (W7-4) - E (W7-7)	L - W-B	Sliding roof motor down	Engine switch on (IG), sliding roof tilted upward, TILT DOWN switch ON	10 to 14 V

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

## DIAGNOSIS SYSTEM

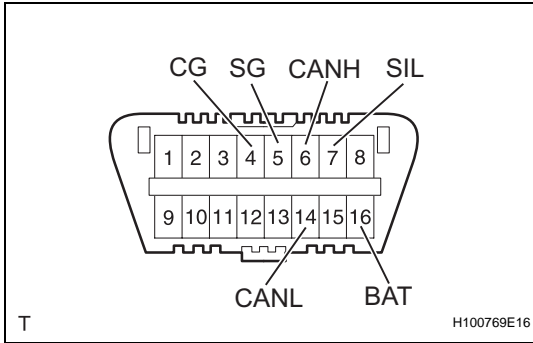
### 1. DESCRIPTION

- (a) Sliding roof system data and Diagnostic Trouble Codes (DTCs) can be read through the vehicle's Data Link Connector 3 (DLC3). When the system seems to be malfunctioning, use the intelligent tester to check for malfunctions and perform repairs.

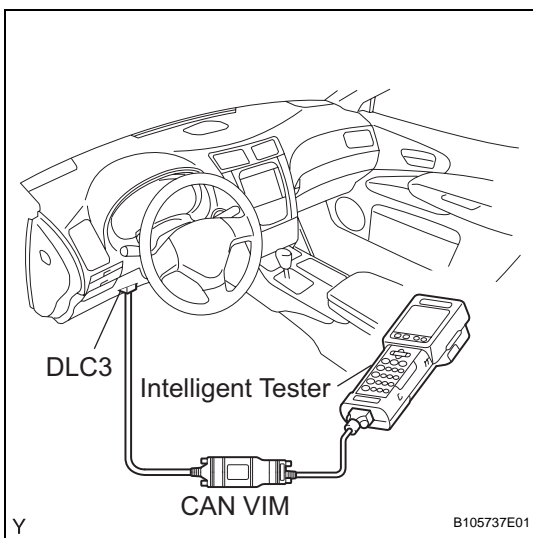
### 2. CHECK DLC3

**HINT:**

The vehicle uses ISO 9141-2 communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 9141-2 format.



Symbols (Terminal No.)	Terminal Description	Condition	Specified Condition
SIL (7) - SG (5)	Bus "+" line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) - Body ground	Battery positive	Always	11 to 14 V
CANH (6) - CANL (14)	CAN bus line	Engine switch OFF*	54 to 69 Ω
CANH (6) - CG (4)	HIGH-level CAN bus line	Engine switch OFF*	200 Ω or more
CANL (14) - CG (4)	LOW-level CAN bus line	Engine switch OFF*	200 Ω or more
CANH (6) - BAT (16)	HIGH-level CAN bus line	Engine switch OFF*	6 kΩ or more
CANL (14) - BAT (16)	LOW-level CAN bus line	Engine switch OFF*	6 kΩ or more



If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.

**HINT:**

Connect the cable of the intelligent tester to the DLC3, turn the engine switch on (IG) and attempt to use the tester. If the display indicates that a communication error has occurred, there is a problem either with the vehicle or with the tester.

- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
- If communication is still not possible when the tester is connected to another vehicle, the problem may be in the tester itself. Consult the Service Department listed in the tester's instruction manual.

## DATA LIST / ACTIVE TEST

### 1. READ DATA LIST

#### HINT:

Using the intelligent tester'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 the intelligent tester to the DLC3.
- (b) Turn the engine switch on (IG).
- (c) Read the DATA LIST according to the display on the tester.

### Sliding roof ECU

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
DOWN SW	Tilt switch down signal / ON or OFF	ON: TILT DOWN switch is pressed OFF: TILT DOWN switch is not pressed	-
UP SW	Tilt switch up signal / ON or OFF	ON: TILT UP switch is pressed OFF: TILT UP switch is not pressed	-
CLOSE SW	Slide switch close signal / ON or OFF	ON: SLIDE CLOSE switch is pressed OFF: SLIDE CLOSE switch is not pressed	-
OPEN SW	Slide switch open signal / ON or OFF	ON: SLIDE OPEN switch is pressed OFF: SLIDE OPEN switch is not pressed	-
WIRLES CL OPRT	Wireless sliding roof open signal / ON or OFF	ON: Transmitter LOCK switch is pressed OFF: Transmitter LOCK switch is not pressed	-
WIRLES OPN OPRT	Wireless sliding roof close signal / ON or OFF	ON: Transmitter UNLOCK switch is pressed OFF: Transmitter UNLOCK switch is not pressed	-
KEY CLOSE OPERT	Key-linked sliding roof close signal / ON or OFF	ON: Door LOCK is turned to close position using key OFF: Door LOCK is not turned	-
KEY OPEN OPERT	Key-linked sliding roof open signal / ON or OFF	ON: Door UNLOCK is turned to close position using key OFF: Door UNLOCK is not turned	-
D-DOOR WARN SW	Driver side door courtesy light switch signal / ON or OFF	ON: Driver side door is open OFF: Driver side door is closed	-
IG (MPX)	Engine switch signal (MPX signal) / ON or OFF	ON: Engine switch is on (IG) OFF: Engine switch is off	-
IG (DIRCT SIG)	Engine switch signal (Direct signal) / ON or OFF	ON: Engine switch is on (IG) OFF: Engine switch is off	-
WIRELESS OPER	Wireless Key Rel Operation / Tilt or Slide	TILT: Sliding roof (TILT) operates SLIDE: Sliding roof (SLIDE) operates	-
DOOR KEY OPER	Door Key Related Operation / Tilt or Slide	TILT: Sliding roof (TILT) operates SLIDE: Sliding roof (SLIDE) operates	-
OPEN / WIRELESS	Wireless Key Rel (Open) / Available or Not available	AVAIL: Sliding roof operation is available NOT A: Sliding roof operation is not available	-



Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
CLOSE / DOOR KEY	Door Key Related (Close) / Available or Not available	AVAIL: Sliding roof operation is available NOT A: Sliding roof operation is not available	-
OPEN / DOOR KEY	Door Key Related (Open) / Available or Not available	AVAIL: Sliding roof operation is available NOT A: Sliding roof operation is not available	-

## 2. PERFORM ACTIVE TEST

### HINT:

Performing the intelligent tester'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 the intelligent tester to the DLC3.
- (b) Turn the engine switch on (IG).
- (c) Perform the ACTIVE TEST according to the display on the tester.

### Sliding roof ECU

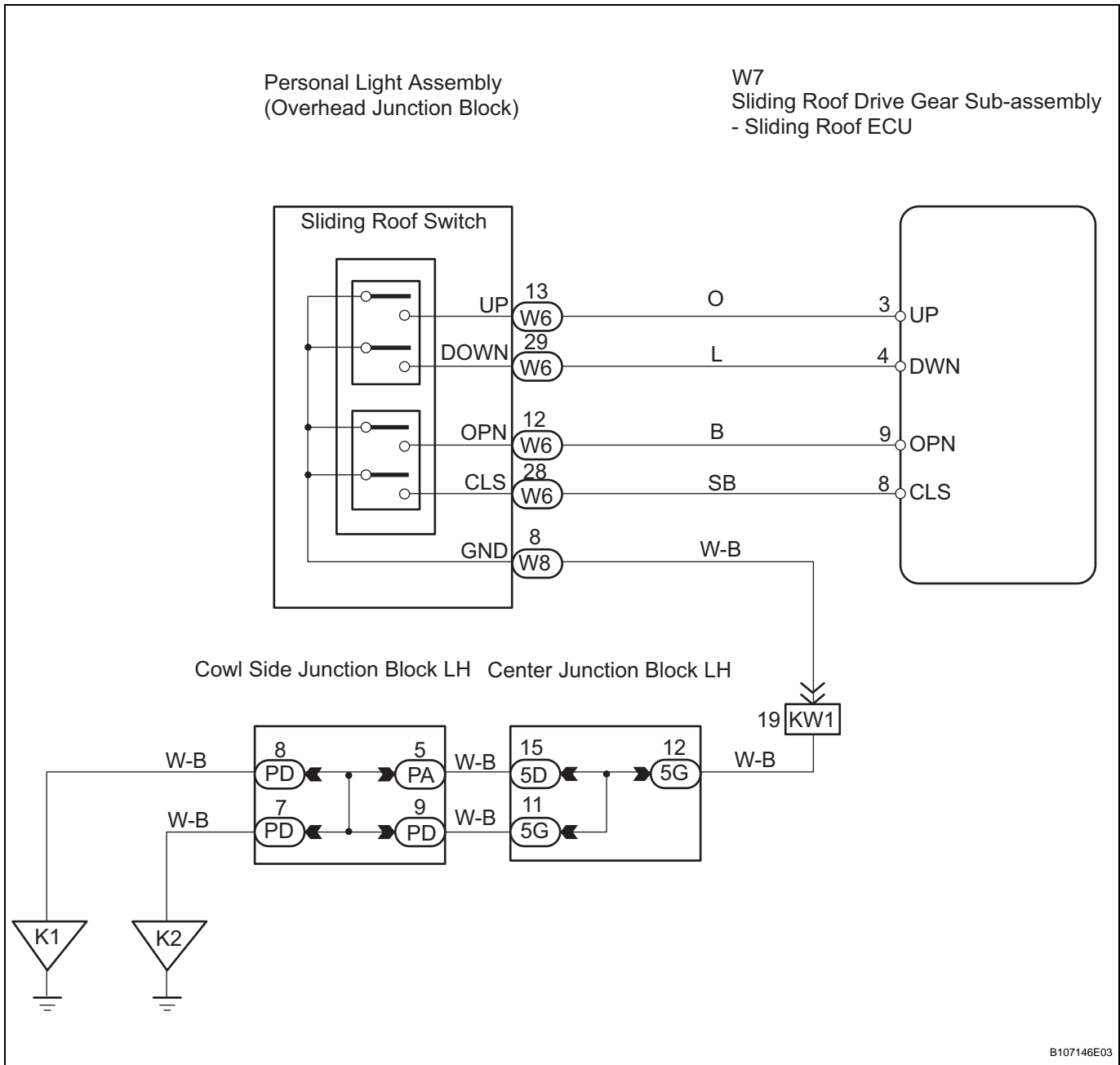
Tester Display	Test Part	Control Range
SLIDING ROOF	Operate sliding roof SLIDE CLOSE / TILT UP	CLOS / UP: Sliding roof SLIDE CLOSE or TILT UP operation occurs OFF: Sliding roof is not operating
SLIDING ROOF	Operate sliding roof SLIDE OPEN / TILT DOWN	OPN / DWN: Sliding roof SLIDE OPEN or TILT DOWN operation occurs OFF: Sliding roof is not operating

# Sliding Roof Control Switch Circuit

## DESCRIPTION

The sliding roof drive gear (sliding roof ECU) receives slide switch and tilt switch signals and drives its built-in motor.

## WIRING DIAGRAM



RF

## INSPECTION PROCEDURE

**1** PERFORM ACTIVE TEST BY INTELLIGENT TESTER (SLIDING ROOF OPERATION)

- (a) Select the ACTIVE TEST, use the intelligent tester to generate a control command, and then check that the sliding roof slides open / close and tilts up / down.

## Sliding roof ECU

Item	Test Details	Diagnostic Note
SLIDING 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	-
SLIDING 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.

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**PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SLIDING ROOF ECU) (See page RF-9)**

OK

RF

**2** READ VALUE OF INTELLIGENT TESTER (SLIDING ROOF SWITCH)

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

## Sliding roof ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
DOWN SW	Tilt switch down signal / ON or OFF	ON: TILT DOWN switch is pressed OFF: TILT DOWN switch is not pressed	-
UP SW	Tilt switch up signal / ON or OFF	ON: TILT UP switch is pressed OFF: TILT DOWN switch is not pressed	-
CLOSE SW	Slide switch close signal / ON or OFF	ON: SLIDE CLOSE switch is pressed OFF: SLIDE CLOSE switch is not pressed	-
OPEN SW	Slide switch open signal / ON or OFF	ON: SLIDE OPEN switch is pressed OFF: SLIDE OPEN switch is not pressed	-

OK:

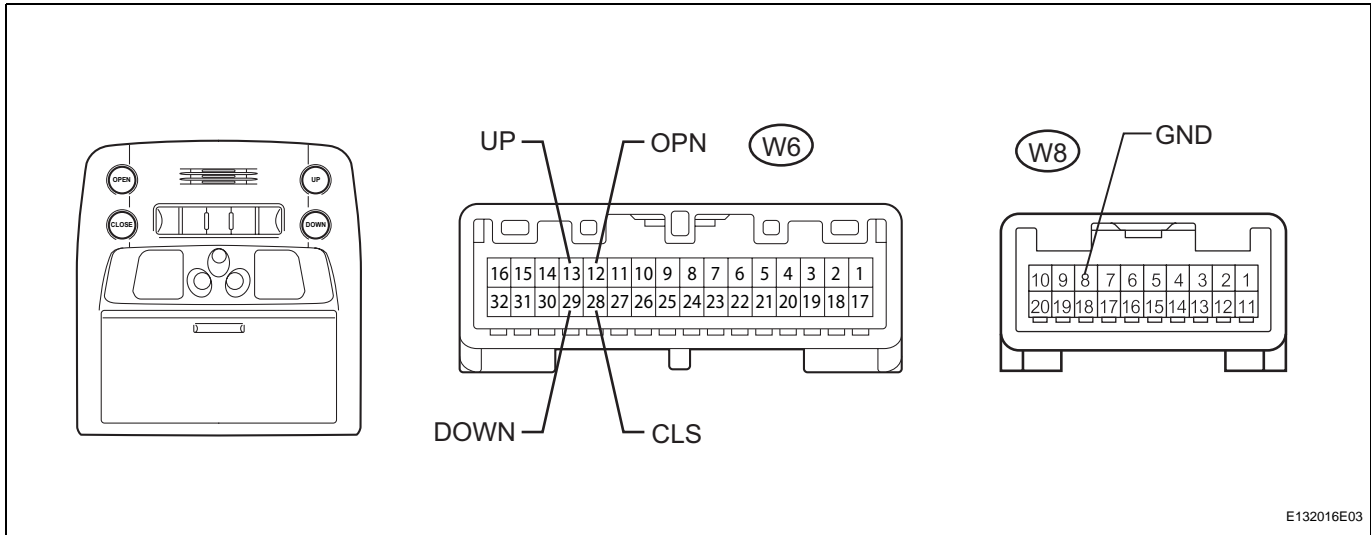
When the switch is operating, the intelligent tester should display as shown in the table.

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SLIDING ROOF ECU) (See page RF-9)

NG

### 3 INSPECT PERSONAL LIGHT ASSEMBLY (SLIDING ROOF SWITCH)



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- Remove the personal light.
- Measure the resistance of the connector.

#### Standard resistance

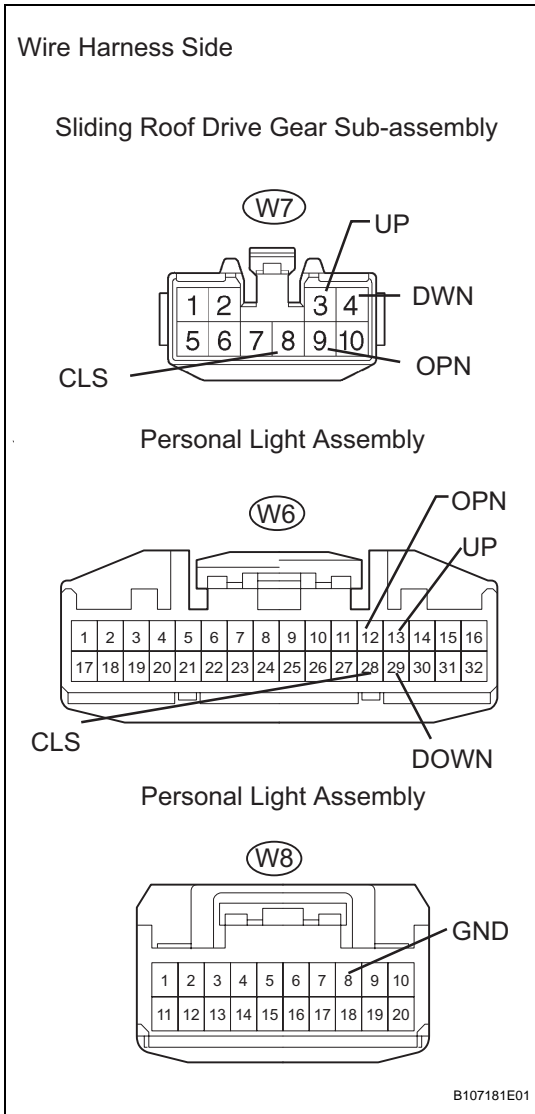
Tester Connection	Switch Condition	Specified Condition
W6-13 (UP) - W8-8 (B)	TILT UP	Below 1 $\Omega$
W6-13 (UP) - W8-8 (B)	Off	10 k $\Omega$ or higher
W6-29 (DOWN) - W8-8 (B)	TILT DOWN	Below 1 $\Omega$
W6-29 (DOWN) - W8-8 (B)	Off	10 k $\Omega$ or higher
W6-12 (OPN) - W8-8 (B)	SLIDE OPEN	Below 1 $\Omega$
W6-12 (OPN) - W8-8 (B)	Off	10 k $\Omega$ or higher
W6-28 (CLS) - W8-8 (B)	SLIDE CLOSE	Below 1 $\Omega$
W6-28 (CLS) - W8-8 (B)	Off	10 k $\Omega$ or higher

NG

REPLACE PERSONAL LIGHT ASSEMBLY

OK

**4 CHECK WIRE HARNESS (PERSONAL LIGHT ASSEMBLY - DRIVE GEAR AND BODY GROUND)**



- (a) Disconnect the W6 and W8 personal light connectors.
- (b) Disconnect the W7 drive gear connector.
- (c) Measure the resistance of the wire harness side connector.

**Standard resistance**

Tester Connection	Specified Condition
W6-13 (UP) - W7-3 (UP)	Below 1 Ω
W6-29 (DOWN) - W7-4 (DWN)	Below 1 Ω
W6-12 (OPN) - W7-9 (OPN)	Below 1 Ω
W6-28 (CLS) - W7-8 (CLS)	Below 1 Ω
W8-8 (GND) - Body ground	Below 1 Ω

**NG** REPAIR OR REPLACE HARNESS AND CONNECTOR

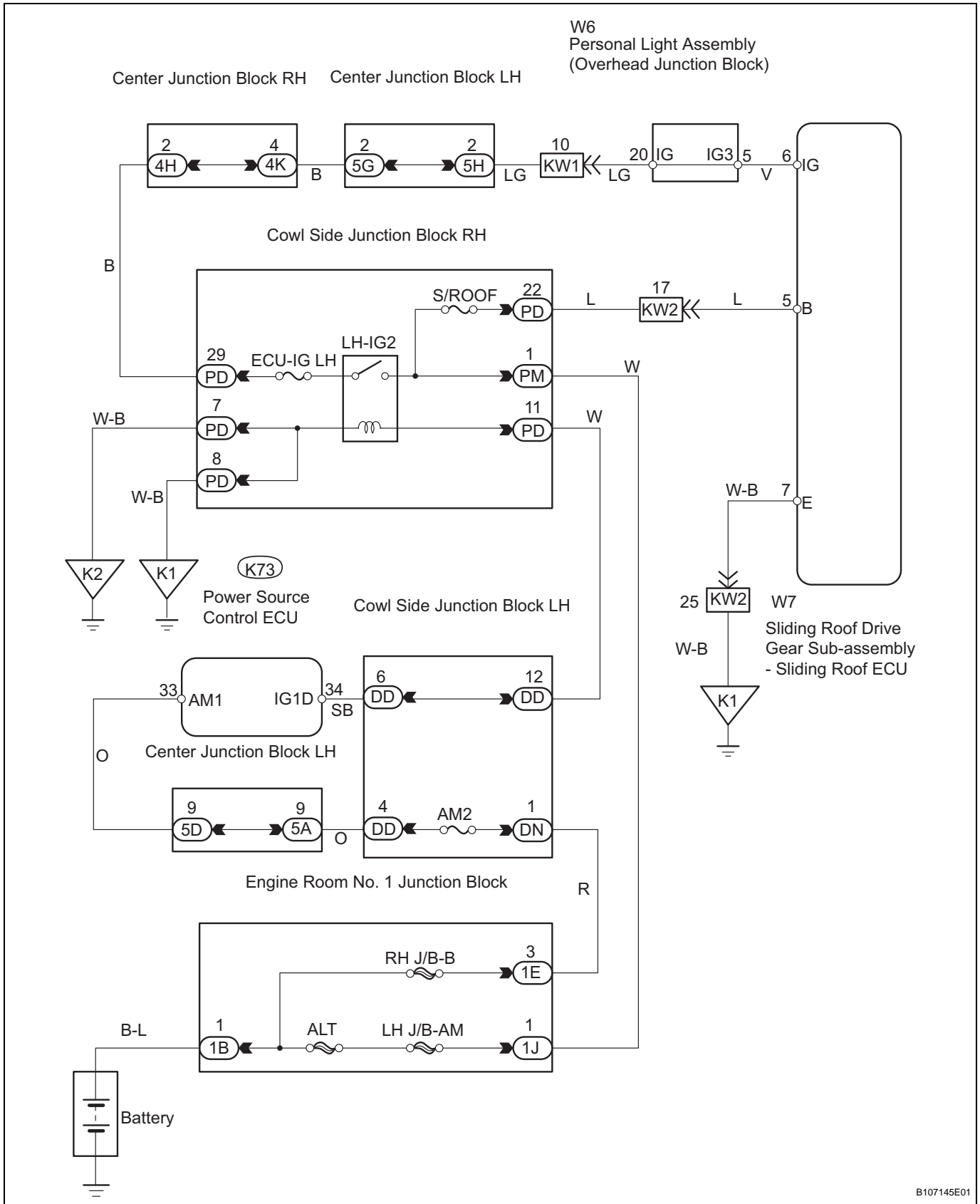
**OK**

**PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SLIDING ROOF ECU) (See page RF-9)**

**Sliding Roof ECU Power Source Circuit****DESCRIPTION**

The sliding roof ECU receives signals from the sliding roof switch and activates the sliding roof. However, fuse, wire harness or sliding roof ECU malfunctions may cause the sliding roof system to stop operating.

WIRING DIAGRAM



RF

## INSPECTION PROCEDURE

**1 PERFORM ACTIVE TEST BY INTELLIGENT TESTER (SLIDING ROOF OPERATION)**

- (a) Select the ACTIVE TEST, use the intelligent tester to generate a control command, and then check that the sliding roof operates normally.

## Sliding roof ECU

Item	Test Details	Diagnostic Note
SLIDING 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	-
SLIDING ROOF	Operate sliding roof SLIDE OPEN / TILT DOWN OPEN / DOWN: Sliding roof SLIDE OPEN or TILT DOWN operation occurs OFF: Sliding roof is not operating	-

OK

**PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SLIDING ROOF ECU) (See page [RF-9](#))**

NG

**2 INSPECT FUSE (S/ROOF, ECU-IG LH, AM2)**

- (a) Remove the S/ROOF and ECU-IG LH fuses from the cowl side junction block LH.  
 (b) Remove the AM2 fuse from the cowl side junction block RH.  
 (c) Measure the resistance of the fuses.

**Standard resistance:**  
**Below 1 Ω**

NG

**REPLACE FUSE**

OK

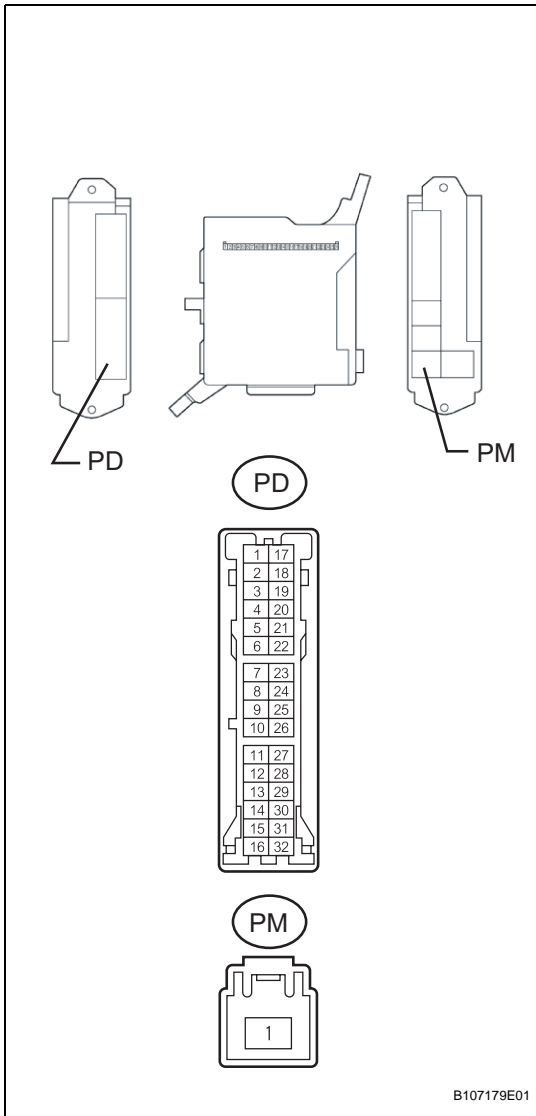


**3 INSPECT MAIN BODY ECU LH (LH-IG2)**

- (a) Disconnect the PD and PM junction block connectors.
- (b) Measure the resistance of the connectors.

**Standard resistance**

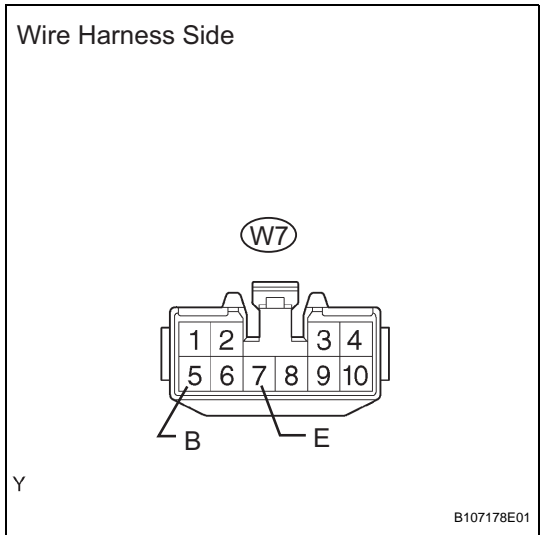
Tester Connection	Specified Condition
PD-29 - PM-1	10 kΩ or higher
PD-29 - PM-1	Below 1 Ω (when battery voltage is applied to terminals PD-11 to PD-7 or PD-8)



**NG** → **REPLACE MAIN BODY ECU LH**

**OK**

**4 CHECK WIRE HARNESS (SLIDING ROOF DRIVE GEAR - BATTERY AND BODY GROUND)**



- (a) Disconnect the W7 drive gear connector.
- (b) Measure the resistance and voltage of the wire harness side connector.

**Standard resistance**

Tester Connection	Specified Condition
W7-7 (E) - Body ground	Below 1 Ω

**Standard voltage**

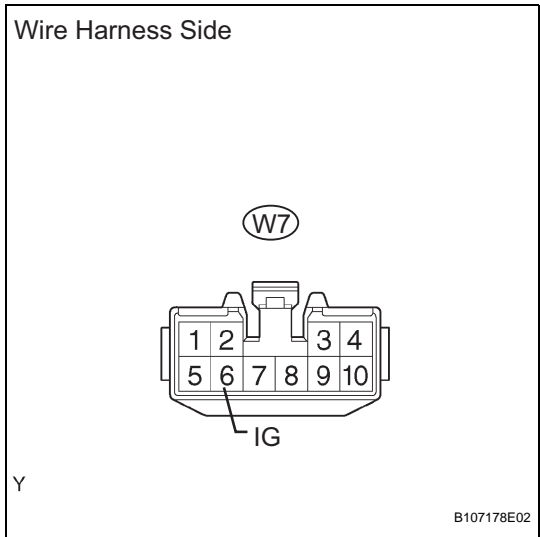
Tester Connection	Specified Condition
W7-5 (B) - Body ground	10 to 14 V

**NG** → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

**OK**

**5 CHECK WIRE HARNESS (SLIDING ROOF DRIVE GEAR - BODY GROUND)**

**RF**



- (a) Disconnect the W7 drive gear connector.
- (b) Measure the voltage of the wire harness side connector.

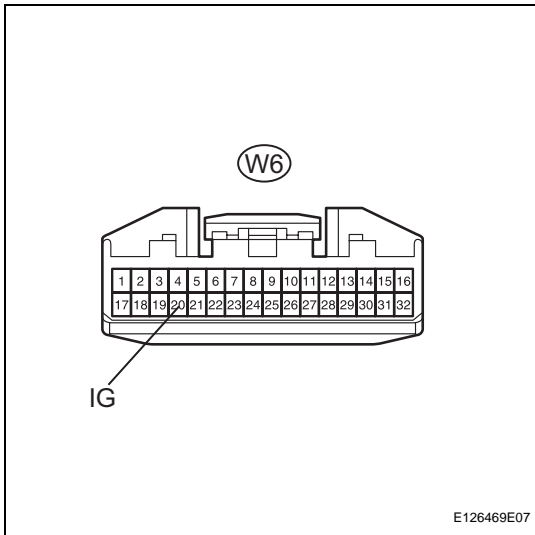
**Standard voltage**

Tester Connection	Switch Condition	Specified Condition
W7-6 (IG) - Body ground	Engine switch off	Below 1 V
W7-6 (IG) - Body ground	Engine switch on (IG)	10 to 14 V

**OK** → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SLIDING ROOF ECU) (See page RF-9)**

**NG**

**6 CHECK WIRE HARNESS (PERSONAL LIGHT ASSEMBLY - BODY GROUND)**



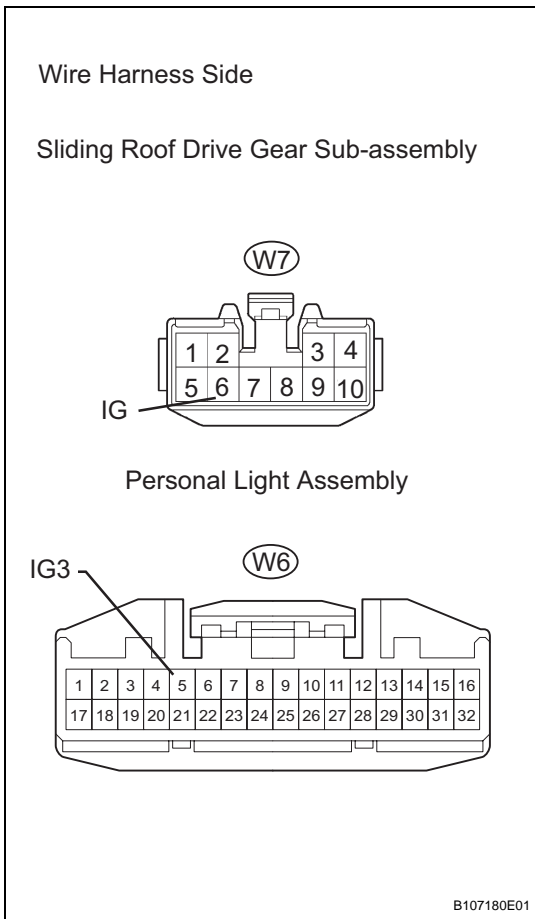
- (a) Disconnect the W6 personal light connector.
  - (b) Measure the voltage of the wire harness side connector.
- Standard voltage**

Tester Connection	Switch Condition	Specified Condition
W6-20 (IG) - Body ground	Engine switch off	Below 1 V
W6-20 (IG) - Body ground	Engine switch on (IG)	10 to 14 V

**NG** REPAIR OR REPLACE HARNESS AND CONNECTOR

**OK**

**7 CHECK WIRE HARNESS (PERSONAL LIGHT ASSEMBLY - SLIDING ROOF DRIVE GEAR)**



- (a) Disconnect the W7 drive gear connector.
  - (b) Disconnect the W6 personal light connector.
  - (c) Measure the resistance of the wire harness side connector.
- Standard resistance**

Tester Connection	Specified Condition
W6-5 (IG3) - W7-6 (IG)	Below 1 Ω

**NG** REPAIR OR REPLACE HARNESS AND CONNECTOR

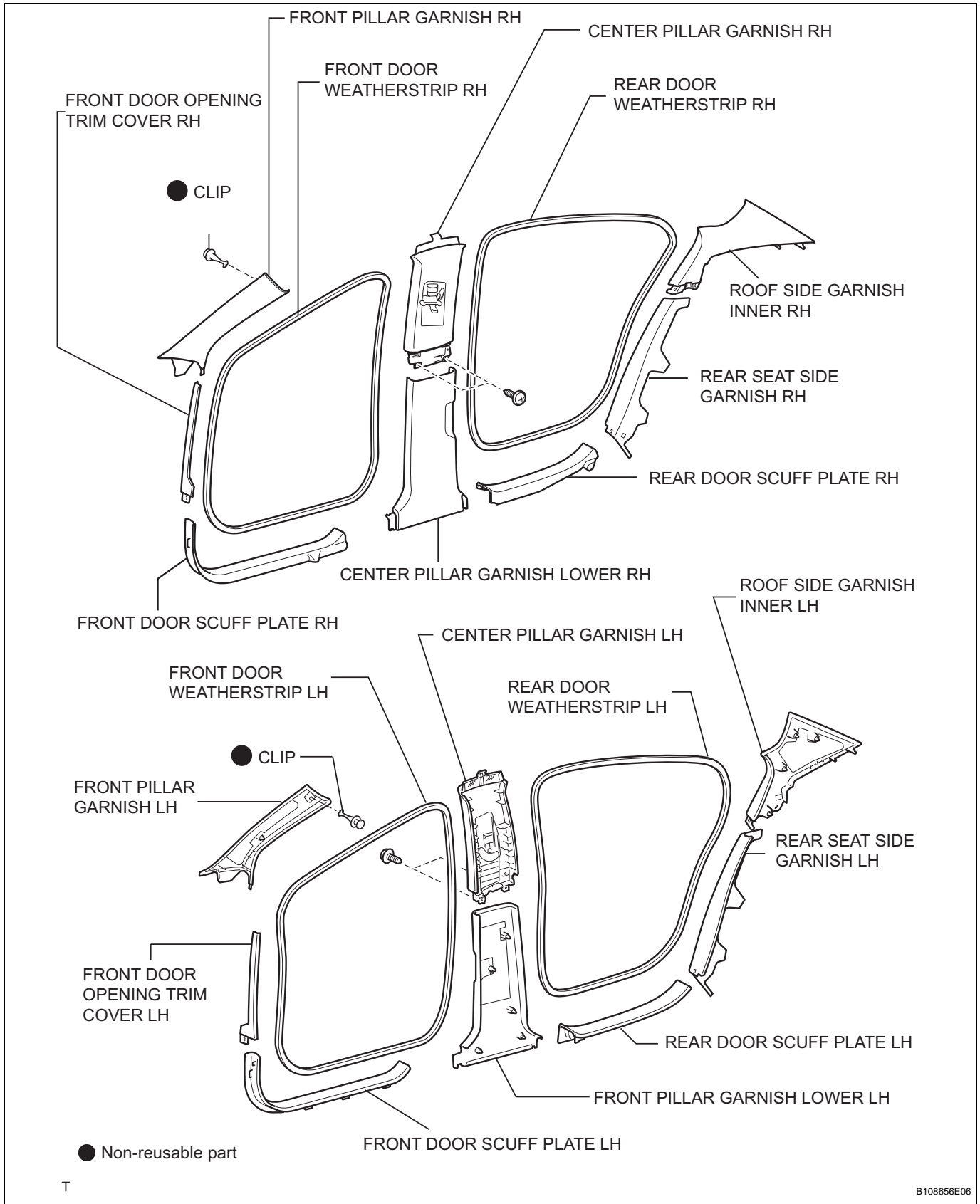
**RF**

OK

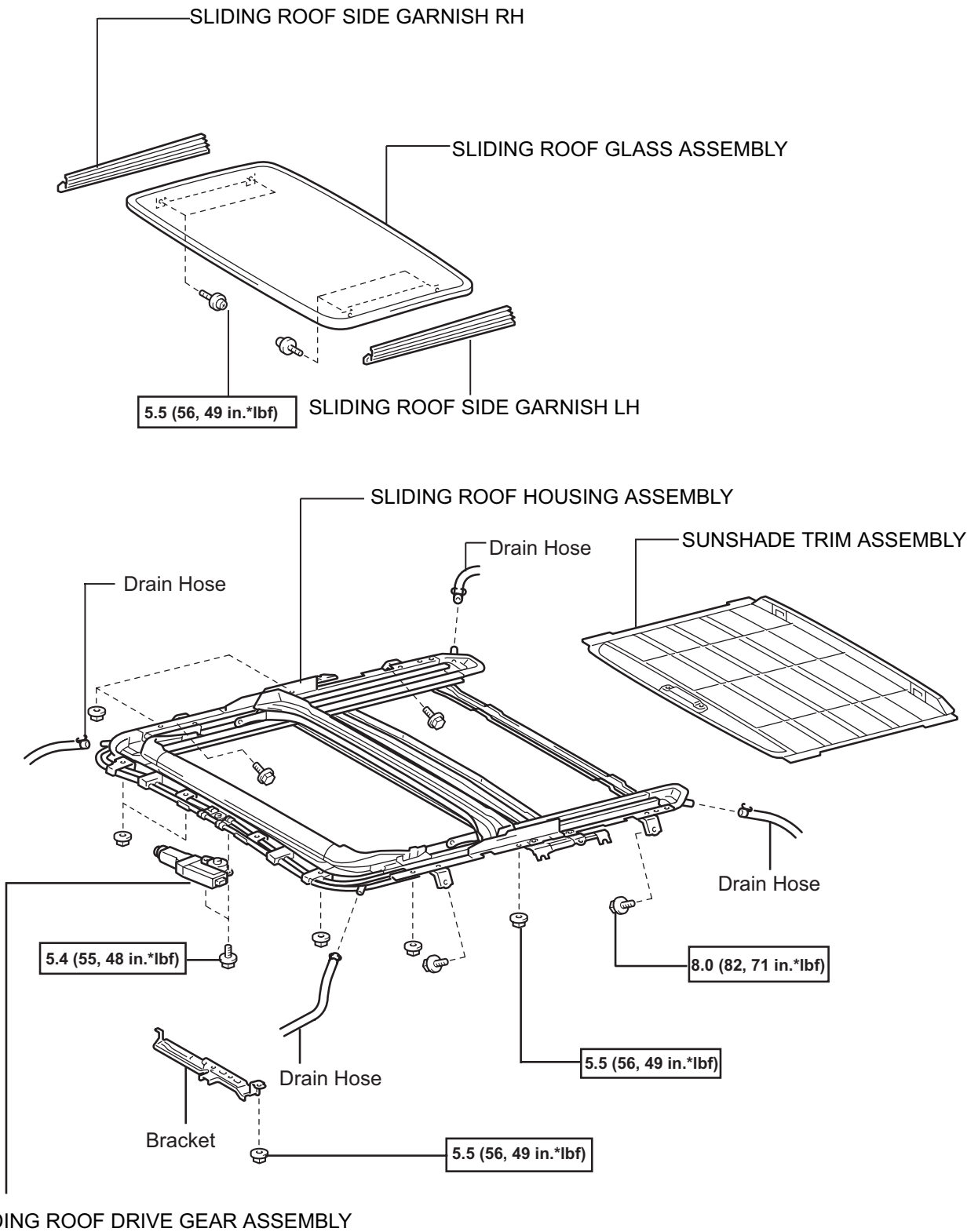
REPLACE PERSONAL LIGHT ASSEMBLY

# SLIDING ROOF HOUSING

## COMPONENTS

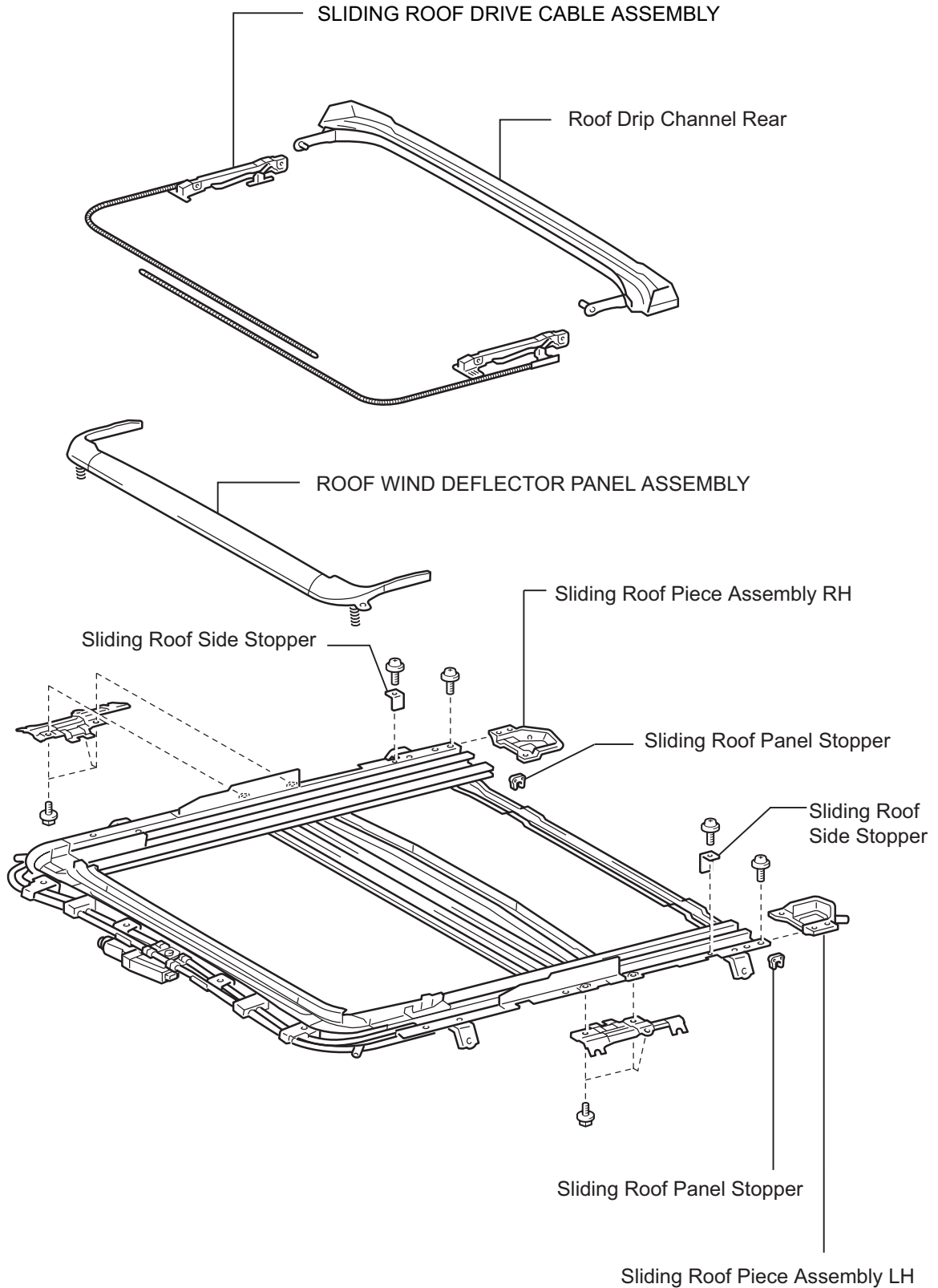






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**N\*m (kgf\*cm, ft\*lbf)** : Specified torque



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## REMOVAL

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

**CAUTION:**

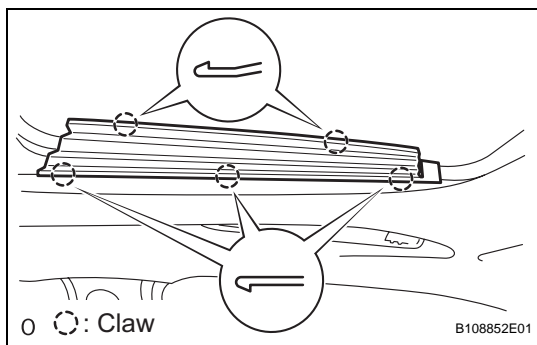
Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

2. **REMOVE ROOF HEADLINING ASSEMBLY**

**NOTICE:**

After removing the roof headlining, connect the cable to the negative (-) battery terminal and reconnect the map light connector.

Remove the roof headlining. (See page [IR-32](#))



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

(a) Tilt up the roof glass.

(b) Detach the 5 claws and remove the side garnish.

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

**NOTICE:**

Use the same procedures described for the LH side.

5. **REMOVE SLIDING ROOF GLASS ASSEMBLY**

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

(b) After removing the roof glass, disconnect the cable from the negative (-) battery terminal and disconnect 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 to avoid injuries whenever performing work between the roof glass and frame.

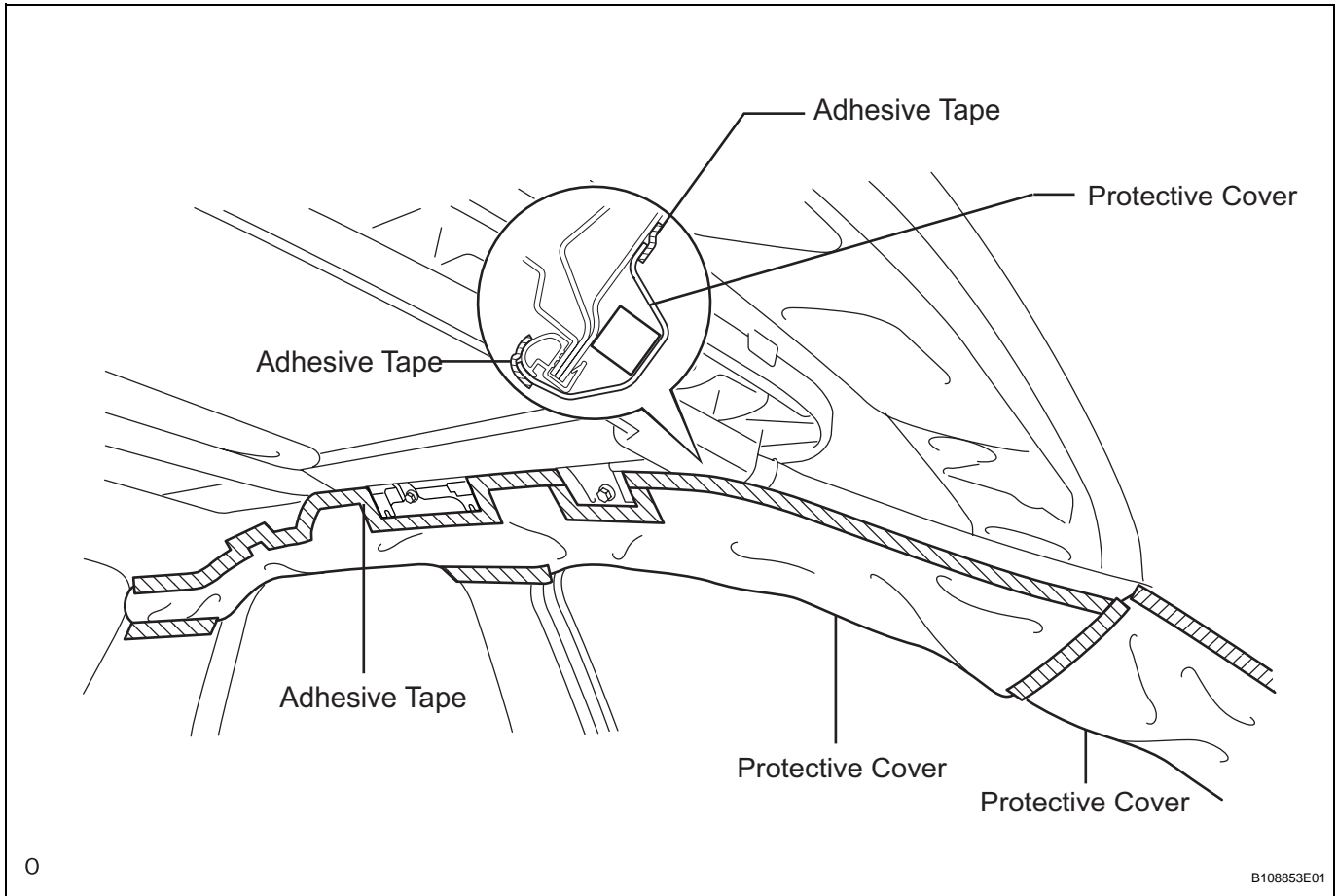
6. **REMOVE SLIDING ROOF WEATHERSTRIP**

7. **PROTECT CURTAIN SHIELD AIRBAG ASSEMBLY**

**CAUTION:**

Cover the curtain shield airbag immediately after removing the roof headlining,

- (a) Completely cover the airbag with a cloth or nylon sheet and apply tape to the ends of the cover, as shown in the illustration.



## 8. REMOVE SLIDING ROOF HOUSING ASSEMBLY

- (a) Disconnect the sliding roof drive gear connector.
- (b) Disconnect the 4 sliding roof drain hoses.
- (c) Remove the 4 bolts on the vehicle body side of the stay.
- (d) Loosen the 4 bolts on the housing side of the stay.
- (e) Remove the 8 nuts and housing.

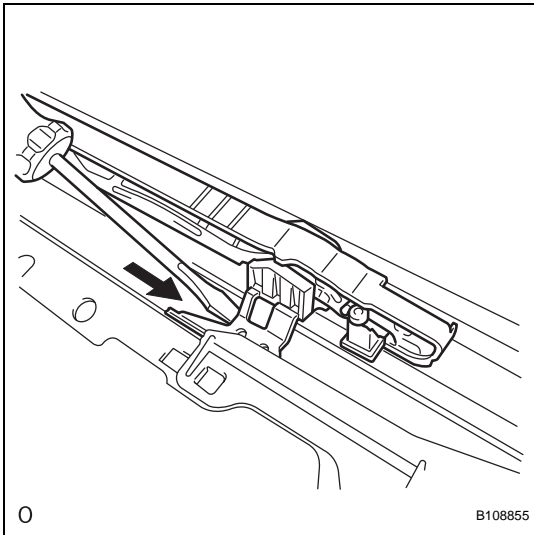
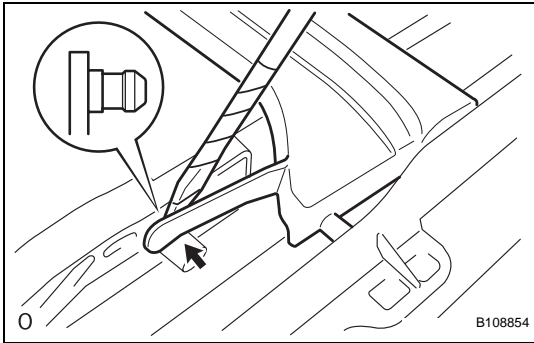
### **CAUTION:**

**Be careful not to damage the curtain shield airbag when removing the housing.**

## DISASSEMBLY

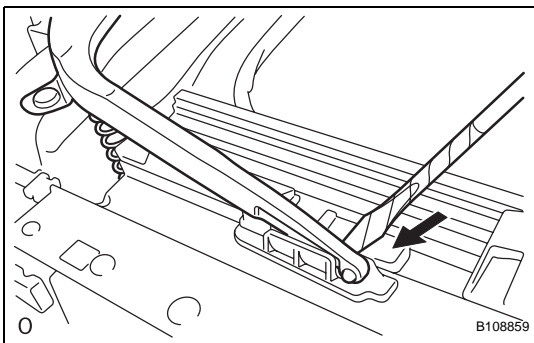
1. **REMOVE SLIDING ROOF DRIVE GEAR ASSEMBLY**
  - (a) Detach the bracket's claw and remove the bracket.
  - (b) Remove the 2 bolts and drive gear.
2. **REMOVE SUNSHADE TRIM ASSEMBLY**
  - (a) Remove the 2 sliding roof panel stoppers and trim.
3. **REMOVE SLIDING ROOF DRIVE CABLE ASSEMBLY**
  - (a) Only when replacing the sliding roof drive cable:
    - (1) Remove the 2 screws and 2 sliding roof side stoppers.
    - (2) Remove the screw and sliding roof piece LH.
    - (3) Remove the screw and sliding roof piece RH.
    - (4) Using a screwdriver, detach the 2 claw. Then slide the drip channel rearward to remove it.
 

HINT:  
Tape the screwdriver tip before use.



- (5) Using a screwdriver, slide the drive cable in the direction indicated by the arrow in the illustration to remove it.
 

HINT:  
Tape the screwdriver tip before use.



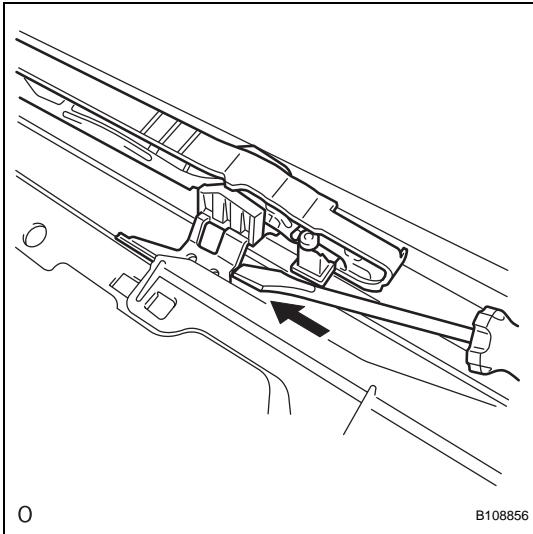
4. **REMOVE ROOF WIND DEFLECTOR PANEL ASSEMBLY**
  - (a) Using a screwdriver, detach the 2 claws. Then remove the wind deflector panel.
 

HINT:  
Tape the screwdriver tip before use.

## REASSEMBLY

### 1. INSTALL ROOF WIND DEFLECTOR PANEL ASSEMBLY

- (a) Attach the 2 claws and install the wind deflector panel.



### 2. INSTALL SLIDING ROOF DRIVE CABLE ASSEMBLY

- (a) Using a screwdriver, slide the drive cable in the direction indicated by the arrow in the illustration to install it.

HINT:

Tape the screwdriver tip before use.

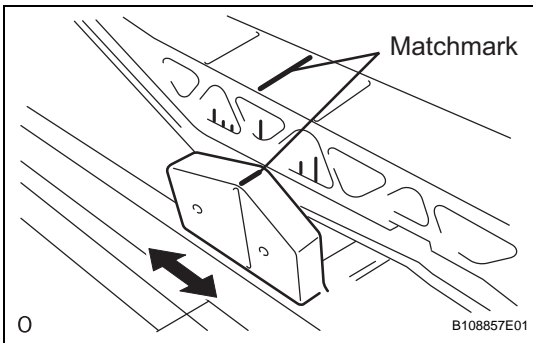
- (b) Attach the 2 claws and install the drip channel.
- (c) Install the sliding roof piece LH and RH with the 2 screws.
- (d) Install the 2 sliding roof side stoppers with the 2 screws.

### 3. ADJUST SLIDING ROOF DRIVE CABLE ASSEMBLY

- (a) Using a screwdriver, align the matchmarks by sliding the drive cable in the direction indicated by the arrow in the illustration.

HINT:

Tape the screwdriver tip before use.



### 4. INSTALL SUNSHADE TRIM ASSEMBLY

### 5. INSTALL SLIDING ROOF DRIVE GEAR ASSEMBLY

- (a) Install the drive gear with the 2 bolts.  
**Torque: 5.4 N\*m (55 kgf\*cm, 48 in.\*lbf)**
- (b) Attach the bracket's claw to install the bracket.

## INSTALLATION

### 1. INSTALL SLIDING ROOF HOUSING ASSEMBLY

- (a) Temporarily install the housing with the 4 bolts (vehicle body side) and 8 nuts.

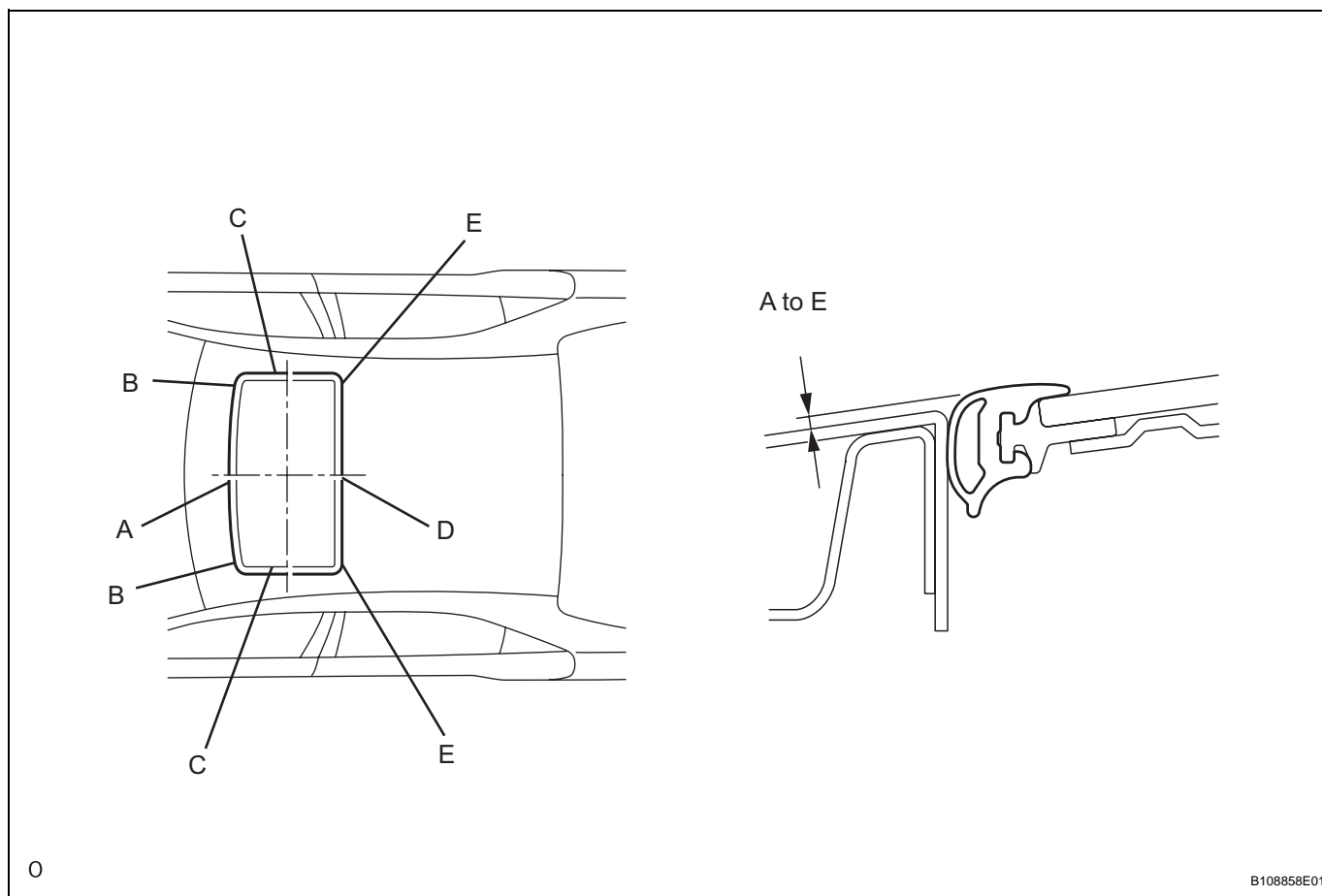
**CAUTION:**

**Be careful not to damage the curtain shield airbag when installing the housing.**

- (b) Tighten the nuts in step (a).  
**Torque: 5.5 N\*m (55 kgf\*cm, 48 in.\*lbf)**
- (c) Tighten the 4 bolts on the housing side of the stay.  
**Torque: 8.0 N\*m (82 kgf\*cm, 71 in.\*lbf)**
- (d) Tighten the bolts in step (a).  
**Torque: 8.0 N\*m (82 kgf\*cm, 71 in.\*lbf)**
- (e) Connect the 4 drain hoses.

### 2. INSTALL SLIDING ROOF GLASS ASSEMBLY

- (a) Using a T25 "torx" driver, temporarily install the glass with the 4 screws.
- (b) Adjust the roof glass position.
- (1) Check the clearance between the roof glass and roof panel.
  - (2) Using a T25 "torx" driver, loosen the 4 screws and adjust the roof glass position.



RF

**Standard:**

A	-2.0 to 1.0 mm (-0.078 to 0.039 in.)
B	-1.0 to 1.5 mm (-0.039 to 0.059 in.)
C	0 +- 1.5 mm (0 +- 0.059 in.)

D	-1.0 to 2.0 mm (-0.039 to 0.078 in.)
E	-1.0 to 1.5 mm (-0.039 to 0.059 in.)

**NOTICE:**

**The clearance should be even all around.**

- (3) Check the clearance between the roof panel and roof glass.
- (c) Tighten the 4 screws in step (a).

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

### 3. INSPECT FITTING OF SLIDING ROOF GLASS ASSEMBLY

If a leak is found, readjust the sliding roof.

### 4. INSTALL ROOF HEADLINING ASSEMBLY

Install the roof headlining. (See page [IR-40](#))

### 5. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

### 6. PERFORM INITIALIZATION

Perform initialization. (See page [IN-37](#))

**CAUTION:**

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

# SLIDING ROOF SWITCH ASSEMBLY

## ON-VEHICLE INSPECTION

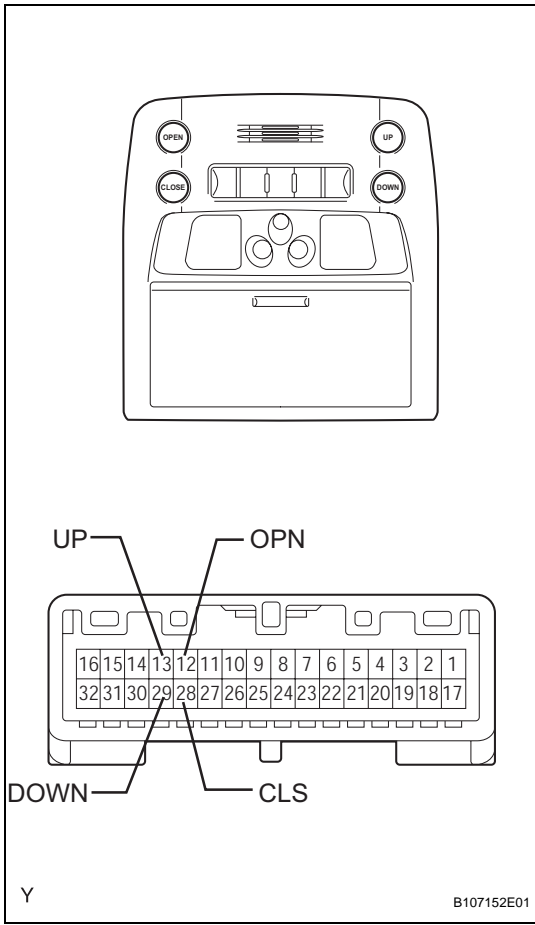
### 1. INSPECT SLIDING ROOF SWITCH ASSEMBLY

- (a) Remove the personal light.
- (b) Measure the resistance of the personal light.

**Standard resistance**

Tester Connection	Switch Condition	Specified Condition
13 (UP) - 8 (E)	TILT UP	Below 1 $\Omega$
13 (UP) - 8 (E)	Off	10 k $\Omega$ or higher
29 (DOWN) - 8 (B)	TILT DOWN	Below 1 $\Omega$
29 (DOWN) - 8 (B)	TILT UP	10 k $\Omega$ or higher
12 (OPN) - 8 (B)	SLIDE OPEN	Below 1 $\Omega$
12 (OPN) - 8 (B)	TILT UP	10 k $\Omega$ or higher
28 (CLS) - 8 (B)	SLIDE CLOSE	Below 1 $\Omega$
28 (CLS) - 8 (B)	TILT UP	10 k $\Omega$ or higher

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



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