

2018 ACCESSORIES & EQUIPMENT

Sunroof - Traverse

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE:

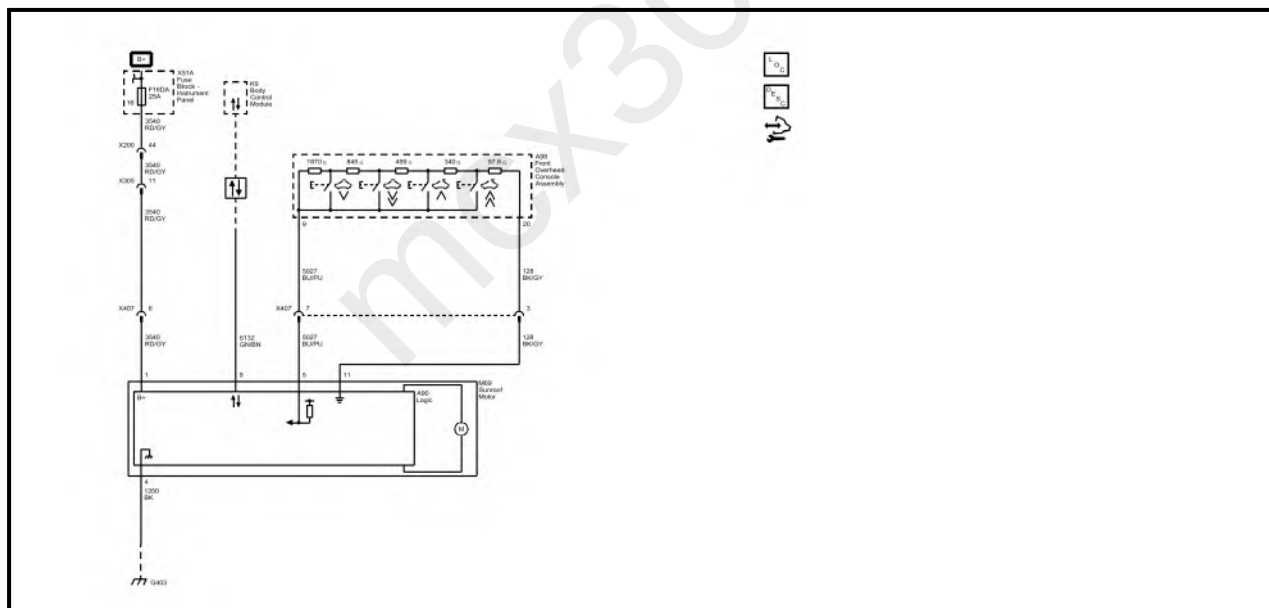
All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Sunroof Module Bolt	9 N.m (80 lb in)
Sunroof Sunshade Bolt	9 N.m (80 lb in)
Sunroof Sunshade Handle Screw	2.5 N.m (22 lb in)
Sunroof Window Motor Bolt	4 N.m (35 lb in)
Sunroof Window Screw	6 N.m (53 lb in)

SCHEMATIC WIRING DIAGRAMS

SUNROOF WIRING SCHEMATICS

Power Sunroof (C3U)



DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B3664

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B3664 02

DTC B3664 05

Sunroof Position Select Switch High Signal Circuit High Voltage/Open

DTC B3664 59

Sunroof Position Select Switch High Signal Circuit Protection Time-Out

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Sunroof Position Select Switch Control	B3664 02	B3664 05	B3664 05	-
Sunroof Position Select Switch Low Reference	-	1	1	-
1. Power Sunroof/Sunshade Malfunction				

Circuit/System Description

The sunroof position select switch is connected directly to the controller. The sliding glass switch provide detent positions for open, express open, off, close, and express close. The sunroof position select switch completes the circuit between two signals provided by the control module, a reference ground input and a pull-up voltage provided by an analog to digital switch input. The control switch places a different resistor ladder network in the circuit depending on the function selected.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC**B3664 02**

The sunroof module has detected and reported via serial data that the sunroof position select switch high signal circuit is shorted to ground.

B3664 05

The sunroof module has detected and reported via the serial data that the sunroof position select switch high signal circuit is open or shorted to voltage.

B3664 59

The sunroof module has detected and reported via the serial data that the sunroof position select switch high signal has been the same active position for 20 seconds after the glass has stopped moving in the requested direction due to reaching the end of the allowable motion.

Action Taken When the DTC Sets

DTC B3664 is stored in the body control module (BCM) memory.

Conditions for Clearing the DTC

The BCM no longer detects a malfunction in the sunroof position select switch high signal circuit.

Reference Information

Schematic Reference

Sunroof Wiring Schematics

Connector End View Reference

Description and Operation

Sunroof Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

NOTE: Because of the accessibility of the sunroof switch, perform the component testing before beginning the Circuit/System Testing.

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S48 Multifunction Switch-Overhead Console. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the low reference circuit terminal 20 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF, disconnect the harness connector at the K61 Sunroof Control Module.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , test or replace the K61 Sunroof Control Module.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON.
4. Test for 4.5 - 5.5 V between the 5 V reference circuit terminal 9 and ground.
 - **If less than 4.5 V**
 1. Ignition OFF, disconnect the harness connector at the K61 Sunroof Control Module.
 2. Test for infinite resistance between the 5 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the 5 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K61 Sunroof Control Module.
 - **If greater than 5.5 V**
 1. Ignition OFF, disconnect the harness connector at the K61 Sunroof Control Module, ignition ON.
 2. Test for less than 1 V between the 5 V reference circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K61 Sunroof Control Module.
 - **Go to next step: If between 4.5 - 5.5 V**
5. Test or replace the S48 Multifunction Switch-Overhead Console.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the diagnostic procedure.

- [Roof Console Replacement](#)

- [Control Module References](#) for sunroof motor/actuator replacement, programming and setup

DTC B3697

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B3697 00

Sunroof Actuator Malfunction

DTC B3697 39

Sunroof Actuator Internal Malfunction

DTC B3697 42

Sunroof Actuator Calibration Not Programmed

DTC B3697 4B

Sunroof Actuator Calibration Not Learned

Circuit/System Description

The sunroof glass is controlled by its own integrated motor/controller containing the necessary electronics, motor, hall effect position sensors, as well as the interface to the driver control switches. The motor/controller is capable of controlling motion based on control switch activation and serial data message commands from the body control module (BCM).

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

B3697 00

The sunroof module has detected and reported via serial data that the sunroof actuator has a malfunction.

B3697 39

The sunroof module has detected and reported via serial data that the sunroof actuator has a internal malfunction.

B3697 42

The sunroof module has detected and reported via serial data that the sunroof actuator is not programmed.

B3697 4B

The sunroof module has detected and reported via serial data that the sunroof actuator calibration is not learned.

Action Taken When the DTC Sets

DTC B3697 is stored in the BCM memory.

Conditions for Clearing the DTC

The BCM no longer detects a malfunction in the sunroof actuator.

Reference Information

Schematic Reference

Sunroof Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Sunroof Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify DTC B3697 42 or DTC B3697 4B is not set.
 - **If DTC B3697 42 or DTC B3697 4B is set**
 1. Calibrate the K61 Sunroof Control Module. Refer to Control Module References.
 2. Verify DTC B3697 42 or DTC B3697 4B does not set while operating the sunroof.
 - If DTC B3697 42 or DTC B3697 4B sets, replace the K61 Sunroof Control Module.
 - Go to next step: If DTC B3697 42 or DTC B3697 4B does not set
 - 3. All OK.
3. Verify DTC B3697 00 or DTC B3697 39 is not set
 - If DTC B3697 00 or DTC B3697 39 is set, replace the K61 Sunroof Control Module.
 - Go to next step: If DTC B3697 00 or DTC B3697 39 is not set
4. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

Control Module References for sunroof control module replacement, programming and setup

SYMPTOMS - ROOF

NOTE: Complete the following procedures before using the symptom tables.

1. Perform the Diagnostic System Check - Vehicle in order to verify that all of the following conditions are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system description and operation in order to learn the system functions. Refer to Sunroof Description and Operation.

Visual/Physical Inspection

- Inspect for aftermarket devices which may affect the operation of the power sunroof system. Refer to [Checking Aftermarket Accessories](#) .
- Inspect the accessible system components for obvious damage or for conditions which can cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to [Testing for Intermittent Conditions and Poor Connections](#) .

Symptom List

Refer to [Power Sunroof Malfunction](#).

POWER SUNROOF MALFUNCTION

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	1	1	-	-
Serial Data	1	1	1	-
Sunroof Switch Signal	B3664 02	B3664 05	B3664 05	-
Sunroof Motor Close Control	1	1	1	-
Sunroof Motor Open Control	1	1	1	-
Sunroof Motor Low Reference	-	1	-	-
Sunroof Motor Ground	-	1	-	-
1. Power Sunroof Malfunction				

Circuit/System Description

The sunroof electrical system uses a master/slave configuration utilizing a serial data based system for communication. The body control module (BCM) is designated as the master, while the sunroof control modules is configured as the slave.

As the system master, the BCM uses the serial data communication bus to enable or disable sunshade operation, communicate vehicle information to each controller, and request sunroof movement. The sunroof e control module provides system status and diagnostic information to the BCM for diagnostic reporting and operational purposes. The control switches places a different resistor ladder network in the circuit depending on the function selected. The controllers analog to digital switch input reads the resulting voltage range and determines the function.

Reference Information

Schematic Reference

[Sunroof Wiring Schematics](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

Sunroof Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Perform the sunroof motor initialization procedure. Refer to [Sunroof Motor/Actuator Initialization/Teach Process](#).
2. Ignition ON.
3. Verify the scan tool Sunroof Switch parameter changes from Inactive to Open, Express Open, Close and Express Close when pressing the S48 Multifunction Switch-Overhead Console.
 - **If the parameters do not change**
Refer to Circuit/System Testing - Sunroof Switch Malfunction
 - **Go to next step: If the sunroof opens and closes**
4. Command the sunroof to OPEN and CLOSE by pressing the appropriate switch on the S48 Multifunction Switch-Overhead Console.
 - **If the sunroof does not OPEN or CLOSE**
Refer to Circuit/System Testing - Power Sunroof Malfunction.
 - **Go to next step: If the sunroof opens and closes to the vent position**
5. Verify the sunroof will OPEN and CLOSE when commanding the sunroof motor Open/Close with a scan tool.
 - **If the sunroof motor does not OPEN or CLOSE**
Refer to Circuit/System Testing - Power Sunroof Malfunction.
 - **Go to next step: If the sunroof motor does OPEN and CLOSE**
6. All OK.

Circuit/System Testing

NOTE: Because of the accessibility of the sunroof switch, perform the component testing before beginning the Circuit/System Testing.

Sunroof Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S48 Multifunction Switch-Overhead Console. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the low reference circuit terminal 20 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF, disconnect the harness connector at the K62 Sunroof Sunshade Motor Module.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , test or replace the K62 Sunroof Sunshade Motor Module.
 - **Go to next step: If less than 10 Ω**

3. Ignition ON.

4. Test for 4.5 - 5.5 V between the 5 V reference circuit terminal 9 and ground.

- **If less than 4.5 V**

1. Ignition OFF, disconnect the harness connector at the K62 Sunroof Sunshade Motor Module.

2. Test for infinite resistance between the 5 V reference circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- Go to next step: If infinite resistance

3. Test for less than 2 Ω in the 5 V reference circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K62 Sunroof Sunshade Motor Module.

- **If greater than 5.5 V**

1. Ignition OFF, disconnect the harness connector at the K62 Sunroof Sunshade Motor Module, ignition ON.

2. Test for less than 1 V between the 5 V reference circuit and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K62 Sunroof Sunshade Motor Module.

- **Go to next step: If between 4.5 - 5.5 V**

5. Test or replace the S48 Multifunction Switch-Overhead Console.

Power Sunroof Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the K62 Sunroof Sunshade Motor Module. It may take up to 2 minutes for all vehicle systems to power down.

2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.

- **If 10 Ω or greater**

1. Ignition OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON.

4. Verify a test lamp illuminates between the B+ circuit terminal 1 and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition OFF.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition OFF.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K62 Sunroof Sunshade Motor Module.

- **Go to next step: If the test lamp illuminates**

5. Test for less than 1 V between the signal circuit terminal 5 and ground.

- **If 1 V or greater**

Repair the short to voltage on the signal circuit.

- **Go to next step: If less than 1 V**

6. Ignition OFF.

7. Test for infinite resistance between the signal circuit terminal 5 and ground:

- **If less than infinite resistance**

Repair the short to ground on the signal circuit

- **Go to next step: If infinite resistance**

8. Disconnect the harness connector at the K62 Sunroof Sunshade Motor Module.

9. Test for less than 5 Ω between the circuit terminals listed below:

- S48 Multifunction Switch-Overhead Console terminal 9 and K62 Sunroof Sunshade Motor Module terminal 5
- **If greater than 5 Ω**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 5 Ω**

10. Replace the K62 Sunroof Sunshade Motor Module.

Component Testing

Sunroof Switch

1. Ignition OFF, disconnect the harness connector at the S48 Multifunction Switch-Overhead Console.

2. Test for infinite resistance between the control circuit terminal 9 and the low reference terminal 20.

- **If less than infinite resistance**

Replace the S48 Multifunction Switch-Overhead Console.

- **Go to next step: If infinite resistance**

3. Test for less than 5 Ω between the control terminals listed below and the low reference terminal 20 with the switch in the appropriate position.

- S48 Multifunction Switch-Overhead Console terminal 9, sunroof switch CLOSE position
- S48 Multifunction Switch-Overhead Console terminal 9, sunroof switch OPEN position
- **If not less than 5 Ω**

Replace the S48 Multifunction Switch-Overhead Console.

- **Go to next step: If less than 5 Ω**

4. All OK.

Repair Instructions

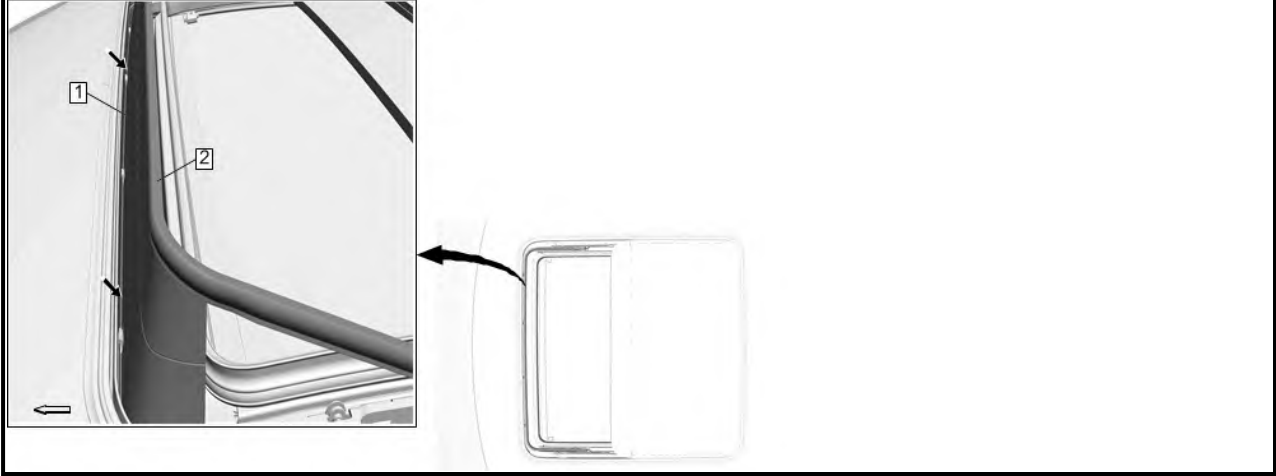
Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Roof Console Replacement](#)
- [Sunroof Window Motor Replacement](#)
- [Control Module References](#) for sunroof control module replacement, programming and setup

REPAIR INSTRUCTIONS

SUNROOF AIR DEFLECTOR REPLACEMENT

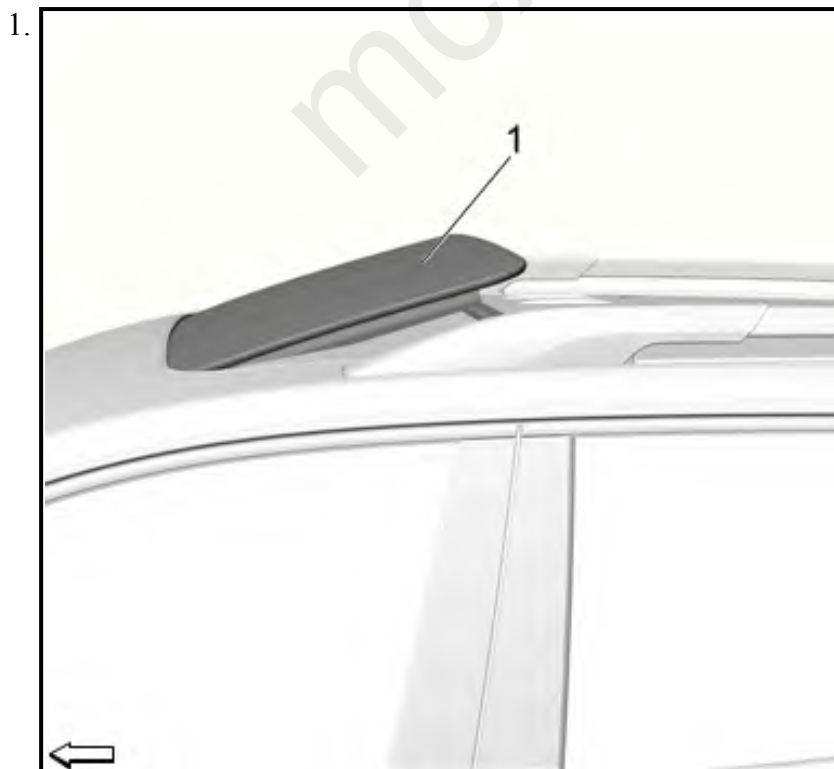




Callout	Component Name
1	Sunroof Air Deflector Retainer Procedure 1. Open the front sunroof window to the full open position. 2. Using the appropriate tool, push the sunroof air deflector retainer down and back, then pull upward to release from the sunroof module assembly clips.
2	Sunroof Air Deflector Procedure Lift the sunroof air deflector up and back to remove. NOTE: Verify the sunroof window and the sunroof air deflector for proper operation.

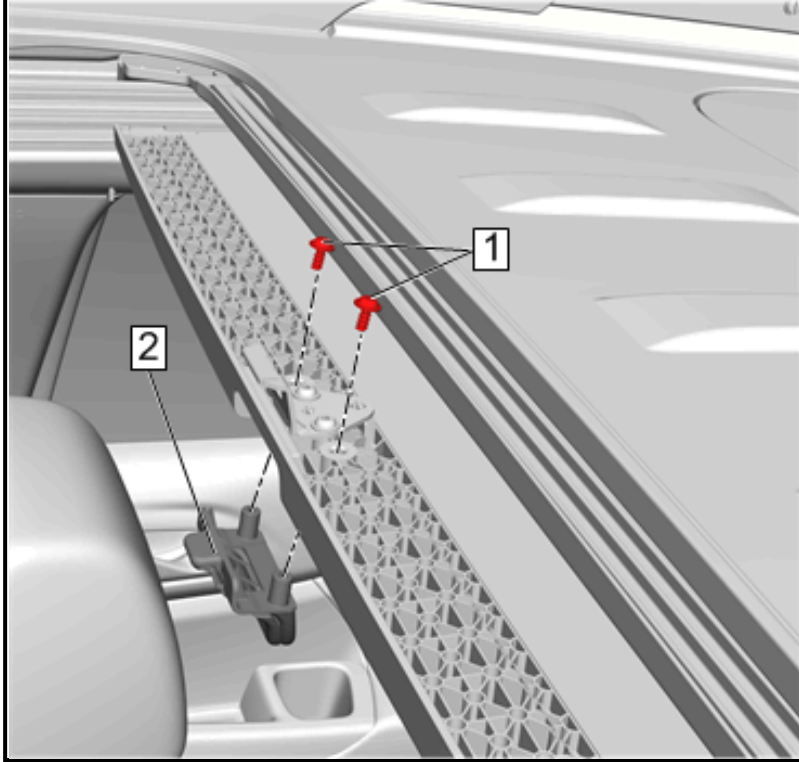
SUNROOF SUNSHADE HANDLE REPLACEMENT (FRONT)

Removal Procedure



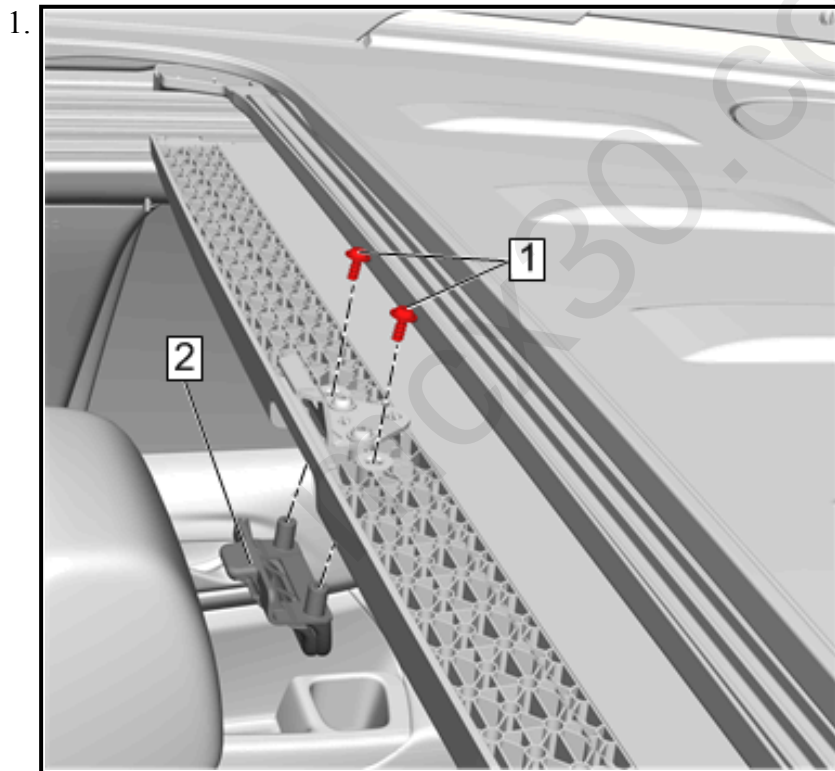
Place the sunroof (1) in the vent position.





Remove the sunroof sunshade handle screw (1) from the sunshade locking handle. (2)

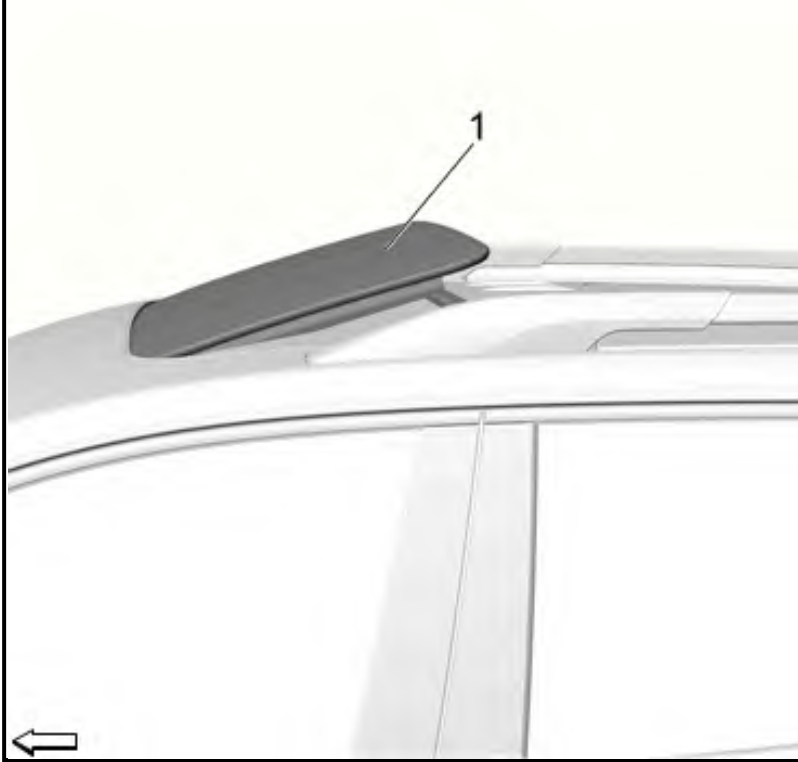
Installation Procedure



CAUTION: Refer to [Fastener Caution](#)

Install the sunroof sunshade locking handle screw (1) to the sunshade locking handle (2) and tighten [2x] to 2.5 N.m (22 lb in)



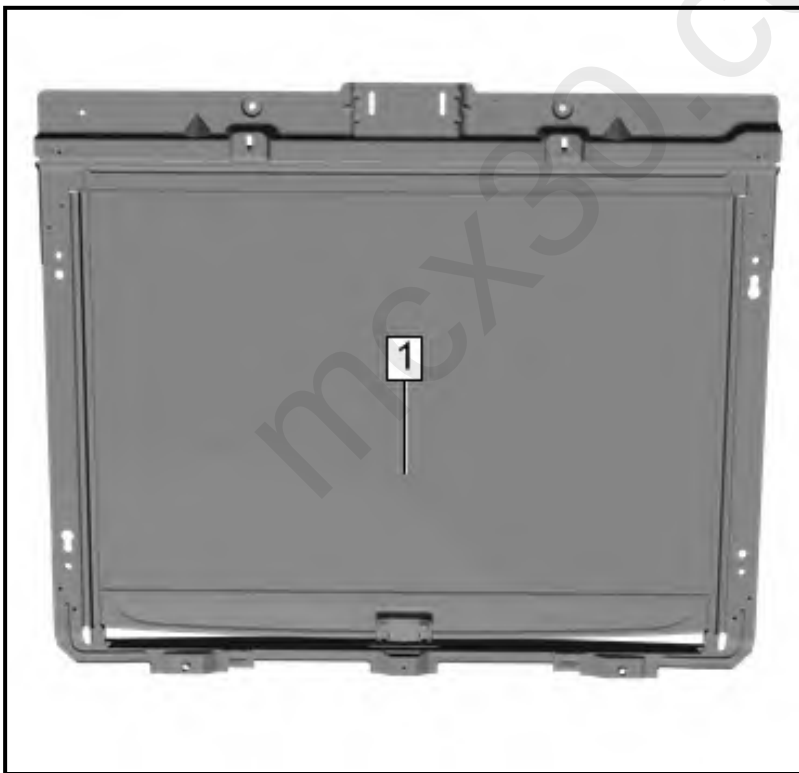


Place the sunroof (1) in the closed position.

SUNROOF SUNSHADE HANDLE REPLACEMENT (REAR)

Removal Procedure

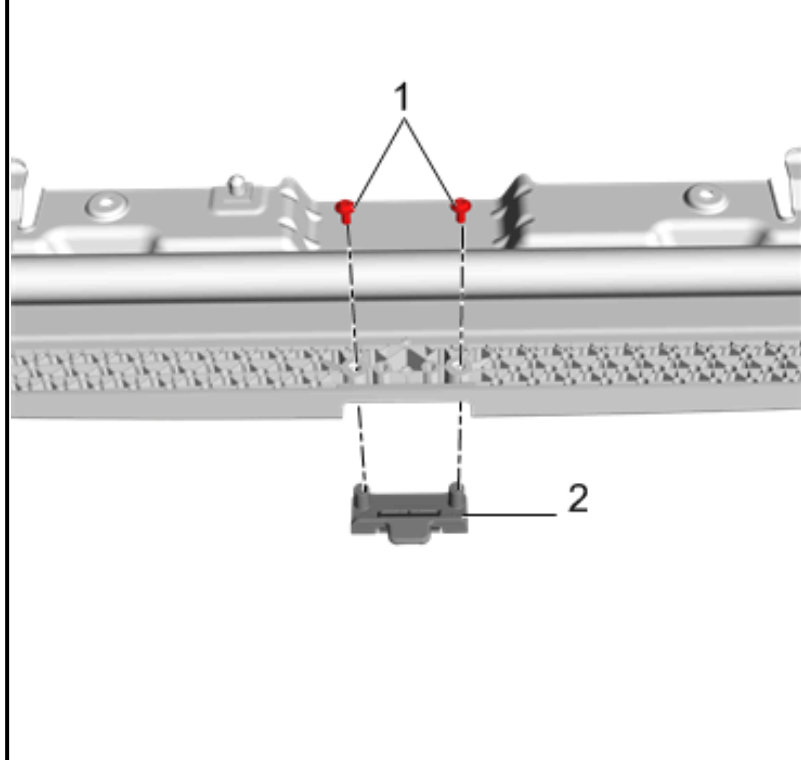
1.



Sunroof Sunshade (1) - Remove - [Sunroof Sunshade Replacement \(Rear\)](#)[Sunroof Sunshade Replacement \(Front\)](#)

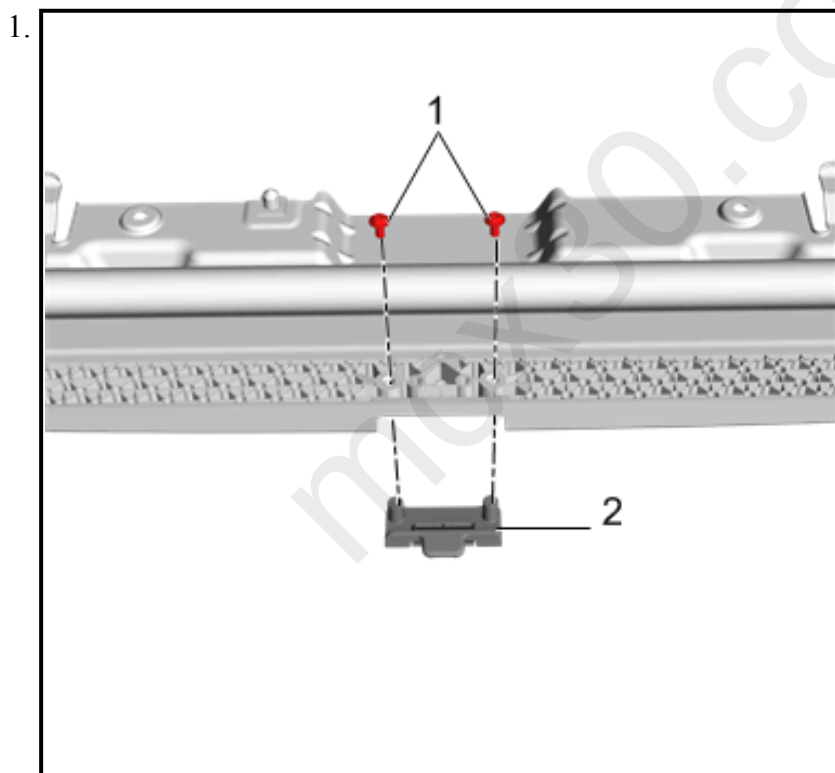
2.





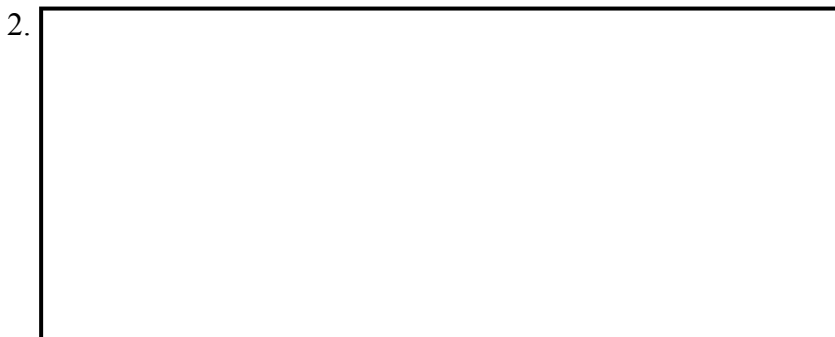
Remove the sunroof sunshade handle screw (1) from the sunroof sunshade handle. (2)

Installation Procedure



CAUTION: Refer to [Fastener Caution](#)

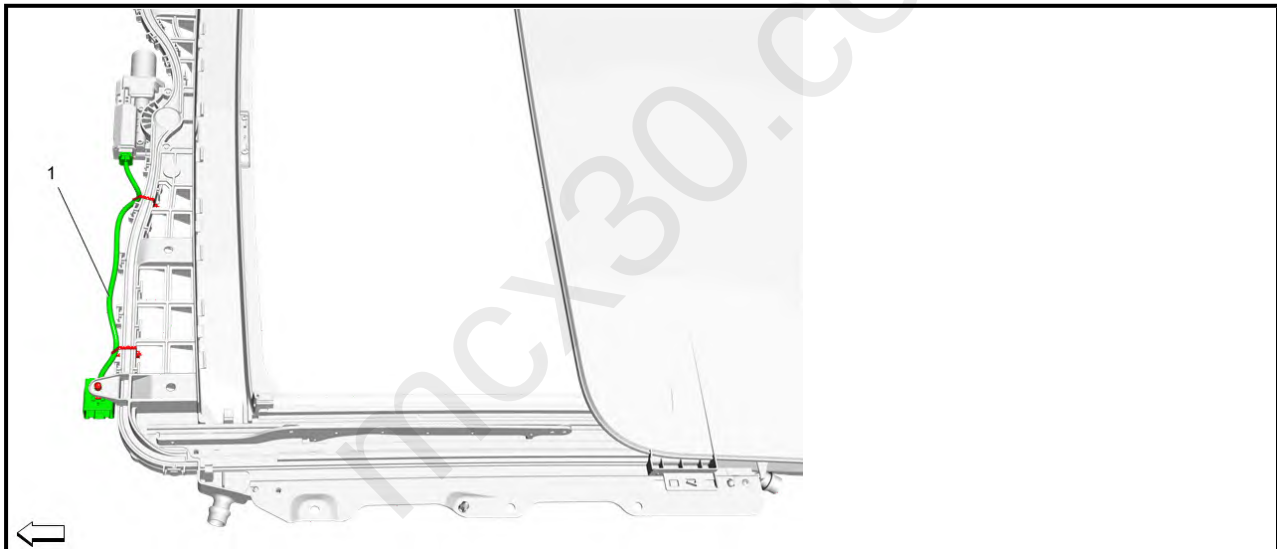
Install the sunroof sunshade handle screw (1) to the sunroof sunshade handle (2) - Install and tighten [2x] 2.5 N.m (22 lb in)





Sunroof Sunshade (1) - Install - [Sunroof Sunshade Replacement \(Rear\)](#)[Sunroof Sunshade Replacement \(Front\)](#)

SUNROOF WIRING HARNESS REPLACEMENT

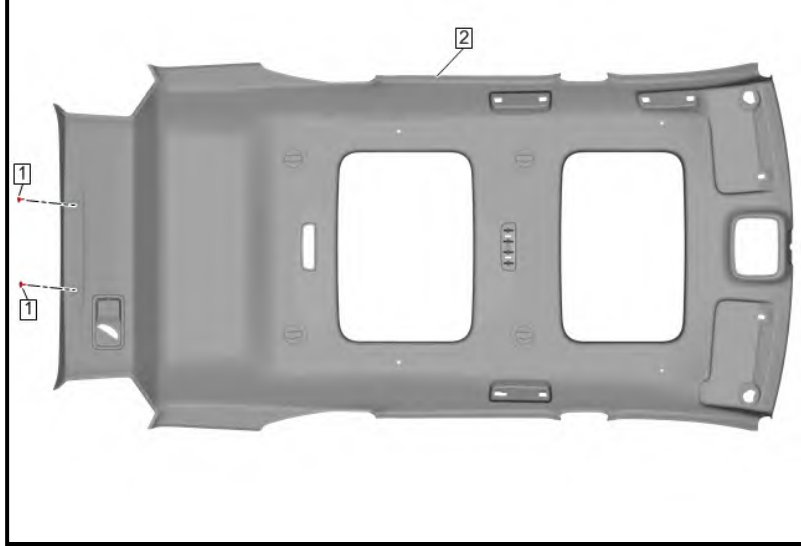


Callout	Component Name
Preliminary Procedure It is only necessary to lower the headlining. Only do those steps in the headlining procedure that will allow access to the component being removed. Headlining Trim Panel Replacement (With C3U) Headlining Trim Panel Replacement (Without C3U)	
1	Sunroof Wiring Harness Procedure Disconnect all electrical connectors.

SUNROOF HOUSING FRONT DRAIN HOSE REPLACEMENT (LEFT SIDE)

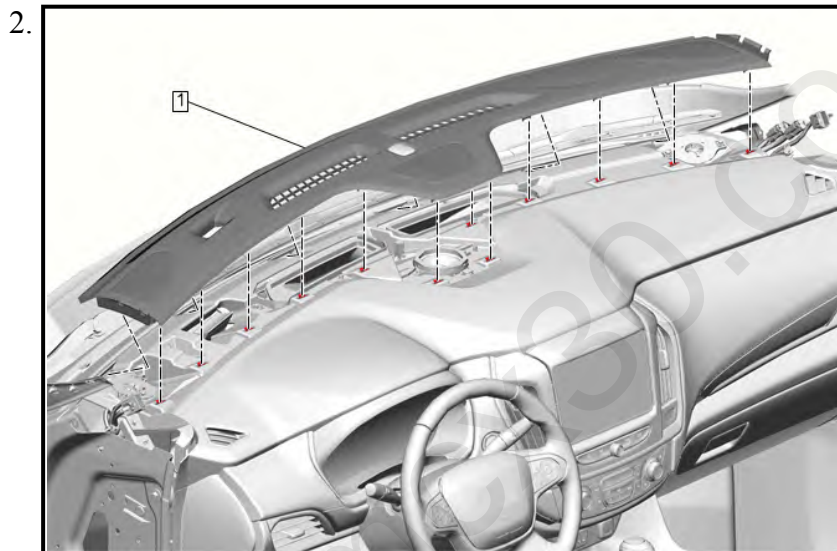
Removal Procedure

1.

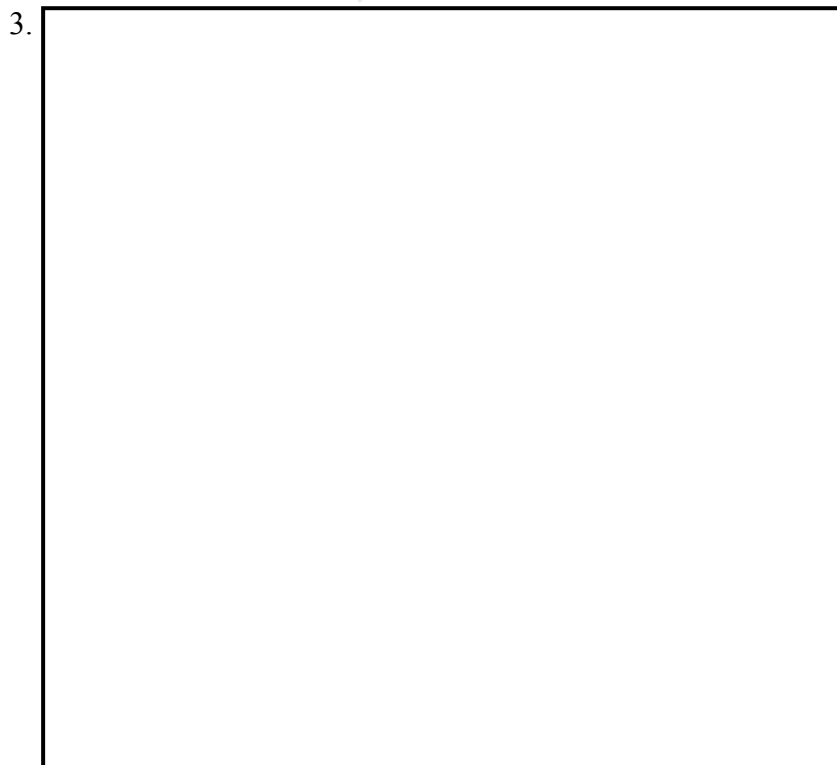


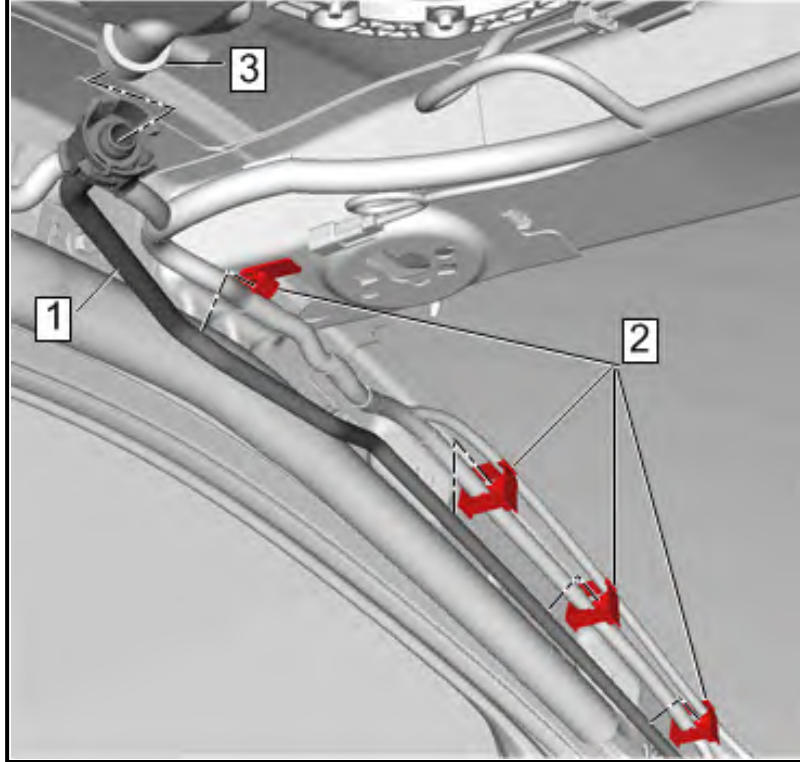
NOTE: It is only necessary to lower the headliner. Only do those steps in headliner replacement that will lower the headliner enough to gain access to the part.

Headlining Trim Panel (2) - Remove - [Headlining Trim Panel Replacement \(With C3U\)](#),
[Headlining Trim Panel Replacement \(Without C3U\)](#).



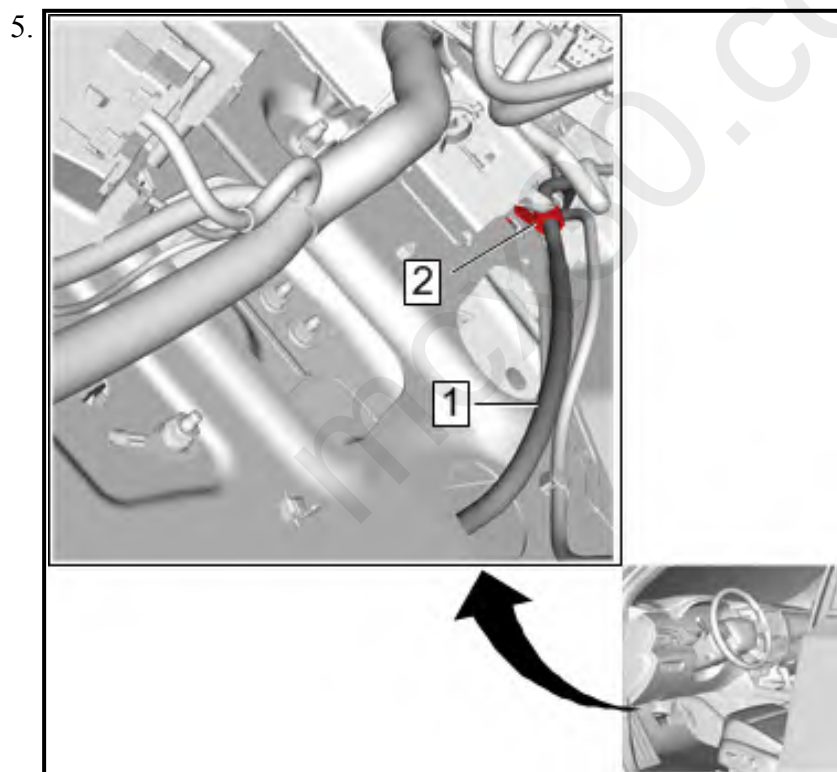
Instrument Panel Extension (1) - Remove - [Instrument Panel Extension Replacement](#)





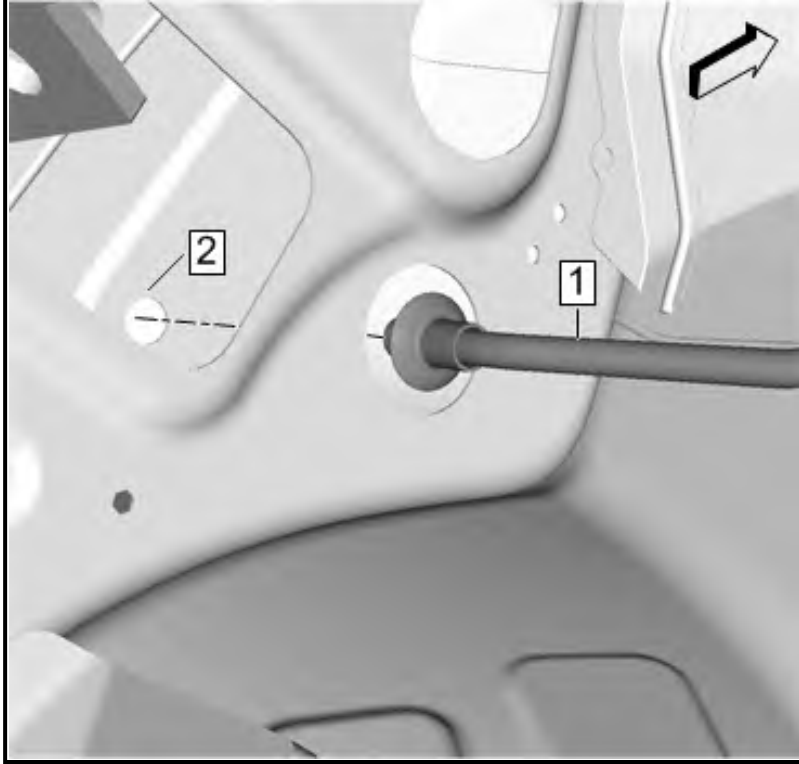
Sunroof Housing Front Drain Hose (1) @ Sunroof Housing Front Drain Hose Retainer (2) - Unclip [4x]

4. Sunroof Housing Front Drain Hose (1) @ Sunroof Housing (3) - Remove



Sunroof Housing Front Drain Hose (1) @ Sunroof Housing Front Drain Hose Retainer (2) - Unclip



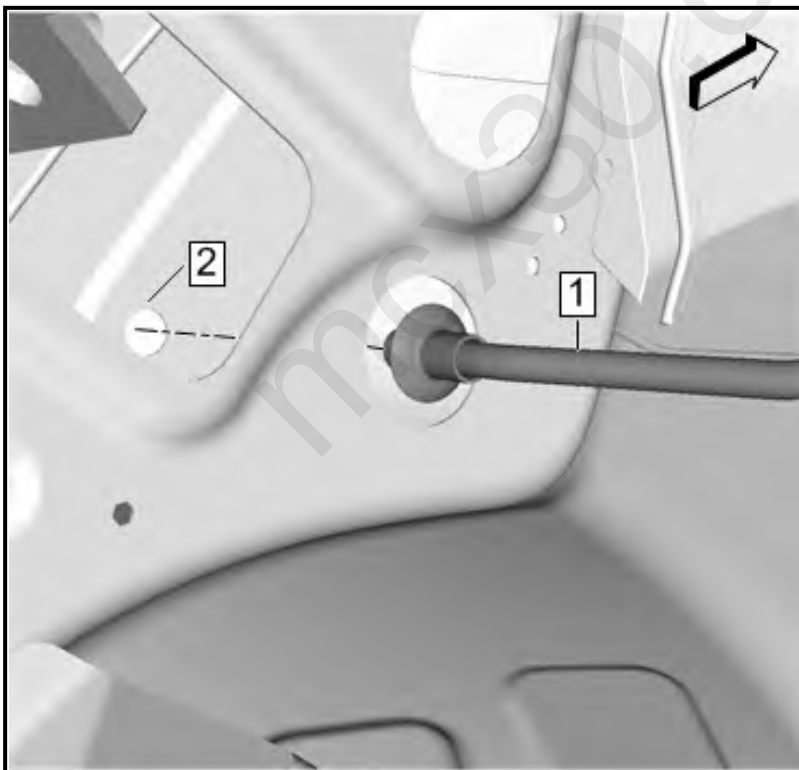


Sunroof Housing Front Drain Hose (1) @ Body Hinge Pillar Outer Panel Reinforcement Access Hole (2) - Remove

7. Sunroof Housing Front Drain Hose (1) - Remove

Installation Procedure

1.

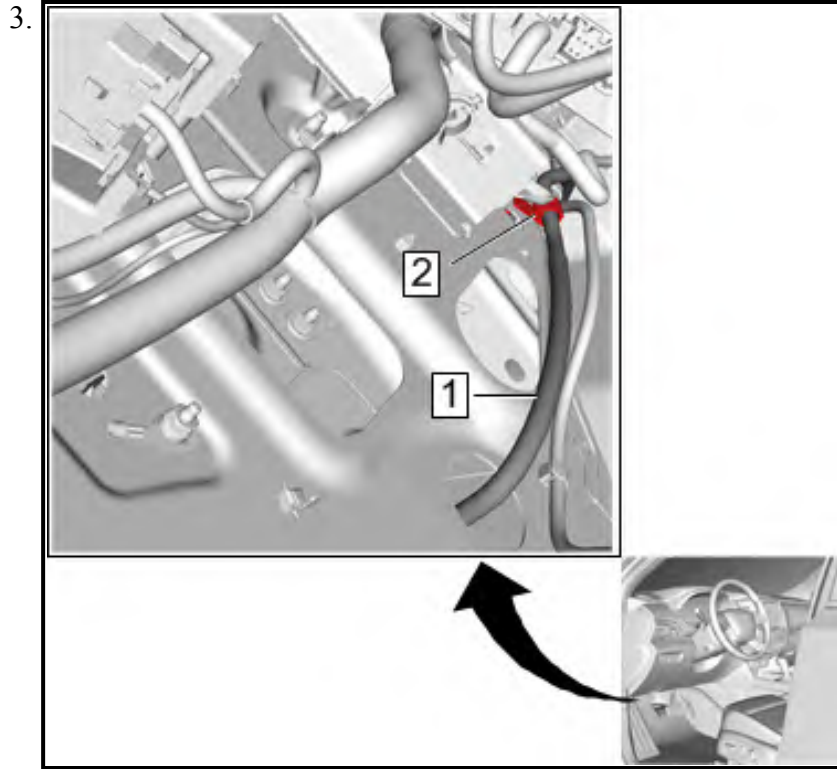


NOTE: The sunroof housing front drain hose and grommet are a one piece assembly and installed together.

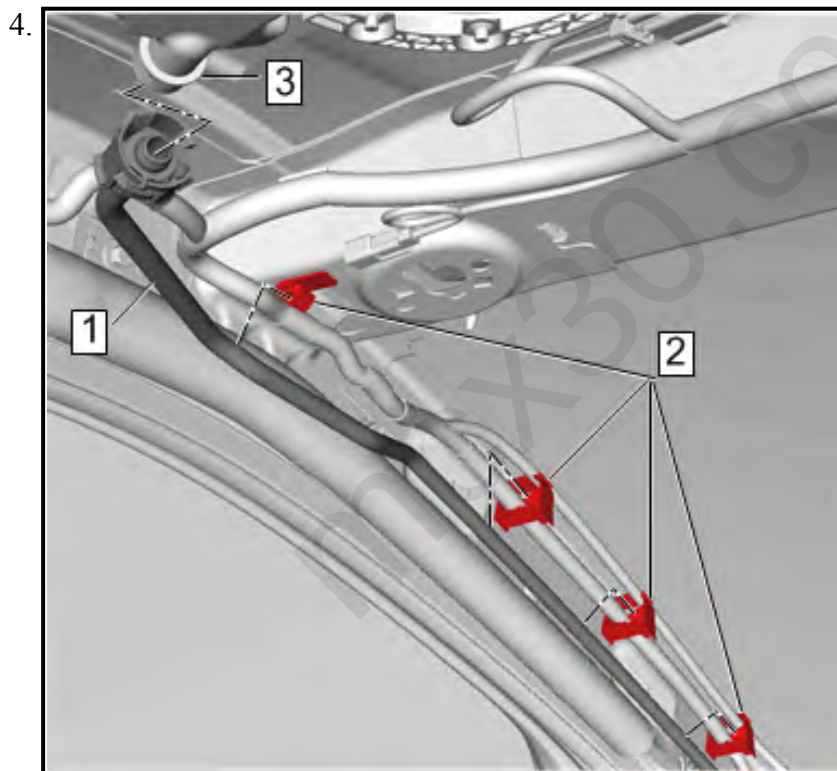
Sunroof Housing Front Drain Hose (1) - Install

NOTE: Ensure the front sunroof drain hose grommet is seated properly in the body hinge pillar outer panel reinforcement hole to prevent water leaks.

2. Sunroof Housing Front Drain Hose (1) @ Body Hinge Pillar Outer Panel Reinforcement Access Hole (2) - Install



Sunroof Housing Front Drain Hose (1) @ Sunroof Housing Front Drain Hose Retainer (2) - Clip

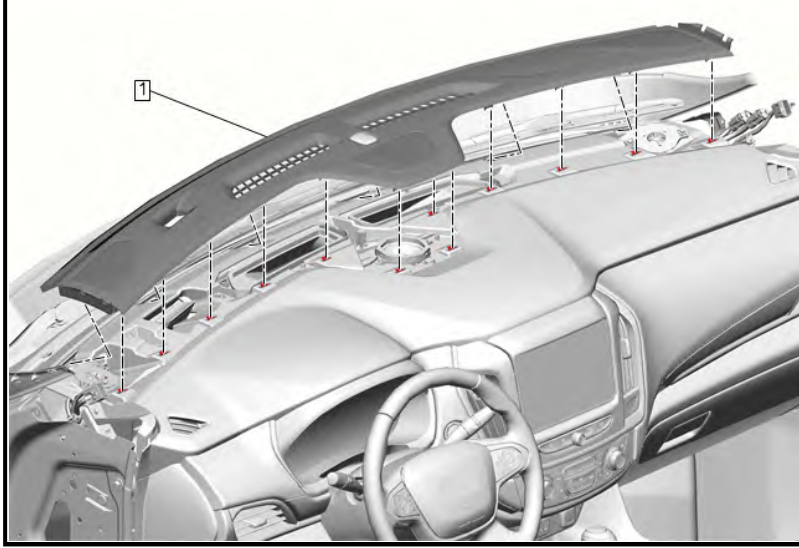


Sunroof Housing Front Drain Hose (1) @ Sunroof Housing Front Drain Hose Retainer (2) - Clip [4x]

5. Sunroof Housing Front Drain Hose (1) @ Sunroof Housing (3) - Install

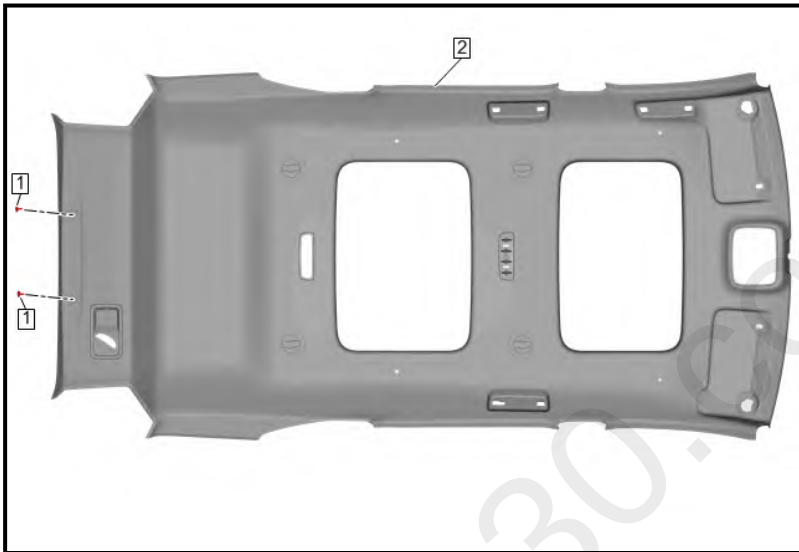
6. Check sunroof drain hose for any leaks before installing the trim panels.





Instrument Panel Extension (1) - Install - [Instrument Panel Extension Replacement](#)

8.

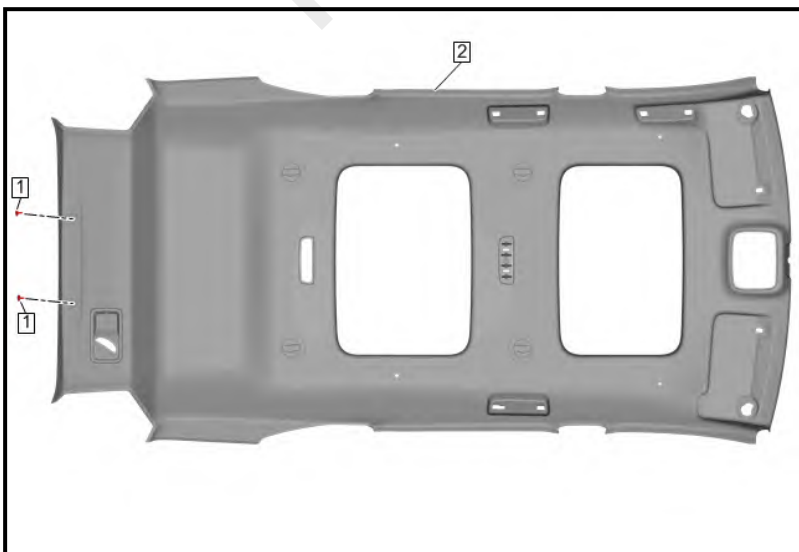


Headlining Trim Panel (2) - Install - [Headlining Trim Panel Replacement \(With C3U\)](#)
[Headlining Trim Panel Replacement \(Without C3U\)](#)

SUNROOF HOUSING FRONT DRAIN HOSE REPLACEMENT (RIGHT SIDE)

Removal Procedure

1.

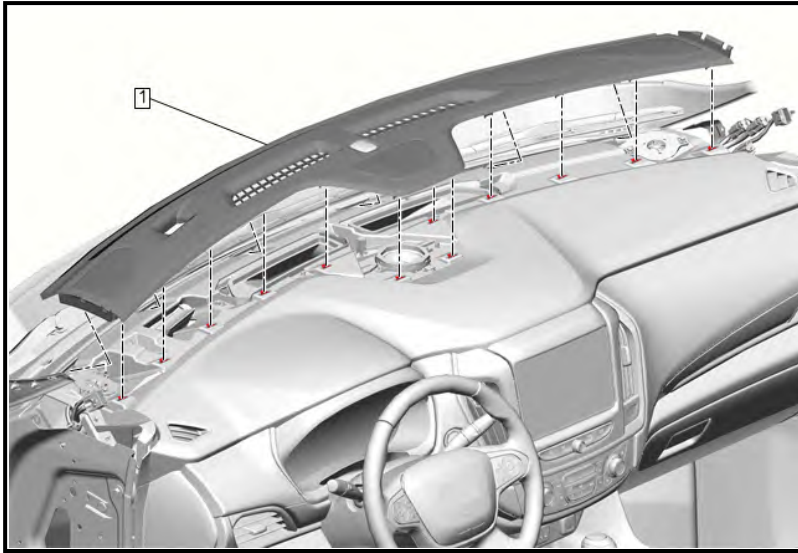


NOTE:

It is only necessary to lower the headliner. Only do those steps in headliner replacement that will lower the headliner enough to gain access to the part.

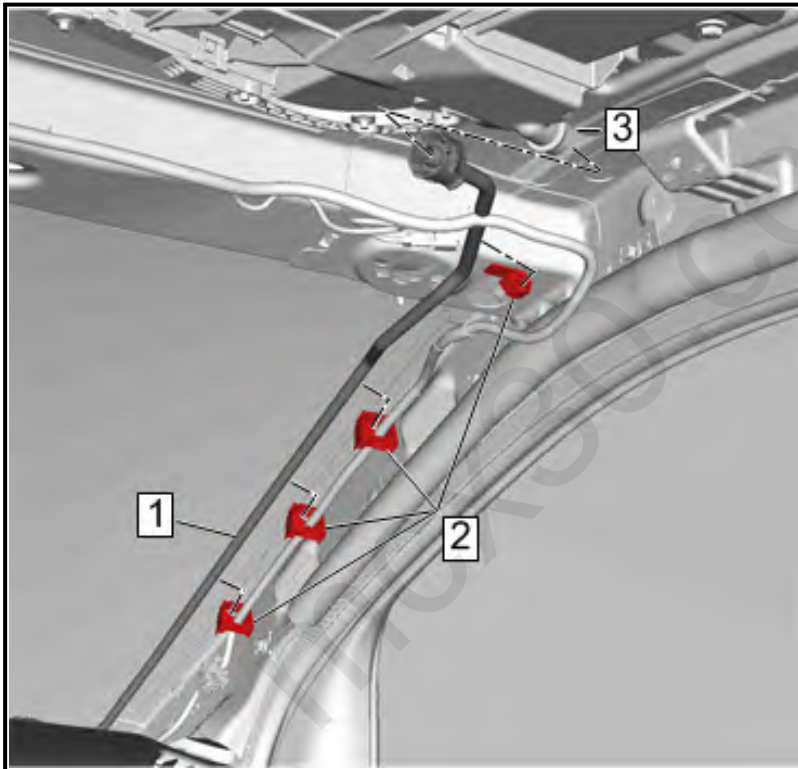
Headlining Trim Panel (2) - Remove - [Headlining Trim Panel Replacement \(With C3U\)](#),
[Headlining Trim Panel Replacement \(Without C3U\)](#).

2.



Instrument Panel Extension (1) - Remove - [Instrument Panel Extension Replacement](#)

3.

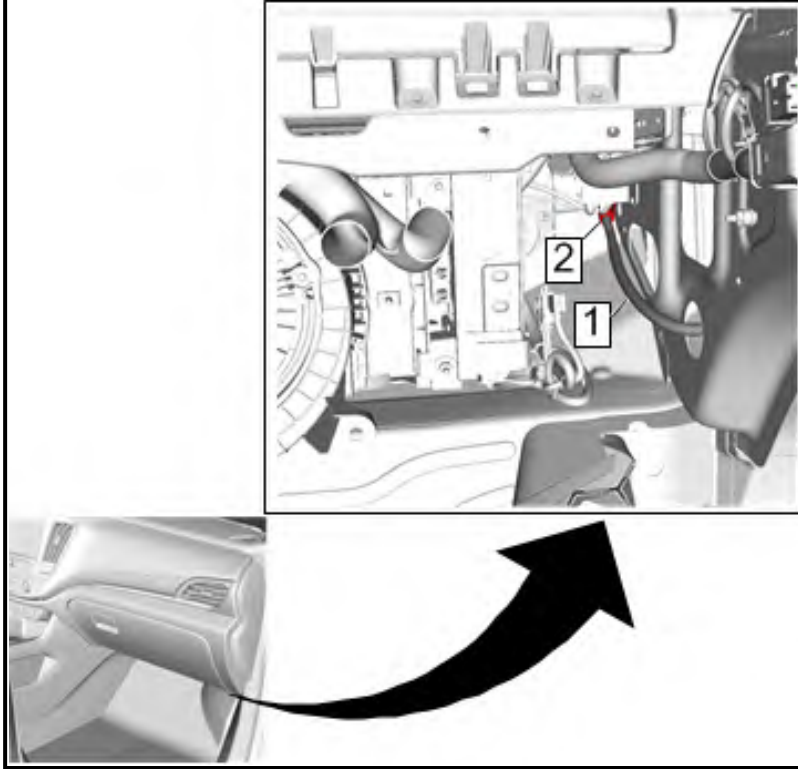


Sunroof Housing Front Drain Hose (1) @ Sunroof Housing Front Drain Hose Retainer (2) -
Unclip [4x]

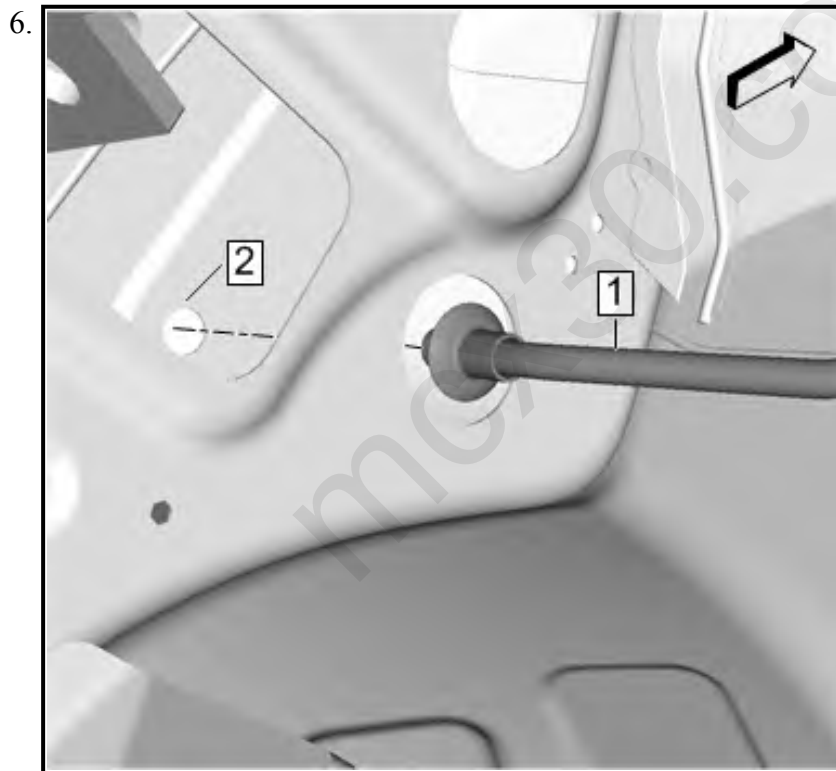
4. Sunroof Housing Front Drain Hose (1) @ Sunroof Housing (3) - Remove

5.





Sunroof Housing Front Drain Hose (1) @ Sunroof Housing Front Drain Hose Retainer (2) - Unclip

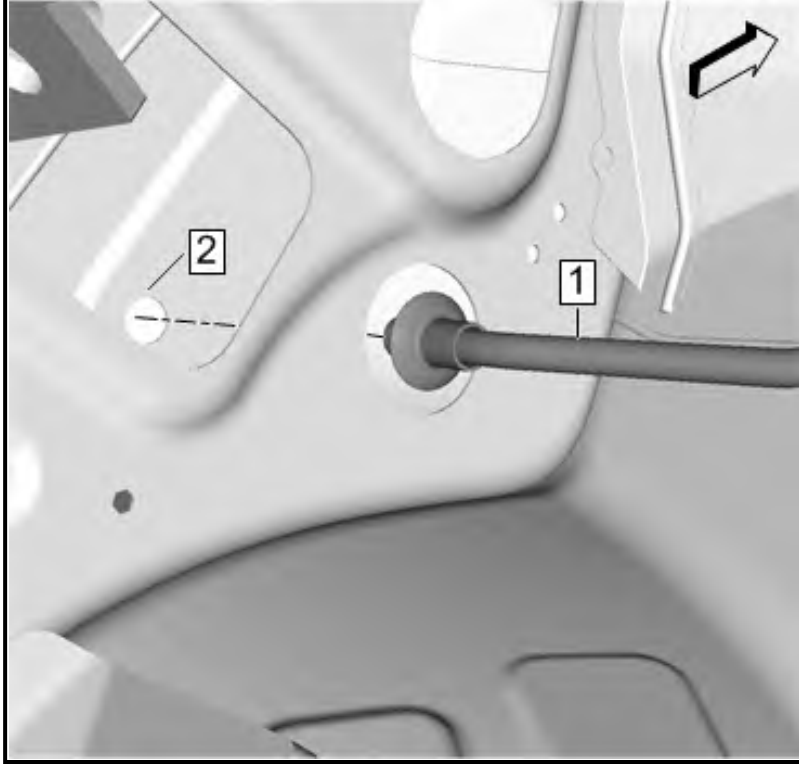


Sunroof Housing Front Drain Hose (1) @ Body Hinge Pillar Outer Panel Reinforcement Access Hole (2) - Remove

7. Sunroof Housing Front Drain Hose (1) - Remove

Installation Procedure



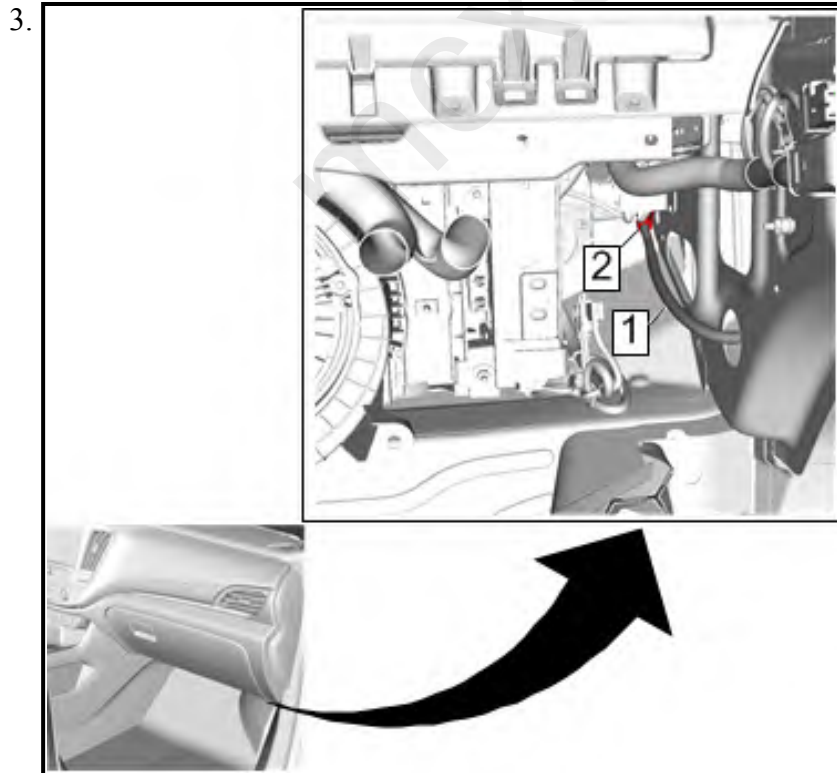


NOTE: The sunroof housing front drain hose and grommet are a one piece assembly and installed together.

Sunroof Housing Front Drain Hose (1) - Install

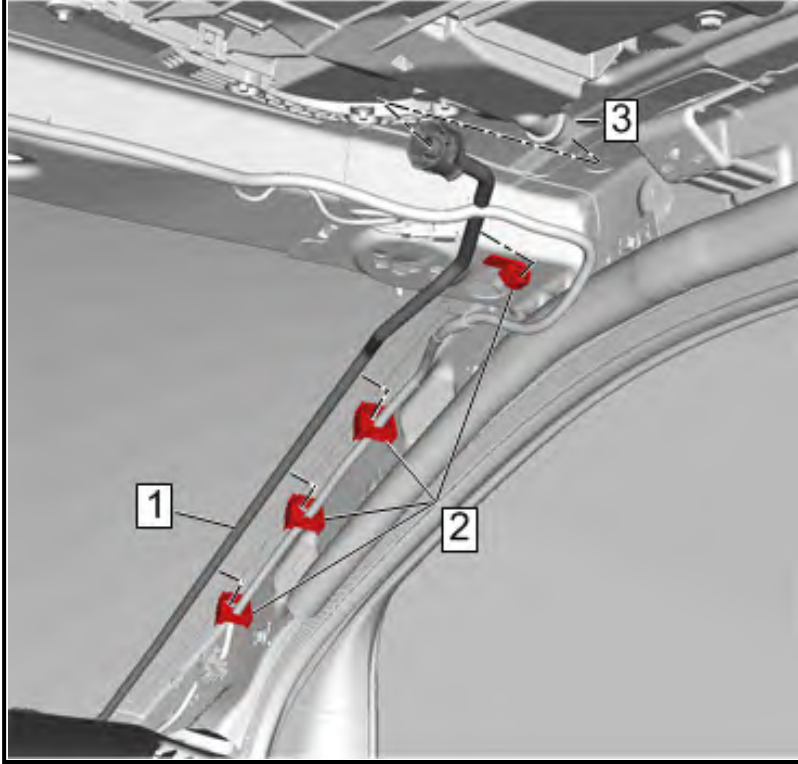
NOTE: Ensure the front sunroof drain hose grommet is seated properly in the body hinge pillar outer panel reinforcement hole to prevent water leaks.

2. Sunroof Housing Front Drain Hose (1) @ Body Hinge Pillar Outer Panel Reinforcement Access Hole (2) - Install



Sunroof Housing Front Drain Hose (1) @ Sunroof Housing Front Drain Hose Retainer (2) - Clip



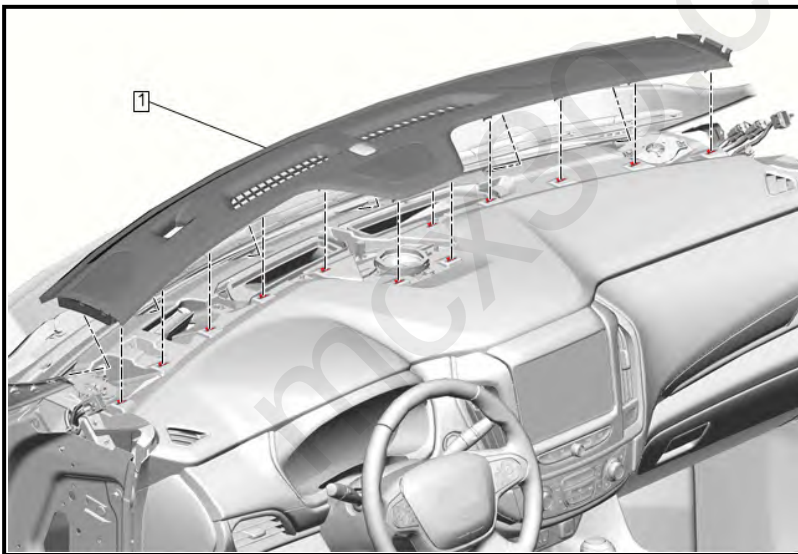


Sunroof Housing Front Drain Hose (1) @ Sunroof Housing Front Drain Hose Retainer (2) - Clip [4x]

5. Sunroof Housing Front Drain Hose (1) @ Sunroof Housing (3) - Install

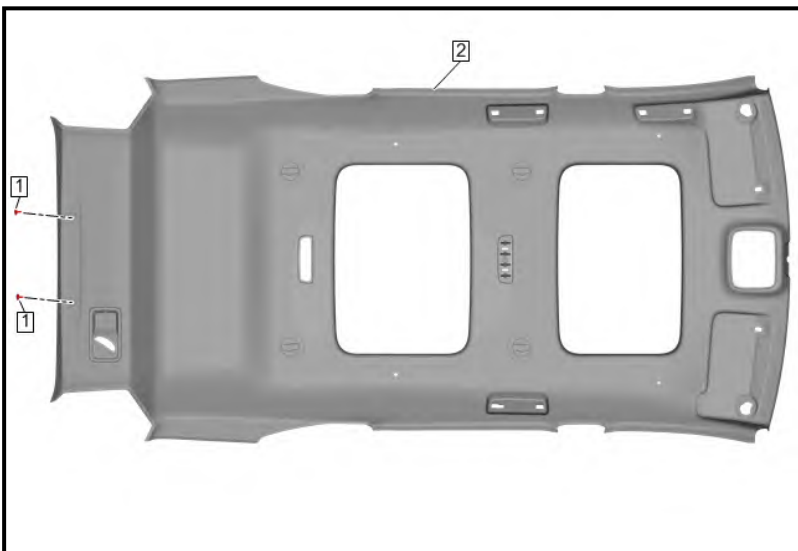
6. Check sunroof drain hose for any leaks before installing the trim panels.

7.

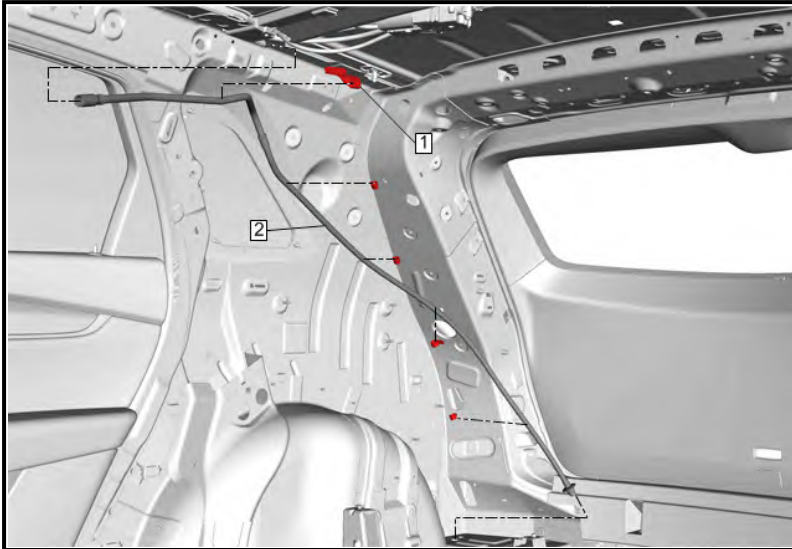


Instrument Panel Extension (1) - Install - [Instrument Panel Extension Replacement](#)

8.



SUNROOF HOUSING REAR DRAIN HOSE REPLACEMENT (RIGHT REAR)



Callout	Component Name
Preliminary Procedures 1. It is only necessary to lower the headliner. Only do those steps in headliner replacement that will lower the headliner enough to gain access to the part. Headlining Trim Panel Replacement (With C3U) , Headlining Trim Panel Replacement (Without C3U) . 2. Quarter Lower Rear Trim Panel Replacement (Right Side) .	
1	Sunroof Housing Rear Drain Hose Retainer [5x]
2	Sunroof Housing Rear Drain Hose Procedure 1. Disconnect the sunroof drain hose from the sunroof frame spigot. 2. Grasp the grommet and pull upward to release. 3. When installing the drain hose grommet, ensure the end of the drain hose is installed through the access drain hole to prevent interior water leaks. 4. Water test and inspect sunroof for proper operation.

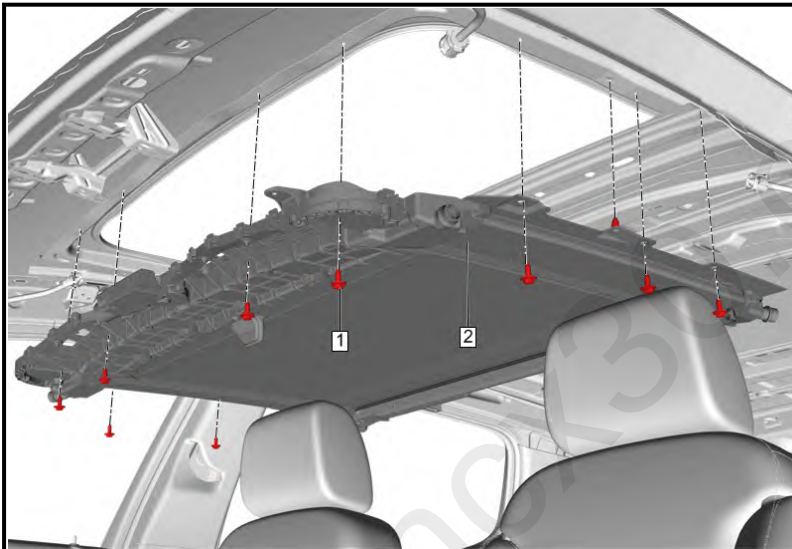
SUNROOF HOUSING REAR DRAIN HOSE REPLACEMENT (LEFT REAR)



Callout	Component Name

Callout	Component Name
Preliminary Procedures 1. It is only necessary to lower the headliner. Only do those steps in headliner replacement that will lower the headliner enough to gain access to the part. Headlining Trim Panel Replacement (With C3U), Headlining Trim Panel Replacement (Without C3U). 2. Quarter Lower Rear Trim Panel Replacement (Left Side).	
1	Sunroof Housing Rear Drain Hose Retainer [5x]
2	Sunroof Housing Rear Drain Hose Procedure 1. Disconnect the sunroof drain hose from the sunroof frame spigot. 2. Grasp the grommet and pull upward to release. 3. When installing the drain hose grommet, ensure the end of the drain hose is installed through the access drain hole to prevent interior water leaks. 4. Water test and inspect sunroof for proper operation.

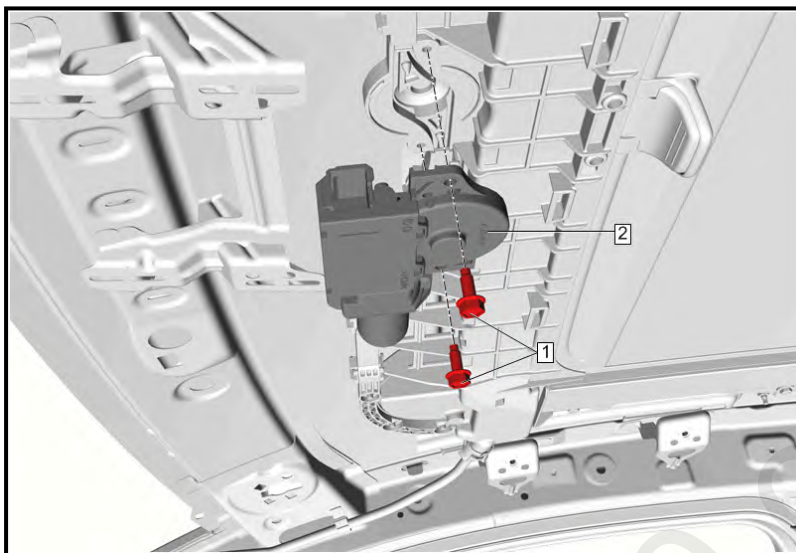
SUNROOF MODULE ASSEMBLY REPLACEMENT



Callout	Component Name
Preliminary Procedures 1. Sunroof Window Replacement - Front 2. Do not remove the drain hoses from the vehicle, only disconnect the drain hoses from the front sunroof frame spigots. Sunroof Housing Front Drain Hose Replacement (Left Side)Sunroof Housing Front Drain Hose Replacement (Right Side) 3. Do not remove the drain hoses from the vehicle, only disconnect the drain hoses from the rear sunroof frame spigots. Sunroof Housing Rear Drain Hose Replacement (Right Rear)Sunroof Housing Rear Drain Hose Replacement (Left Rear)	
1	Sunroof Module Bolt [9x] CAUTION: Refer to Fastener Caution . Tighten 9 N.m (80 lb in)

Callout	Component Name
2	Sunroof Module Assembly Procedure 1. Disconnect the electrical connectors. 2. With aid of assistant, remove the sunroof housing from the vehicle and place it on a clean dry prepared surface. 3. Transfer components as necessary. 4. Water test and inspect sunroof for proper operation.

SUNROOF WINDOW MOTOR REPLACEMENT



Callout	Component Name
Preliminary Procedure It is only necessary to lower the headlining. Only do those steps in the headlining procedure that will allow access to the component being removed. Headlining Trim Panel Replacement (With C3U) Headlining Trim Panel Replacement (Without C3U)	
1	Sunroof Window Motor Bolt [2x] CAUTION: Refer to Fastener Caution . Tighten 4 N.m (35 lb in)
2	Sunroof Window Motor Procedure 1. Disconnect the electrical connector. 2. With a turning motion, pull downward on the sunroof window motor to disengage the motor from the drive cables. 3. Install the sunroof window motor to the frame with a turning motion, pushing upward to engage the motor into the drive cables. 4. Sunroof Motor/Actuator Initialization/Teach Process 5. Verify the sunroof window motor operation.

SUNROOF MOTOR/ACTUATOR INITIALIZATION/TEACH PROCESS

Initialization

"Initialization" refers to the sunroof system learning the reference location of the hard stop. Initialization is done in the following scenarios:

- First time system is powered - Initialization has not been executed yet
- Sunroof/Sunshade has lost calibration value or has encountered a false reversal
- Motor assembly has been removed or replaced
- If the glass is adjusted after Sunroof/Sunshade initialization has already been completed

Until the motor assembly has been initialized, the express open and close switch inputs and manual open inputs are disregarded. During the process of initialization, anti-pinch detection is not active.

Initialization/Teach Procedure

NOTE:

- There are two positions in the close switch. The first detent is the close position. The second detent is the express close position. When performing the Initialization/Teach Procedure, the switch must be held in the close position, which is the first detent.
- If the switch is held for more than 10 s after the glass or sunshade has completed the Initialization/Teach Procedure, the sunroof may enter a "stuck switch" fault condition. If this happens, repeat the Initialization/Teach Procedure, making sure to release the switch when the sunroof glass panel has stopped moving.

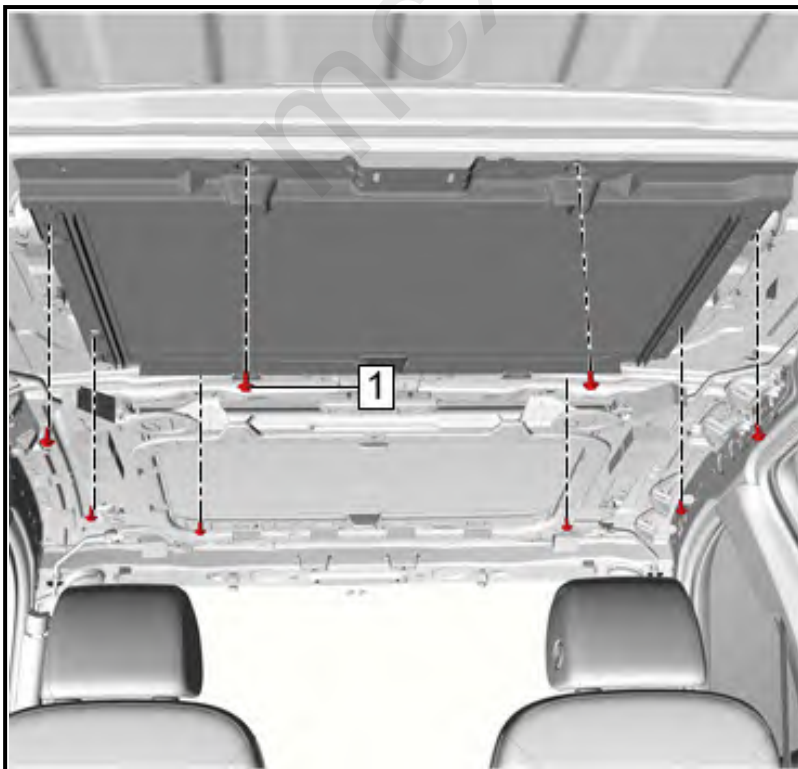
Ignition ON and the glass panel is in full closed position, press and hold the close switch (first detent) for greater than 15 s. The glass panel will open to vent, go to fully open, and then the fully closed position. Once the sunroof glass panel has closed, release the switch.

SUNROOF SUNSHADE REPLACEMENT (REAR)

Removal Procedure

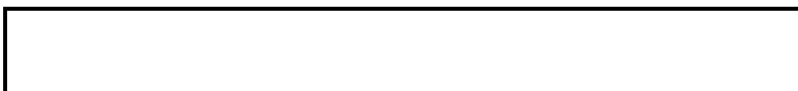
1. Headlining Trim Panel - Remove - [Headlining Trim Panel Replacement \(With C3U\)](#)
[Headlining Trim Panel Replacement \(Without C3U\)](#)

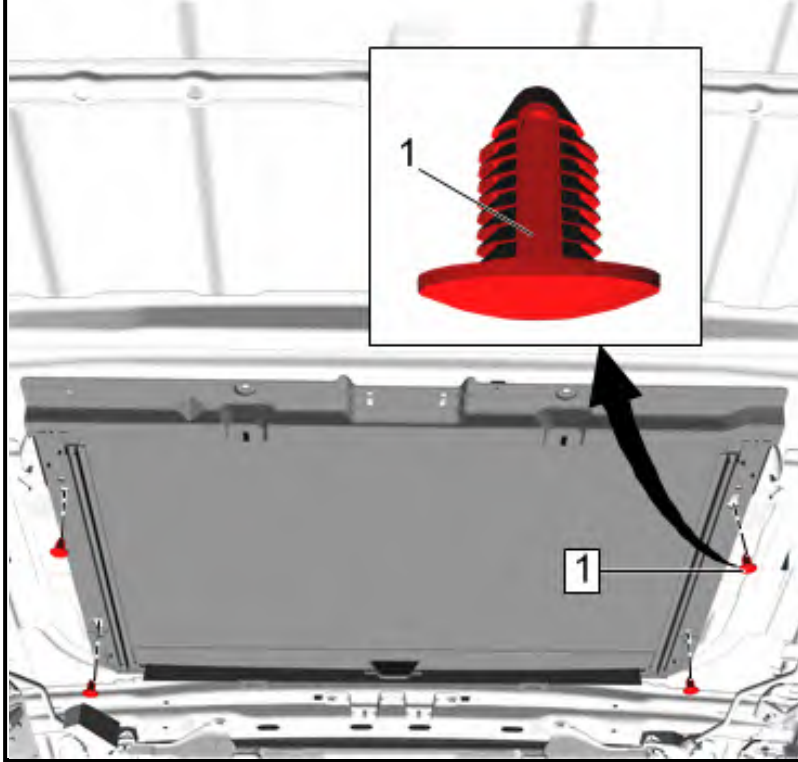
2.



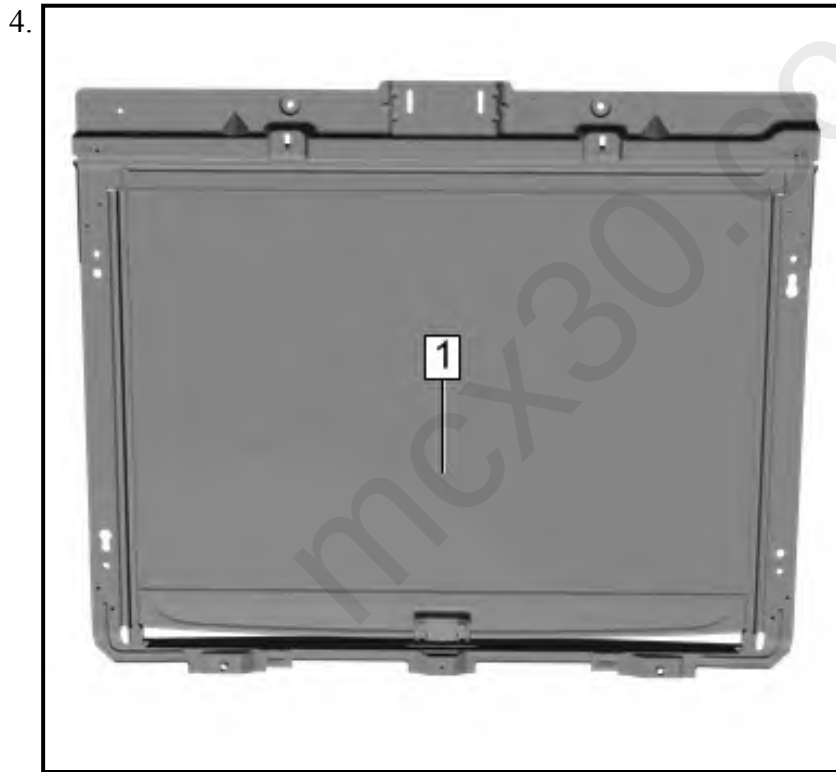
Sunroof Sunshade Bolt (1) - Remove [8x]

3.





Sunshade Push Pin (1) - Remove [4x]



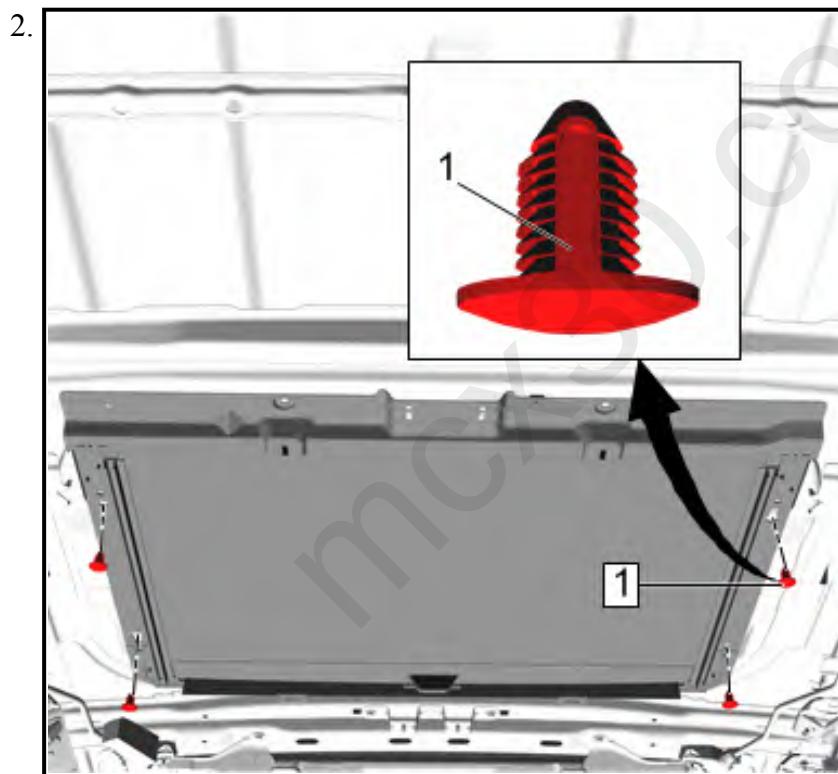
Sunroof Sunshade (1) - Remove

Installation Procedure



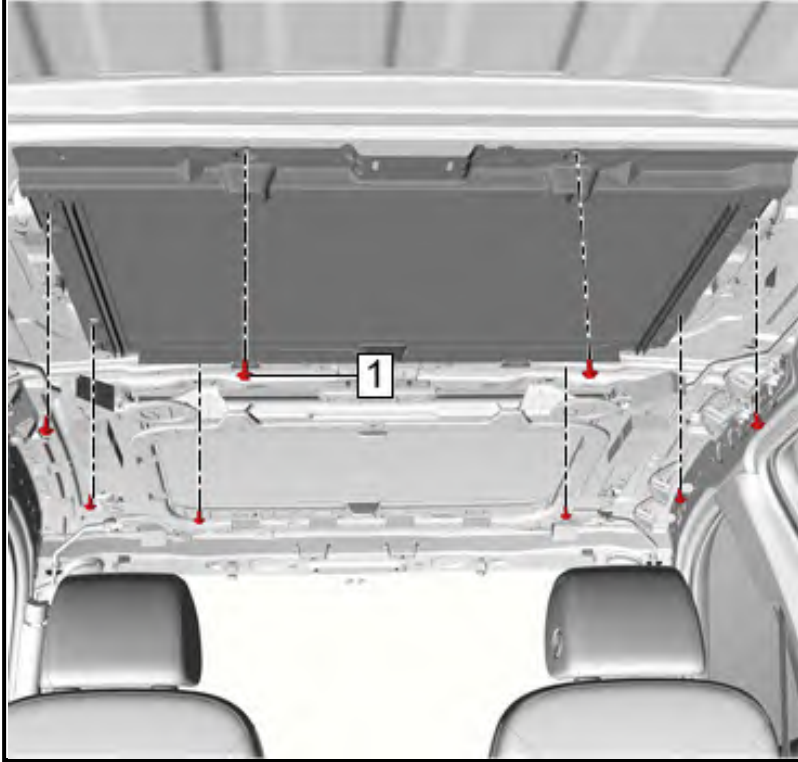


Sunroof Sunshade (1) - Install



Sunshade Push Pin (1) - Install [4x]





CAUTION: Refer to [Fastener Caution](#) .

Sunroof Sunshade Bolt (1) - Install and tighten [8x] 9 N.m (80 lb in)

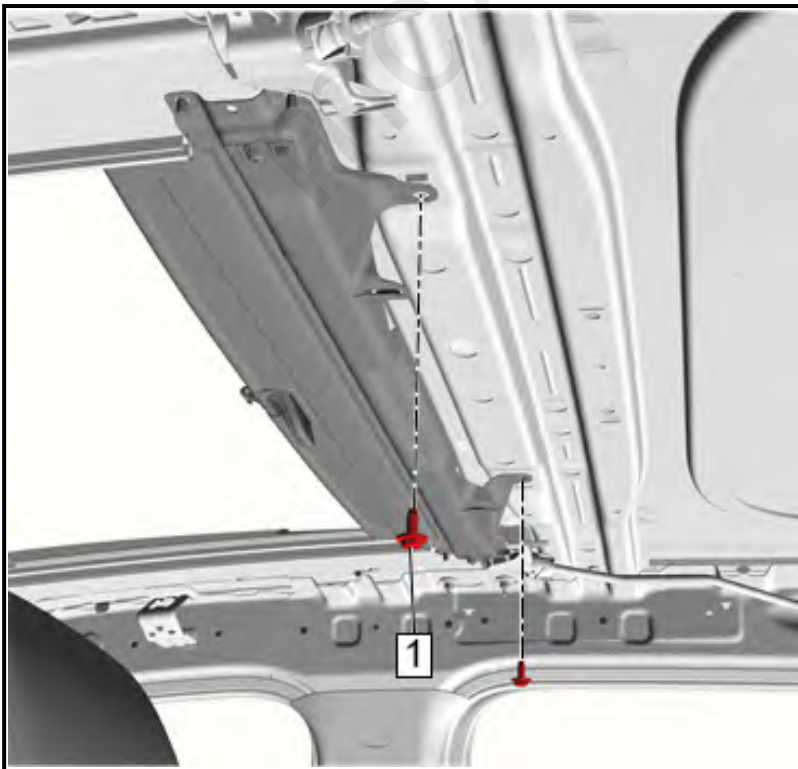
4. Headlining Trim Panel - Install - [Headlining Trim Panel Replacement \(With C3U\)](#) [Headlining Trim Panel Replacement \(Without C3U\)](#).

SUNROOF SUNSHADE REPLACEMENT (FRONT)

Removal Procedure

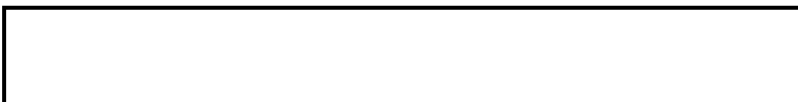
1. Headlining Trim Panel - Remove - [Headlining Trim Panel Replacement \(With C3U\)](#) [Headlining Trim Panel Replacement \(Without C3U\)](#).

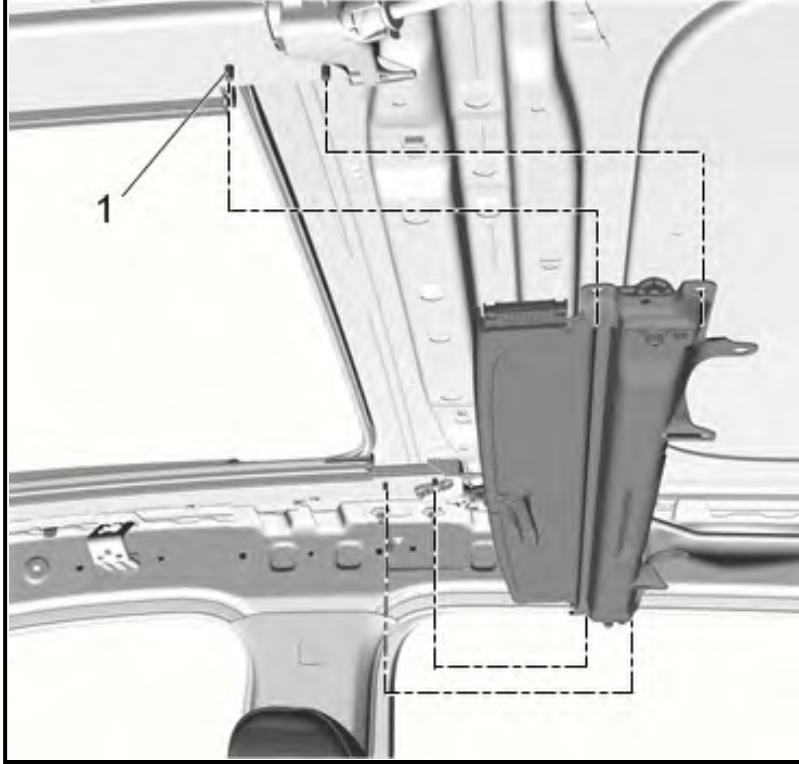
2.



Sunroof Sunshade Bolt (1) - Remove [2x]

3.





Lower the sunroof sunshade from the module assembly studs. (1)

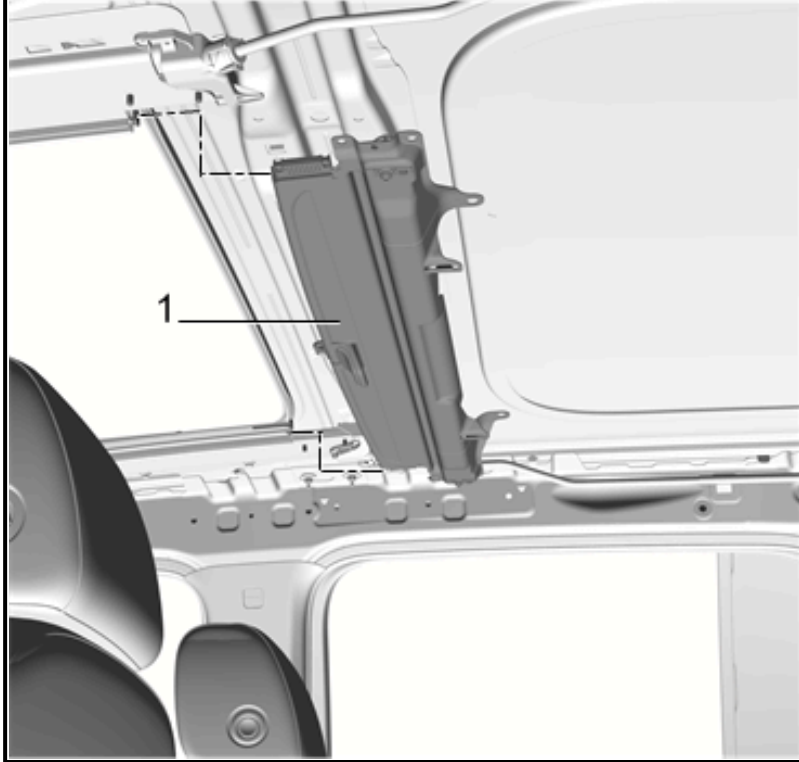
4.



Remove the sunroof sunshade (1) with the sunshade stops (2) out the back of the sunroof module.

5.



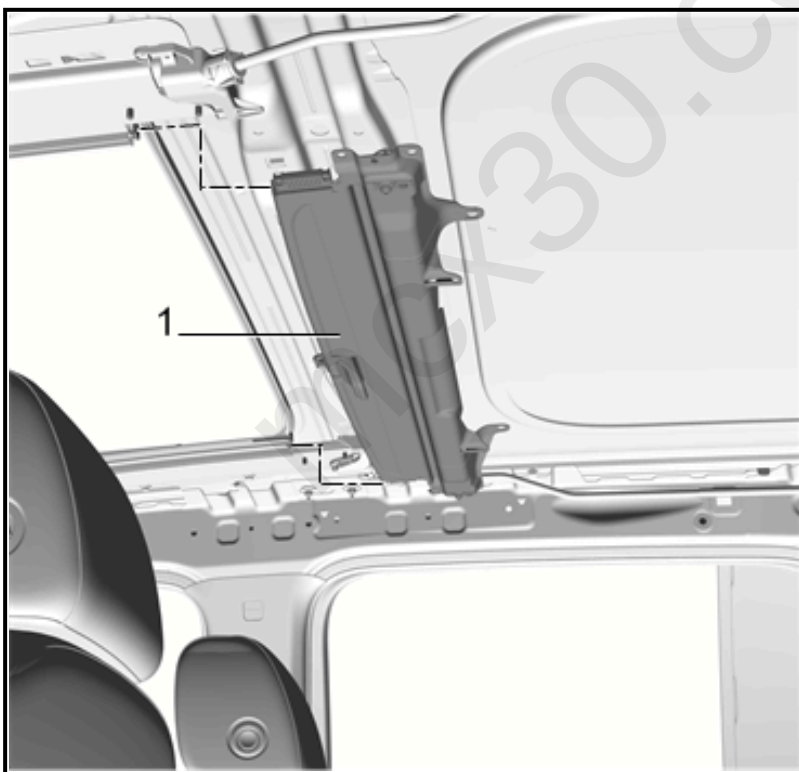


Sunroof Sunshade (1) - Remove

6. Transfer components as necessary.

Installation Procedure

1.



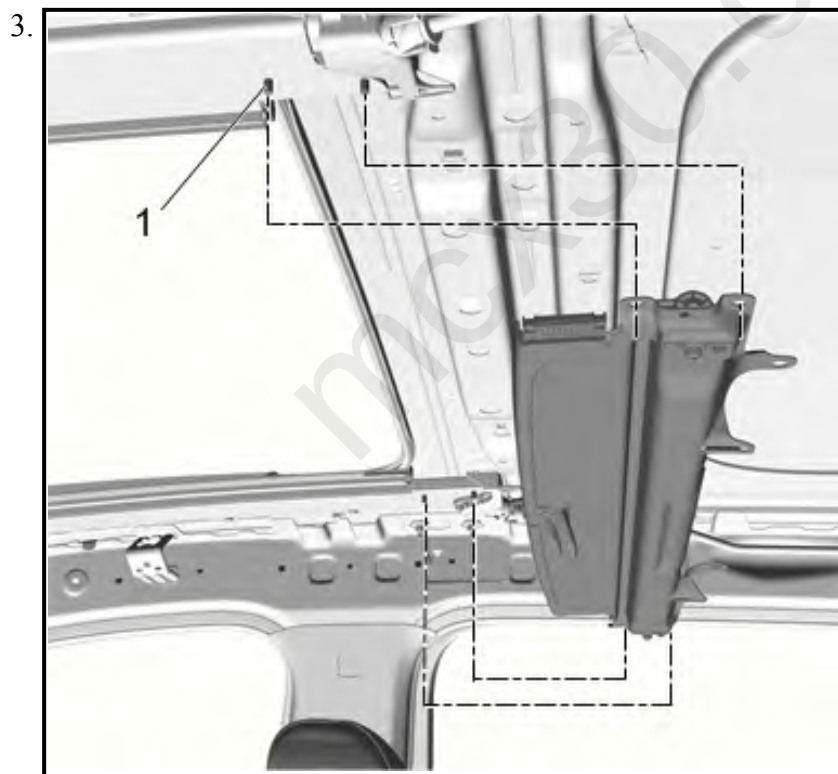
Sunroof Sunshade (1) - Install

2.



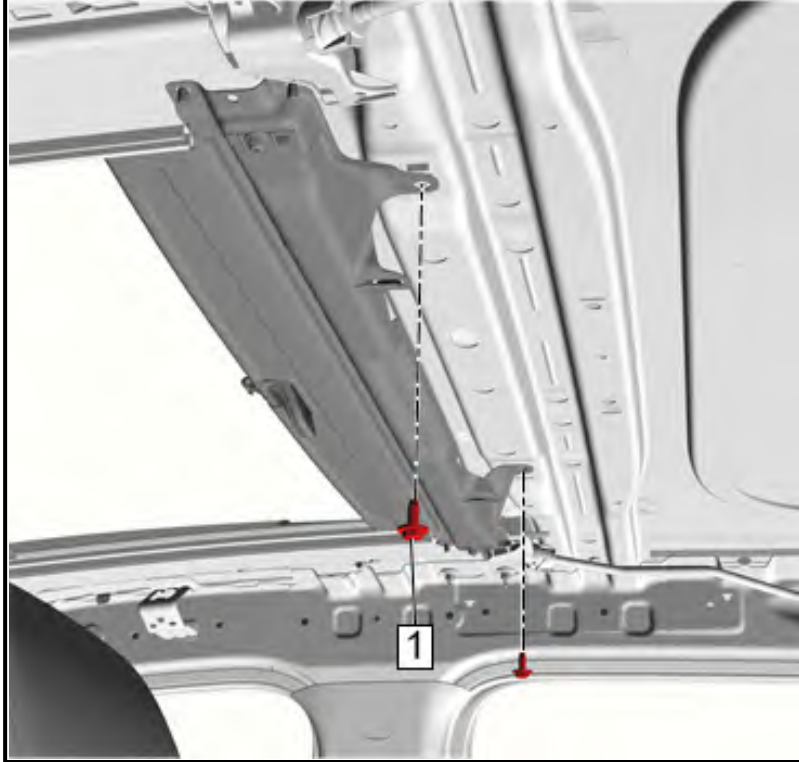


Install the sunroof sunshade (1) with the sunshade stops (2) into the back of the sunroof module.



Raise the sunroof sunshade to the module assembly studs. (1)



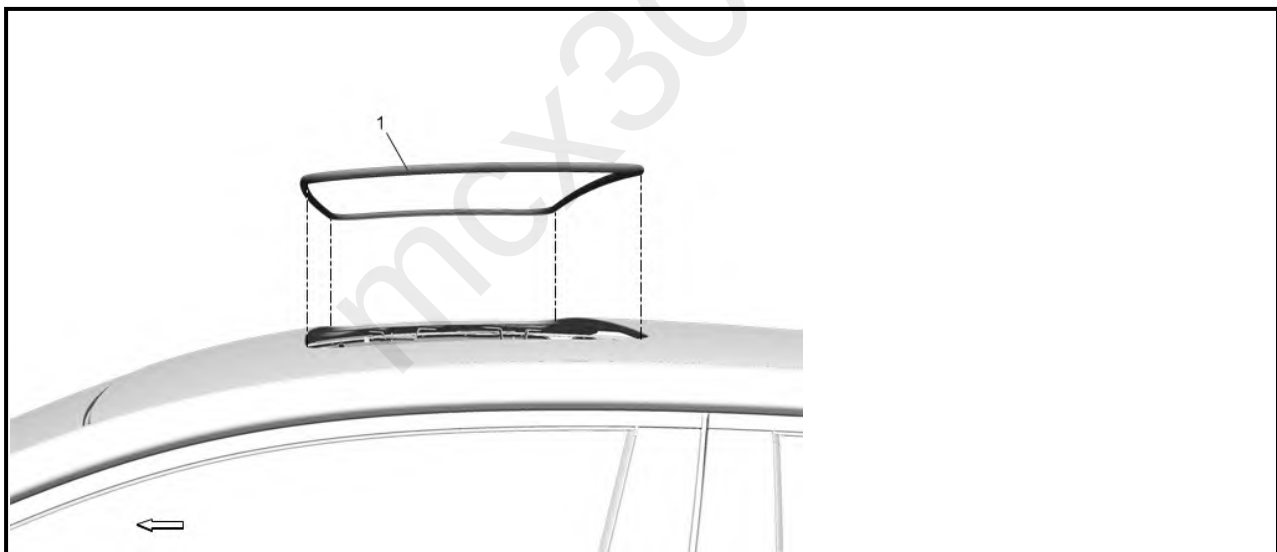


CAUTION: Refer to [Fastener Caution](#) .

Sunroof Sunshade Bolt (1) - Install and tighten [2x] 9 N.m (80 lb in)

5. Headlining Trim Panel - Install - [Headlining Trim Panel Replacement \(With C3U\)](#), [Headlining Trim Panel Replacement \(Without C3U\)](#).

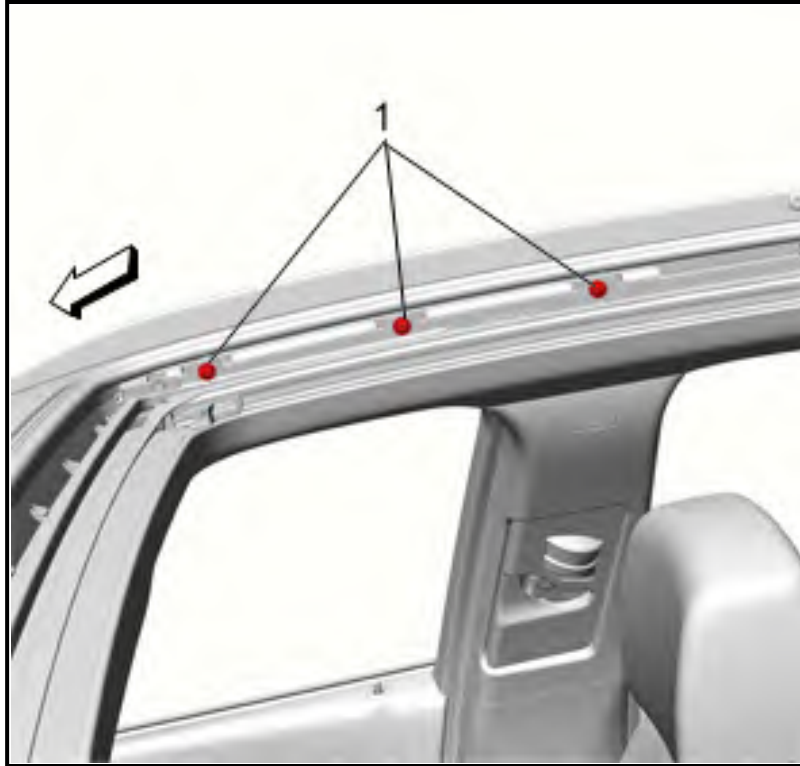
SUNROOF WINDOW SEAL REPLACEMENT



Callout	Component Name
Preliminary Procedure Sunroof Window Replacement - Front	
1	Sunroof Window Seal Procedure 1. Start at one end of the seal, pulling up and away from the housing. 2. Clean around the edge of the inside surface of the housing with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint-free cloth. 3. Water test the vehicle before installing the headlining trim panel.

SUNROOF WINDOW HEIGHT AND OPENING FIT ADJUSTMENT (WITH C3U)

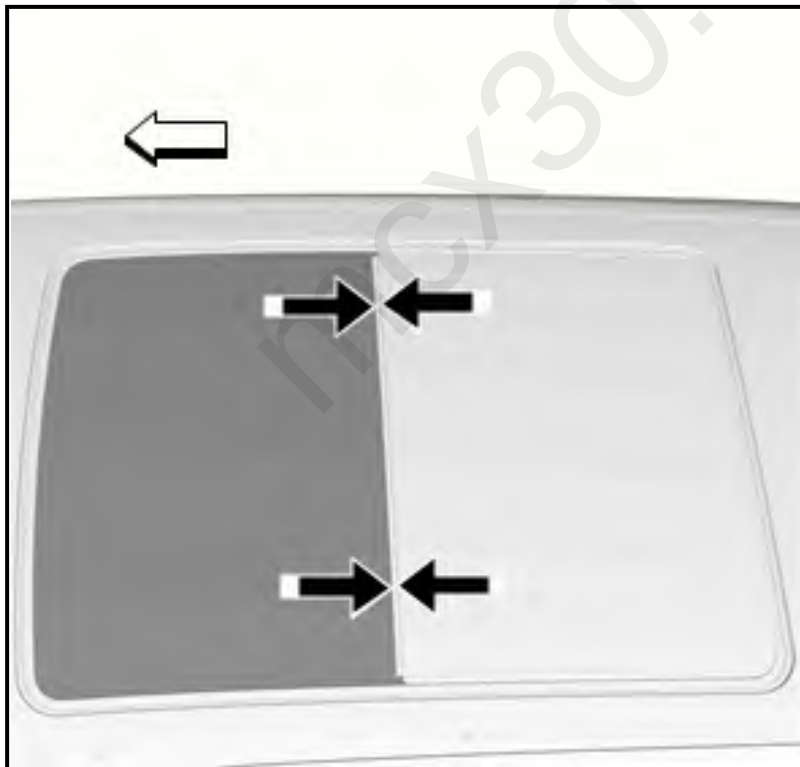
1.



Open the front sunroof window to the vent position.

2. Loosen the front sunroof window rear screws (1), left and right side.
3. Open the front sunroof to the half open position.
4. Loosen the front and middle sunroof window screws (1), left and right side.
5. Close the front sunroof.

6.



NOTE: Tighten the sunroof window in the upper position.

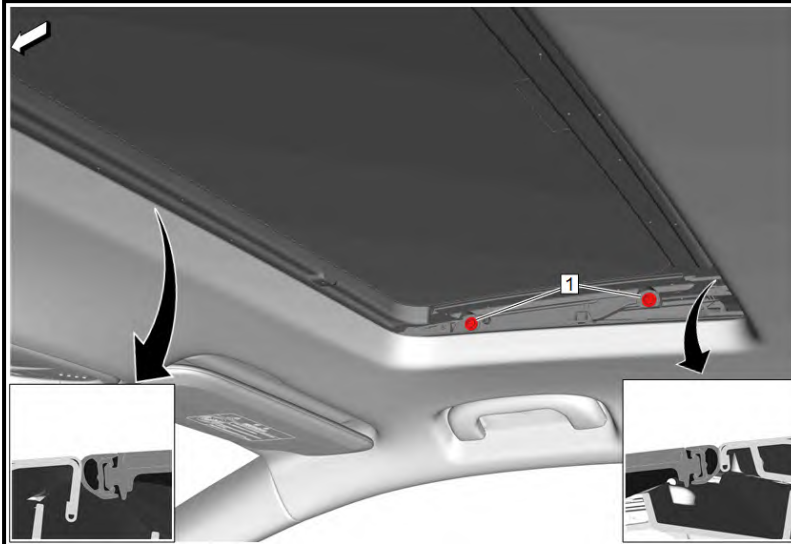
Adjust the window to the following specs, gap 11.0 + or - 0.3 mm (0.43 in) between the front rear and rear front edges.

CAUTION: Refer to [Fastener Caution](#) .

7. Tighten the front sunroof window rear screws (1) to 1.5 N.m (13 lb in).
8. Open the front sunroof window until the rear part is in the vent position.

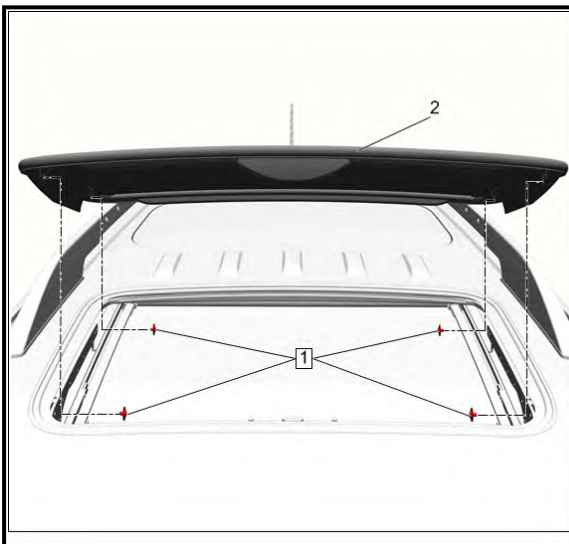
9. Tighten the front and middle sunroof window screws (1) to 1.5 N.m (13 lb in).
10. Close the front sunroof.

SUNROOF WINDOW HEIGHT AND OPENING FIT ADJUSTMENT (WITHOUT C3U)



Callout	Component Name
1	Sunroof Window Fastener (Qty: 4) CAUTION: <u>Fastener Caution</u> Procedure 1. Cycle the sunroof window from full open to closed position. 2. Loosen the adjusting screws on the sunroof window. 3. Adjust the front of the sunroof window to window to 0-1 mm (0.00-0.04 in) below the top surface of the roof panel. 4. Adjust the rear center line of the sunroof window to 0-1 mm (0.00-0.04 in) above the top surface of the roof panel. 5. Cycle the sunroof window through all positions. 6. Inspect the sunroof window adjustment. Adjust if necessary. Tighten 4.5 N.m (40 lb in)

SUNROOF WINDOW REPLACEMENT - FRONT



Callout	Component Name
1	Sunroof Window Screw [4x] CAUTION: Refer to Fastener Caution . Tighten 6 N.m (53 lb in)
2	Sunroof Window Procedure 1. Open the sunroof window to the access the screws. 2. Sunroof Window Height and Opening Fit Adjustment (With C3U)Sunroof Window Height and Opening Fit Adjustment (Without C3U)

SUNROOF WINDOW REPLACEMENT - REAR

Special Tools

- **BO 39032** Stationary Glass Removal Tool
- Use a urethane adhesive systems which meet GM Specification GMW 15672

Removal Procedure

WARNING: Refer to [Glass and Sheet Metal Handling Warning](#) .

WARNING: Refer to [Cracked Window Warning](#) .

WARNING: Refer to [Window Retention Warning](#) .

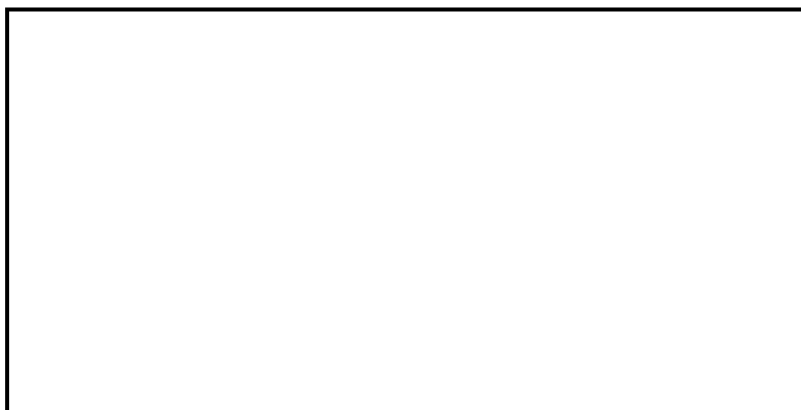
NOTE: Before cutting out a stationary window, apply a double layer of masking tape around the perimeter of the painted surfaces and the interior trim.

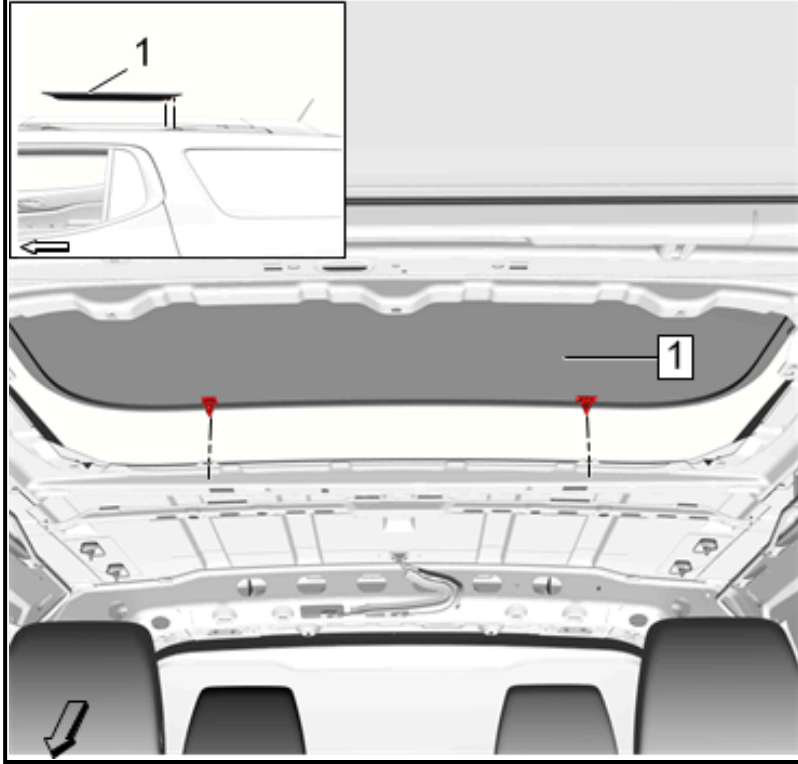
1. Headlining Trim Panel - Remove - [Headlining Trim Panel Replacement \(With C3U\)](#)
[Headlining Trim Panel Replacement \(Without C3U\)](#)
2. Cover the seats and carpeting to protect from broken glass.

NOTE: Keep the cutting edge of the tool against the window from inside the vehicle. This will allow the urethane adhesive to be separated from the window.

3. Use **BO 39032** stationary glass removal tool or equivalent in order to remove the window.
 - Leave a base of urethane on the pinchweld flange.
 - The only suitable lubrication is clear water.

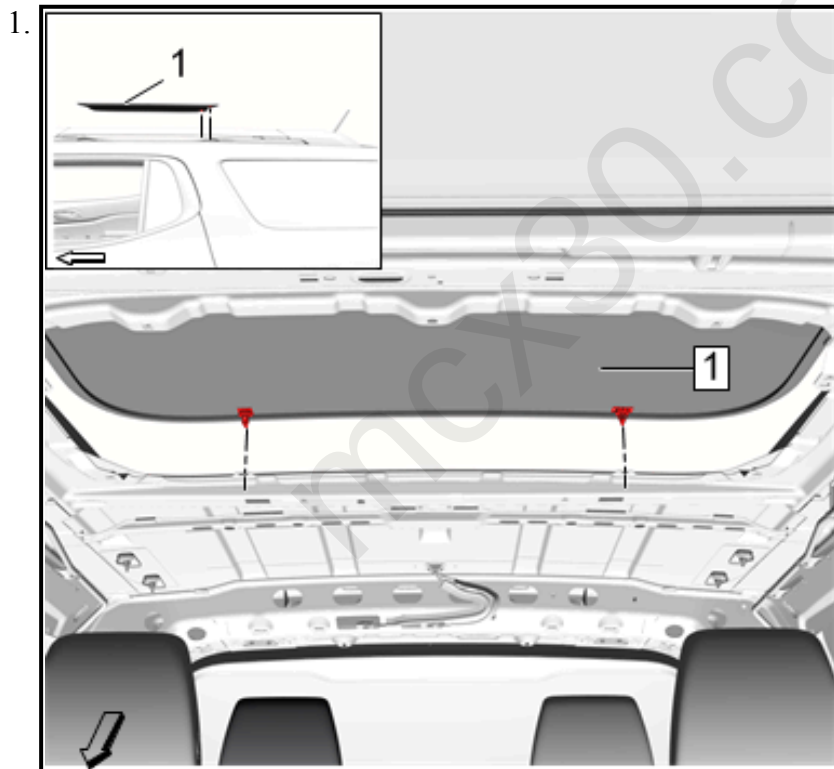
4.





Sunroof Window (1) - Remove

Installation Procedure



Sunroof Window (1) - Install

2. Headlining Trim Panel (1) - Install - [Headlining Trim Panel Replacement \(With C3U\)](#)
[Headlining Trim Panel Replacement \(Without C3U\)](#)

DESCRIPTION AND OPERATION

SUNROOF DESCRIPTION AND OPERATION

The sunroof system consists of a moving glass panel and a 2nd fixed glass panel located just behind the moving glass panel. The moving glass component slides over the top of the fixed glass, and the roof panel. There is also a power roller sunroof which covers both glass panels. The electrical portion of the system controls the opening and closing of the sunroof glass and the power roller sunroof. The ignition

must be in ON/RUN/START, ACC/ACCESSORY, or in retained accessory power (RAP) to operate the sunroof.

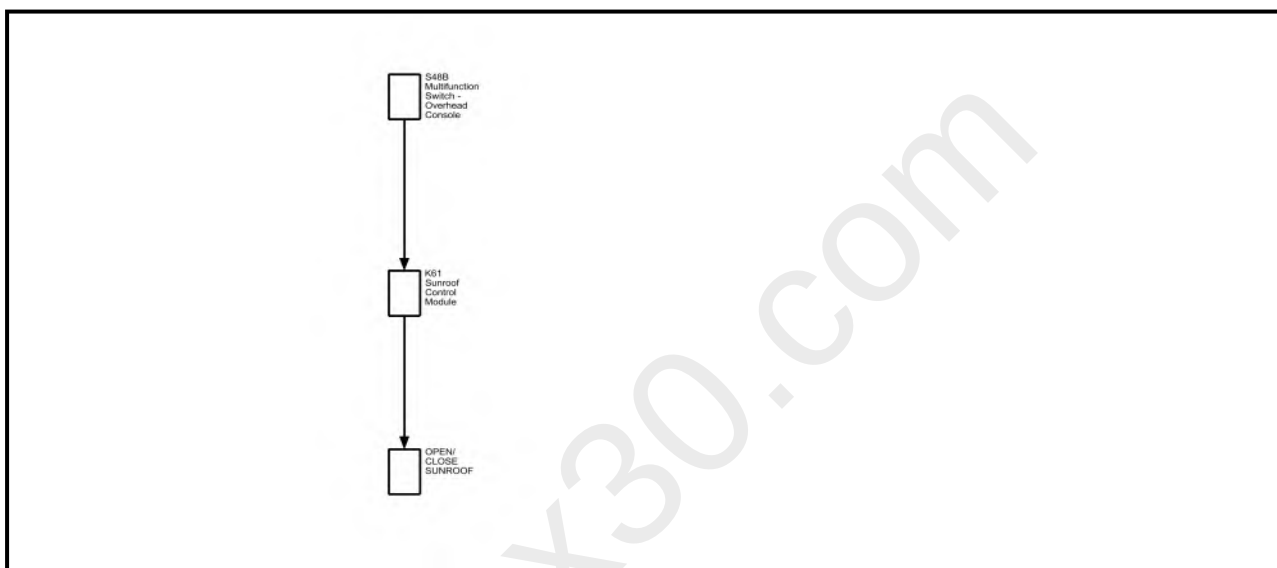
The electrical portion of the spoiler sunroof system consists of:

- Body control module (BCM)
- Sunroof control module

The BCM communicates with the sunroof glass control module to enable or disable sunroof operation. The sunroof control modules provide system status and diagnostic information to the BCM for diagnostic reporting and operational purposes.

The sunroof glass is controlled by its own integrated motor/controller containing the necessary electronics, motor, hall effect position sensors, as well as the interface to the driver control switches. The motor/controller is capable of controlling motion based on control switch activation and message commands from the BCM.

There are times when the sunroof operation are dependent on each other (see below). This dependency is controlled by the BCM.



Callout	Component Name
S48B	S48B Multifunction Switch - Overhead Console
K61	K61 Sunroof Control Module

Sunroof Glass Control Switches

The sunroof control switch is connected directly to their respective controllers and provide positions for open, express open, off, close, and express close. The control switch completes the circuit between two signals provided by the control module, a reference ground input and a pull-up voltage.

System Protection Functions

Normal operation of the sunroof system may be altered by one of the following events.

Obstacle or Blockage Detection

When enabled, obstacle detection is active only while the sunroof opening is approximately 4 - 200 mm (0.16 - 7.87 in) when moving in the closing direction. When an obstacle is detected in this range, the motion in the closing direction will stop and the sunroof will reverse direction for a short distance. The reversal shall complete regardless of operating Mode. If the travel is outside the range defined above, the sunroof will try to continue closing until it detects a motor stall condition or the system is at one of its defined stops.

Motor Stall

If the sunroof is moving in the open or close direction and stops moving for 350 ms while a command is active, and no obstacle has been detected, the motor shall be turned off to prevent overheating.

Sunroof System Thermal Protection

The sunroof controllers have a thermal protection algorithm to protect the sunroof control and motor from damage due to overheating conditions resulting from immoderate switch actuations. The thermal protection algorithm will cause any new sunroof open commands to be ignored until the motors are allowed to cool. A number of close requests during an over temperature condition will be allowed. If the thermal protection is triggered during an obstacle detection event, the sunroof reversal shall be finished.

Service Tool Commanded Open

When a service tool commands the sunroof open, it results in the Sunroof going to half way point mentioned above or to the fully open depending on the calibration. If the half way point is calibrated on, this position is as far as the sunroof can be opened with the service tool. To go beyond this point a switch activation must be used.

Sunroof Operation

Open to Vent Position

When the position of the sunroof is less than the defined vent position, activating the sunroof Open switch for less than 500 ms results in the sunroof moving until it reaches the vent position.

Normal Open (Non-Express)

When the sunroof switch is held in the Open position, the sunroof begins opening. As long as the switch is continuously held in the Open state the sunroof will not stop in the vent position.

Sunroof Express Open

Press and release the sunroof switch Open position, the Sunroof will Express Open until the controller determines the Sunroof has reached the Comfort Stop position or the Fully Open position.

Normal Close (Non-Express)

When the sunroof switch is in the Close state, the sunroof will begin moving in the closed direction.

Sunroof Express Close

Press and release the sunroof switch Close position, the Sunroof will express close until the controller determines the sunroof has reached the fully closed position.
