

Sunroof Description and Operation

Power Sunroof System Components

The Power Sunroof System consists of the following components:

- Sunroof control module
- Sunroof switch
- Sunroof glass, tilt/slide style, with glass sliding between the headliner and roof
- Rail and track assembly upon which the sunroof glass rides
- SUNROOF Fuse 20 A
- Body control module (BCM)

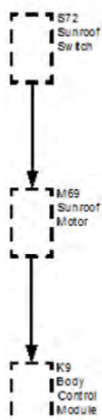
Power and Grounds

Battery positive voltage is supplied at all times to the sunroof control module assembly from the 20A SUNROOF fuse located in the underhood fuse block. Ground is supplied to the sunroof control module through the module ground circuit.

Ground is supplied to the sunroof switch through the switch ground circuit.

Power Sunroof Operation

The power sunroof system will operate with the ignition switch turned to Accessory or RUN positions, this allows for retained accessory power (RAP) control of the sunroof through the BCM. Once the ignition switch is turned to OFF the sunroof will continue to operate until any door is opened, or when the RAP timer reaches its shut-off limit. For a description and operation of the RAP operation, refer to [Retained Accessory Power Malfunction](#).



Sunroof Switch

The sunroof switch, located in the front center of the headliner, contains two rocker type switches that are used to control the following sunroof functions:

- Roof express open
- Roof open/close

- Vent open/close

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

When the sunroof control switch transitions to the Express Open state, the Sunroof will Express Open until the controller determines the Sunroof has reached the Comfort Stop position or the Fully Open position, or the switch transitions to another state after first returning to the Off 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

The Sunroof must be closed manually (Normal close), and the Sunroof Express Close feature is not supported for this vehicle. When the sunroof control switch transitions to the Express Open state, the Sunroof will Express Open until the controller determines the Sunroof has reached the Comfort Stop position or the Fully Open position, or the switch transitions to another state after first returning to the Off position.

Sunroof Window Motor Initialization

Initialization and Teaching

"Initialization" refers to the sunroof system's learning where the hard stop reference location is.

"Teaching" refers to the system's learning of the mechanical profile of the sunroof, it is a record of motor RPM over the entire range of movement.

Initialization and Teaching are done in the following scenarios:

- First Time System is Powered – Initialization has not been executed yet
- Drive System Service Replacement or Removal
- Excessive false reversals are experienced
- If the glass is adjusted after initialization and teaching has already been done.

Until the drive 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.

An Initialization process that was not carried out completely can be started again at any time after first cycling power, as long as the interruption did not leave the mechanism right at the hard stop*. Ensure the supply voltage does not dip below 9.0V at the E-drive during initialization and teach.

The initialization and teach process is as follows:

For a New Drive Assembly:

1. Press and hold the CLOSE switch, press to first detent of button only, for approximately 10 seconds until the sunroof moves slightly past Full Vent (2 mm) and suddenly back to Full Vent.
2. Quickly release the CLOSE switch and re-press and hold, within 1 second, while the sunroof moves to Full Open and back to Closed. The roof should start to move within about 4 seconds.
3. Release the switch and verify successful initialization by performing one-touch open and close operations.

For an Existing Drive Assembly:

1. Fully close the sunroof. Release the switch.
2. Press and hold the CLOSE switch, press to first detent of button only, for approximately 10 seconds until the sunroof moves slightly past Full Vent (2 mm) and suddenly back to Full Vent.
3. Quickly release the CLOSE switch and re-press and hold, within 1 second, while the sunroof moves to Full Open and back to Closed. The roof should start to move within about 4 seconds.
4. Release the switch and verify successful initialization by performing one-touch open and close operations.

* If The Process is Interrupted Right at the Hard Stop:

Note: The controller needs to see motor movement to initialize but no movement can occur because the process was interrupted when the motor was stalled against the hard stop.

1. Either disconnect power and/or ignition to the E-drive.

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2. Insert a 4 mm hex wrench into the drive assembly and back the motor away from the hard stop, move the glass toward CLOSE, about 2 inches. Repeat if glass cannot achieve closed position.
3. Reconnect power to the E-drive. Proceed as directed in For An Existing Drive Assembly.

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

[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	—	—
Ignition	1	1	2	—
Sunroof Switch Close Signal	1	1	1	—
Sunroof Switch Open Signal	1	1	1	—
Sunroof Switch Express Signal	1	1	1	—
Sunroof Switch Open Vent Signal	1	1	1	—
Sunroof Switch Close Vent Signal	1	1	1	—
1. Power Sunroof Malfunction 2. Power Sunroof Always Operable				

Circuit/System Description

Ignition voltage is supplied to the Sunroof Motor Module by the BCM. B+ is applied to the Sunroof Motor via the SUNROOF F32UA 20Amp fuse. The Sunroof Motor supply each of the switch signal circuits with a voltage reference. When a switch is pressed the signal circuit is pulled low signaling the sunroof or sunroof vent open or close request. The modules determine the motor direction based on inputs received from the switches. When the modules reverse the polarity of the applied voltage, the motors reverse direction.

Reference Information

Schematic Reference

[Sunroof Schematics](#)

Connector End View Reference

[Component Connector End Views](#)

Description and Operation

[Sunroof Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)

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- [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 the sunroof opens and closes when pressing the open and close sunroof switch.
⇒ **If the sunroof does not open or close**
Refer to Circuit/System Testing.
⇓ **If the sunroof opens and closes**
3. Verify the sunroof opens and closes to the vent position when pressing the open and close sunroof vent switch.
⇒ **If the sunroof does not open or close to the vent position**
Refer to Circuit/System Testing.
⇓ **If the sunroof opens and closes to the vent position**
4. All OK.

Circuit/System Testing

Note: Because of the accessibility of the switches, perform the Switch Component Testing before beginning the Circuit/System Testing.

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the M69 Sunroof Motor. 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 1 and ground.
⇒ **If 10 Ω or greater**
 - 2.1. Ignition OFF, disconnect the harness connector at the M69 Sunroof Motor.
 - 2.2. 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.
⇓ **If less than 10 Ω**
3. Verify a test lamp illuminates between the B+ circuit terminal 6 and ground.
⇒ **If test lamp does not illuminate and the circuit fuse is good**
 - 3.1. Ignition OFF.
 - 3.2. 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**
 - 3.1. Ignition OFF.
 - 3.2. 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 M69 Sunroof Motor.
⇓ **If the test lamp illuminates**
4. Ignition ON.
5. Verify a test lamp illuminates between the ignition circuit terminal 9 and ground.
⇒ **If the test lamp does not illuminate**

5.1. Ignition OFF.

5.2. Test for less than $2\ \Omega$ in the ignition circuit end to end.

⇒ If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.

⇒ If less than $2\ \Omega$, refer to [Retained Accessory Power Malfunction](#).

↓ **If the test lamp illuminates**

6. Test for less than 1 V between the signal circuit terminals listed below and ground:

- Terminal 2– M69 Sunroof Motor
- Terminal 3 – M69 Sunroof Motor
- Terminal 4 – M69 Sunroof Motor
- Terminal 5– M69 Sunroof Motor

⇒ **If 1 V or greater**

Repair the short to voltage on the signal circuit.

↓ **If less than 1 V**

7. Ignition OFF.

8. Test for infinite resistance between the signal circuit terminals listed below and ground:

- Terminal 2– M69 Sunroof Motor
- Terminal 3 – M69 Sunroof Motor
- Terminal 4 – M69 Sunroof Motor
- Terminal 5– M69 Sunroof Motor

⇒ **If less than infinite resistance**

Repair the short to ground on the signal circuit

↓ **If infinite resistance**

9. Disconnect the harness connector at the S72 Sunroof Switch.

10. Test for less than $5\ \Omega$ between the circuit terminals listed below:

- S72 Sunroof Switch terminal 1 and M69 Sunroof Motor terminal 3
- S72 Sunroof Switch terminal 4 and M69 Sunroof Motor terminal 2
- S72 Sunroof Switch terminal 6 and M69 Sunroof Motor terminal 4
- S72 Sunroof Switch terminal 8 and M69 Sunroof Motor terminal 2
- S72 Sunroof Switch terminal 2 and M69 Sunroof Motor terminal 5

⇒ **If greater than $5\ \Omega$**

Repair the open/high resistance in the circuit.

↓ **If less than $5\ \Omega$**

11. Ignition OFF and all vehicle systems OFF. Disconnect the harness connector at the S72 Sunroof Switch. It may take up to 2 minutes for all vehicle systems to power down.

12. Test for less than $10\ \Omega$ between the ground circuit terminal 5 and ground.

⇒ **If $10\ \Omega$ or greater**

12.1. Ignition OFF.

12.2. Test for less than $2\ \Omega$ in the ground circuit end to end.

⇒ If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.

⇒ If less than $2\ \Omega$, repair the open/high resistance in the ground connection.

↓ **If less than $10\ \Omega$**

13. Ignition ON, Install a 10 A fused jumper wire between the signal circuit terminal 6 and the ground circuit terminal 5.

14. Verify the Sunroof opens.

⇒ **If not Open**

Replace the M69 Sunroof Motor.

↓ **If Open**

15. Test or replace the S72 Sunroof Switch.

Component Testing**Sunroof Switch**

1. Ignition OFF, disconnect the harness connector at the S72 Sunroof Switch.
2. Test for infinite resistance between the control terminals listed below and the ground terminal 5.
 - S72 Sunroof Switch terminal 1
 - S72 Sunroof Switch terminal 2
 - S72 Sunroof Switch terminal 4
 - S72 Sunroof Switch terminal 6
 - S72 Sunroof Switch terminal 8

⇒ **If less than infinite resistance**

Replace the S72 Sunroof Switch.

↓ **If infinite resistance**

3. Test for less than 5 Ω between the control terminals listed below and the ground terminal 5 with the switch in the appropriate position.
 - S72 Sunroof Switch terminal 1, sunroof switch CLOSE position
 - S72 Sunroof Switch terminal 2, sunroof switch OPEN position
 - S72 Sunroof Switch terminal 4, sunshade switch OPEN position
 - S72 Sunroof Switch terminal 6, sunshade switch CLOSE position
 - S72 Sunroof Switch terminal 8, sunshade switch CLOSE position

⇒ **If not less than 5 Ω**

Replace the S72 Sunroof Switch.

↓ **If less than 5 Ω**

4. All OK.

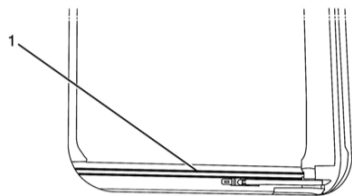
Repair Instructions

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

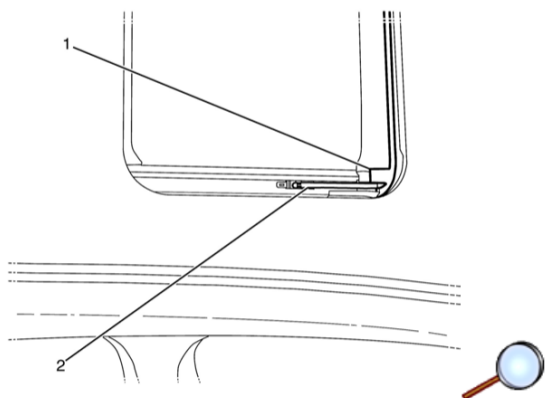
- [Sunroof Switch Replacement](#)
- [Sunroof Actuator Motor Replacement](#)

Sunroof Cleaning and Inspection

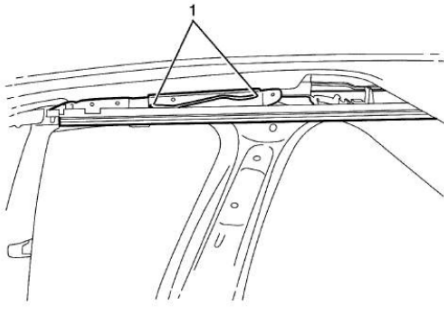
1. Open the sunshade to the full rearward position.
2. Cycle the sunroof window from the full closed to the full open position.
3. Remove the sunroof vent window latch cover. Refer to [Roof Vent Window Latch Cover Replacement](#).



4. Remove the excess dirt from the sunroof runner guide (1).
5. Clean the sunroof drains. Refer to [Sunroof Drain Inspection and Cleaning](#).

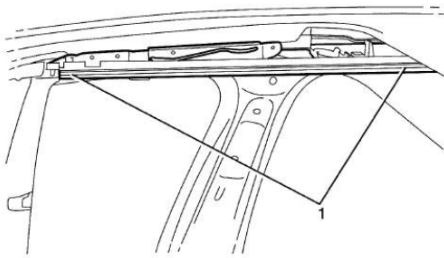


6. Remove the excess dirt around the sunroof air deflector (1) and sunroof air deflector spring (2).

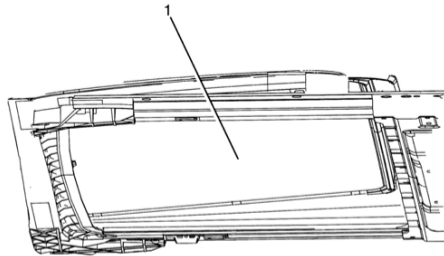


7. Remove the excess dirt around the sunroof glass guide (1).

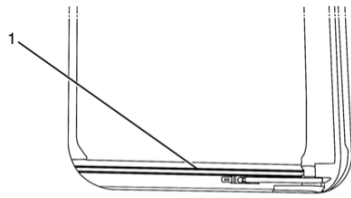
8. Inspect the sunroof glass guide (1) for wear or deterioration of the sunroof mechanism.



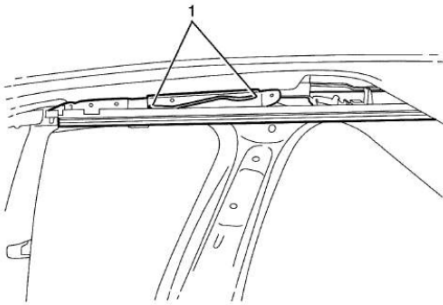
9. Remove the excess dirt from the sunroof shade runner (1).



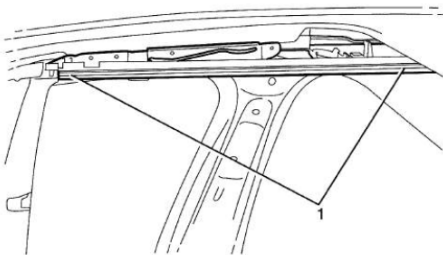
10. Clean the excess dirt around the sunroof glass (1).



11. Lubricate the sunroof runner guide (1) with an approved grease or equivalent.



12. Lubricate the sunroof glass guide (1) with an approved grease or equivalent.



13. Lubricate the sunroof shade runner (1) with an approved grease or equivalent.

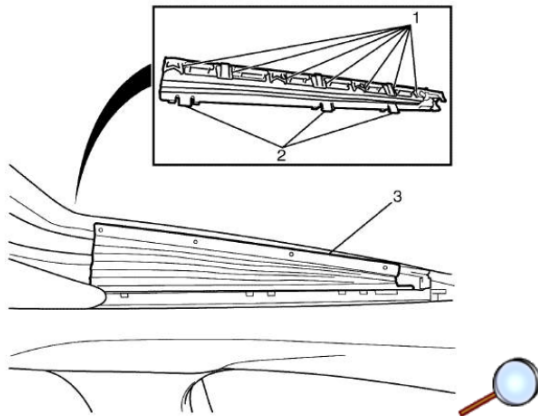
Important: Before fitment of the sunroof vent window latch cover make sure that the cover is clean.

14. Install the sunroof vent window latch cover. Refer to [Roof Vent Window Latch Cover Replacement](#).

Roof Vent Window Latch Cover Replacement

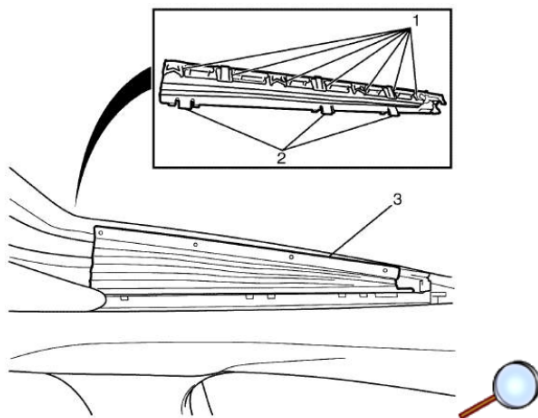
Removal Procedure

1. Slide the sunshade to the full rearward position.
2. Open the sunroof window to the full vent position.



3. From inside the sunroof opening, detach the sunroof vent window latch cover to the sunroof window locating tabs (1).
4. From inside the sunroof opening, detach the sunroof vent window latch cover to the sunroof panel assembly locating tabs (2).
5. Remove the sunroof vent window latch cover (3) from the sunroof panel assembly.
6. Repeat for the opposite side.

Installation Procedure



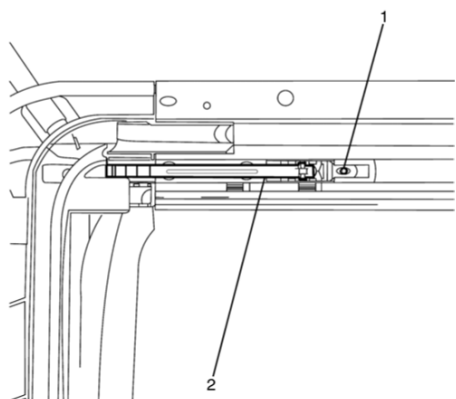
1. Position the new sunroof vent window latch cover (3) to the sunroof panel assembly.
2. Hold the lower part of the sunroof vent window latch cover firmly and press the locking tabs (2) into the sunroof panel assembly, listen for audible clicks to confirm fitting.

3. Make sure the entire length of the sunroof vent window latch cover is secure to the sunroof panel assembly.
4. Attach the sunroof vent window latch cover to the sunroof window locating tabs (1), listen for audible clicks to confirm fitting.
5. Repeat for the opposite side.
6. Close the sunroof window to make sure proper operation and fitting.
7. Close the sunshade .

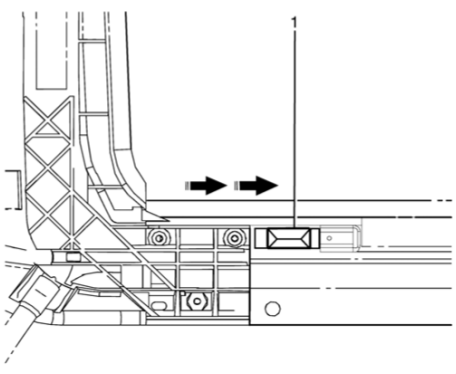
Sunroof Air Deflector Replacement

Removal Procedure

1. Cycle the sunroof window to the rear.



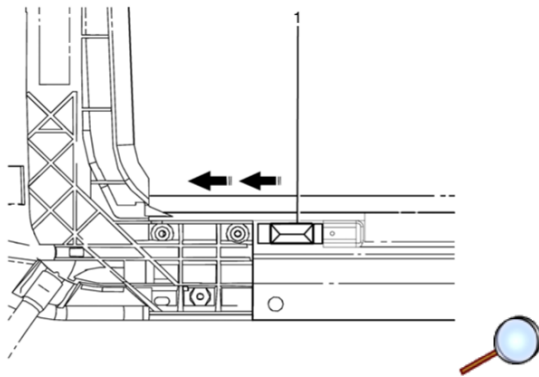
2. Remove the air deflector to sunroof actuator/motor bolt (1). Repeat for the opposite side.
3. Disconnect deflector spring (2) from the sunroof actuator/motor. Repeat for opposite side.



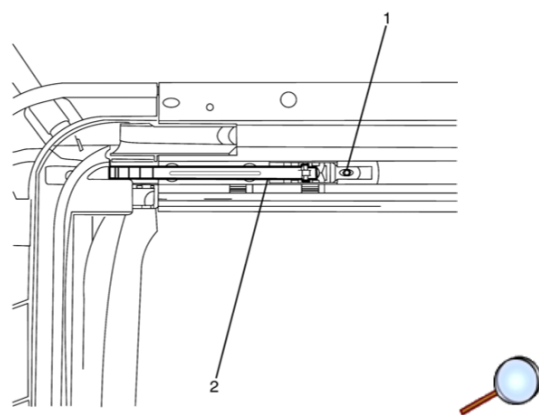
4. With an assistant, slide the air deflector towards the rear of the vehicle to disengage the retaining clips (1) of the sunroof sunroof actuator/motor bolt.
5. Remove the air deflector from the vehicle.

Installation Procedure

1. Install the air deflector to the sunroof actuator/motor.



2. With an assistant, slide the air deflector towards the front of the vehicle to engage the retaining clips (1) of the sunroof actuator/motor bolt.
3. While holding the right side down push the left front side of the air deflector towards the right side.
4. Pull up on the left side until the lower tab (1) clears the roof opening.



5. Connect the deflector spring (2) to the sunroof actuator/motor bolt. Repeat for opposite side.
6. Install the air deflector to sunroof actuator/motor bolt (1). Repeat for opposite side.
Tighten
Tighten the bolts to 7 N·m (62 lb in).
7. Push the left front side of the air deflector inwards and down so the tab clears the roof opening.
8. Close the sunroof window.

Sunroof Drain Inspection and Cleaning

Important: The drain hoses are pushed on as an interference fit and are not clamped or cemented. Do NOT disconnect the hose from the drain channel spouts while cleaning.

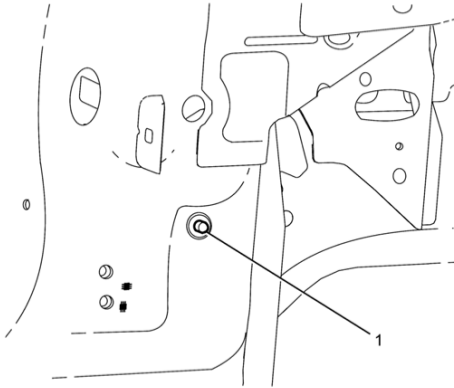
A drain trough encircles the sliding panel which leads to the drain spouts and into the hoses. The drain hoses are located at each corner of the housing. The two front drain hoses route down the windshield pillars and exit out the hinge pillars between the door hinges. The two rear drain hoses route down the quarter panels and exit the inner wheelhouse panels.

If you encounter a wet headliner or other water leak, inspect the following areas for the source of the leak:

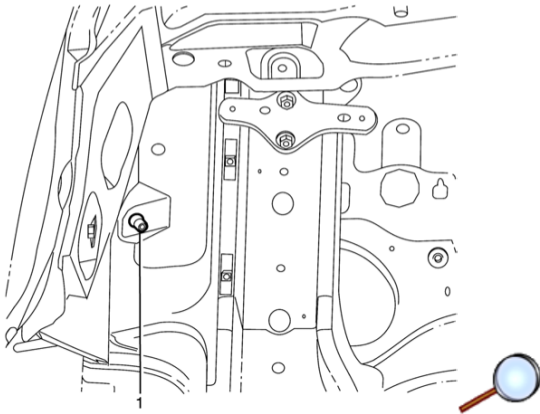
- The windshield
- The rear window

Verify the drainage system is not plugged or restricted. Use the following procedure:

1. With the sunroof open, using a one litre container, pour water into the drain trough.
2. Open the front doors.



3. Inspect for water drainage exiting through the grommets (1) at the hinge pillar.



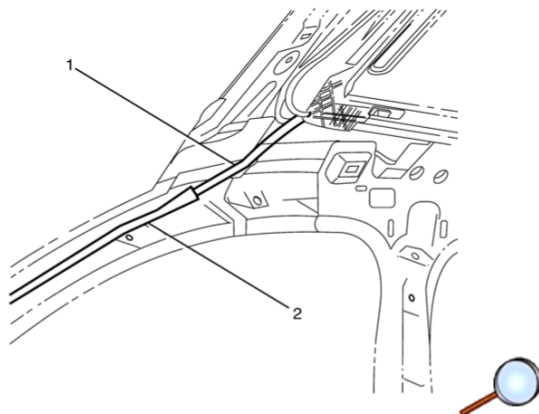
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4. Look at the rear of the inner wheelhouse panels for water exiting the rear drain grommet (1).
5. If the water flow is restricted, use a low volume of compressed air in order to clear the drainage system.
6. Retest the system.
7. If water drips from the headliner above the doors, lower the headliner. Refer to [Headlining Trim Panel Replacement](#). Inspect for proper drain tube connections at the housing drain spouts.
8. If necessary, secure the tubes onto the housing drain spouts.
9. If blockage is still present, replace the restricted drain hose. Refer to [Sunroof Housing Front Drain Hose Replacement](#) or [Sunroof Housing Rear Drain Hose Replacement](#).

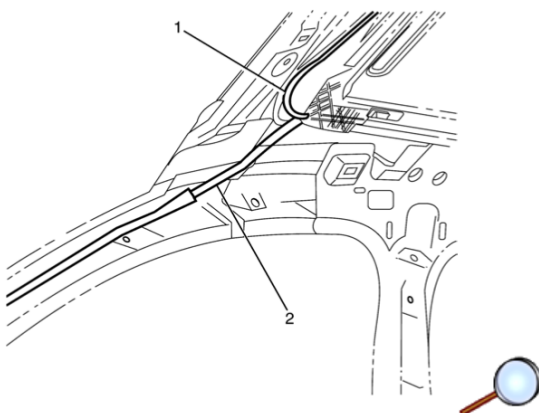
Sunroof Housing Front Drain Hose Replacement (Upper)

Removal Procedure

1. Remove the headliner. Refer to [Headlining Trim Panel Replacement](#).



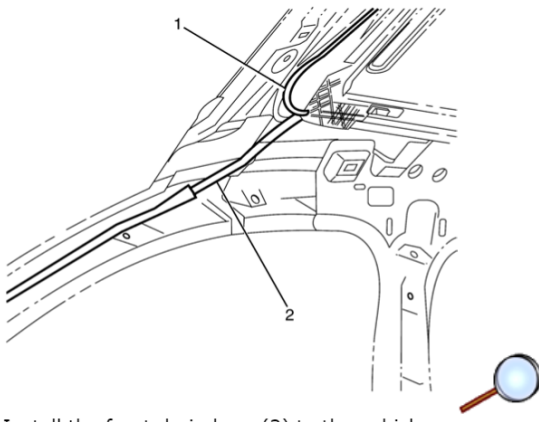
2. Disengage the front drain hose from the front drain tube (2).



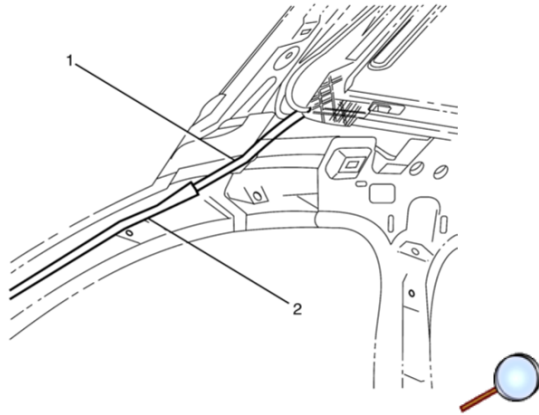
3. Disengage the front drain hose from the sunroof front drain spout (1).
4. Remove the front drain hose (2) from the vehicle.

Installation Procedure

Important: The only suitable lubricant is clean water for the drain hose installation.



1. Install the front drain hose (2) to the vehicle.
2. Connect the front drain hose to the sunroof front drain spout (1).

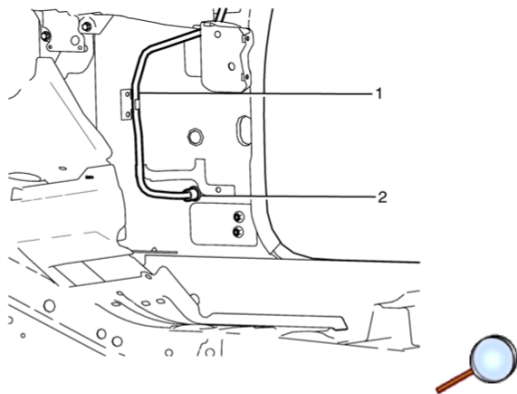


3. Connect the front drain hose to the front drain tube (1).
4. Inspect for proper drainage.
5. Install the headliner. Refer to [Headlining Trim Panel Replacement](#).

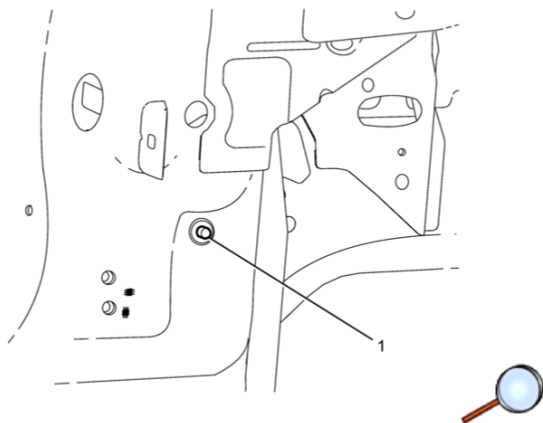
Sunroof Housing Front Drain Hose Replacement (Lower)

Removal Procedure

1. Remove the front fender. Refer to [Front Fender Replacement](#).
2. Remove the body hinge pillar garnish molding. Refer to [Body Hinge Pillar Garnish Molding Replacement](#).



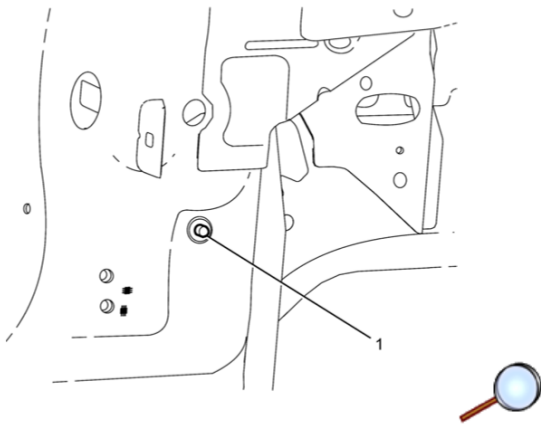
3. Disengage the drain tube (1) from the front sunroof grommet.



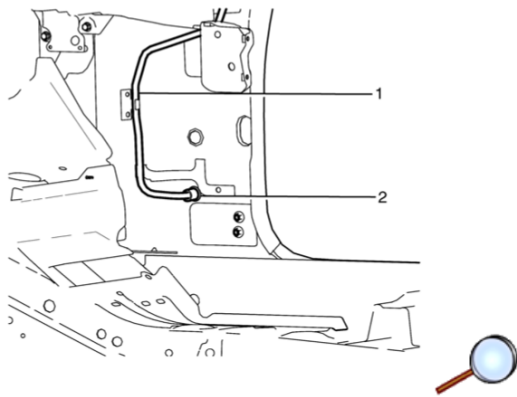
Note: Heat the front sunroof grommet to aid in removal.

4. Remove the front sunroof grommet (1) from the front hinge pillar.
Discard the front sunroof drain grommet.
5. Scrape the remaining adhesive of the front sunroof grommet from the front hinge pillar.

Installation Procedure



1. Install the NEW front sunroof grommet (1) to the front hinge pillar.
2. Heat the front sunroof grommet to allow adhesion of the front sunroof grommet to the front hinge pillar.



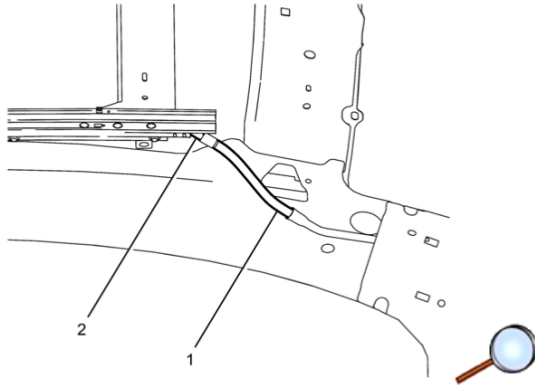
Note: The only suitable lubricant is clean water for the drain hose installation.

3. Connect the front lower drain tube (1) to the front sunroof grommet (2).
4. Inspect for proper drainage.
5. Install the body hinge pillar garnish molding. Refer to [Body Hinge Pillar Garnish Molding Replacement](#).
6. Install the front fender. Refer to [Front Fender Replacement](#).

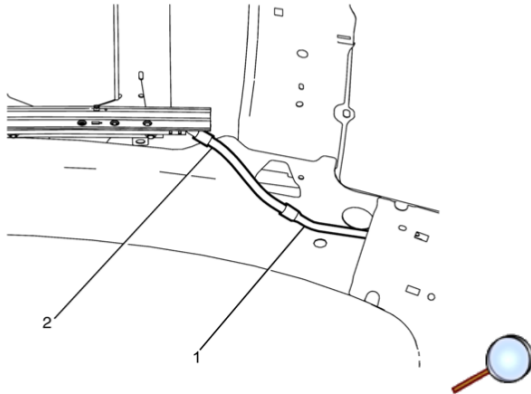
Sunroof Housing Rear Drain Hose Replacement (Upper)

Removal Procedure

1. Remove the body lock pillar upper trim panel. Refer to [Body Lock Pillar Upper Trim Panel Replacement](#).
2. Remove the headliner in order to access the upper rear drain hose connections. Refer to [Headlining Trim Panel Replacement](#).

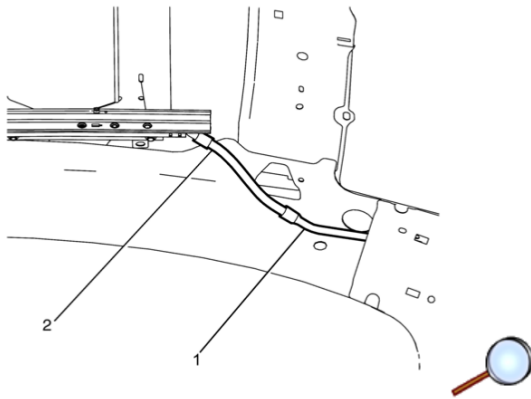


3. Disconnect the rear upper drain hose (1) from the sunroof spout (2).



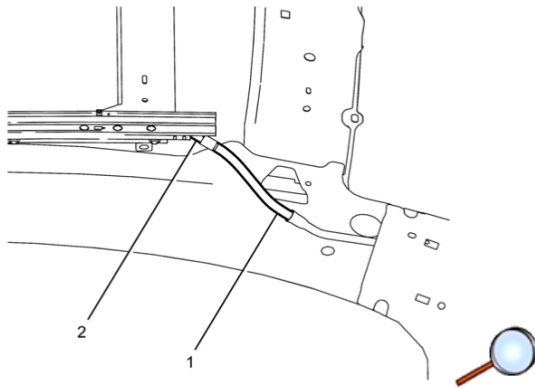
4. Disconnect the rear upper drain hose (2) from the rear drain tube (1).
5. Remove the rear upper drain hose (2) from the rear of the sunroof panel assembly.

Installation Procedure



Note: The only suitable lubricant is clean water for the drain hose installation.

1. Connect the rear upper drain hose (2) to the rear drain tube (1).

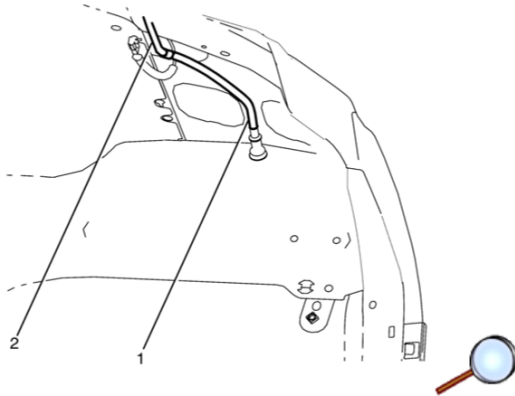


2. Connect the rear upper drain hose (1) to the sunroof spout (2).
3. Inspect for proper drainage.
4. Install the headliner with the aid of an assistant. Refer to [Headlining Trim Panel Replacement](#).
5. Install the body lock pillar upper trim panel. Refer to [Body Lock Pillar Upper Trim Panel Replacement](#).

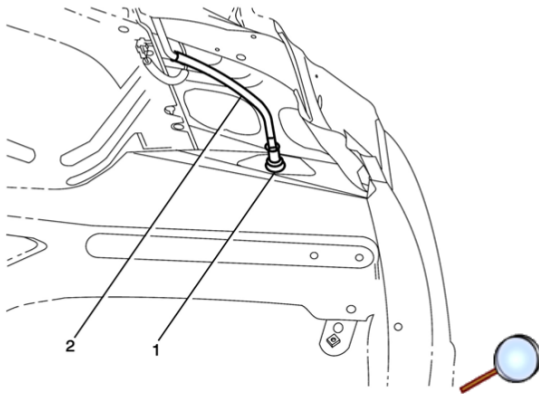
Sunroof Housing Rear Drain Hose Replacement (Lower)

Removal Procedure

1. Remove the rear quarter inner trim finish panel. Refer to [Quarter Inner Trim Finish Panel Replacement - Right Side](#) and [Quarter Inner Trim Finish Panel Replacement - Left Side](#).



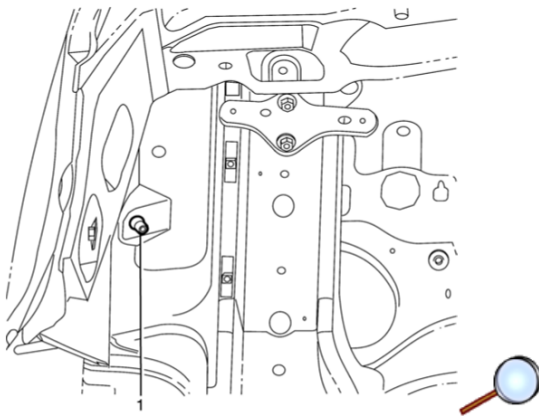
2. Disconnect the rear lower drain hose (1) from the rear drain tube (2).



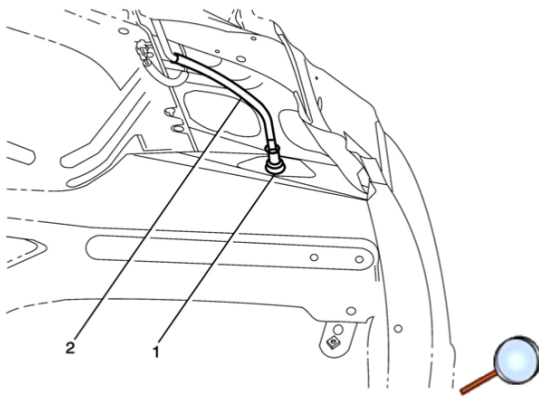
3. Disconnect the rear lower drain hose (2) from the rear drain hose grommet (1).
4. Remove the rear lower drain hose (2) from the vehicle.
- Note:** Heat the rear lower drain hose grommet to aid in removal.
5. Remove the rear lower drain hose grommet (1) from the vehicle.
6. Scrape the remaining adhesive of the rear lower drain hose grommet from the rear inner wheelhouse.

Installation Procedure

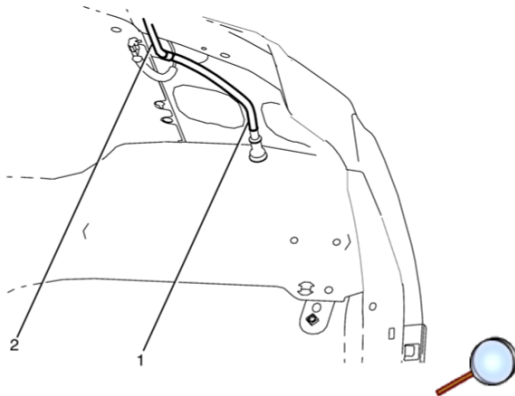
Note: The only suitable lubricant is clean water for the drain hose installation.



1. Install the rear lower drain hose grommet (1) to the rear inner wheelhouse.
2. Heat the rear lower drain hose grommet (1) to allow adhesion of the sunroof grommet to the rear inner wheelhouse.



3. Install the rear lower drain hose to the vehicle.
4. Connect the rear lower drain hose (2) to the rear lower drain hose grommet (1).



5. Connect the rear drain hose (1) to the rear drain tube (2).

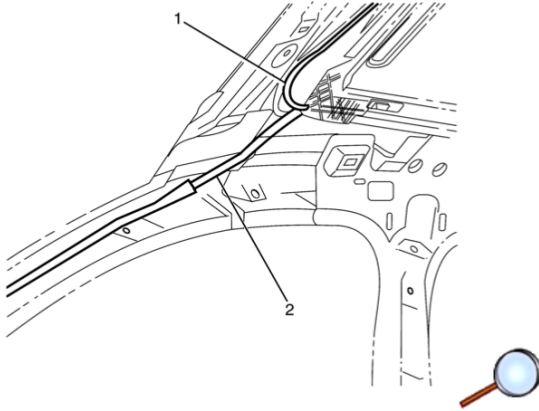
6. Inspect for proper drainage.
7. Install the rear quarter inner trim finish panel. Refer to [Quarter Inner Trim Finish Panel Replacement - Right Side](#) and [Quarter Inner Trim Finish Panel Replacement - Left Side](#).

Sunroof Module Assembly Replacement

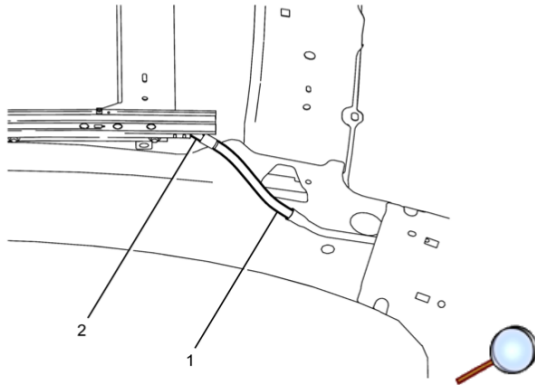
Removal Procedure

Note: A new sunroof module will not have the sunroof window or the sunshade as components of the new service part.

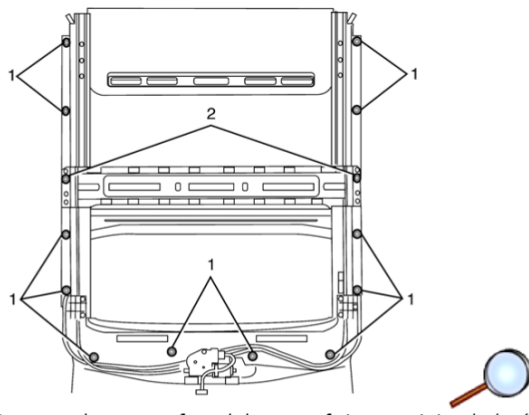
1. The old sunroof window and sunshade will need to be installed to the new sunroof module.
2. Remove the headliner. Refer to [Headlining Trim Panel Replacement](#).



3. Disconnect the front drain hoses from the sunroof front drain spouts (1).



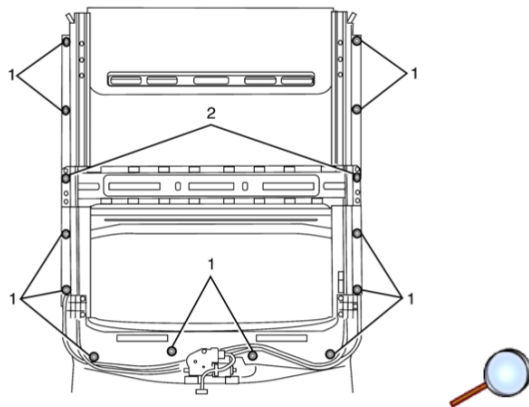
4. Disconnect the rear upper drain hoses (1) from the sunroof rear drain spouts (2).



5. Remove the sunroof module to roof ring retaining bolts (1).
6. Remove the two centre, side to side, bolts last in order to help support the sunroof module to the roof ring.
7. With the aid of an assistant, remove the last two sunroof module to roof ring retaining bolts.
8. With the aid of an assistant, lower and remove the sunroof module out the front passenger side door.
9. Remove the sunroof window. Refer to [Sunroof Window Replacement](#).
10. Remove the sunshade panel. Refer to [Sunroof Sunshade Assembly Replacement](#).
11. Remove the air deflector. Refer to [Sunroof Air Deflector Replacement](#).

Installation Procedure

1. Install the air deflector. Refer to [Sunroof Air Deflector Replacement](#).
2. Install the sunshade panel. Refer to [Sunroof Sunshade Assembly Replacement](#).
3. Install the sunroof window and loosely install the retaining screws. Refer to [Sunroof Window Replacement](#).



4. With the aid of an assistant, position the new sunroof module into the alignment pins (2) located on the roof ring.
5. Hand start the two centre, side to side, sunroof module to roof ring retaining bolts (1) in order to hold the sunroof module in place.

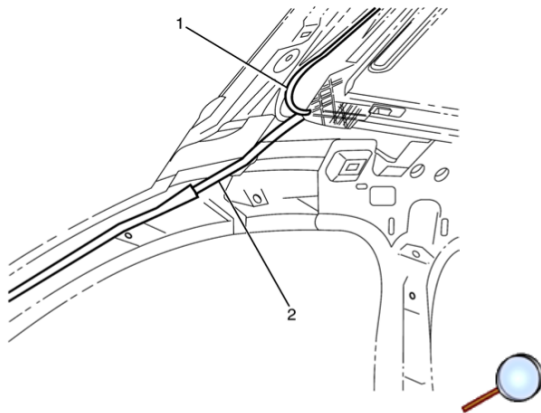
6. Finger tighten the two centre retaining bolts.

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

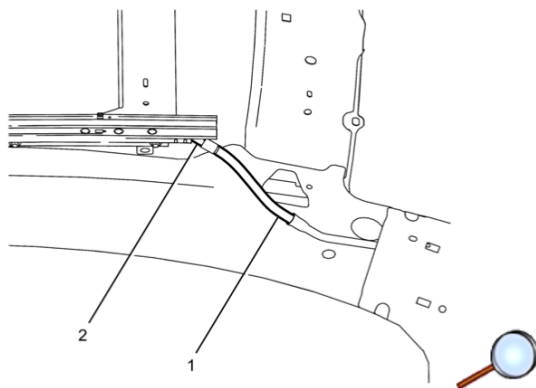
7. Install the remaining sunroof module to roof ring retaining bolts (1).

Tighten

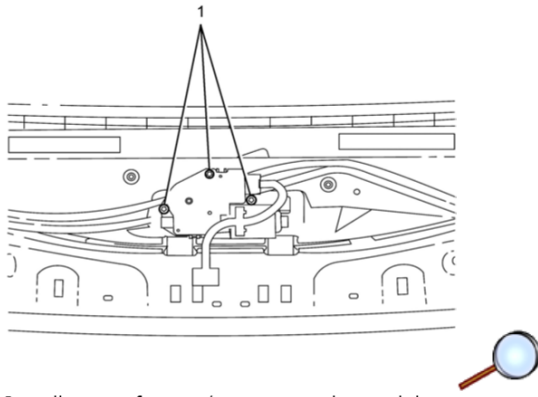
Tighten the bolts to 2 N•m (18 lb in).



8. Connect the front drain hoses to the drain spouts (1).



9. Connect the rear drain hoses to the drain spouts (1).

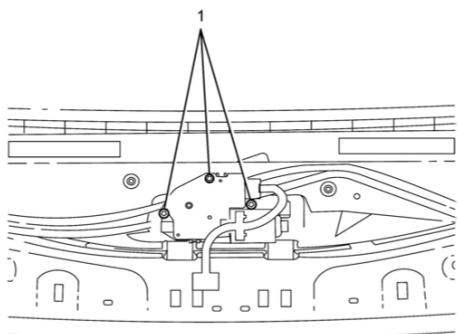


10. Install sunroof motor/actuator to the module.
11. Install the motor/actuator to sunroof module retaining screws (1).
Tighten
Tighten all of the bolts to 2N•m (18 lb in).
12. Connect the electrical connector to the sunroof motor/actuator.
13. Secure the harness with suitable straps.
14. Adjust the sunroof window. Refer to [Sunroof Window Height and Opening Fit Adjustment](#).
15. If re-programming is required. Refer to [Control Module References](#).
16. Verify the proper operation of the sunroof before securing the headliner.
17. Initialization /Teach the sunroof motor. Refer to [Sunroof Actuator Motor Synchronization](#).
18. Install the headliner, with an assistant. Refer to [Headlining Trim Panel Replacement](#).

Sunroof Actuator Motor Replacement

Removal Procedure

1. Lower the headliner to access the sunroof actuator/motor. Refer to [Headlining Trim Panel Replacement](#).

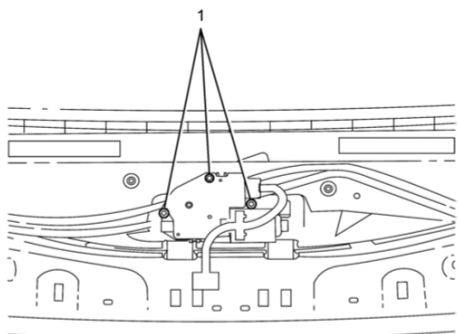


Note: If the sunroof window is partially closed, remove the sunroof actuator/motor first, before moving the sunroof window forward.

2. Remove the sunroof actuator/motor bolts (1).
3. Disconnect the sunroof actuator/motor electrical connector.
4. Remove the sunroof actuator/motor.

Installation Procedure

1. Manually move the sunroof window to the fully closed position.
2. Install the sunroof actuator/motor.



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

3. Install the sunroof actuator/motor bolts (1).

Tighten

Tighten the bolts to 7 N•m (62 lb in).

4. Connect the sunroof actuator/motor electrical connector to the sunroof actuator/motor.
5. Initialization/Teach the sunroof actuator/motor. Refer to [Sunroof Actuator Motor Synchronization](#).
6. Verify the sunroof operation.
7. Install the headliner. Refer to [Headlining Trim Panel Replacement](#).

Sunroof Actuator Motor Synchronization

Initialization and Teaching

"Initialization" refers to the sunroof system's learning where the hard stop reference location is.

"Teaching" refers to the system's learning of the mechanical profile of the sunroof, it is a record of motor RPM over the entire range of movement.

Initialization and Teaching are done in the following scenarios:

- First Time System is Powered – Initialization has not been executed yet
- Drive System Service Replacement or Removal
- Excessive false reversals are experienced
- If the glass is adjusted after initialization and teaching has already been done.

Until the drive 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.

An Initialization process that was not carried out completely can be started again at any time after first cycling power, as long as the interruption did not leave the mechanism right at the hard stop*. Ensure the supply voltage does not dip below 9.0V at the E-drive during initialization and teach.

The initialization and teach process is as follows:

For a New Drive Assembly:

1. Press and hold the CLOSE switch, press to first detent of button only, for approximately 10 seconds until the sunroof moves slightly past Full Vent (2 mm) and suddenly back to Full Vent.
2. Quickly release the CLOSE switch and re-press and hold, within 1 second, while the sunroof moves to Full Open and back to Closed. The roof should start to move within about 4 seconds.
3. Release the switch and verify successful initialization by performing one-touch open and close operations.

For an Existing Drive Assembly:

1. Fully close the sunroof. Release the switch.
2. Press and hold the CLOSE switch, press to first detent of button only, for approximately 10 seconds until the sunroof moves slightly past Full Vent (2 mm) and suddenly back to Full Vent.
3. Quickly release the CLOSE switch and re-press and hold, within 1 second, while the sunroof moves to Full Open and back to Closed. The roof should start to move within about 4 seconds.
4. Release the switch and verify successful initialization by performing one-touch open and close operations.

* If The Process is Interrupted Right at the Hard Stop:

Note: The controller needs to see motor movement to initialize but no movement can occur because the process was interrupted when the motor was stalled against the hard stop.

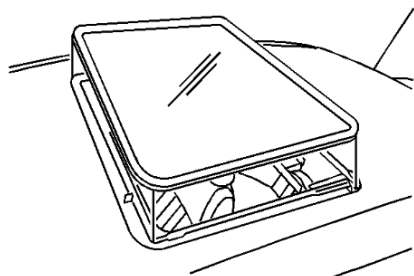
1. Either disconnect power and/or ignition to the E-drive.

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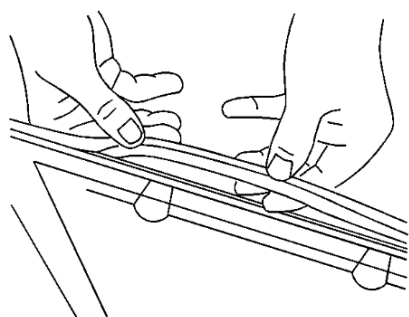
2. Insert a 4 mm hex wrench into the drive assembly and back the motor away from the hard stop, move the glass toward CLOSE, about 2 inches. Repeat if glass cannot achieve closed position.
3. Reconnect power to the E-drive. Proceed as directed in For An Existing Drive Assembly.

Sunroof Panel/Window Weatherstrip Replacement

Removal Procedure



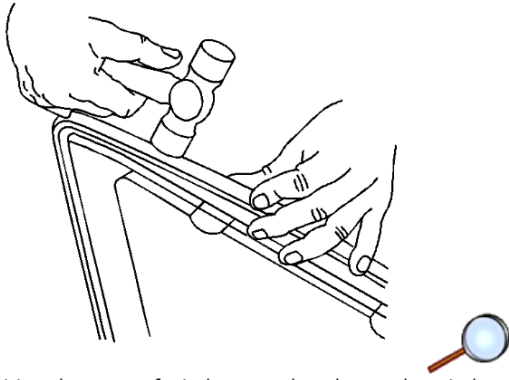
1. Remove the sunroof window panel. Refer to [Sunroof Window Replacement](#).



2. Remove the seal from the window panel frame by pulling the seal away at one point and continuing around the perimeter of the frame.
3. Wipe the perimeter of the frame area with a clean, dampened cloth using window cleaner GM P/N 1050427 (Canadian P/N 992727) or equivalent in order to clean the surface of the perimeter.
Allow to air dry.

Installation Procedure

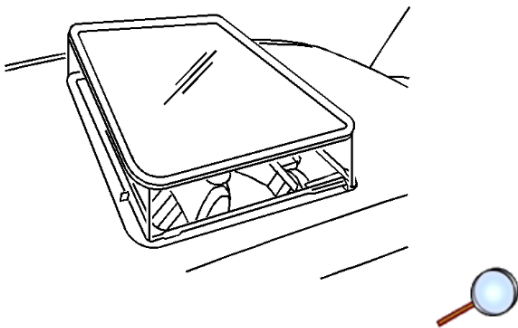
1. Using a clean dampened cloth wipe the seal with a small amount of the same window cleaner in order to ease installation.



2. Position the sunroof window panel seal onto the window frame, locating the starting end of the seal at the relief notch in the center of the passenger side of the frame.

Important: Ensure that the seal is properly seated around the entire perimeter of the window frame.

3. Firmly press the window seal into place. A small rubber hammer will help in the installation.

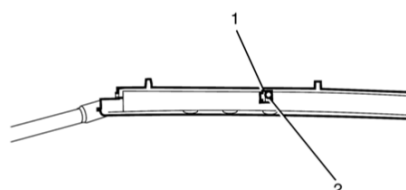


4. Install the sunroof window panel. Refer to [Sunroof Window Replacement](#).
5. Adjust the window panel height. Refer to [Sunroof Window Height and Opening Fit Adjustment](#).

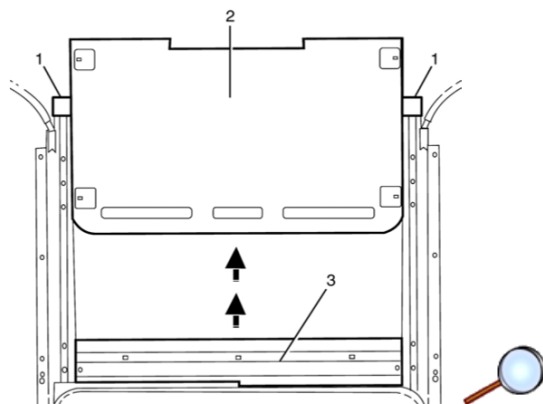
Sunroof Sunshade Assembly Replacement

Removal Procedure

1. Cycle the sunroof window to the vent position in order to ease in the removal of the sunshade .
2. Remove the headliner. Refer to [Headlining Trim Panel Replacement](#).
3. Remove the sunroof actuator/motor. Refer to [Sunroof Actuator Motor Replacement](#).



4. Remove the sunshade stop rubber to sunroof rail retaining screw (2). Repeat for the opposite side.
5. Remove the sunshade stop rubber (1) from the sunroof rail by sliding the sunshade stop rubber to the rear of the sunroof rail. Repeat for the opposite side.



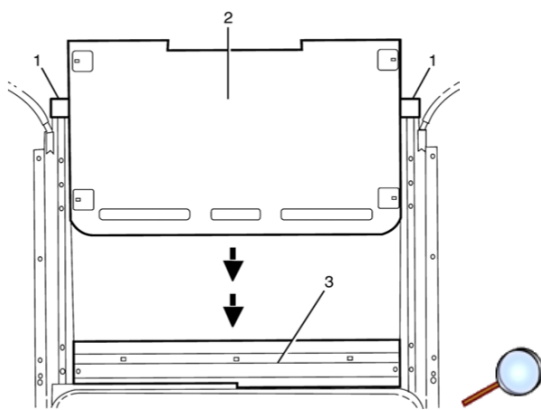
6. Remove the end caps (1) from the sunroof rail.
7. Carefully remove the sunshade (2) by sliding the sunshade towards the rear of the sunroof rail.

Note: Do not apply excessive pressure when arching the sunshade, failure to comply may result in damage to the sunshade.

8. Remove the sunshade (1) from the sunroof panel assembly (3).

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Installation Procedure



1. Position front edge of the sunshade (2) to the sunroof rail.

Note: Do not apply excessive pressure to the sunshade, failure to comply may result in damage to the sunshade.

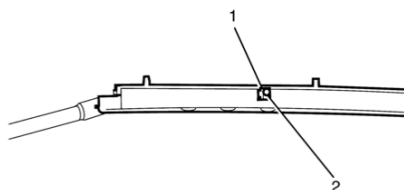
2. Carefully install the sunshade (2) by sliding the sunshade toward to the front of the sunroof panel assembly (3).
3. Install the sunroof end caps (1) to the sunroof rail.

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

Tighten

Tighten the screw to 1 N·m (9 lb in).

4. Slide the sunshade forward and rearward to make sure free operation is present.



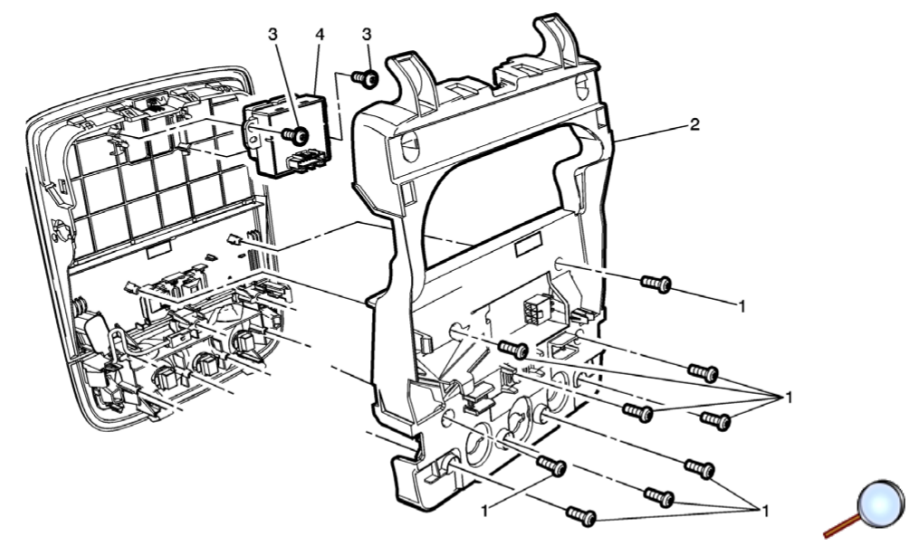
5. Install the sunshade stop rubber (1) to the sunroof rail. Repeat for the opposite side.
6. Install the sunshade stop rubber to sunroof rail retaining screw (2). Repeat for the opposite side.

Tighten

Tighten the screws to 1 N·m (9 lb in).

7. Install the sunroof actuator/motor. Refer to [Sunroof Actuator Motor Replacement](#).
8. Install the headliner. Refer to [Headlining Trim Panel Replacement](#).

Sunroof Switch Replacement



Sunroof Switch Replacement

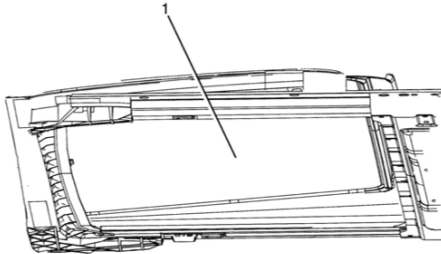
Callout	Component Name
Preliminary Procedure Remove the roof console. Refer to Roof Console Replacement .	
1	Roof Console Back Cover Fasteners (Qty: 9) Caution: Refer to Fastener Caution .
2	Roof Console Back Cover
3	Sunroof Switch Fasteners (Qty: 2)
4	Sunroof Switch

Sunroof Window Height and Opening Fit Adjustment

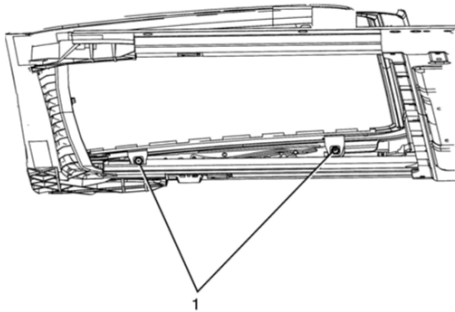
Adjustment Procedure

Note: Correct adjustment cannot be achieved if the sunroof window is closed from the vent position.

1. Cycle the sunroof window from the full open to the full closed position.



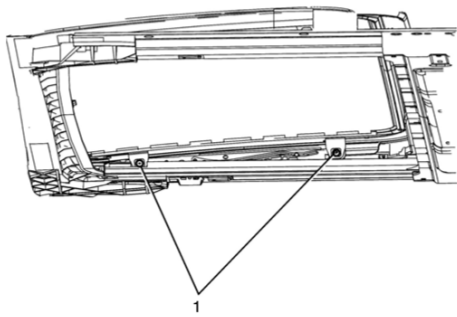
2. Remove the top side of the sunroof vent window latch covers (1) from the 3 clips located on the inner edge of the sunroof window (2) in order to access the window adjustment screws.
3. Cycle the sunroof to the closed position.



4. Loosen the adjusting screws (1) on each side of the sunroof window.
5. Centre the window front to rear in the opening.
- Note:** Do not fully tighten the sunroof retaining screws at this stage.
6. Adjust the front of the sunroof window (2) from flush to 1 mm (0.04 in) (1) below the top surface of the roof panel (3).
Do not fully tighten at this stage.

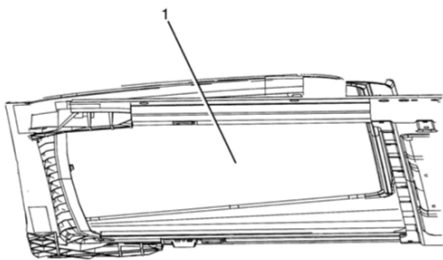
Note: Do not fully tighten the sunroof retaining screws at this stage.

7. Adjust the rear of the sunroof window (2) from flush to 1 mm (0.04 in) above the top surface of the roof panel (1).
Do not fully tighten at this stage.



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

8. Tighten the sunroof glass to the sunroof frame retaining screws (1).
Tighten
Tighten the screws to 3 N·m (27 lb in).



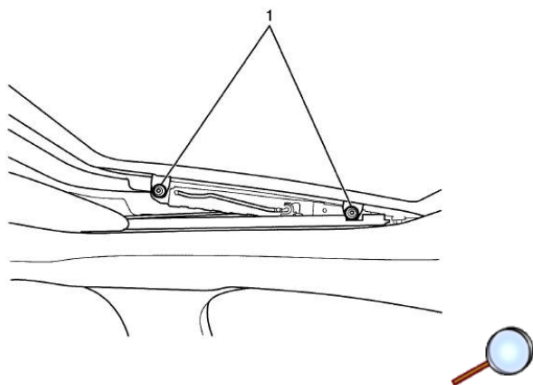
9. Install the sunroof vent window latch covers (2).
10. Cycle the sunroof window through all of the positions.
11. Verify the sunroof window fore/aft adjustment.
12. Verify the front and rear height adjustment.
13. Readjust the sunroof window, if necessary.

Sunroof Window Replacement

Removal Procedure

Caution: In order to prevent damage to the paint, mask the roof panel in front of the sunroof opening using masking tape and paper.

1. Slide the sunshade to the full rearward position.
2. Open the sunroof window to the full vent position.
3. Remove the sunroof vent window latch covers. Refer to [Roof Vent Window Latch Cover Replacement](#).

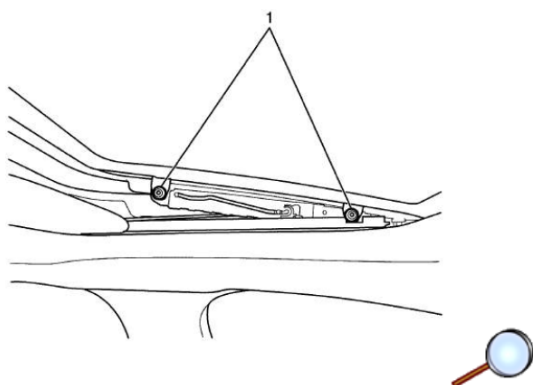


4. Remove the sunroof window from the sunroof rail retaining screws (1). Repeat for the opposite side.

Note: Be careful not to scratch the roof surface or the sunroof window.

5. Remove the sunroof window from the sunroof panel assembly.

Installation Procedure



1. Position the sunroof window into the sunroof opening, with the window trade mark pointing rearward.

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Note: Do not fully tighten the sunroof window to the sunroof rail retaining screws (1) at this stage.

2. Install the sunroof window to the sunroof rail retaining screws (1).

Tighten

Tighten the screws to 3 N·m (27 lb in).

3. Install the sunroof vent window latch covers. Refer to [Roof Vent Window Latch Cover Replacement](#).
4. Close the sunroof window to make sure proper operation and fitting. Refer to [Sunroof Window Height and Opening Fit Adjustment](#)
5. Close the sunshade.

Fastener Tightening Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Sunroof Actuator/Motor Retaining Bolts	7 N•m	62 lb in
Sunroof Sunshade Stop Rubber Retaining Screws	1 N•m	9 lb in
Sunroof Window Retaining Screws	3 N•m	27 lb in

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