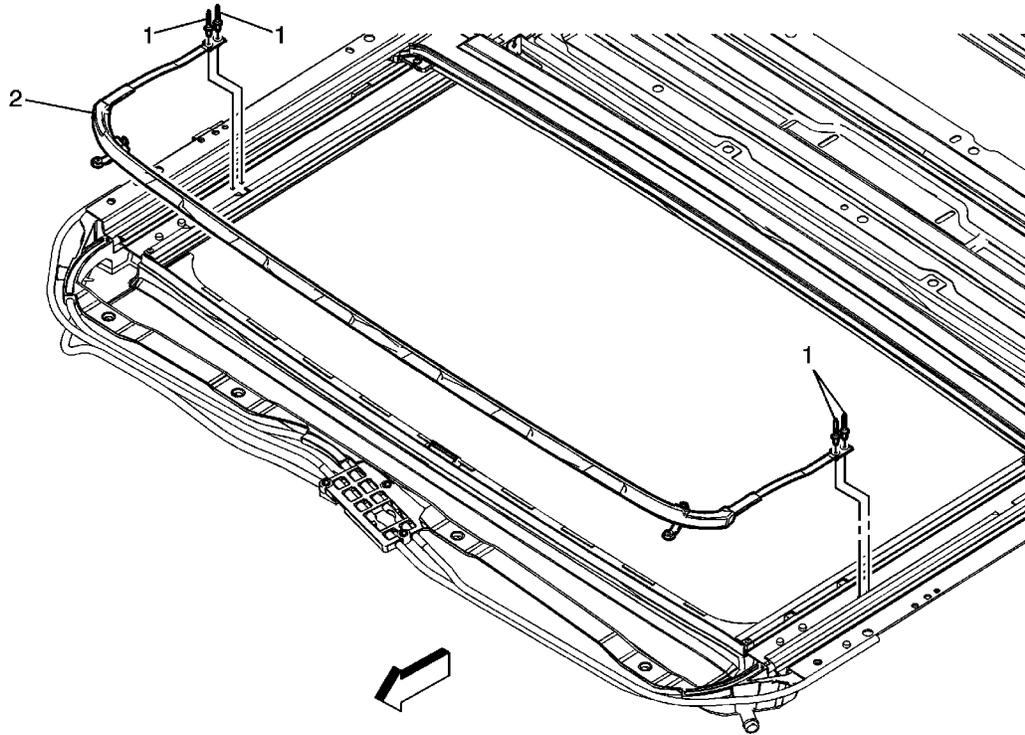


Fastener Tightening Specifications

Application	Specifications	
	Metric	English
Sunroof Actuator/Motor Screws	3 N·m	27 lb in
Sunroof Module Bolts	10 N·m	89 lb in
Sunroof Sunshade Actuator/Motor Screws	3 N·m	27 lb in
Sunroof Water Trough to Sunroof Module Screws	1 N·m	9 lb in
Sunroof Window to Module Screws	4 N·m	35 lb in

Sunroof Air Deflector Replacement



Callout	Component Name
1	Sunroof Air Deflector (Qty: 4) Warning: Refer to Glass and Sheet Metal Handling Warning in the Preface section. Procedure 1. Open the sunroof to expose the 2 rivets located on each side. 2. Tape the under side of the tracks to protect them from metal shaving. 3. Drill out the rivets.
2	Sunroof Air Deflector

Sunroof Drain Inspection and Cleaning

Drain Hose Routing

Note: If the headliner is wet DO NOT remove any interior trim. Do the Plugged Drain Hose test first.

A drain trough encircles the sunroof window panel and water is drained off by the drain hoses located at each corner of the housing. A drain channel spans across the sunroof module at the rear of the window panel and directs water into the trough.

1. The front drain hoses are routed down the windshield pillars and out the center of the pillar between the door hinges. The front hoses are installed in a rubber grommet and retained by clips.
2. The rear drain hoses are routed through the rear pillars and out of the rocker panel. In some vehicle the drain hoses are routed out through the metal roof slots and routed to the lower wheelhouse to drain out of the vehicle. The rear hoses are installed in a rubber grommet and retained by clips.

Plugged Drain Hose

If a waterleak has occurred check for a plugged drain hose at each corner of drainage system.

1. Open the sunroof window.
2. To test for blockage, pour a small container of water into the module housing drain trough. Check each corner to confirm the drain hose is draining water.

Warning: Wear safety glasses in order to avoid eye damage.

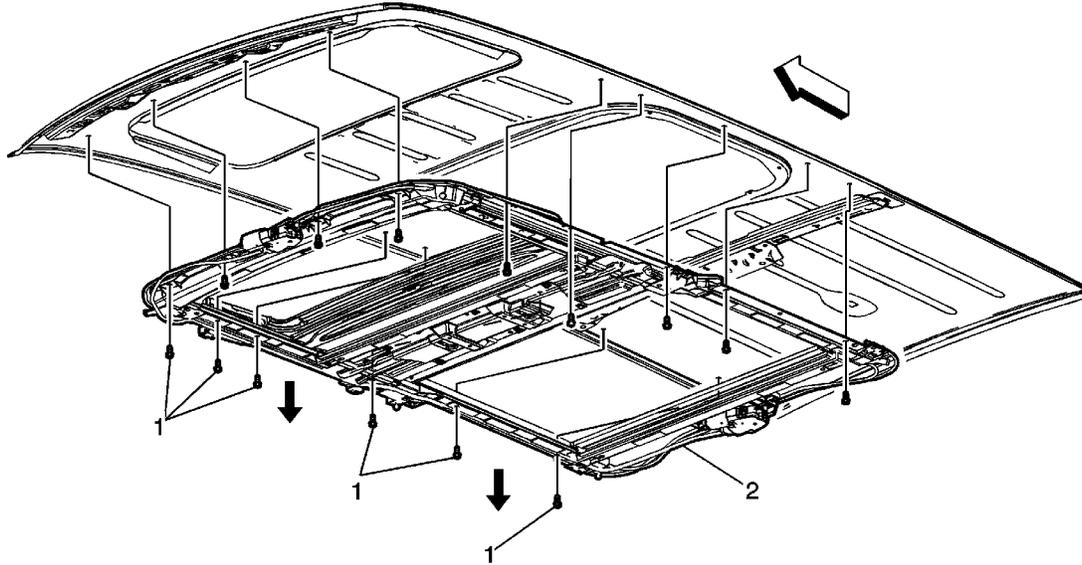
3. Use compressed air, 241 kPa (35 psi) or less to blow out any drain hose that is plugged.
4. Test the system again.
5. If the hose remains plugged, check to see it is properly routed and does not have a kink. Refer to [Sunroof Housing Front Drain Hose Replacement](#) or [Sunroof Housing Rear Drain Hose Replacement](#).
6. Remove the blockage using the following steps.
 - 6.1. Push mechanics wire through the hose to remove the obstruction.
 - 6.2. Use compressed air in order to blow out any remaining material.

Disconnected Drain Hose

Inspect the drainage system for disconnected drain hoses. Complete the following steps in order to obtain partial access to drain hoses and check for a disconnected hose.

1. Open the sunroof window panel.
2. Lower the headliner as needed. Refer to [Headlining Trim Panel Replacement](#).
3. Connect any disconnected hoses.
4. Ensure that the rear drain hoses are properly routed in the metal roof slot and taped in place.

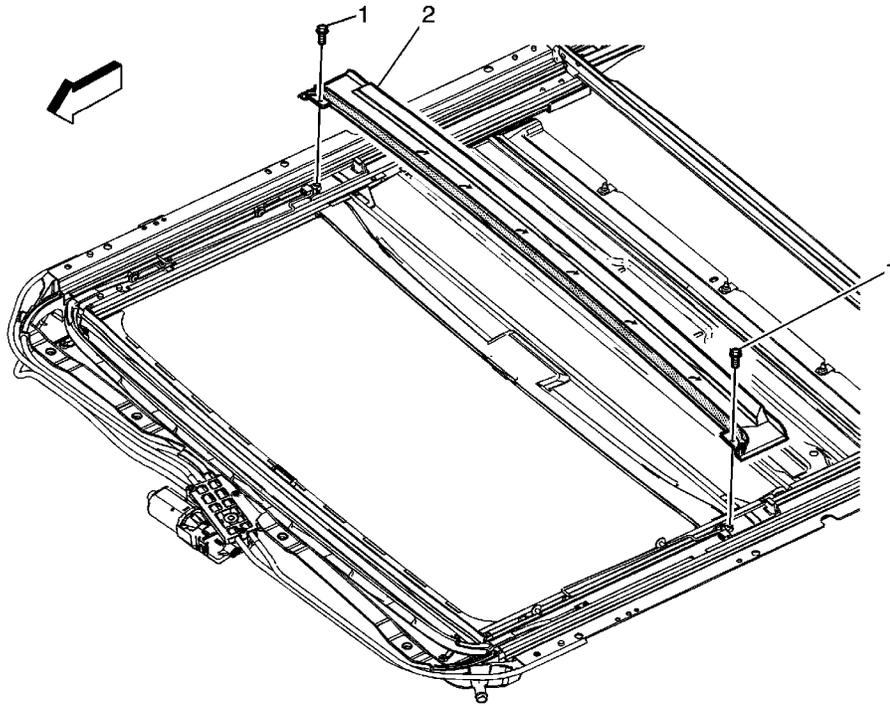
Sunroof Frame Replacement



Callout	Component Name
<p>Preliminary Procedure</p> <ol style="list-style-type: none"> 1. Remove the sunroof window from the sunroof module assembly. Refer to Sunroof Window Replacement. 2. Remove the headliner. Refer to Headlining Trim Panel Replacement. 3. Disconnect the sunroof harness electrical connectors. 4. Disconnect the drain hoses from the sunroof assembly. Refer to the following procedures: <ul style="list-style-type: none"> • Sunroof Housing Front Drain Hose Replacement • Sunroof Housing Rear Drain Hose Replacement 	
<p>1</p>	<p>Sunroof Module Bolt (Qty: 16)</p> <p>Caution: Refer to Fastener Caution in the Preface section.</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Do not remove the drain hoses from the vehicle, disconnect the drain hoses from the module only. 2. Leave the four corner bolts until last.

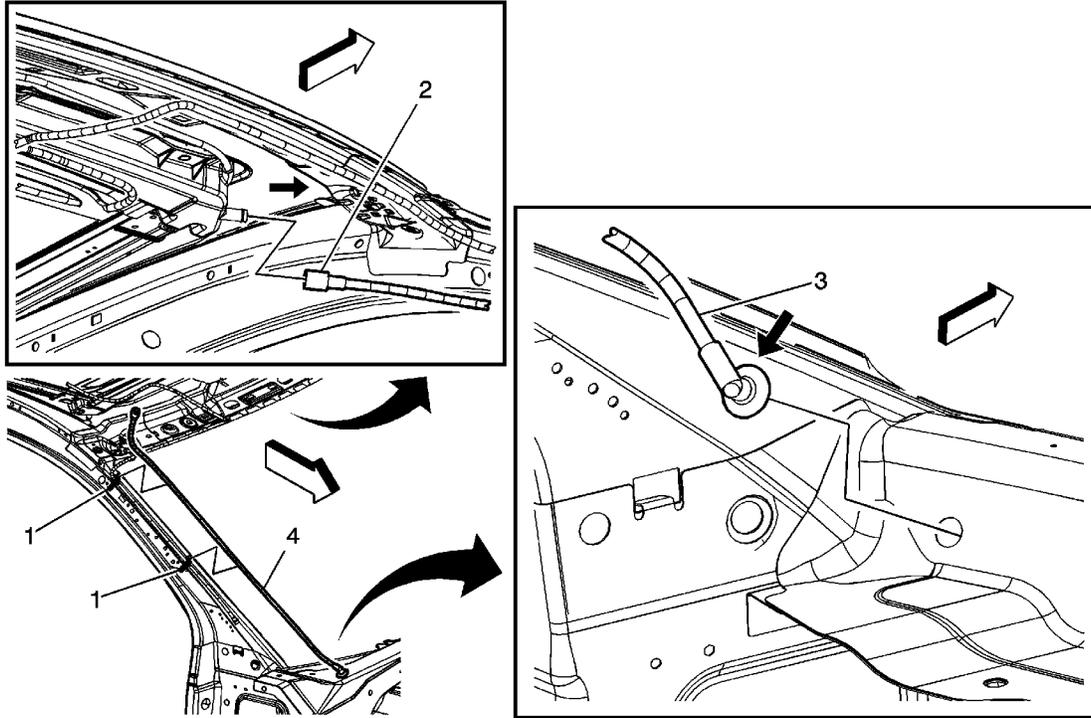
	<ol style="list-style-type: none">3. Recline the seats all the way rearward.4. With the aid of an assistant, remove the sunroof module assembly from the vehicle and place on a clean, prepared surface. <p>Tighten 10 N·m (89 lb in)</p>
2	<p>Sunroof Module</p> <p>Procedure</p> <ol style="list-style-type: none">1. Transfer all necessary component to the new sunroof assembly.2. Initialize/Teach the sunroof and sunshade motor/actuators. Refer to Sunroof Motor/Actuator Initialization/Teach Process.

Sunroof Housing Drain Gutter Replacement



Callout	Component Name
Preliminary Procedure	
Remove the sunroof window. Refer to Sunroof Window Replacement .	
1	Sunroof Gutter Screws (Qty: 2)
2	Sunroof Gutter

Sunroof Housing Front Drain Hose Replacement

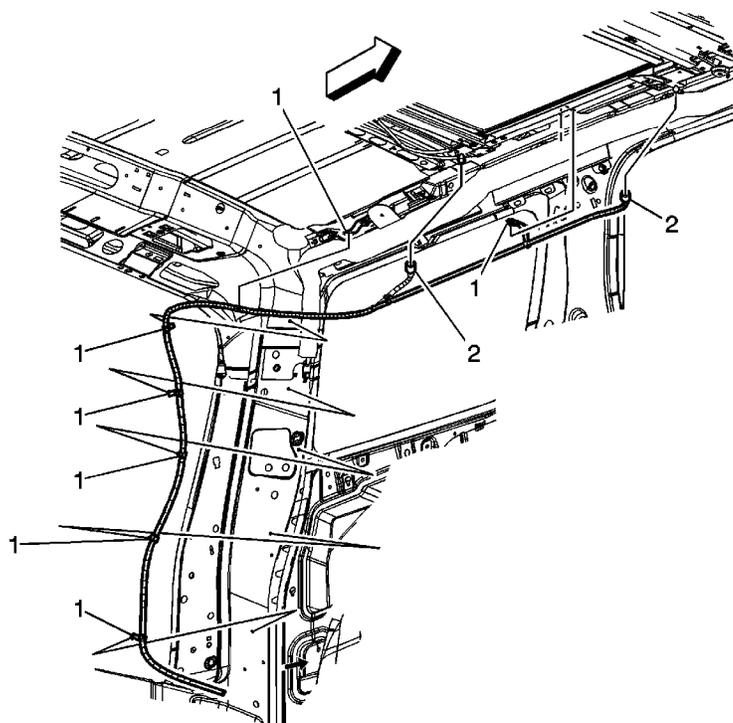


Callout	Component Name
<p>Preliminary Procedure</p> <ol style="list-style-type: none"> 1. It is only necessary to lower the headliner. Only do those step in headliner replacement that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement . 2. Remove the instrument upper trim panel. Refer to Instrument Panel Upper Trim Panel with Windshield Defroster Nozzle Grille Replacement . 	
1	Sunroof Drain Hose Retainer (Qty: 2)
2	<p>Sunroof Drain Hose Coupler</p> <p>Procedure</p> <p>Disconnect the sunroof drain hose from the sunroof module spigot.</p>
3	Sunroof Drain Hose Plug
4	<p>Sunroof Drain Hose</p> <p>Procedure</p>

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1. Installing the drain hose, ensure that the routing of the end of the drain hose is through the access hole in the cowl panel to prevent interior water leaks.
2. Install the 2 retainers that secure the drain hose to the windshield pillar.

Sunroof Housing Rear Drain Hose Replacement



Callout	Component Name
<p>Preliminary Procedure</p> <p>It is only necessary to lower the headliner. Only do those step in headliner replacement that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement .</p>	
1	Sunroof Drain Hose Retainers (Qty: 8)
2	<p>Sunroof Drain Hose</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Disconnect the sunroof drain hose from the sunroof module spigot. 2. When install drain hoses, ensure to route the end of the drain hose through the access hole in the side quarter panel to prevent interior water leaks.

Sunroof Motor/Actuator Initialization/Teach Process (New Motor)

Perform the initialization/teach procedure at first operation test of the sunroof. Ensure the electrical harness on the headliner is connected to the large roof, battery power is applied, and the ignition switch is ON.

1. Press the sunroof switch to the vent open position until the window stalls at the front hard stop in the vent open position, and then moves slightly to the soft stop position. Release the button.
2. Within 3 seconds, press and hold the sunroof switch vent open again. The sunroof window will move toward and past the flush position.
3. Continue holding the switch until the sunroof window moves to full open and then back to close and stops at the closed position. Release the button. The initialization/teach procedure is complete.
4. Verify the operation of the sunroof.

The initialization/teach procedure is not complete if one of the following events occurs before the initialization/teach cycle is done:

- | The sunroof switch is not held in the vent open position.
- | Ignition and/or battery power has been removed.
- | The glass panel has not reached the close position.

If the initialization/teach procedure is not carried out completely, it has to be started again.

Sunroof Motor/Actuator Initialization/Teach Process (New Roller Sunshade)

Perform the initialization/teach procedure at first operation test of the roller sunshade. Ensure the electrical harness on the headliner is connected to the large roof, battery power is applied, and the ignition switch is ON.

1. Press the roller sunshade switch to the open position until the sunshade stalls at the rear hard stop in the full open position, and then moves slightly to the soft stop position. Release the button.
2. Within 3 seconds, press and hold the roller switch open again. The roller sunshade will move toward the closed position.
3. Continue holding the switch until the roller sunshade moves to close and stops at the closed position. Release the button. The initialization/teach procedure is complete.
4. Verify the operation of the roller sunshade.

The initialization/teach procedure is not complete if one of the following events occurs before the initialization/teach cycle is done:

- | The roller sunshade switch is not held in the open position.
- | Ignition and/or battery power has been removed.
- | The roller sunshade has not reached the close position.

If the initialization/teach procedure is not carried out completely, it has to be started again.

Sunroof Motor/Actuator Initialization/Teach Process (Existing Motor)

Perform the initialization/teach procedure at first operation test of the sunroof. Ensure the electrical harness on the headliner is connected to the large roof, battery power is applied, and the ignition switch is ON.

1. Press the sunroof switch to the vent open position until the window reaches the vent open soft stop position, and release the switch. Press the sunroof switch vent open and hold for approximately 10 seconds, until the window stalls at the front hard stop in the vent open position, and then moves slightly to the soft stop position. Release the button.
2. Within 3 seconds, press and hold the sunroof switch vent open again. The sunroof window will move toward and past the flush position.
3. Continue holding the switch until the sunroof window moves to full open and then back to close and stops at the closed position. Release the button. The initialization/teach procedure is complete.
4. Verify the operation of the sunroof.

The initialization/teach procedure is not complete if one of the following events occurs before the initialization/teach cycle is done:

- | The sunroof switch is not held in the vent open position.
- | Ignition and/or battery power has been removed.
- | The glass panel has not reached the close position.

If the initialization/teach procedure is not carried out completely, it has to be started again.

Sunroof Motor/Actuator Initialization/Teach Process (Existing Roller Sunshade)

Perform the initialization/teach procedure at first operation test of the roller sunshade. Ensure the electrical harness on the headliner is connected to the large roof, battery power is applied, and the ignition switch is ON.

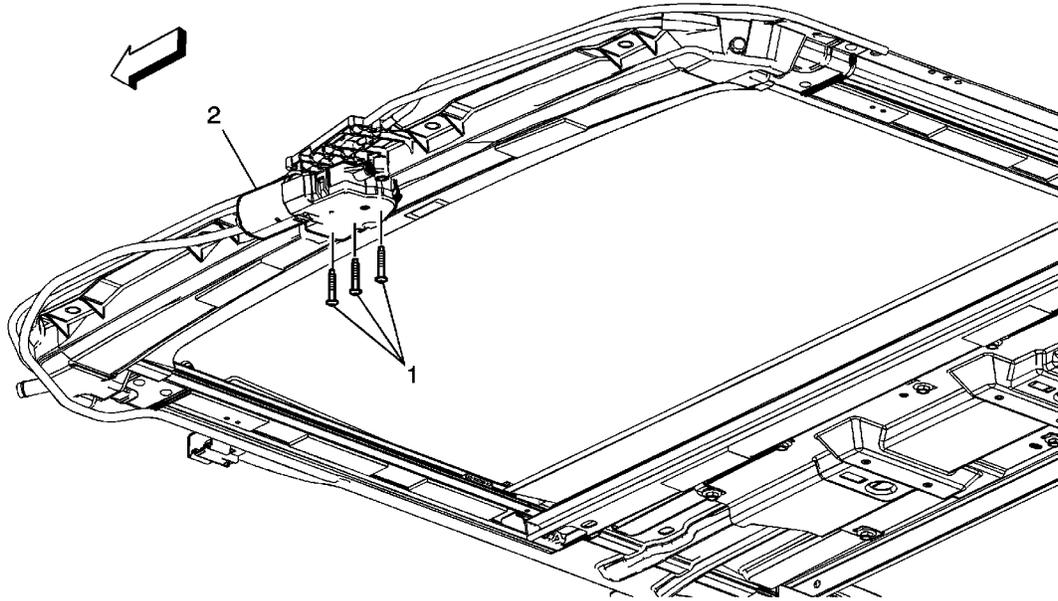
1. Press the roller sunshade switch to the open position until the sunshade reaches the full open soft stop position, and release the switch. Press the roller sunshade switch open and hold for approximately 10 seconds, until the sunshade stalls at the rear hard stop in the full open position, and then moves slightly to the soft stop position. Release the button.
2. Within 3 seconds, press and hold the roller switch open again. The roller sunshade will move toward the closed position.
3. Continue holding the switch until the roller sunshade moves to close and stops at the closed position. Release the button. The initialization/teach procedure is complete.
4. Verify the operation of the roller sunshade.

The initialization/teach procedure is not complete if one of the following events occurs before the initialization/teach cycle is done:

- | The roller sunshade switch is not held in the open position.
- | Ignition and/or battery power has been removed.
- | The roller sunshade has not reached the close position.

If the initialization/teach procedure is not carried out completely, it has to be started again.

Sunroof Motor/Actuator Replacement



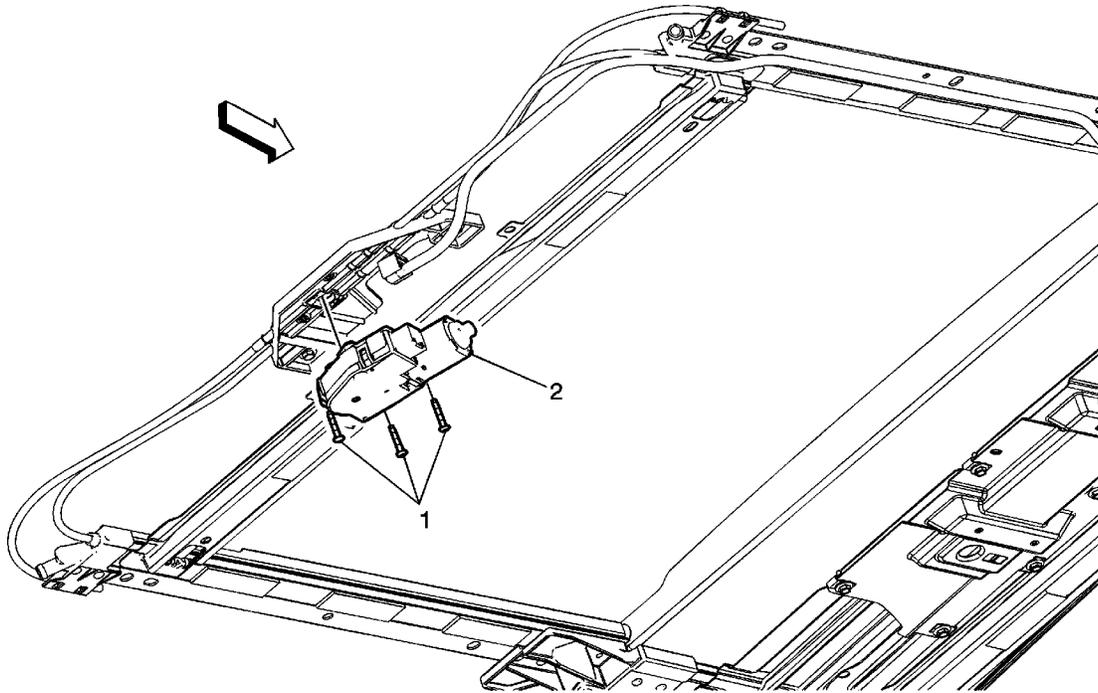
Callout	Component Name
<p>Preliminary Procedure</p> <p>It is only necessary to lower the headliner. Only do those step in headliner replacement that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement.</p>	
<p>1</p>	<p>Sunroof Window Motor/Actuator Screw (Qty: 3)</p> <p>Caution: Refer to Fastener Caution in the Preface section.</p> <p>Procedure</p> <p>Disconnect the electrical connector.</p> <p>Tip When removing the motor/actuator the cables and tubes stay with the module.</p> <p>Tighten 3 N·m (27 lb in)</p>
<p>Sunroof Window Motor/Actuator</p> <p>© 2010 General Motors Corporation. All rights reserved.</p>	

2

Procedure

Initialization/Teach motor/actuator, refer to [Sunroof Motor/Actuator Initialization/Teach Process](#).

Sunroof Sunshade Motor/Actuator Replacement



Callout	Component Name
<p>Preliminary Procedure</p> <p>It is only necessary to lower the headliner. Only do those step in headliner replacement that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement.</p>	
<p>1</p>	<p>Sunroof Sunshade Motor/Actuator Screw (Qty: 3)</p> <p>Caution: Refer to Fastener Caution in the Preface section.</p> <p>Procedure</p> <p>Disconnect the electrical connector.</p> <p>Tip When removing the sunroof motor/actuator the cables and tubes stay with the module.</p> <p>Tighten 3 N·m (27 lb in)</p>
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Sunroof Sunshade Motor/Actuator

2

Procedure

Initialization/Teach motor/actuator, refer to [Sunroof Motor/Actuator Initialization/Teach Process](#).

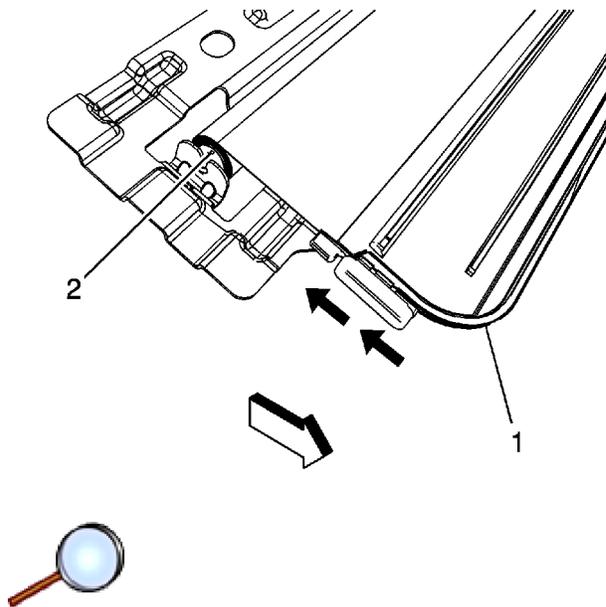
Sunroof Sunshade Replacement (Front Manual)

Removal Procedure

Important: If the sunshade spring releases, it will be necessary to rewind it. Turn the sunshade roller end slot 20 times in the counterclockwise direction.

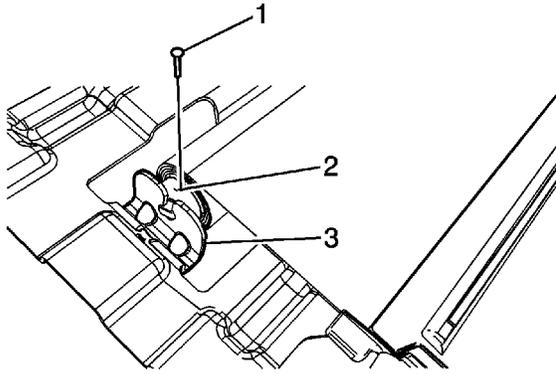
Important: A new sunshade service part comes pre-loaded with a pin tool holding spring tension on the sunshade. If the sunshade spring releases, it will be necessary to rewind it and reinstall the pin tool. Following installation, retain the pin tool for future applications.

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

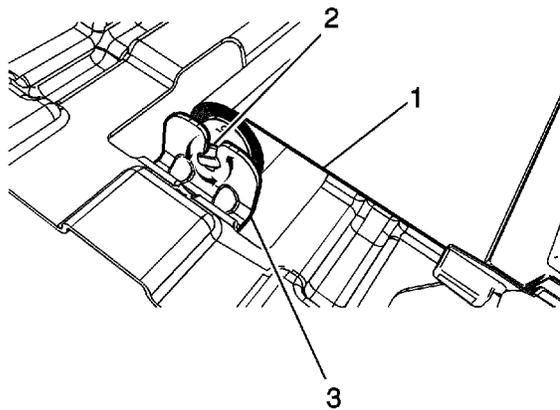


Important: The cam locking hole will come in to view when the sunshade is in the fully open position on the passengers side.

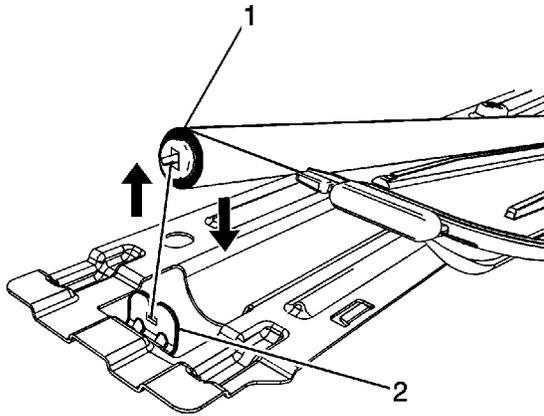
2. Power the sunroof module window tracks to the fully open position.
3. Close the sunshade (1) until the cam locking hole (2) come in to view.



4. Insert a suitable tool (1) into the sunshade cam locking hole (2).



5. Turn the sunshade (1) counterclockwise until the shade cam (2) is aligned with the bracket (3) notch.



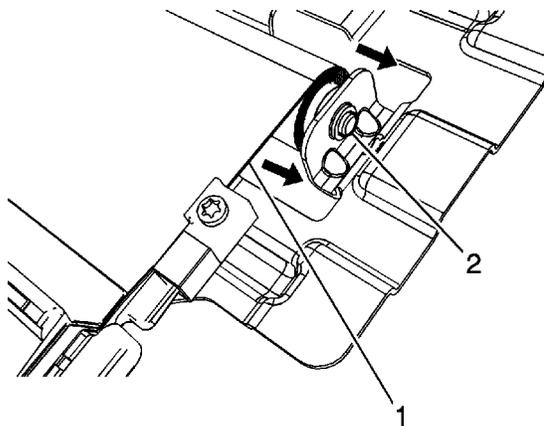
6. Lift upward on the sunshade (1) removing it from the bracket (2).

Important: The sunshade must be removed from the top of the vehicle.

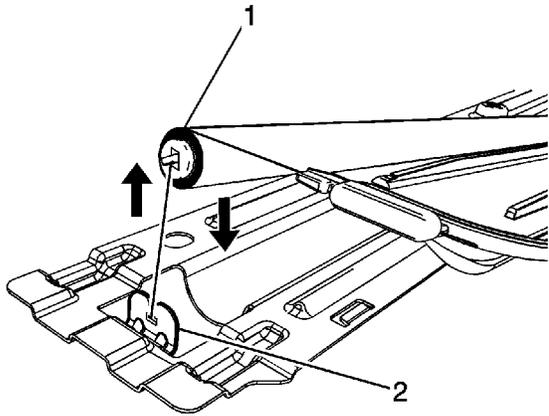
7. Remove the sunshade from outside of the vehicle.

Installation Procedure

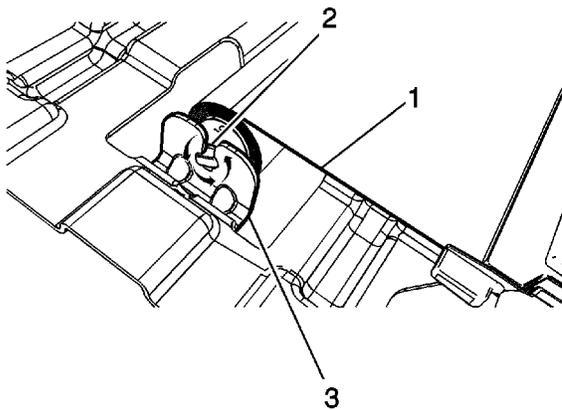
1. Install the sunshade to the vehicle from the passengers side.



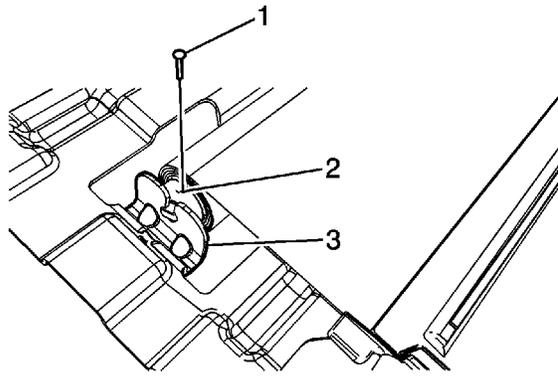
2. Insert the end of the sunshade (1) to the driver side bracket (2) notch.



3. Insert the sunshade (1) to the passengers side bracket (2) notch.



4. Turn the sunshade cam (2) until it is aligned with the bracket (3) notch.
5. Install the sunshade.



6. Remove the suitable tool (1) from the sunshade cam locking hole (2).
7. Ensure that the sunshade cam (2) is fully seated in the bracket (3) and the sunshade slides smoothly.
8. Power the sunroof module window tracks to the fully closed position.
9. Install the sunroof window. Refer to [Sunroof Window Replacement](#) .
10. Verify the operation of the sunshade.

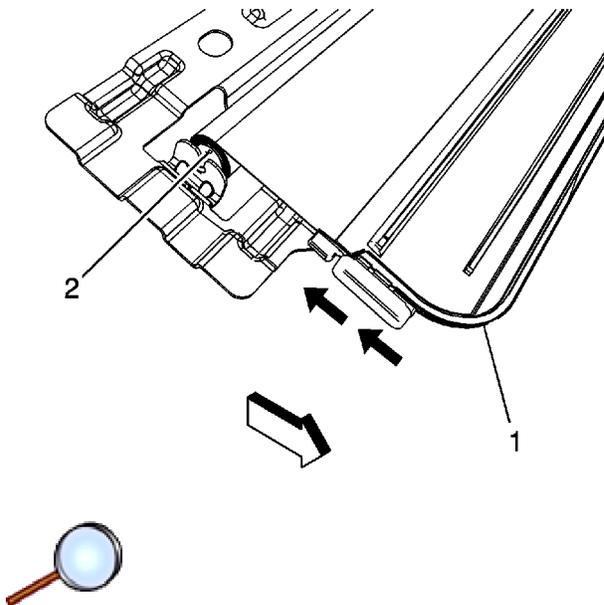
Sunroof Sunshade Replacement (Rear Power)

Removal Procedure

1. Open both the sunroof sunshades to the fully open position.
2. Remove the sunroof window. Refer to [Sunroof Window Replacement](#).
3. It is only necessary to lower the headliner. Only do those step in headliner replacement that will lower the headliner enough to gain access to the part. Refer to [Headlining Trim Panel Replacement](#).
4. Remove the sunroof module. Refer to [Sunroof Frame Replacement](#).
5. Remove the sunroof sunshade trim cover.
6. Grasping the front corners of the sunshade, roll the sunshade counterclockwise to release the front bar from the sunshade guides.

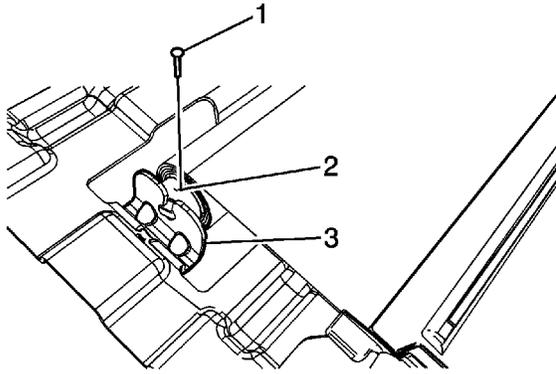
Note: If the sunshade spring releases, it will be necessary to rewind it.

Note: A new sunshade service part comes pre-loaded with a pin tool holding spring tension on the sunshade. If the sunshade spring releases, it will be necessary to rewind it and reinstall the pin tool. Following installation, retain the pin tool for future applications.

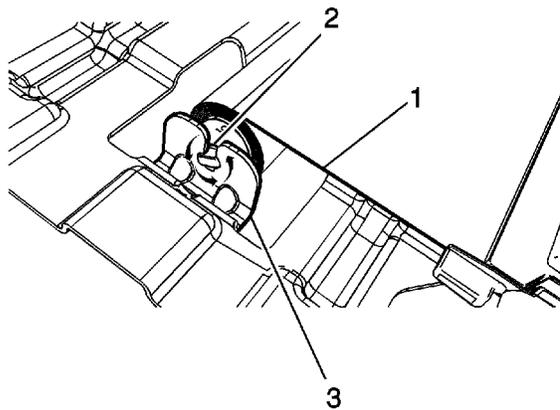


Note: The cam locking hole will come in to view when the sunshade is in the fully open position on the passengers side.

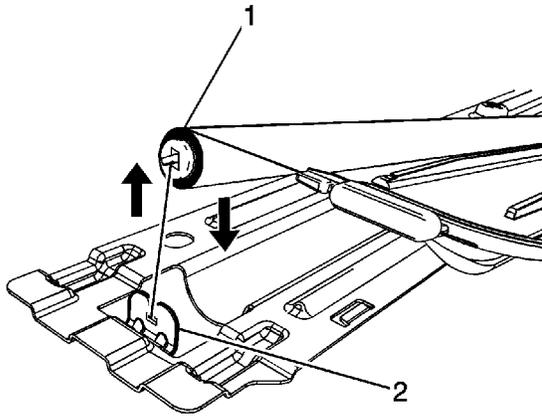
7. Close the sunshade (1) until the cam locking hole (2) come in to view.



8. Insert a suitable tool (1) into the sunshade cam locking hole (2).

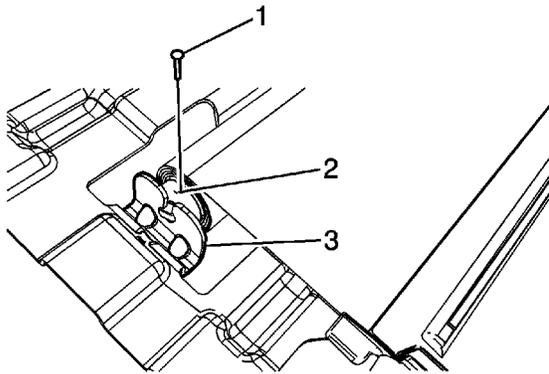


9. Turn the sunshade (1) counterclockwise until the shade cam (2) is aligned with the bracket (3) notch.



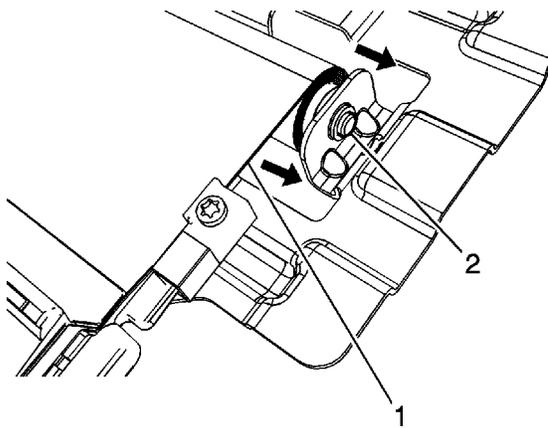
10. Lift upward on the sunshade (1) removing it from the bracket (2).
11. Remove the sunshade.

Installation Procedure

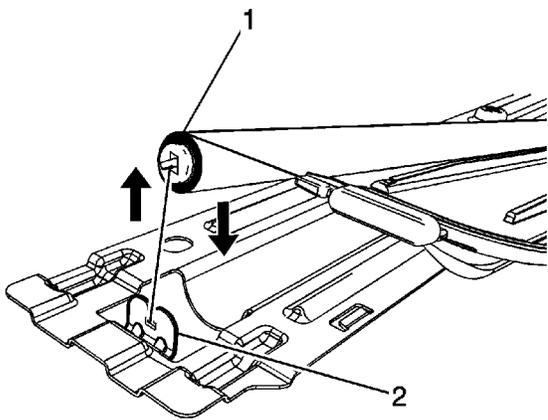


Note: If the sunshade spring releases, it will be necessary to rewind it.

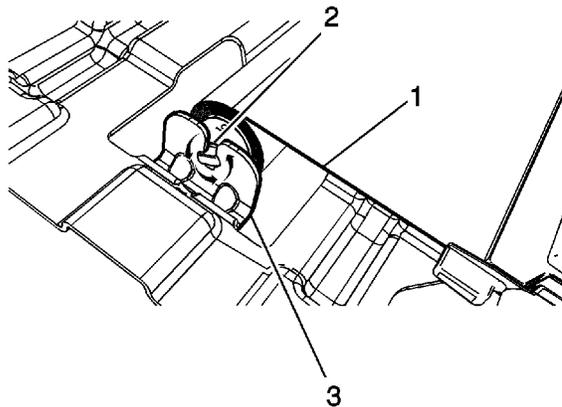
1. If the sunshade spring released turn the sunshade roller end slot 20 times in the counterclockwise direction. Insert a suitable tool (1) into the sunshade cam locking hole (2).
2. Install the sunshade to the vehicle from the passengers side.



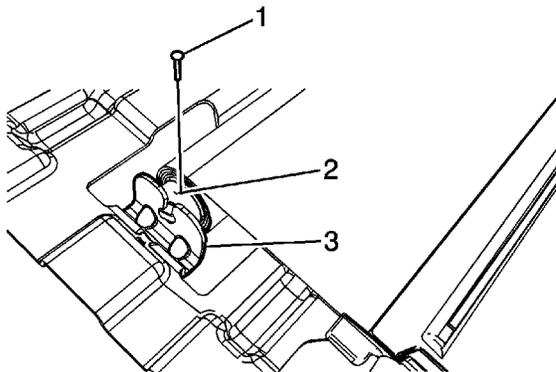
3. Insert the end of the sunshade (1) to the driver side bracket (2) notch.



4. Insert the sunshade (1) to the passengers side bracket (2) notch.

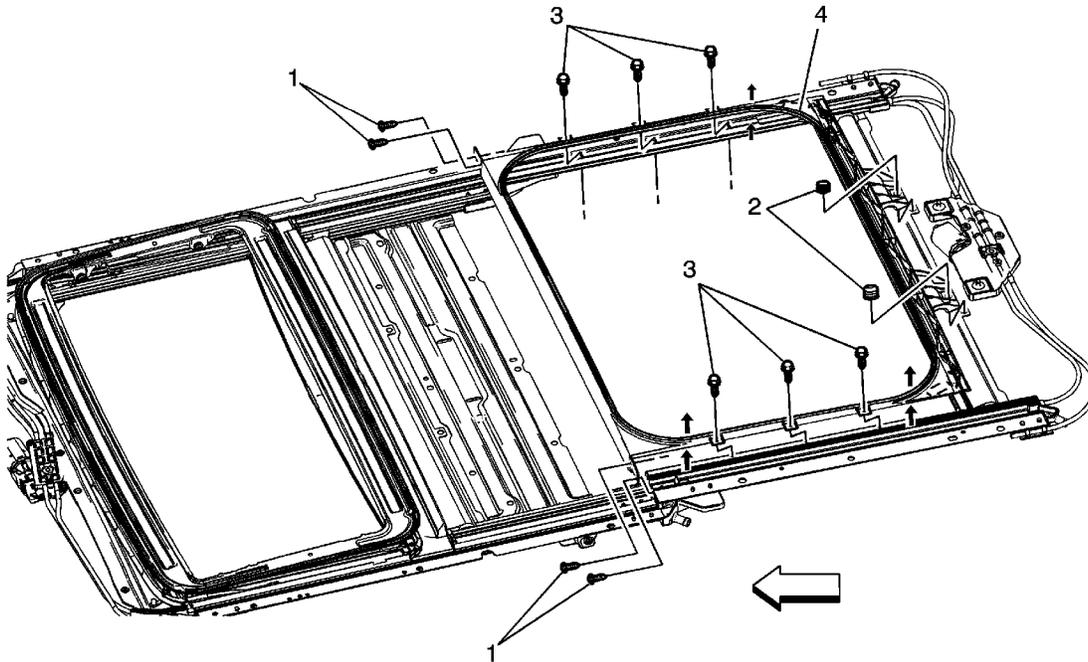


5. Turn the sunshade cam (2) until it is aligned with the bracket (3) notch.
6. Install the sunshade front bar to the sunshade guides on the frame.



7. Remove the suitable tool (1) from the sunshade cam locking hole (2).
8. Ensure that the sunshade cam (2) is fully seated in the bracket (3).
9. Install the sunroof sunshade trim cover. Refer to [Sunroof Frame Replacement](#).
10. Install the sunroof module. Refer to [Sunroof Frame Replacement](#).
11. Install the headliner. Refer to [Headlining Trim Panel Replacement](#).
12. Install the sunroof window. Refer to [Sunroof Window Replacement](#).
13. Initialization/Teach sunshade motor/actuator. Refer to [Sunroof Motor/Actuator Initialization/Teach Process](#).
14. Verify the operation of the sunshade.

Sunroof Sunshade Trim Cover Replacement



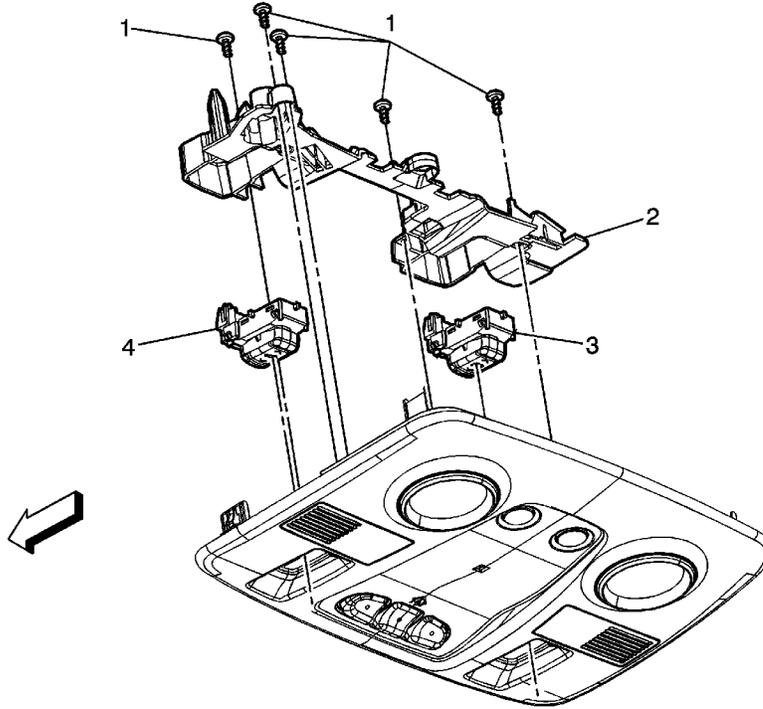
Callout	Component Name
<p>Preliminary Procedure</p> <ol style="list-style-type: none"> 1. It is only necessary to lower the headliner. Only do those steps in the headliner replacement procedure that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement. 2. Remove the sunroof module. Refer to Sunroof Frame Replacement 	
1	<p>Sunroof Sunshade Trim Cover Screw (Qty: 4)</p> <p>Caution: Refer to Fastener Caution in the Preface section.</p> <p>Tighten 2 N·m (18 lb in)</p>
2	<p>Sunroof Sunshade Trim Cover Retainer (Qty: 2)</p>
3	<p>Sunroof Sunshade Trim Cover Screw (Qty: 6)</p> <p>Tighten 2 N·m (18 lb in)</p>
<p>Sunroof Sunshade Trim Cover</p> <p>© 2010 General Motors Corporation. All rights reserved.</p>	

4

Tip

The sunroof sunshade trim cover is separate from the module.

Sunroof Switch Replacement

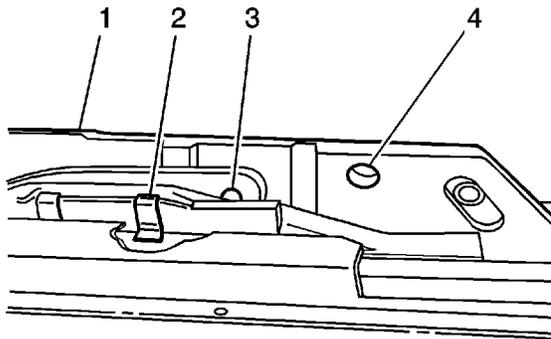


Callout	Component Name
<p>Preliminary Procedures</p> <ol style="list-style-type: none"> 1. Remove the roof console assembly. Refer to Roof Console Replacement. 2. Remove the garage door opener. Refer to Garage Door Opener Replacement. 	
1	Utility Overhead Console Bracket Screw (Qty: 5) Caution: Refer to Fastener Caution in the Preface section. Tighten 2 N·m (18 lb in)
2	Utility Overhead Console Bracket Procedure Disconnect the electrical connection.
3	Sun Roof Sunshade Switch Assembly
4	Sun Roof Switch Assembly

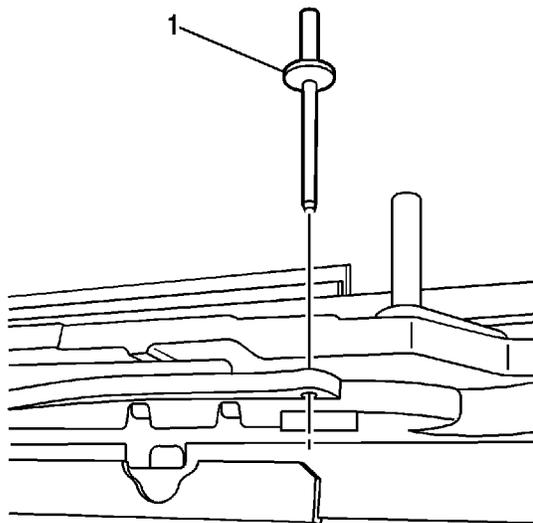
Sunroof Track Timing/Synchronization

Removal Procedure

1. Place the module in the closed/flush position.
2. Lower the headliner. Refer to [Headlining Trim Panel Replacement](#).
3. Disconnect the electrical connector from the motor/actuator.
4. Remove the motor/actuator. Refer to [Sunroof Motor/Actuator Replacement](#).



5. Push the cam assembly (2) forward until the timing hole (3) in the cam is aligned with the timing hole (4) in the lifter arm (1).



Note: Both mechanisms should now be in the closed position.

6. Insert a pin (1) in the holes on both sides of the module to hold the position while installing the drive motor.

Installation Procedure

Caution: Refer to [Fastener Caution](#) in the Preface section.

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

Tighten

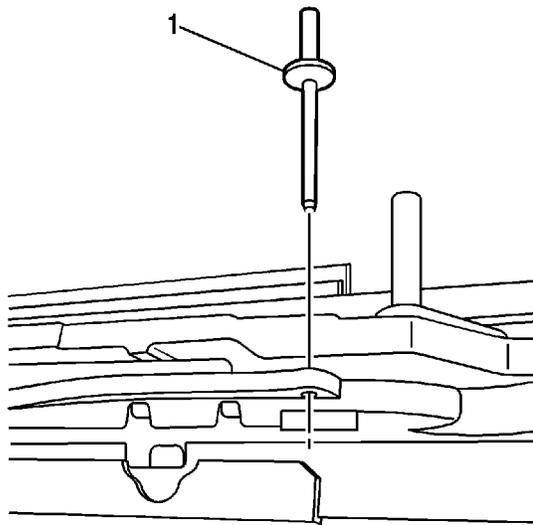
Tighten the screws to 4 N·m (35 lb in).

2. Install the motor/actuator. Refer to [Sunroof Motor/Actuator Replacement](#).

Tighten

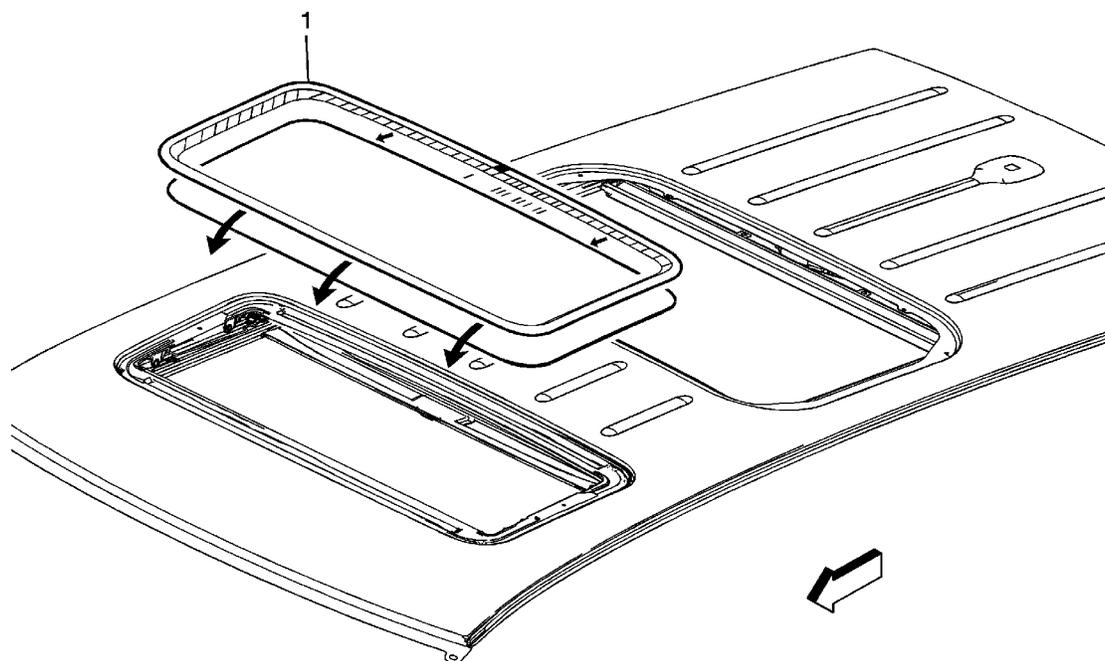
Tighten the motor attachment screws to 3.5 N·m (31 lb in).

3. Connect the electrical connector to the motor/actuator.



4. Remove the pin (1) from the holes that held the position while installing the drive motor.
5. Install the headliner. Refer to [Headlining Trim Panel Replacement](#).
6. Perform the Initialization/Teach Procedure. Refer to [Sunroof Motor/Actuator Initialization/Teach Process](#).
7. Verify the operation of the sunroof.

Sunroof Window Weatherstrip Replacement



Callout	Component Name
<p>Preliminary Procedure</p> <p>Remove the sunroof window. Refer to Sunroof Window Replacement .</p>	
<p>1</p>	<p>Sunroof Window Sealing Strip</p> <p>Procedure</p> <ol style="list-style-type: none"> Carefully remove the sunroof window weatherstrip from the perimeter of the sunroof window. Use a plastic tool in the removal of the weatherstrip from the sunroof retainer. When reinstalling the weatherstrip, spray a 50/50 soap mix on the edge of the retainer to assist in the reinstall. Place the weatherstrip seam in the rear center of the sunroof window . Place the weatherstrip around all four corners before working the weatherstrip into the retainer. Carefully install the sunroof window weatherstrip to the perimeter of the sunroof window, ensuring that the weatherstrip is fully seated. Ensure that the sunroof does not have any air or water leaks. Refer to Sunroof Window Height and Opening Fit Adjustment .

Roof Stationary Window Replacement

Special Tools

- [J 24402-A](#) Glass Sealant (Cold Knife) Remover
- [J 39032](#) Stationary Glass Removal Tool
- Urethane Adhesive Kit GM P/N 12346392 or Equivalent
- Isopropyl Alcohol or Equivalent
- Cartridge-type Caulking Gun
- Commercial-type Utility Knife
- Razor Blade Scraper
- Suction Cups
- Plastic Paddle

Removal Procedure

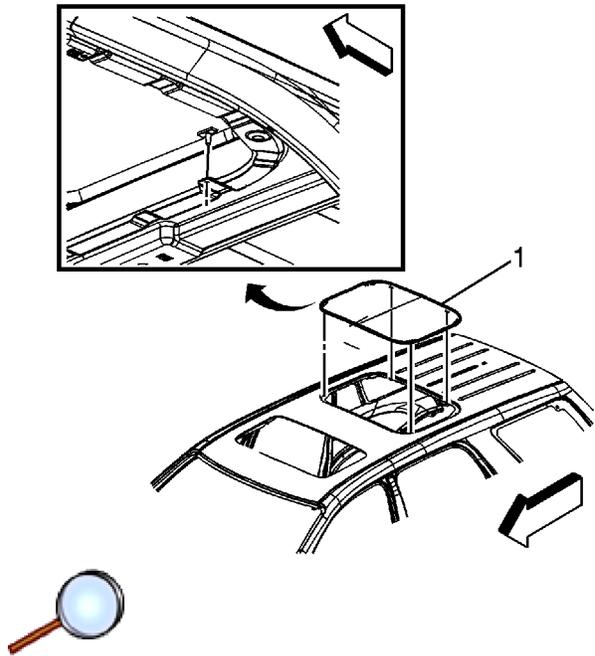
Warning: Refer to [Cracked Window Warning](#) in the Preface section.

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

Warning: Refer to [Defroster Outlet Warning](#) in the Preface section.

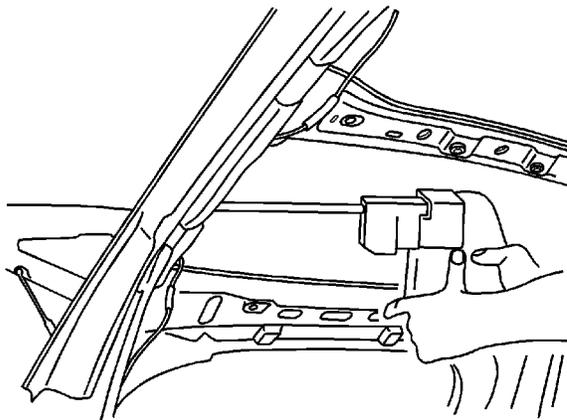
2. Cover the following parts to protect from broken glass:
 - Upper dash pad
 - Defroster outlets and A/C outlets
 - Seats and carpeting

Warning: Refer to [Glass and Sheet Metal Handling Warning](#) in the Preface section.



Note: The roof window reveal molding is a one piece molding and fills the cavities between the body and the roof window (1).

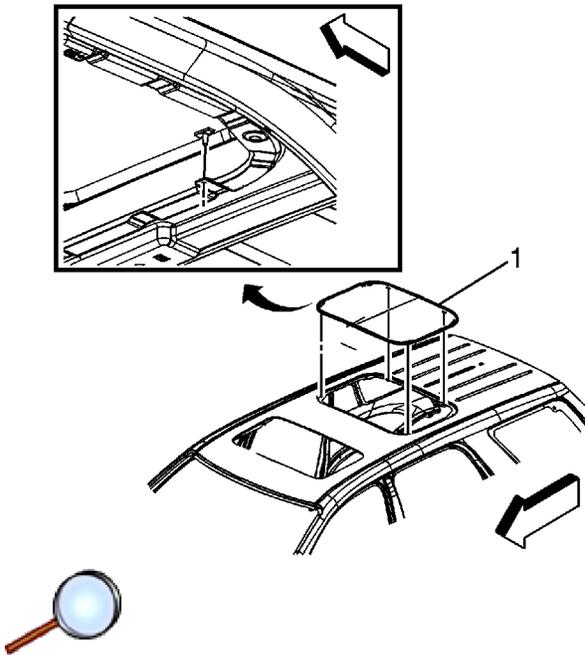
3. If equipped, inspect the roof window reveal molding for damage. If the roof window reveal molding is damaged or becomes detached from the window, the reveal molding cannot be reused and must be replaced.



Note: Keep the cutting edge of the tool against the window.

4. Remove the window from the urethane adhesive.
 - Leave a base of urethane approximately 2 mm (0.078 in) on the pinch-weld flange.

- The only suitable lubrication is clear water.
- Use [J 24402-A](#) , [J 39032](#) or equivalent in order to cut the urethane bead to remove the window.



5. With the aid of an assistant, remove the window (1) from the vehicle.

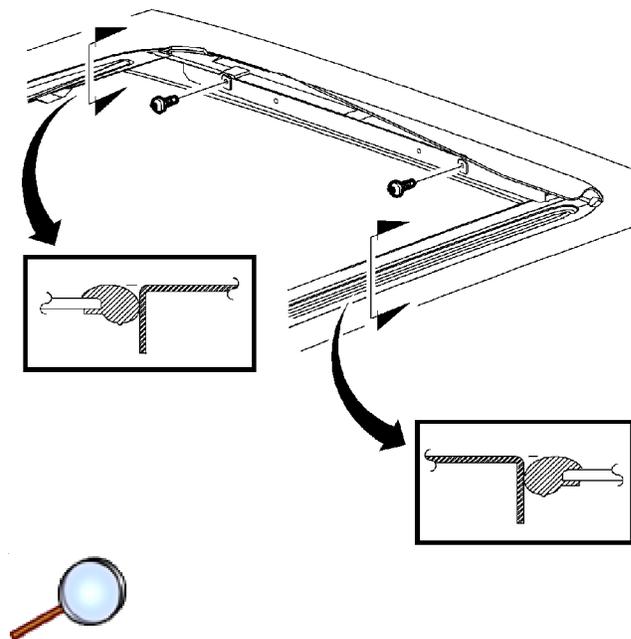
Installation Procedure

1. Install the roof window into the opening. Refer to [Adhesive Installation of Roof Stationary Windows](#).
2. Remove the double layer of masking tape from around the perimeter of the painted surfaces and the interior trim.

Sunroof Window Height and Opening Fit Adjustment

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

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



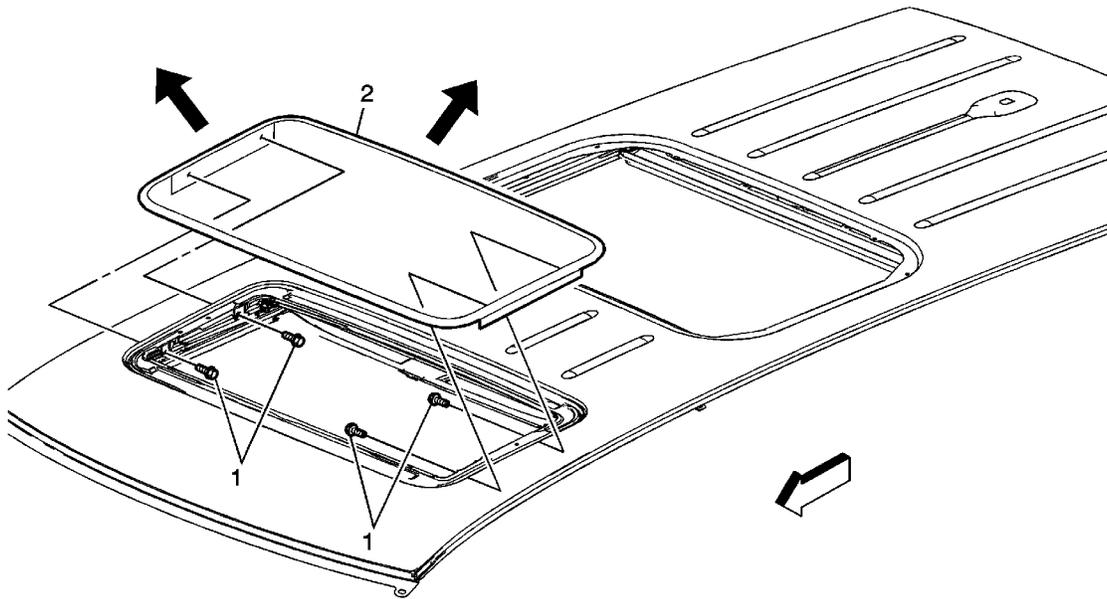
Note: Do Not remove or lower headliner to access sunroof window screws.

2. Loosen the adjusting screws on the window.
3. Adjust the corners of the front window panel using the following guidelines:
 - Adjust the front of the sunroof window to 0.0 mm - 1.0 mm (0.0 in - 0.04 in) below the top surface of the roof panel.
 - Adjust the rear center line of the sunroof window to 2 mm to 3 mm (0.08 in to 0.12 in) below the top surface of the roof panel.

Caution: Refer to [Fastener Caution](#) in the Preface section.

4. Tighten the sunroof window adjustment screws to **5 N·m (44 lb in)**.
5. Cycle sunroof window through all positions.
6. Inspect the sunroof window adjustment. Adjust if necessary.

Sunroof Window Replacement



Callout	Component Name
1	<p>Sunroof Window Screw (Qty: 4)</p> <p>Caution: Refer to Fastener Caution in the Preface section.</p> <p>Tip Open the window.</p> <p>Tighten 6 N·m (53 lb in)</p>
2	<p>Sunroof Window</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Close the sunroof window to the access the screws. 2. Adjust the sunroof window as necessary. Refer to Sunroof Window Height and Opening Fit Adjustment