

2007 Saturn Outlook XE

2007 ACCESSORIES & EQUIPMENT Sunroof - Outlook

2007 ACCESSORIES & EQUIPMENT

Sunroof - Outlook

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

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

SCHEMATIC AND ROUTING DIAGRAMS

SUNROOF SCHEMATICS

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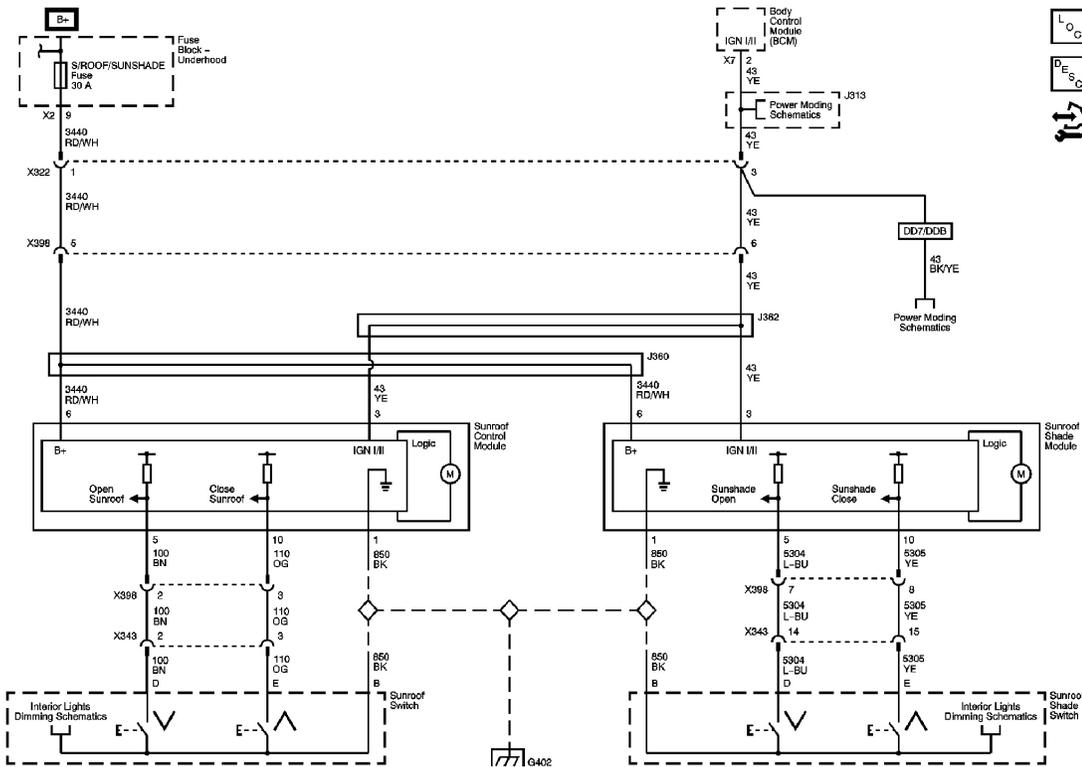


Fig. 1: Sunroof Schematic (C3U)
Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

SUNROOF COMPONENT VIEWS

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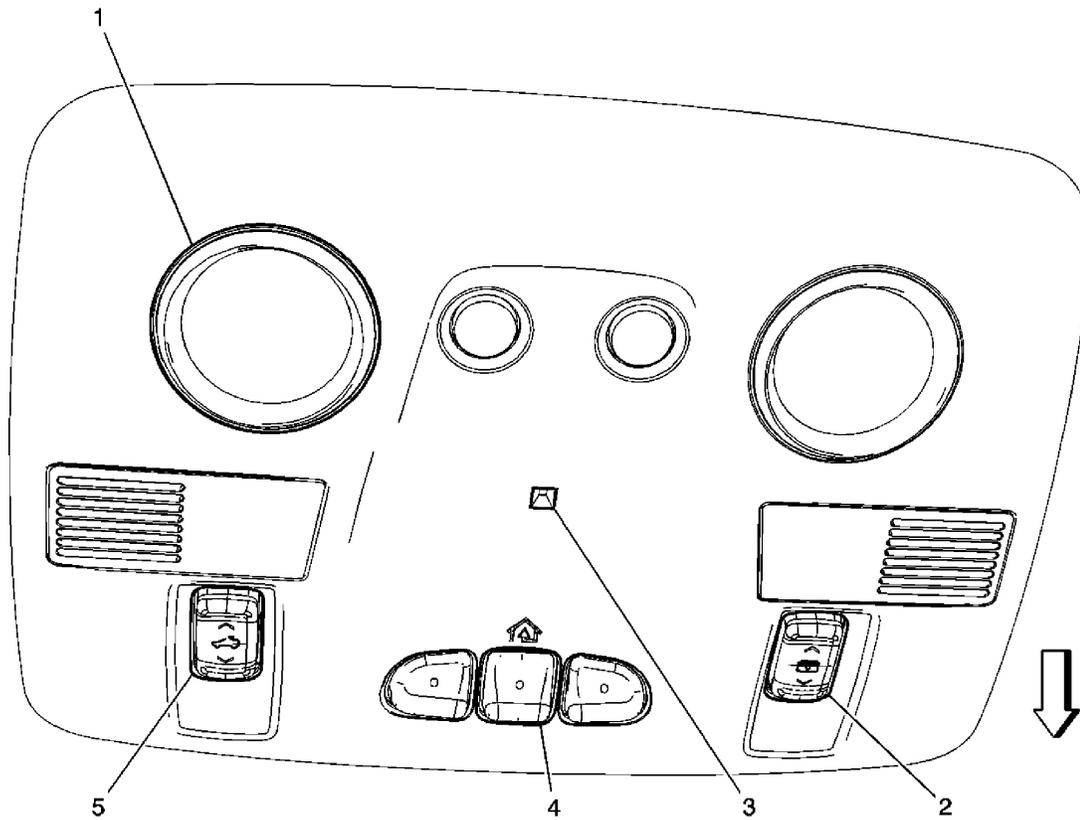


Fig. 2: View Of Overhead Console Components (C3U)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 2

Callout	Component Name
1	Courtesy/Reading Lamp - Front
2	Sunroof Shade Switch (C3U)
3	Console Flood Lamp
4	Garage Door Opener (UG1)
5	Sunroof Switch (C3U)

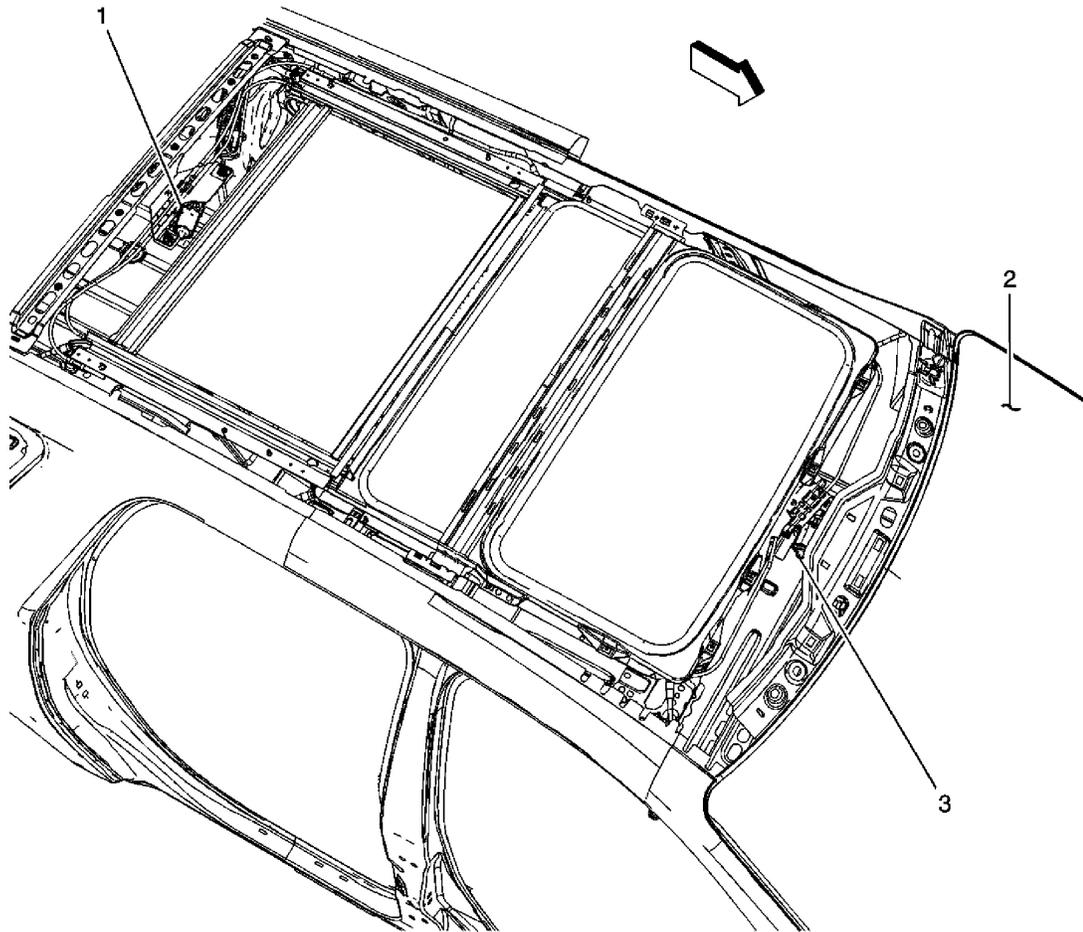


Fig. 3: Identifying Sunroof Modules
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 3

Callout	Component Name
1	Sunshade Module
2	Windshield
3	Sunroof Module

SUNROOF CONNECTOR END VIEWS

Sunroof Control Module

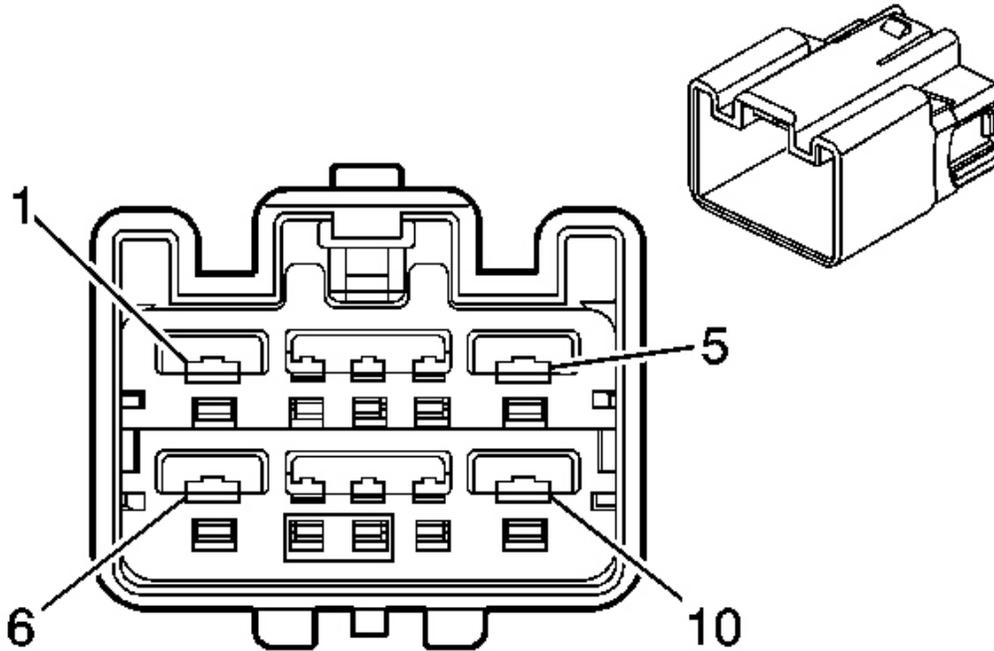


Fig. 4: Sunroof Control Module Connector End View
 Courtesy of GENERAL MOTORS CORP.

Sunroof Control Module Connector Parts Information

Connector Part Information

- OEM: 7282-6459-40
- Service: See Catalog
- Description: 10-Way M (L-GY)

Terminal Part Information

- Terminal/Tray: See Terminal Repair Kit
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit

Sunroof Control Module Connector Terminal Identification

Pin	Wire	Circuit No.	Function

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1	3.0 BK	850	Ground
2	-	-	Not Used
3	0.35 YE	43	Ignition I/II Voltage
4	-	-	Not Used
5	0.35 BN	100	Sunroof Switch Open Signal
6	1.3 RD/WH	3440	Battery Positive Voltage
7-9	-	-	Not Used
10	0.35 OG	110	Sunroof Switch Close Signal

Sunroof Shade Module

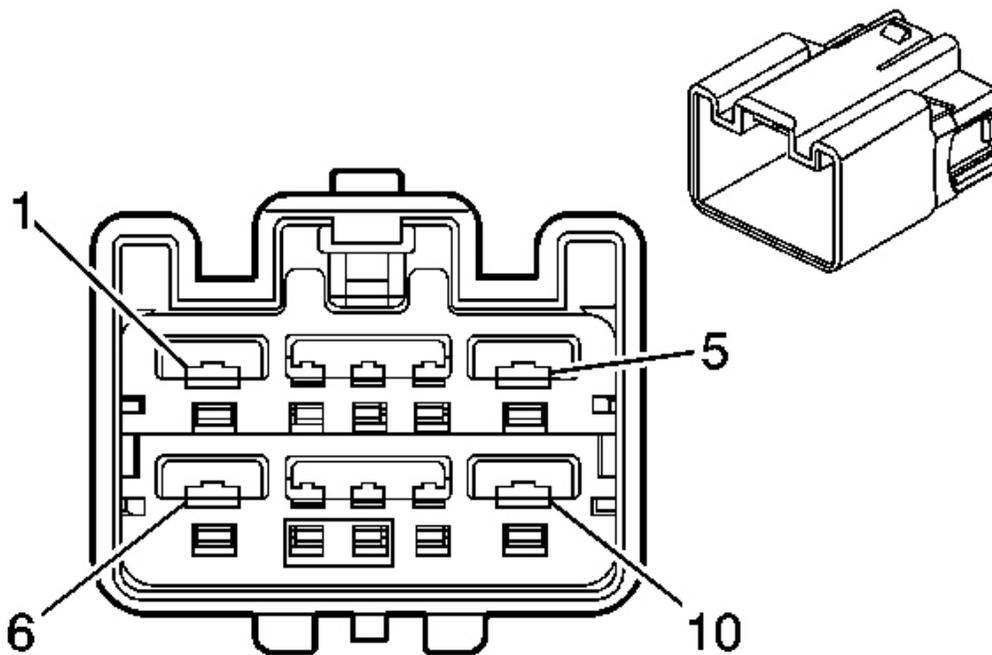


Fig. 5: Sunroof Shade Module Connector End View
 Courtesy of GENERAL MOTORS CORP.

Sunroof Shade Module Connector Parts Information

<p>Connector Part Information</p>
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- OEM: 7282-6459-40
- Service: See Catalog
- Description: 10-Way M (L-GY)

Terminal Part Information

- Terminal/Tray: See Terminal Repair Kit
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit

Sunroof Shade Module Connector Terminal Identification

Pin	Wire	Circuit No.	Function
1	1.3 BK	850	Ground
2	-	-	Not Used
3	0.35 YE	43	Ignition I/II Voltage
4	-	-	Not Used
5	035 L-BU	5304	Front Sunshade Switch Open Signal
6	1.3 RD/WH	3440	Battery Positive Voltage
7-9	-	-	Not Used
10	035 YE	5305	Front Sunshade Switch Close Signal

Sunroof Shade Switch

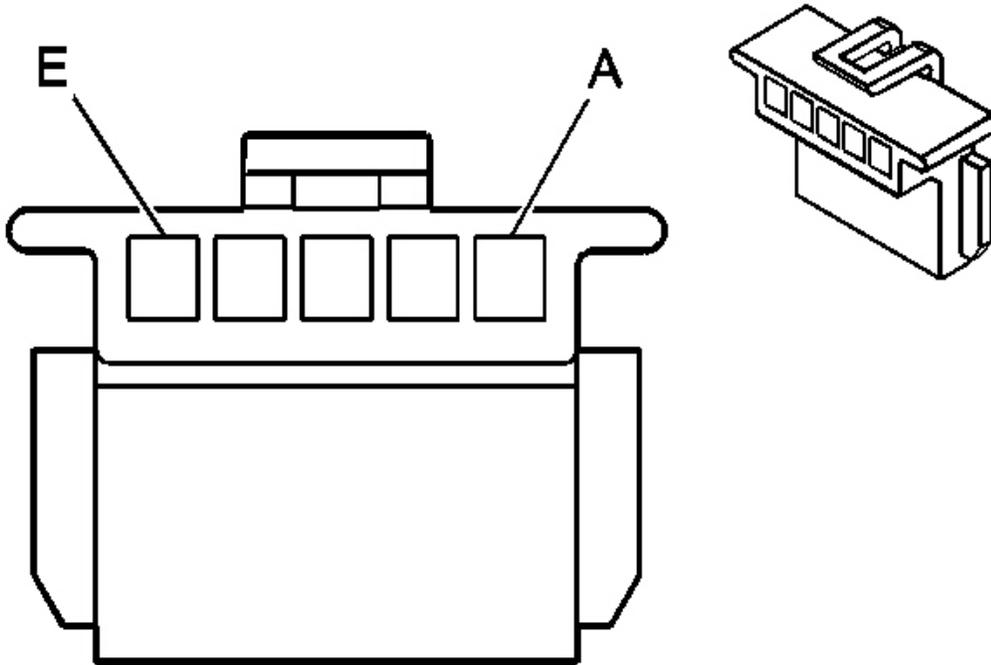


Fig. 6: Sunroof Shade Switch Connector End View
 Courtesy of GENERAL MOTORS CORP.

Sunroof Shade Switch Connector Parts Information

Connector Part Information

- OEM: 12124997
- Service: 12167130
- Description: 5-Way F Metri-Pack 150 Series, Unsealed (BK)

Terminal Part Information

- Terminal/Tray: See Terminal Repair Kit
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit

Sunroof Shade Switch Connector Terminal Identification

Pin	Wire	Circuit No.	Function

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A	0.35 GY	8	Instrument Panel Lamp Supply Voltage
B	0.35 BK	850	Ground
C	-	-	Not Used
D	0.35 L-BU	5304	Front Sunshade Switch Open Signal
E	0.35 YE	5305	Front Sunshade Switch Close Signal

Sunroof Switch

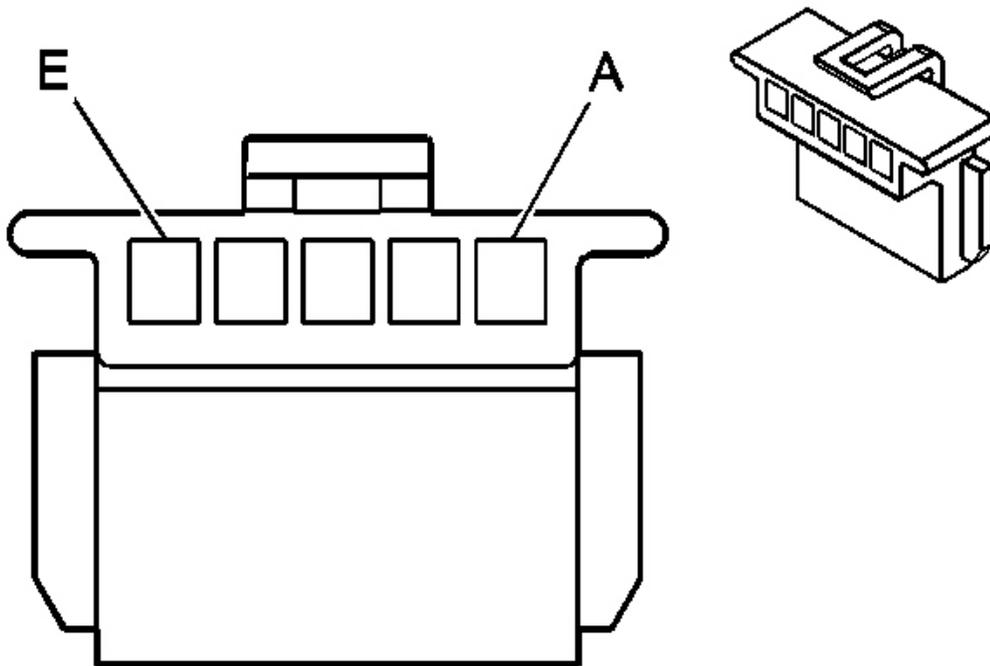


Fig. 7: Sunroof Switch Connector End View
Courtesy of GENERAL MOTORS CORP.

Sunroof Switch Connector Parts Information

Connector Part Information

- OEM: 12124997
- Service: 12167130
- Description: 5-Way F Metri-Pack 150 Series, Unsealed (BK)

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Terminal Part Information

- Terminal/Tray: See Terminal Repair Kit
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit

Sunroof Switch Connector Terminal Identification

Pin	Wire	Circuit No.	Function
A	0.35 GY	8	Instrument Panel Lamp Supply Voltage
B	0.35 BK	850	Ground
C	-	-	Not Used
D	0.35 BN	100	Sunroof Switch Open Signal
E	0.35 OG	110	Sunroof Switch Close Signal

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - ROOF

Before you begin any diagnostic procedure, always review the system Description and Operation. Reviewing the Description and Operation will help you determine the correct diagnostic procedure, when a malfunction exists. Reviewing the Description and Operation will also help you determine if the condition described by the customer is normal operation.

After reviewing the system description and operation, always begin the system diagnosis with the **Diagnostic System Check - Vehicle**. The Diagnostic System Check will provide the following information:

- The identification of the control modules which command the system
- The ability of the control modules to communicate through the serial data circuit
- The identification of any stored diagnostic trouble codes and their status

The use of the Diagnostic System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

SYMPTOMS - ROOF

IMPORTANT: 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:
 - No DTCs are 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 could 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 intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** .

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

Power Sunroof/Sunshade Inoperative

POWER SUNROOF/SUNSHADE INOPERATIVE

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.

Circuit/System Description

The sunroof and sunshade modules supply each of the switch signal circuits with a 12-volt reference. When a switch is pressed the signal circuit is pulled low signaling the sunroof or sunshade open or close request. The modules determine the motor direction based on inputs received from the overhead console sunroof switches. When the modules reverse the polarity of the applied voltage, the motors reverse direction. Ignition voltage is supplied to the sunroof and

sunshade modules by the BCM. B+ is applied to the sunroof and sunshade modules via the S/ROOF/SUNSHADE fuse.

Diagnostic Aids

A short to B+ on any of the sunroof switch signal circuits will open the ground trace in the sunroof switch.

Reference Information**Schematic Reference****Sunroof Schematics****Connector End View Reference****Sunroof Connector End Views****Electrical Information Reference**

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

Circuit/System Testing

1. Ignition OFF, disconnect the appropriate sunroof or sunshade module harness connector.
2. Test for less than 1.0 ohm of resistance between the ground circuit terminal 1 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Verify that a test lamp illuminates between the B+ circuit terminal 6 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal and the B+ circuit fuse is open, replace the fuse and determine if the sunroof or sunshade module is causing the fuse to open. Replace the appropriate module.
4. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal 3 and ground.
 - If the test lamp does not illuminate, test the ignition circuit for an open/high resistance. If the circuit tests normal, replace the body control module.
5. Connect the sunroof and sunshade modules.

6. Disconnect the appropriate sunroof or sunshade switch.
7. Test for less than 1.0 ohm of resistance between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.

IMPORTANT: Apply ground to the module for no longer than 2 seconds at a time or the module could be damaged.

IMPORTANT: When performing the following tests, make sure that the sunroof or sunshade is not at its end if travel position by switching the grounded jumper to the other signal circuit if the sunroof or sunshade did not move in one direction.

8. Momentarily install a 10-amp fused jumper wire between the signal circuit terminal D and ground. The sunroof or sunshade should move.
 - If the sunroof or sunshade does not move, test the switch signal circuit for a short to ground, short to voltage or an open/high resistance. If the circuit test is normal, replace the inoperative module.
9. Momentarily install a 10-amp fused jumper wire between the signal circuit terminal E and ground. The sunroof or sunshade should move.
 - If the sunroof or sunshade does not move, test the switch signal circuit for a short to ground, short to voltage or an open/high resistance. If the circuit test is normal, replace the inoperative module.
10. If all circuits test normal, replace the appropriate sunroof or sunshade switch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Sunroof Switch Replacement**
- **Control Module References** for BCM, sunroof control module or sunroof shade module replacement, setup and programming

REPAIR INSTRUCTIONS

SUNROOF AIR DEFLECTOR REPLACEMENT

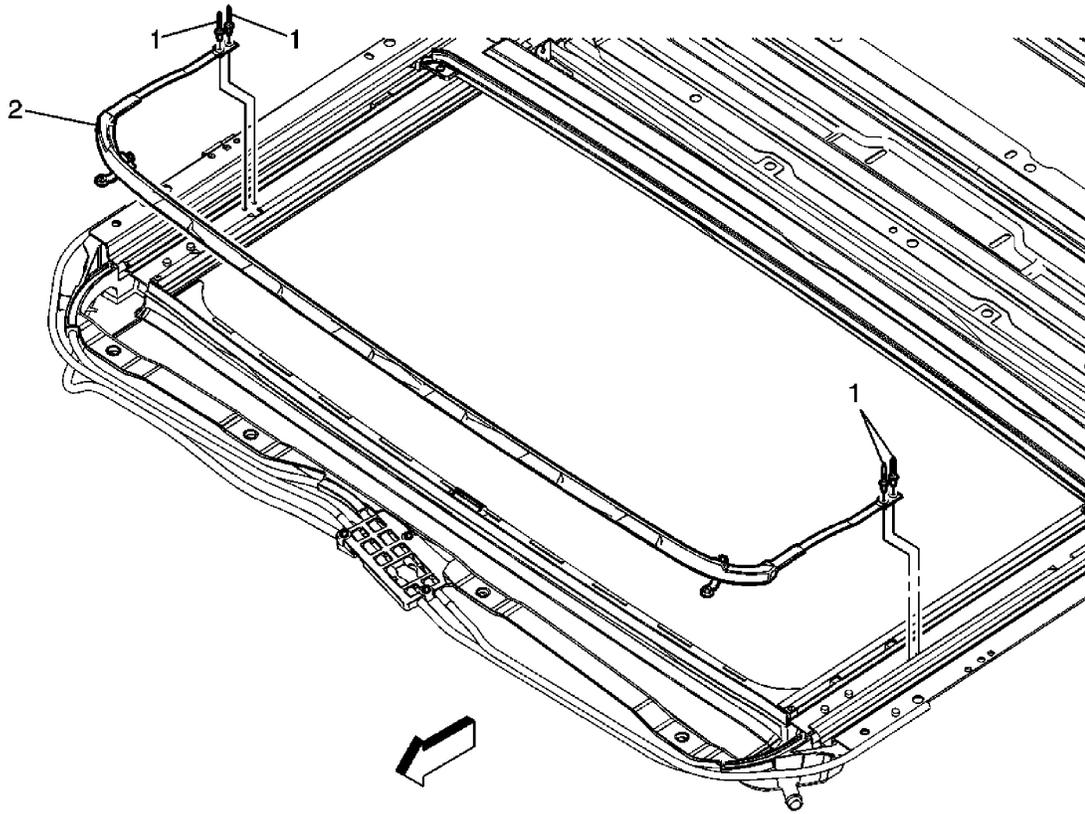


Fig. 8: View Of Sunroof Air Deflector
 Courtesy of GENERAL MOTORS CORP.

Sunroof Air Deflector Replacement

Callout	Component Name
1	Sunroof Air Deflector (Qty: 4) CAUTION: Refer to <u>Glass and Sheet Metal Handling Caution</u> . Procedure 1. Open the sunroof to expose the 2 rivets located on each side. 2. Tape the under side of the tracks to protect then from metal shaving. 3. Drill out the rivets.
2	Sunroof Air Deflector

Drain Hose Routing

A drain trough encircles the sunroof window panel and water is drained off by the 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. Ensure that the front drain hoses are routed down the windshield pillars and out the center of the front pillar between the door hinges. Ensure that the hoses are not kinked. Replace any torn or cracked hose. Refer to **Sunroof Housing Front Drain Hose Replacement**.
2. Ensure that the rear drain hoses are routed through the rear pillars and out of the rear lower quarter panel. Ensure that the rear hoses are properly routed in the metal roof slot and are attached in place. Replace any torn or cracked hose. Refer to **Sunroof Housing Rear Drain Hose Replacement**.

Plugged Drain Hose

If a waterleak has occurred, inspect for a plugged drain hose at each corner of the drainage system:

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

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

3. Use compressed air, 35 psi or less, to blow out any drain hose that is plugged.
4. Test the system again.
5. If the hose remains plugged, inspect for improper routing or kinks. Refer to Drain Hose Routing above.
6. Remove any hoses that remain plugged. Refer to **Sunroof Housing Front Drain Hose Replacement** or to **Sunroof Housing Rear Drain Hose Replacement**.
7. Remove the blockage:
 1. Push a mechanics wire through the hose to remove the obstruction.
 2. Use compressed air in order to blow out any remaining material.
8. Reinstall the hose. Refer to **Sunroof Housing Front Drain Hose Replacement** or to **Sunroof Housing Rear Drain Hose Replacement**.

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 inspect 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 attached in place.

SUNROOF WATER GUTTER REPLACEMENT

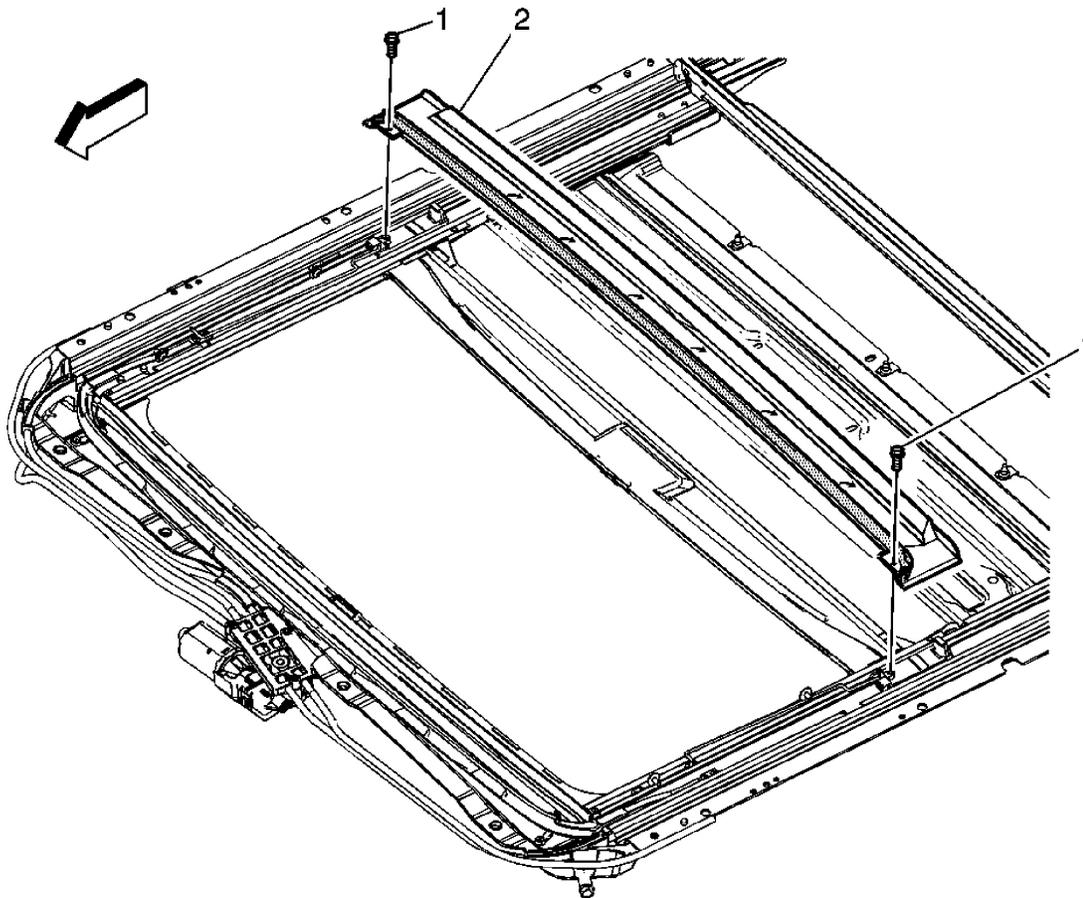


Fig. 9: Identifying Sunroof Water Gutter
 Courtesy of GENERAL MOTORS CORP.

Sunroof Water 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

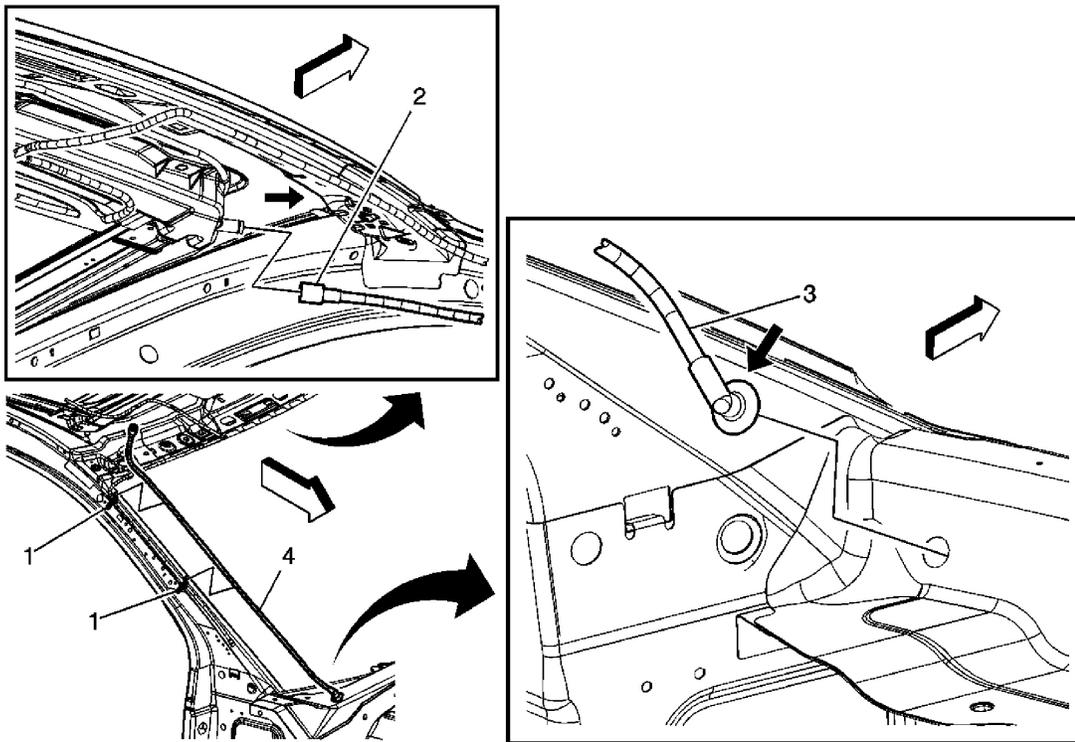


Fig. 10: View Of Sunroof Housing Front Drain Hose
 Courtesy of GENERAL MOTORS CORP.

Sunroof Housing Front Drain Hose Replacement

Callout	Component Name
Preliminary Procedure	
1. Remove the headliner. 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)
	Sunroof Drain Hose Coupler

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2	Procedure: Disconnect the sunroof drain hose from the sunroof module spigot.
3	Sunroof Drain Hose Plug
4	Sunroof Drain Hose Procedure <ol style="list-style-type: none">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 retainer that secure the drain hose to the windshield pillar.

SUNROOF HOUSING REAR DRAIN HOSE REPLACEMENT

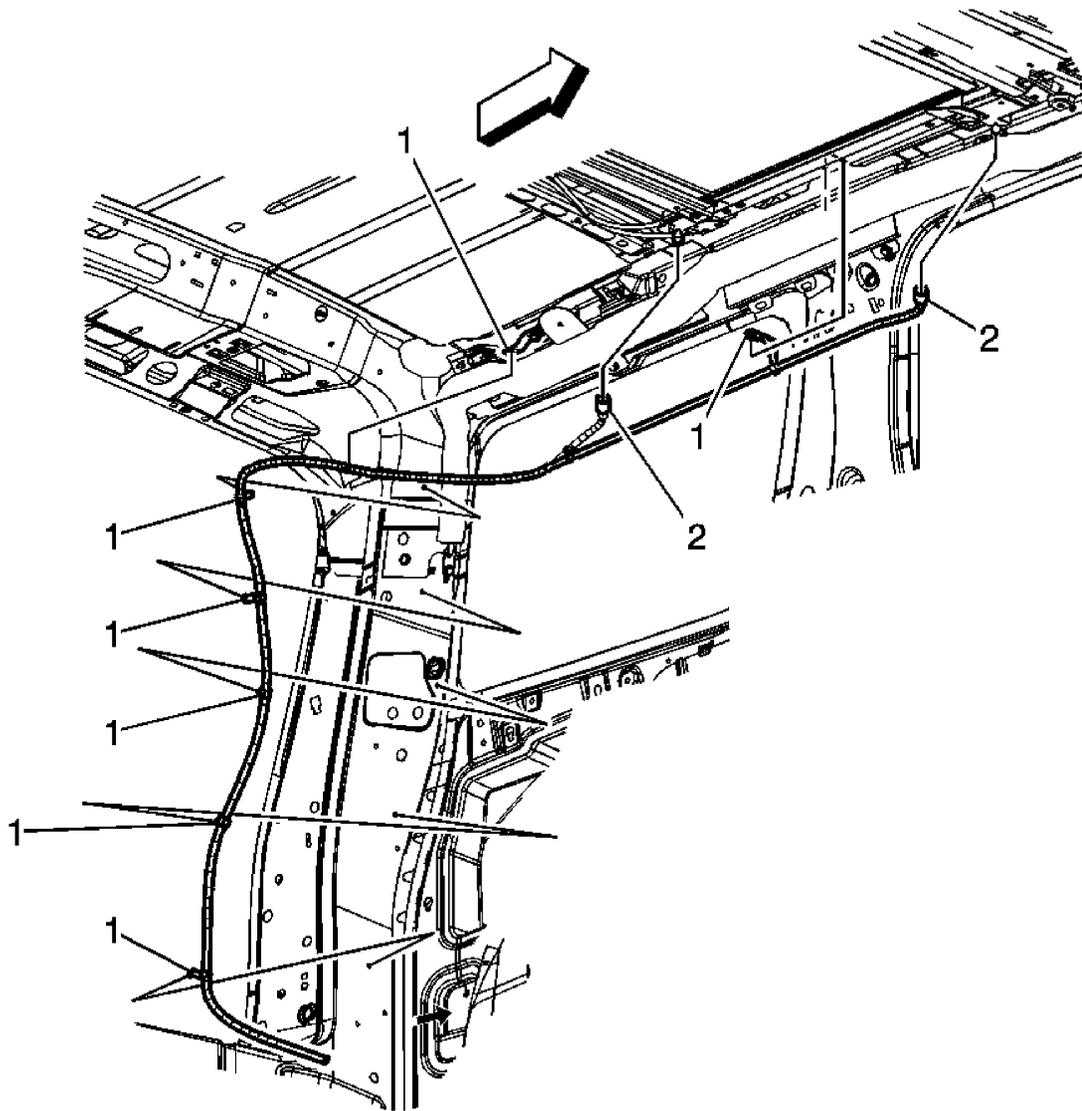


Fig. 11: View Of Sunroof Housing Rear Drain Hose
 Courtesy of GENERAL MOTORS CORP.

Sunroof Housing Rear Drain Hose Replacement

Callout	Component Name
Preliminary Procedure: Lower the headliner. Refer to Headlining Trim Panel Replacement .	
1	Sunroof Drain Hose Retainers (Qty: 8)
	Sunroof Drain Hose Procedure

- | | |
|---|---|
| 2 | <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 MODULE ASSEMBLY REPLACEMENT

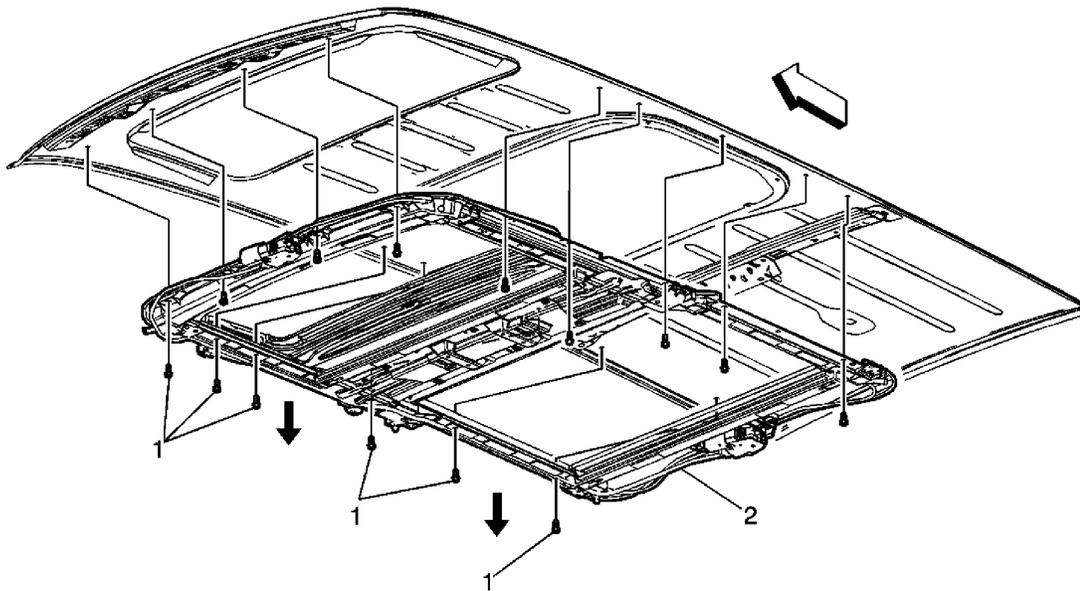


Fig. 12: Locating Sunroof Module Assembly
 Courtesy of GENERAL MOTORS CORP.

Sunroof Module Assembly Replacement

Callout	Component Name
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Preliminary Procedure

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.

IMPORTANT:

Do not remove the drain hoses from the vehicle, disconnect the drain hoses from the module only.

4. Disconnect the drain hoses from the sunroof assembly. Refer to the following procedures:

- **Sunroof Housing Front Drain Hose Replacement**
- **Sunroof Housing Rear Drain Hose Replacement**

1	<p>Sunroof Module Bolt (Qty: 16)</p> <p>NOTE: Refer to <u>Fastener Notice</u> .</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Leave the four corner bolts until last. 2. Recline the seats all the way rearward. 3. 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 <u>Sunroof Motor/Actuator Initialization/Teach Process (New Motor)</u>, <u>Sunroof Motor/Actuator Initialization/Teach Process (New Roller Sunshade)</u>, <u>Sunroof Motor/Actuator Initialization/Teach Process (Existing Motor)</u> or <u>Sunroof Motor/Actuator Initialization/Teach Process (Existing Roller Sunshade)</u>.

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

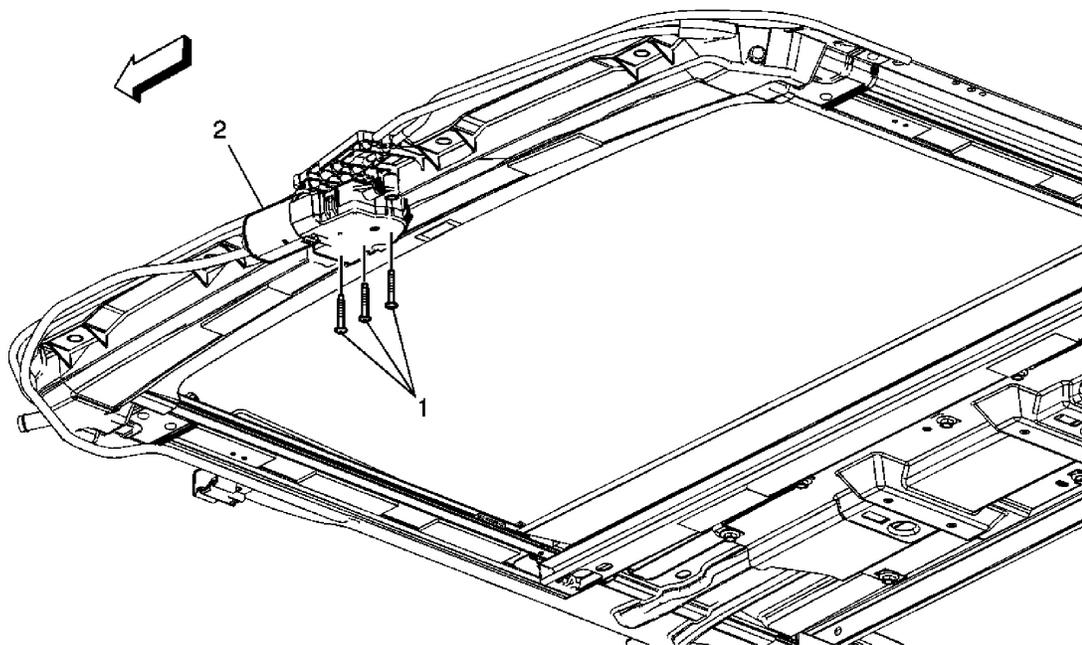


Fig. 13: Locating Sunroof Motor/Actuator
 Courtesy of GENERAL MOTORS CORP.

Sunroof Motor/Actuator Replacement

Callout	Component Name
Preliminary Procedure:	

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Lower the headliner. Refer to **Headlining Trim Panel Replacement** .

1	<p>Sunroof Window Motor/Actuator Screw (Qty: 3)</p> <p>NOTE: Refer to <u>Fastener Notice</u> .</p> <p>Procedure: Disconnect the electrical connector. Tip: When removing the motor/actuator the cables and tubes stay with the module.</p> <p>Tighten: 3 N.m (27 lb in)</p>
2	<p>Sunroof Window Motor/Actuator</p> <p>Procedure: Initialization/Teach motor/actuator, refer to <u>Sunroof Motor/Actuator Initialization/Teach Process (New Motor)</u>, <u>Sunroof Motor/Actuator Initialization/Teach Process (New Roller Sunshade)</u>, <u>Sunroof Motor/Actuator Initialization/Teach Process (Existing Motor)</u> or <u>Sunroof Motor/Actuator Initialization/Teach Process (Existing Roller Sunshade)</u>.</p>

SUNROOF SUNSHADE MOTOR/ACTUATOR REPLACEMENT

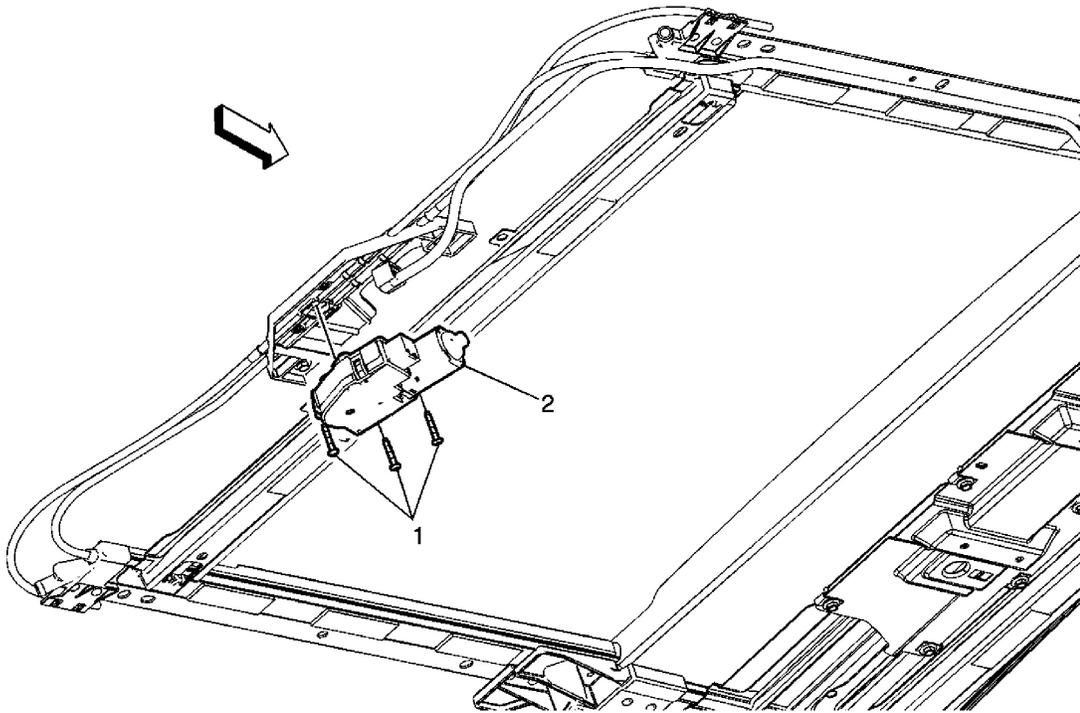


Fig. 14: Identifying Sunroof Sunshade Motor/Actuator
 Courtesy of GENERAL MOTORS CORP.

Sunroof Sunshade Motor/Actuator Replacement

Callout	Component Name
<p>Preliminary Procedure: Remove the headliner. Refer to <u>Headlining Trim Panel Replacement</u> .</p>	
<p>1</p>	<p>Sunroof Sunshade Motor/Actuator Screw (Qty: 3)</p> <p>NOTE: Refer to <u>Fastener Notice</u> .</p> <p>Procedure: Disconnect the electrical connector. 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>
	<p>Sunroof Sunshade Motor/Actuator</p> <p>Procedure:</p>

2

Initialization/Teach motor/actuator, refer to Sunroof Motor/Actuator Initialization/Teach Process (New Motor), Sunroof Motor/Actuator Initialization/Teach Process (New Roller Sunshade), Sunroof Motor/Actuator Initialization/Teach Process (Existing Motor) or Sunroof Motor/Actuator Initialization/Teach Process (Existing Roller 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. Remove the headliner. Refer to Headlining Trim Panel Replacement.
4. Remove the sunroof module. Refer to Sunroof Module Assembly Replacement.
5. Grasping the front corners of the sunshade, roll the sunshade counterclockwise to release tension from the cable guides.
6. Remove the sunroof sunshade trim cover. Refer to

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

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.

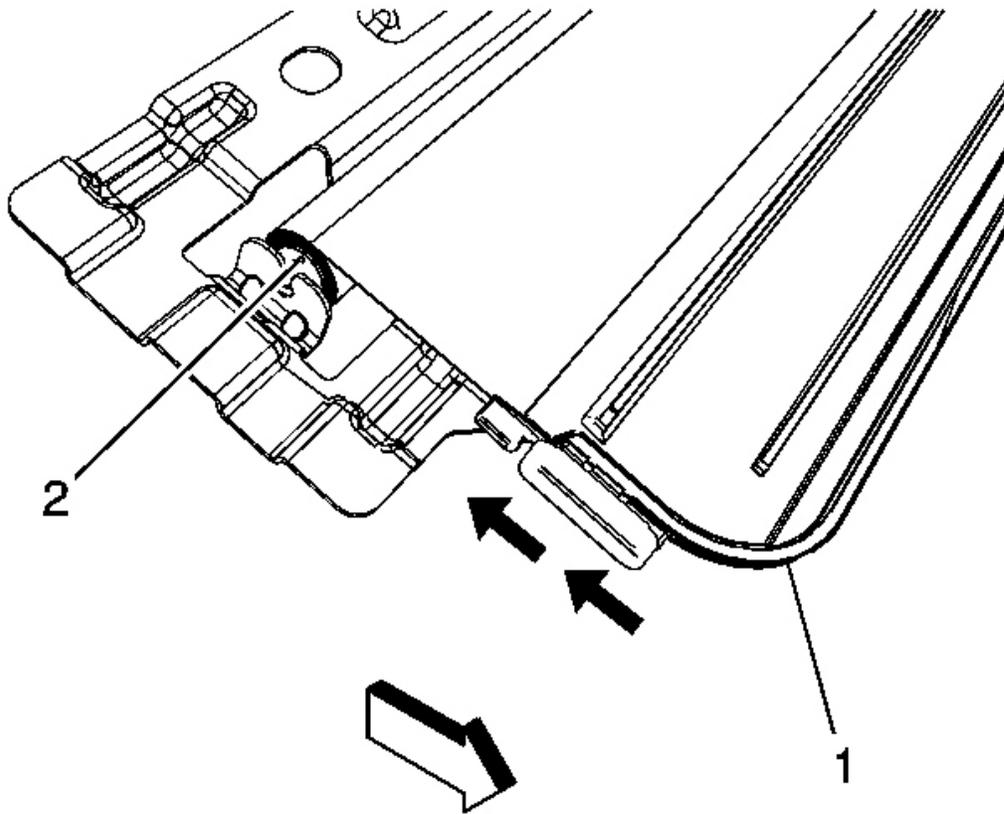


Fig. 15: View of Sunshade & Cam Locking Hole
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: 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.

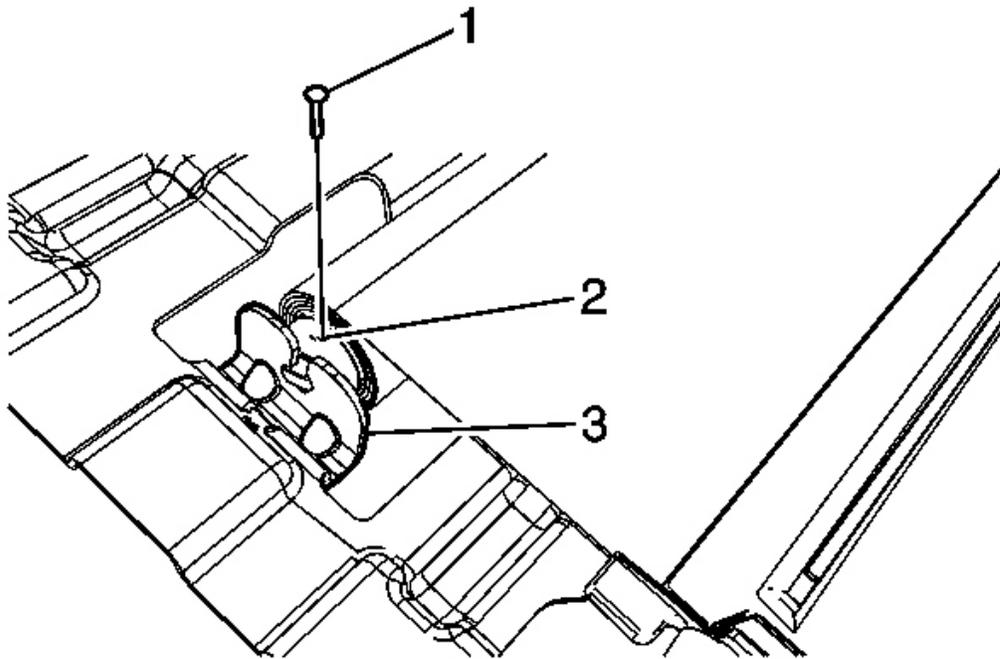


Fig. 16: Identifying Suitable Tool For Procedure
Courtesy of GENERAL MOTORS CORP.

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

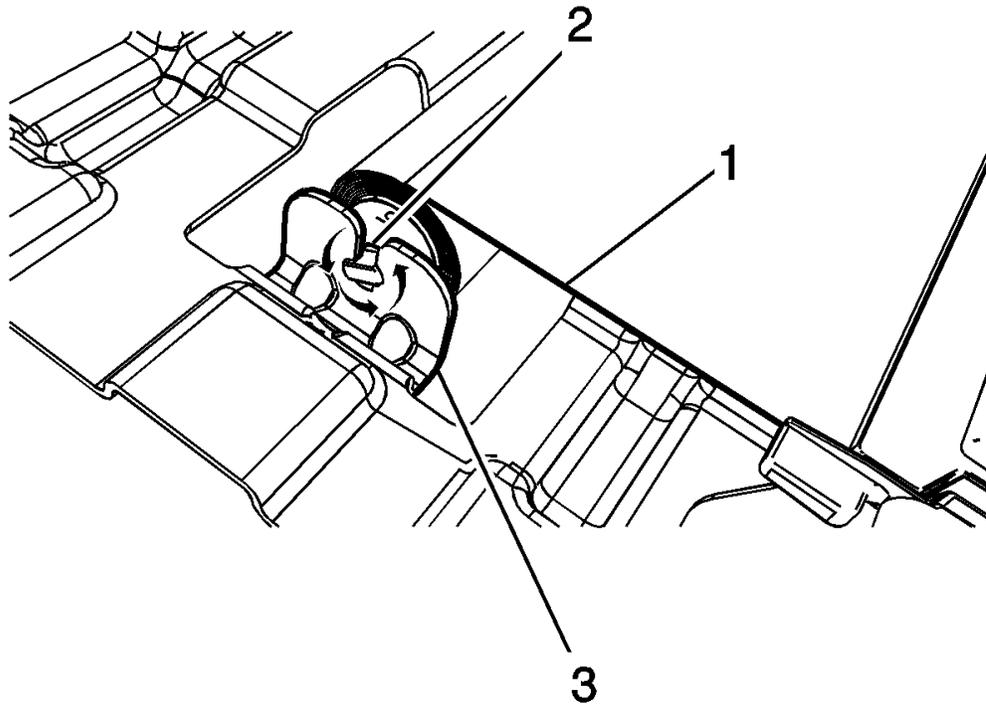


Fig. 17: View Of Turning Sunshade Cam Counterclockwise
Courtesy of GENERAL MOTORS CORP.

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

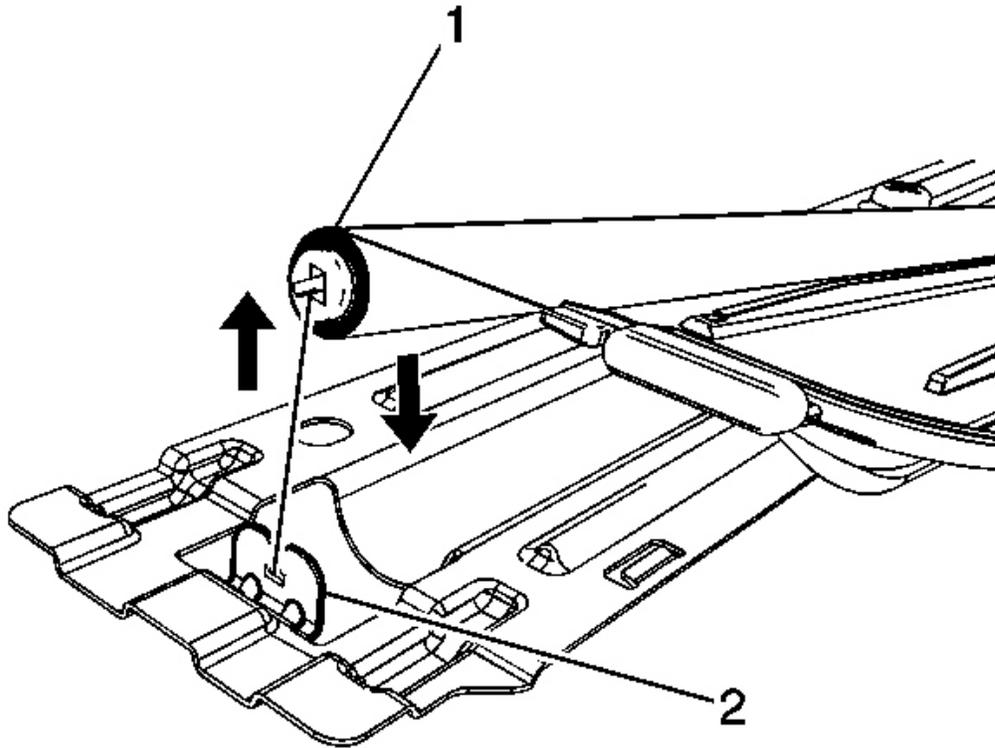


Fig. 18: Identifying Sunshade Bracket Notch
Courtesy of GENERAL MOTORS CORP.

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

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

11. Remove the sunshade from outside of the vehicle.

Installation Procedure

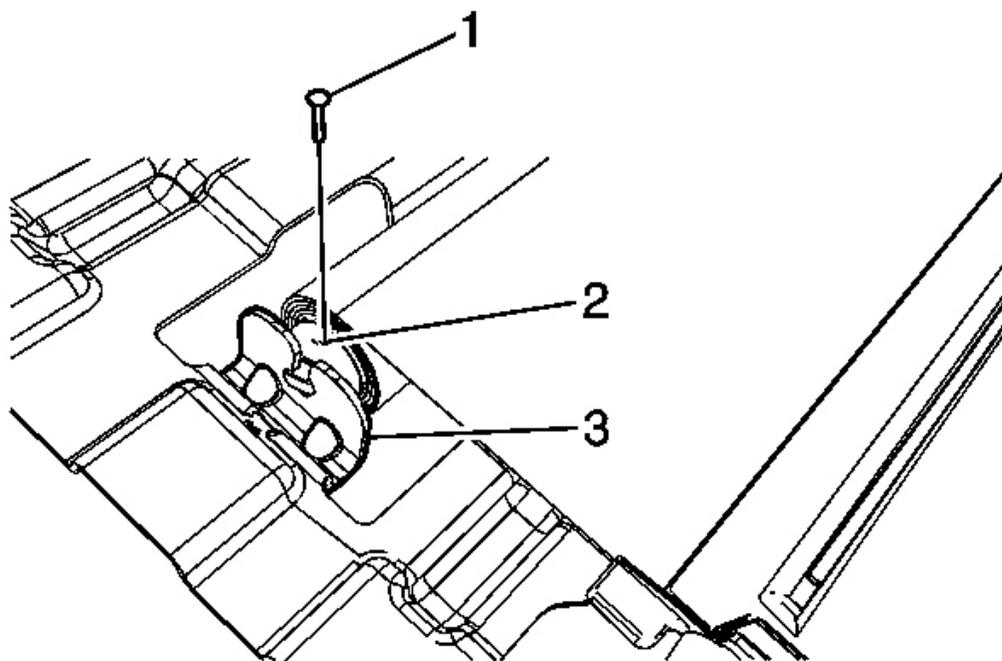


Fig. 19: Identifying Suitable Tool For Procedure
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: 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.

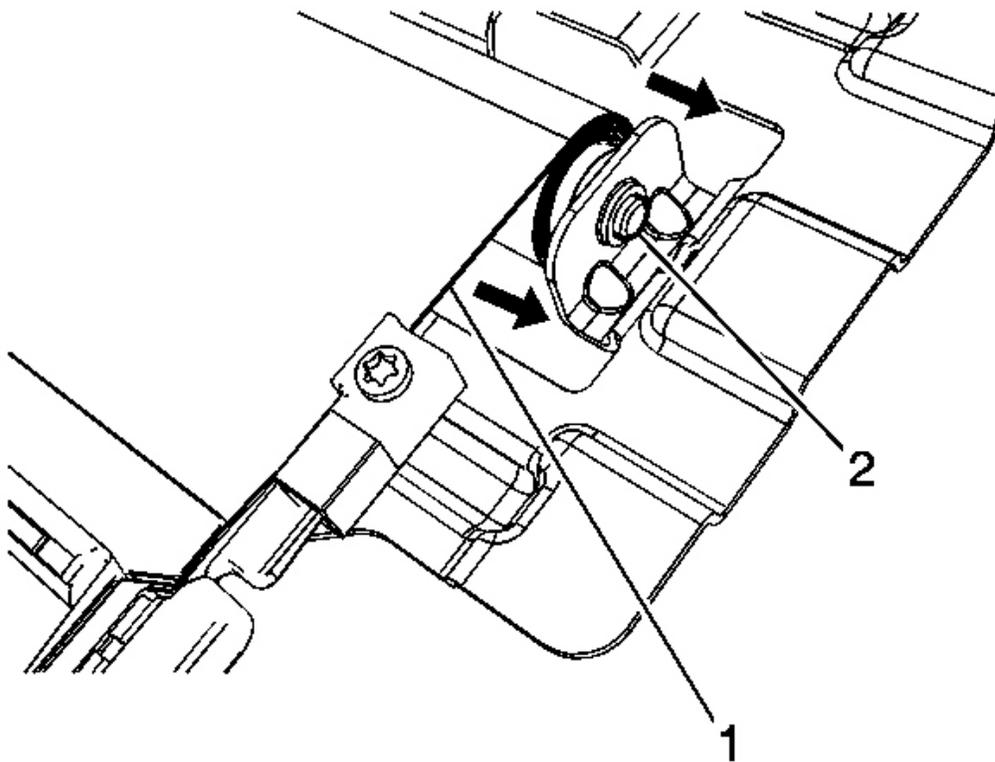


Fig. 20: View Of Sunshade End & Bracket Notch
Courtesy of GENERAL MOTORS CORP.

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

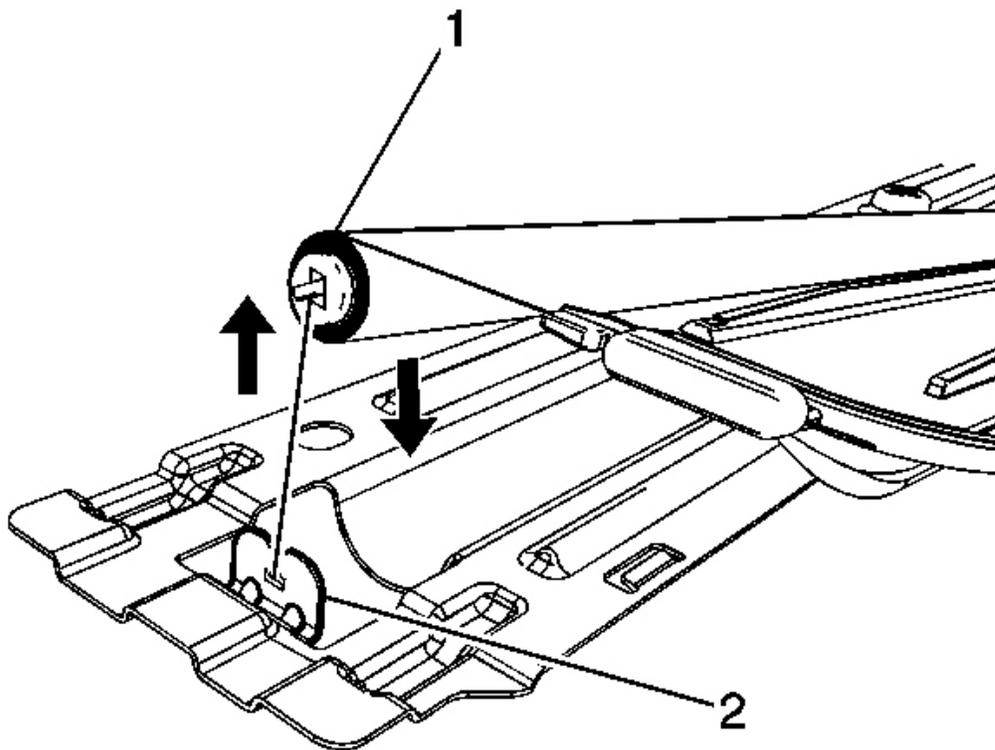


Fig. 21: Identifying Sunshade Bracket Notch
Courtesy of GENERAL MOTORS CORP.

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

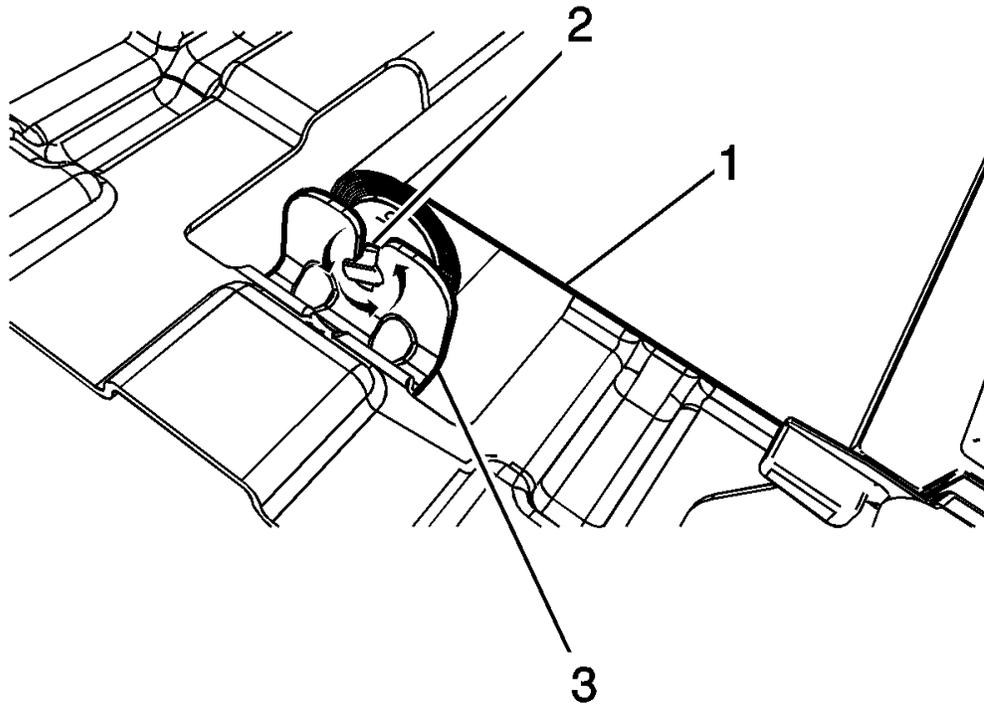


Fig. 22: View Of Turning Sunshade Cam Counterclockwise
Courtesy of GENERAL MOTORS CORP.

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

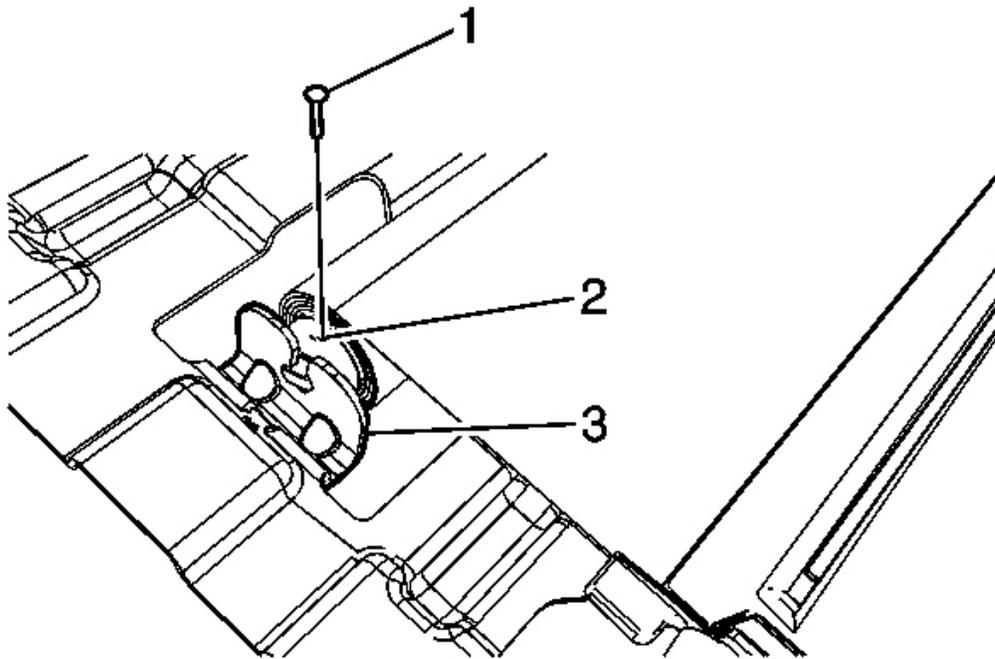


Fig. 23: Identifying Suitable Tool For Procedure
Courtesy of GENERAL MOTORS CORP.

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) and the sunshade slides smoothly.
9. Install the sunroof sunshade trim cover. Refer to **Sunroof Module Assembly Replacement**.
10. Install the sunroof module. Refer to **Sunroof Module Assembly 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 (New Motor)**, **Sunroof Motor/Actuator Initialization/Teach Process (New Roller Sunshade)**, **Sunroof Motor/Actuator Initialization/Teach Process (Existing Motor)** or **Sunroof Motor/Actuator Initialization/Teach Process (Existing Roller Sunshade)**.
14. Verify the operation of the sunshade.

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.

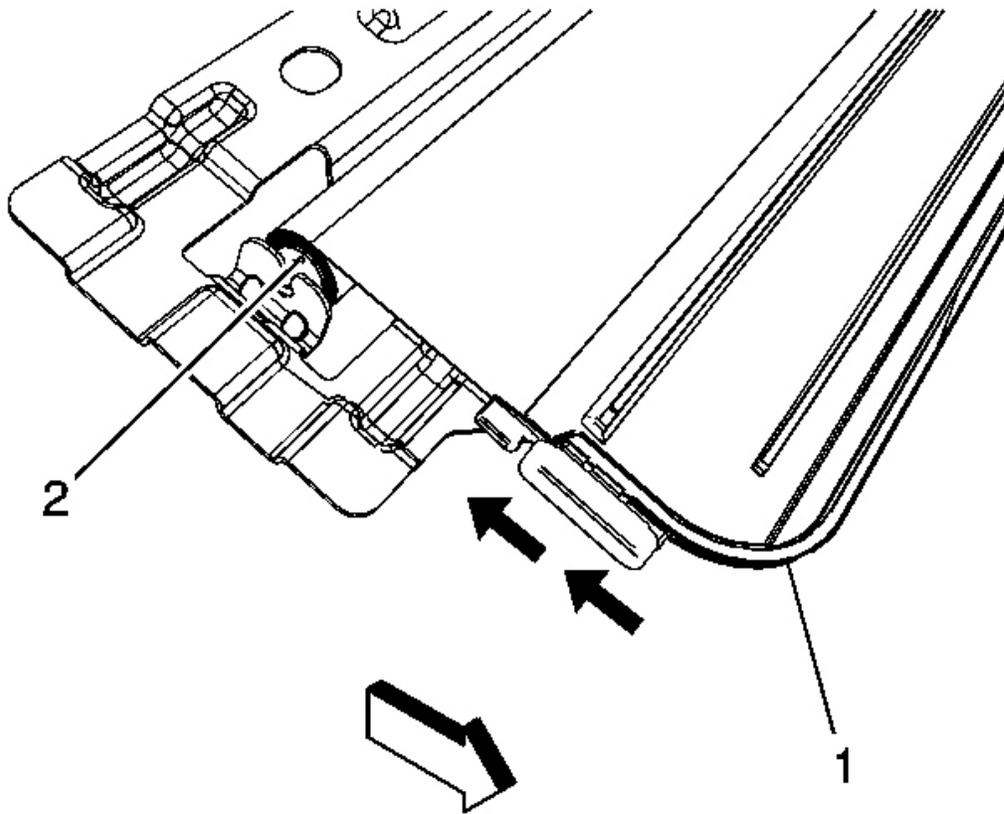


Fig. 24: View of Sunshade And Cam Locking Hole
Courtesy of GENERAL MOTORS CORP.

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.

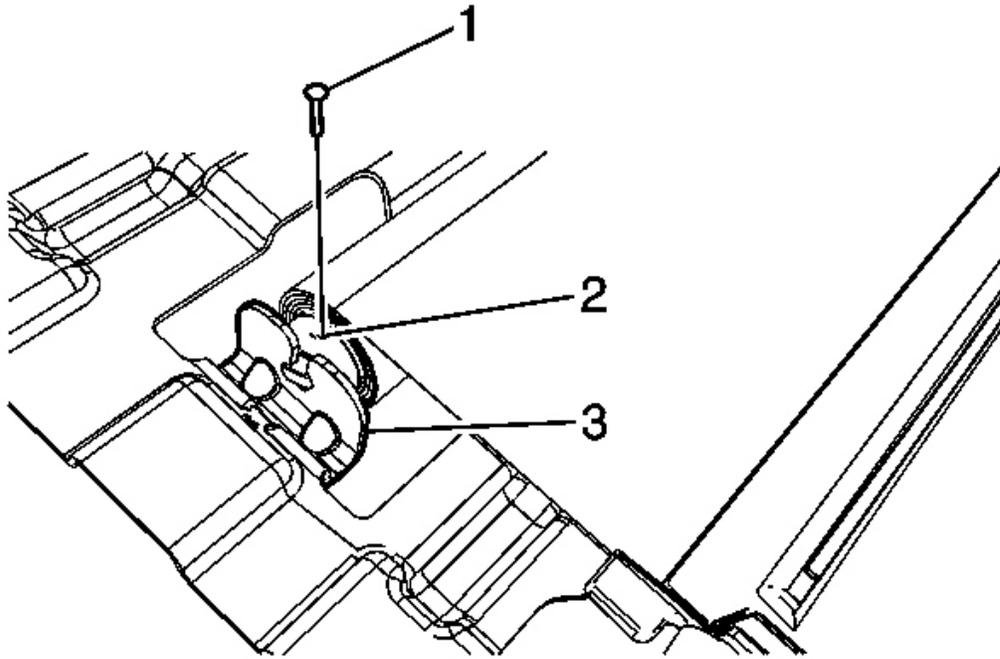


Fig. 25: Identifying Suitable Tool For Procedure
Courtesy of GENERAL MOTORS CORP.

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

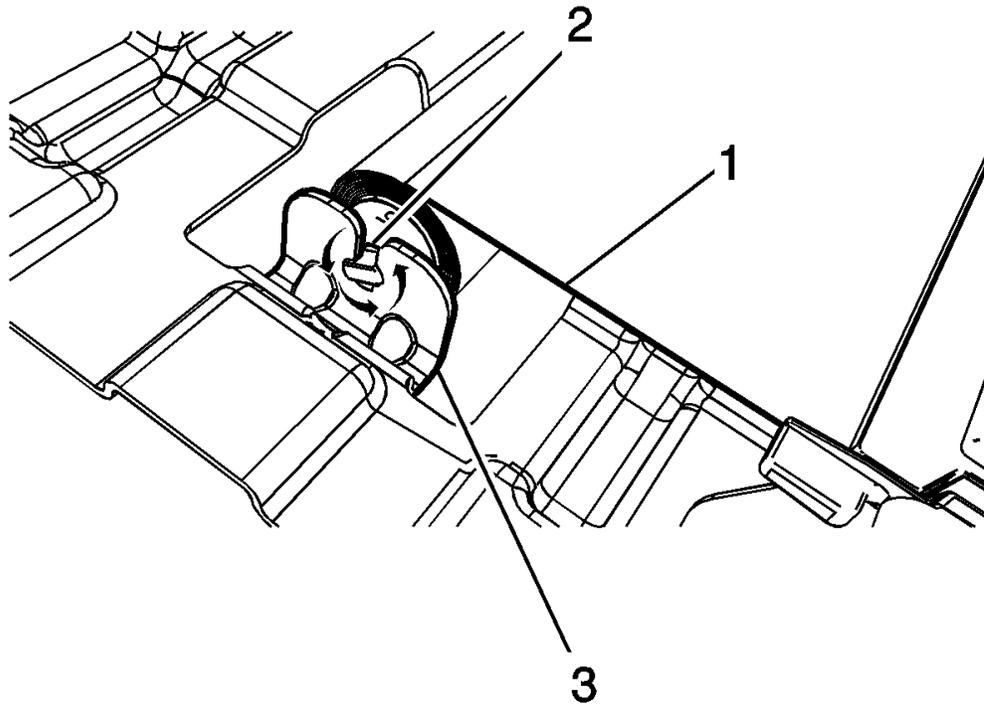


Fig. 26: View Of Turning Sunshade Cam Counterclockwise
Courtesy of GENERAL MOTORS CORP.

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

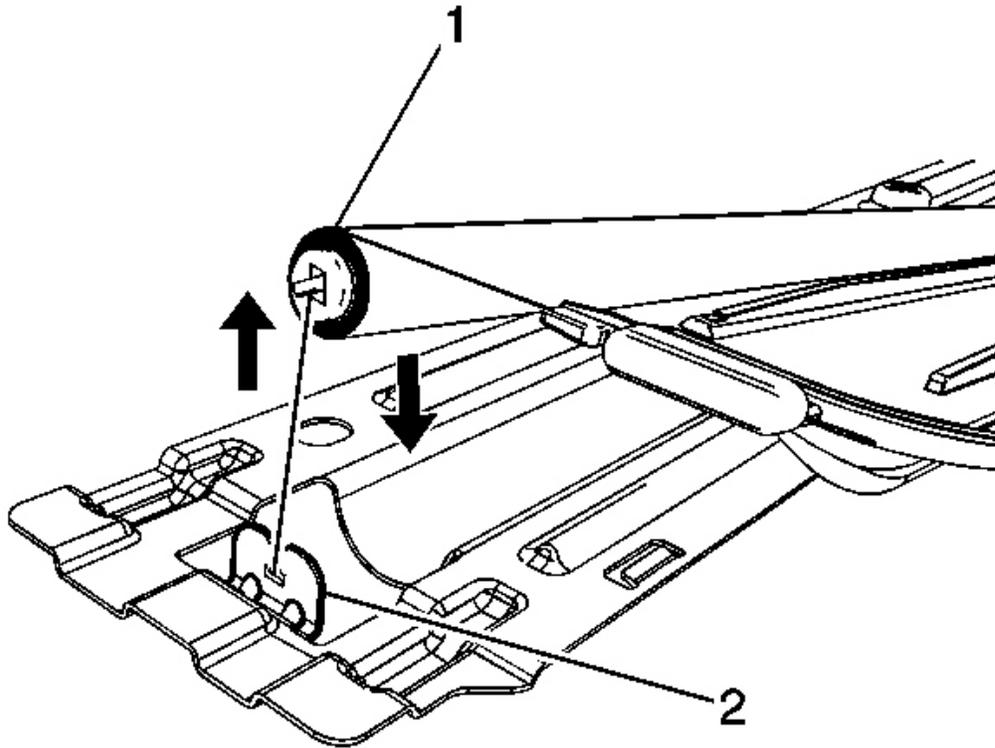


Fig. 27: Identifying Sunshade Bracket Notch
Courtesy of GENERAL MOTORS CORP.

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.

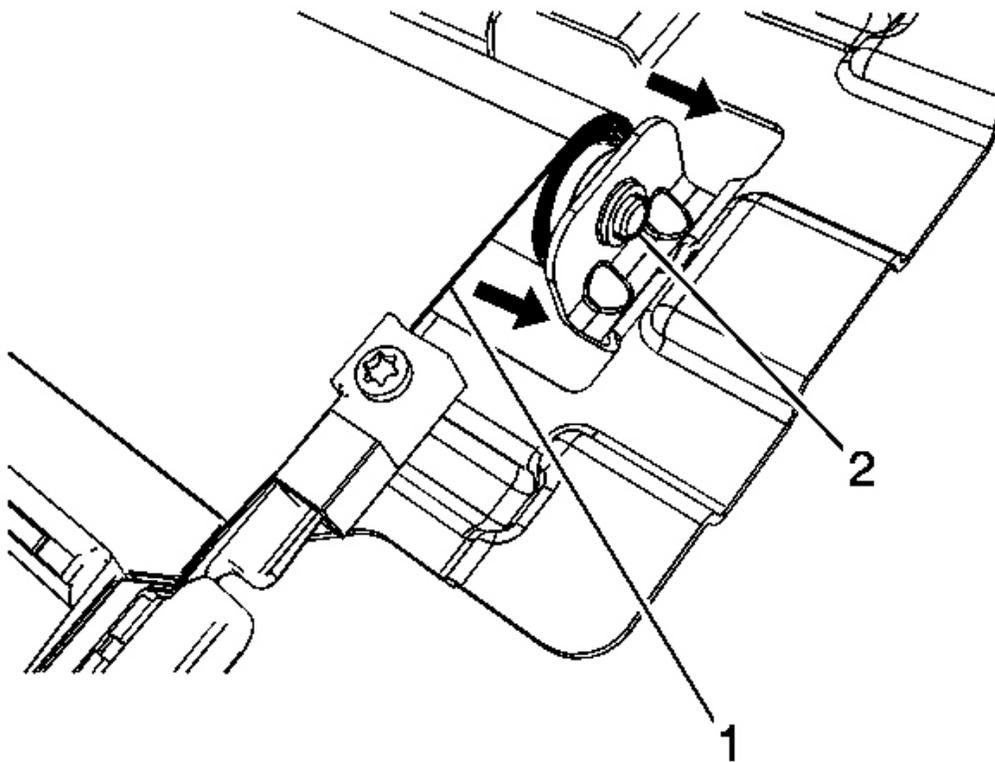


Fig. 28: View Of Sunshade End & Bracket Notch
Courtesy of GENERAL MOTORS CORP.

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

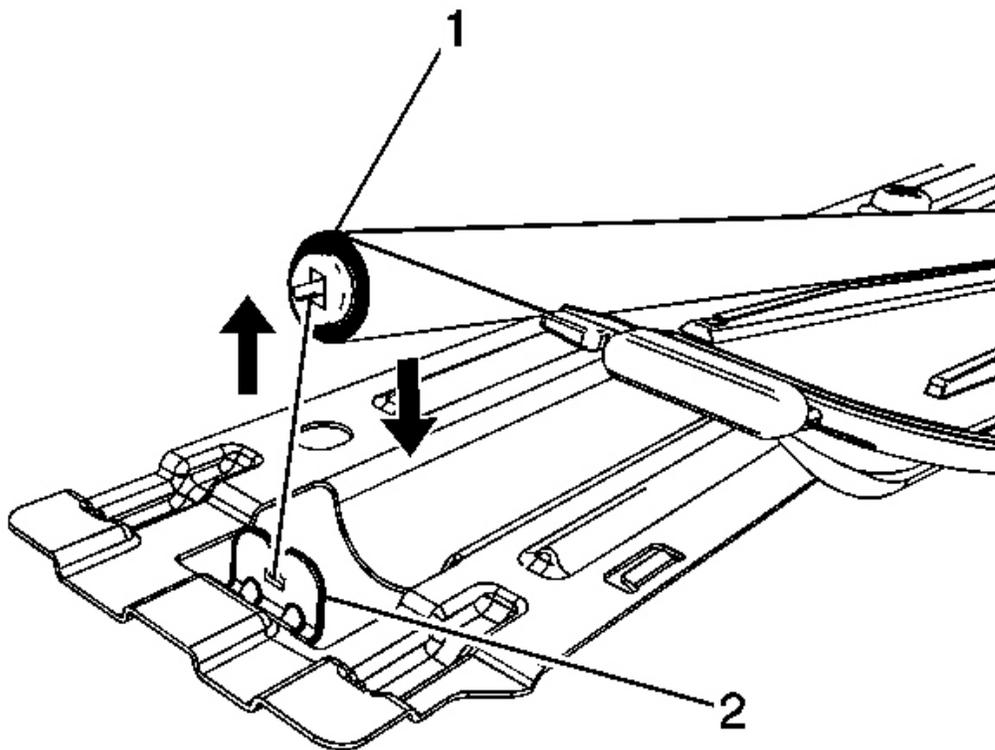


Fig. 29: Identifying Sunshade Bracket Notch
Courtesy of GENERAL MOTORS CORP.

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

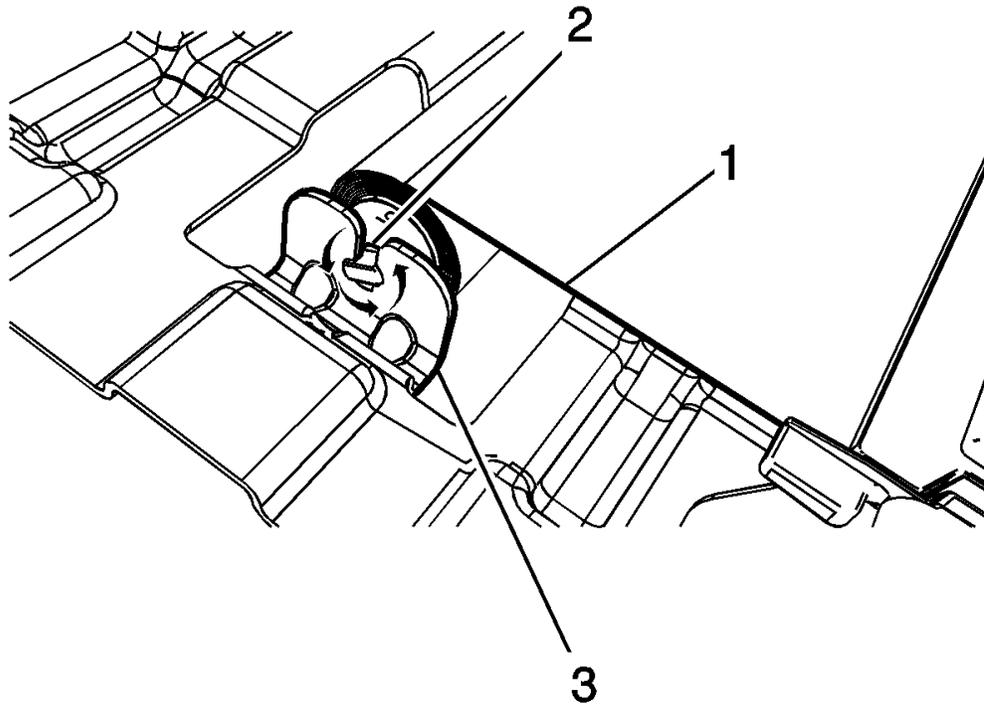


Fig. 30: View Of Turning Sunshade Cam Counterclockwise
Courtesy of GENERAL MOTORS CORP.

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

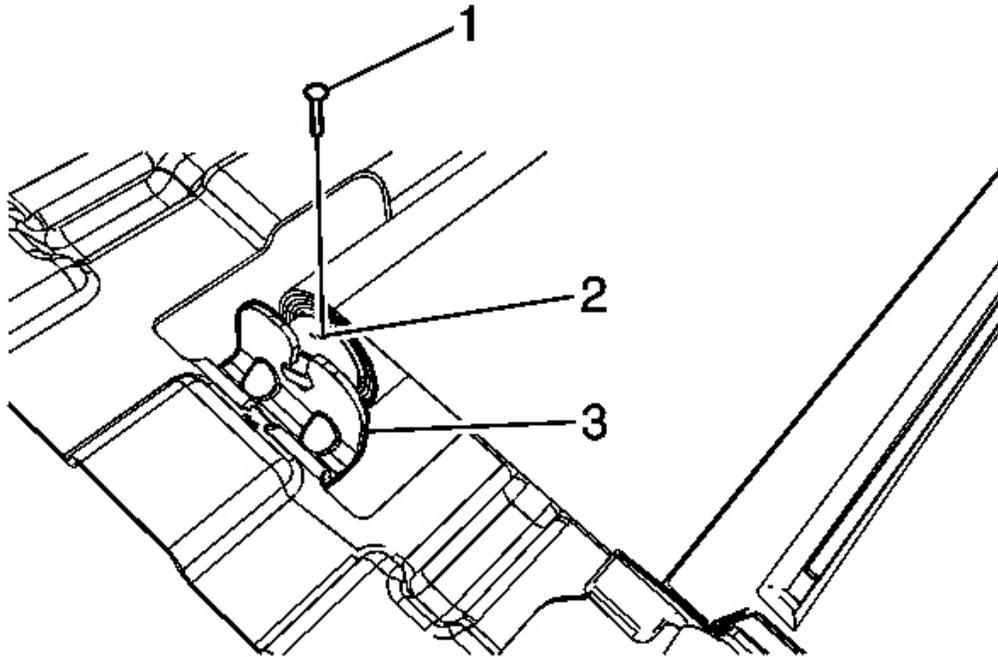


Fig. 31: Identifying Suitable Tool For Procedure
Courtesy of GENERAL MOTORS CORP.

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 TRIM COVER REPLACEMENT

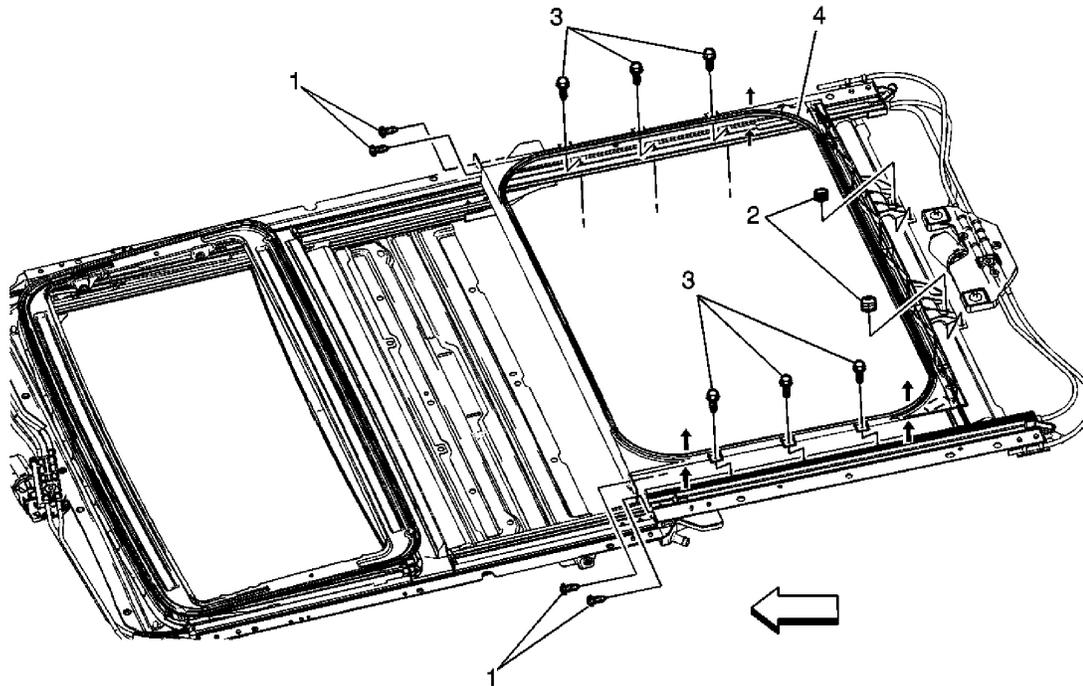


Fig. 32: Identifying Sunroof Sunshade Trim Cover
 Courtesy of GENERAL MOTORS CORP.

Sunroof Sunshade Trim Cover Replacement

Callout	Component Name
Preliminary Procedure	
1. Remove the headliner. Refer to <u>Headlining Trim Panel Replacement</u> . 2. Remove the sunroof module. Refer to <u>Sunroof Module Assembly Replacement</u>	
1	Sunroof Sunshade Trim Cover Screws (Qty: 4) NOTE: Refer to <u>Fastener Notice</u> . Tighten: 2 N.m (18 lb in)
2	Sunroof Sunshade Trim Cover

SUNROOF SWITCH REPLACEMENT

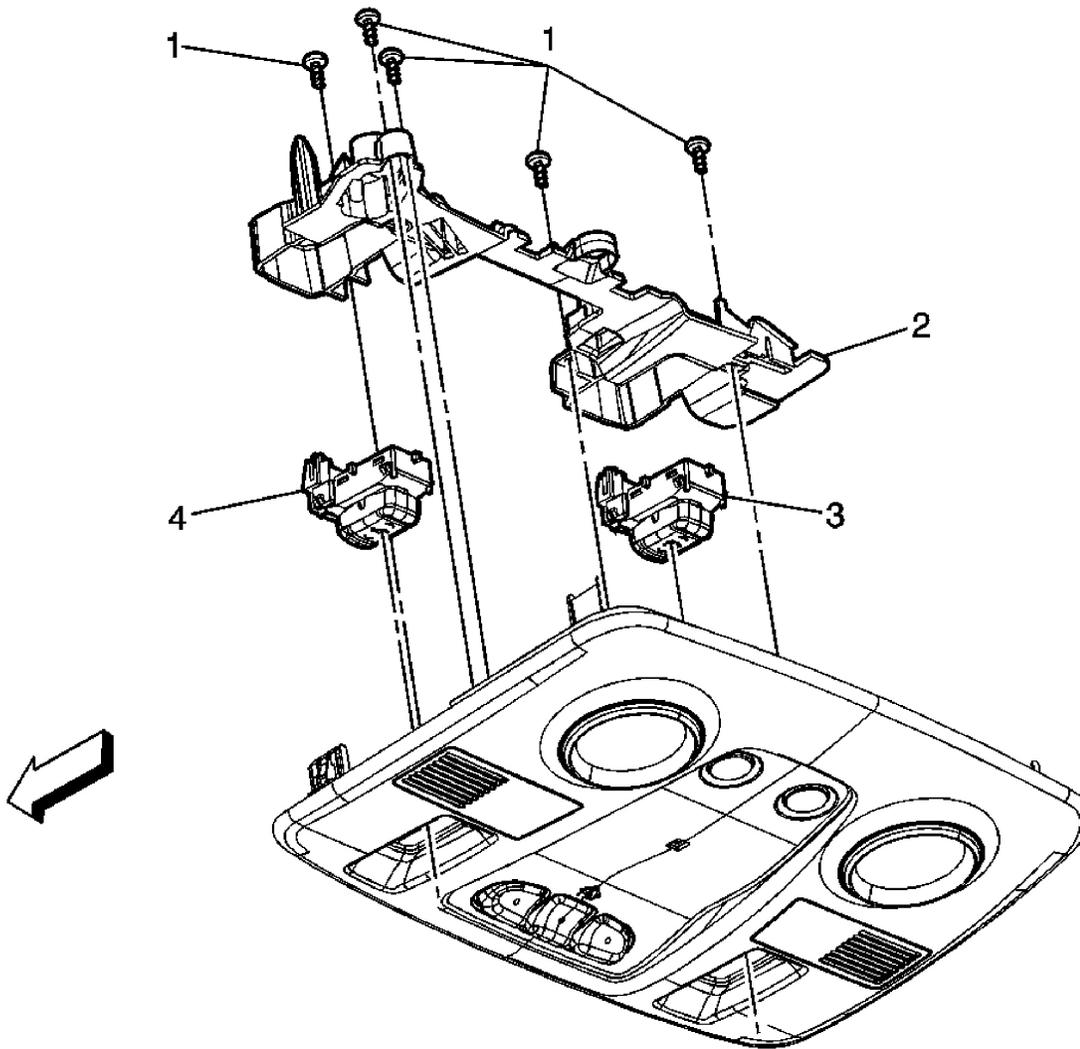


Fig. 33: View Of Sunroof Switch
 Courtesy of GENERAL MOTORS CORP.

Sunroof Switch Replacement

Callout	Component Name
Preliminary Procedures	
1. Remove the roof console assembly. Refer to <u>Roof Console Replacement</u> . 2. Remove the garage door opener. Refer to <u>Garage Door Opener Replacement</u> .	
1	Utility Overhead Console Bracket Screw (Qty: 5) NOTE: Refer to <u>Fastener Notice</u> .

	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**.

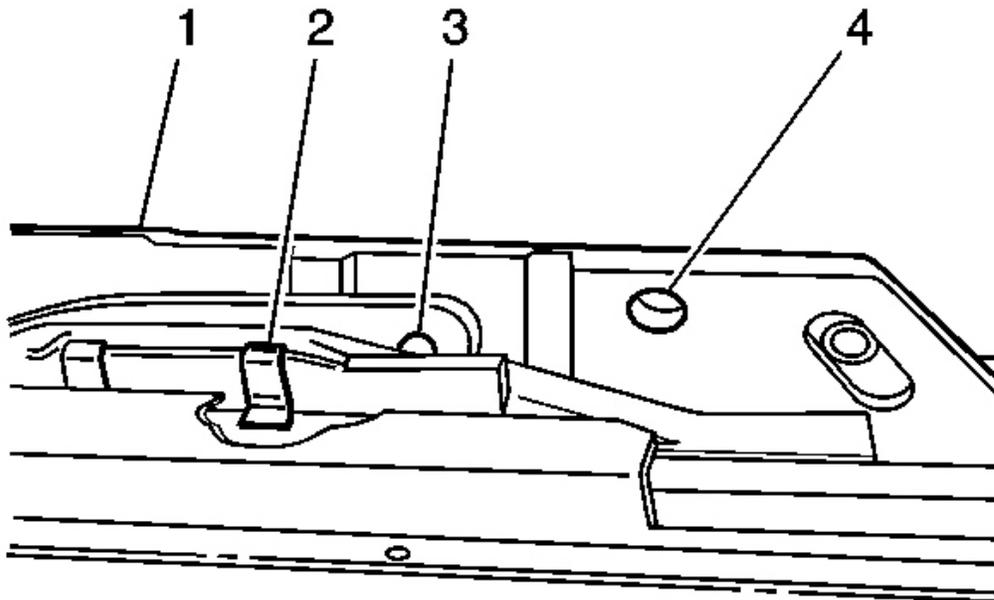


Fig. 34: View Of Cam Assembly, Timing Hole & Lifter Arm
Courtesy of GENERAL MOTORS CORP.

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).

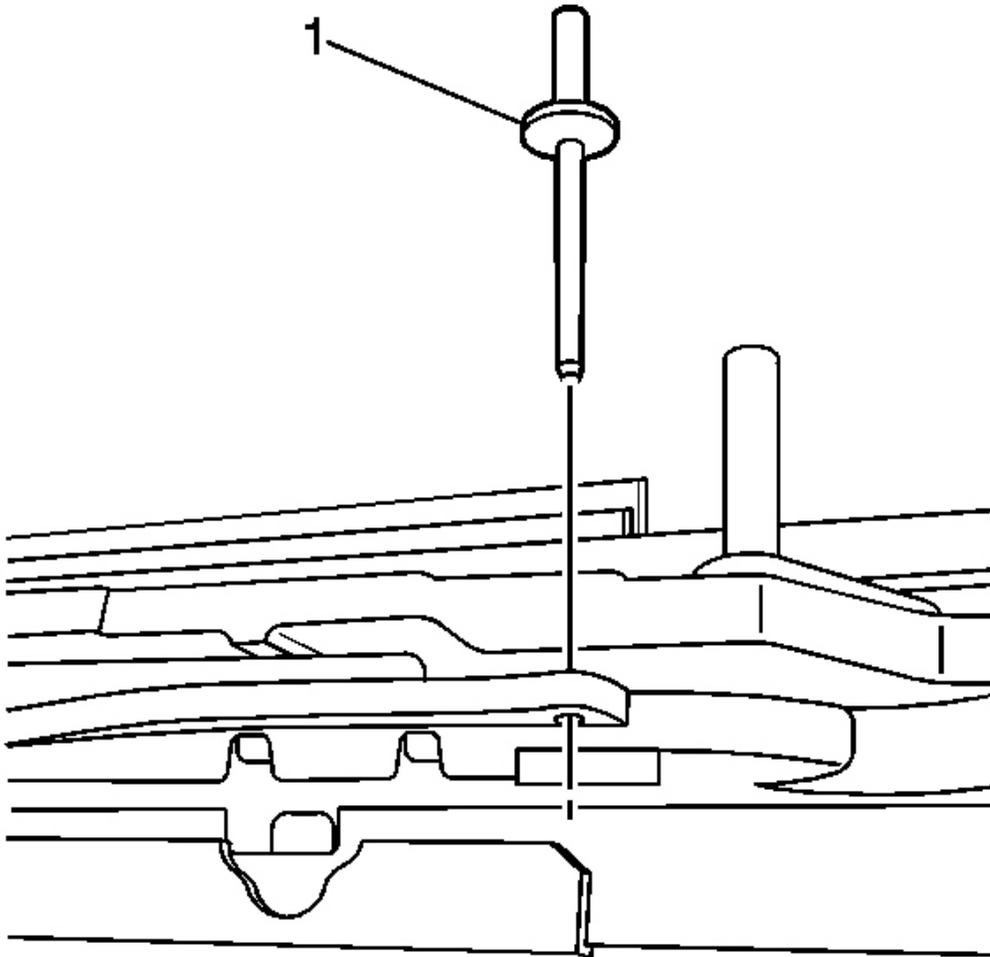


Fig. 35: View Of Pin & Drive Motor
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: 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

NOTE: Refer to Fastener Notice .

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.

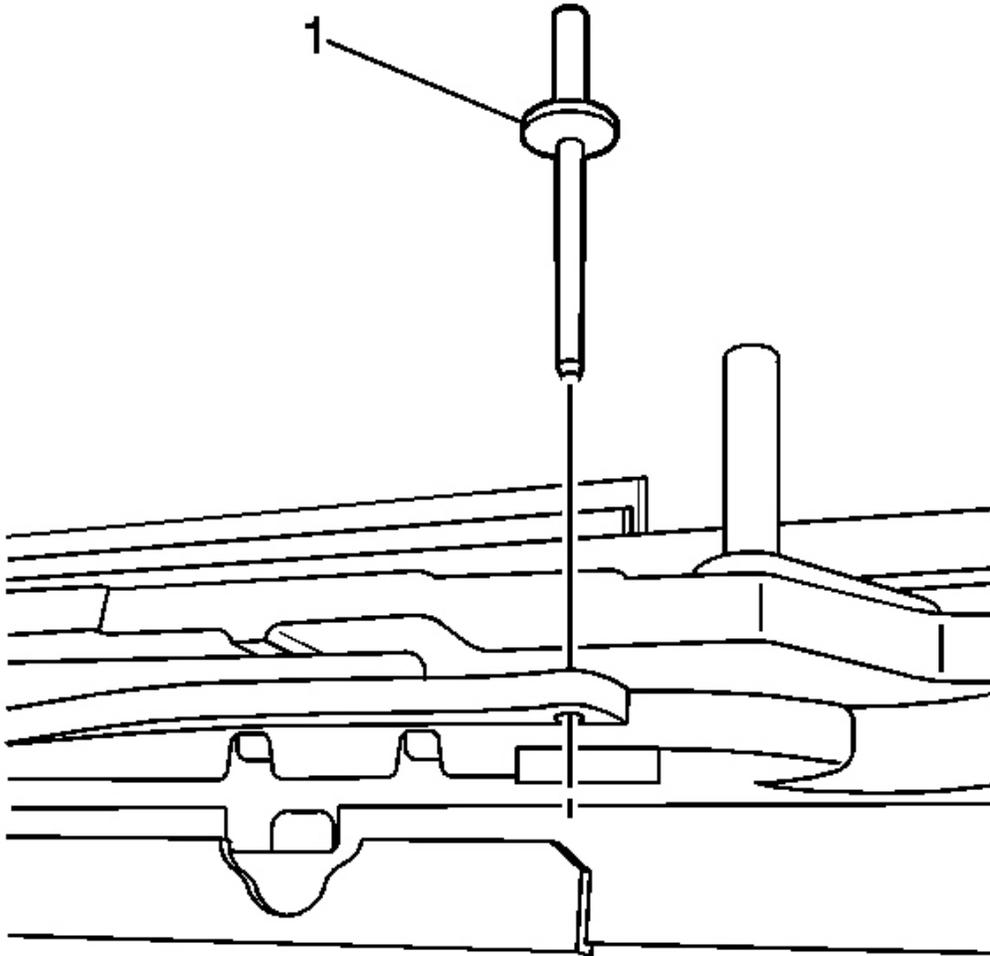


Fig. 36: View Of Pin & Drive Motor
Courtesy of GENERAL MOTORS CORP.

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 (New Motor)**, **Sunroof Motor/Actuator Initialization/Teach Process (New Roller Sunshade)**, **Sunroof Motor/Actuator Initialization/Teach Process (Existing Motor)** or **Sunroof Motor/Actuator Initialization/Teach Process (Existing Roller Sunshade)**.

7. Verify the operation of the sunroof.

SUNROOF WINDOW WEATHERSTRIP REPLACEMENT

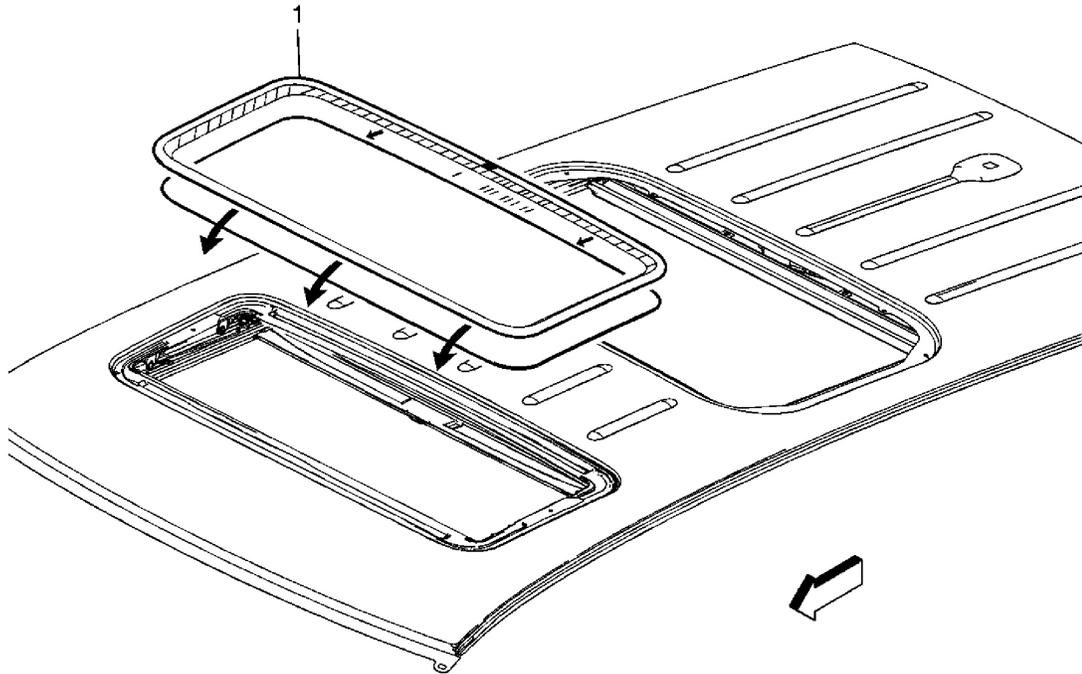


Fig. 37: Identifying Sunroof Window Sealing Strip
 Courtesy of GENERAL MOTORS CORP.

Sunroof Window Weatherstrip Replacement

Callout	Component Name
<p>Preliminary Procedure: Remove the sunroof window. Refer to <u>Sunroof Window Replacement</u>.</p>	
<p>1</p>	<p>Sunroof Window Sealing Strip</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Carefully remove the sunroof window weatherstrip from the perimeter of the sunroof window. 2. 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. 3. Place the weatherstrip seam in the rear center of the sunroof window.

4. Place the weatherstrip around all four corners before working the weatherstrip into the retainer.
5. Carefully install the sunroof window weatherstrip to the perimeter of the sunroof window, ensuring that the weatherstrip is fully seated.
6. 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

Tools Required

- **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

CAUTION: Refer to Cracked Window Caution .

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.

CAUTION: Refer to Defroster Outlet Caution .

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

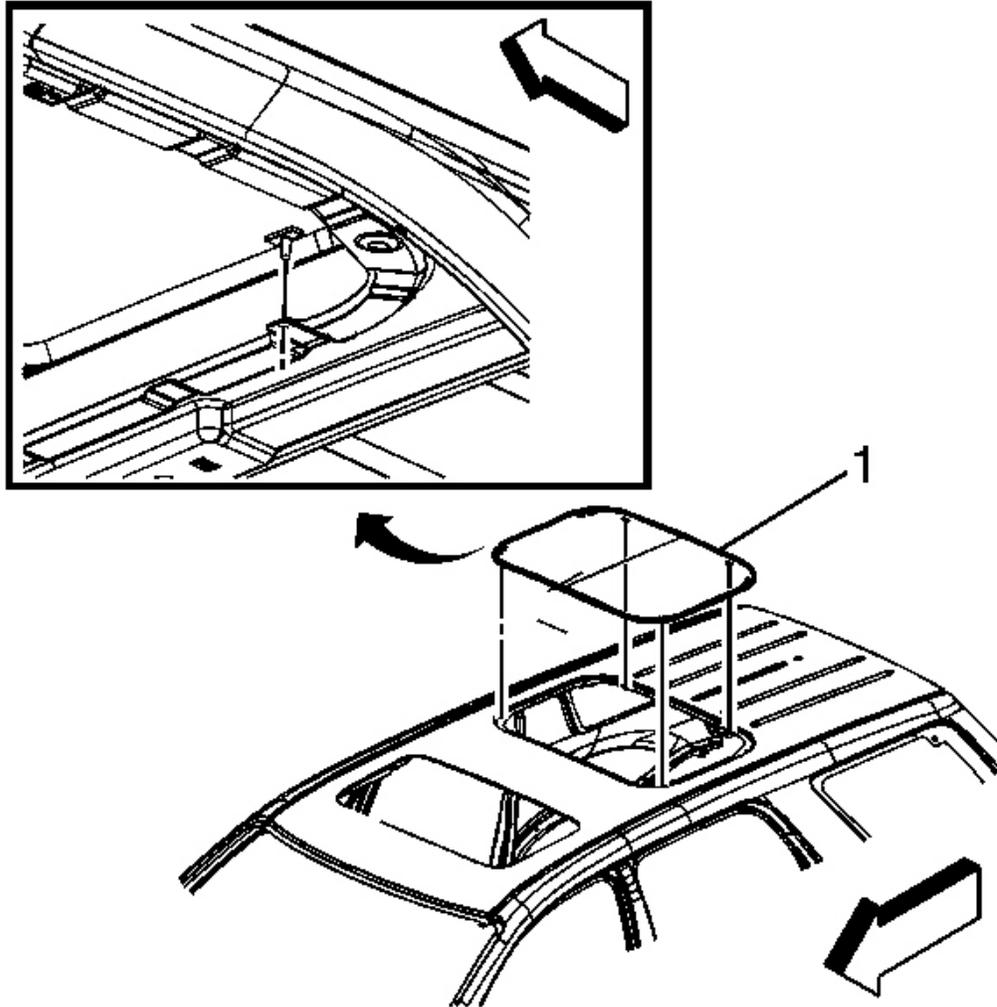


Fig. 38: Identifying Roof Stationary Window
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Glass and Sheet Metal Handling Caution .

IMPORTANT: 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.

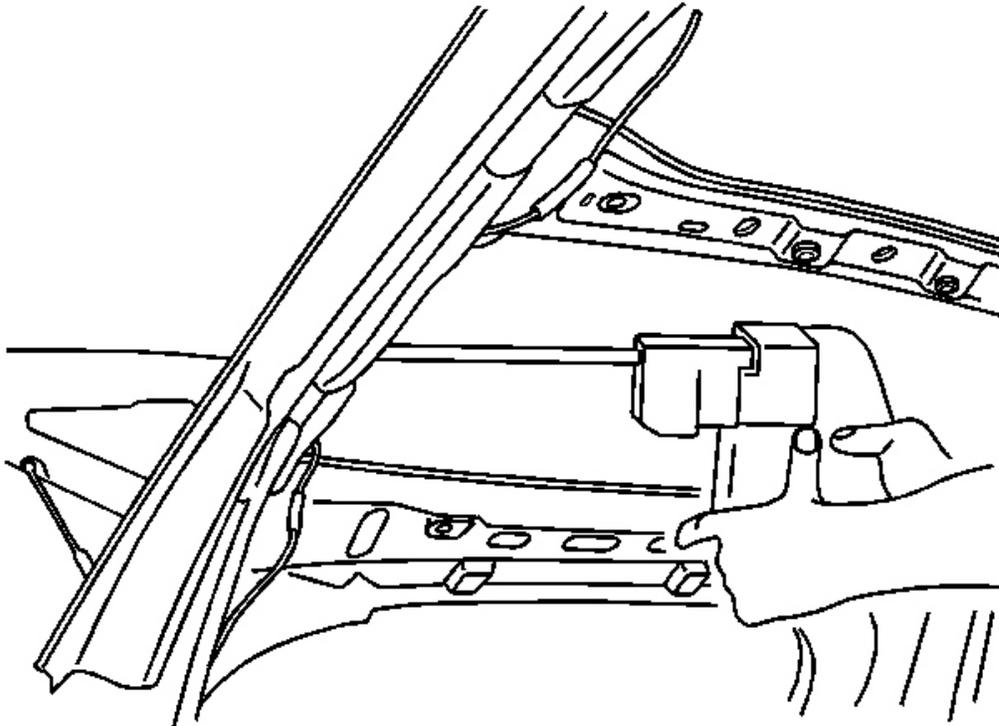


Fig. 39: Illustrating Removal Of Urethane Adhesive From Window
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: 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.

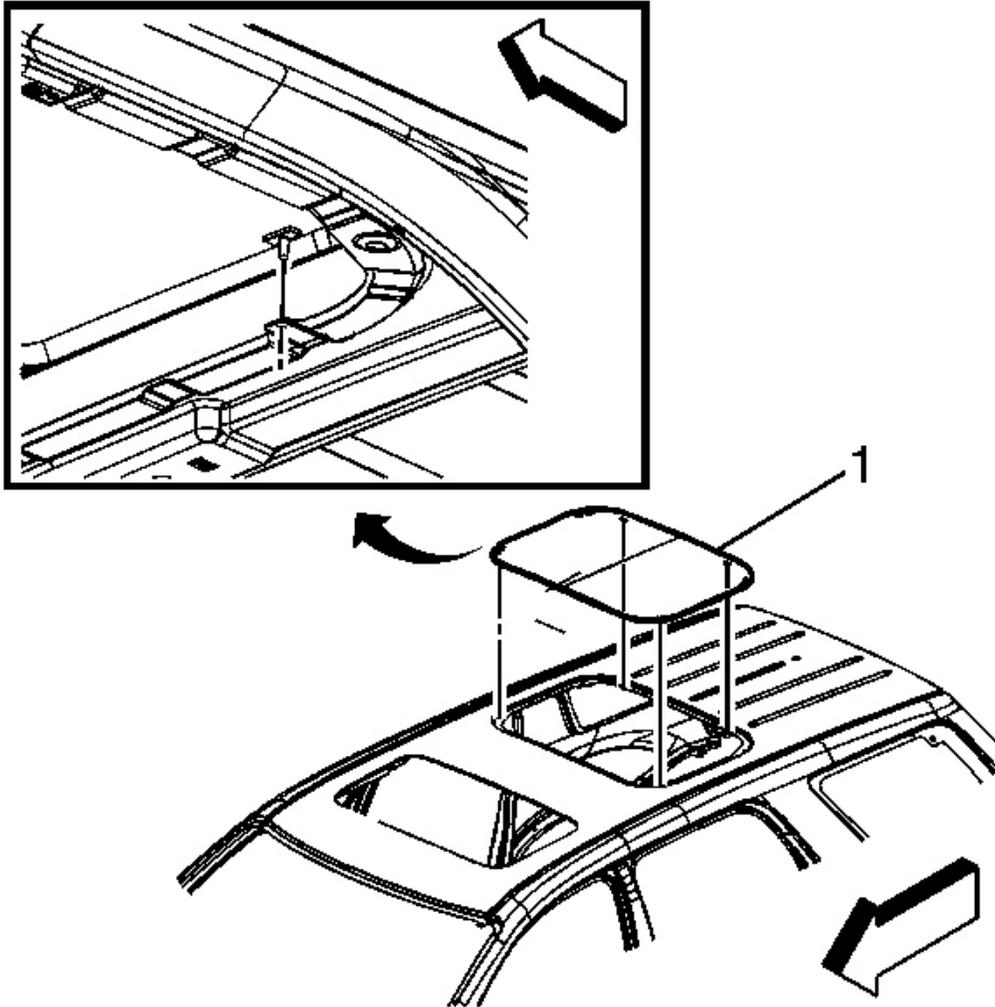


Fig. 40: Identifying Roof Stationary Window
Courtesy of GENERAL MOTORS CORP.

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

IMPORTANT: 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.

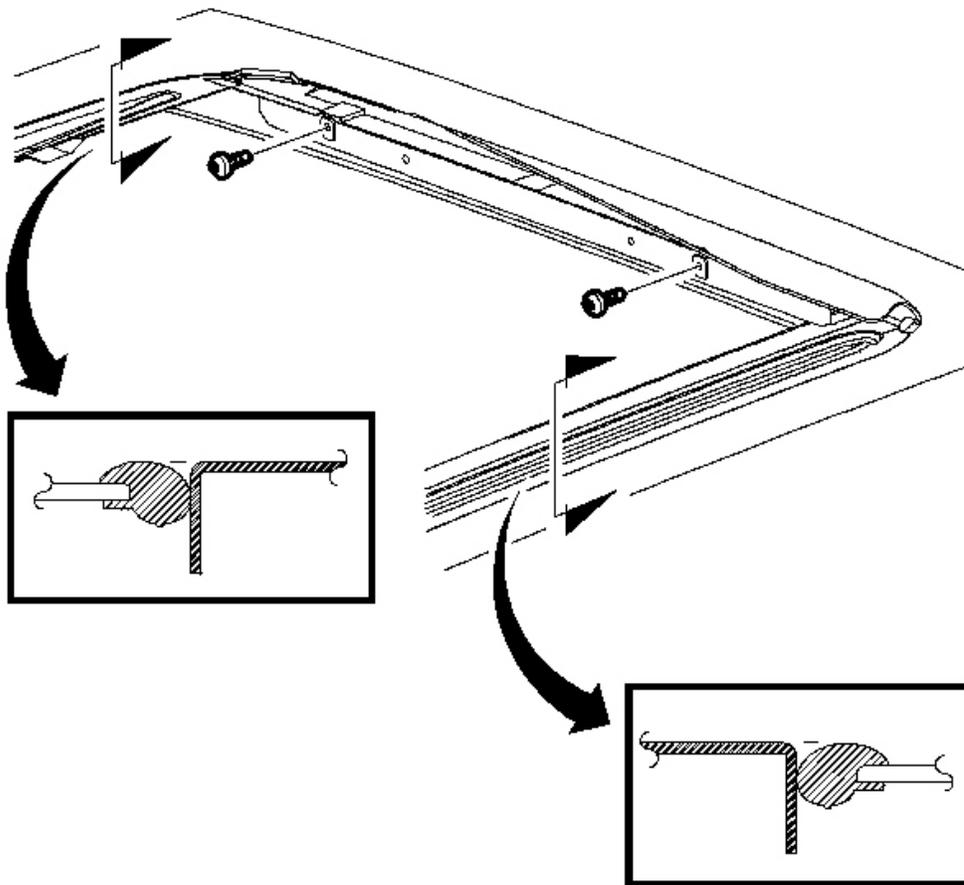


Fig. 41: View Of Sunroof Window & Opening Fit
Courtesy of GENERAL MOTORS CORP.

2. Loosen the adjusting screws.
3. Adjust the corners of the glass panel using the following guidelines:
 - Adjust the front of the sunroof window flush to 1 mm (0.04 in) below the top surface of the roof panel.
 - Adjust the rear of the sunroof window flush to 1 mm (0.04 in) above the top surface of the roof panel.

NOTE: Refer to Fastener Notice .

4. Install the sunroof window adjustment screws.

Tighten: Tighten the sunroof window adjusting screws to 6 N.m (53 lb in).

5. Cycle sunroof window through all positions.
6. Inspect the sunroof window adjustment. Adjust if necessary.

SUNROOF WINDOW REPLACEMENT

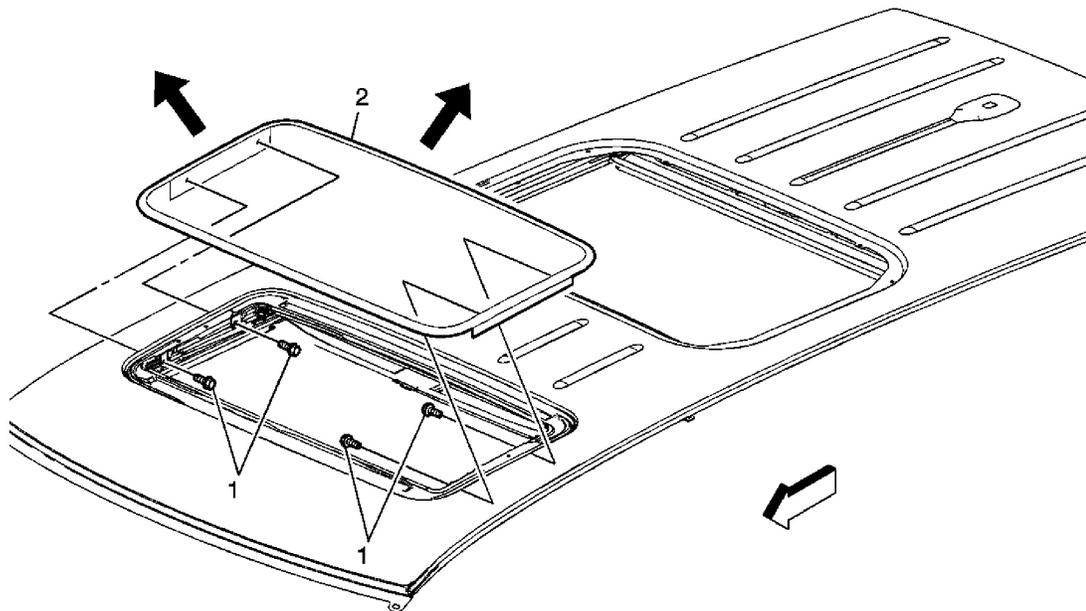


Fig. 42: View Of Sunroof Window
Courtesy of GENERAL MOTORS CORP.

Sunroof Window Replacement

Callout	Component Name
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2007 Saturn Outlook XE

2007 ACCESSORIES & EQUIPMENT Sunroof - Outlook

1	Sunroof Window Screw (Qty: 4) NOTE: Refer to <u>Fastener Notice</u> . Tip: Open the window. Tighten: 6 N.m (53 lb in)
2	Sunroof Window Procedure: Close the sunroof window to the access the screws.

DESCRIPTION AND OPERATION

SUNROOF DESCRIPTION AND OPERATION

Power Sunroof System Components

The Power Sunroof and Sunshade System consists of the following components:

- Sunroof control module and sunshade control module
- Sunroof switch and sunshade switch
- Rail and track assembly upon which the sunroof and sunshade glass rides
- S/ROOF/SUNSHADE Fuse 30 A
- Body control module (BCM)

Power and Grounds

Battery positive voltage is supplied at all times to the sunroof control module and sunshade control module from the 30 A S/ROOF/SUNSHADE Fuse located in the underhood fuse block. Ground is supplied to the sunroof and sunshade module through the body ground circuit G402.

Ground is supplied to the sunroof and sunshade switch through the body ground circuit G402.

Power Sunroof Operation

The Power Sunroof System will operate only with the ignition turned to the RUN or Accessory positions, this allows for retained accessory power (RAP) control of the sunroof and sunshade through the body control module (BCM). With the ignition in the run or accessory positions, the BCM supplies the sunroof and sunshade with ignition voltage which allows sunroof and sunshade

operation. 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 (RAP) Description and Operation** .

Sunroof Switch

The sunroof and sunshade switch assembly contains two rocker type switches that are used to control the following functions:

- Sunroof open/close switch
- Sunshade open/close switch

Sunroof Motor

The sunroof and sunshade module assemblies have bi-directional motors. The motors ground is removed when the sunroof or sunshade reaches the soft stop end of travel position. This is based on the learned position that was performed during the initialization process. The internal hall effect sensors within the sunroof and sunshade control module assemblies create pulses that are counted by the modules until the end of travel position is reached.