

2017 ACCESSORIES & EQUIPMENT

Sunroof - CT6

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE:

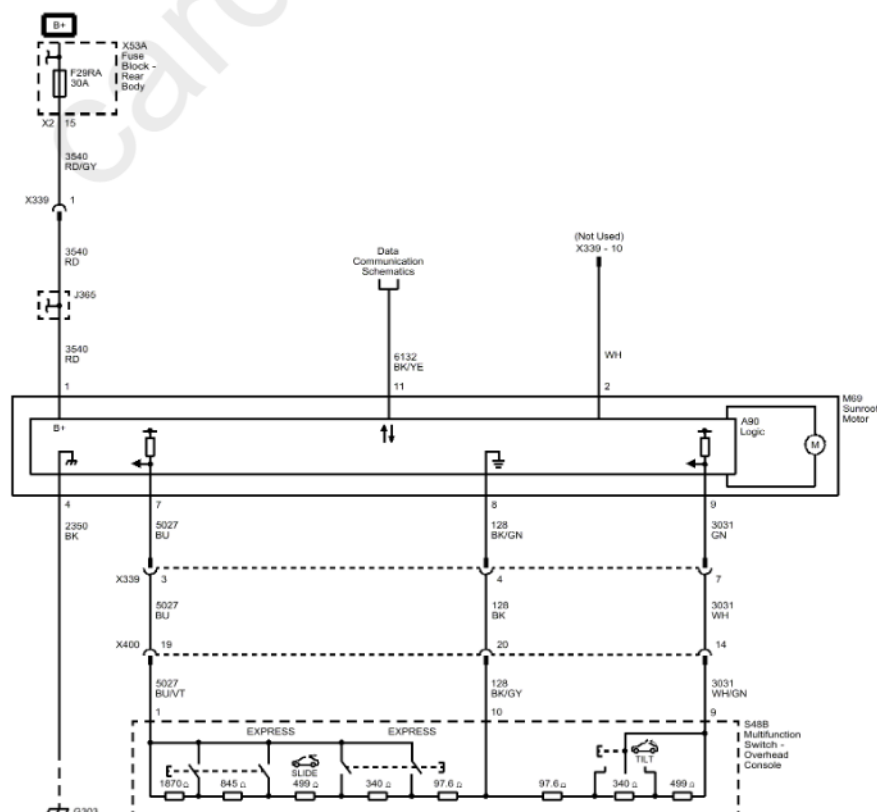
All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Sunroof Actuator Motor Bolt	4 N.m (35 lb in)
Sunroof Housing Bolt	9 N.m (80 lb in)
Sunroof Housing Drain Gutter Bolt	1.5 N.m (13 lb in)
Sunroof Housing Rear Side Bolt	27 N.m (20 lb ft)
Sunroof Sunshade Actuator Bolt	4 N.m (35 lb in)
Sunroof Sunshade Housing Bracket Bolt	4 N.m (35 lb in)
Sunroof Sunshade Housing Screw	2.5 N.m (22 lb in)
Sunroof Window Screw	4 N.m (35 lb in)

SCHEMATIC WIRING DIAGRAMS

SUNROOF WIRING SCHEMATICS

Sunroof (C3U)

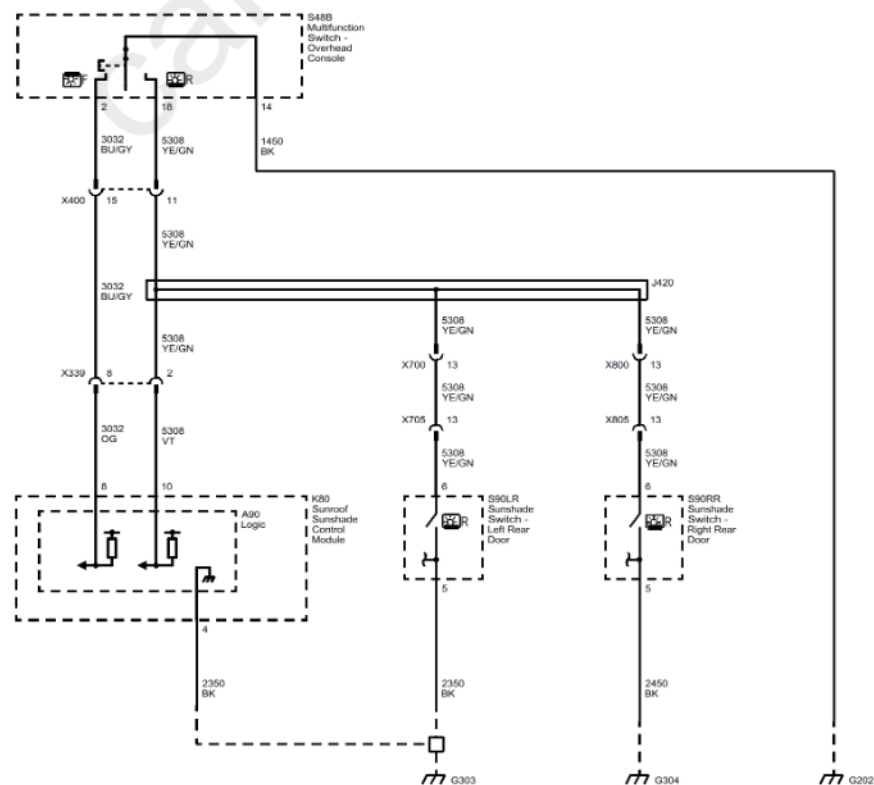


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DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B3664: SUNROOF POSITION SELECT SWITCH HIGH SIGNAL CIRCUIT (C3U)

Diagnostic Instructions

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

DTC Descriptors

DTC B3664

Sunroof Position Select Switch High Signal Circuit

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	B3664 02	B3664 05	B3664 05	-
Low Reference	-	B3664 05, B369C 05	1	-
1. Power Sunroof Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

Ignition ON/Vehicle in Service Mode.

Conditions for Setting the DTC

B3664 02

The sunroof motor has detected and reported via serial data that the sunroof switch signal is shorted to ground.

B3664 05

The sunroof motor has detected and reported via serial data that the sunroof switch signal is open or shorted to voltage.

B3664 59

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Sunroof Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Sunroof Description and Operation (C3U)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information.

Circuit/System Testing

NOTE: Because of the accessibility of the A98 Front Overhead Console Assembly, perform the Component Testing before the Circuit/System Testing.

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S48B Multifunction Switch-Overhead Console. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 14 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K80 Sunroof Sunshade Control Module.
 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 , test or replace the K80 Sunroof Sunshade Control Module.
 - **If less than 10 Ω**
3. Connect the harness connector at the S48B Multifunction Switch-Overhead Console. Disconnect the harness connector at the K80 Sunroof Sunshade Control Module.
4. Ignition ON/Vehicle in Service Mode.
5. Test for less than 1V between the terminals listed below and ground:
 - Signal circuit terminal 8
 - Signal circuit terminal 10
 - **If 1V or greater**
 1. Disconnect the harness connector at the S48B Multifunction Switch-Overhead Console.
 2. Test for less than 1V between the appropriate signal circuit and ground.
 - If 1V or greater, repair the short to voltage on the circuit.
 - If less than 1V, test or replace the S48B Multifunction Switch-Overhead Console.
 - **If less than 1V**
6. Ignition OFF/Vehicle OFF.

7. Test for infinite resistance between the terminals listed below and ground:

- Signal circuit terminal 8
- Signal circuit terminal 10
- **If less than infinite resistance**

1. Disconnect the harness connector at the S48B Multifunction Switch-Overhead Console.
2. Test for less than infinite resistance between the appropriate signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, test or replace the S48B Multifunction Switch-Overhead Console.

- **If infinite resistance**

8. Disconnect the harness connector at the S48B Multifunction Switch-Overhead Console.

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

- S48B Multifunction Switch-Overhead Console terminal 2 and K80 Sunroof Sunshade Control Module terminal 8
- S48B Multifunction Switch-Overhead Console terminal 18 and K80 Sunroof Sunshade Control Module terminal 10
- **If greater than 5 Ω**

Repair the open/high resistance in the appropriate circuit.

- **If less than 5 Ω**

10. Test or replace the K80 Sunroof Sunshade Control Module.

Component Testing

Sunroof Switch Static Test

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the S48B Multifunction Switch-Overhead Console.
2. Test for 3.3-4.0 k Ω between the control terminal 2 and the ground circuit terminal 14.

- **If not between 3.3-4.0 k Ω**

Replace the S48B Multifunction Switch-Overhead Console.

- **If between 3.3-4.0 k Ω**

3. Test for 390-480 Ω between the control terminal 2 and the ground circuit terminal 14 while pressing the open switch while pressing the open switch.

- **If not between 390-480 Ω**

Replace the S48B Multifunction Switch-Overhead Console.

- **If between 390-480 Ω**

4. Test for 88-107 Ω between the control terminal 2 and the ground circuit terminal 14 while pressing the express open switch.

- **If not between 88-107 Ω**

Replace the S48B Multifunction Switch-Overhead Console.

- **If between 88-107 Ω**

5. Test for 1.6-2.0 k Ω between the control terminal 2 and the ground circuit terminal 14 while pressing the close switch.

- **If not between 1.6-2.0 k Ω**

Replace the S48B Multifunction Switch-Overhead Console.

- **If between 1.6-2.0 k Ω**

6. Test for 840-1030 Ω between the control terminal 2 and the ground circuit terminal 14 while pressing the express close switch.

- **If not between 840-1030 Ω**

Replace the S48B Multifunction Switch-Overhead Console.

- **If between 840-1030 Ω**

7. All OK.

Repair Instructions

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

- [Sunroof Sunshade Switch Replacement](#)
- [Sunroof Sunshade Motor Replacement \(Rear\)](#)[Sunroof Sunshade Motor Replacement \(Front\)](#)
- [Sunroof Window Motor Replacement \(Without C3U\)](#)[Sunroof Window Motor Replacement \(With C3U\)](#)

DTC B3664: SUNROOF POSITION SELECT SWITCH HIGH SIGNAL CIRCUIT (CF5)

Diagnostic Instructions

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

DTC Descriptors

DTC B3664

Sunroof Position Select Switch High Signal Circuit

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	B3664 02	B3664 05	B3664 05	-
Low Reference	-	B3664 05, B369C 05	1	-
1. Power Sunroof Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

Ignition ON/Vehicle in Service Mode.

Conditions for Setting the DTC

B3664 02

The sunroof motor has detected and reported via serial data that the sunroof switch signal is shorted to ground.

B3664 05

The sunroof motor has detected and reported via serial data that the sunroof switch signal is open or shorted to voltage.

B3664 59

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Sunroof Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Sunroof Description and Operation (CF5)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

NOTE: **Because of the accessibility of the S72 Sunroof Switch, perform the Component Testing before the Circuit/System Testing.**

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S72 Sunroof Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the low reference circuit terminal 10 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the M69 Sunroof Motor.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , test or replace the M69 Sunroof Motor.
 - **If less than 10 Ω**
3. Connect the harness connector at the S72 Sunroof Switch. Disconnect the harness connector at the M69 Sunroof Motor.
4. Ignition ON/Vehicle in Service Mode.
5. Test for less than 1V between the terminals listed below and ground:

- Signal circuit terminal 3

- Signal circuit terminal 8

- **If 1V or greater**

1. Disconnect the harness connector at the S72 Sunroof Switch.
2. Test for less than 1V between the appropriate signal circuit and ground.
 - If 1V or greater, repair the short to voltage on the circuit.
 - If less than 1V, test or replace the S72 Sunroof Switch.

- **If less than 1V**

6. Ignition OFF/Vehicle OFF.

7. Test for infinite resistance between the terminals listed below and ground:

- Signal circuit terminal 3
- Signal circuit terminal 8

- **If less than infinite resistance**

1. Disconnect the harness connector at the S72 Sunroof Switch.
2. Test for less than infinite resistance between the appropriate signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, test or replace the S72 Sunroof Switch.

- **If infinite resistance**

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

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

- S72 Sunroof Switch terminal 1 and M69 Sunroof Motor terminal 8
- S72 Sunroof Switch terminal 9 and M69 Sunroof Motor terminal 3

- **If greater than 5 Ω**

Repair the open/high resistance in the appropriate circuit.

- **If less than 5 Ω**

10. Test or replace the M69 Sunroof Motor.

Component Testing

Sunroof Switch Static Test

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the S72 Sunroof Switch.
2. Test for 3.3-4.0 k Ω between the control terminal 1 and the low reference terminal 10.

- **If not between 3.3-4.0 k Ω**

Replace the S72 Sunroof Switch.

- **If between 3.3-4.0 k Ω**

3. Test for 390-480 Ω between the control terminal 1 and the low reference terminal 10 while pressing the open switch while pressing the open switch.

- **If not between 390-480 Ω**

Replace the S72 Sunroof Switch.

- **If between 390-480 Ω**

4. Test for 88-107 Ω between the control terminal 1 and the low reference terminal 10 while pressing the express open switch.

- **If not between 88-107 Ω**

Replace the S72 Sunroof Switch.

- **If between 88-107 Ω**

5. Test for 1.6-2.0 k Ω between the control terminal 1 and the low reference terminal 10 while pressing the close switch.

- **If not between 1.6-2.0 k Ω**

Replace the S72 Sunroof Switch.

- **If between 1.6-2.0 k Ω**

6. Test for 840-1030 Ω between the control terminal 1 and the low reference terminal 10 while pressing the express close switch.

- **If not between 840-1030 Ω**

Replace the S72 Sunroof Switch.

- **If between 840-1030 Ω**

7. All OK.

Repair Instructions

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

- [Roof Console Replacement](#)
- [Sunroof Window Motor Replacement \(Without C3U\)](#)[Sunroof Window Motor Replacement \(With C3U\)](#)

DTC B3697: SUNROOF ACTUATOR MALFUNCTION (CF5)

Diagnostic Instructions

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

DTC Descriptors

DTC B3697

Sunroof Actuator Malfunction

For symptom byte information, refer to [Symptom Byte List](#).

Circuit/System Description

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

Conditions for Running the DTC

Ignition ON/Vehicle in Service Mode.

Conditions for Setting the DTC

B3697 00

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

B3697 39

The sunroof motor has detected and reported via serial data that the sunroof actuator has an internal malfunction.

B3697 42

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

B3697 4B

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

Action Taken When the DTC Sets

DTC B3697 is stored in the BCM memory.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Sunroof Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Sunroof Description and Operation (CF5)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC B3697 42 or DTC B3697 4B is not set.
 - **If DTC B3697 42 or DTC B3697 4B is set**
 1. Calibrate the M69 Sunroof Motor. Refer to **Sunroof Motor/Actuator Initialization/Teach Process (CF5)**.
 2. Verify DTC B3697 42 or DTC B3697 4B does not set while operating the sunroof.
 - **If DTC B3697 42 or DTC B3697 4B sets**

Replace the M69 Sunroof Motor.
 - **If DTC B3697 42 or DTC B3697 4B does not set**
3. All OK.
 - **If DTC B3697 42 or DTC B3697 4B is not set**
3. Verify DTC B3697 00 or DTC B3697 39 is not set
 - **If DTC B3697 00 or DTC B3697 39 is set**

Replace the M69 Sunroof Motor.
 - **If DTC B3697 00 or DTC B3697 39 is not set**

4. All OK.

Repair Instructions

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

[Sunroof Window Motor Replacement \(Without C3U\)](#)[Sunroof Window Motor Replacement \(With C3U\)](#)

DTC B369B: SUNROOF SUNSHADE POSITION SELECT SWITCH CIRCUIT (C3U)

Diagnostic Instructions

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

DTC Descriptors

DTC B369B

Sunroof Sunshade Position Select Switch Circuit

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Sunroof Sunshade Position Select Switch Control	B369B 02	B369B 05	B369B 05	-
Sunroof Sunshade Position Select Switch Low Reference	-	1	1	-
1. Power Sunroof/Sunshade Malfunction				

Circuit/System Description

The sunshade control switch is connected directly to the controller and provide detent positions for open, express open, off, close and express close. The control switch completes the circuit between two signals provided by the control module, a reference ground Input and a pull-up voltage provided by the analog to digital switch input. The control switch places a different resistor ladder network in the circuit depending on the function selected. The controllers analog to digital switch input reads the resulting voltage range and determines the function.

Conditions for Running the DTC

Ignition ON/Vehicle in Service Mode.

Conditions for Setting the DTC

B369B 02

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

B369B 05

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

B369B 59

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

Action Taken When the DTC Sets

DTC B369B is stored in the body control module (BCM) memory.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Sunroof Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Sunroof Description and Operation (C3U)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S48B Multifunction Switch-Overhead Console. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 14 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K80 Sunroof Sunshade Control Module.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , test or replace the K80 Sunroof Sunshade Control Module.
 - **If less than 10 Ω**
3. Connect the harness connector at the S48B Multifunction Switch-Overhead Console. Disconnect the harness connector at the K80 Sunroof Sunshade Control Module.
4. Ignition ON/Vehicle in Service Mode.
5. Test for 4.5-5.5 V between the 5 V reference circuit terminals listed below and ground.
 - Signal circuit terminal 8
 - Signal circuit terminal 10
 - **If less than 4.5 V**

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K80 Sunroof Sunshade Control Module.
2. Test for infinite resistance between the 5 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 Ω in the 5 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K80 Sunroof Sunshade Control Module.
- **If greater than 5.5 V**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K80 Sunroof Sunshade Control Module, ignition ON/vehicle in Service Mode.
 2. Test for less than 1 V between the 5 V reference circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K80 Sunroof Sunshade Control Module.
- **If between 4.5-5.5 V**
6. Test or replace the S48B Multifunction Switch-Overhead Console.

Component Testing

Static Test

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the S48B Multifunction Switch-Overhead Console.
2. Test for 3.3-4.0 k Ω between the control terminal 18 and the ground circuit terminal 14.
 - **If not between 3.3-4.0 k Ω**
Replace the S48B Multifunction Switch-Overhead Console.
 - **If between 3.3-4.0 k Ω**
3. Test for 390-480 Ω between the control terminal 18 and the ground circuit terminal 14 while pressing the open switch while pressing the open switch.
 - **If not between 390-480 Ω**
Replace the S48B Multifunction Switch-Overhead Console.
 - **If between 390-480 Ω**
4. Test for 88-107 Ω between the control terminal 18 and the ground circuit terminal 14 while pressing the express open switch.
 - **If not between 88-107 Ω**
Replace the S48B Multifunction Switch-Overhead Console.
 - **If between 88-107 Ω**
5. Test for 1.6-2.0 k Ω between the control terminal 18 and the ground circuit terminal 14 while pressing the close switch.
 - **If not between 1.6-2.0 k Ω**
Replace the S48B Multifunction Switch-Overhead Console.
 - **If between 1.6-2.0 k Ω**
6. Test for 840-1030 Ω between the control terminal 18 and the ground circuit terminal 14 while pressing the express close switch.
 - **If not between 840-1030 Ω**
Replace the S48B Multifunction Switch-Overhead Console.
 - **If between 840-1030 Ω**

Repair Instructions

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

- [Sunroof Sunshade Switch Replacement](#)
- [Sunroof Sunshade Motor Replacement \(Rear\)](#)[Sunroof Sunshade Motor Replacement \(Front\)](#)
- [Control Module References](#) for sunshade motor/actuator replacement, setup and programming.

DTC B369D: SUNROOF SUNSHADE ACTUATOR (C3U)

Diagnostic Instructions

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

DTC Descriptors

DTC B369D 00

Sunroof Sunshade Actuator Malfunction

DTC B369D 39

Sunroof Sunshade Actuator Internal Malfunction

DTC B369D 42

Sunroof Sunshade Actuator Calibration Not Programmed

DTC B369D 4B

Sunroof Sunshade Actuator Calibration Not Learned

Circuit/System Description

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

Conditions for Running the DTC

Ignition ON/Vehicle in Service Mode.

Conditions for Setting the DTC

B369D 00

The sunshade module has detected and reported via serial data that the sunshade actuator has an malfunction.

B369D 39

The sunshade module has detected and reported via serial data that the sunshade actuator has an internal malfunction.

B369D 42

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

B369D 4B

The sunshade module has detected and reported via the LIN-Bus that the sunshade actuator calibration is not learned.

Action Taken When the DTC Sets

DTC B369D is stored in the BCM memory.

Conditions for Clearing the DTC

The BCM no longer detects a malfunction in the sunshade actuator circuit.

Reference Information

Schematic Reference

Sunroof Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Sunroof Description and Operation (C3U)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information.

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC B369D 42 or DTC B369D 4B is not set.
 - **If DTC B369D 42 or DTC B369D 4B is set**
 1. Calibrate the K62 Sunroof Sunshade Motor Module. Refer to Sunroof Motor/Actuator Initialization/Teach Process (C3U).
 2. Verify DTC B369D 42 or DTC B369D 4B does not set while operating the sunroof.
 - If DTC B369D 42 or DTC B369D 4B sets, replace the K62 Sunroof Sunshade Motor Module.
 - If DTC B369D 42 or DTC B369D 4B does not set
3. All OK.
 - **If DTC B369D 42 or DTC B369D 4B is not set**
3. Verify DTC B369D 00 or DTC B369D 39 is not set
 - If DTC B369D 00 or DTC B369D 39 is set, replace the K62 Sunroof Sunshade Motor Module.
 - If DTC B369D 00 or DTC B369D 39 is not set
4. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Sunroof Sunshade Motor Replacement (Rear)Sunroof Sunshade Motor Replacement (Front)

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

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 \(CF5\)](#) and/or [Sunroof Description and Operation \(C3U\)](#).

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 \(CF5\)](#)[Power Sunroof Malfunction \(C3U\)](#)

[Power Sunshade Malfunction \(C3U\)](#)

POWER SUNROOF MALFUNCTION (CF5)

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	-	-
Sunroof Switch Signal	B3664 02	B3664 05	B3664 05, B369C 05	-
Sunroof Tilt Signal	B369C 02	B369C 05	B3664 05, B369C 05	-
Low Reference	-	B3664 05, B369C 05	1	-
Sunroof Motor Ground	-	1	-	-
1. Power Sunroof Malfunction				

Circuit/System Description

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

As the system master, the BCM uses the serial data communication bus to enable or disable sunroof operation, communicate vehicle information to each controller and request sunroof movement. The

sunroof controller provide system status and diagnostic information to the BCM for diagnostic reporting and operational purposes. The control switch places a different resistor ladder network in the circuit depending on the function selected. The controllers analog to digital switch input reads the resulting voltage range and determines the function.

Reference Information

Schematic Reference

Sunroof Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Sunroof Description and Operation (CF5)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Perform the sunroof motor initialization procedure. Refer to **Sunroof Motor/Actuator Initialization/Teach Process (CF5)**.
2. Ignition ON/Vehicle in Service Mode.
3. 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**
4. 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**
5. 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**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the M69 Sunroof Motor.

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 $10\ \Omega$**

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**

1. Ignition OFF/Vehicle OFF.

2. Test for less than $2\ \Omega$ in the B+ circuit end to end.

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

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

1. Ignition OFF/Vehicle OFF.

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

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the M69 Sunroof Motor.

- **If the test lamp illuminates**

4. Ignition ON/Vehicle in Service Mode.

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

- Terminal 3 - M69 Sunroof Motor
- Terminal 4- M69 Sunroof Motor
- Terminal 8 - M69 Sunroof Motor
- **If 1 V or greater**

Repair the short to voltage on the signal circuit.

- **If less than 1 V**

6. Ignition OFF/Vehicle OFF.

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

- Terminal 3 - M69 Sunroof Motor
- Terminal 4 - M69 Sunroof Motor
- Terminal 8 - M69 Sunroof Motor
- **If less than infinite resistance**

Repair the short to ground on the signal circuit

- **If infinite resistance**

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

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

- S72 Sunroof Switch terminal 9 and M69 Sunroof Motor terminal 3
- S72 Sunroof Switch terminal 10 and M69 Sunroof Motor terminal 4
- S72 Sunroof Switch terminal 1 and M69 Sunroof Motor terminal 8
- **If greater than $5\ \Omega$**

Repair the open/high resistance in the circuit.

- **If less than $5\ \Omega$**

10. Test or replace the M69 Sunroof Motor.

Component Testing

Sunroof Switch Static Test

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the S72 Sunroof Switch.

2. Test for 3.3-4.0 k Ω between the control terminal 1 and the low reference terminal 10.

- **If not between 3.3-4.0 kΩ**

Replace the S72 Sunroof Switch.

- **If between 3.3-4.0 kΩ**

3. Test for 390-480 Ω between the control terminal 1 and the low reference terminal 10 while pressing the open switch while pressing the open switch.

- **If not between 390-480 Ω**

Replace the S72 Sunroof Switch.

- **If between 390-480 Ω**

4. Test for 88-107 Ω between the control terminal 1 and the low reference terminal 10 while pressing the express open switch.

- **If not between 88-107 Ω**

Replace the S72 Sunroof Switch.

- **If between 88-107 Ω**

5. Test for 1.6-2.0 kΩ between the control terminal 1 and the low reference terminal 10 while pressing the close switch.

- **If not between 1.6-2.0 kΩ**

Replace the S72 Sunroof Switch.

- **If between 1.6-2.0 kΩ**

6. Test for 840-1030 Ω between the control terminal 1 and the low reference terminal 10 while pressing the express close switch.

- **If not between 840-1030 Ω**

Replace the S72 Sunroof Switch.

- **If between 840-1030 Ω**

7. Test for 840-1030Ω between the control terminal 9 and the low reference terminal 10.

- **If not between 840-1030 Ω**

Replace the S72 Sunroof Switch.

- **If between 840-1030 Ω**

8. Test for 88-107 Ω between the control terminal 9 and the low reference terminal 10 while pressing the open switch.

- **If not between 88-107 Ω**

Replace the S72 Sunroof Switch.

- **If between 88-107 Ω**

9. Test for 390-480 Ω between the control terminal 9 and the ground terminal 10 while pressing the close switch.

- **If not between 390-480 Ω**

Replace the S72 Sunroof Switch.

- **If between 390-480 Ω**

10. All OK

Repair Instructions

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

- [Roof Console Replacement](#)

- [Sunroof Window Motor Replacement \(Without C3U\)](#)[Sunroof Window Motor Replacement \(With C3U\)](#)

POWER SUNROOF MALFUNCTION (C3U)

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	-	-
Sunroof Switch Signal	B3664 02	B3664 05	B3664 05, B369C 05	-
Sunroof Tilt Signal	B369C 02	B369C 05	B3664 05, B369C 05	-
Low Reference	-	B3664 05, B369C 05	1	-
Sunroof Motor Ground	-	1	-	-
1. Power Sunroof Malfunction				

Circuit/System Description

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

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

Reference Information

Schematic Reference

[Sunroof Schematics](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[Sunroof Description and Operation \(C3U\)](#)

Electrical Information Reference

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

Scan Tool Reference

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

1. Perform the sunroof motor initialization procedure. Refer to **Sunroof Motor/Actuator Initialization/Teach Process (C3U)**.
2. Ignition ON/Vehicle in Service Mode.
3. 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**
4. 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**
5. 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 K80 Sunroof Sunshade Control Module. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K80 Sunroof Sunshade Control Module.
 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 1 and ground.
 - **If test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF/Vehicle OFF.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF/Vehicle OFF.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K80 Sunroof Sunshade Control Module.
 - **If the test lamp illuminates**
4. Ignition ON/Vehicle in Service Mode.
5. Test for less than 1 V between the signal circuit terminals listed below and ground:
 - Terminal 8 - K80 Sunroof Sunshade Control Module
 - Terminal 10 - K80 Sunroof Sunshade Control Module
 - **If 1 V or greater**
Repair the short to voltage on the signal circuit.

- **If less than 1 V**

6. Ignition OFF/Vehicle OFF.

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

- Terminal 8 - K80 Sunroof Sunshade Control Module
- Terminal 10 - K80 Sunroof Sunshade Control Module
- **If less than infinite resistance**

Repair the short to ground on the signal circuit

- **If infinite resistance**

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

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

- S48B Multifunction Switch-Overhead Console terminal 2 and K80 Sunroof Sunshade Control Module terminal 8
- S48B Multifunction Switch-Overhead Console terminal 18 and K80 Sunroof Sunshade Control Module terminal 10
- **If greater than 5 Ω**

Repair the open/high resistance in the circuit.

- **If less than 5 Ω**

10. Test or replace the K80 Sunroof Sunshade Control Module.

Component Testing

Sunroof Switch Static Test

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the S48B Multifunction Switch-Overhead Console.

2. Test for 3.3-4.0 k Ω between the control terminal 2 and the ground circuit terminal 14.

- **If not between 3.3-4.0 k Ω**

Replace the S48B Multifunction Switch-Overhead Console.

- **If between 3.3-4.0 k Ω**

3. Test for 390-480 Ω between the control terminal 2 and the ground circuit terminal 14 while pressing the open switch while pressing the open switch.

- **If not between 390-480 Ω**

S48B Multifunction Switch-Overhead Console

- **If between 390-480 Ω**

4. Test for 88-107 Ω between the control terminal 2 and the ground circuit terminal 14 while pressing the express open switch.

- **If not between 88-107 Ω**

S48B Multifunction Switch-Overhead Console

- **If between 88-107 Ω**

5. Test for 1.6-2.0 k Ω between the control terminal 2 and the ground circuit terminal 14 while pressing the close switch.

- **If not between 1.6-2.0 k Ω**

S48B Multifunction Switch-Overhead Console

- **If between 1.6-2.0 k Ω**

6. Test for 840-1030 Ω between the control terminal 2 and the ground circuit terminal 14 while pressing the express close switch.

- **If not between 840-1030 Ω**

S48B Multifunction Switch-Overhead Console

- **If between 840-1030 Ω**

7. Test for 840-1030 Ω between the control terminal 18 and the ground circuit terminal 14.

- **If not between 840-1030 Ω**

S48B Multifunction Switch-Overhead Console

- **If between 840-1030 Ω**

8. Test for 88-107 Ω between the control terminal 18 and the ground circuit terminal 14 while pressing the open switch.

- **If not between 88-107 Ω**

S48B Multifunction Switch-Overhead Console

- **If between 88-107 Ω**

9. Test for 390-480 Ω between the control terminal 18 and the ground circuit terminal 14 while pressing the close switch.

- **If not between 390-480 Ω**

S48B Multifunction Switch-Overhead Console

- **If between 390-480 Ω**

10. All OK

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Sunroof Sunshade Switch Replacement**
- **Sunroof Window Motor Replacement (Without C3U)****Sunroof Window Motor Replacement (With C3U)**

POWER SUNSHADE MALFUNCTION (C3U)

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, 2	-	-
Serial Data	1, 2	1, 2	1, 2	-
Front Sunshade Switch Close Signal	B369B 02	B369B 05	B369B 05	-
Front Sunshade Switch Open Signal	B369B 02	B369B 05	B369B 05	-
Right Rear Sunshade Switch Signal	6	3, 6	6	-
Left Rear Sunshade Switch Signal	5	4, 6	5	-
Multifunction Switch Overhead Console Ground	-	3, 4, 5, 6	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Sunroof Sunshade Control Module Ground	-	1	-	-
Left Rear Sunshade Switch Ground	-	5	-	-
Right Rear Sunshade Switch Ground	-	6	-	-
1. Front Sunshade Power Malfunction 2. Rear Sunshade Power Malfunction 3. Rear Sunshade Inoperative From Overhead Console Sunshade Switch 4. Front Sunshade Inoperative From Overhead Console Sunshade Switch 5. Rear Sunshade Inoperative From Left Rear Sunshade Switch 6. Rear Sunshade Inoperative From Right Rear Sunshade Switch				

Circuit/System Description

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

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

The rear sunshade control module contains the logic for extending or retracting the sunshade based on inputs received from the sunshade switch. Both control switches are a momentary type, one is located in the overhead console, the other is located in the Rear Audio Control Module. The module activates the sunshade motor based on the inputs received from either switch. When the ignition switch is in the ON position, voltage is applied to the rear sunshade control module. The rear sunshade control module controls the rear sunshade motor direction by changing the polarity of the applied voltage. If the ignition switch is turned to the OFF position while the sunshade is moving, the module enters a "Standby" mode and the shade will complete its cycle. The module will remain in the "Standby" mode and the shade will remain in the position it was in when movement ceased, until the module receives another switch activation input. Movement will then resume, but in the opposite direction from the last activation.

The rear sunshade control module also monitors the voltage level in the backup lamp control circuit, if the module detects voltage in the backup lamp circuit while the sunshade is extended, it will command the sunshade motor to retract the sunshade to provide the operator with an unobstructed view through the rear and will automatically extend when the voltage in the backup lamps drops to 0 volts.

Reference Information

Schematic Reference

Sunroof Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Sunroof Description and Operation (C3U)

Electrical Information Reference

- Circuit Testing

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

Scan Tool Reference

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

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Command the front sunshade to OPEN and CLOSE by pressing the front switch on the S48B Multifunction Switch-Overhead Console.
 - **If the front sunshade does not OPEN or CLOSE**
Refer to Circuit/System Testing - Front Sunshade Malfunction.
 - **If the front sunshade opens and closes to the vent position**
3. Verify the rear sunshade will EXTEND and RETRACT when pressing the rear sunshade switch on the S48B Multifunction Switch-Overhead Console and pressing the S90LR Sunshade Switch-Left Rear Door and S90RR Sunshade Switch-Rear Rear Door.
 - **If the EXTEND and RETRACT function does not work from the rear sunshade switch on the S48B Multifunction Switch-Overhead Console only**
Refer to Circuit/System Testing - Overhead Console Rear Sunshade Switch Inoperative
 - **If the EXTEND and RETRACT function does not work from the Sunshade Switch-Left Rear or Sunshade Switch-Right Rear**
Refer to Circuit/System Testing - Rear Sunshade Switch Inoperative
 - **If the EXTEND and RETRACT function does not work from all switches**
Refer to Circuit/System Testing - Rear Sunshade Inoperative from All Three Switches
 - **If the EXTEND and RETRACT function works from all switches**
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.

Front Sunshade Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S48B Multifunction Switch-Overhead Console. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 14 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**
3. Connect the harness connector at the S48B Multifunction Switch-Overhead Console and disconnect the K80 Sunroof Sunshade Control Module.
4. Test for less than 10 Ω between the ground circuit terminal 4 and ground.
 - **If 10 Ω or greater**

1. Ignition OFF/Vehicle OFF.
2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
- **If less than 10 Ω**
5. Ignition ON/Vehicle in Service Mode.
6. Verify a test lamp illuminates between the B+ circuit terminal 1 and ground.
 - **If test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF/Vehicle OFF.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF/Vehicle OFF.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K80 Sunroof Sunshade Control Module.
 - **If the test lamp illuminates**
7. Connect a test lamp between the signal circuit terminal 8 and B+
8. Verify the test lamp turns ON and OFF when pressing sunshade switch on the S48B Multifunction Switch-Overhead Console
 - **If the test lamp is always OFF**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K80 Sunroof Sunshade Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K80 Sunroof Sunshade Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF/Vehicle OFF, remove the test lamp, disconnect the harness connector at the K80 Sunroof Sunshade Control Module, ignition ON/vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K80 Sunroof Sunshade Control Module.
 - **If test lamp turns ON and OFF**
9. Test or replace the K80 Sunroof Sunshade Control Module.

Overhead Console Rear Sunshade Switch Inoperative

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S48B Multifunction Switch-Overhead Console. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω ; between the ground circuit terminal 14 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**

3. Ignition ON/Vehicle in Service Mode.

4. Test for greater than 10 V between the signal circuit terminal 18 and ground.

- **If 10 V or less**

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K80 Sunroof Sunshade Control Module.

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

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K80 Sunroof Sunshade Control Module.

- **If greater than 10 V**

5. Test or replace the S48B Multifunction Switch-Overhead Console.

Rear Sunshade Switch Inoperative

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate S90LR Sunshade Switch-Left Rear Door or S90RR Sunshade Switch-Rear Rear Door. 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 5 and ground.

- **If 10 Ω or greater**

1. Ignition OFF/Vehicle OFF.

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

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

- **If less than 10 Ω**

3. Ignition ON/Vehicle in Service Mode.

4. Test for greater than 10 V between the signal circuit terminal 6 and ground.

- **If 10 V or less**

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K80 Sunroof Sunshade Control Module.

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

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K80 Sunroof Sunshade Control Module.

- **If greater than 10 V**

5. Test or replace the S90LR Sunshade Switch-Left Rear Door or S90RR Sunshade Switch-Rear Rear Door.

Rear Sunshade Inoperative from All Three Switches

1. Disconnect the harness connector at the S48B Multifunction Switch-Overhead Console and the S90LR Sunshade Switch-Left Rear Door or S90RR Sunshade Switch-Rear Rear Door.

2. Test for greater than 10 V between the signal circuit terminal 18 and ground.

- **If 10 V or less**

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K80 Sunroof Sunshade Control Module.

2. Test for infinite resistance between the signal circuit and ground

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance

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

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K80 Sunroof Sunshade Control Module.

- **If greater than 10 V**

3. Connect the harness connector at the S48B Multifunction Switch-Overhead Console.

4. Test for less than 10 V between the signal circuit terminal 6 and ground.

- If 10 V or greater, test or replace the S48B Multifunction Switch-Overhead Console.

- **If less than 10 V**

5. Connect the harness connector at the S90LR Sunshade Switch-Left Rear Door.

6. Test for greater than 10 V between the signal circuit terminal 6 and ground.

- If less than 10 V, test or replace the S90LR Sunshade Switch-Left Rear Door.

- **If 10 V or greater**

7. Connect the harness connector at the S90RR Sunshade Switch-Rear Rear Door.

8. Test for greater than 10 V between the signal circuit terminal 6 and ground.

- If less than 10 V, test or replace the S90LR Sunshade Switch-Left Rear Door.

- **If 10 V or greater**

9. Test or replace the K80 Sunroof Sunshade Control Module.

Repair Instructions

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

- [Sunroof Sunshade Switch Replacement](#)
- [Sunroof Sunshade Motor Replacement \(Rear\)](#)[Sunroof Sunshade Motor Replacement \(Front\)](#)

REPAIR INSTRUCTIONS

SUNROOF AIR DEFLECTOR REPLACEMENT (WITH C3U)

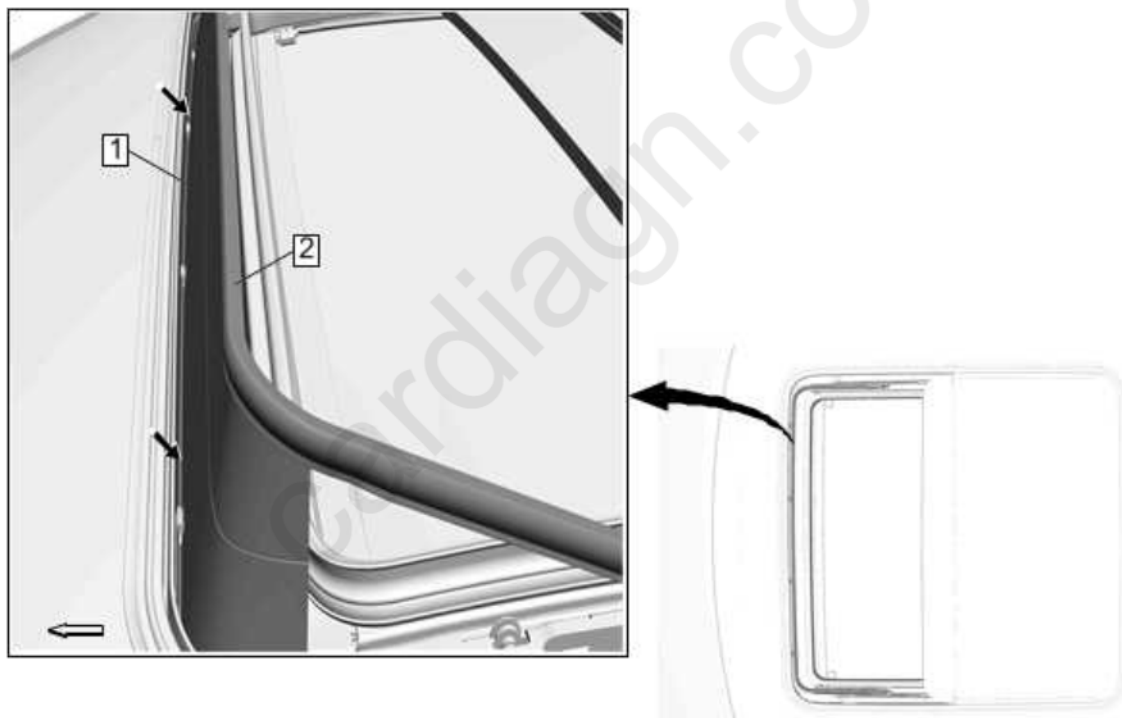


Fig. 4: Sunroof Air Deflector (With C3U)

Courtesy of GENERAL MOTORS COMPANY

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

Callout	Component Name
2	Sunroof Air Deflector Procedure Lift the sunroof air deflector up and back to remove. NOTE: Verify the sunroof window and the sunroof air deflector for proper operation.

SUNROOF AIR DEFLECTOR REPLACEMENT (WITHOUT C3U)

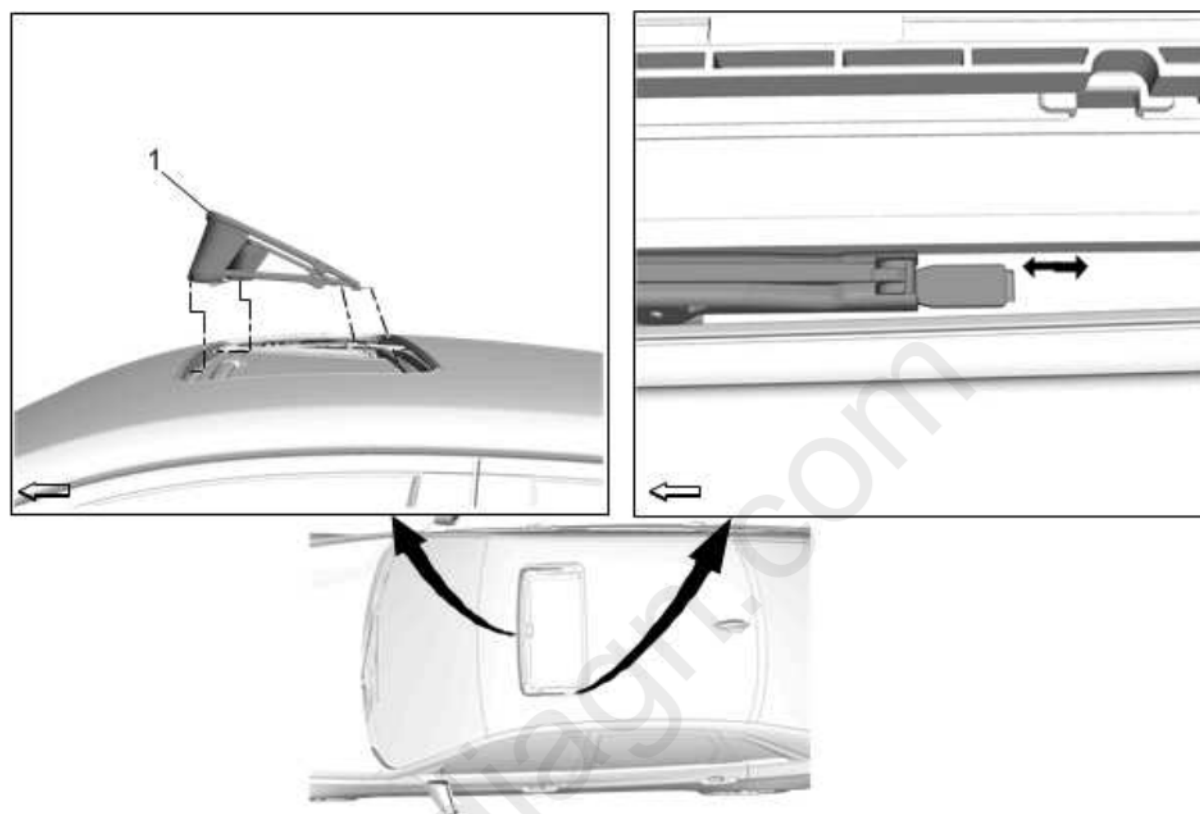


Fig. 5: Sunroof Air Deflector (Without C3U)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Sunroof Air Deflector Procedure 1. Open the sunroof window and sunshade to the full rear position. 2. Pull rearward on both left and right front corners of the air deflector wind screen to release the front lower retainers from the sunroof housing module. 3. Pull rearward and lift up to release the rear of the air deflector from the sunroof housing module 4. Cycle the sunroof window for a proper fit.

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.
3. Use compressed air, 241 kPa (35 psi) or less to blow out any drain hose that is plugged.

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

4. Test the system again.
5. If the hose remains plugged, check to see it is properly routed and does not have a kink.
6. [Sunroof Housing Front Drain Hose Replacement \(Left\)](#)[Sunroof Housing Front Drain Hose Replacement \(Right\)](#) or [Sunroof Housing Rear Drain Hose Replacement \(Right Side without C24\)](#)[Sunroof Housing Rear Drain Hose Replacement \(Left Side without C24\)](#)[Sunroof Housing Rear Drain Hose Replacement \(Left Side with C24\)](#)[Sunroof Housing Rear Drain Hose Replacement \(Right Side with C24\)](#)
7. Remove the blockage using the following steps.
 1. Push mechanics wire through the hose to remove the obstruction.
 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 \(Without C3U\)](#) and/or [Headlining Trim Panel Replacement \(With C3U\)](#).
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 HOUSING DRAIN GUTTER REPLACEMENT



Fig. 6: Sunroof Housing Drain Gutter
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Sunroof Window Replacement (Front)	
1	Sunroof Housing Drain Gutter Bolt [2x] CAUTION: Refer to Fastener Caution . Tighten 1.5 N.m (13 lb in)
2	Sunroof Housing Drain Gutter Procedure 1. Slide the sunroof housing drain gutter from the sunroof housing. 2. Inspect sunroof for proper operation. 3. Sunroof Window Height and Opening Fit Adjustment

SUNROOF WIRING HARNESS REPLACEMENT (WITH C3U)

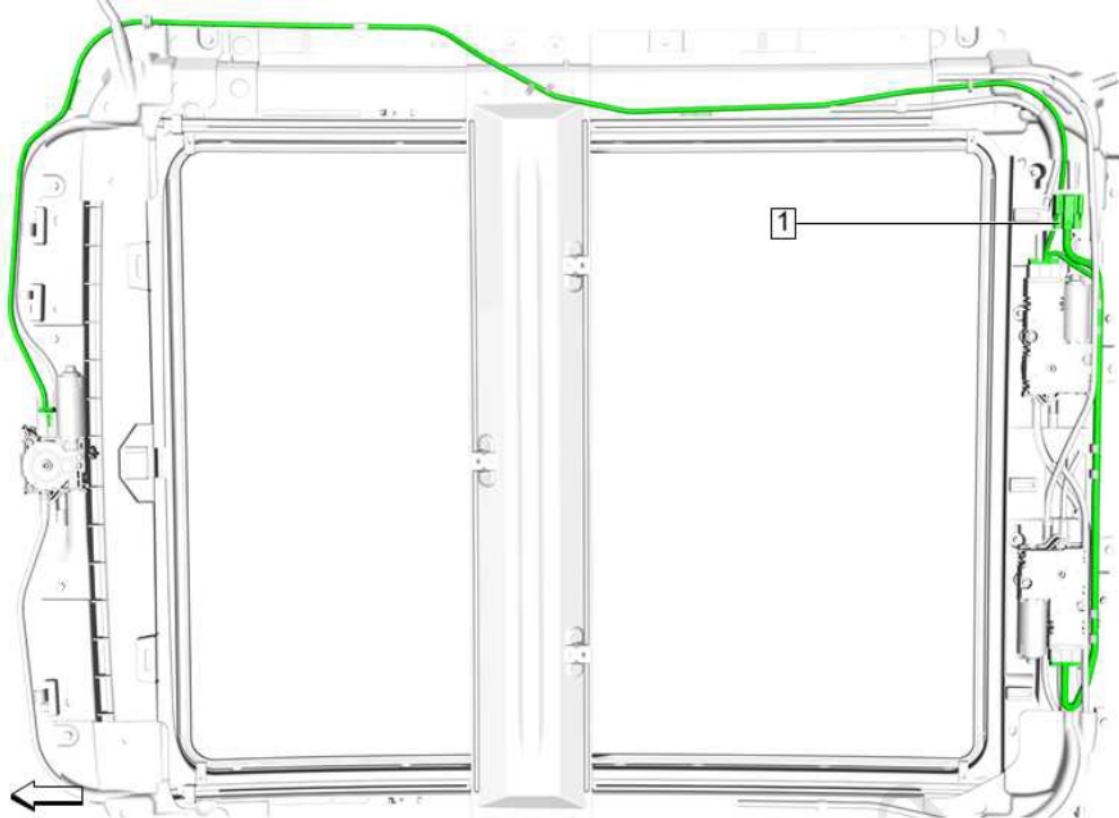


Fig. 7: Sunroof Wiring Harness (With C3U)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure It is only necessary to lower the headlining. Only do those steps in the headlining procedure that will allow access to the component being removed. Refer to Headlining Trim Panel Replacement (With C3U) .	
1	Sunroof Wiring Harness Procedure Disconnect all electrical connectors.

SUNROOF WIRING HARNESS REPLACEMENT (WITHOUT C3U)

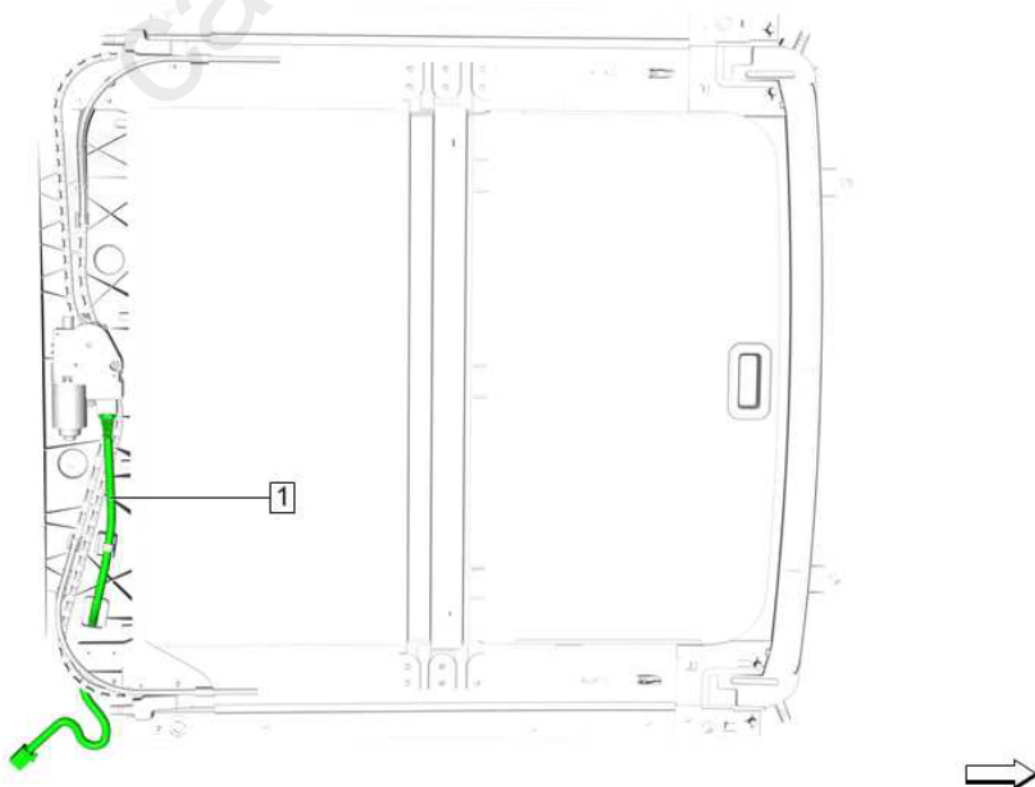


Fig. 8: Sunroof Wiring Harness (Without C3U)
 Courtesy of GENERAL MOTORS COMPANY

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

SUNROOF HOUSING REPLACEMENT (WITHOUT C24)

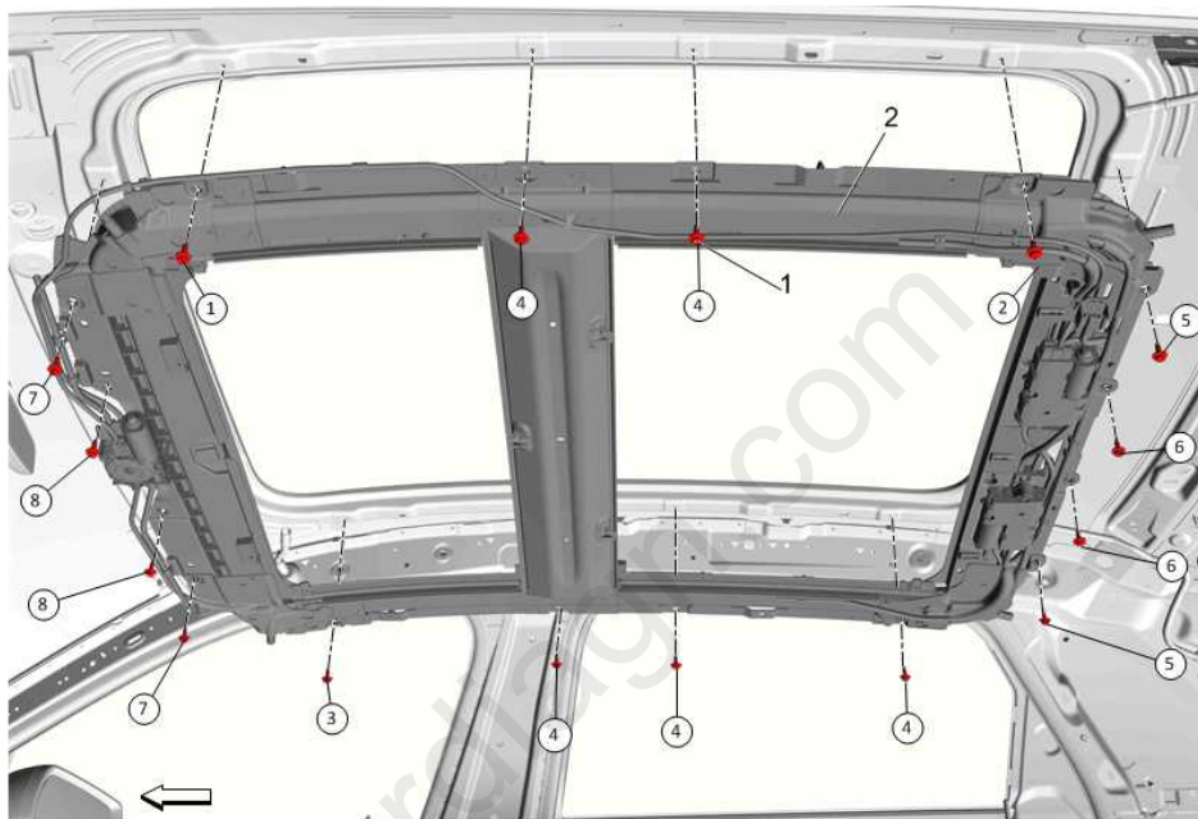


Fig. 9: Sunroof Housing
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Roof Rail Front Assist Handle Bracket Replacement Sunroof Window Replacement (Front) Roof Stationary Window Replacement - Disconnect the electrical connectors. - Do not remove the drain hoses from the vehicle, disconnect the drain hoses from all corners of the sunroof frame spigot only. Sunroof Housing Front Drain Hose Replacement (Left)Sunroof Housing Front Drain Hose Replacement (Right) and Sunroof Housing Rear Drain Hose Replacement (Right Side without C24)Sunroof Housing Rear Drain Hose Replacement (Left Side without C24)	

Callout	Component Name
Preliminary Procedures 1. Remove all roof rail assist handle brackets. Refer to Roof Rail Front Assist Handle Bracket Replacement 2. Auxiliary Air Conditioning Air Outlet Duct Replacement (Right Side) Auxiliary Air Conditioning Air Outlet Duct Replacement (Left Side) 3. Sunroof Window Replacement (Front) 4. Roof Stationary Window Replacement 5. Disconnect the electrical connectors. 6. Do not remove the drain hoses from the vehicle, disconnect the drain hoses from all corners of the sunroof frame spigot only. Refer to Sunroof Housing Front Drain Hose Replacement (Left) Sunroof Housing Front Drain Hose Replacement (Right) and Sunroof Housing Rear Drain Hose Replacement (Left Side with C24) Sunroof Housing Rear Drain Hose Replacement (Right Side with C24)	
1	Sunroof Housing Bolt [16x] CAUTION: Refer to Fastener Caution . Tighten 9 N.m (80 lb in)
2	Sunroof Housing Procedure 1. With aid of assistant, remove the sunroof housing from the vehicle and place it on a clean dry prepared surface. 2. Transfer components as necessary. 3. Water test and inspect sunroof for proper operation.

SUNROOF HOUSING FRONT DRAIN HOSE REPLACEMENT (LEFT)

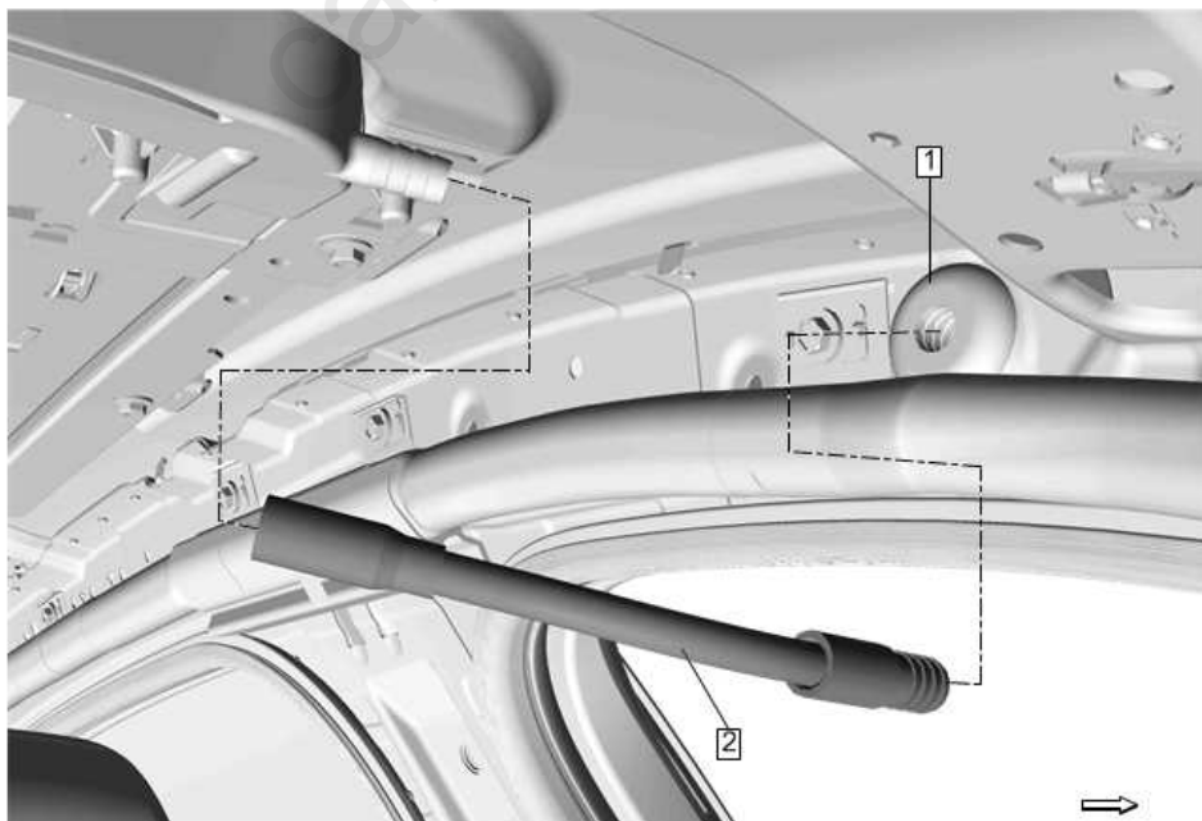


Fig. 11: Sunroof Housing Front Drain Hose (Left)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures It is only necessary to lower the headliner. Only do those steps in headliner replacement that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement (Without C3U) and/or Headlining Trim Panel Replacement (With C3U)	
1	Sunroof Housing Front Drain Hose Grommet
2	Sunroof Housing Front Drain Hose Procedure 1. Disconnect the sunroof drain hose from the sunroof frame spigot. 2. When installing the drain hose, ensure that the routing end of the drain hose and grommet are installed through the access hole in the plenum upper panel to prevent interior water leaks. 3. Water test and inspect sunroof for proper operation.

SUNROOF HOUSING FRONT DRAIN HOSE REPLACEMENT (RIGHT)

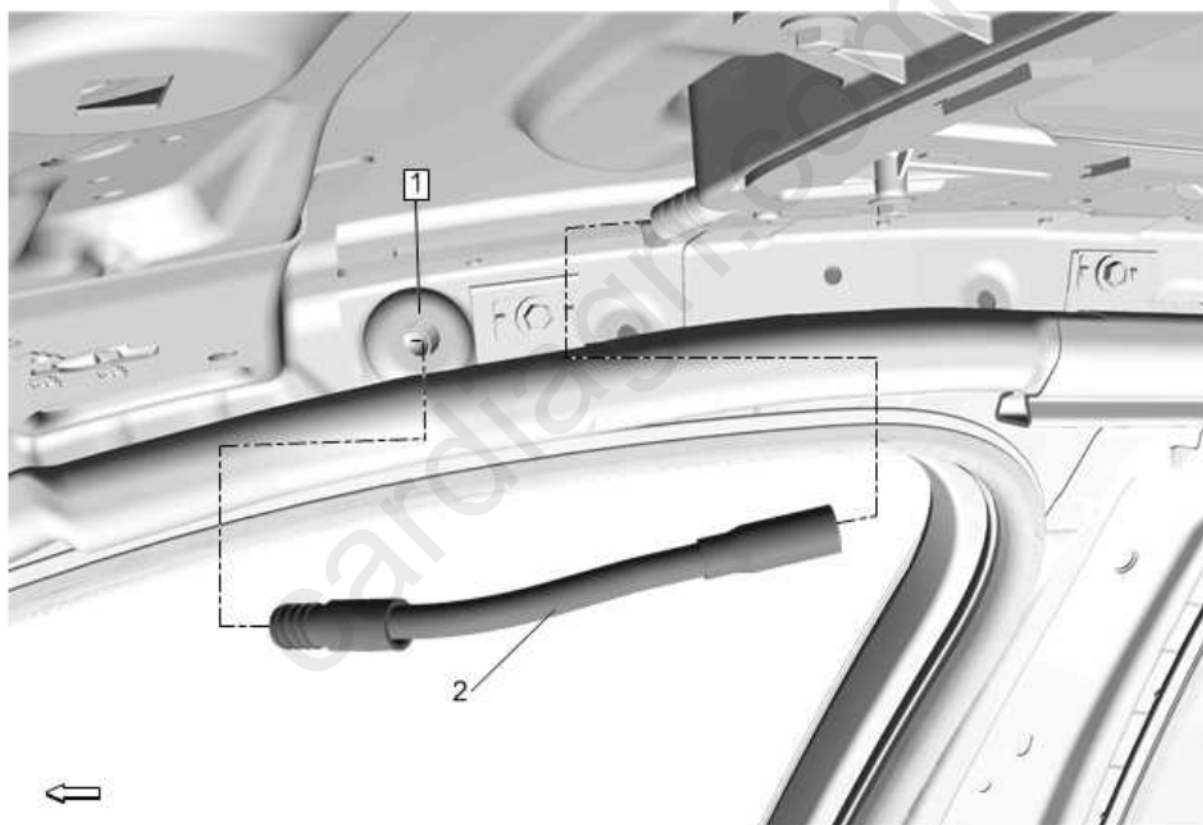


Fig. 12: Sunroof Housing Front Drain Hose (Right)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures It is only necessary to lower the headliner. Only do those steps in headliner replacement that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement (Without C3U) and/or Headlining Trim Panel Replacement (With C3U)	
1	Sunroof Housing Front Drain Hose Grommet
Empty row for additional content	

Callout	Component Name
2	Sunroof Housing Front Drain Hose Procedure 1. Disconnect the sunroof drain hose from the sunroof frame spigot. 2. When installing the drain hose, ensure that the routing end of the drain hose and grommet are installed through the access hole in the plenum upper panel to prevent interior water leaks. 3. Water test and inspect sunroof for proper operation.

SUNROOF HOUSING REAR DRAIN HOSE REPLACEMENT (RIGHT SIDE WITHOUT C24)

Removal Procedure

1. It is only necessary to lower the headliner. Only do those steps in headliner replacement that will lower the headliner enough to gain access to the part. Refer to [Headlining Trim Panel Replacement \(Without C3U\)](#) and/or [Headlining Trim Panel Replacement \(With C3U\)](#) ã,â» Remove
2. [Rear Compartment Side Trim Replacement - Right Side \(Without HP9\)](#) and/or [Rear Compartment Side Trim Replacement - Right Side \(With HP9\)](#) ã,â» Remove
3. Front and Rear Row Seat Roof Rail Airbag Right Sideã,â» Remove - [Front and Rear Row Seat Roof Rail Airbag Replacement](#)
4. Quarter Upper Trim Panel Bracket Right Side (1)ã,â» Remove

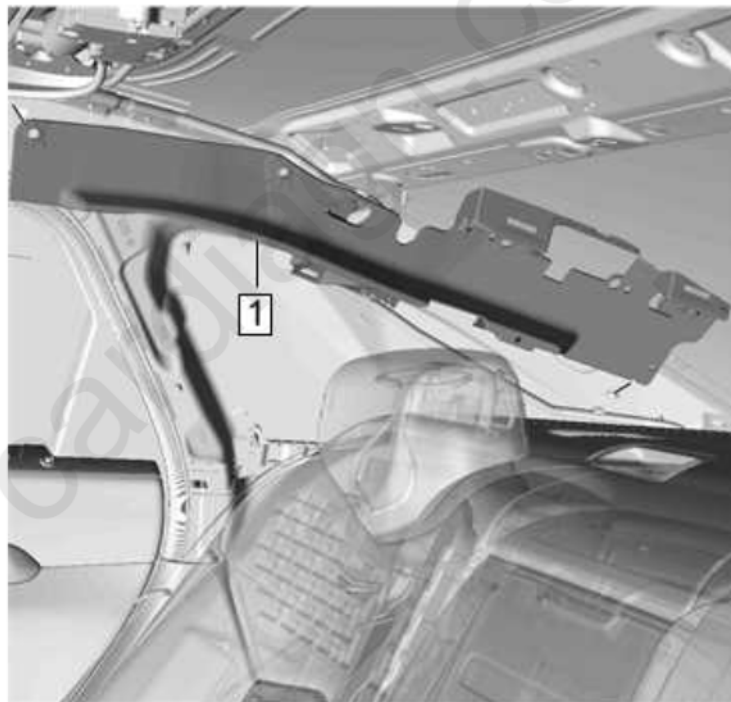


Fig. 13: Quarter Upper Trim Panel Bracket Right Side

Courtesy of GENERAL MOTORS COMPANY

5. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2)ã,â» Unclip

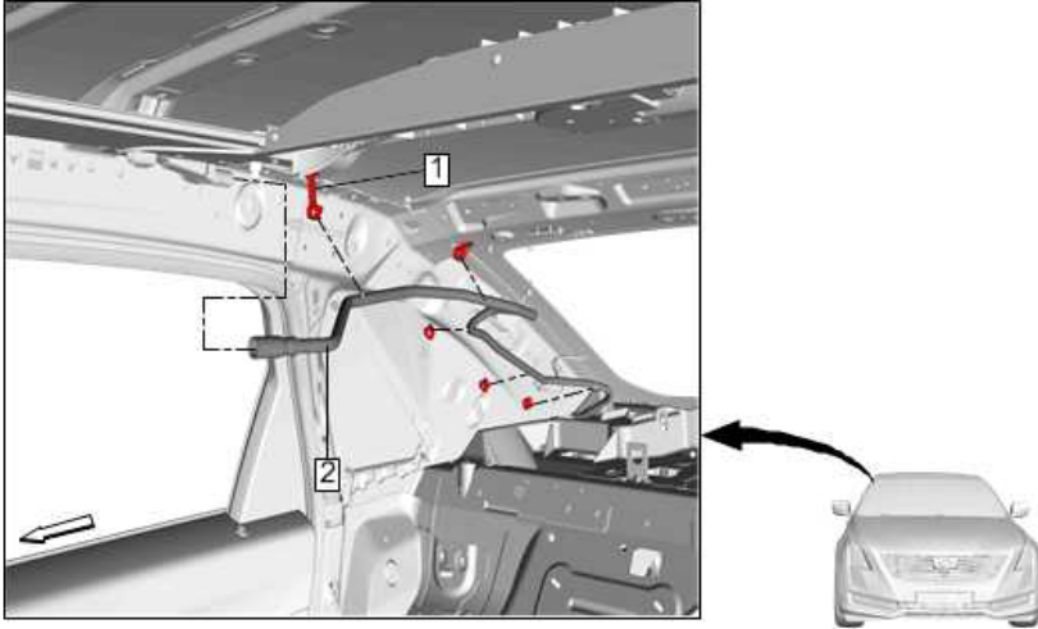


Fig. 14: Sunroof Housing Rear Drain Hose Retainer And Hose
Courtesy of GENERAL MOTORS COMPANY

6. Sunroof Housing Rear Drain Hose (2) @ Sunroof Module» Remove
7. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2)» Unclip

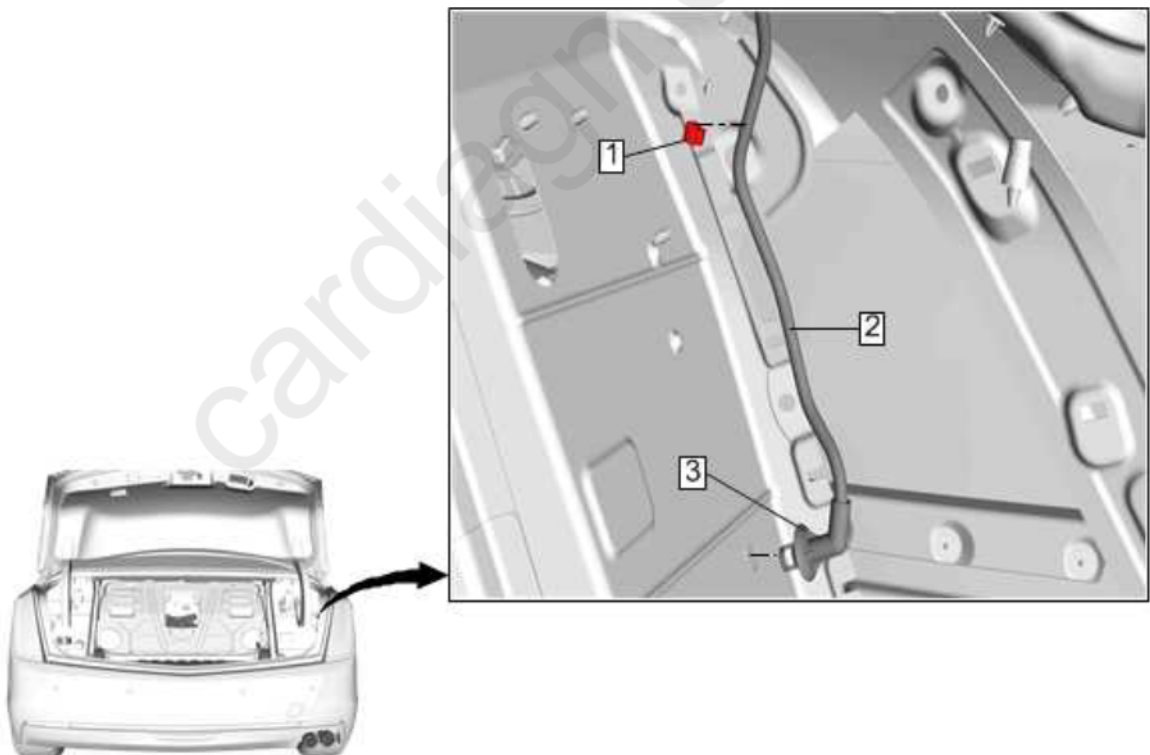


Fig. 15: Sunroof Housing Rear Drain Hose Retainer And Hose
Courtesy of GENERAL MOTORS COMPANY

8. Sunroof Housing Rear Drain Hose (2) @ Sunroof Housing Rear Drain Hose Grommet (3)» Remove

Installation Procedure

1. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2)» Clip

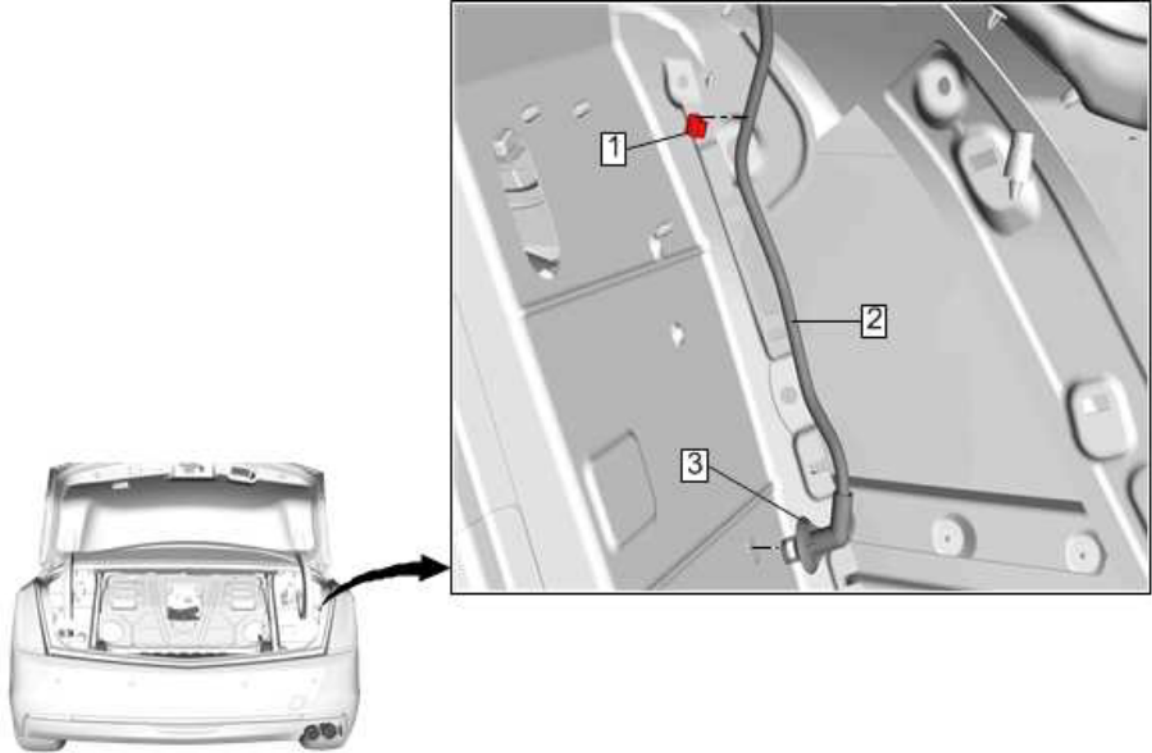


Fig. 16: Sunroof Housing Rear Drain Hose Retainer And Hose
 Courtesy of GENERAL MOTORS COMPANY

2. Sunroof Housing Rear Drain Hose (2) @ Sunroof Housing Rear Drain Hose Grommet (3)» Install
3. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2)» Clip

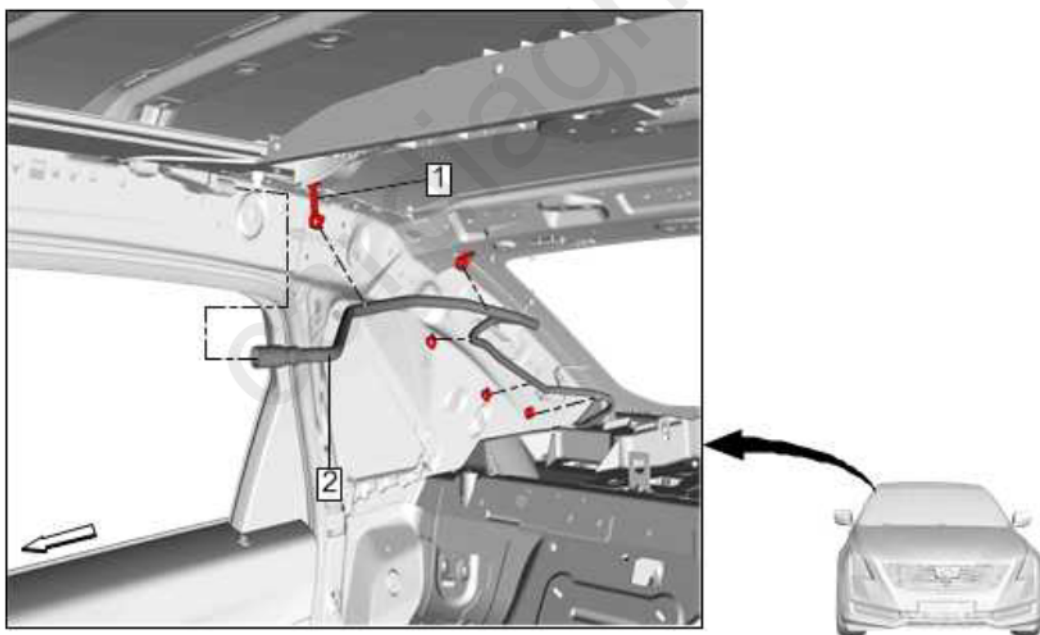


Fig. 17: Sunroof Housing Rear Drain Hose Retainer And Hose
 Courtesy of GENERAL MOTORS COMPANY

4. Sunroof Housing Rear Drain Hose (2) @ Sunroof Module» Install
5. Check sunroof rear drain hose for any leaks before installing the trim panels.
6. Quarter Upper Trim Panel Bracket Right Side (1)» Install

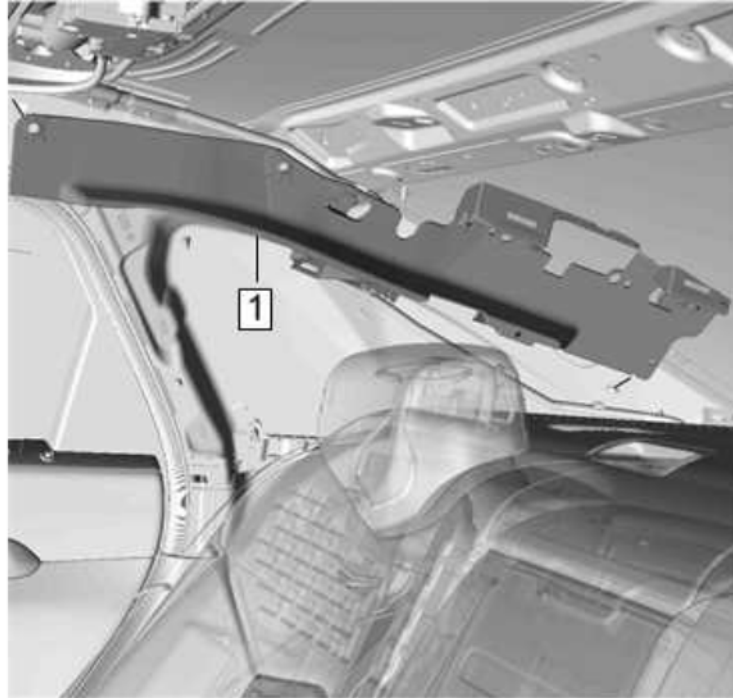


Fig. 18: Quarter Upper Trim Panel Bracket Right Side

Courtesy of GENERAL MOTORS COMPANY

7. Front and Rear Row Seat Roof Rail Airbag Right Side ã, â» Install - **Front and Rear Row Seat Roof Rail Airbag Replacement**
8. **Rear Compartment Side Trim Replacement - Right Side (Without HP9) Rear Compartment Side Trim Replacement - Right Side (With HP9)** ã, â» Install
9. **Headlining Trim Panel Replacement (Without C3U) Headlining Trim Panel Replacement (With C3U)** ã, â» Install

SUNROOF HOUSING REAR DRAIN HOSE REPLACEMENT (LEFT SIDE WITHOUT C24)

Removal Procedure

1. It is only necessary to lower the headliner. Only do the steps in headliner replacement that will lower the headliner enough to gain access to the part. Refer to **Headlining Trim Panel Replacement (Without C3U) Headlining Trim Panel Replacement (With C3U)** ã, â» Remove
2. **Rear Compartment Side Trim Replacement - Left Side (Without HP9) Rear Compartment Side Trim Replacement - Left Side (With HP9)** ã, â» Remove
3. Front and Rear Row Seat Roof Rail Airbag Left Side ã, â» Remove - **Front and Rear Row Seat Roof Rail Airbag Replacement**
4. Quarter Upper Trim Panel Bracket Left Side (1) ã, â» Remove

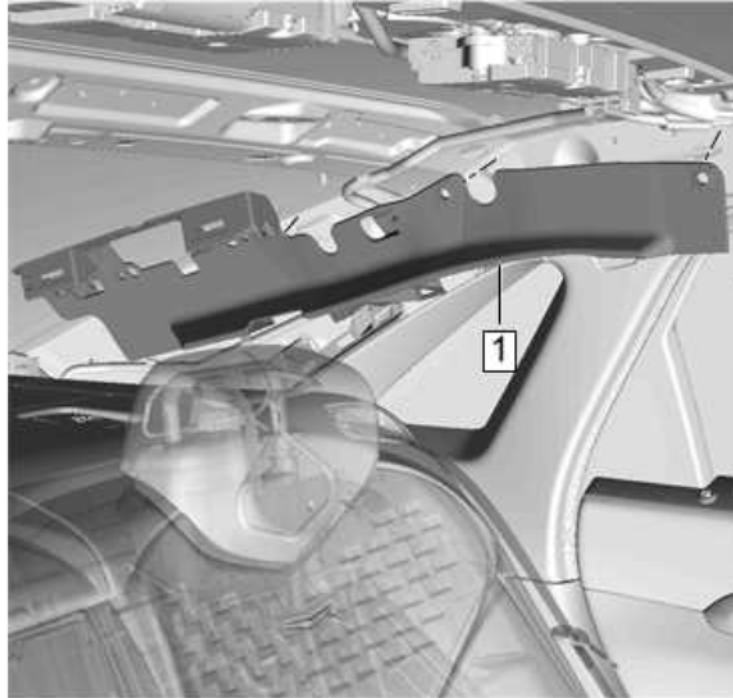


Fig. 19: Quarter Upper Trim Panel Bracket Left Side
Courtesy of GENERAL MOTORS COMPANY

5. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2) » Unclip [4x]

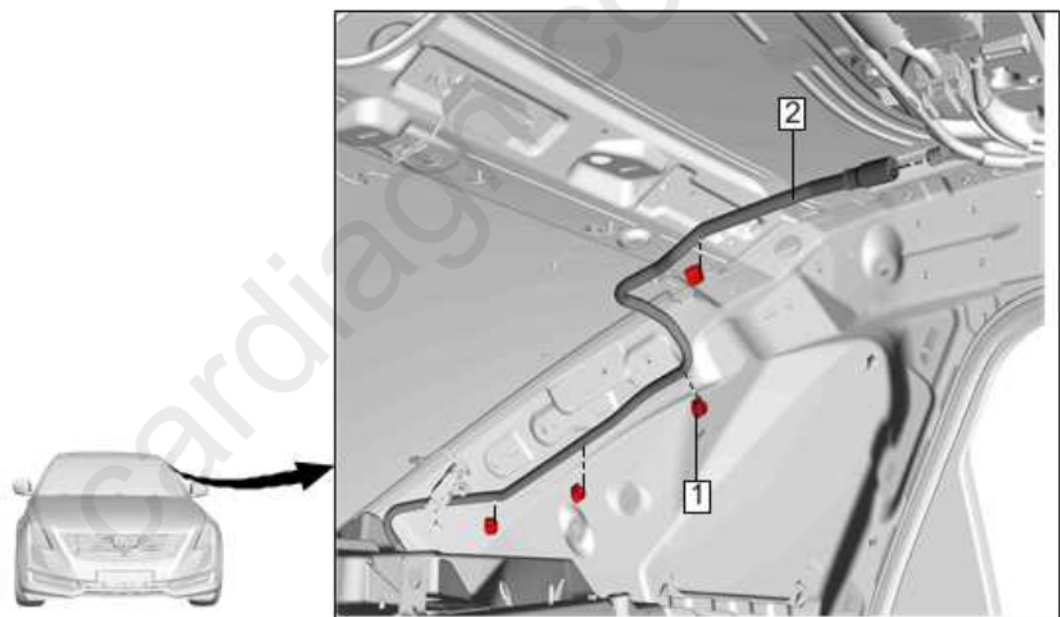


Fig. 20: Sunroof Housing Rear Drain Hose Retainer
Courtesy of GENERAL MOTORS COMPANY

6. Sunroof Housing Rear Drain Hose (2) @ Sunroof Module » Remove
7. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2) » Unclip

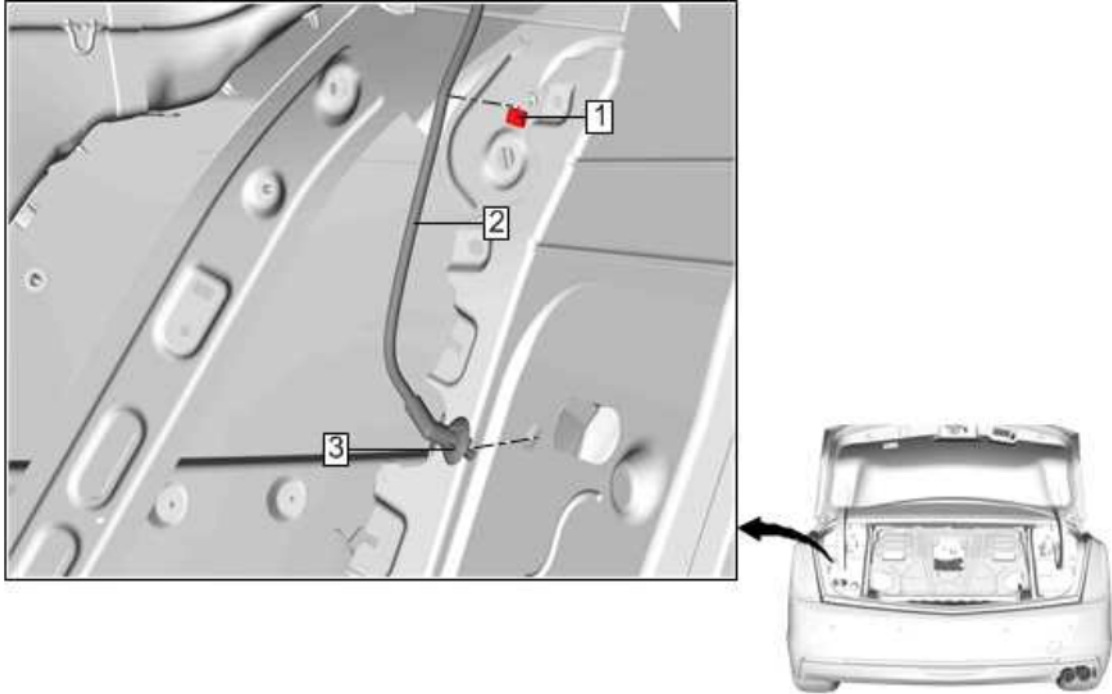


Fig. 21: Sunroof Housing Rear Drain Hose And Retainer
 Courtesy of GENERAL MOTORS COMPANY

8. Sunroof Housing Rear Drain Hose (2) @ Sunroof Housing Rear Drain Hose Grommet (3) » Remove

Installation Procedure

1. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2) » Clip

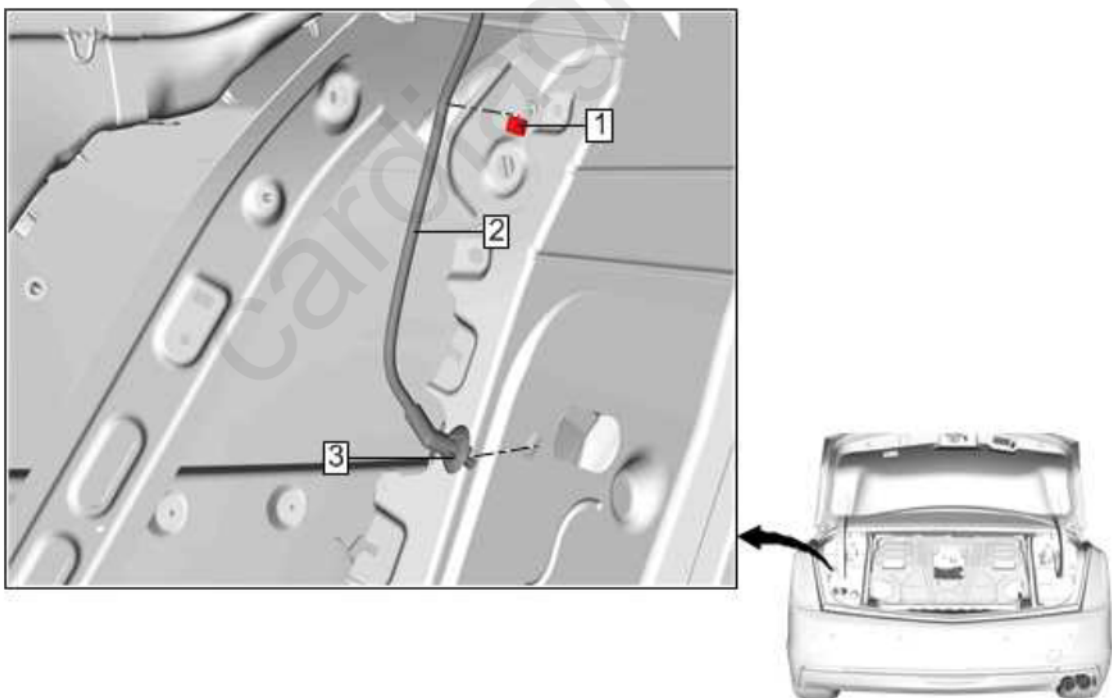


Fig. 22: Sunroof Housing Rear Drain Hose And Retainer
 Courtesy of GENERAL MOTORS COMPANY

2. Sunroof Housing Rear Drain Hose (2) @ Sunroof Housing Rear Drain Hose Grommet (3) » Install
3. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2) » Clip [4x]

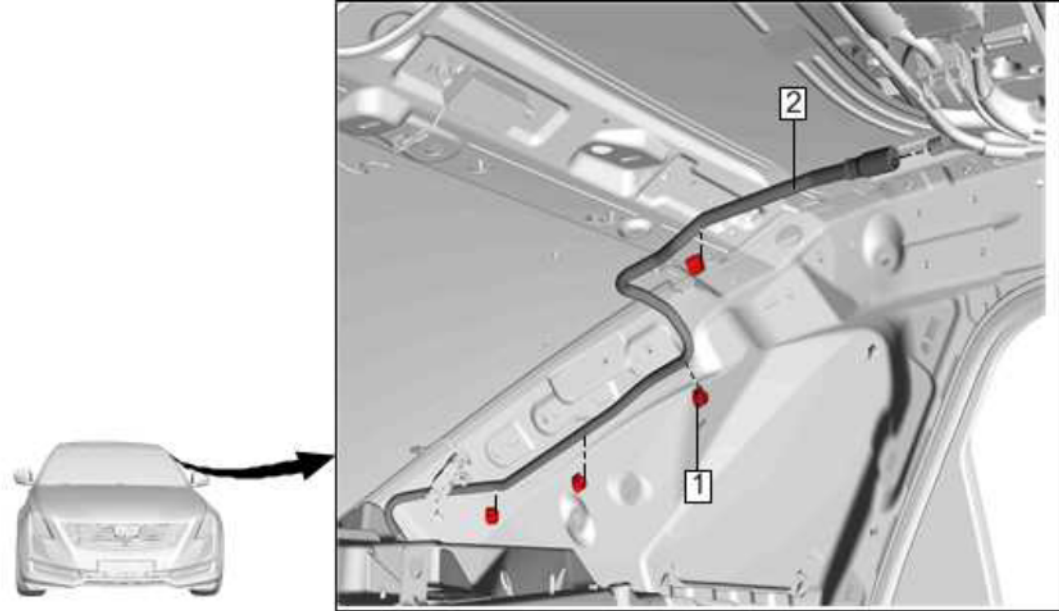


Fig. 23: Sunroof Housing Rear Drain Hose Retainer
 Courtesy of GENERAL MOTORS COMPANY

4. Sunroof Housing Rear Drain Hose (2) @ Sunroof ModuleÃ,Â» Install
5. Check sunroof rear drain hose for any leaks before installing the trim panels.
6. Quarter Upper Trim Panel Bracket Left Side (1)Ã,Â» Install

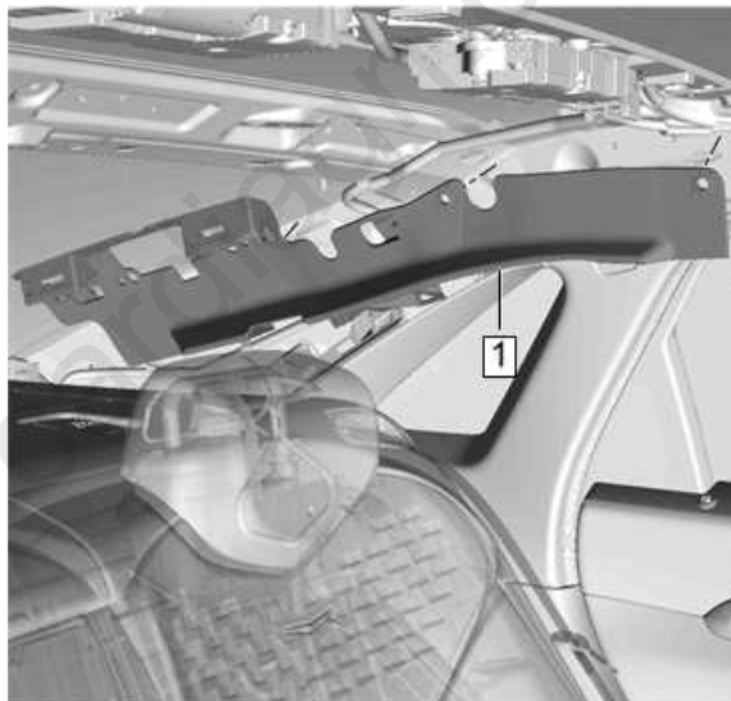


Fig. 24: Quarter Upper Trim Panel Bracket Left Side
 Courtesy of GENERAL MOTORS COMPANY

7. Front and Rear Row Seat Roof Rail Airbag Left SideÃ,Â» Install - **Front and Rear Row Seat Roof Rail Airbag Replacement**
8. **Rear Compartment Side Trim Replacement - Left Side (Without HP9) Rear Compartment Side Trim Replacement - Left Side (With HP9)** Ã,Â» Install
9. **Headlining Trim Panel Replacement (Without C3U) Headlining Trim Panel Replacement (With C3U)** Ã,Â» Install

SUNROOF HOUSING REAR DRAIN HOSE REPLACEMENT (LEFT SIDE WITH C24)

Removal Procedure

1. It is only necessary to lower the headliner. Only do the steps in headliner replacement that will lower the headliner enough to gain access to the part. Refer to [Headlining Trim Panel Replacement \(Without C3U\)](#) [Headlining Trim Panel Replacement \(With C3U\)](#) ã, ã» Remove
2. [Rear Compartment Side Trim Replacement - Left Side \(Without HP9\)](#) [Rear Compartment Side Trim Replacement - Left Side \(With HP9\)](#) ã, ã» Remove
3. Auxiliary Air Conditioning Air Outlet Duct Left Side ã, ã» Remove - [Auxiliary Air Conditioning Air Outlet Duct Replacement \(Left Side\)](#)
4. Front and Rear Row Seat Roof Rail Airbag Left Side ã, ã» Remove - [Front and Rear Row Seat Roof Rail Airbag Replacement](#)
5. Quarter Upper Trim Panel Bracket Left Side (1) ã, ã» Remove

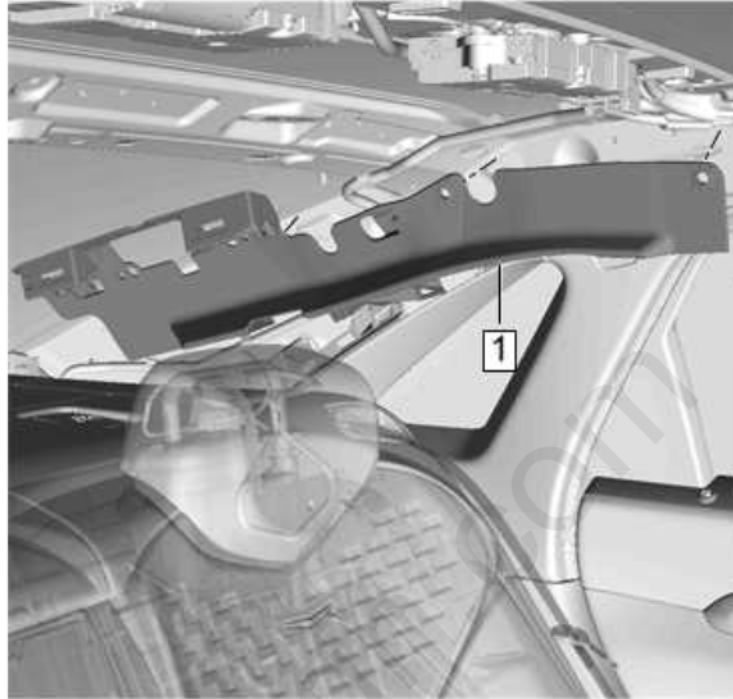


Fig. 25: Quarter Upper Trim Panel Bracket Left Side
 Courtesy of GENERAL MOTORS COMPANY

6. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2) ã, ã» Unclip [4x]

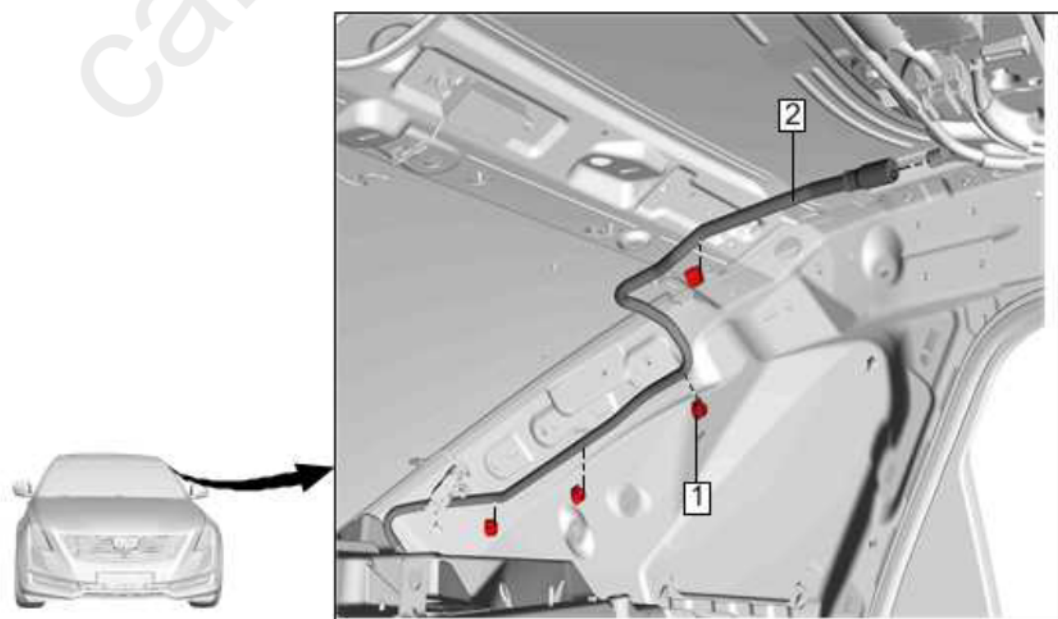


Fig. 26: Sunroof Housing Rear Drain Hose Retainer
 Courtesy of GENERAL MOTORS COMPANY

7. Sunroof Housing Rear Drain Hose (2) @ Sunroof Module ã, ã» Remove

8. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2) »
Unclip

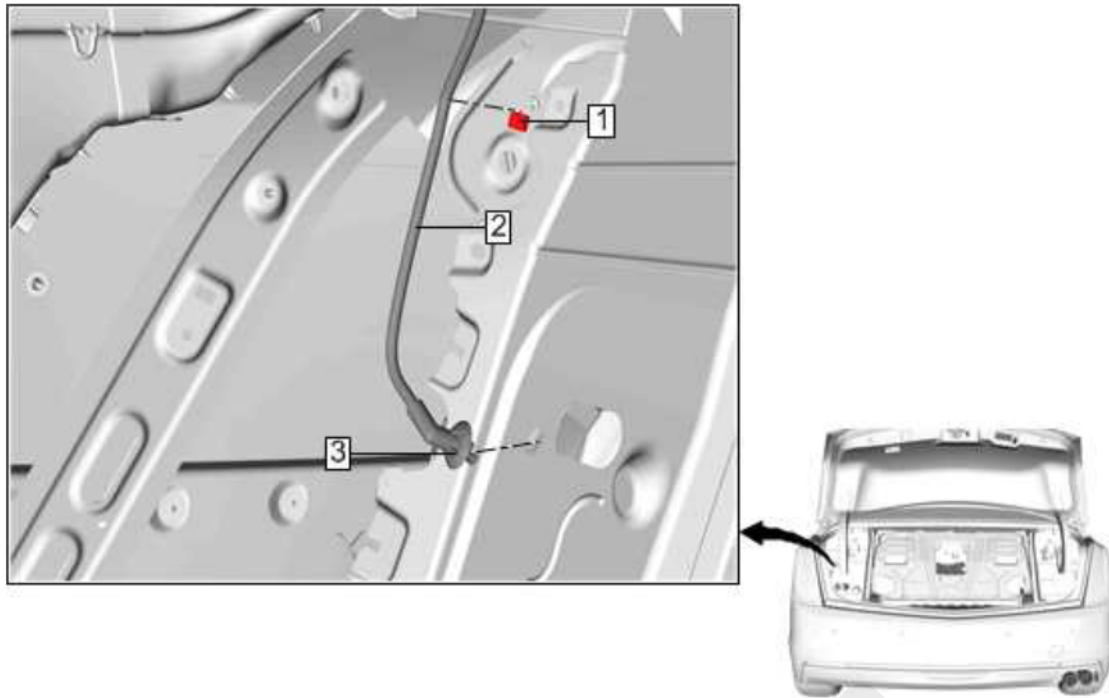


Fig. 27: Sunroof Housing Rear Drain Hose And Retainer
Courtesy of GENERAL MOTORS COMPANY

9. Sunroof Housing Rear Drain Hose (2) @ Sunroof Housing Rear Drain Hose Grommet (3) »
Remove

Installation Procedure

1. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2) »
Clip

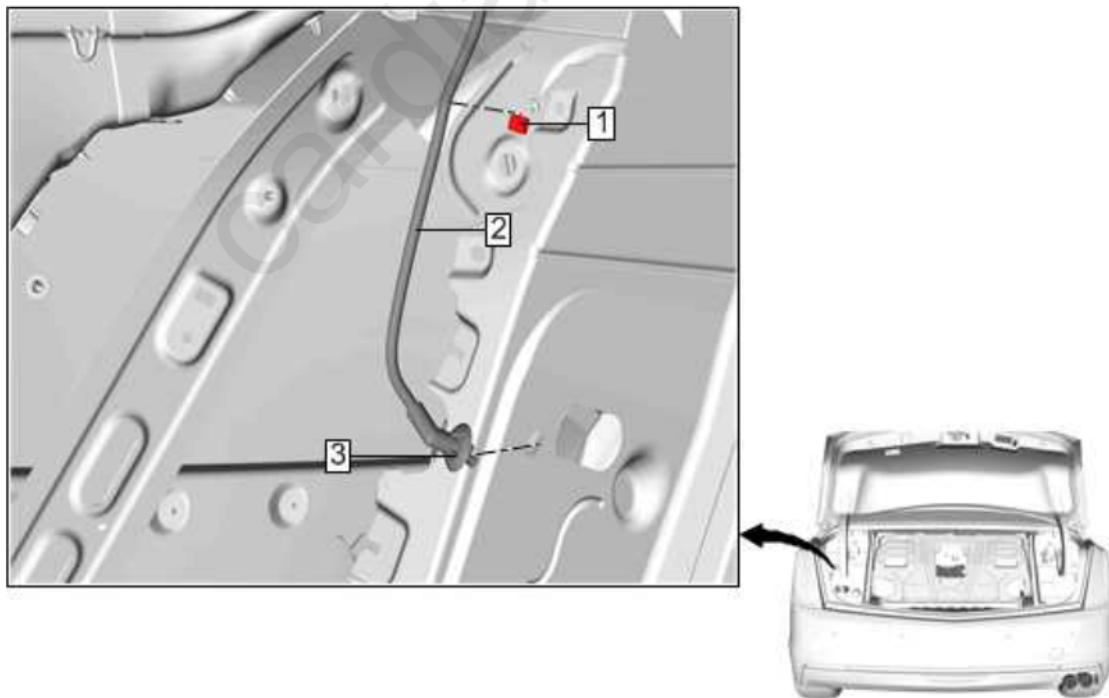


Fig. 28: Sunroof Housing Rear Drain Hose And Retainer
Courtesy of GENERAL MOTORS COMPANY

2. Sunroof Housing Rear Drain Hose (2) @ Sunroof Housing Rear Drain Hose Grommet (3) »
Install
3. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2) »
Clip [4x]

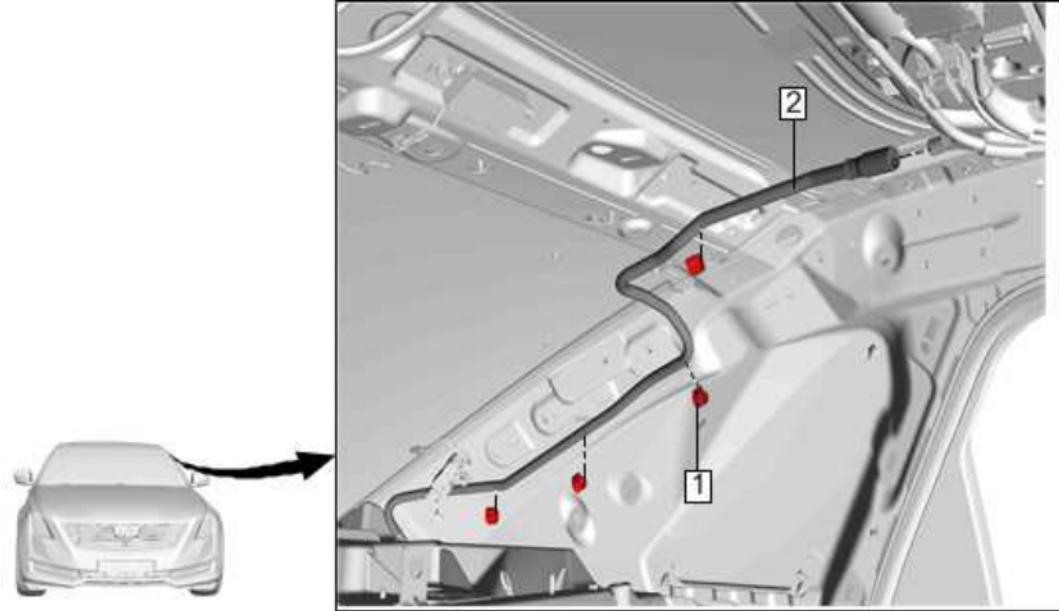


Fig. 29: Sunroof Housing Rear Drain Hose Retainer
 Courtesy of GENERAL MOTORS COMPANY

4. Sunroof Housing Rear Drain Hose (2) @ Sunroof ModuleÃ,Â» Install
5. Check sunroof rear drain hose for any leaks before installing the trim panels.
6. Quarter Upper Trim Panel Bracket Left Side (1)Ã,Â» Install

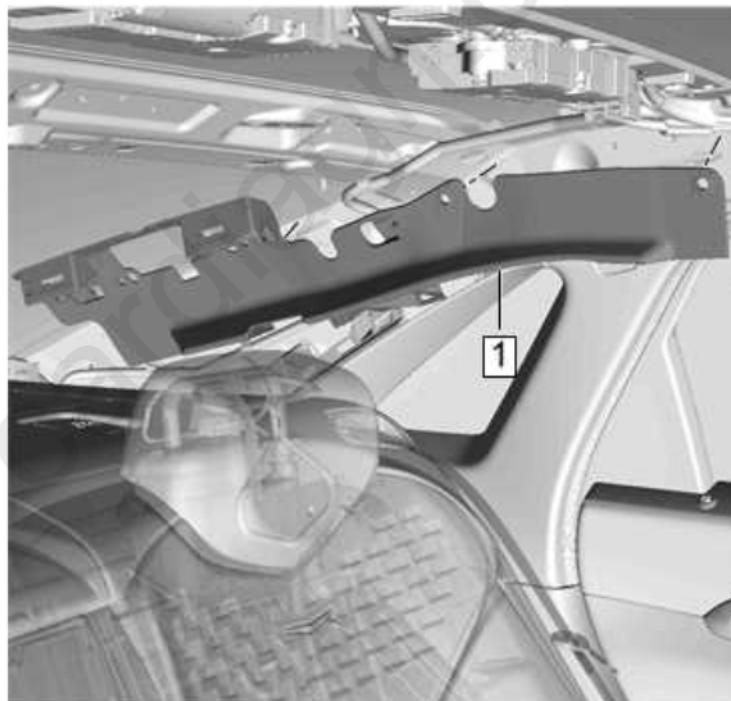


Fig. 30: Quarter Upper Trim Panel Bracket Left Side
 Courtesy of GENERAL MOTORS COMPANY

7. Front and Rear Row Seat Roof Rail Airbag Left SideÃ,Â» Install - **Front and Rear Row Seat Roof Rail Airbag Replacement**
8. Auxiliary Air Conditioning Air Outlet Duct Left SideÃ,Â» Install - **Auxiliary Air Conditioning Air Outlet Duct Replacement (Left Side)**
9. **Rear Compartment Side Trim Replacement - Left Side (Without HP9) Rear Compartment Side Trim Replacement - Left Side (With HP9)** Ã,Â» Install
10. **Headlining Trim Panel Replacement (Without C3U) Headlining Trim Panel Replacement (With C3U)** Ã,Â» Install

SUNROOF HOUSING REAR DRAIN HOSE REPLACEMENT (RIGHT SIDE WITH C24)

Removal Procedure

1. It is only necessary to lower the headliner. Only do those steps in headliner replacement that will lower the headliner enough to gain access to the part. Refer to [Headlining Trim Panel Replacement \(Without C3U\)](#) and/or [Headlining Trim Panel Replacement \(With C3U\)](#) ã, ã» Remove
2. [Rear Compartment Side Trim Replacement - Right Side \(Without HP9\)](#) and/or [Rear Compartment Side Trim Replacement - Right Side \(With HP9\)](#) ã, ã» Remove
3. Auxiliary Air Conditioning Air Outlet Duct Right Side ã, ã» Remove - [Auxiliary Air Conditioning Air Outlet Duct Replacement \(Right Side\)](#)
4. Front and Rear Row Seat Roof Rail Airbag Right Side ã, ã» Remove - [Front and Rear Row Seat Roof Rail Airbag Replacement](#)
5. Quarter Upper Trim Panel Bracket Right Side (1) ã, ã» Remove

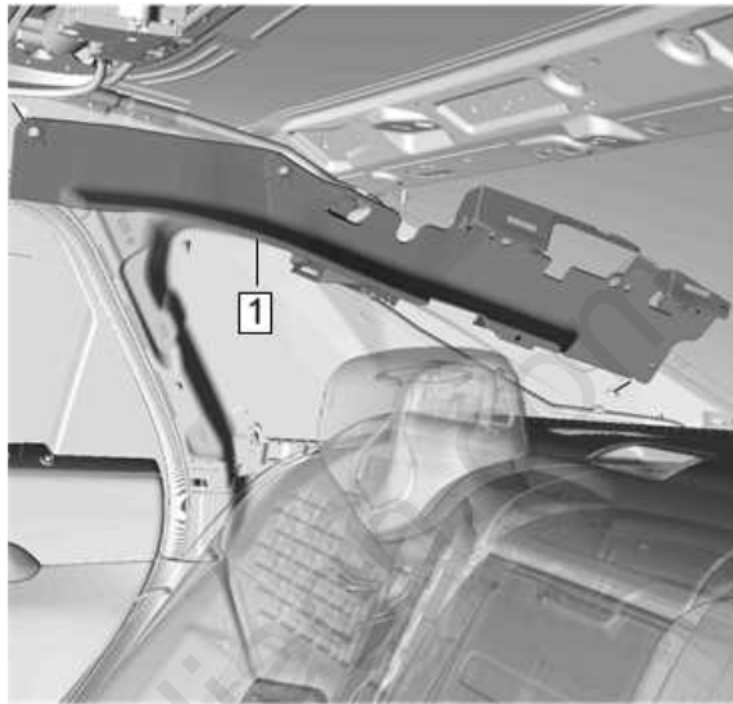


Fig. 31: Quarter Upper Trim Panel Bracket Right Side
Courtesy of GENERAL MOTORS COMPANY

6. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2) ã, ã» Unclip

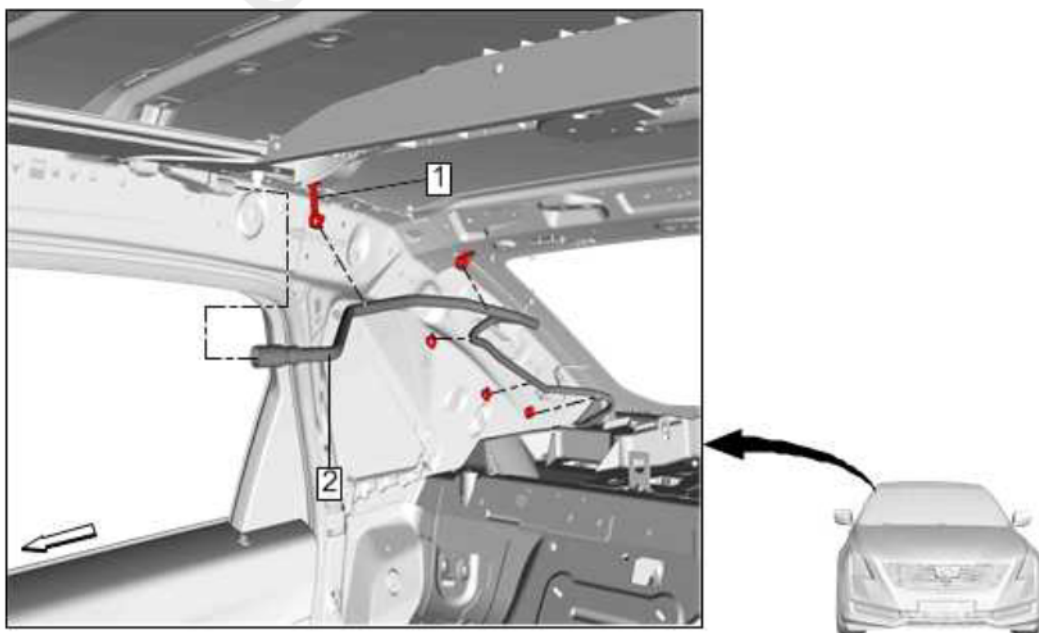


Fig. 32: Sunroof Housing Rear Drain Hose Retainer And Hose
Courtesy of GENERAL MOTORS COMPANY

7. Sunroof Housing Rear Drain Hose (2) @ Sunroof Module» Remove
8. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2)» Unclip

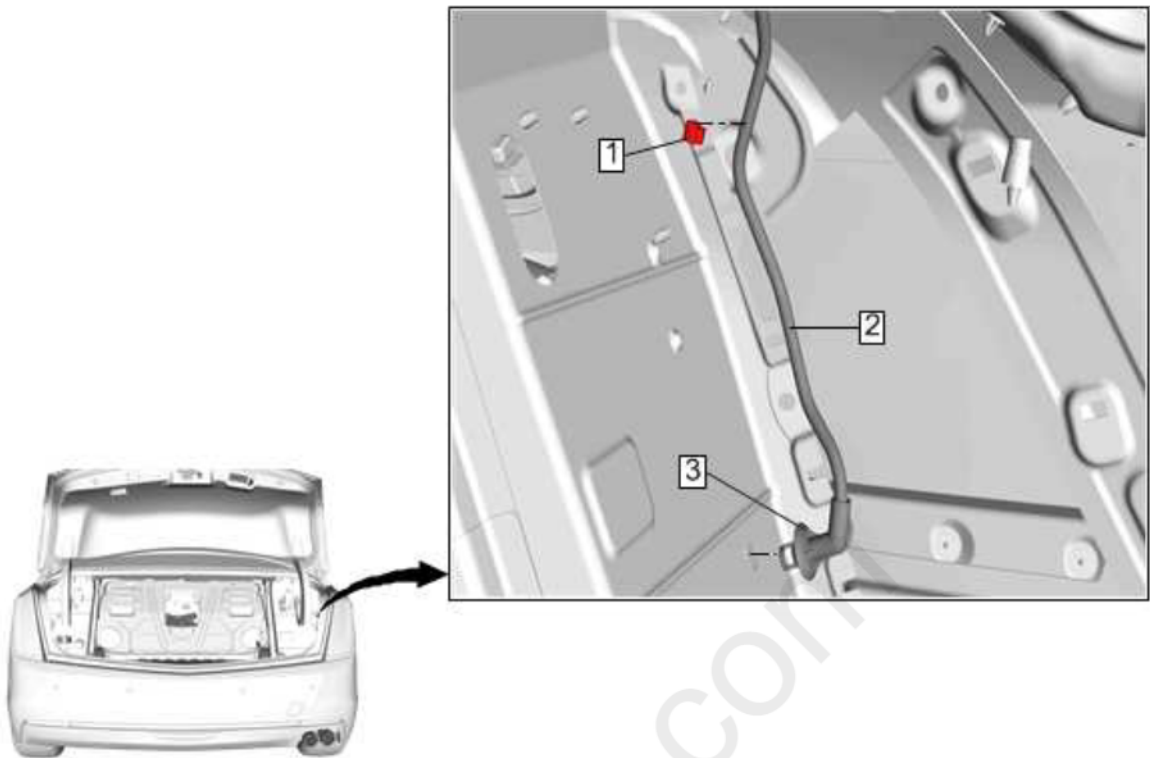


Fig. 33: Sunroof Housing Rear Drain Hose Retainer And Hose
Courtesy of GENERAL MOTORS COMPANY

9. Sunroof Housing Rear Drain Hose (2) @ Sunroof Housing Rear Drain Hose Grommet (3)» Remove

Installation Procedure

1. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2)» Clip

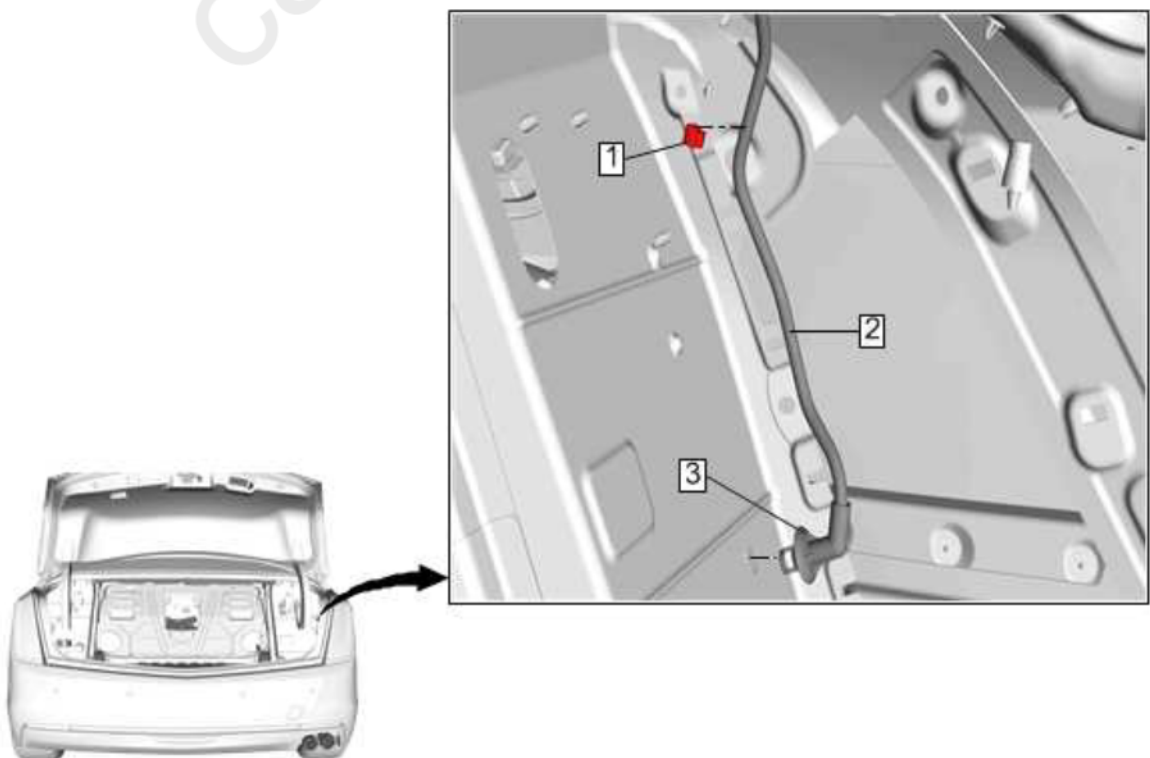


Fig. 34: Sunroof Housing Rear Drain Hose Retainer And Hose
Courtesy of GENERAL MOTORS COMPANY

2. Sunroof Housing Rear Drain Hose (2) @ Sunroof Housing Rear Drain Hose Grommet (3)» Install
3. Sunroof Housing Rear Drain Hose Retainer (1) @ Sunroof Housing Rear Drain Hose (2)» Clip

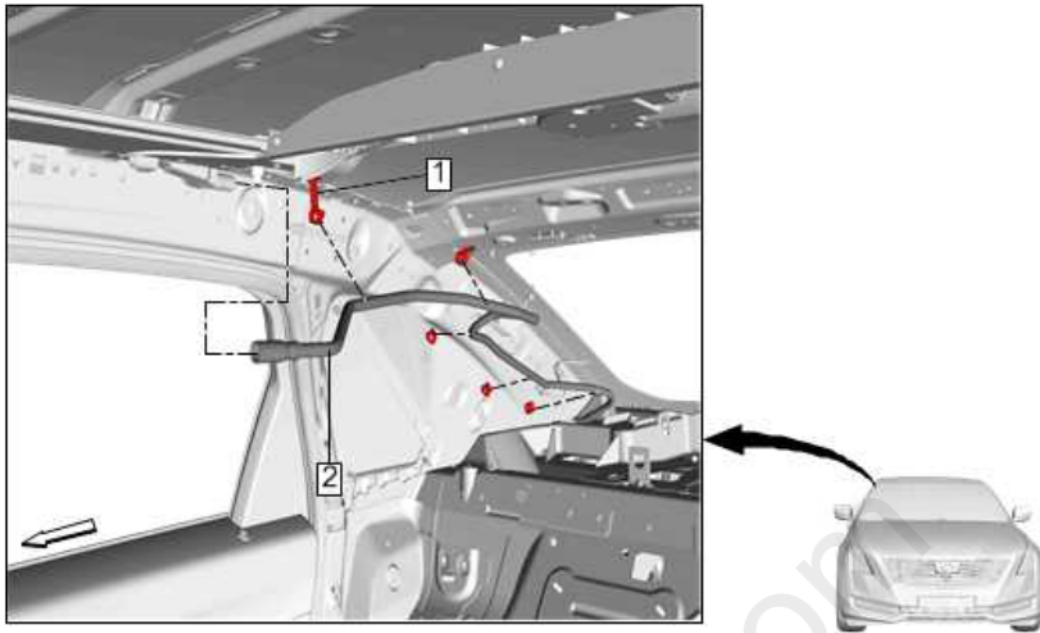


Fig. 35: Sunroof Housing Rear Drain Hose Retainer And Hose
Courtesy of GENERAL MOTORS COMPANY

4. Sunroof Housing Rear Drain Hose (2) @ Sunroof Module» Install
5. Check sunroof rear drain hose for any leaks before installing the trim panels.
6. Quarter Upper Trim Panel Bracket Right Side (1)» Install

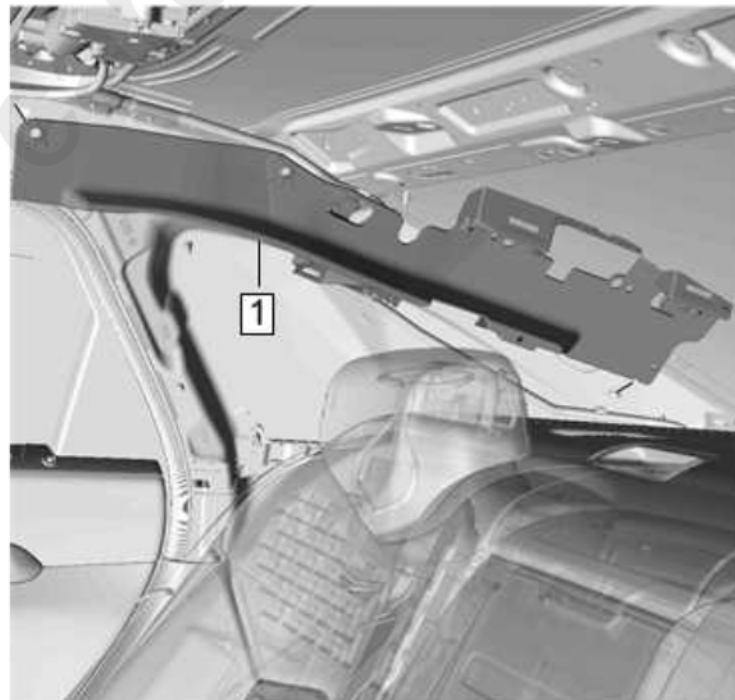


Fig. 36: Quarter Upper Trim Panel Bracket Right Side
Courtesy of GENERAL MOTORS COMPANY

7. Front and Rear Row Seat Roof Rail Airbag Right Side» Install - **Front and Rear Row Seat Roof Rail Airbag Replacement**

8. Auxiliary Air Conditioning Air Outlet Duct Right SideA,A» Install- [Auxiliary Air Conditioning Air Outlet Duct Replacement \(Right Side\)](#)
9. [Rear Compartment Side Trim Replacement - Right Side \(Without HP9\)](#) [Rear Compartment Side Trim Replacement - Right Side \(With HP9\)](#) A,A» Install
10. [Headlining Trim Panel Replacement \(Without C3U\)](#) [Headlining Trim Panel Replacement \(With C3U\)](#) A,A» Install

SUNROOF WINDOW MOTOR REPLACEMENT (WITHOUT C3U)

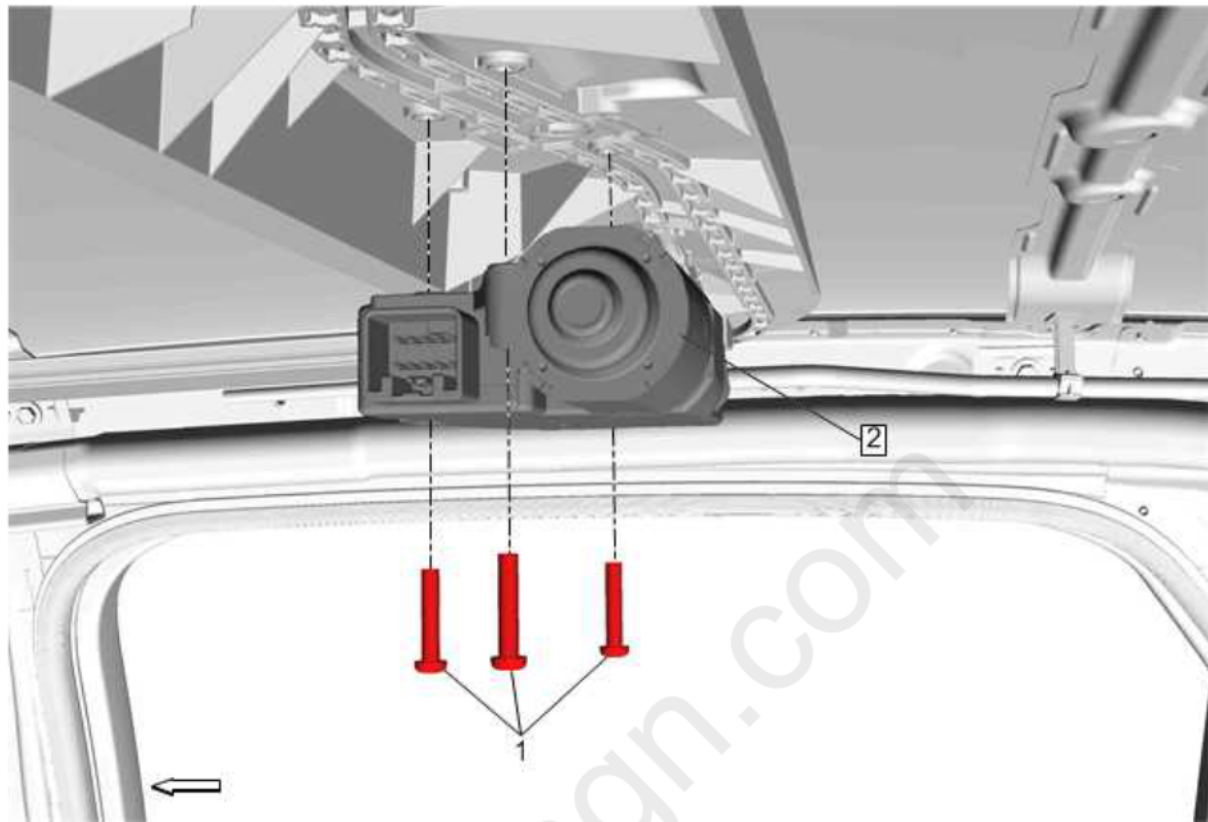


Fig. 37: Sunroof Window Motor (Without C3U)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure It is only necessary to lower the headliner. Only perform the steps in the headliner replacement procedure that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement (Without C3U)	
1	Sunroof Actuator Motor Bolt [3x] CAUTION: Refer to Fastener Caution . Tighten 4 N.m (35 lb in)

Callout	Component Name
2	Sunroof Window Motor Procedure 1. Disconnect the electrical connector. 2. Pull downward and turn the sunroof window motor to disengage the motor from the drive cables. 3. Install the sunroof window motor to the frame with a turning motion, pushing upward. This will engage the motor into the drive cables. 4. Sunroof Motor/Actuator Initialization/Teach Process (CF5)Sunroof Motor/Actuator Initialization/Teach Process (C3U) 5. Verify the sunroof window motor operation.

SUNROOF WINDOW MOTOR REPLACEMENT (WITH C3U)

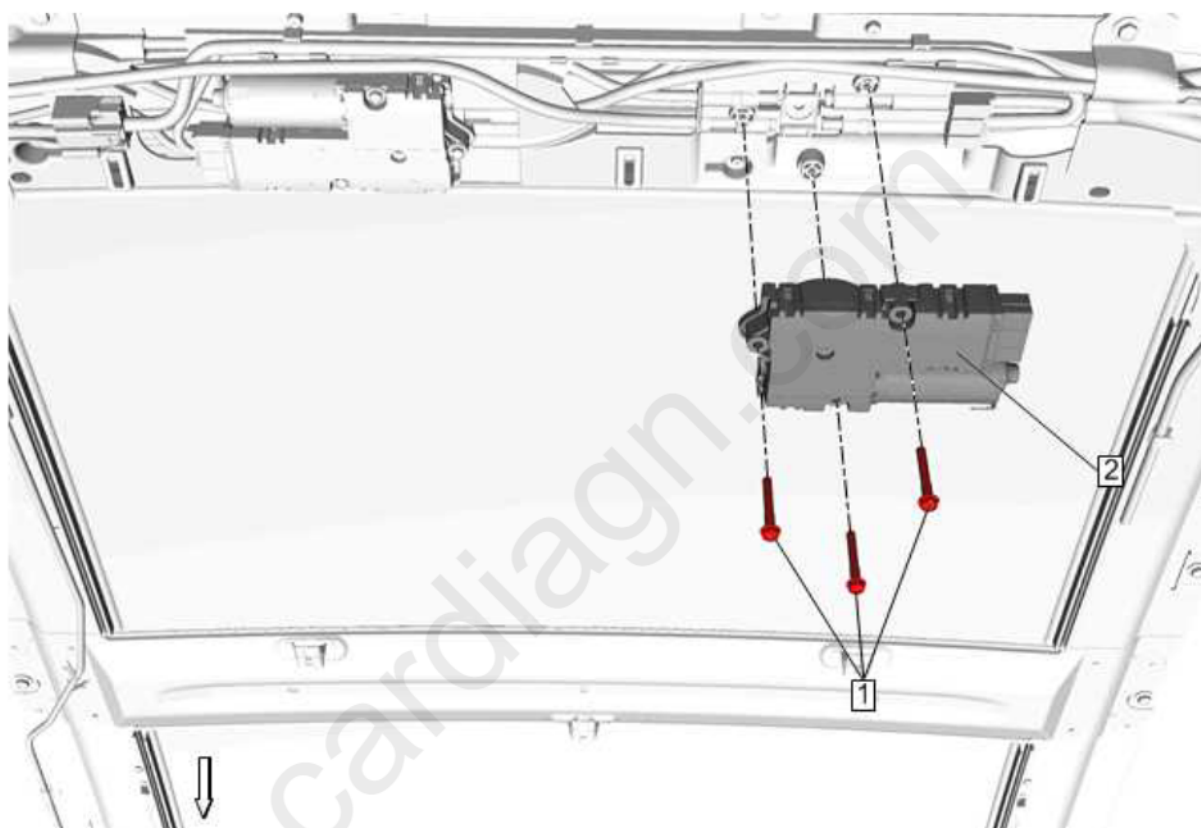


Fig. 38: Sunroof Window Motor (With C3U)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure It is only necessary to lower the headliner. Only perform the steps in the headliner replacement procedure that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement (With C3U)	
1	Sunroof Actuator Motor Bolt [3x] CAUTION: Refer to Fastener Caution . Tighten 4 N.m (35 lb in)

Callout	Component Name
2	Sunroof Window Motor Procedure 1. Disconnect the electrical connector. 2. Pull downward and turn the sunroof window motor to disengage the motor from the drive cables. 3. Install the sunroof window motor to the frame with a turning motion, pushing upward. This will engage the motor into the drive cables. 4. <u>Sunroof Motor/Actuator Initialization/Teach Process (CF5)</u><u>Sunroof Motor/Actuator Initialization/Teach Process (C3U)</u> 5. Verify the sunroof window motor operation.

SUNROOF MOTOR/ACTUATOR INITIALIZATION/TEACH PROCESS (CF5)

Initialization Procedure

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

- First Time System is Powered - Initialization has not been executed yet
- Drive System (motor and controller) has been removed or replaced
- False reversals are experienced (To re-teach the sunroof)
- If the glass is adjusted after initialization has already been completed

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 1). (Ensure the supply voltage doesn't dip below 9.0V at the drive during Initialization Teach.)

Initialization/Teach Procedure For a New Drive Assembly:

"Teach" refers to the sunroof system's learning a baseline profile for the system. This is almost always done following an initialization.

1. Press and hold the CLOSE switch (Do NOT use 'express' close) 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 it (within 1.0 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.

Initialization/Teach Procedure For an Existing Drive Assembly:

"Teach" refers to the sunroof system's learning a baseline profile for the system. This is almost always done following an initialization.

1. Use the CLOSE switch (do NOT use 'express' close) to fully close the sun roof. Release the switch.
2. Press and hold the CLOSE switch (for approximately ten (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 it (within 1.0 second) while the sun roof 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:

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 drive.
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 can't achieve closed position.
3. Reconnect power to the drive. Proceed as directed above in, **"For An Existing Drive Assembly"**.

SUNROOF MOTOR/ACTUATOR INITIALIZATION/TEACH PROCESS (C3U)

Initialization Procedure

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

- First Time System is Powered - Initialization has not been executed yet
- Sunroof/Sunshade lost calibration or false reversal
- Motor assembly has been removed or replaced
- If the glass is adjusted after Sunroof/Sunshade initialization has already been completed

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

Initialization/Teach Procedure/First Time Installation For a New Drive Assembly:

"Teach" refers to the sunroof system's learning a baseline profile for the system. This is almost always done following an initialization.

1. Press/hold on the Sunroof Close button until the sunroof close/open cycle complete (5 Sec - 15 Sec) to activate the Initialization Procedure (Teach).
2. And keep holding the Sunroof switch until the Initialization Procedure is complete (Initialization start).
3. Press the sunroof Open switch and once the sunroof open to vent, the procedure is complete.
4. When Hard stop is encountered Sunroof / Sunshade will move towards open position.
5. When Sunroof / Sunshade reaches close position it will automatically stop.
6. Now the Normalization procedure is complete.

Sunroof/Sunshade Re-Initialization/Teach Procedure/Reinstallation For an Existing Drive Assembly:

NOTE: Perform the initialization/teach procedure on a reinstall sunroof/sunshade motor or a new sunroof/sunshade motor. Ensure the electrical harness on the headliner is connected to the sunroof motor, battery power is applied and the ignition switch is ON.

1. Press/hold on the Sunshade Close button until the sunshade close/open cycle complete (15 Sec) to activate the Initialization Procedure (Teach).
2. And keep holding the Sunshade switch until the Initialization Procedure is complete (Initialization start).
3. When the sunshade Open and close, the procedure is complete.

SUNROOF SUNSHADE MOTOR REPLACEMENT (REAR)

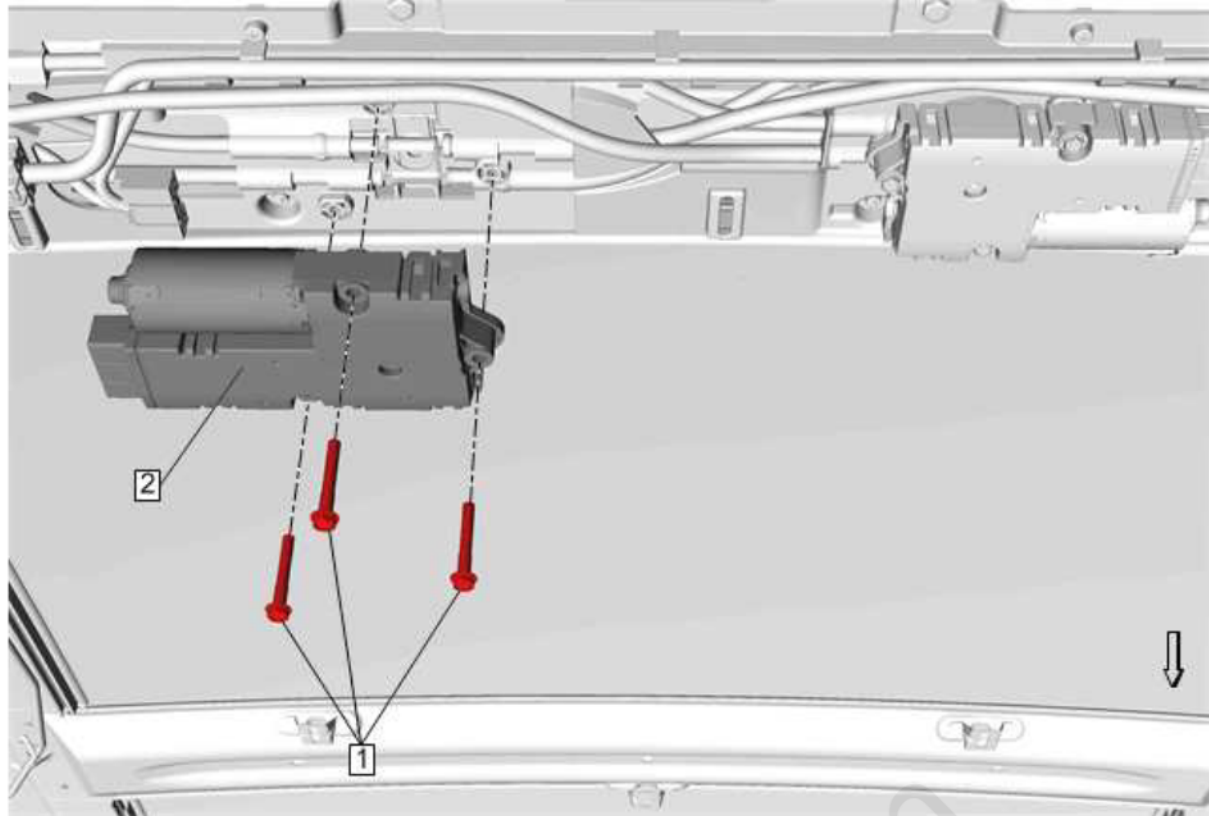


Fig. 39: Sunroof Sunshade Motor (Rear)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure It is only necessary to lower the headliner. Only perform the steps in the headliner replacement procedure that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement (Without C3U) and/or Headlining Trim Panel Replacement (With C3U)	
1	Sunroof Sunshade Actuator Bolt [3x] CAUTION: Refer to Fastener Caution . Tighten 4 N.m (35 lb in)
2	Sunroof Sunshade Motor Procedure 1. Disconnect the electrical connector. 2. With a turning motion, pull downward on the sunroof sunshade motor. Disengage the motor from the drive cables. 3. Install the sunroof sunshade motor to the frame with a turning motion, pushing upward. This will engage the motor into the drive cables. 4. Sunroof Motor/Actuator Initialization/Teach Process (CF5)Sunroof Motor/Actuator Initialization/Teach Process (C3U) 5. Verify the sunroof sunshade motor operation.

SUNROOF SUNSHADE MOTOR REPLACEMENT (FRONT)

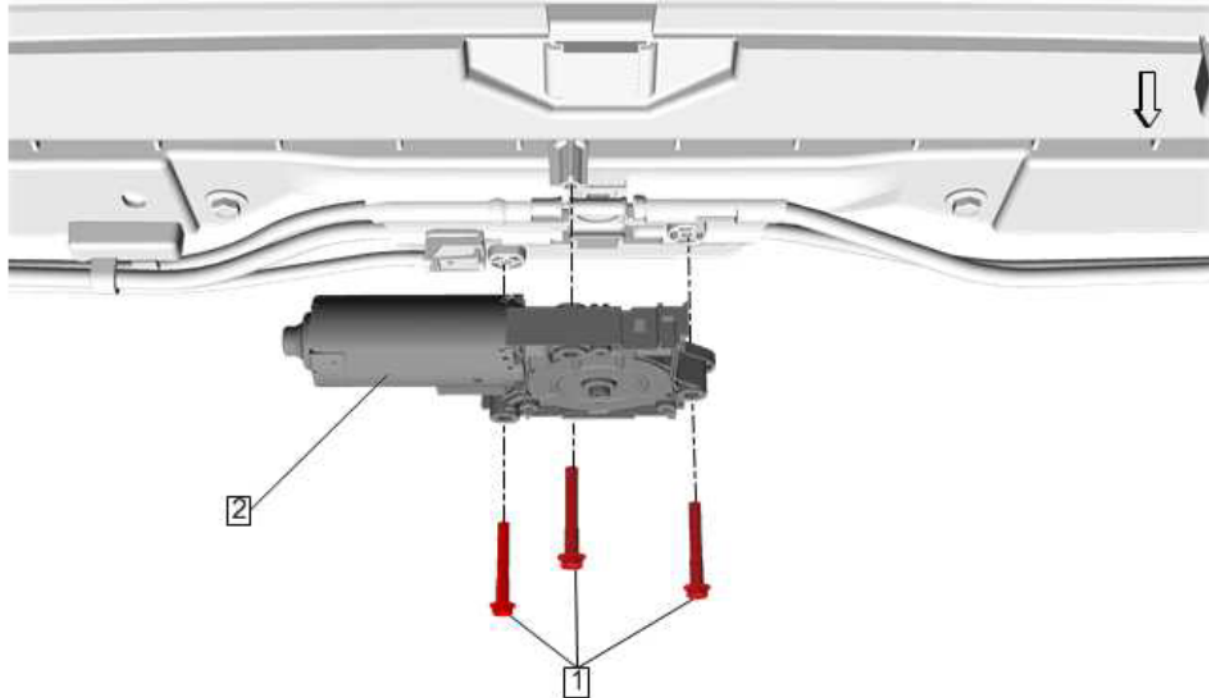


Fig. 40: Sunroof Sunshade Motor (Front)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Roof Console Replacement	
1	Sunroof Sunshade Actuator Bolt [3x] CAUTION: Refer to Fastener Caution . Tighten 4 N.m (35 lb in)
2	Sunroof Sunshade Motor Procedure 1. Disconnect the electrical connector. 2. With a turning motion, pull downward on the sunroof sunshade motor. Disengage the motor from the drive cables. 3. Install the sunroof sunshade motor to the frame with a turning motion, pushing upward. This will engage the motor into the drive cables. 4. <u>Sunroof Motor/Actuator Initialization/Teach Process (CF5)</u><u>Sunroof Motor/Actuator Initialization/Teach Process (C3U)</u> 5. Verify the sunroof sunshade motor operation.

SUNROOF SUNSHADE REPLACEMENT (WITHOUT C3U)

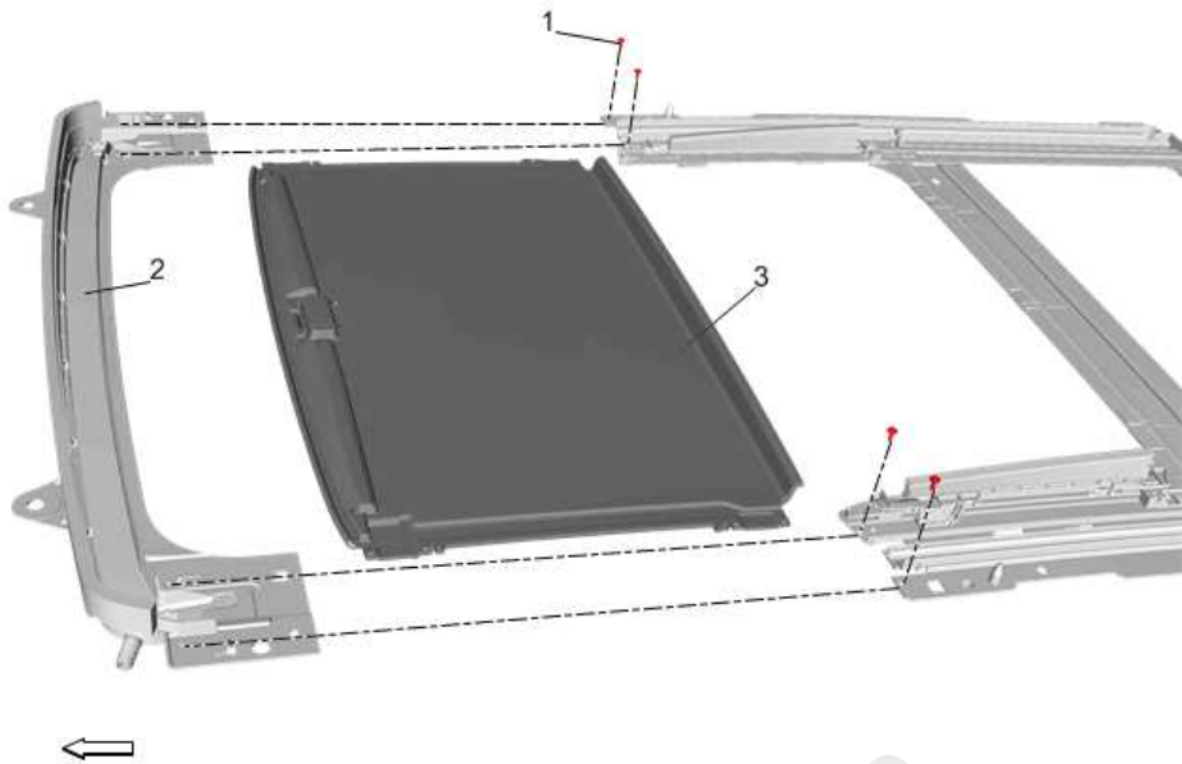


Fig. 41: Sunroof Sunshade (Without C3U)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Sunroof Housing Drain Gutter Replacement</u> - It is only necessary to lower the headliner. Only perform the steps in the headliner replacement procedure that will lower the headliner enough to gain access to the part. Refer to <u>Headlining Trim Panel Replacement (Without C3U)</u> - Do not remove the drain hoses from the vehicle, disconnect the drain hoses from the corners of the sunroof frame spigot only. Refer to <u>Sunroof Housing Front Drain Hose Replacement (Left)</u><u>Sunroof Housing Front Drain Hose Replacement (Right)</u>	
1	Sunroof Sunshade Housing Bracket Bolt [4x] CAUTION: Refer to <u>Fastener Caution</u> . Tighten 4 N.m (35 lb in).
2	Sunroof Housing Front
3	Sunroof Sunshade Procedure - Remove sunshade cable from the sunshade guide. - Remove the sunshade from the sunroof housing front. - Verify the proper operation of the sunroof before installing the headliner.

SUNROOF SUNSHADE REPLACEMENT (WITH C3U REAR)

Removal Procedure

- Roof Stationary Window (2)Ã,Â» Remove - **Roof Stationary Window Replacement**

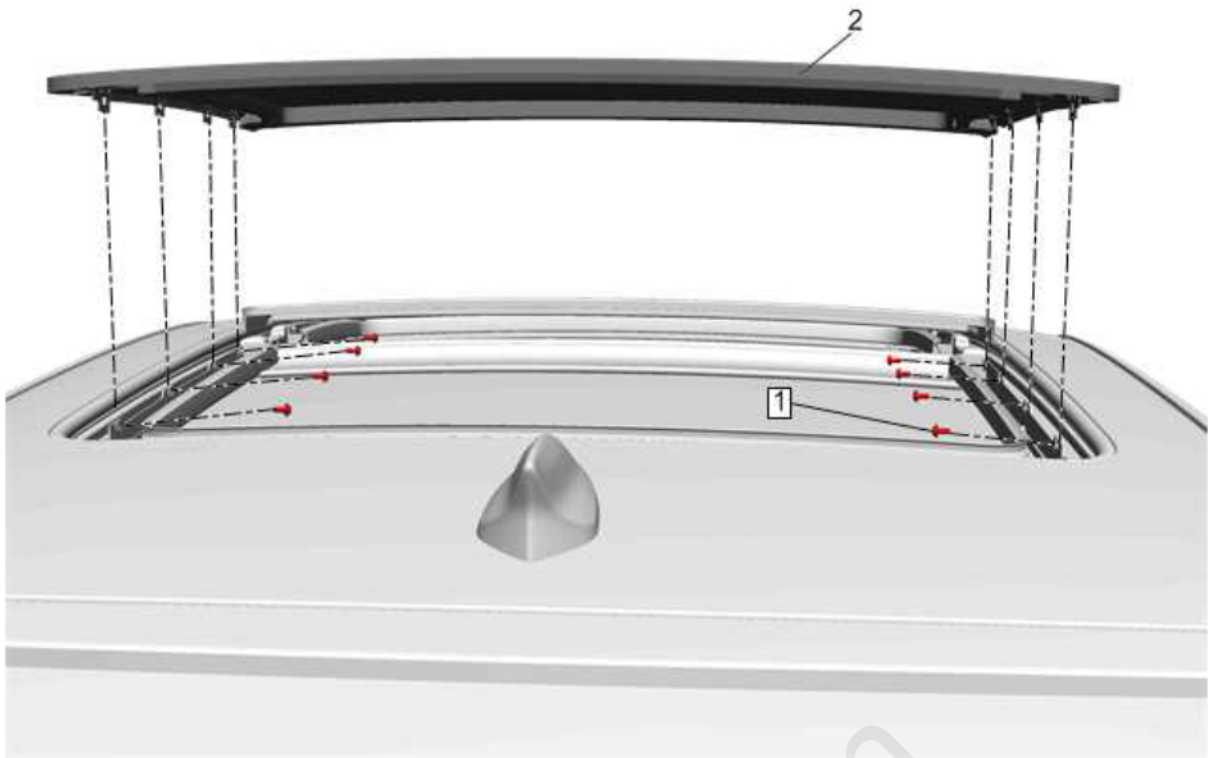


Fig. 42: Roof Stationary Window

Courtesy of GENERAL MOTORS COMPANY

2. Sunroof Window Seal (1) Remove - [Sunroof Window Seal Replacement \(Outer Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Front Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Rear Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Middle Seal With C3U\)](#)

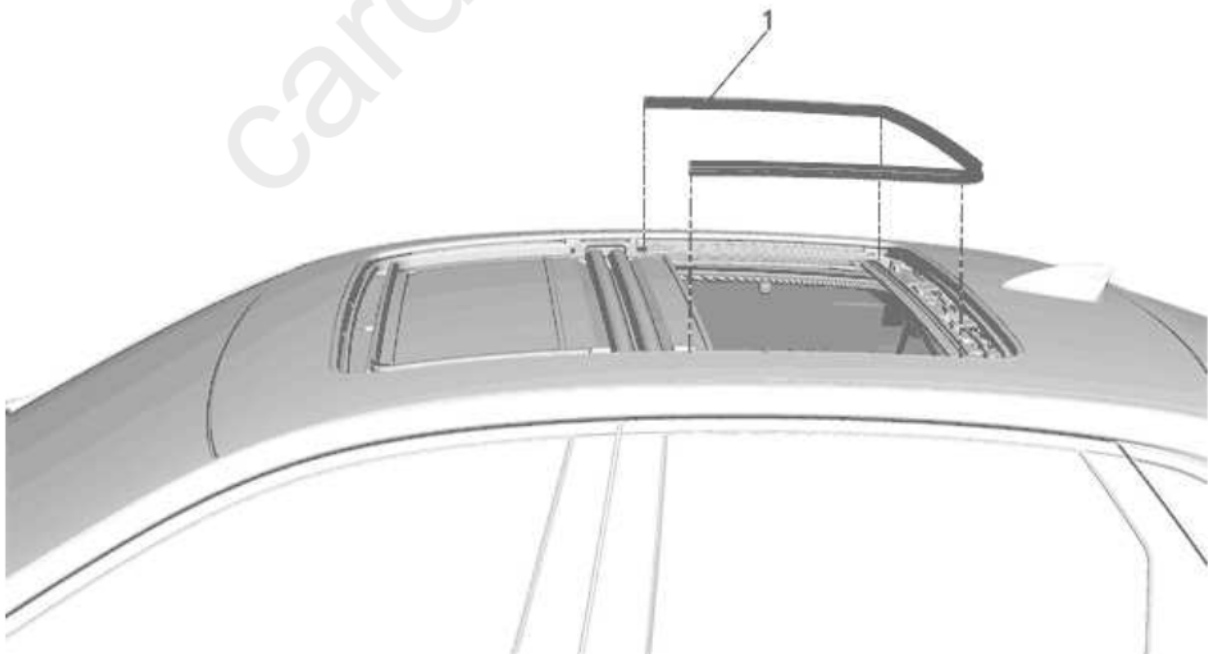


Fig. 43: Sunroof Window Seal

Courtesy of GENERAL MOTORS COMPANY

3. Pull rear half of inner middle seal (1) up and move to the side.



Fig. 44: Rear Half Of Inner Middle Seal

Courtesy of GENERAL MOTORS COMPANY

4. Using a suitable tool, remove the fabric clip (1) while holding the sunshade fabric, not to let it rewind all the way in.

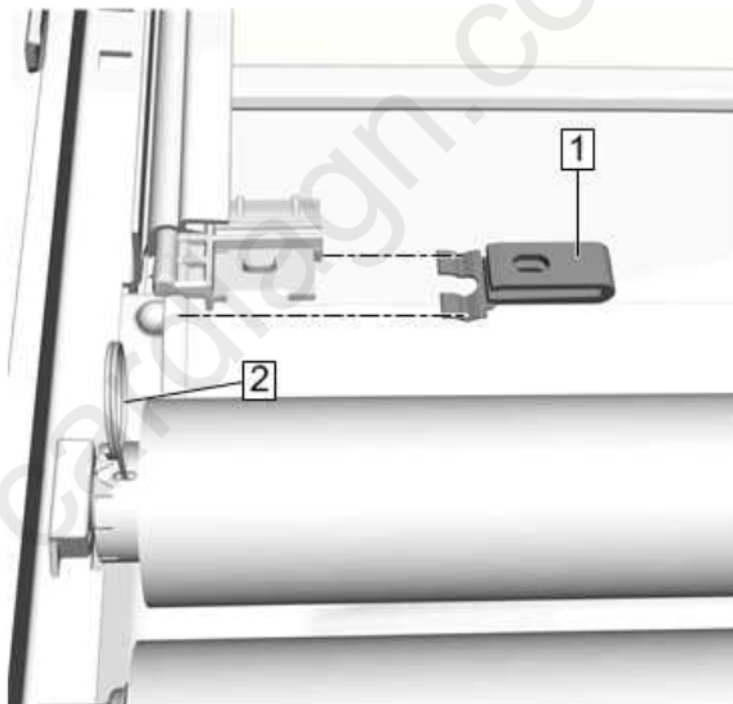


Fig. 45: Fabric Clip

Courtesy of GENERAL MOTORS COMPANY

5. Hold and let the fabric wind up slow until the sunshade locking pin (2) can be installed into the sunshade hole.
6. If the sunshade spring releases, it will be necessary to rewind it and reinstall the pin tool.
7. Pull the sunshade edge stiffener (1) from the sunroof side rail guide.

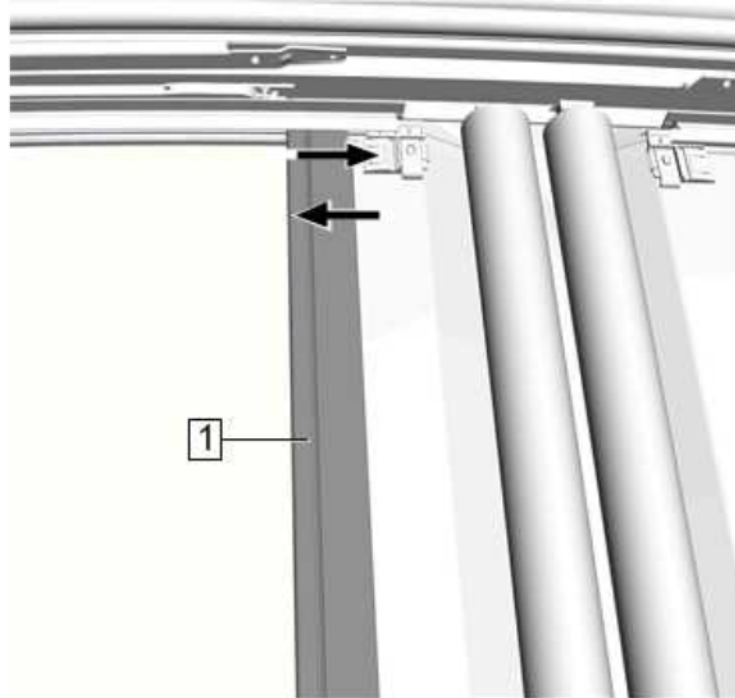


Fig. 46: Sunshade Edge Stiffener

Courtesy of GENERAL MOTORS COMPANY

8. Remove the screw (1) that retains the sunshade (2) to the sunroof housing.

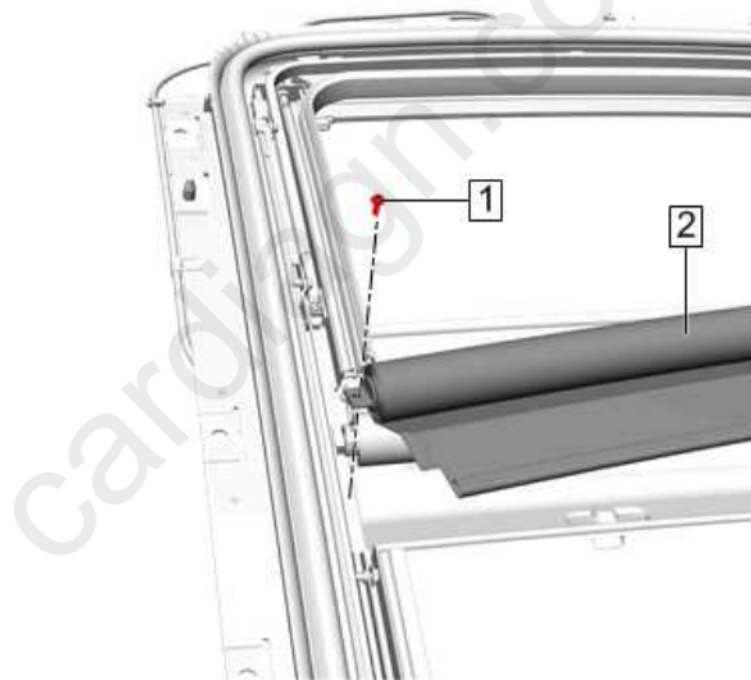


Fig. 47: Sunshade

Courtesy of GENERAL MOTORS COMPANY

9. Pull the sunshade (1) up and away from sunroof housing.

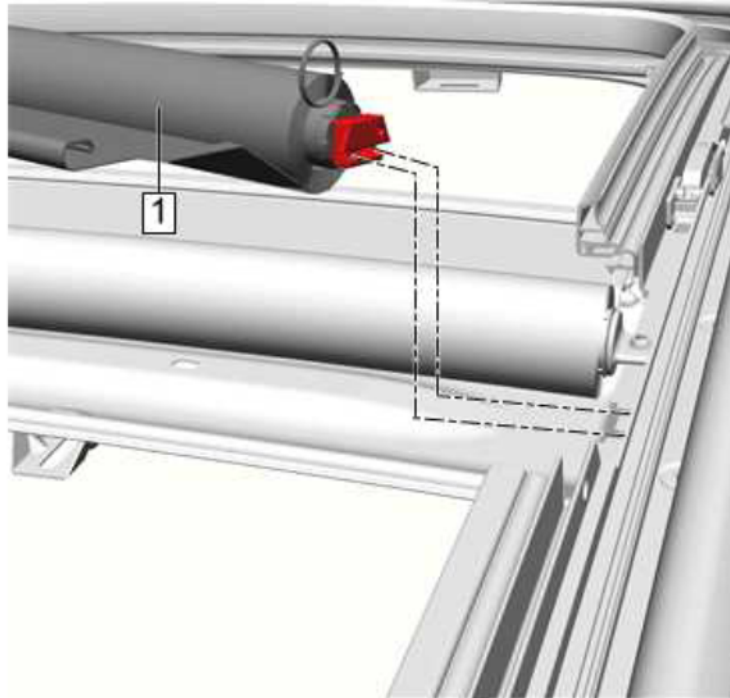


Fig. 48: Sunshade

Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Place the end of the sunshade (1) with the tension clip into the grooves at the sunroof housing.

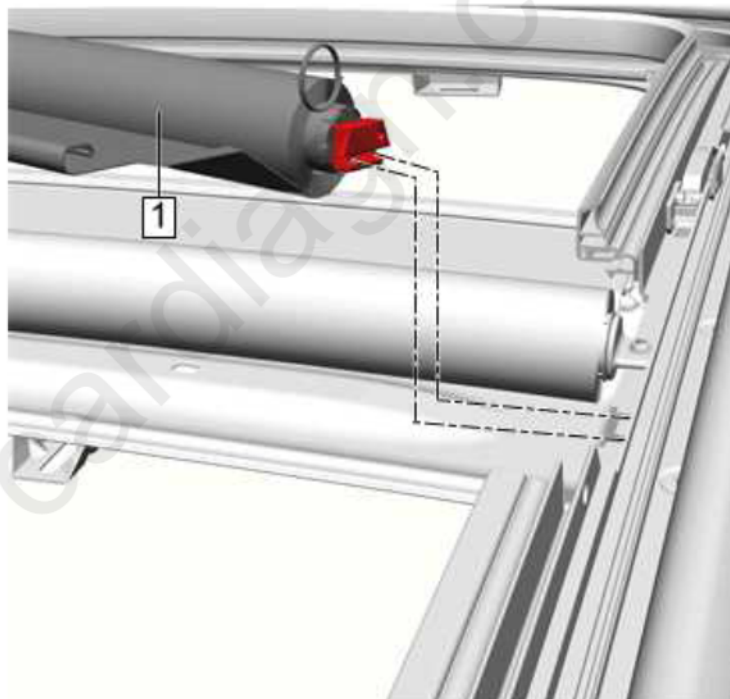


Fig. 49: Sunshade

Courtesy of GENERAL MOTORS COMPANY

2. Install the screw (1) that retains the sunshade to the sunroof housing and tighten screw to 2.5 N.m (22 lb in).

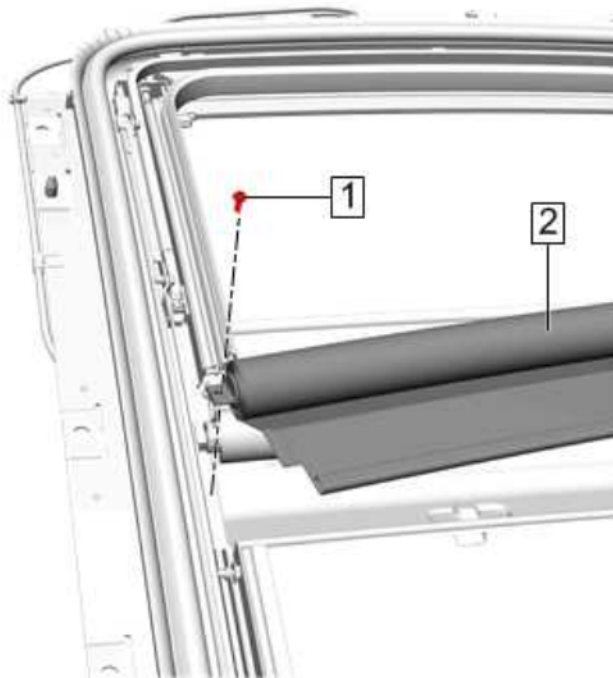


Fig. 50: Sunshade

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

3. Install the sunroof edge stiffener (1) to the sunshade side rail guide.



Fig. 51: Sunshade Edge Stiffener

Courtesy of GENERAL MOTORS COMPANY

4. Place the sunshade fabric outer end over the outer edge of the fabric clip. (1)

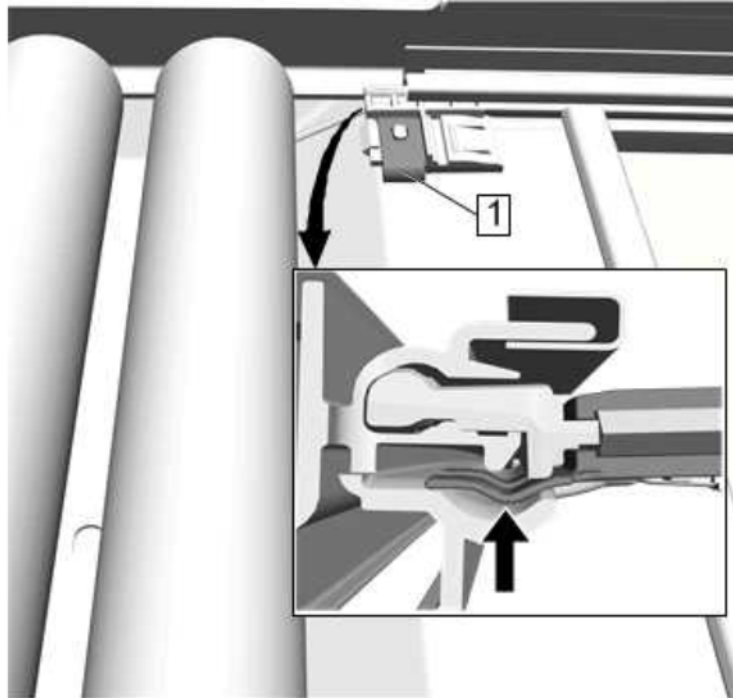


Fig. 52: Sunshade Fabric Outer End

Courtesy of GENERAL MOTORS COMPANY

5. Ensure the fabric clip is in the proper grooves of the sunroof housing.
6. A new service part sunshade comes pre-loaded with a pin tool (1) holding spring tension on the sunshade. If the sunshade spring releases, it will be necessary to rewind it and reinstall the pin tool.



Fig. 53: Pin Tool

Courtesy of GENERAL MOTORS COMPANY

7. Remove the pin tool (1) that holds the sunshade tension.
8. Place rear half of inner middle seal (1) back to prior removal.

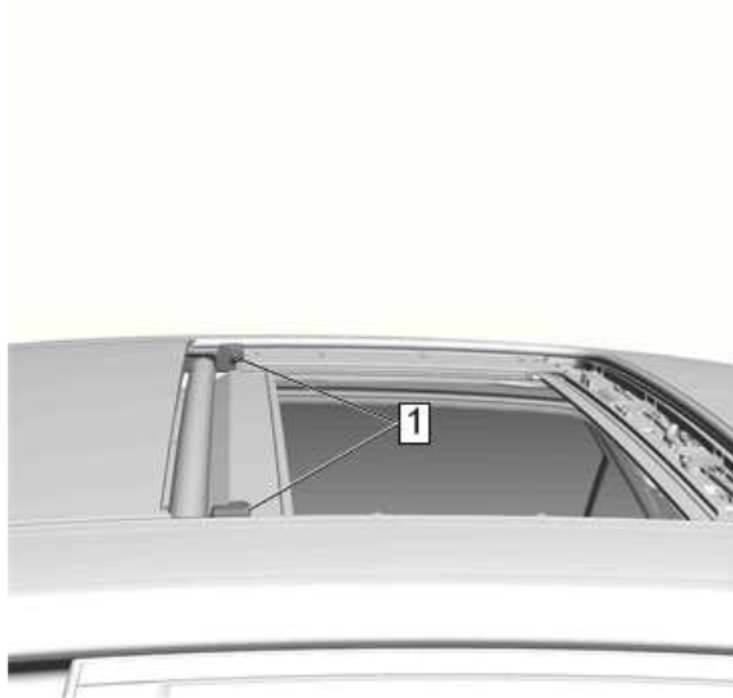


Fig. 54: Rear Half Of Inner Middle Seal

Courtesy of GENERAL MOTORS COMPANY

9. Sunroof Window Seal (1) » Install - [Sunroof Window Seal Replacement \(Outer Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Front Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Rear Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Middle Seal With C3U\)](#)

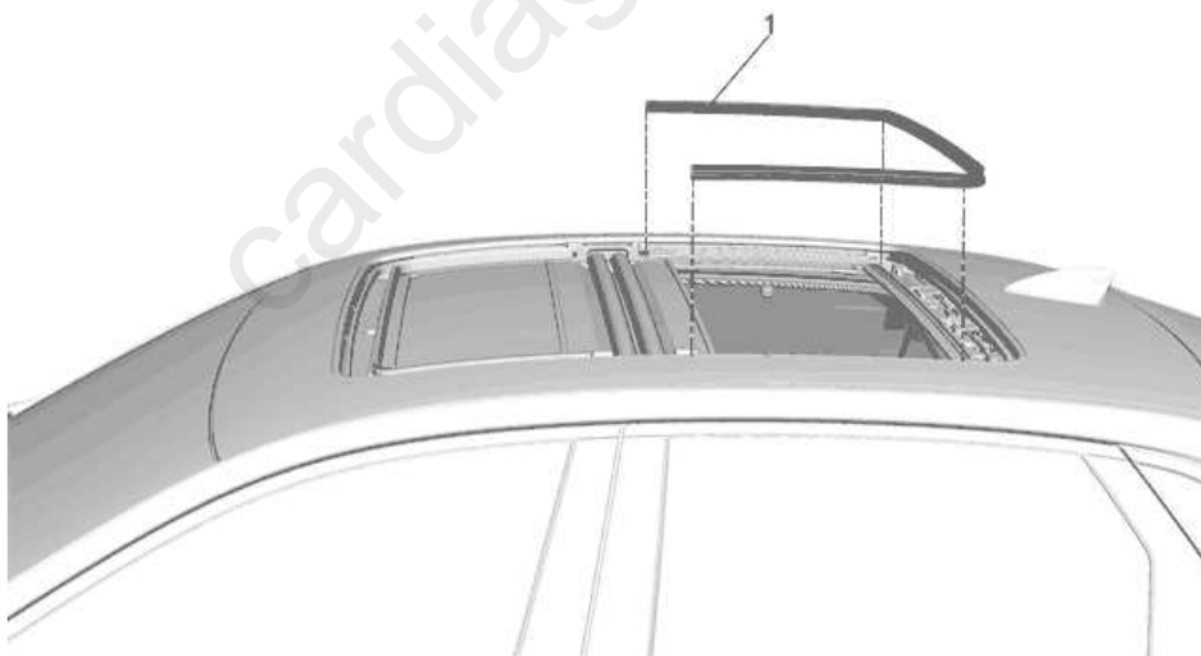


Fig. 55: Sunroof Window Seal

Courtesy of GENERAL MOTORS COMPANY

10. Roof Stationary Window (2) » Install - [Roof Stationary Window Replacement](#)

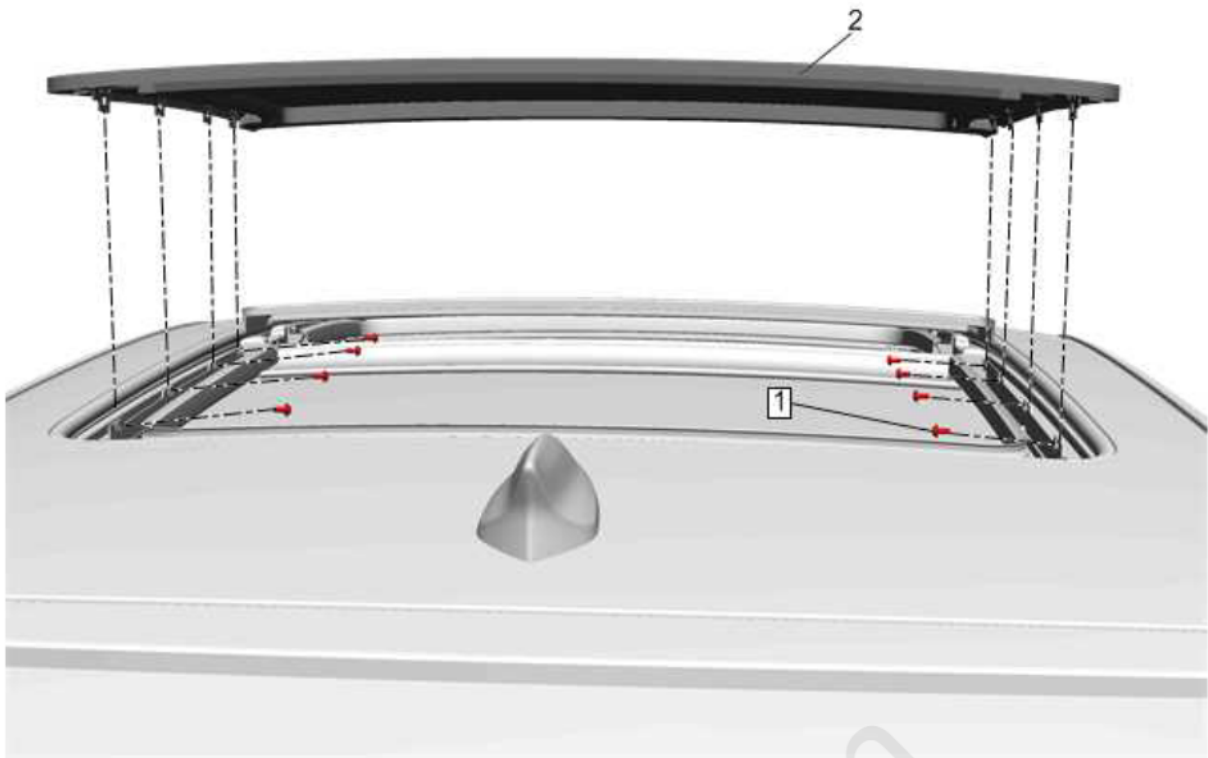


Fig. 56: Roof Stationary Window

Courtesy of GENERAL MOTORS COMPANY

SUNROOF SUNSHADE REPLACEMENT (WITH C3U FRONT)

Removal Procedure

1. Sunroof Window (1) » Remove - [Sunroof Window Replacement \(Front\)](#)



Fig. 57: Sunroof Window

Courtesy of GENERAL MOTORS COMPANY

2. Sunroof Window Seal (1) » Remove - [Sunroof Window Seal Replacement \(Outer Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Front Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Rear Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Middle Seal With C3U\)](#)



Fig. 58: Sunroof Window Seal

Courtesy of GENERAL MOTORS COMPANY

3. Pull front half of inner middle seal (1) up and move to the side.

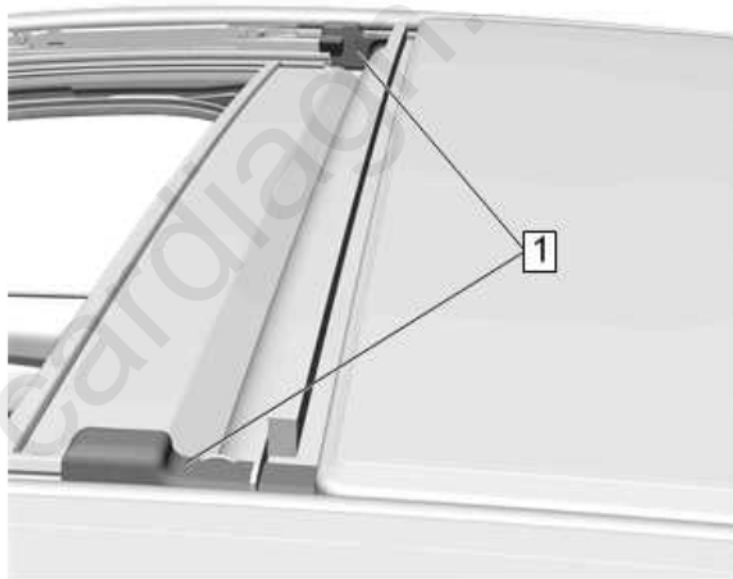


Fig. 59: Inner Middle Seal

Courtesy of GENERAL MOTORS COMPANY

4. Using a suitable tool, remove the fabric clip (1) while holding the sunshade fabric, not to let it rewind all the way in.

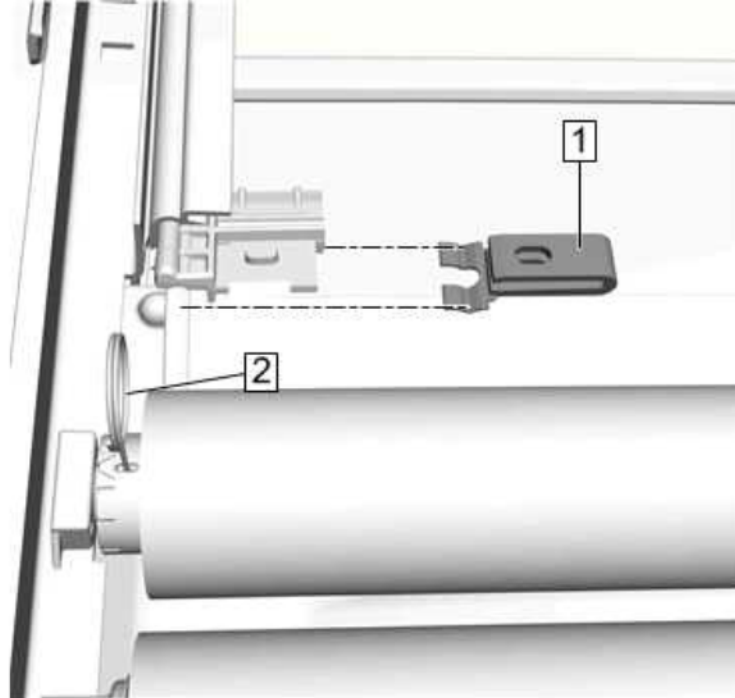


Fig. 60: Fabric Clip

Courtesy of GENERAL MOTORS COMPANY

5. Hold and let the fabric wind up slow until the sunshade locking pin (2) can be installed into the sunshade hole.
6. If the sunshade spring releases, it will be necessary to rewind it and reinstall the pin tool.
7. Pull the sunshade edge stiffener (1) from the sunroof side rail guide.



Fig. 61: Sunshade Edge Stiffener

Courtesy of GENERAL MOTORS COMPANY

8. Remove the screw (1) that retains the sunshade (2) to the sunroof housing.

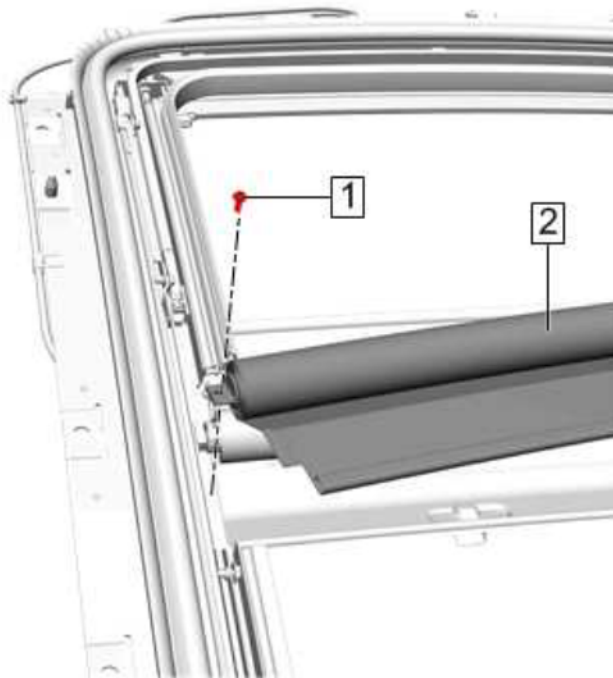


Fig. 62: Sunshade

Courtesy of GENERAL MOTORS COMPANY

9. Pull the sunshade (1) up and away from sunroof housing.

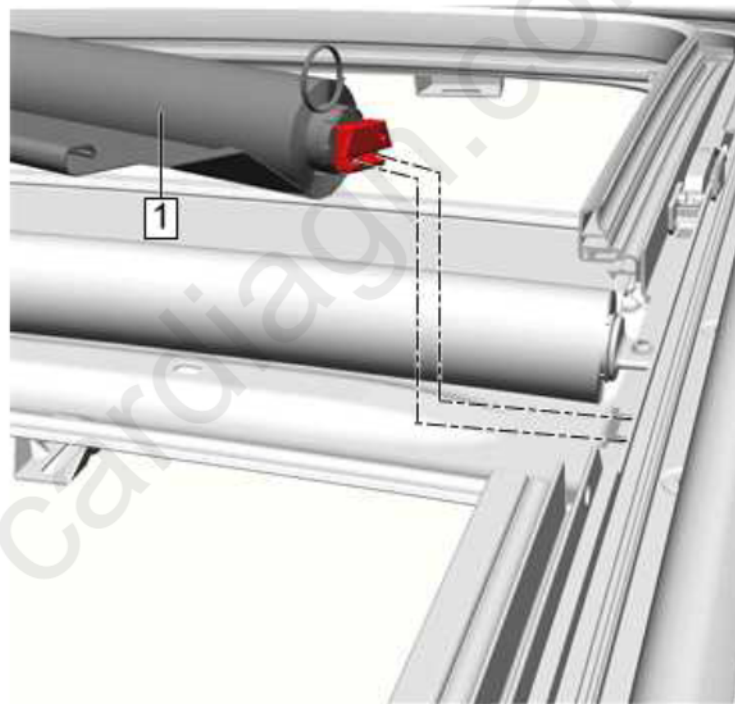


Fig. 63: Sunshade

Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Place the end of the sunshade (1) with the tension clip into the grooves at the sunroof housing.

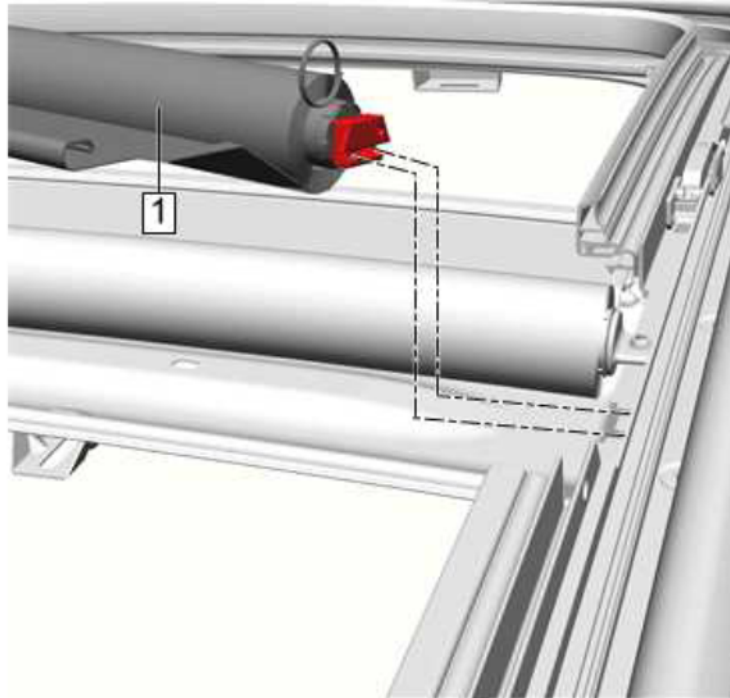


Fig. 64: Sunshade

Courtesy of GENERAL MOTORS COMPANY

2. Install the screw (1) that retains the sunshade to the sunroof housing and tighten screw to 2.5 N.m (22 lb in).

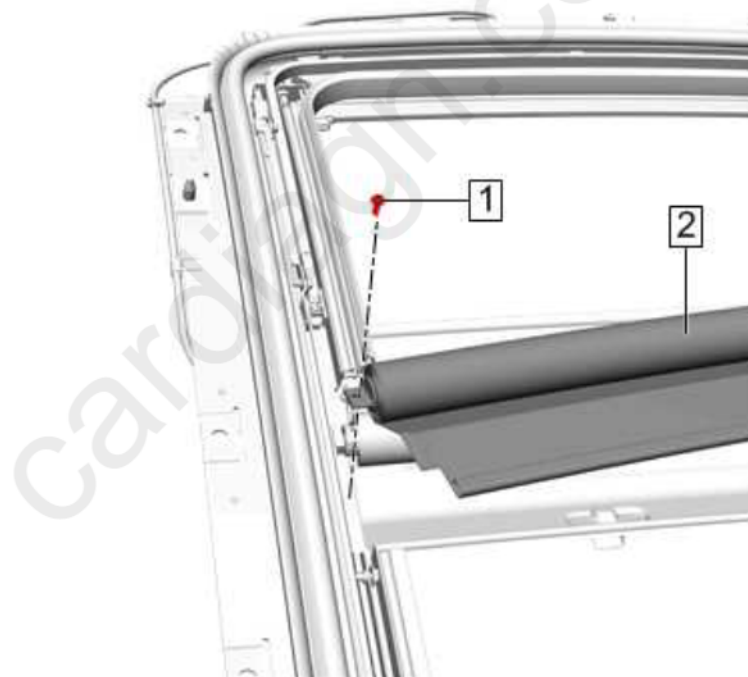


Fig. 65: Sunshade

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

3. Install the sunroof edge stiffener (1) to the sunshade side rail guide.

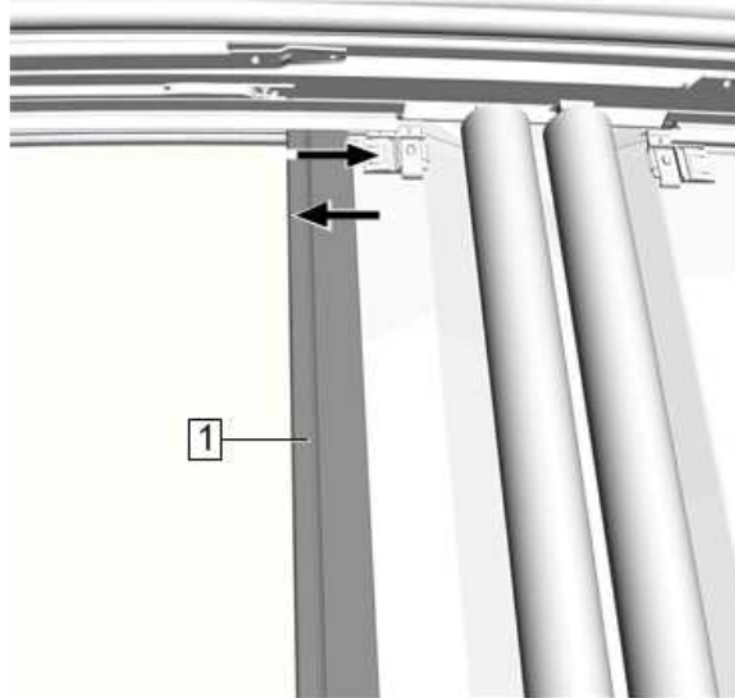


Fig. 66: Sunshade Edge Stiffener

Courtesy of GENERAL MOTORS COMPANY

4. Place the sunshade fabric outer end over the outer edge of the fabric clip. (1)

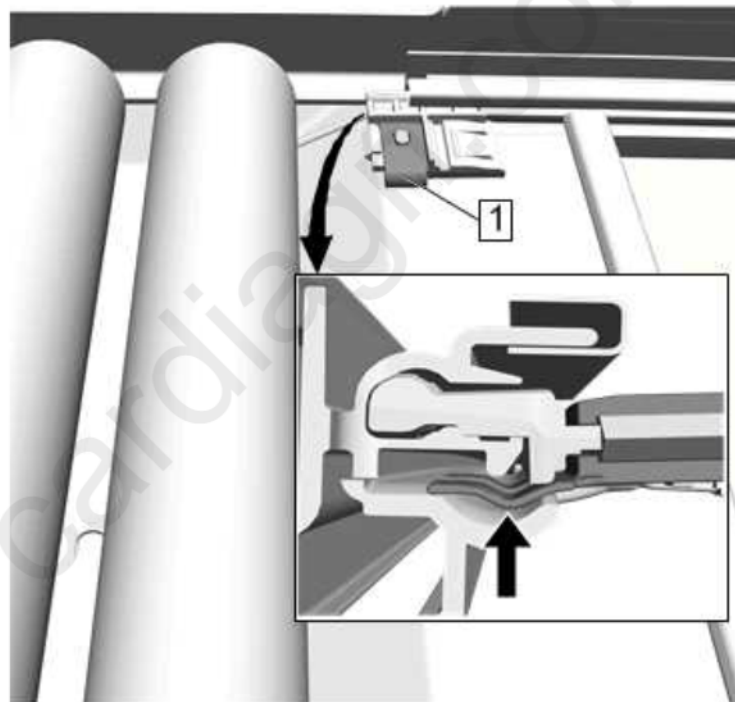


Fig. 67: Sunshade Fabric Outer End

Courtesy of GENERAL MOTORS COMPANY

5. Ensure the fabric clip is in the proper grooves of the sunroof housing.
6. A new service part sunshade comes pre-loaded with a pin tool (1) holding spring tension on the sunshade. If the sunshade spring releases, it will be necessary to rewind it and reinstall the pin tool.

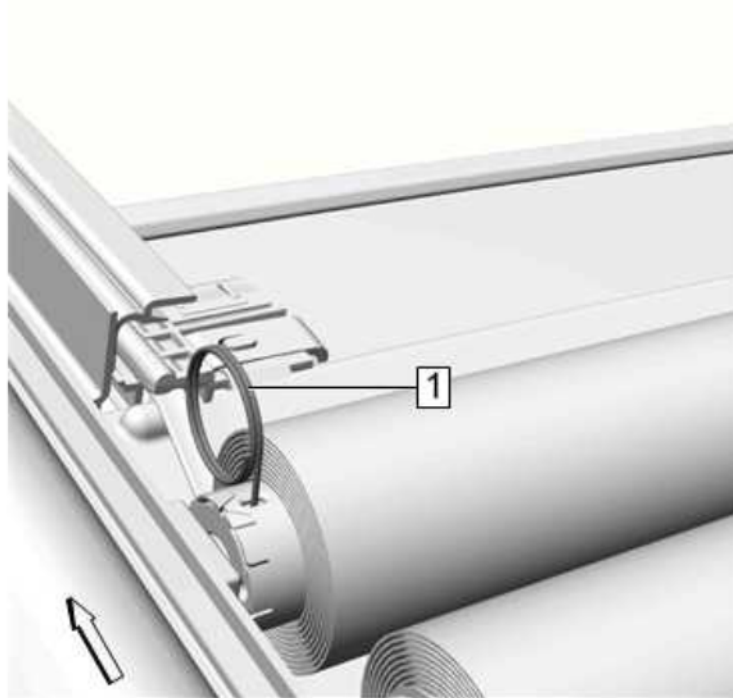


Fig. 68: Pin Tool

Courtesy of GENERAL MOTORS COMPANY

7. Remove the pin tool (1) that holds the sunshade tension.
8. Place front half of inner middle seal (1) back to prior removal.

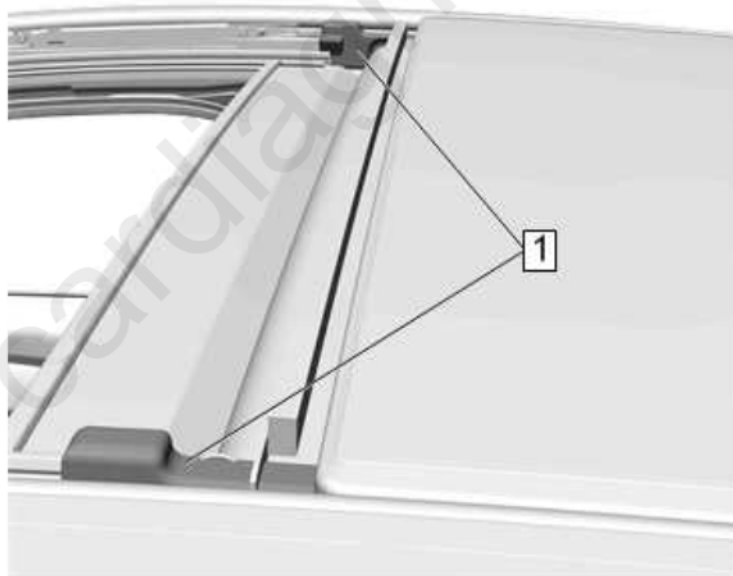


Fig. 69: Inner Middle Seal

Courtesy of GENERAL MOTORS COMPANY

9. Sunroof Window Seal (1) » Install - [Sunroof Window Seal Replacement \(Outer Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Front Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Rear Seal With C3U\)](#)[Sunroof Window Seal Replacement \(Inner Middle Seal With C3U\)](#)



Fig. 70: Sunroof Window Seal

Courtesy of GENERAL MOTORS COMPANY

10. Sunroof Window (1) » Install - **Sunroof Window Replacement (Front)**



Fig. 71: Sunroof Window

Courtesy of GENERAL MOTORS COMPANY

SUNROOF WINDOW SEAL REPLACEMENT (OUTER SEAL WITH C3U)

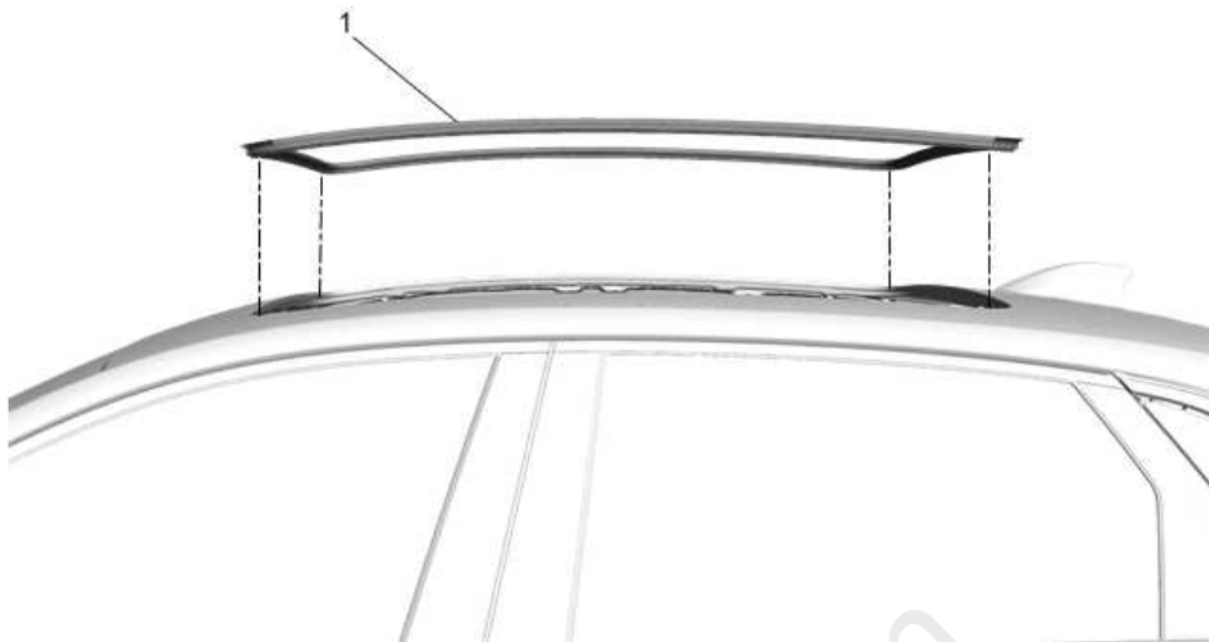


Fig. 72: Sunroof Window Seal

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Sunroof Housing Replacement (With C24)</u><u>Sunroof Housing Replacement (Without C24)</u>	
1	Sunroof Window Seal Procedure 1. Start at one end of the seal, pulling up and away from the housing. 2. Clean around the edge of the inside surface of the housing with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint-free cloth. 3. Water test the vehicle before installing the headlining trim panel.

SUNROOF WINDOW SEAL REPLACEMENT (OUTER SEAL WITHOUT C3U)

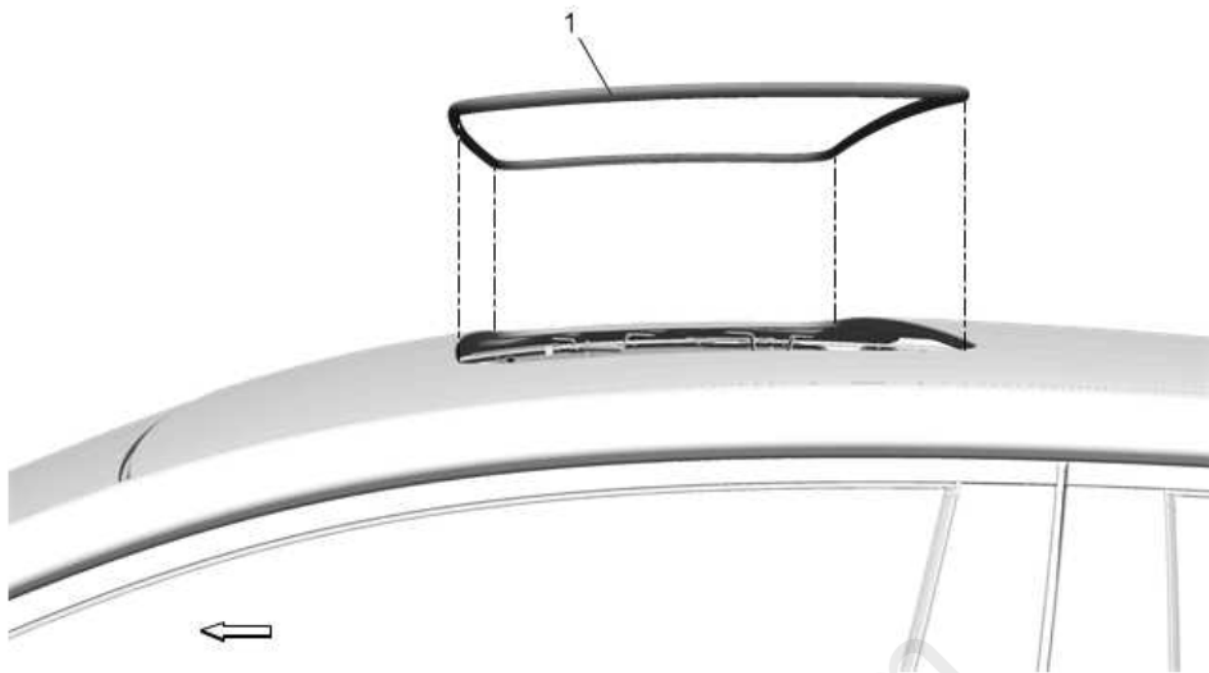


Fig. 73: Sunroof Window Seal

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Sunroof Housing Replacement (With C24)</u> <u>Sunroof Housing Replacement (Without C24)</u>	
1	Sunroof Window Seal Procedure 1. Start at one end of the seal, pulling up and away from the housing. 2. Clean around the edge of the inside surface of the housing with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint-free cloth. 3. Water test the vehicle before installing the headlining trim panel.

SUNROOF WINDOW SEAL REPLACEMENT (INNER FRONT SEAL WITH C3U)

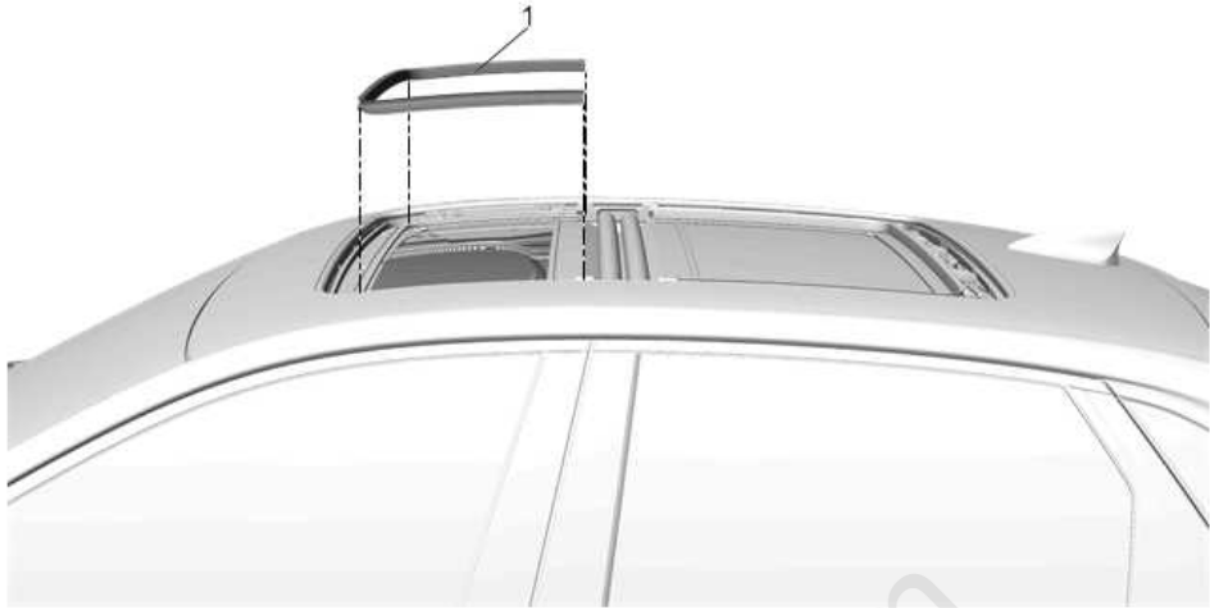


Fig. 74: Sunroof Window Seal

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Open the front sunroof window to the full open position.	
1	Sunroof Window Seal Procedure 1. Start at one end of the seal, pulling up and away from the frame. 2. Clean around the edge of the inside surface of the housing with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint-free cloth. 3. Water test the vehicle.

SUNROOF WINDOW SEAL REPLACEMENT (INNER REAR SEAL WITH C3U)

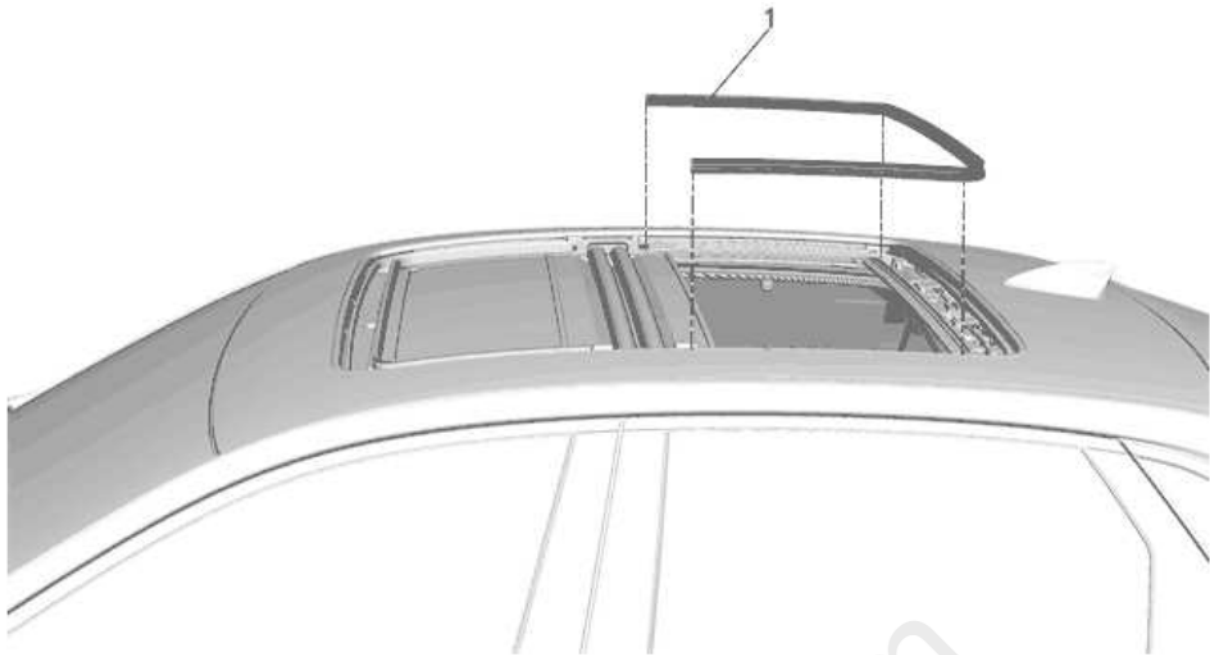


Fig. 75: Sunroof Window Seal

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
<u>Roof Stationary Window Replacement</u>	
1	Sunroof Window Seal Procedure 1. Start at one end of the seal, pulling up and away from the frame. 2. Clean around the edge of the inside surface of the housing with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint-free cloth. 3. Water test the vehicle.

SUNROOF WINDOW SEAL REPLACEMENT (INNER MIDDLE SEAL WITH C3U)

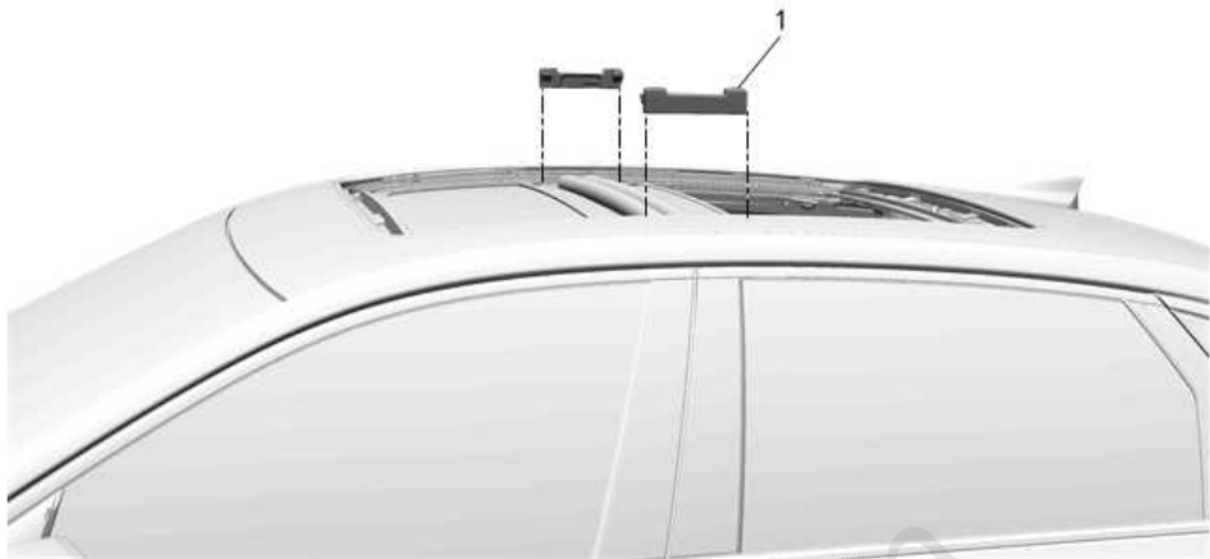


Fig. 76: Sunroof Window Seal

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures <u>Sunroof Window Replacement (Front)</u> <u>Roof Stationary Window Replacement</u>	
1	Sunroof Window Seal [2x] Procedure 1. Start at one end of the seal, pulling up and away from the frame. 2. Clean around the edge of the inside surface of the housing with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint-free cloth. 3. Water test the vehicle.

SUNROOF SUNSHADE SWITCH REPLACEMENT

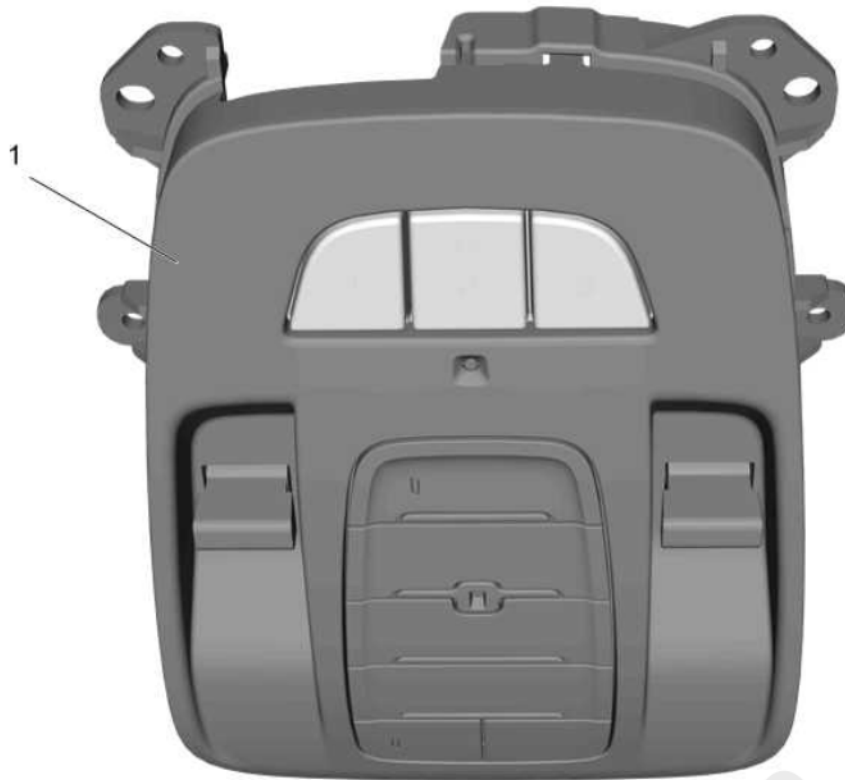


Fig. 77: Sunroof Sunshade Switch

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Roof Console Replacement</u>	
1	Sunroof Sunshade Switch Procedure 1. Release the tabs and remove the switch. 2. Disconnect all electrical connectors. 3. Transfer components as necessary.

ROOF STATIONARY WINDOW REPLACEMENT

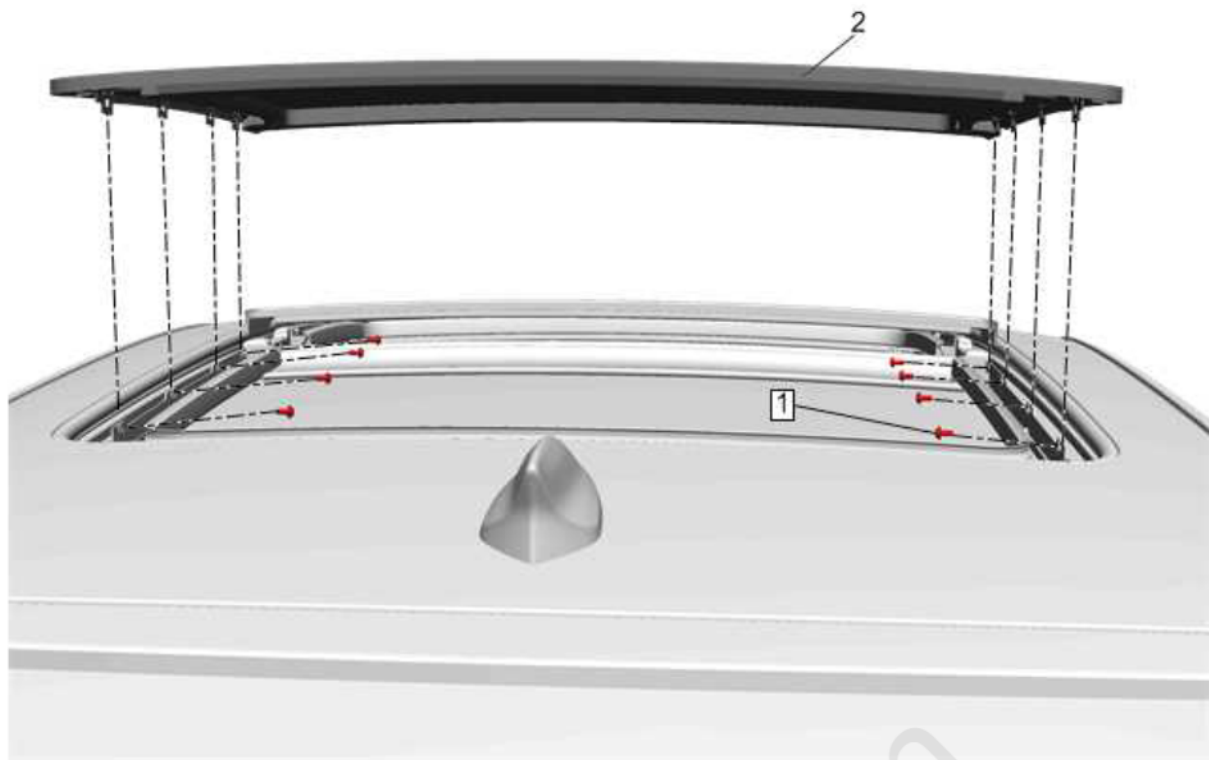


Fig. 78: Roof Stationary Window

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Place the sunroof front window in the vent position.	
1	Sunroof Window Screw [8x] CAUTION: Refer to Fastener Caution . Procedure Pull down on the inner sunroof window seal to gain access to the stationary window screws. Tighten 4 N.m (35 lb in)
2	Roof Stationary Window Procedure 1. Lift the stationary window from the sunroof housing. 2. Sunroof Window Height and Opening Fit Adjustment 3. Water test and inspect sunroof for proper operation.

SUNROOF WINDOW HEIGHT AND OPENING FIT ADJUSTMENT

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

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

2. Cycle the sunroof window to the closed position.
3. Loosen the adjusting screws (1) on left and right sides of the window to guide cables.

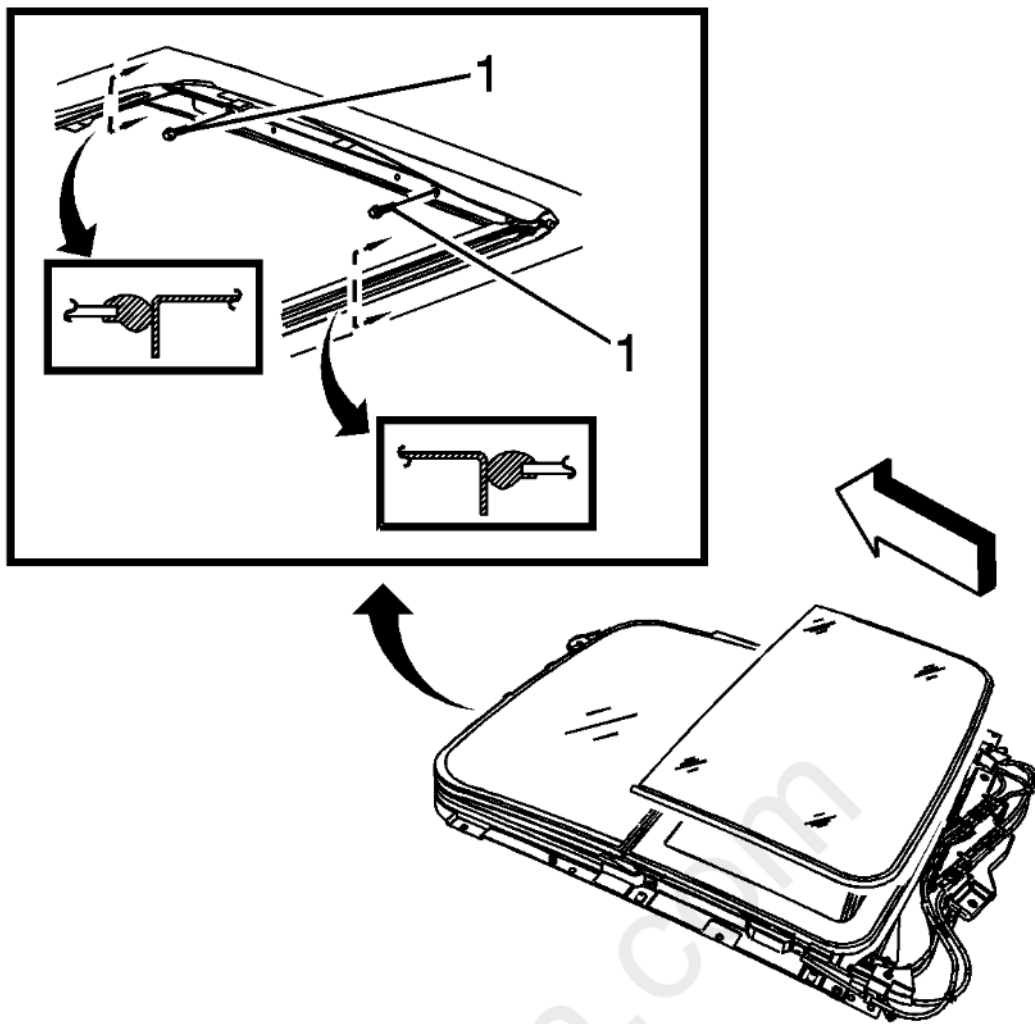


Fig. 79: Adjusting Sunroof Window Height & Opening Fit
 Courtesy of GENERAL MOTORS COMPANY

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

To ensure proper adjustment on the sunroof windows all four (8) screws (1) Must be loosen.

4. Adjust sunroof window to a uniform seal tension fore/aft and panel to panel.
5. Adjust the corners of the sunroof window using the following guidelines:
 - Adjust the front edge of the sunroof window to 0.0 mm - 1.5 mm (0.0 in - 0.06 in) below the top surface of the roof panel.
 - Adjust the rear edge of the sunroof window to the roof 0.0 mm + 1.0 mm (0.0 in +.04 in).
6. Tighten the adjusting screws (1) on left and right sides of the sunroof windows to 4 N.m (35 lb in).

CAUTION: Refer to **Fastener Caution** .

7. Cycle sunroof window to vent, then close. Cycle the sunroof window from full open to closed position.
8. Using 0.25 mm (0.01 in) shim or a similar item to check the sunroof window seal for even compression around the seal opening.
9. Inspect the sunroof window adjustment. Adjust if necessary.
10. Water test the sunroof window to ensure No leaks.

SUNROOF WINDOW REPLACEMENT (FRONT)

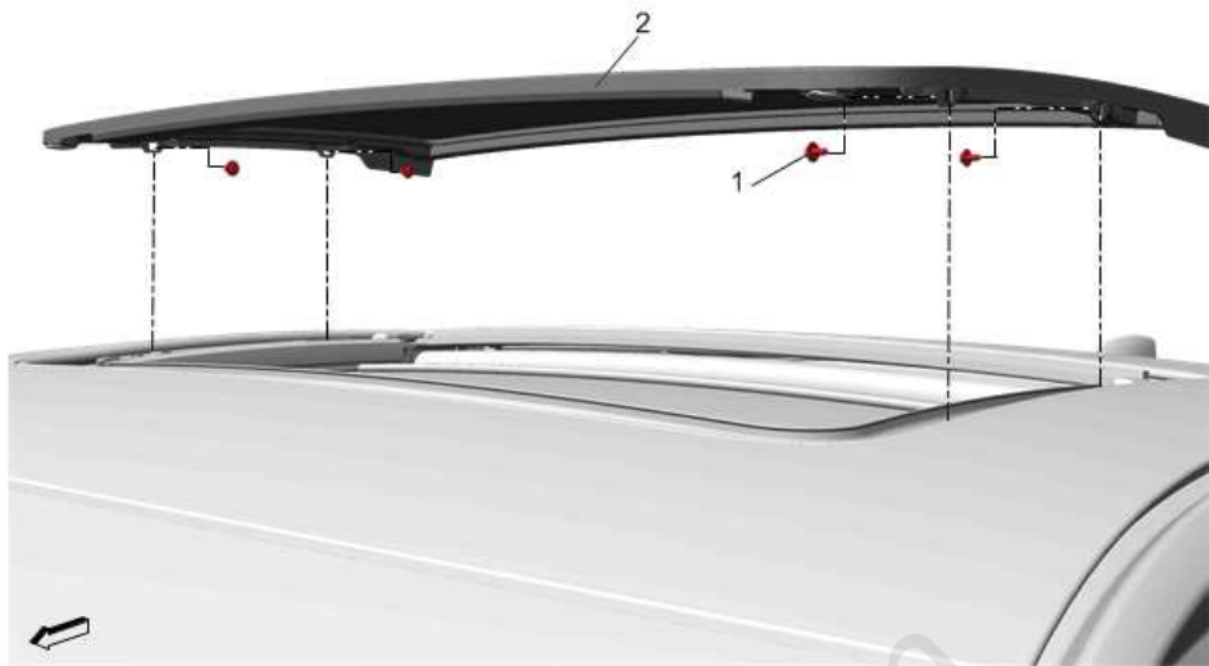


Fig. 80: Sunroof Window (Front)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Open the sunshade. 2. Position the front sunroof window in the vent position.	
1	Sunroof Window Screw [4x] CAUTION: Refer to Fastener Caution . Tighten 4 N.m (35 lb in)
2	Sunroof Window Procedure 1. Align the side sunroof window brackets to the left and right side of the housing frame. 2. Close the sunroof and adjust sunroof window if needed. 3. Sunroof Window Height and Opening Fit Adjustment 4. Inspect sunroof for proper operation and water test to ensure no leaks.

DESCRIPTION AND OPERATION

SUNROOF DESCRIPTION AND OPERATION (CF5)

The tilt/slide sunroof consists of a moving glass panel and a manual sunshade. In the tilt/slide sunroof system the rear of the glass tilts up for venting and slides between the head liner and roof panel as it slides open. The glass is controlled by an integrated motor/controller. The sunshade has a mechanical connection to the glass causing it to open with the glass and keeping it from closing more than the glass.

The electrical portion of the tilt/slide sunroof system consists of:

- Body control module (BCM)
- Sunroof glass control module
- Sunroof control switch assembly
- Vent control switch assembly
- Serial Data Bus

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

As the system master, the BCM uses the serial data communication bus to enable or disable sunroof operation, communicate vehicle information to the sunroof controller and request sunroof movement. The sunroof controller provides system status and diagnostic information to the BCM for diagnostic reporting and operational purposes.

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

The operational calibrations for the sunroof integrated motor/controller are loaded over the serial data communication bus by the sunroof system master, the BCM.

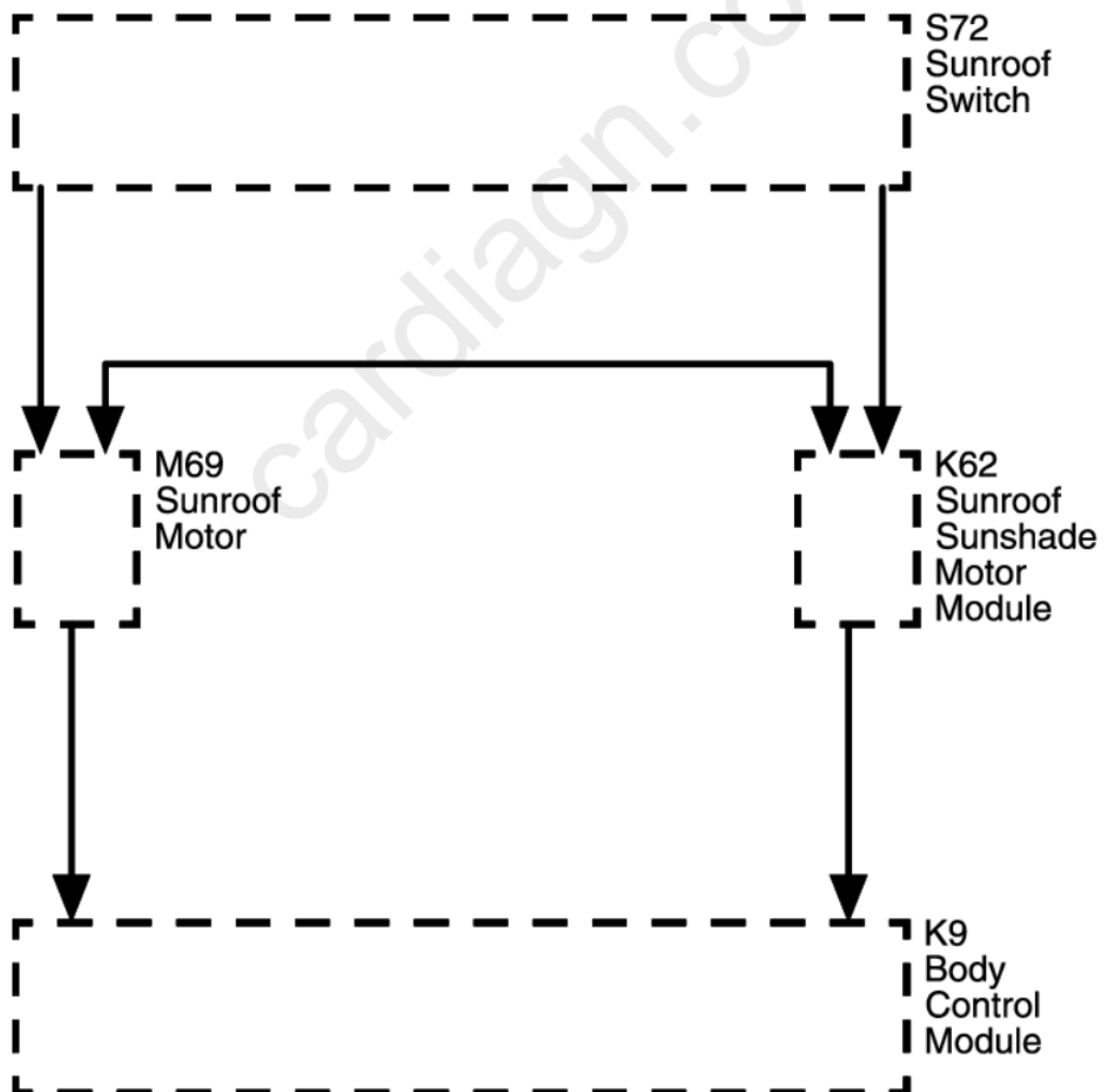


Fig. 81: Sunroof System Block Diagram
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S72	S72 Sunroof Switch
M69	M69 Sunroof Motor
K62	K62 Sunroof Sunshade Motor Module
K9	K9 Body Control Module

Sunroof Control Switches

The sunroof control switches are connected directly to the controller. The sliding glass switches provide detent positions for open, express open, off, close and express close. The vent switches provide detent positions for open, off and close. The control switch completes the circuit between two signals provided by the control module, a reference ground input and a pull-up voltage provided by an analog to digital switch input. The control switches place a different resistor ladder network in the circuit depending on the function selected. The controller's analog to digital switch input reads the resulting voltage range and determines the function as indicated in the included charts.

System Protection Functions

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

Obstacle or Blockage Detection

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

Motor Stall

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

Sunroof System Thermal Protection

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

Sunroof Operation

Open to Vent Position

When the sunroof is closed or in a partial vent position and the sunroof vent open switch becomes active, the sunroof shall begin to express open to the vent position. Sunroof motion shall cease when the sunroof reaches the vent position or if the sunroof sliding glass switch becomes active.

Close from Vent

When the sunroof is in the vent position and the sunroof vent switch enters the Close state, the sunroof will begin to express close the sunroof. Motion will continue until the sunroof has reached its fully closed position or if the sunroof sliding glass switch becomes active.

Normal Open (Non-Express)

When the sunroof is not in a vent position and the sunroof sliding glass switch is held in the Open position, the sunroof will begin opening. Motion will continue until the switch returns to the Off state or the vent switch transitions to any active state.

Sunroof Express Open

When the sunroof control switch transitions to the Express Open state and the sunroof is not in a vent position, the sunroof will express open until the controller determines the sunroof has reached the comfort stop position or the fully Open position, the switch transitions to another state after first returning to the Off position or the vent switch transitions to an active state.

Normal Close (Non-Express)

When the sunroof switch is in the Close state and the sunroof is not in the vent position, the controller will begin moving the sunroof in the close direction. If the vent switch becomes active the motor will be turned off.

Sunroof Express Close

When the sunroof switch is in the Express Close state and the sunroof is not in a vent position, the sunroof will express close until the controller determines the sunroof has reached the fully closed position or the switch transitions to another state after first returning to the Off position. The sunroof motion will cease if the switch transitions back to the Close or Express Close state after returning to the Off position first or the vent switch transitions to any active state.

SUNROOF DESCRIPTION AND OPERATION (C3U)

The sunroof is a Bottom Loaded top-Slide type sunroof system. The sunroof contains moving glass panel, a moving front sunshade and a moving rear sunshade. Moving Glass is controlled by Glass Motor Controller. Front shade and rear sunshade is controlled by Master Motor Controller.

The electrical portion of the tilt/slide sunroof system consists of:

- Body control module (BCM)
- Sunroof glass control module
- Sunroof control switch assembly
- Vent control switch assembly
- Serial Data Bus
- Sunshade control switch
- Rear Sunshade control switch

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

As the system master, the BCM uses the serial data communication bus to enable or disable sunroof operation, communicate vehicle information to the sunroof controller and request sunroof movement. The sunroof controller provides system status and diagnostic information to the BCM for diagnostic reporting and operational purposes.

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

The left rear and right rear door sunshade switches are dual function switches, pressing one side of the switch will command the rear window sunshade to extend or retract, pressing the other side of the switch will command the rear sunroof sunshade to extend or retract.

The operational calibrations for the sunroof integrated motor/controller are loaded over the serial data communication bus by the sunroof system master, the BCM.

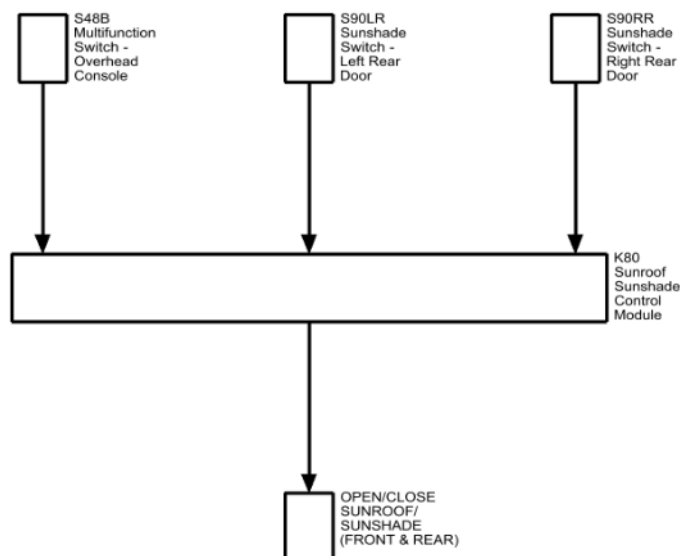


Fig. 82: Sunroof System Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S48B	S48B Multifunction Switch - Overhead Console
S90LR	S90LR Sunshade Switch - Left Rear Door
S90RR	S90RR Sunshade Switch - Right Rear Door
K80	K80 Sunroof Sunshade Control Module

Sunroof Control Switches

The sunroof control switches are connected directly to the controller. The sliding glass switches provide detent positions for open, express open, off, close and express close. The vent switches provide detent positions for open, off and close. The control switch completes the circuit between two signals provided by the control module, a reference ground input and a pull-up voltage provided by an analog to digital switch input. The control switches place a different resistor ladder network in the circuit depending on the function selected. The controller's analog to digital switch input reads the resulting voltage range and determines the function as indicated in the included charts.

System Protection Functions

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

Obstacle or Blockage Detection

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

Motor Stall

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

Sunroof System Thermal Protection

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

Sunroof Operation

Open to Vent Position

The Sunroof Shall be in close position. Where the user presses the vent open switch, the Sunroof shall move towards vent open position and shall stop when the vent open position is reached.

Close from Vent

The Sunroof Shall be in open position. Where the user presses the vent close switch, the Sunroof shall move towards vent close position and shall stop when the vent close position is reached.

Sunroof Express Open

When the sunroof control switch transitions to the Express Open state and the sunroof is not in a vent position, the sunroof will express open until the controller determines the sunroof has reached the comfort stop position or the fully Open position, the switch transitions to another state after first returning to the Off position or the vent switch transitions to an active state.

Sunroof Express Close

When the sunroof switch is in the Express Close state and the sunroof is not in a vent position, the sunroof will express close until the controller determines the sunroof has reached the fully closed position or the switch transitions to another state after first returning to the Off position. The sunroof motion will cease if the switch transitions back to the Close or Express Close state after returning to the Off position first or the vent switch transitions to any active state.

Sunshade Operation

Sunshade Express Open

The sunshade shall be in close position, the user will press the front shade switch, the sunshade shall move to open position and shall stop when the open position is reached.

Sunshade Express Close

The sunshade shall be in open position, the user will press the front shade switch, the sunshade shall move to close position and shall stop when the close position is reached.

Sunshade Manual Open

The sunshade shall be in close position, the user will press and hold front shade switch, the sunshade shall move towards open position as long as the switch is pressed and shall stop when the full open position is reached. If the switch input is interrupted then the sunshade shall stop.

Sunshade Manual Close

The sunshade shall be in open position, the user will press and hold rear shade switch, the sunshade shall move towards open position as long as the switch is pressed and shall stop when the open position is reached. If the switch input is interrupted then the sunshade shall stop.

Rear Sunshade Operation

Rear Sunshade Express Open

The sunshade shall be in close position, the user will press the rear shade switch, the sunshade shall move to open position and shall stop when the open position is reached.

Rear Sunshade Express Close

The sunshade shall be in open position, the user will press the rear shade switch, the sunshade shall move to close position and shall stop when the close position is reached.

Rear Sunshade Manual Open

The sunshade shall be in open position, the user will press and hold rear shade switch, the sunshade shall move towards close position as long as the switch is pressed and shall stop when the full close position is reached. If the switch input is interrupted then the sunshade shall stop.

Rear Sunshade Manual Close

The sunshade shall be in close position, the user will press and hold rear shade switch, the sunshade shall move towards open position as long as the switch is pressed and shall stop when the open position is reached. If the switch input is interrupted then the sunshade shall stop.

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