

2017 ACCESSORIES & EQUIPMENT

Floor Coverings and Headlinings - CT6

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Application	Specification
	Metric (English)
Roof Console Bolt	2.5 N.m (22 lb in)

ADHESIVES, FLUIDS, LUBRICANTS AND SEALERS

Application	Type of Material	GM Part Number
GM Vehicle Care Odor Eliminator	Fluids	Refer to Electronic Parts Catalog.

REPAIR INSTRUCTIONS

ELIMINATING UNWANTED ODORS IN VEHICLES

GM Vehicle Care Odor Eliminator, Refer to [Adhesives, Fluids, Lubricants and Sealers](#), may control or eliminate odors in the interior and luggage compartment areas of GM vehicles. This non-toxic, biodegradable, odorless product has been shown to greatly reduce or remove the following types of odor:

- Objectionable smells of mold and mildew resulting from vehicle water leaks
- Customer created odors, such as smoke

You may safely use GM Vehicle Care Odor Eliminator on fabrics, vinyl, leather, carpet and sound deadening materials. You may also induce this product into HVAC modules and instrument panel ducts for the control of non-bacterial related odors.

NOTE: This product leaves no residual scent and should not be used as an air freshener.

This product may result in the permanent elimination of an odor and may be preferable to customers whose allergies make them sensitive to perfumes. This product may effectively remove odors when directly contacting the odor source. In cases such as water leaks, use this product with diagnostic procedures to first eliminate the primary cause of the odor. Then use further applications on the residual odor to permanently correct the vehicle condition.

How to Use this Product

- Spray GM Vehicle Care Odor Eliminator directly or as an additive with carpet shampoo in steam cleaners.
- Do not use on any interior surface that plain water would deteriorate, because this product will have the same effect. Also avoid letting this product come into contact with vinegar or any acidic substance. Acid-based products will hamper the effectiveness of GM Vehicle Care Odor Eliminator.

- Complete eight page treatment sheets are enclosed within each case of GM Vehicle Care Odor Eliminator. These treatment instructions range from simple vehicle odor elimination to full step by step procedures for odor removal from water leaks.
- Instructions and cautions are printed on the bottle, but additional help is available. If you encounter a persistent or recurring odor, you may call to obtain additional information and usage suggestions.

FLOOR CARPET DRYING

If the carpet or the pad or insulator is wet, use the following criteria for drying or for replacing the components:

- For a 1-piece carpet assembly bonded to a cotton or a fiber padding, replace the entire assembly.
- For a 2-piece carpet assembly with a cotton or a fiber padding, replace the padding only. While the carpet is out of the vehicle, dry the carpet using the method described below.
- For a 1-piece carpet assembly bonded to a foam padding or attached to a synthetic padding, dry the carpet using the method described below.
- For a 2-piece carpet assembly with a synthetic padding, dry the assembly using the method described below.

Drying Method

1. If you observe puddles of liquid on the carpet face, use a wet vacuum to remove the excess moisture.
2. Blot the face of the carpet with a towel in order to absorb as much moisture as possible.
3. Point a fan at the affected area and air dry the carpet.

FRONT FLOOR PANEL CARPET REPLACEMENT - LEFT SIDE

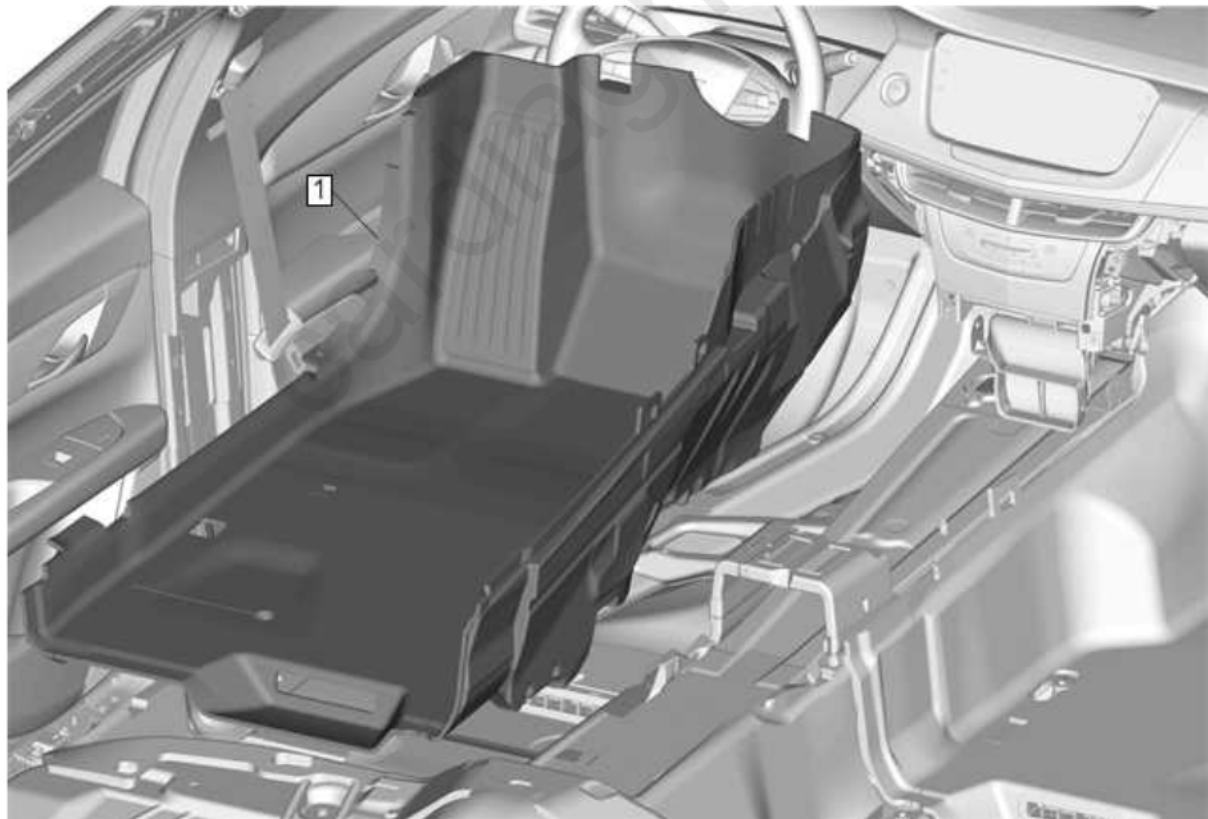


Fig. 1: Front Floor Panel Carpet - Left Side

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Callout	Component Name
Preliminary Procedures 1. It is only necessary to unbolt and move the seat rearward. Only do those steps in the seat removal and installation to gain enough access to the part. Refer to Driver or Passenger Seat Removal and Installation 2. Accelerator Pedal with Position Sensor Assembly Replacement 3. Front Side Door Sill Garnish Molding Replacement 4. Center Pillar Lower Trim Panel Replacement 5. Front Floor Lower Console Replacement (Left Side) Front Floor Lower Console Replacement (Right Side) 6. Remove the auxiliary floor air outlet. Refer to Floor Rear Air Outlet Duct Replacement - Left Side	
1	Front Floor Panel Carpet

FRONT FLOOR PANEL CARPET REPLACEMENT - RIGHT SIDE

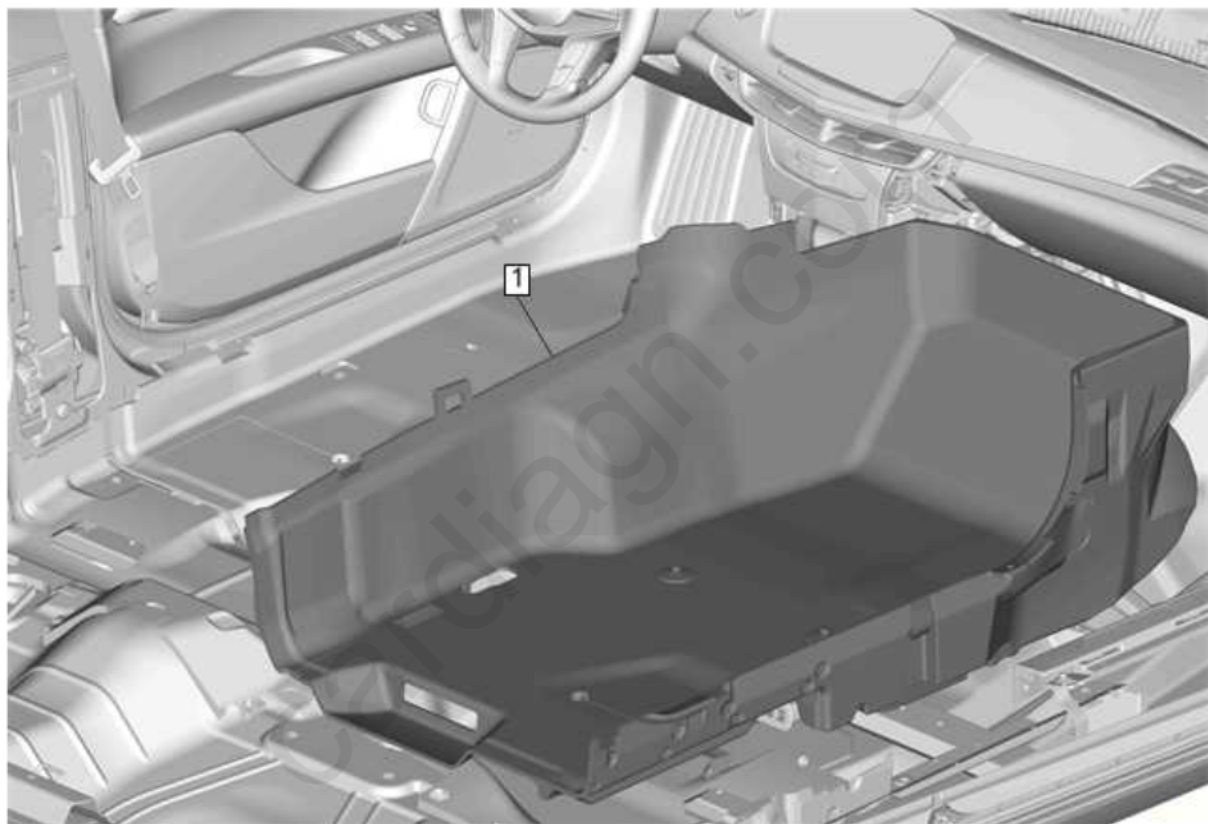


Fig. 2: Front Floor Panel Carpet - Right Side
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. It is only necessary to unbolt and move the seat rearward. Only do those steps in the seat removal and installation to gain enough access to the part. Refer to Driver or Passenger Seat Removal and Installation 2. Front Side Door Sill Garnish Molding Replacement 3. Center Pillar Lower Trim Panel Replacement 4. Front Floor Lower Console Replacement (Left Side) Front Floor Lower Console Replacement (Right Side) 5. Floor Rear Air Outlet Duct Replacement - Right Side	
1	Front Floor Panel Carpet

REAR FLOOR PANEL CARPET REPLACEMENT

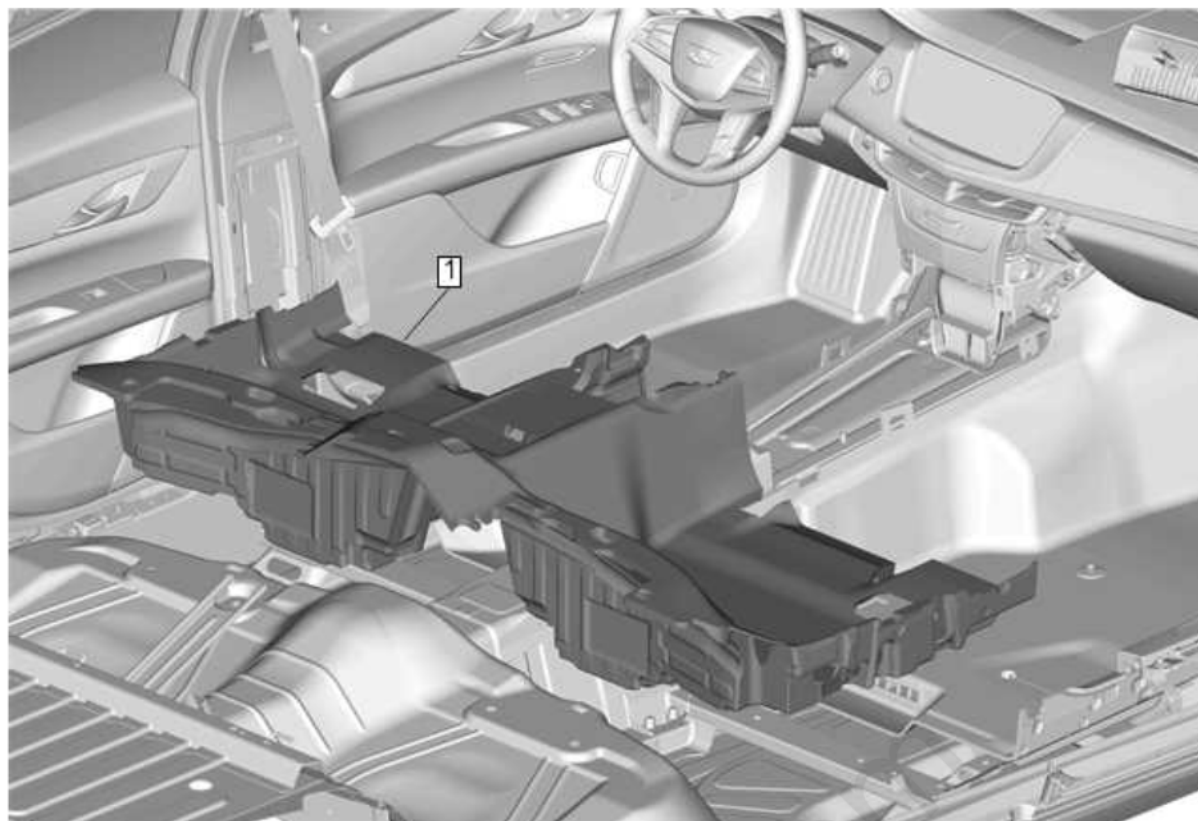


Fig. 3: Rear Floor Panel Carpet

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures <u>Driver or Passenger Seat Removal and Installation</u> <u>Rear Seat Cushion Removal and Installation (except Platinum) Rear Seat Cushion Removal and Installation (Platinum 40%) Rear Seat Cushion Removal and Installation (Platinum 20%)</u> <u>Front Floor Console Replacement</u> <u>Center Pillar Lower Trim Panel Replacement</u>	
1	Rear Floor Panel Carpet Procedure Reposition front floor panel carpet as needed.

HEADLINING TRIM PANEL REPLACEMENT (WITHOUT C3U)

Removal Procedure

1. Disable the SIR system. Refer to **SIR Disabling and Enabling**
2. Sunshade (3)» Remove [2x] - **Sunshade Replacement**

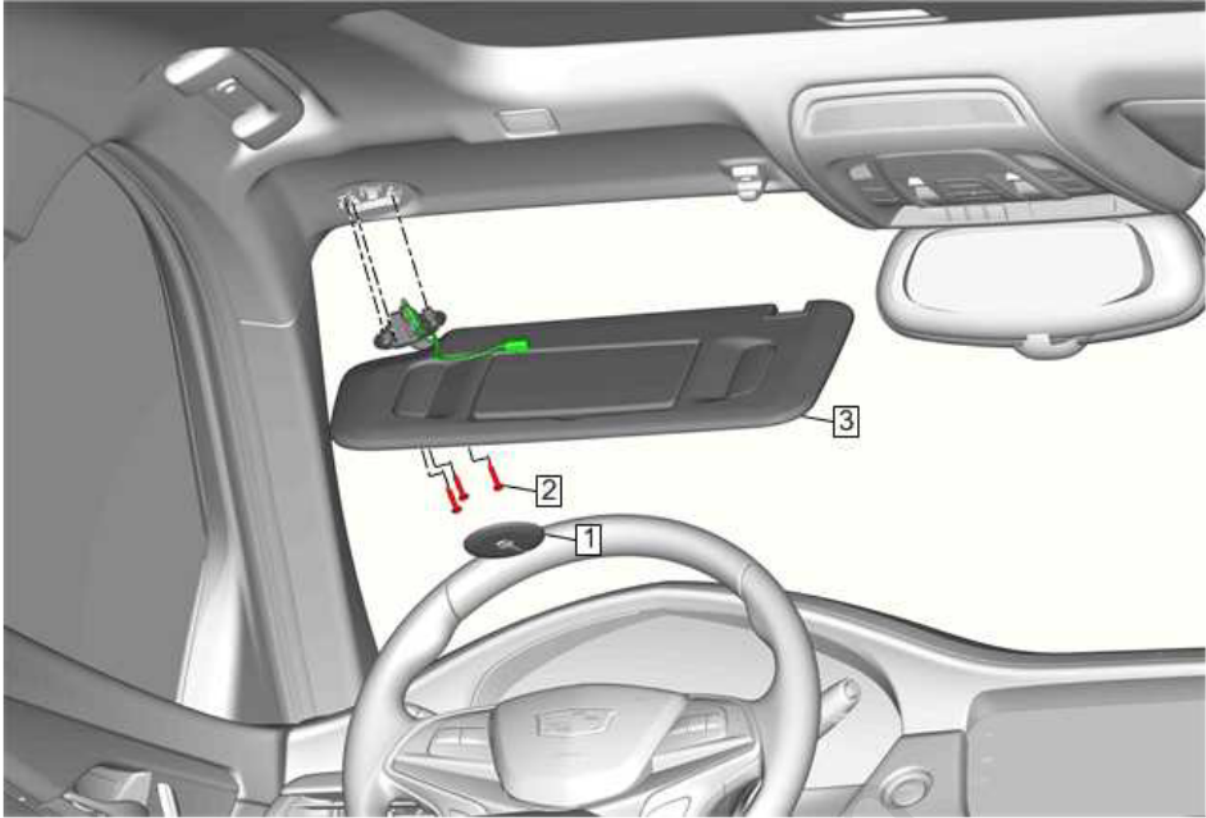


Fig. 4: Sunshade

Courtesy of GENERAL MOTORS COMPANY

3. Sunshade Support (2) » Remove [2x] - **Sunshade Support Replacement**



Fig. 5: Sunshade Support

Courtesy of GENERAL MOTORS COMPANY

4. Roof Rail Assist Handle (2) » Remove [2x] - **Roof Rail Assist Handle Replacement (Front)**

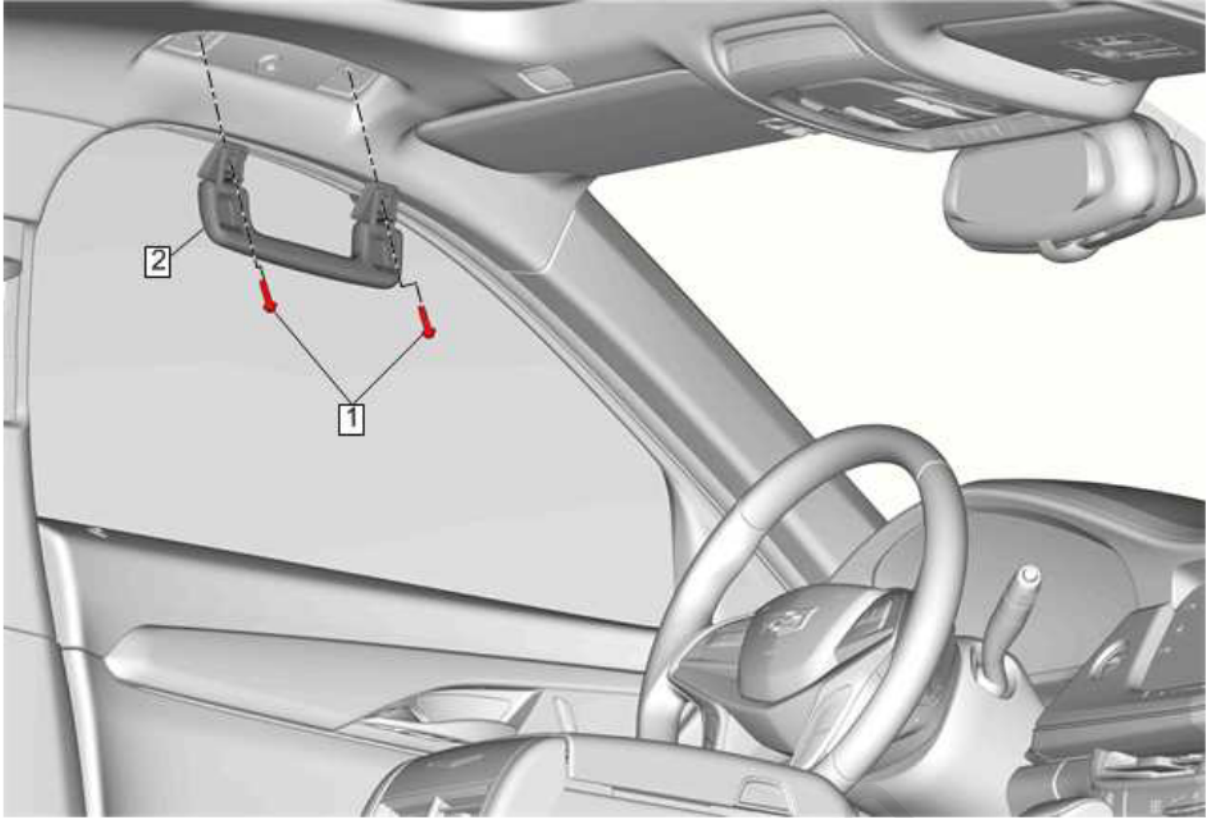


Fig. 6: Roof Rail Assist Handle (Front)

Courtesy of GENERAL MOTORS COMPANY

5. Roof Rail Assist Handle (2)» Remove [2x] - **Roof Rail Assist Handle Replacement (Rear)**

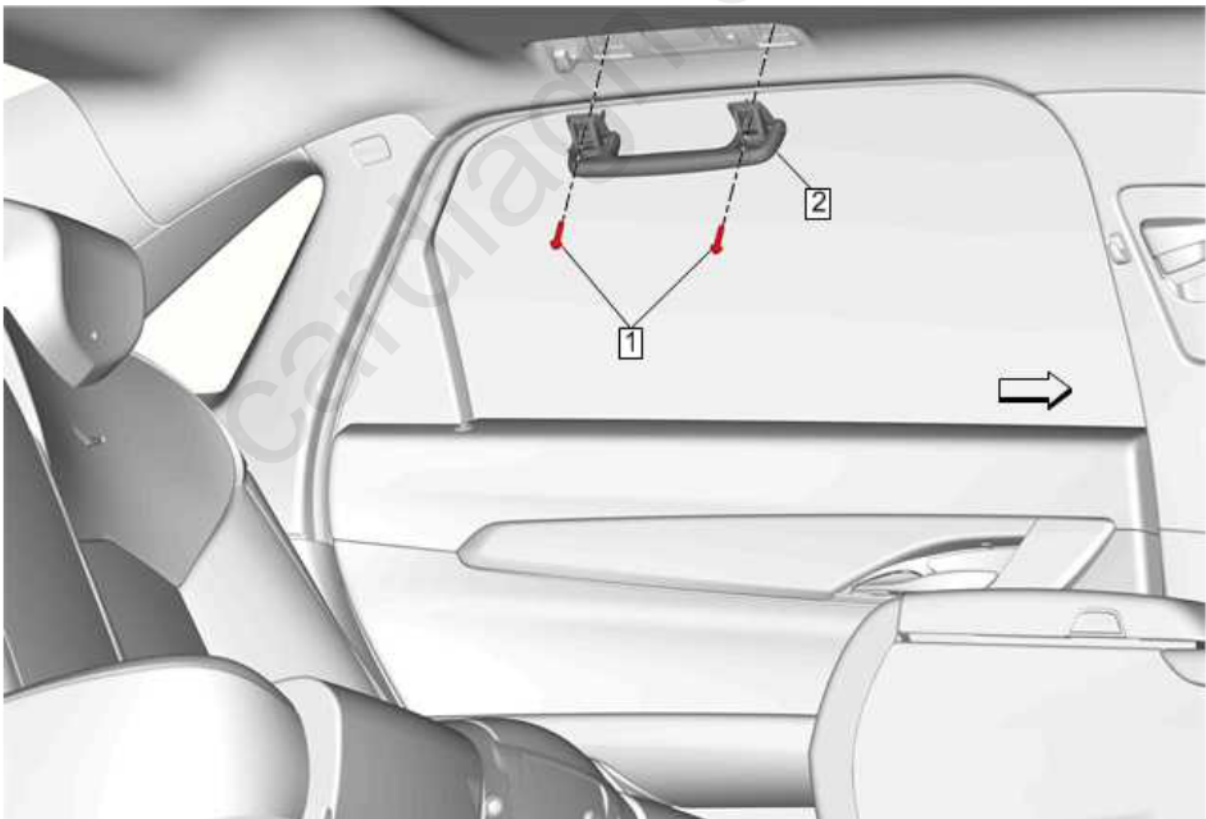


Fig. 7: Roof Rail Assist Handle (Rear)

Courtesy of GENERAL MOTORS COMPANY

6. Active Noise Cancellation Microphone Grille (1)» Remove [4x] - **Active Noise Cancellation Microphone Grille Replacement (Front)** **Active Noise Cancellation Microphone Grille Replacement (Rear)**



Fig. 8: Active Noise Cancellation Microphone Grille
Courtesy of GENERAL MOTORS COMPANY

7. Windshield Garnish Molding (1) » Remove [2x]- [Windshield Garnish Molding Replacement](#)

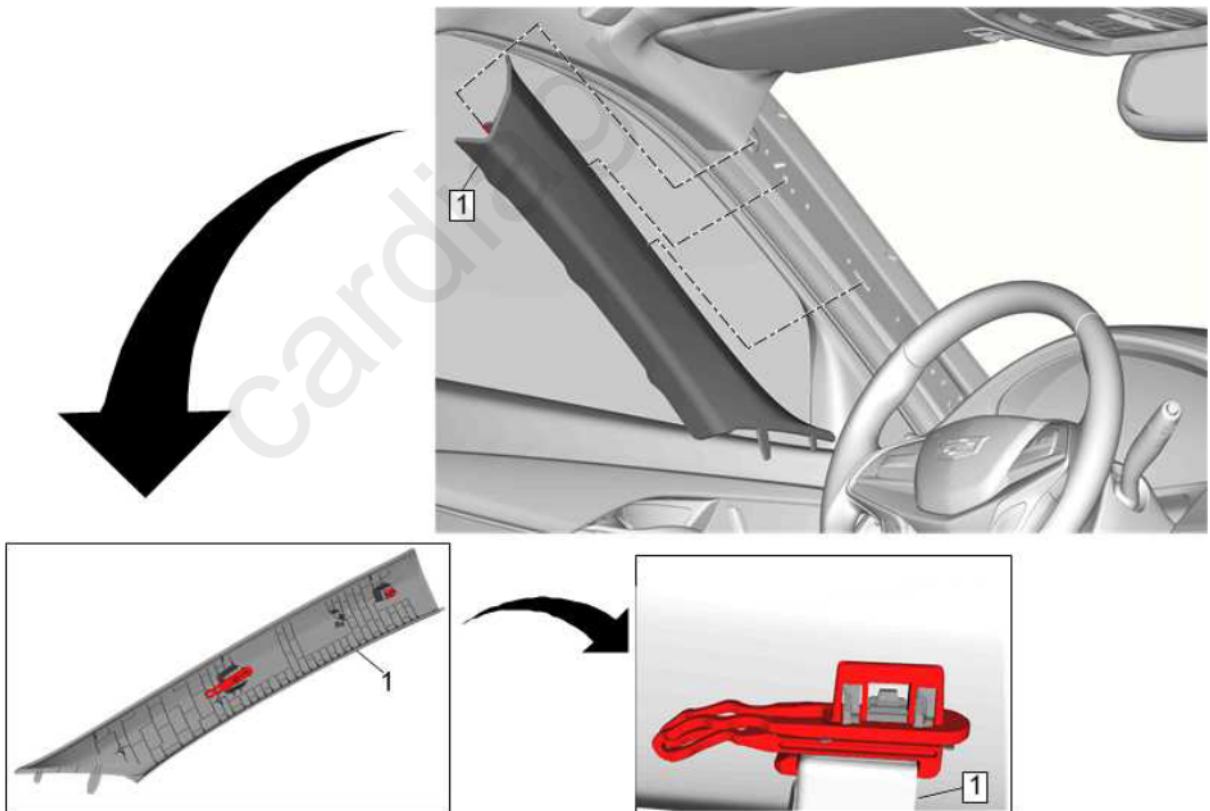


Fig. 9: Windshield Garnish Molding
Courtesy of GENERAL MOTORS COMPANY

8. Windshield Multifunction Sensor Mount Bracket Cover (1) » Remove - [Windshield Multifunction Sensor Mount Bracket Cover Replacement \(without UEU\)](#)

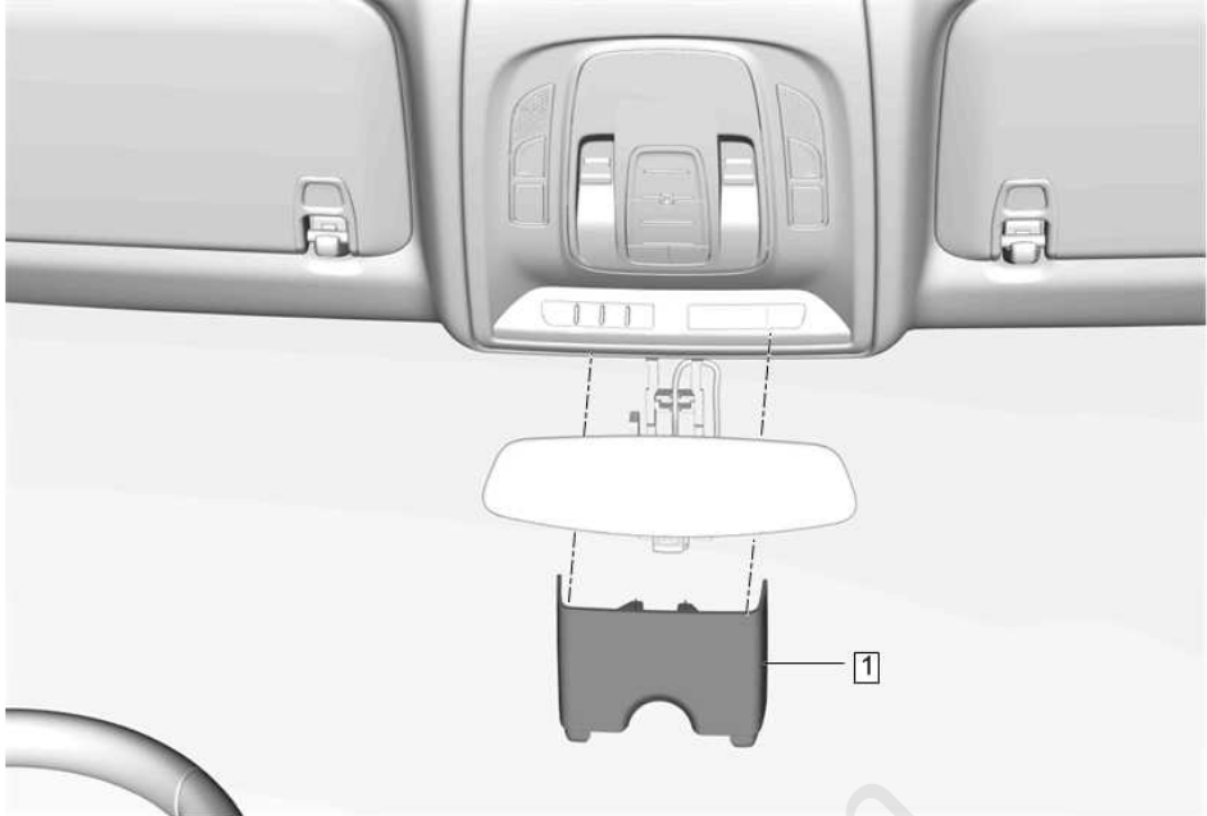


Fig. 10: Windshield Multifunction Sensor Mount Bracket Cover (without UEU)
 Courtesy of GENERAL MOTORS COMPANY

9. Roof Console (1) » Remove - **Roof Console Replacement**

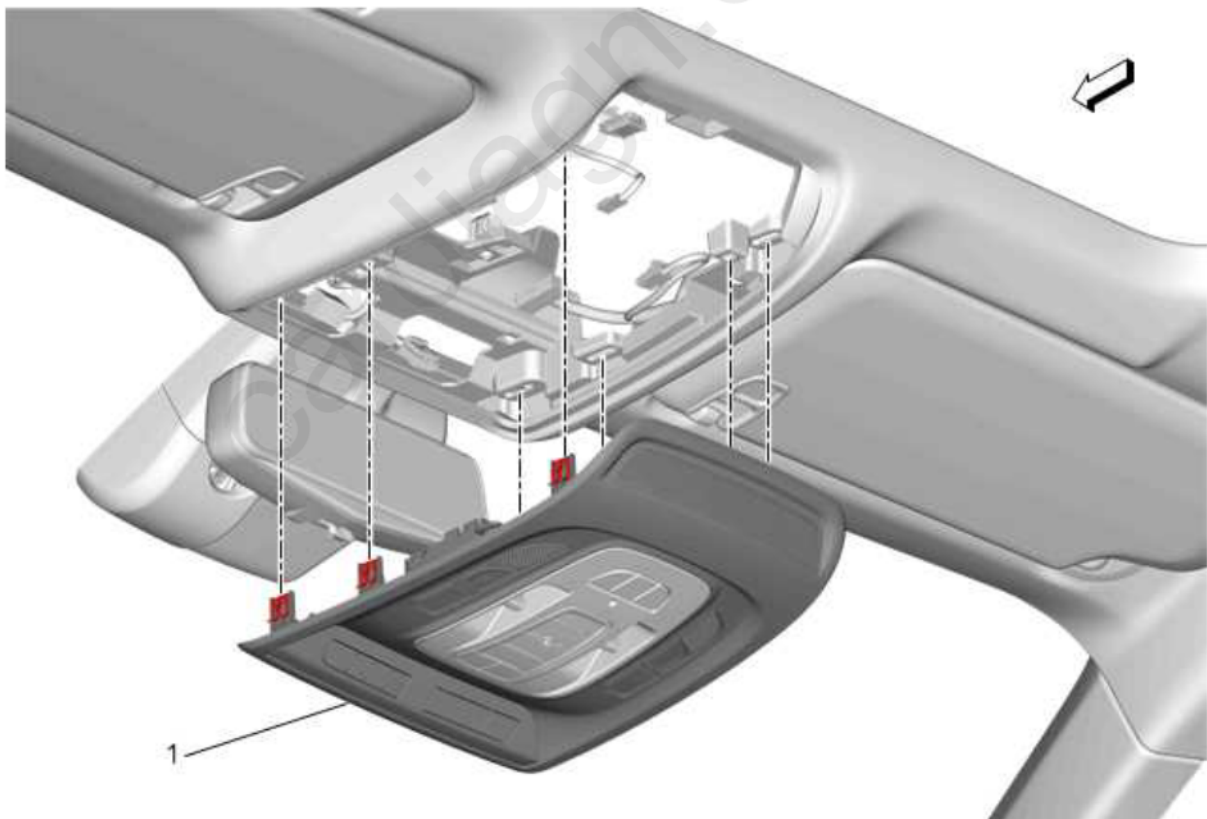


Fig. 11: Roof Console
 Courtesy of GENERAL MOTORS COMPANY

10. Center Pillar Upper Trim Panel (1) » Remove [2x] - **Center Pillar Upper Trim Panel Replacement**

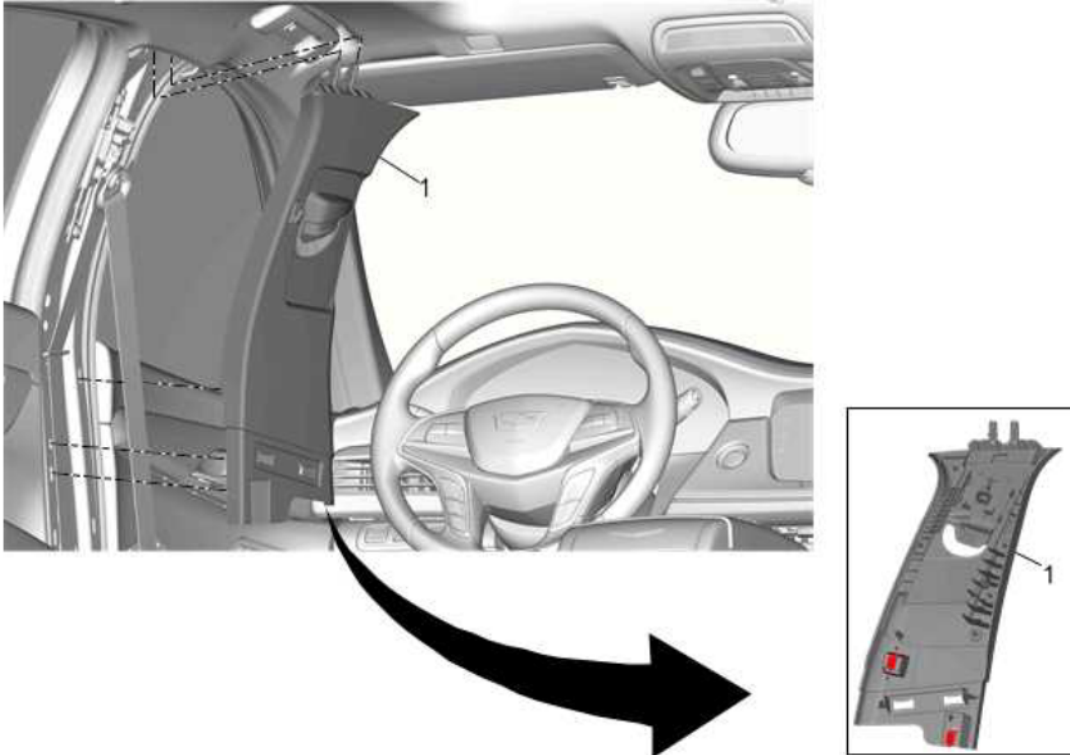


Fig. 12: Center Pillar Upper Trim Panel
Courtesy of GENERAL MOTORS COMPANY

11. Move the driver and passenger seats fully forward and recline.

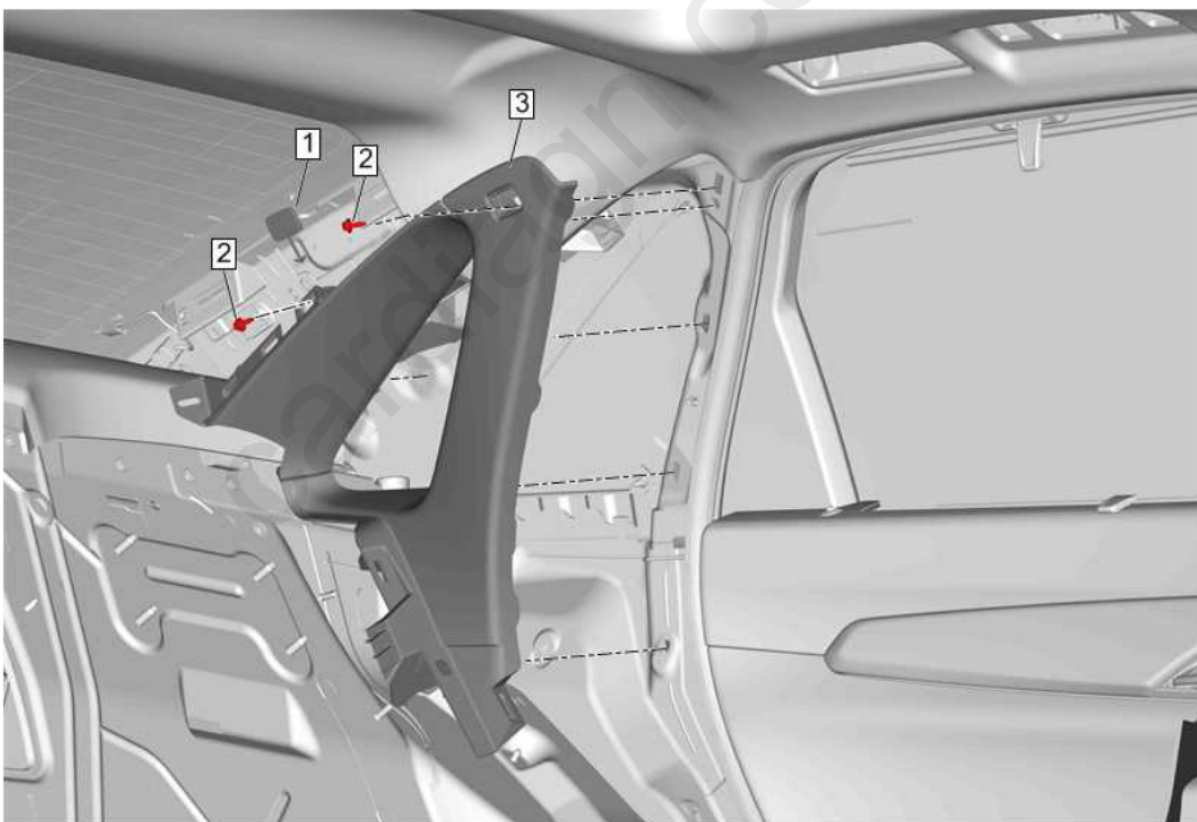


Fig. 13: Body Side Rear Window Lower Garnish Molding
Courtesy of GENERAL MOTORS COMPANY

12. Move the driver and passenger seats fully forward and recline.
13. Fold down the rear seat backs.
14. Roof Console Bolt (1)» Remove

NOTE: Prior to removal, note the routing of the wire harness to aid in reassembly and to ensure proper installation.



Fig. 14: Roof Console Bolt

Courtesy of GENERAL MOTORS COMPANY

15. Drop the headliner (2) down.
16. Disconnect the electrical connectors.
17. Remove and DISCARD the retainer. (3) [4x]

NOTE: There are 4 headlining trim panel retainers (3) located on the rear underside of the headliner (2), these are single use and must be discarded and replaced with new after removal.

18. **Windshield Replacement** Â» Remove
19. With the aid of an assistant, remove the headliner trim panel assembly (2) from the vehicle through the rear side door.
20. Transfer components as necessary.
21. If transferring or replacing the wiring harness. Refer to **Headliner Harness Replacement**

Installation Procedure

1. Install a NEW retainer. Do NOT reuse the old retainer. (1) [2x]



Fig. 15: Roof Console Bolt

Courtesy of GENERAL MOTORS COMPANY

2. With the aid of an assistant, position the headliner trim panel assembly (2) into the vehicle through the rear side door.
3. Connect the electrical connectors.
4. Tape any unused connectors to the headlining with a high adhesive tape.
5. Roof Console Bolt (1)» Install and tighten 2.5 N.m (22 lb in)
6. **Windshield Replacement** » Install
7. Body Side Rear Window Lower Garnish Molding (3)» Install [2x] - **Body Side Rear Window Lower Garnish Molding Replacement**

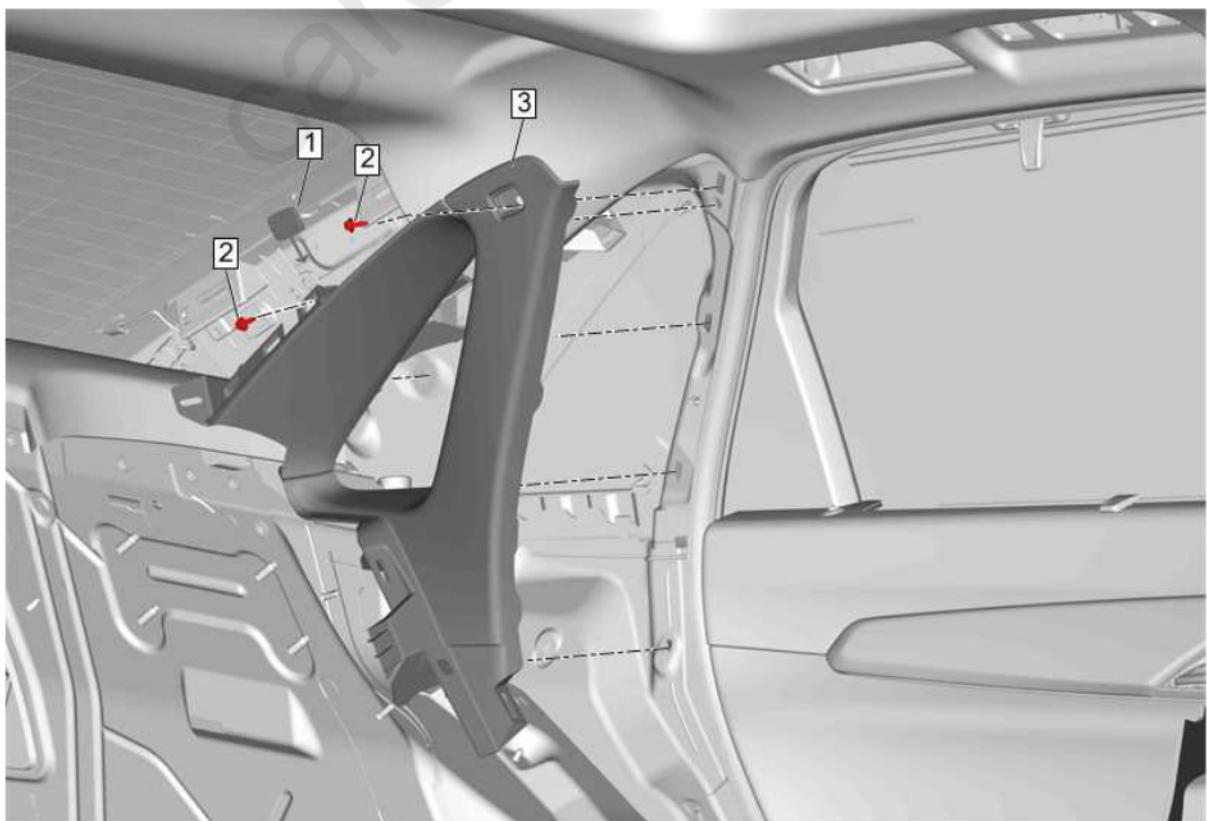


Fig. 16: Body Side Rear Window Lower Garnish Molding

Courtesy of GENERAL MOTORS COMPANY

8. Center Pillar Upper Trim Panel (1)» Install [2x]- [Center Pillar Upper Trim Panel Replacement](#)

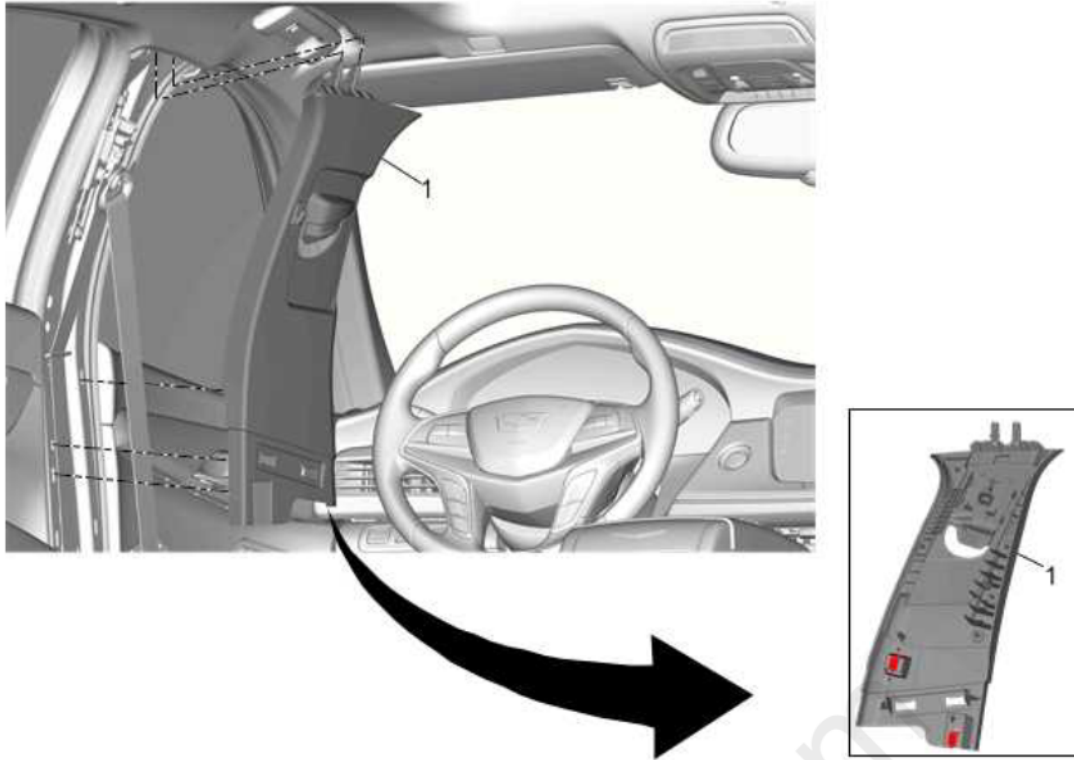


Fig. 17: Center Pillar Upper Trim Panel
Courtesy of GENERAL MOTORS COMPANY

9. Roof Console (1)» Install- [Roof Console Replacement](#)

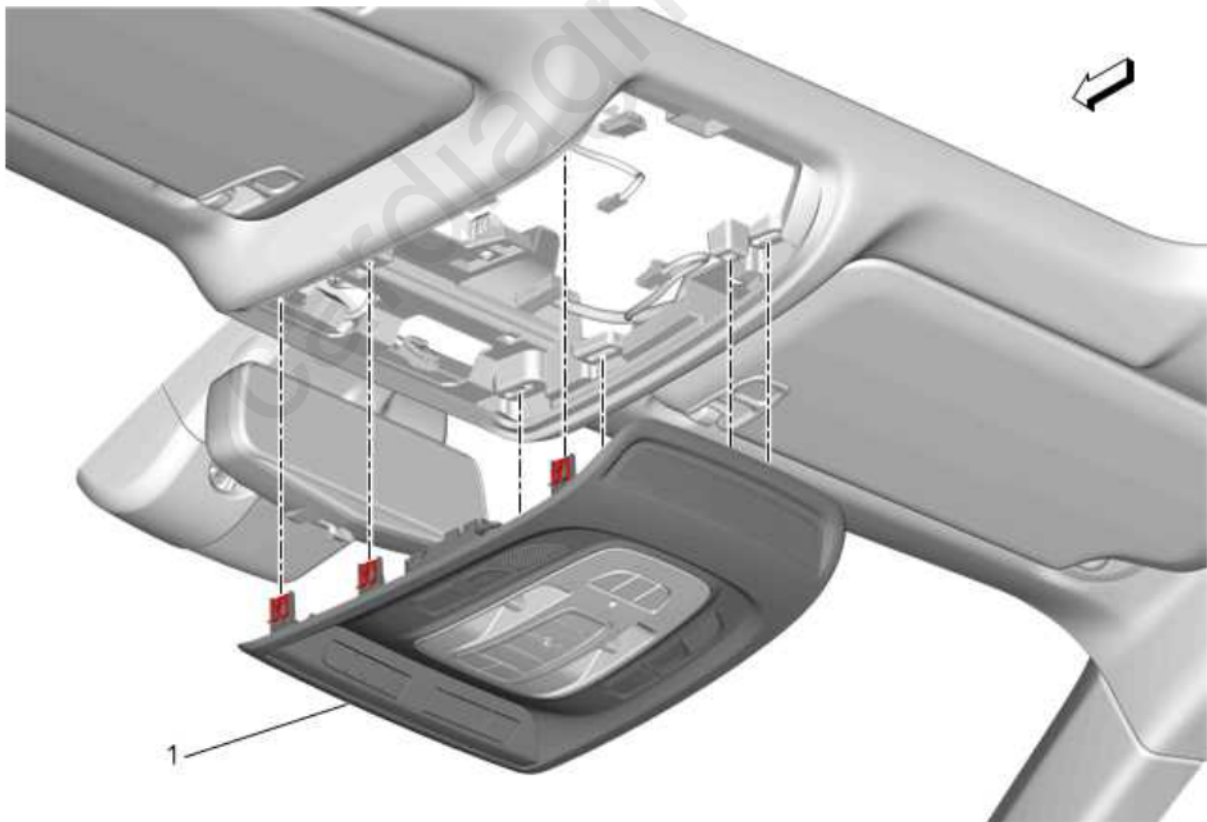


Fig. 18: Roof Console
Courtesy of GENERAL MOTORS COMPANY

10. Windshield Multifunction Sensor Mount Bracket Cover (1)» Install - [Windshield Multifunction Sensor Mount Bracket Cover Replacement \(without UEU\)](#)

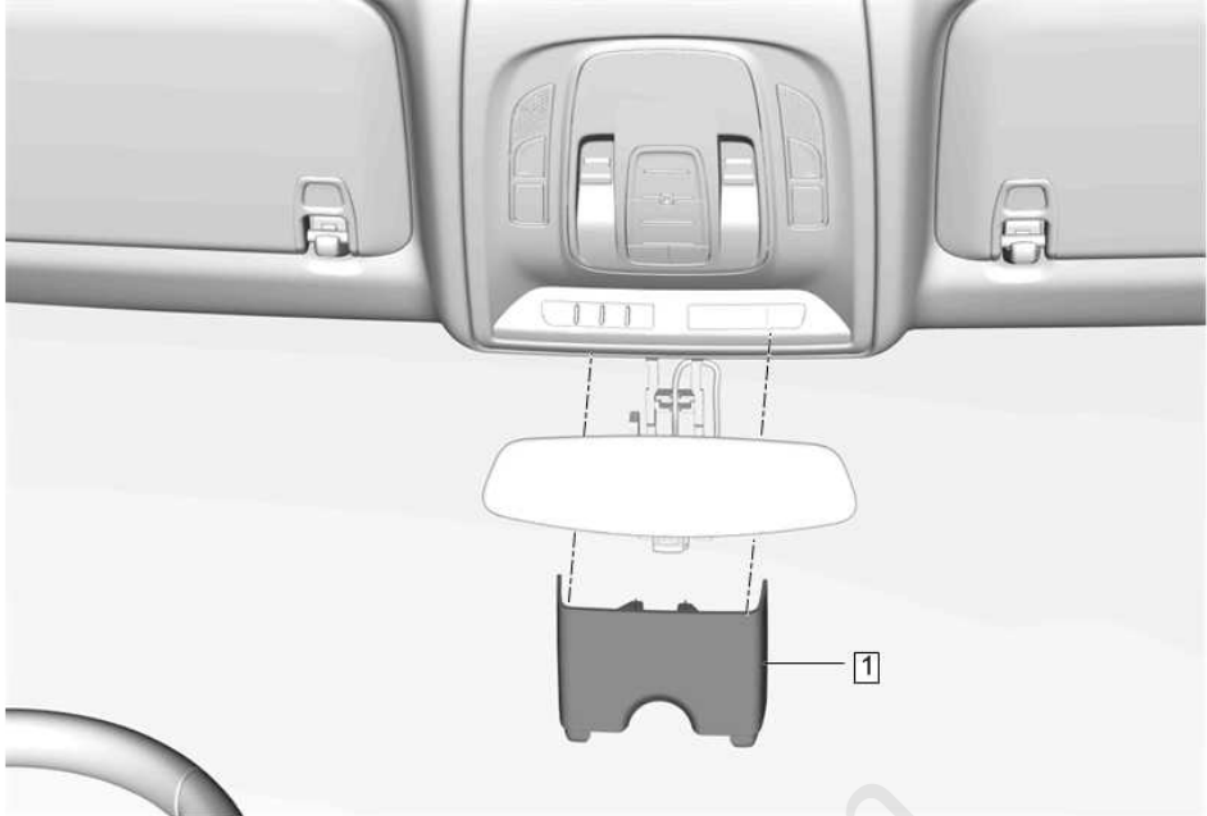


Fig. 19: Windshield Multifunction Sensor Mount Bracket Cover (without UEU)
 Courtesy of GENERAL MOTORS COMPANY

11. Windshield Garnish Molding (1) » Install [2x] - [Windshield Garnish Molding Replacement](#)

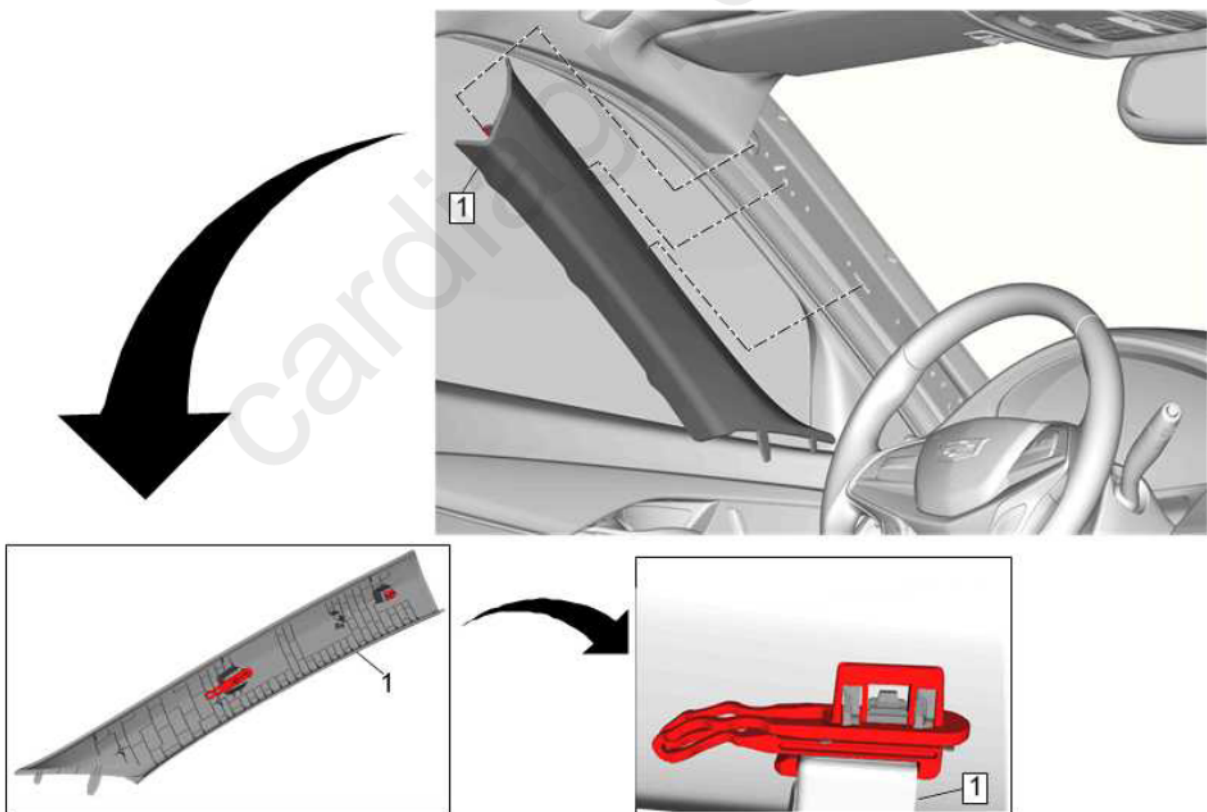


Fig. 20: Windshield Garnish Molding
 Courtesy of GENERAL MOTORS COMPANY

12. Active Noise Cancellation Microphone Grille (1) » Install [4x] - [Active Noise Cancellation Microphone Grille Replacement \(Front\)](#) [Active Noise Cancellation Microphone Grille Replacement \(Rear\)](#)

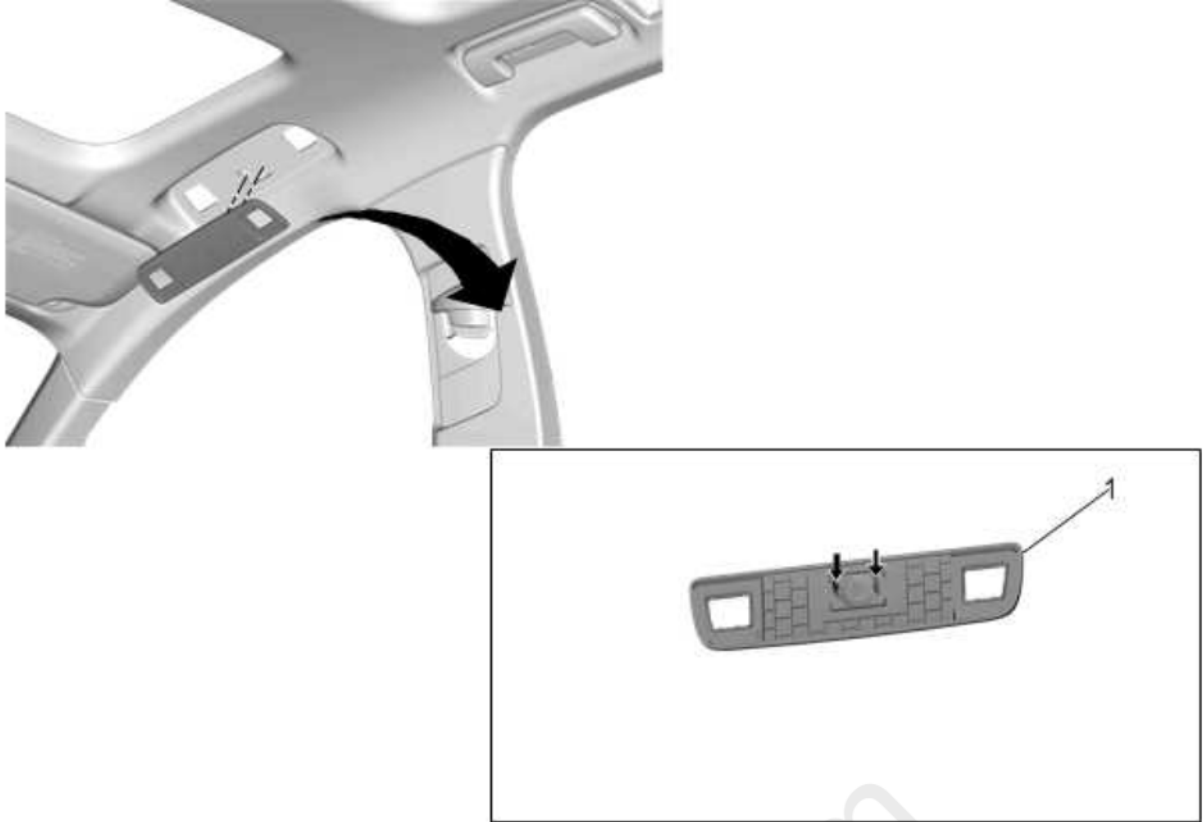


Fig. 21: Active Noise Cancellation Microphone Grille
 Courtesy of GENERAL MOTORS COMPANY

13. Roof Rail Assist Handle (2)» Install [2x] - **Roof Rail Assist Handle Replacement (Rear)**

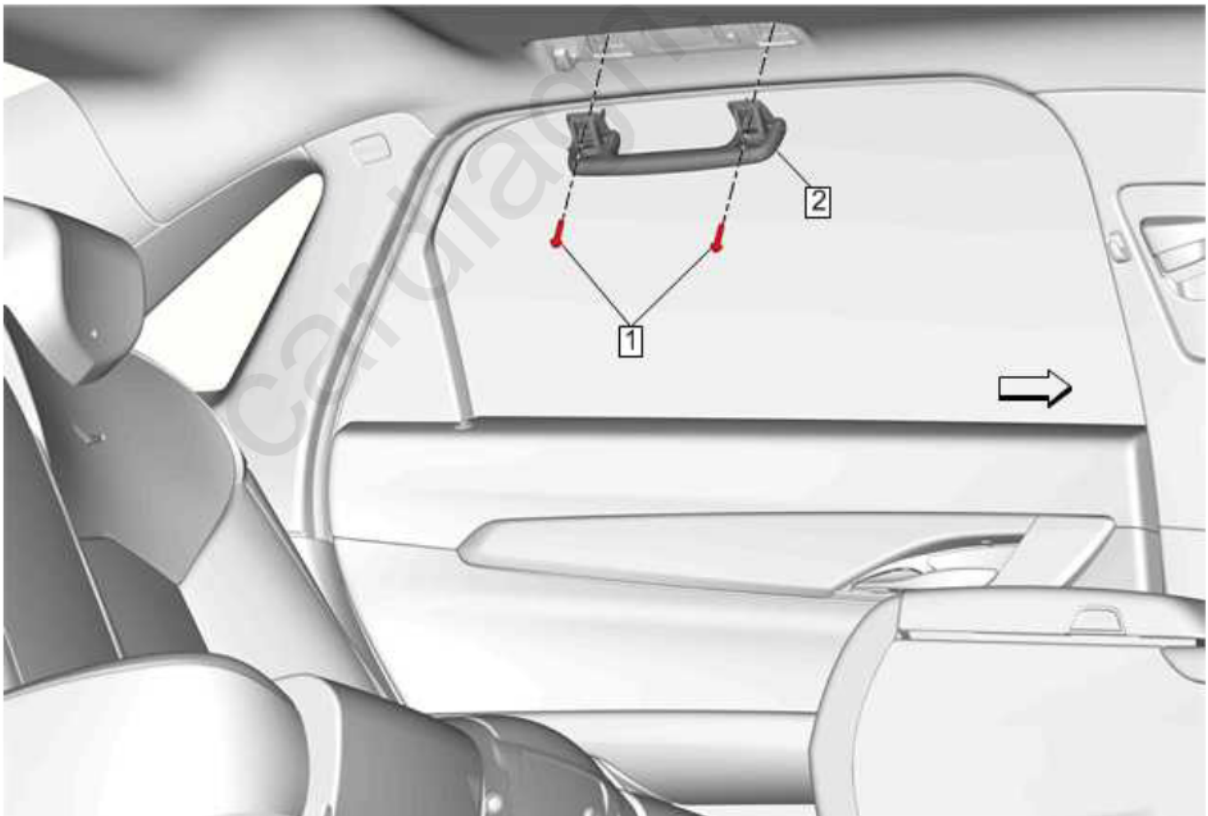


Fig. 22: Roof Rail Assist Handle (Rear)
 Courtesy of GENERAL MOTORS COMPANY

14. Roof Rail Assist Handle (2)» Install [2x] - **Roof Rail Assist Handle Replacement (Front)**

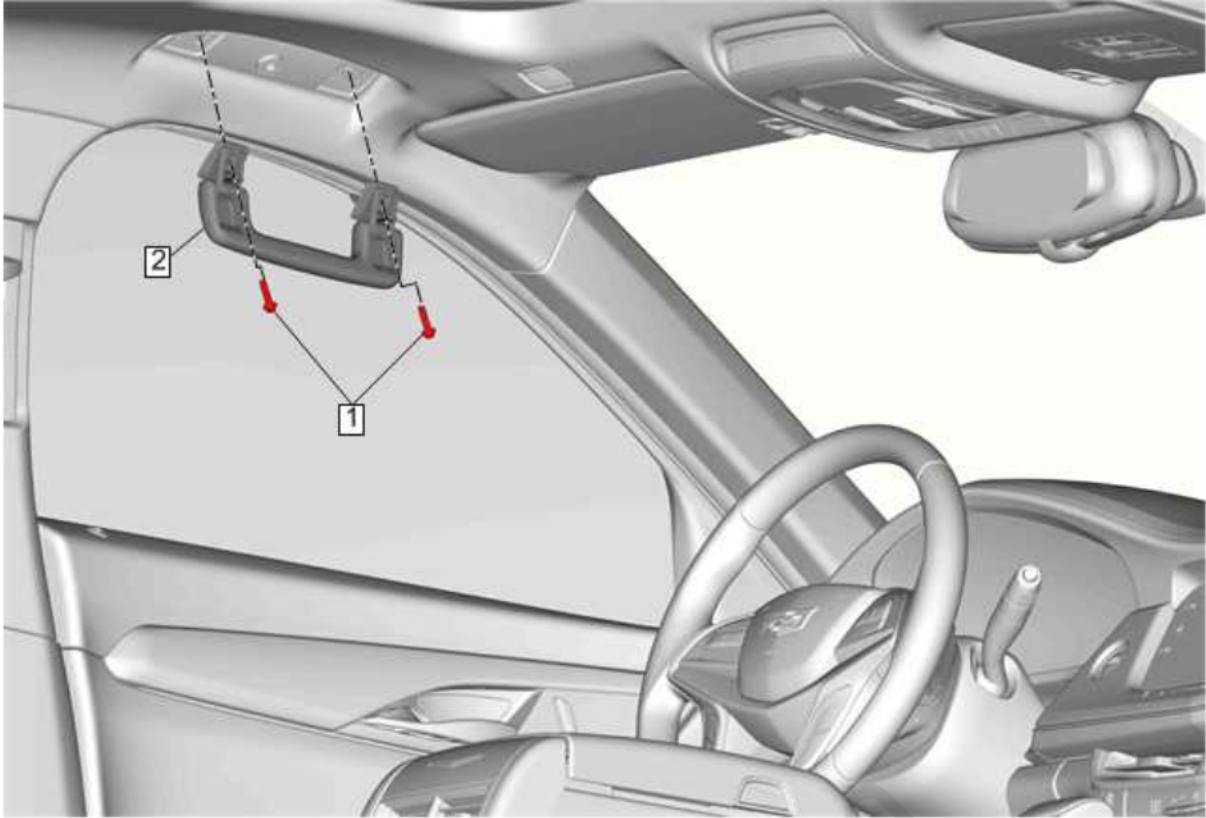


Fig. 23: Roof Rail Assist Handle (Front)

Courtesy of GENERAL MOTORS COMPANY

15. Sunshade Support (2)» Install [2x] - **Sunshade Support Replacement**



Fig. 24: Sunshade Support

Courtesy of GENERAL MOTORS COMPANY

16. **Sunshade Replacement** (3)» Install [2x]

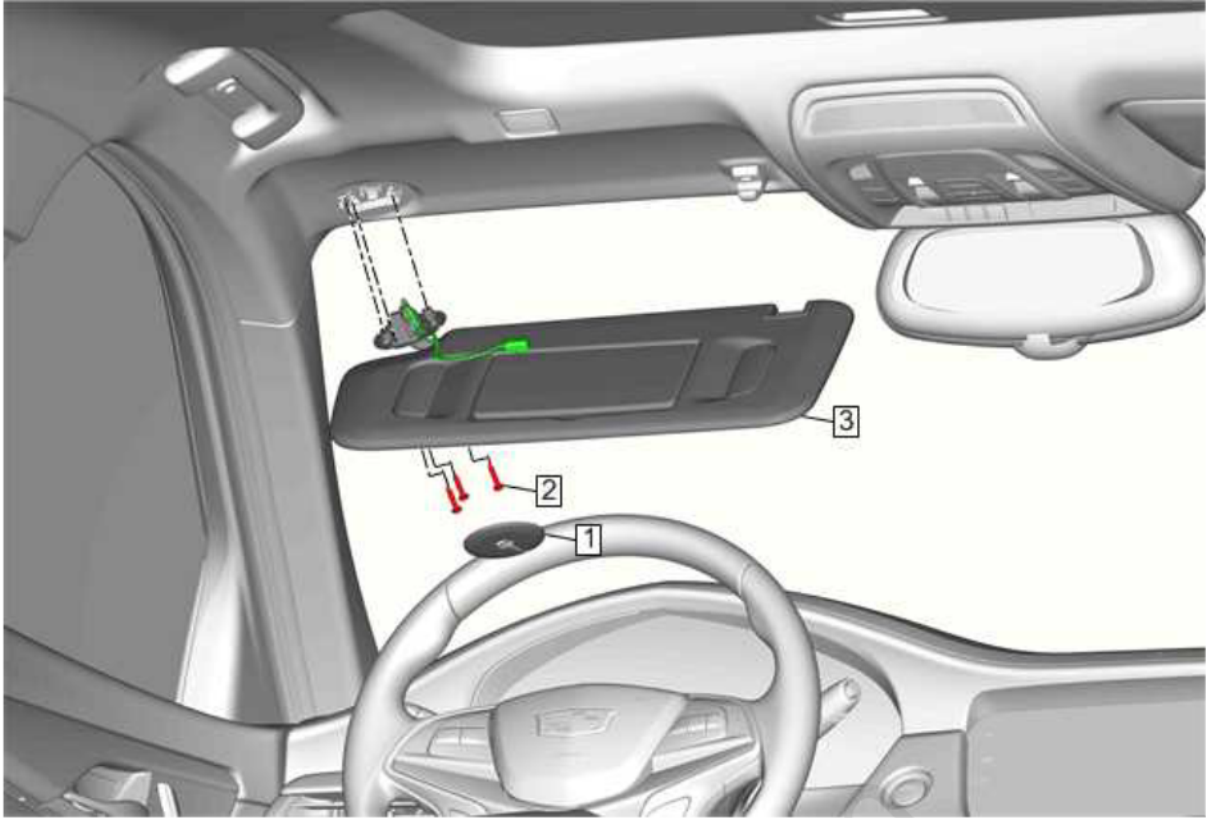


Fig. 25: Sunshade

Courtesy of GENERAL MOTORS COMPANY

17. Enable the SIR System. Refer to [SIR Disabling and Enabling](#)

HEADLINING TRIM PANEL REPLACEMENT (WITH C3U)

Removal Procedure

- WARNING:** Do not attempt to repair or alter the head impact energy-absorbing material glued to the headliner or to the garnish trims. If the material is damaged, replace the headliner and/or the garnish trim. Failure to do so could result in personal injury.
- CAUTION:** If a vehicle is equipped with a head curtain inflator module ensure that the inflator module and tether are undamaged. If tether or curtain airbag are damaged in any way, they must be replaced.
- CAUTION:** Use care when working around the head curtain inflator module. Sharp tools may puncture the curtain airbag. If the head curtain inflator module is damaged in any way, it must be replaced.

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#)
2. Sunshade (3) » Remove [2x]- [Sunshade Replacement](#)

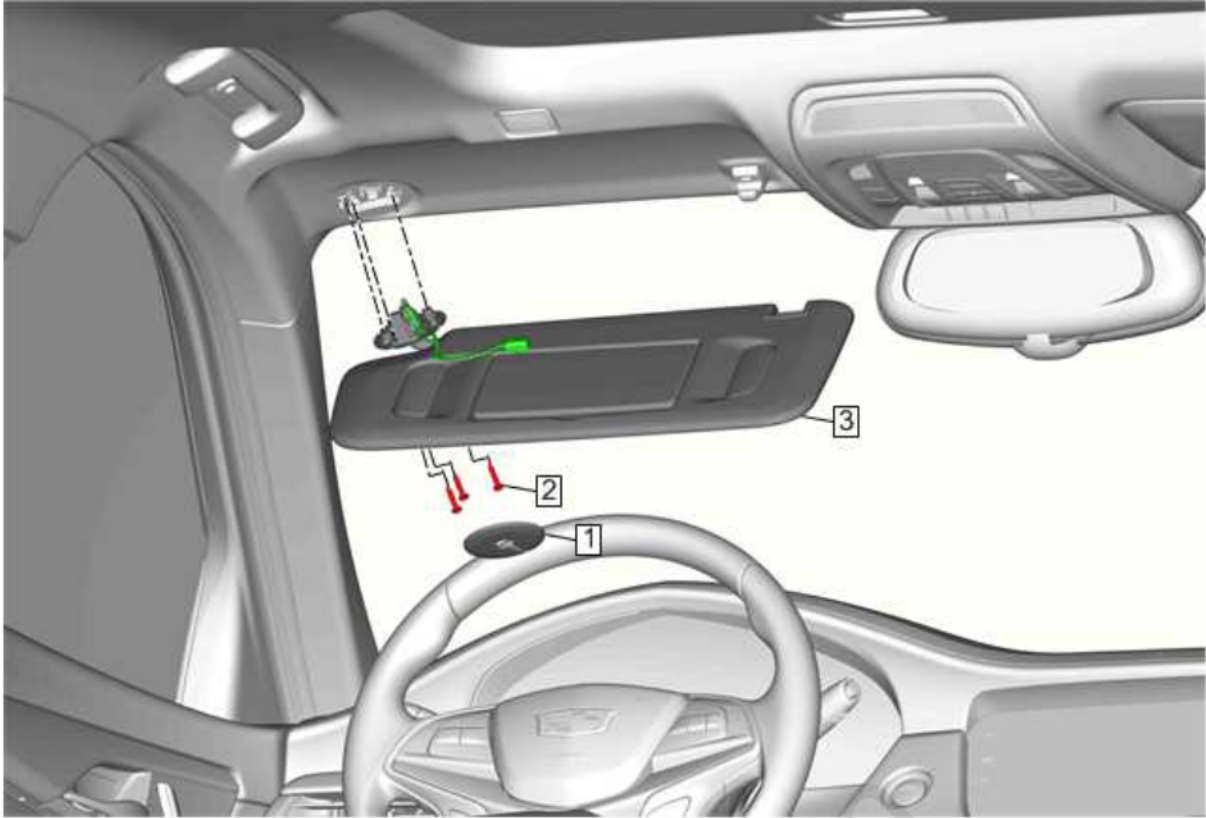


Fig. 26: Sunshade

Courtesy of GENERAL MOTORS COMPANY

3. Sunshade Support (2) Â» Remove [2x] - **Sunshade Support Replacement**



Fig. 27: Sunshade Support

Courtesy of GENERAL MOTORS COMPANY

4. Roof Rail Assist Handle (2) Â» Remove [2x] - **Roof Rail Assist Handle Replacement (Front)**

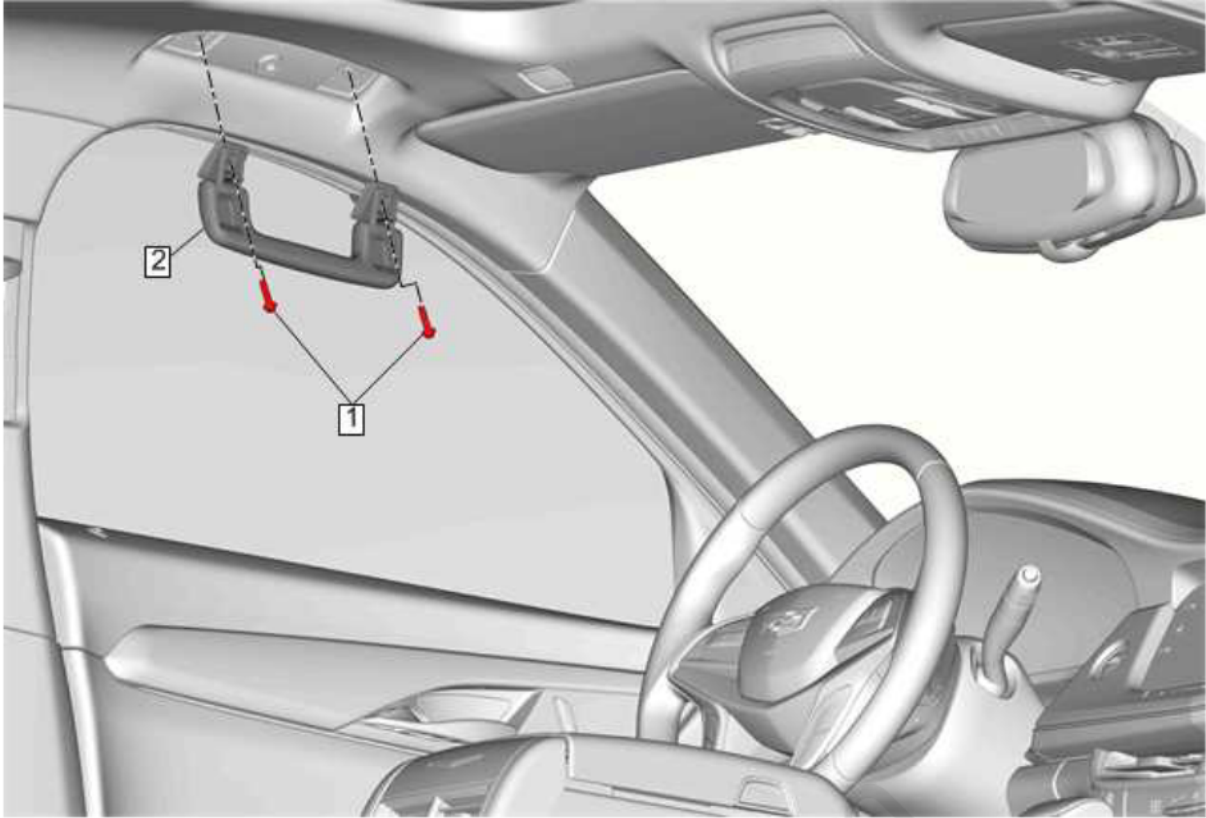


Fig. 28: Roof Rail Assist Handle (Front)

Courtesy of GENERAL MOTORS COMPANY

5. Roof Rail Assist Handle (2) » Remove [2x] - **Roof Rail Assist Handle Replacement (Rear)**

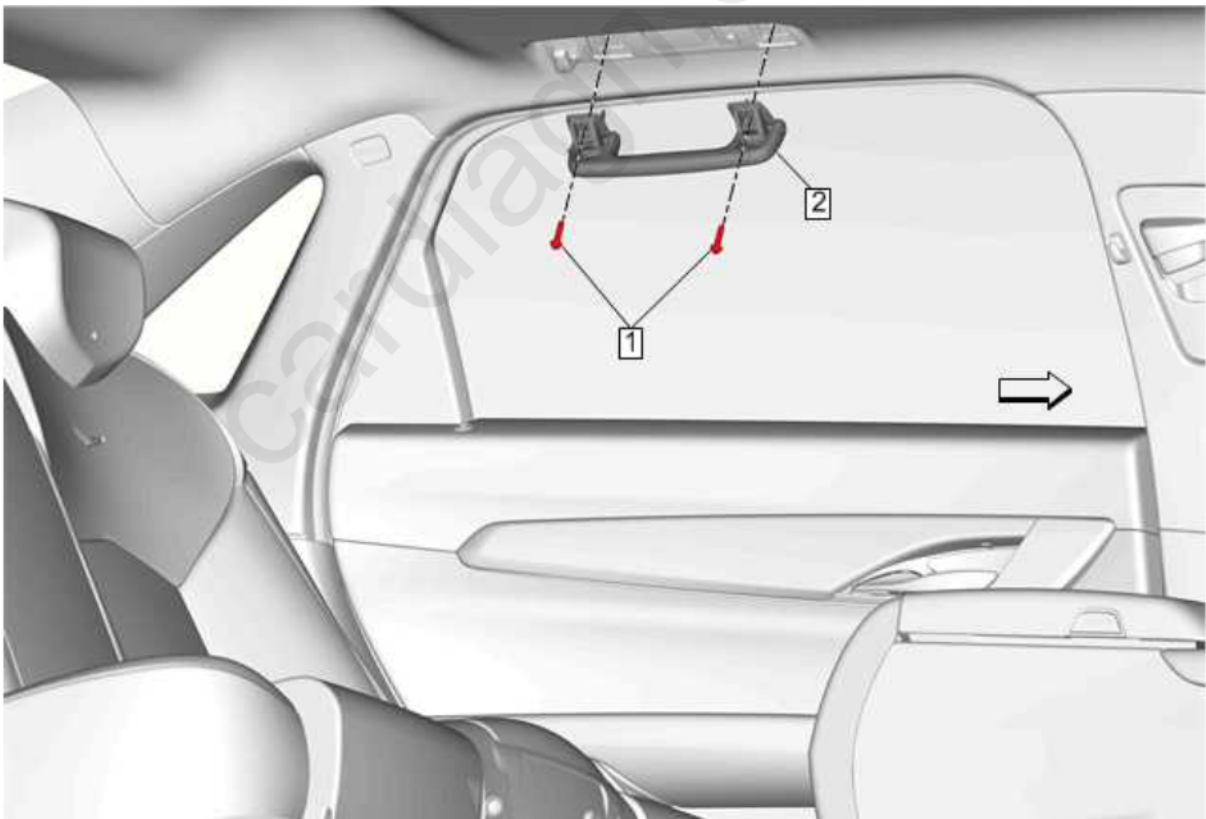


Fig. 29: Roof Rail Assist Handle (Rear)

Courtesy of GENERAL MOTORS COMPANY

6. Active Noise Cancellation Microphone Grille (1) » Remove [4x] - **Active Noise Cancellation Microphone Grille Replacement (Front)** **Active Noise Cancellation Microphone Grille Replacement (Rear)**



Fig. 30: Active Noise Cancellation Microphone Grille
Courtesy of GENERAL MOTORS COMPANY

7. Windshield Garnish Molding (1) » Remove [2x] - [Windshield Garnish Molding Replacement](#)

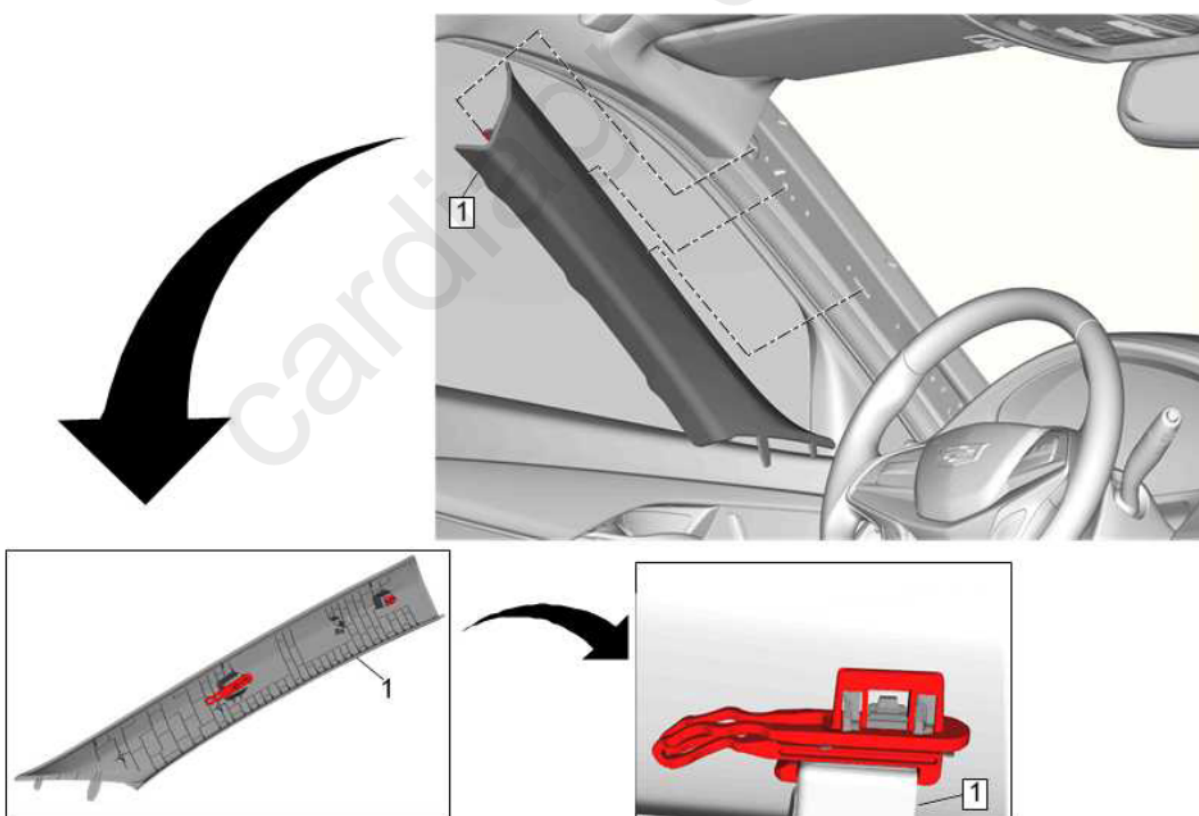


Fig. 31: Windshield Garnish Molding
Courtesy of GENERAL MOTORS COMPANY

8. Windshield Multifunction Sensor Mount Bracket Cover (1) » Remove - [Windshield Multifunction Sensor Mount Bracket Cover Replacement \(without UEU\)](#)

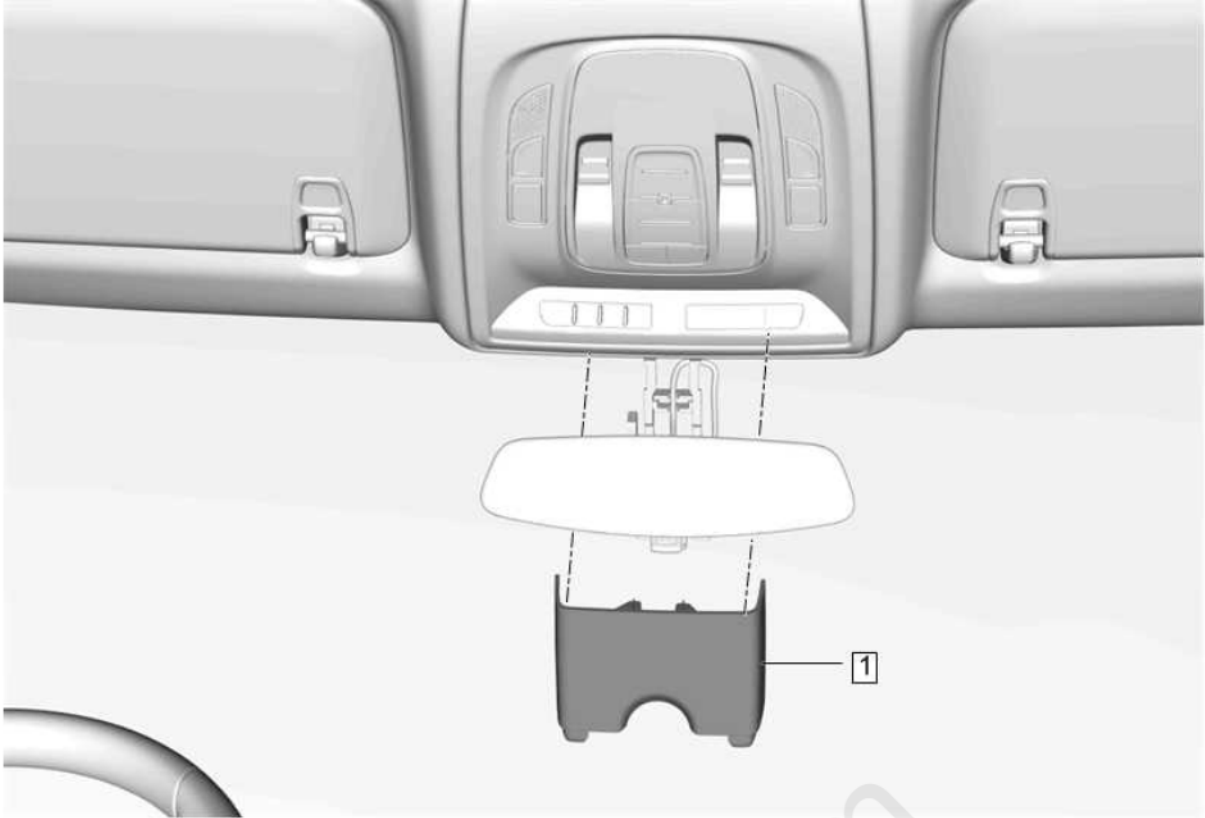


Fig. 32: Windshield Multifunction Sensor Mount Bracket Cover (without UEU)
 Courtesy of GENERAL MOTORS COMPANY

9. Windshield Multifunction Sensor Mount Bracket Cover (1) » Remove- **Windshield Multifunction Sensor Mount Bracket Cover Replacement (with UEU)**

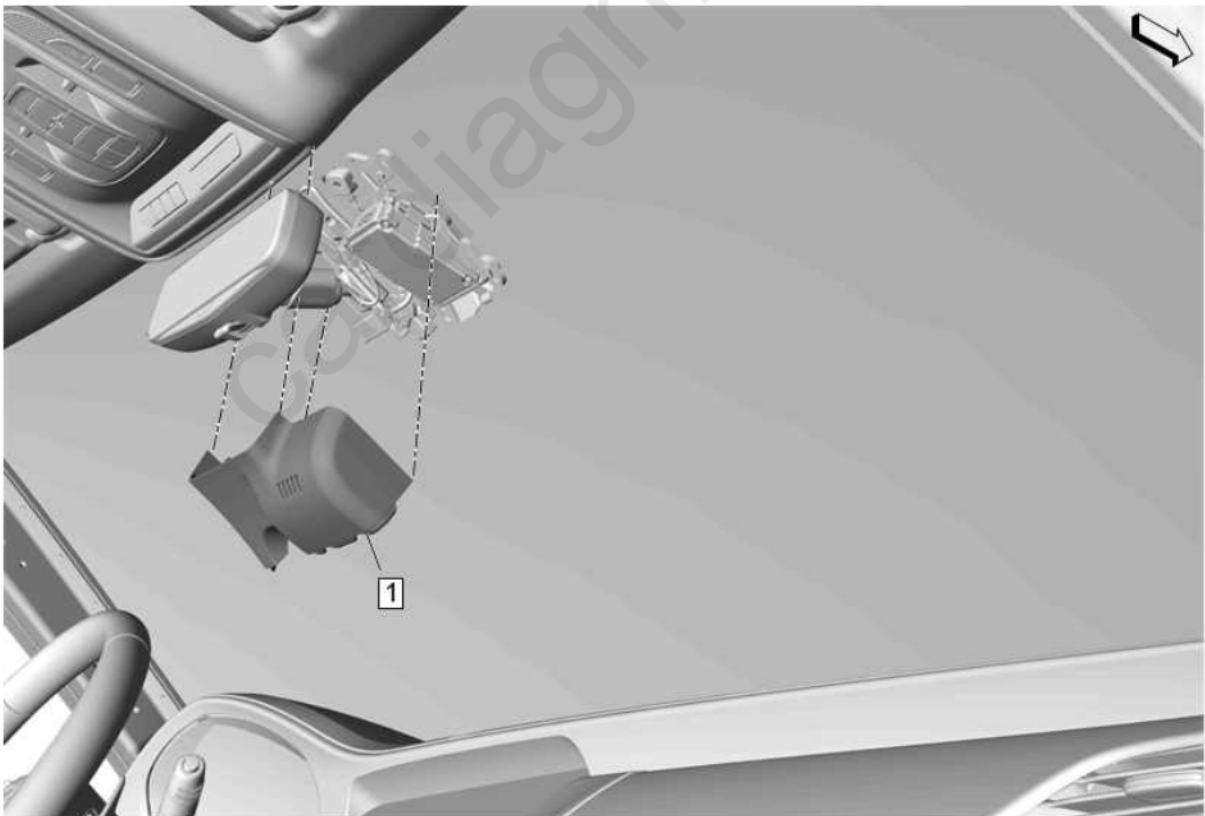


Fig. 33: Windshield Multifunction Sensor Mount Bracket Cover (with UEU)
 Courtesy of GENERAL MOTORS COMPANY

10. Roof Console (1) » Remove - **Roof Console Replacement**

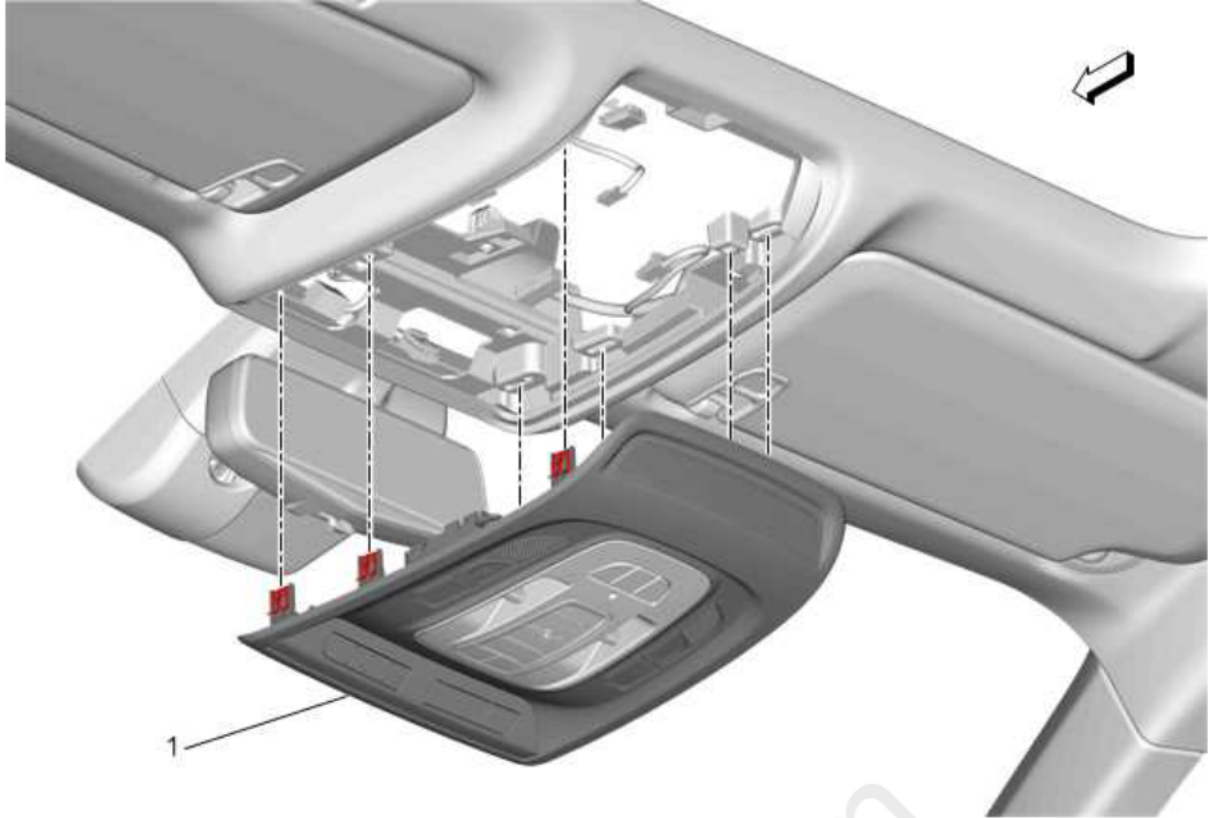


Fig. 34: Roof Console

Courtesy of GENERAL MOTORS COMPANY

11. Center Pillar Upper Trim Panel (1)» Remove [2x] - **Center Pillar Upper Trim Panel Replacement**

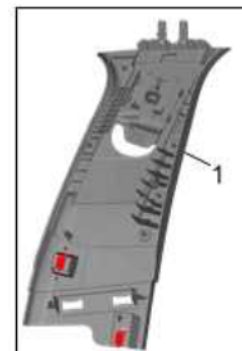


Fig. 35: Center Pillar Upper Trim Panel

Courtesy of GENERAL MOTORS COMPANY

12. Body Side Rear Window Lower Garnish Molding (3)» Remove [2x] - **Body Side Rear Window Lower Garnish Molding Replacement**

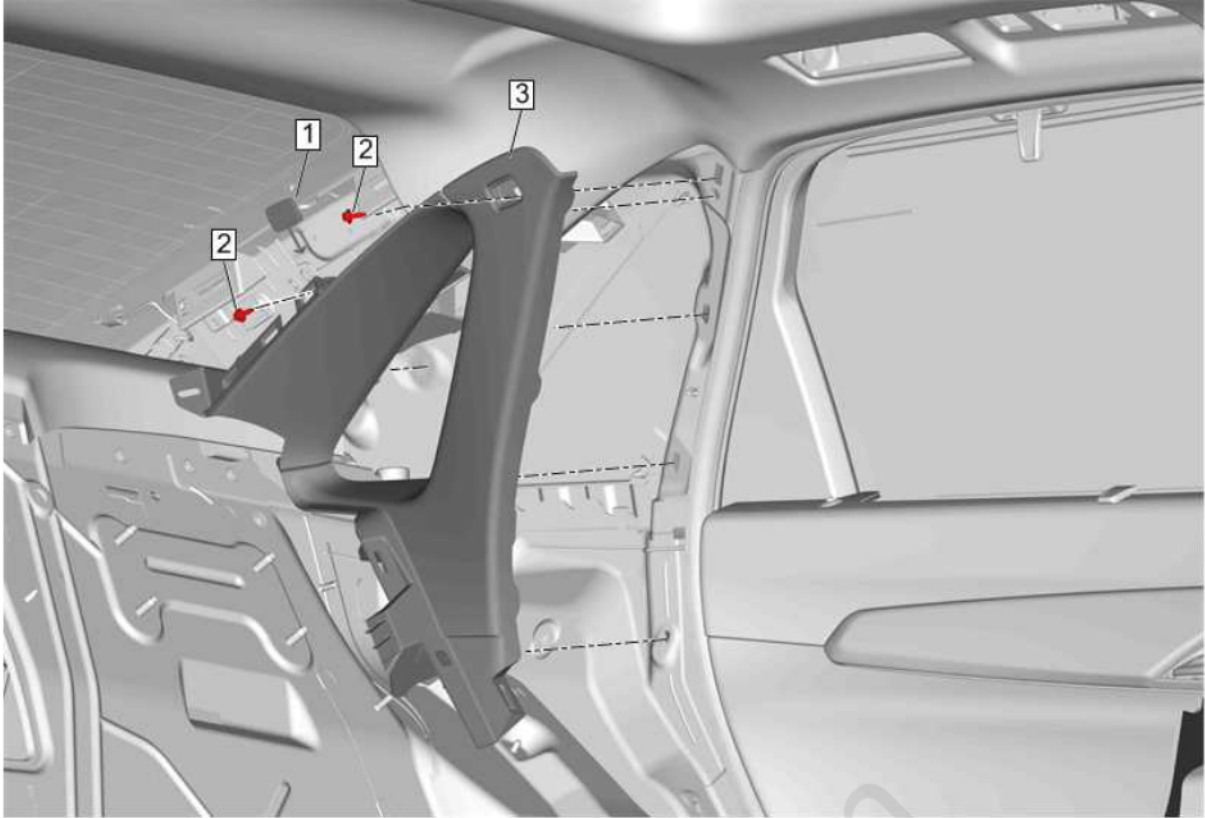


Fig. 36: Body Side Rear Window Lower Garnish Molding
 Courtesy of GENERAL MOTORS COMPANY

13. Move the driver and passenger seats fully forward and recline.
14. Fold down the rear seat backs.
15. Roof Console Bolt (1)» Remove



Fig. 37: Roof Console Bolt
 Courtesy of GENERAL MOTORS COMPANY

16. Drop the headliner (2) down.
17. Disconnect the electrical connectors.
18. Remove and DISCARD the retainer. (3) [4x]

NOTE:

There are 4 headlining trim panel retainers (3) located on the rear underside of the headliner (2), these are single use and must be discarded and replaced with new after removal.

19. **Windshield Replacement** Â» Remove
20. With the aid of an assistant, remove the headliner trim panel assembly (2) from the vehicle through the rear side door.
21. Transfer components as necessary.
22. If transferring or replacing the wiring harness. Refer to **Headliner Harness Replacement**

Installation Procedure

1. Install a NEW retainer. Do NOT reuse the old retainer. (1) [2x]



Fig. 38: Roof Console Bolt

Courtesy of GENERAL MOTORS COMPANY

2. With the aid of an assistant, position the headliner trim panel assembly (2) into the vehicle through the front windshield.
3. Connect the electrical connectors.
4. Tape any unused connectors to the headlining with a high adhesive tape.
5. Roof Console Bolt (1)Â» Install and tighten 2.5 N.m (22 lb in)
6. **Windshield Replacement** Â» Remove
7. Body Side Rear Window Lower Garnish Molding (3)Â» Install [2x] - **Body Side Rear Window Lower Garnish Molding Replacement**

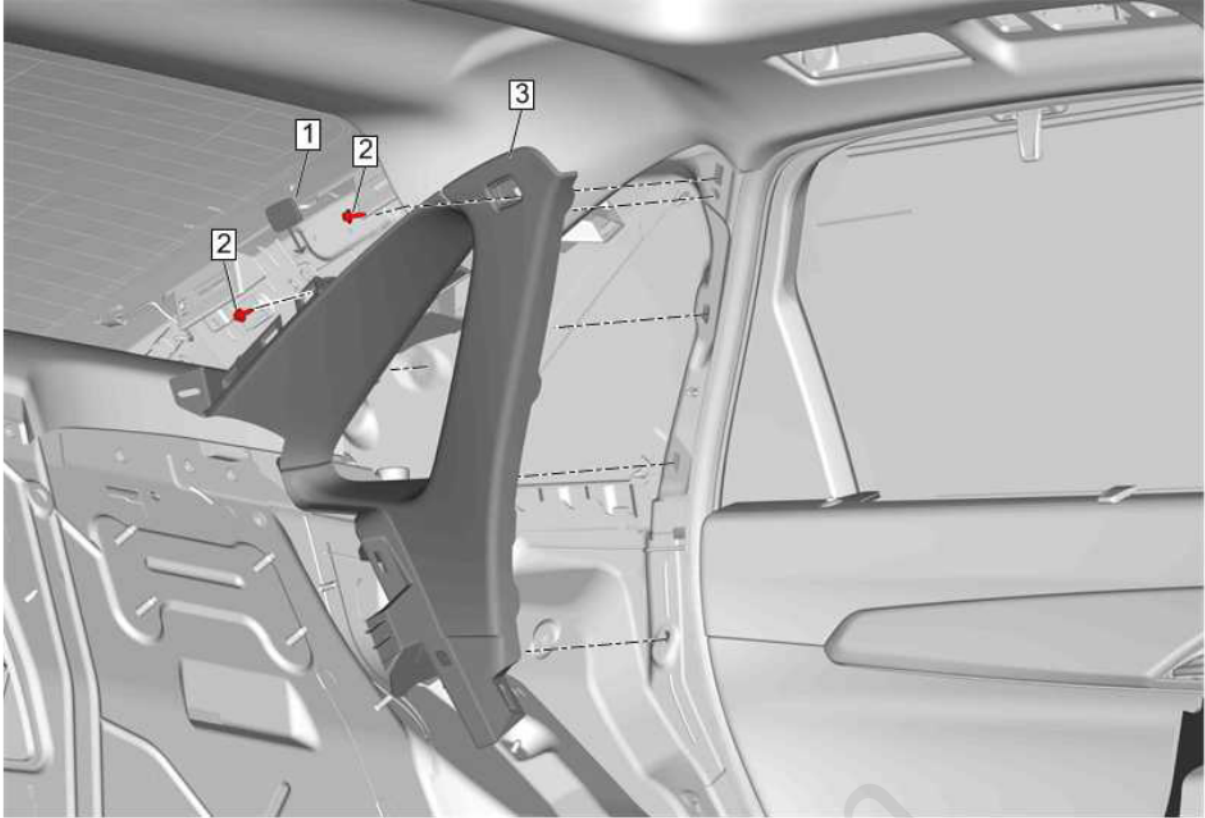


Fig. 39: Body Side Rear Window Lower Garnish Molding
 Courtesy of GENERAL MOTORS COMPANY

8. Center Pillar Upper Trim Panel (1)» Install [2x]- **Center Pillar Upper Trim Panel Replacement**

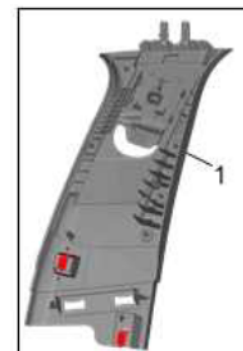


Fig. 40: Center Pillar Upper Trim Panel
 Courtesy of GENERAL MOTORS COMPANY

9. Roof Console (1)» Install - **Roof Console Replacement**

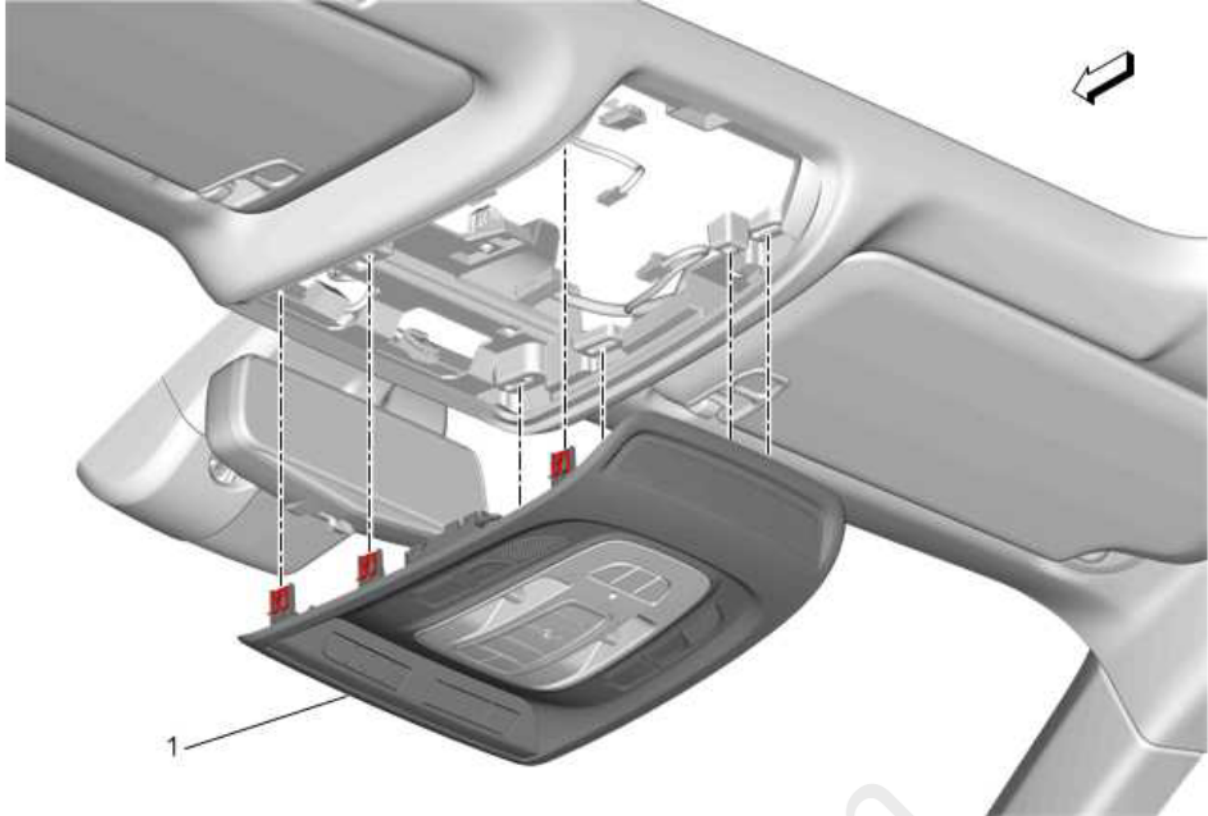


Fig. 41: Roof Console

Courtesy of GENERAL MOTORS COMPANY

10. Windshield Multifunction Sensor Mount Bracket Cover (1)» Install - **Windshield Multifunction Sensor Mount Bracket Cover Replacement (without UEU)**

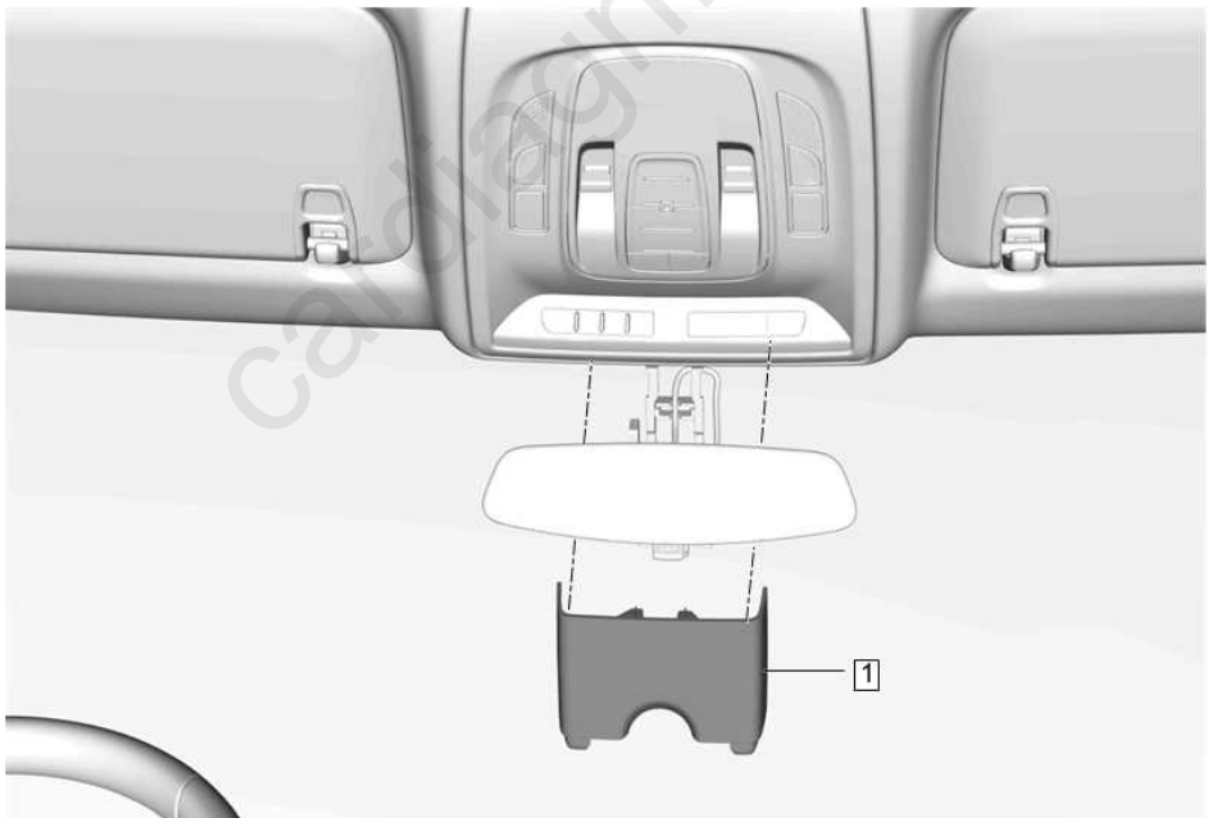


Fig. 42: Windshield Multifunction Sensor Mount Bracket Cover (without UEU)

Courtesy of GENERAL MOTORS COMPANY

11. Windshield Multifunction Sensor Mount Bracket Cover (1)» Install - **Windshield Multifunction Sensor Mount Bracket Cover Replacement (with UEU)**

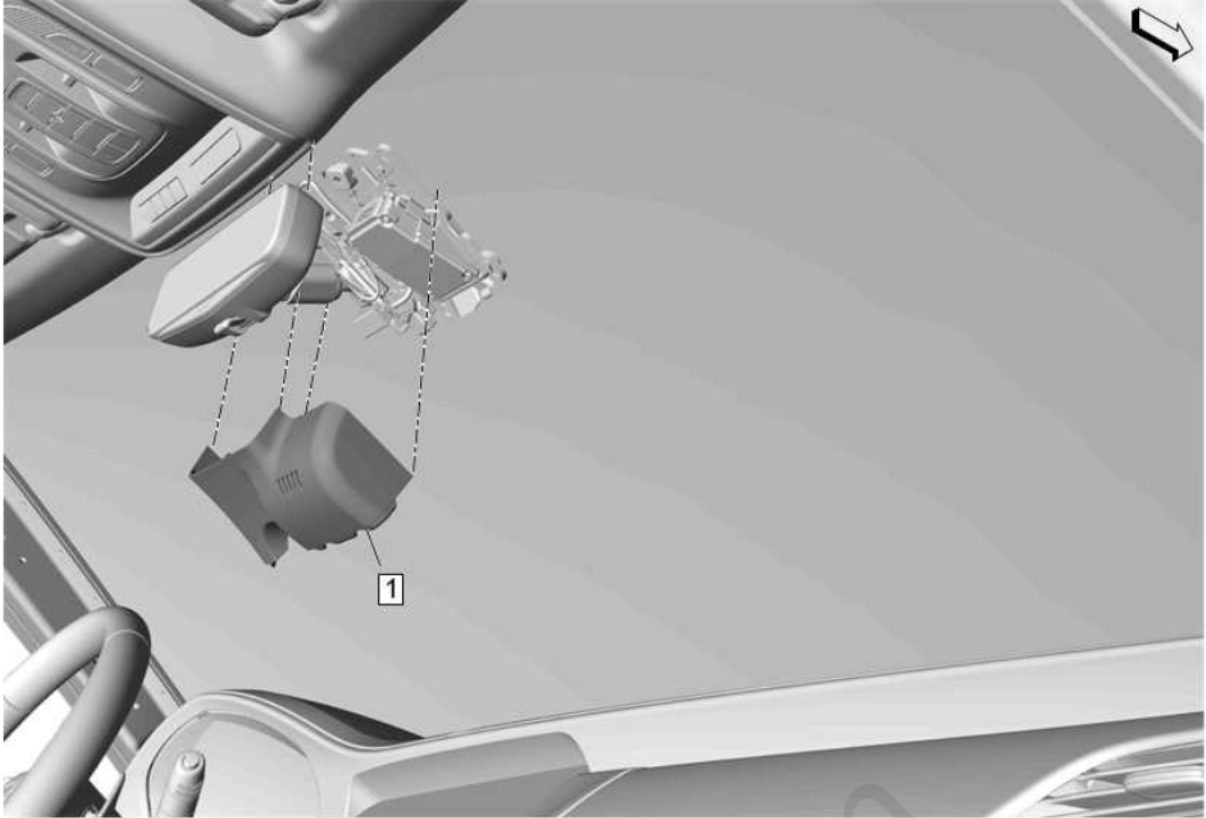


Fig. 43: Windshield Multifunction Sensor Mount Bracket Cover (with UEU)
 Courtesy of GENERAL MOTORS COMPANY

12. Windshield Garnish Molding (1) » Install [2x] - [Windshield Garnish Molding Replacement](#)

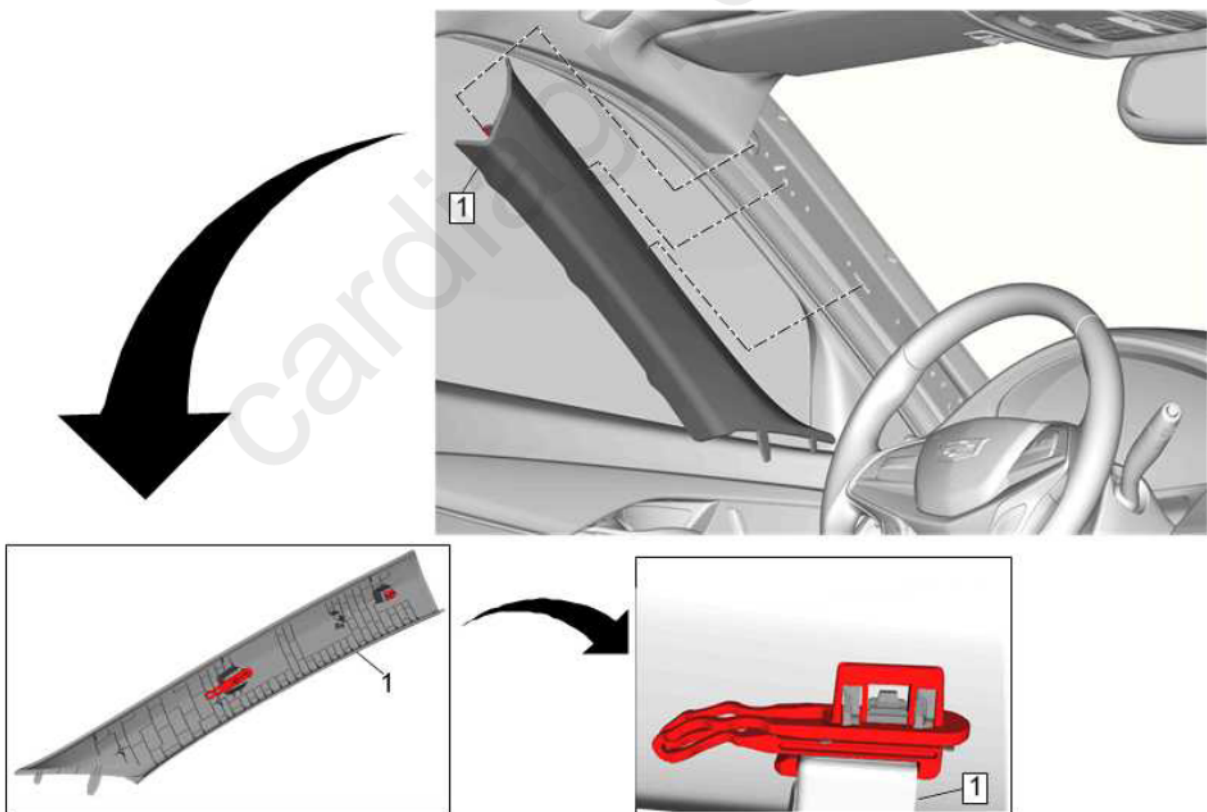


Fig. 44: Windshield Garnish Molding
 Courtesy of GENERAL MOTORS COMPANY

13. Active Noise Cancellation Microphone Grille (1) » Install [4x] - [Active Noise Cancellation Microphone Grille Replacement \(Front\)](#) [Active Noise Cancellation Microphone Grille Replacement \(Rear\)](#)

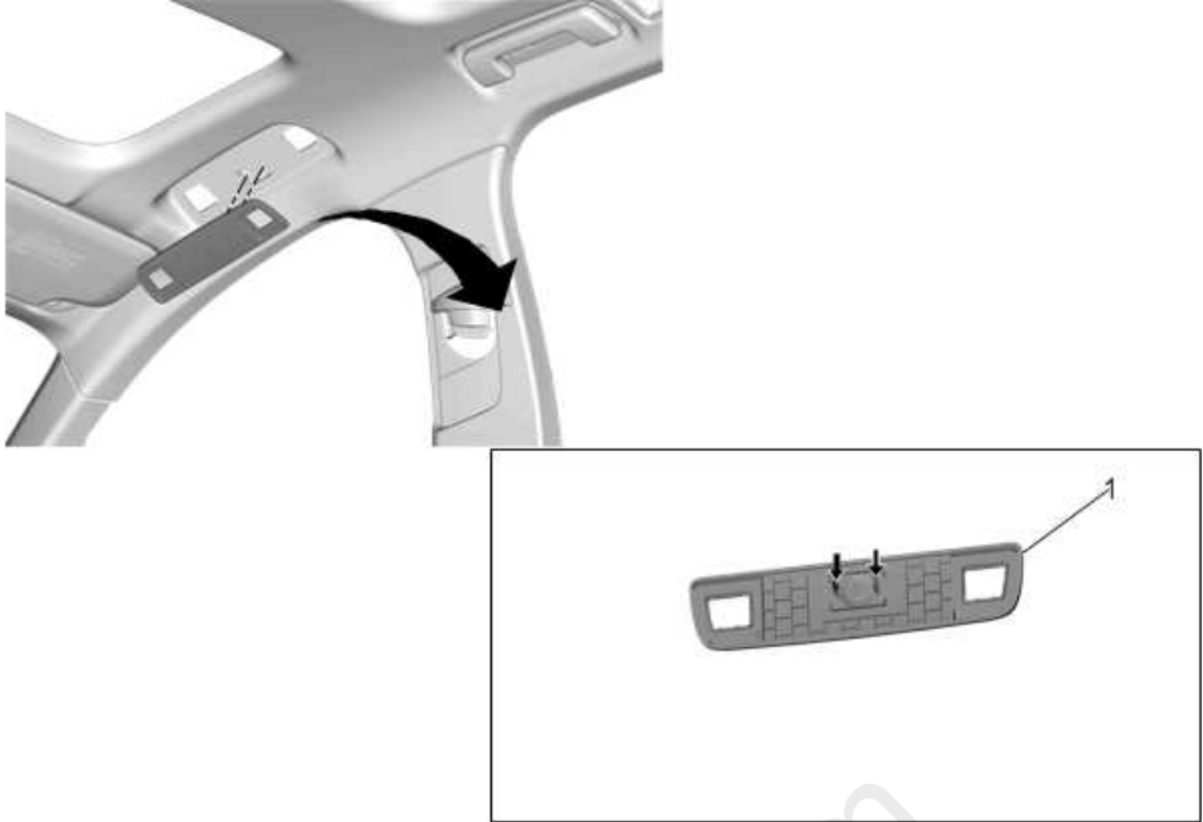


Fig. 45: Active Noise Cancellation Microphone Grille
 Courtesy of GENERAL MOTORS COMPANY

14. Roof Rail Assist Handle (2)» Install [2x] - **Roof Rail Assist Handle Replacement (Rear)**

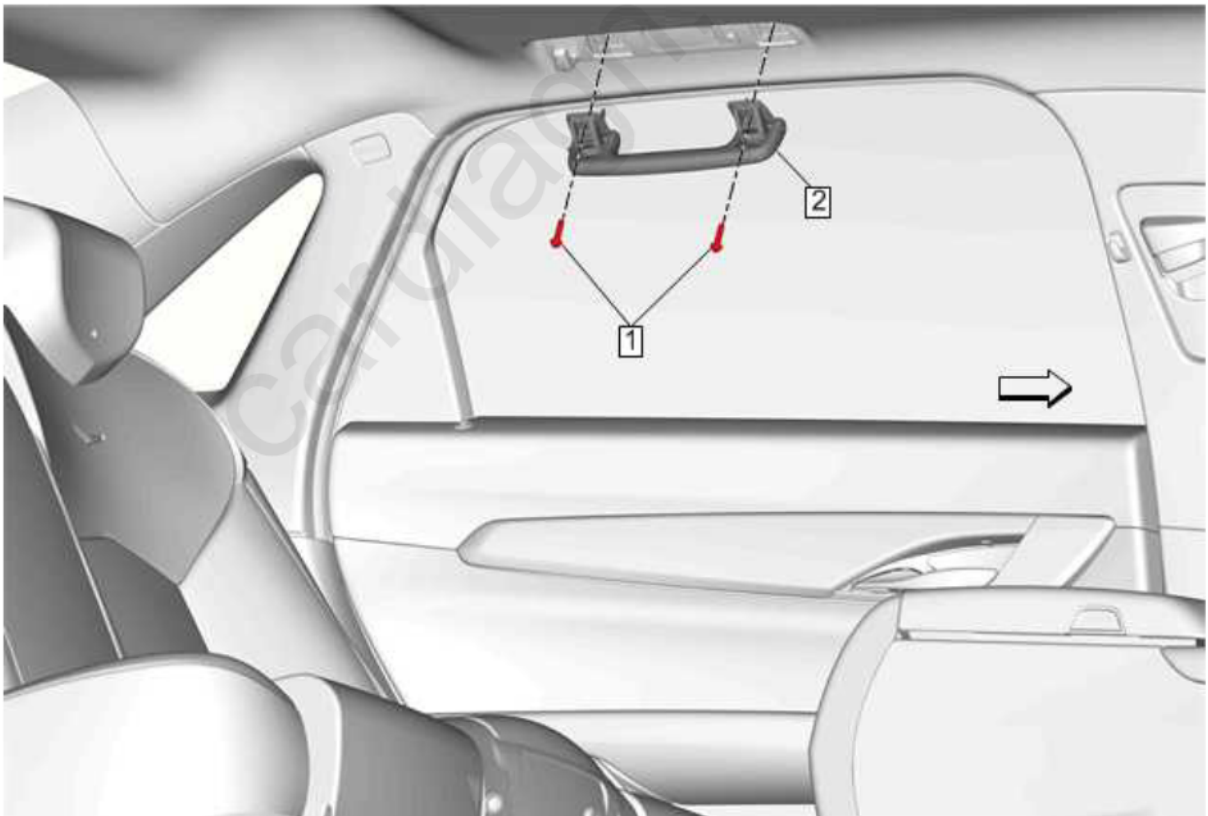


Fig. 46: Roof Rail Assist Handle (Rear)
 Courtesy of GENERAL MOTORS COMPANY

15. Roof Rail Assist Handle (2)» Install [2x] - **Roof Rail Assist Handle Replacement (Front)**

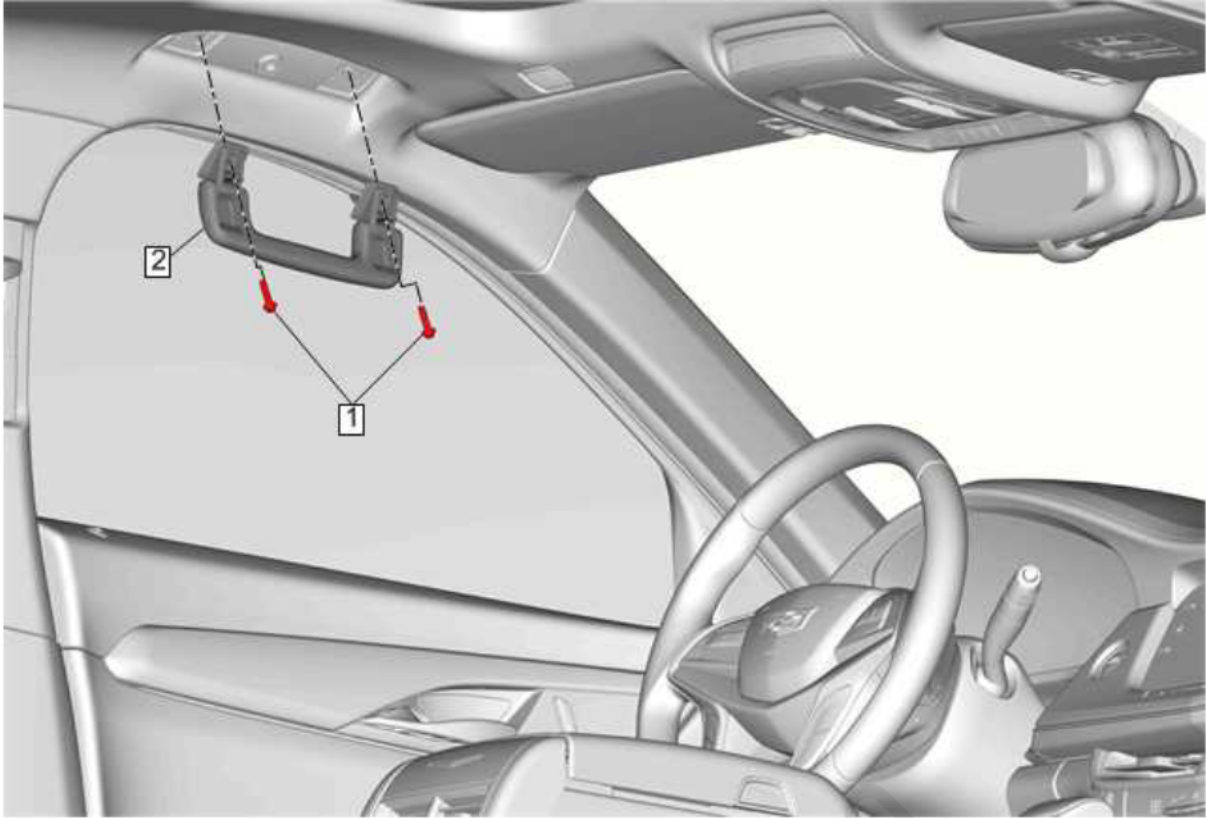


Fig. 47: Roof Rail Assist Handle (Front)

Courtesy of GENERAL MOTORS COMPANY

16. Sunshade Support (2)» Install [2x]-[Sunshade Support Replacement](#)



Fig. 48: Sunshade Support

Courtesy of GENERAL MOTORS COMPANY

17. Sunshade (3)» Install [2x] - [Sunshade Replacement](#)

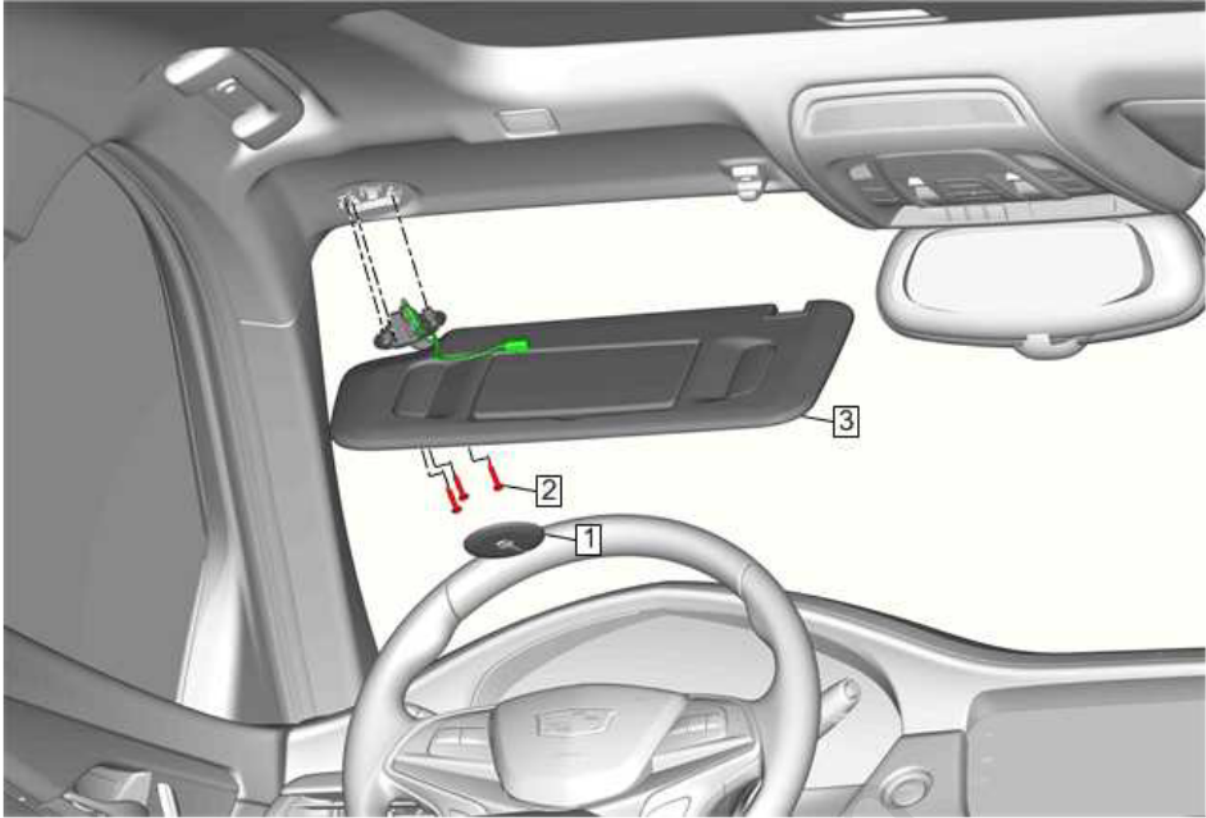


Fig. 49: Sunshade

Courtesy of GENERAL MOTORS COMPANY

18. Enable the SIR System. Refer to [SIR Disabling and Enabling](#)

WIRE TO WIRE REPAIR - HEADLINER

Special Tools

- EL-38125-10 Splice Sleeve Crimping Tool (non GMNA)
- J-38125-5A Ultra Torch Special Tool
- J-38125-8 Splice Sleeve Crimping Tool (GMNA)

For equivalent regional tools, refer to [Special Tools](#) .

WARNING:

In order to reduce the risk of personal injury, loss of high voltage isolation to ground and higher system impedance, do not attempt to repair any HV wiring, connector or terminal that is damaged. High voltage coaxial type cables are not repairable. Never attempt to repair a coaxial type cable. The entire cable/harness or component must be replaced. In order to maintain system integrity and personal safety, never attempt to repair any high voltage wiring, cables or terminals. Performing this procedure on high voltage circuits may result in serious injury or death.

NOTE:

If the wiring harness internal to the transmission is damaged, the wiring harness must be replaced. The use of splice sleeves in an attempt to repair the internal transmission wires, connectors or terminals could result in performance issues.

NOTE:

Do not splice wires in Door Harness Grommets.

NOTE:

The DuraSeal splice sleeves have the following 2 critical features:

- A special heat shrink sleeve environmentally seals the splice. The heat shrink sleeve contains a sealing adhesive inside.
- A cross hatched (knurled) core crimp provides the necessary low resistance contact integrity for these sensitive, low energy circuits.

Use only DuraSeal splice sleeves to form a one-to-one splice on all types of insulation except high voltage and specialty cables. Use DuraSeal splice sleeves where there are special requirements such as moisture sealing. Follow the instructions below in order to splice copper wire using DuraSeal splice sleeves.

Splice Sleeve Selection

Splice Sleeve Color	Crimp Tool Nest Color		Wire Gauge mm ² / (AWG)
	3 Crimp Nests	4 Crimp Nests	
Salmon (Yellow-Pink) 19300089	Red (1) or Red/Green (1)	Red (2)	0.22-0.8/(18-26)
Blue 19168447	Blue (2)	Blue (3)	1.0-2.0/(14-16)
Yellow 19168448	Yellow (3)	Yellow (4)	3.0-5.0/(10-12)

1. Open the harness by removing any tape:

NOTE: You must perform the following procedures in the listed order. Repeat the procedure if any wire strands are damaged. You must obtain a clean strip with all of the wire strands intact.

- Use a sewing seam ripper, available from sewing supply stores, in order to cut open the harness in order to avoid wire insulation damage.
 - Use the DuraSeal splice sleeves on all types of insulation except Tefzel and coaxial.
 - Do not use the crimp and DuraSeal splice sleeve to form a splice with more than 2 wires coming together.
2. Cut as little wire off the harness as possible. You may need the extra length of wire in order to change the location of a splice.

Adjust splice locations so that each splice is at least 40 mm (1.5 in) away from the other splices, harness branches or connectors.
 3. Strip the insulation:
 - When adding a length of wire to the existing harness, use the same size wire as the original wire.
 - Perform one of the following items in order to find the correct wire size:
 - Find the wire on the schematic and convert to regional wiring gauge size.
 - If you are unsure of the wire size, begin with the largest opening in the wire stripper and work down until achieving a clean strip of the insulation.
 - Strip approximately 5.0 mm (0.20 in) of insulation from each wire to be spliced.
 - Do not nick or cut any of the strands. Inspect the stripped wire for nicks or cut strands.
 - If the wire is damaged, repeat this procedure after removing the damaged section.
 4. For high temperature wiring, slide a section of high temperature SCT1 shrink tubing down the length of wire to be spliced. Ensure that the shrink tubing will not interfere with the splice procedure.
 5. Select the proper DuraSeal splice sleeve according to the wire size. Refer to the above table at the beginning of the repair procedure for the color coding of the DuraSeal splice sleeves and the crimp tool nests.
 6. The **EL-38125-10** splice sleeve crimping tool has four crimp nests. The largest crimp nest (4) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (3) is used for crimping 14 and 16 gauge wires. The third largest crimp nest (2) is used for crimping 18 and 20 gauge wires. The smallest crimp nest (1) is used for crimping 22 to 26 gauge wires. The crimp nests are referenced in the table (farther above) under the crimp tool nest color.

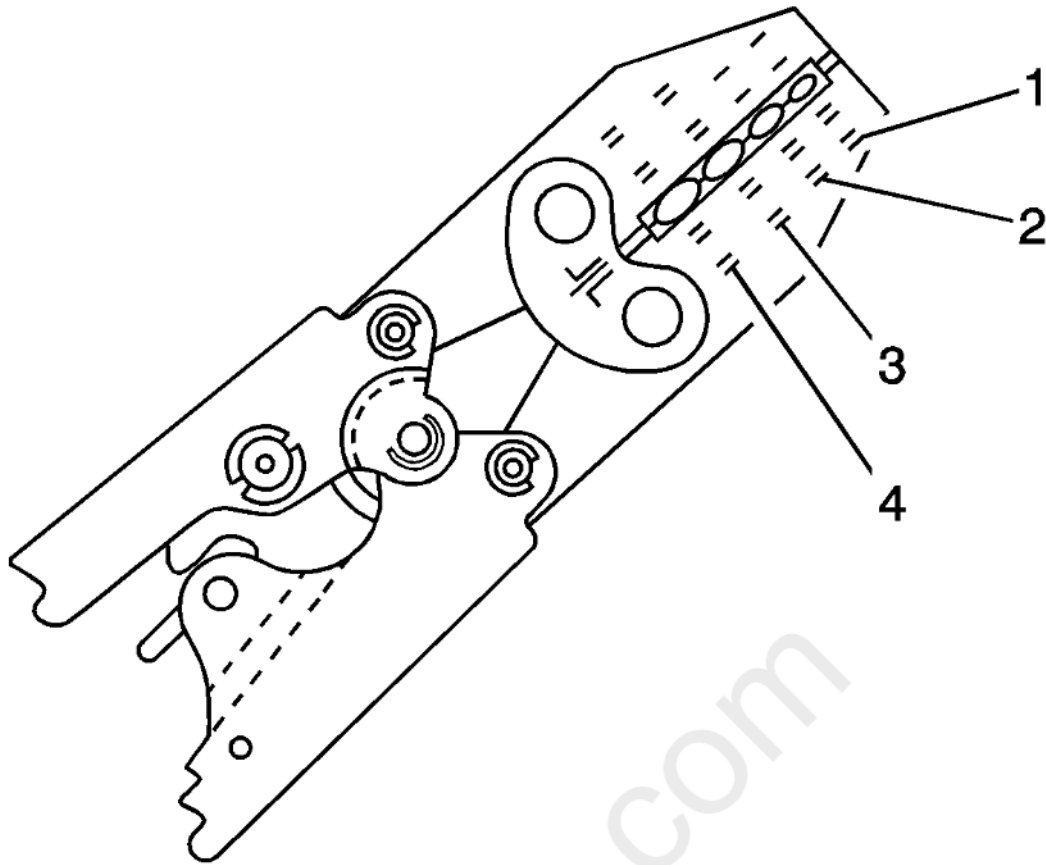


Fig. 50: Crimping Tool

Courtesy of GENERAL MOTORS COMPANY

7. The **J-38125-8** splice sleeve crimping tool has three crimp nests. The largest crimp nest (3) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (2) is used for crimping 14 and 16 gauge wires. The smallest crimp nest (1) is used for crimping 18 to 20 gauge wires. The crimp nests are referenced in the table (farther above) under the crimp tool nest color.

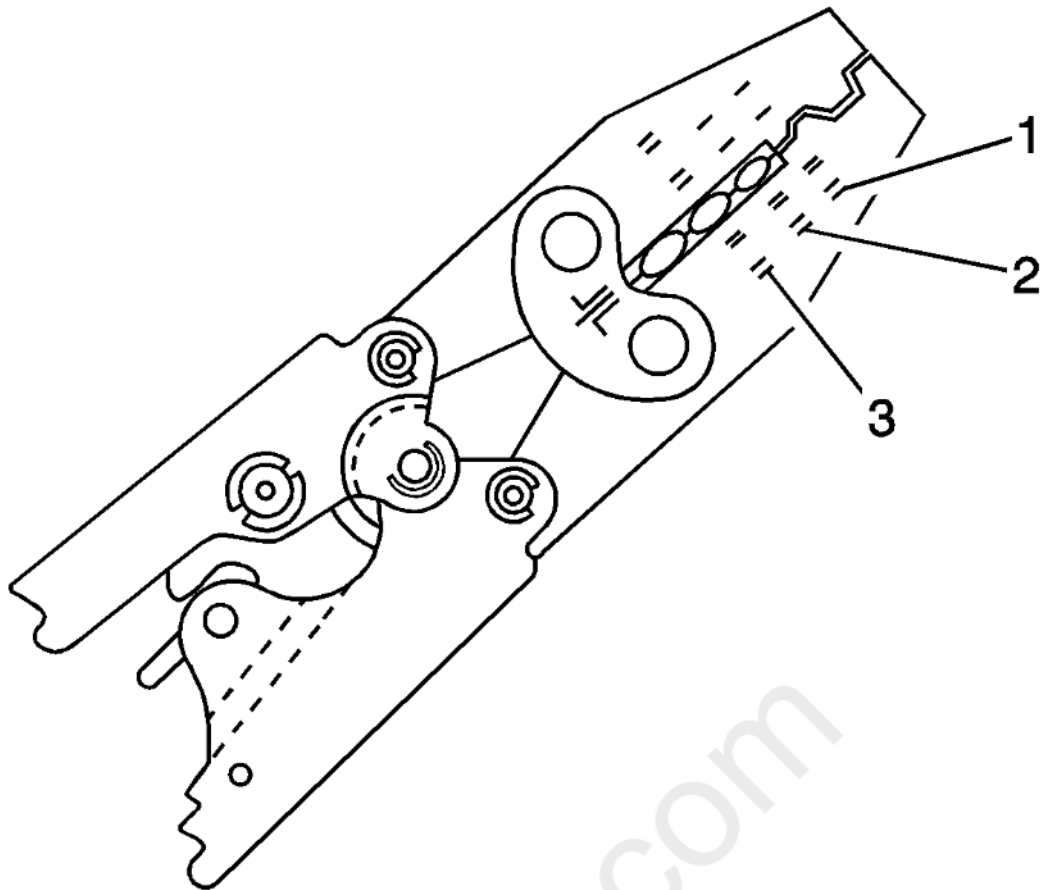


Fig. 51: Identifying Splice Crimp Tool Nests Terminal Identification

Courtesy of GENERAL MOTORS COMPANY

8. Use the splice sleeve crimp tool in order to position the DuraSeal splice sleeve in the proper color nest of the splice sleeve crimp tool. For the four crimp nest tool, use the three largest crimp nests to crimp the splice sleeves. For the three crimp nest tool, use all three crimp nests to crimp the splice sleeves. Use the four and three crimp tool diagrams (above) and the table (farther above) to match the splice sleeve with the correct crimp nest. The crimp tool diagram callout numbers match the numbers in the table (under crimp tool nest color).
9. Place the DuraSeal splice sleeve in the nest. Ensure that the crimp falls midway between the end of the barrel and the stop. The sleeve has a stop (3) in the middle of the barrel (2) in order to prevent the wire (1) from going further. Close the hand crimper handles slightly in order to firmly hold the DuraSeal splice sleeve in the proper nest.

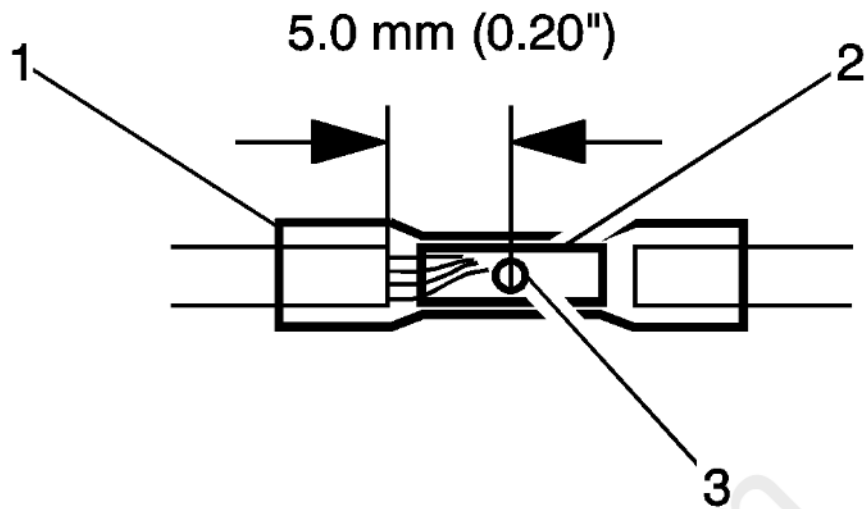


Fig. 52: Identifying Duraseal Splice Sleeve
Courtesy of GENERAL MOTORS COMPANY

10. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop. Refer to **Folded-Over Wire Repair** for splicing wires of 0.35 mm or less (22, 24, 26 gauge sizes) and for splicing wires of different gauges.



Fig. 53: Crimped Duraseal Splice Sleeve

Courtesy of GENERAL MOTORS COMPANY

11. Tightly close the handles of the crimp tool until the crimper handles open when released.

The crimper handles will not open until you apply the proper amount of pressure to the DuraSeal splice sleeve. Repeat steps 4 and 6 for the opposite end of the splice.

12. Using the heat torch, apply heat to the crimped area of the barrel.



Fig. 54: Crimped Duraseal Splice Sleeve

Courtesy of GENERAL MOTORS COMPANY

13. Start in the middle and gradually move the heat barrel to the open ends of the tubing:
 - The tubing will shrink completely as the heat is moved along the insulation.
 - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

Weatherpack™ Wiring Repair

NOTE: Some replacement pigtail connectors may be delivered without the terminated leads installed into the connector. For Weatherpack™ connectors, all terminated leads included in the package should to be installed into the connector. If the connector end view shows that a terminal is not occupied, the extra terminated lead(s) need to be installed and the end(s) sealed using a DuraSeal splice sleeve and taped back into the harness.

1. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop. Refer to **Folded-Over Wire Repair** for splicing wires of 0.35 mm or less (22, 24, 26 gauge sizes) and for splicing wires of different gauges.

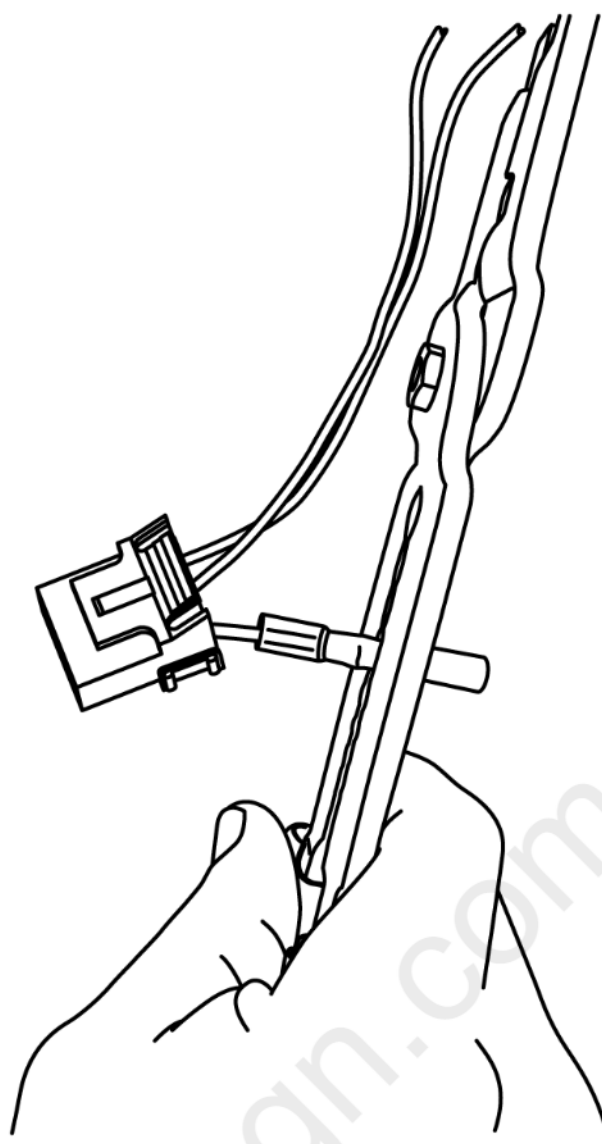


Fig. 55: Tightly Close Handles Of Crimp Tool
Courtesy of GENERAL MOTORS COMPANY

2. Tightly close the handles of the crimp tool until the crimper handles open when released.

The crimper handles will not open until you apply the proper amount of pressure to the DuraSeal splice sleeve. Holding the DuraSEAL with one hand gently tug on the wire to ensure it is crimped in the DuraSeal.

3. Using the heat torch, apply heat to the crimped area of the barrel.
4. Start in the middle and gradually move the heat barrel to the open ends of the tubing:

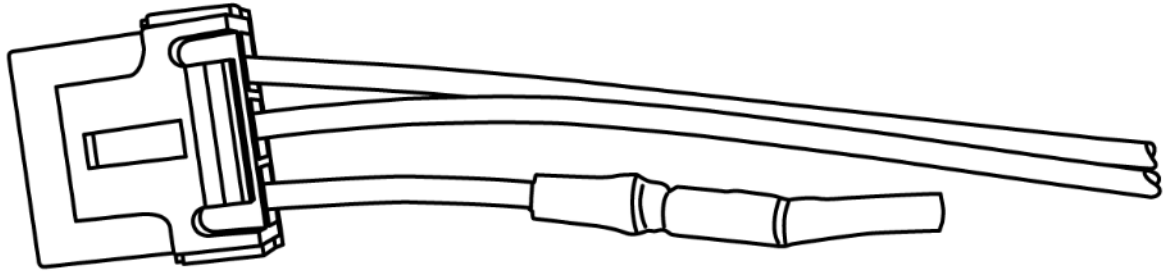


Fig. 56: Heat To Crimped Area Of Barrel

Courtesy of GENERAL MOTORS COMPANY

- The tubing will shrink completely as the heat is moved along the insulation.
- A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

5. Tape the extra terminated lead(s) back into the harness.

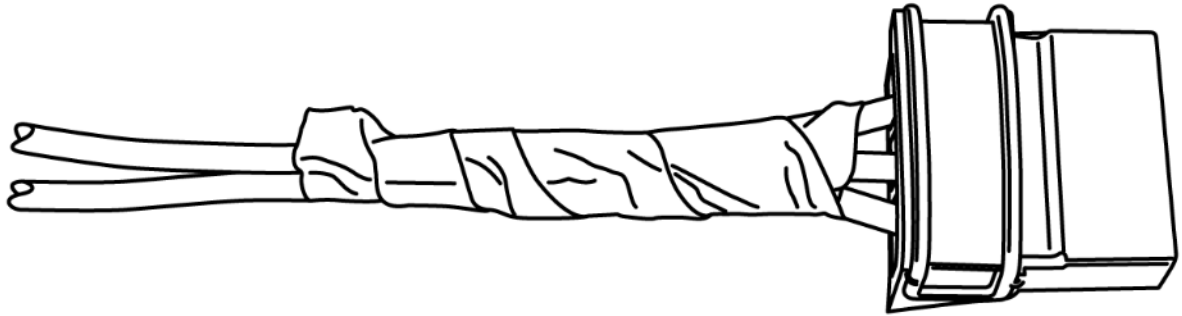


Fig. 57: Taping Extra Terminated Leads Back Into Harness
Courtesy of GENERAL MOTORS COMPANY

High Temperature Wiring Repairs

Use the following procedures to perform high temperature wiring repairs:

1. Center the high temperature SCT1 shrink tube over the DuraSeal splice sleeve.
2. Using the heat torch, apply heat to the high temperature heat shrink tubing.
3. Gradually move the heat from the center to the open end of the tubing:
 - The tubing will shrink completely as the heat is moved along the insulation.
 - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.
4. Replace any reflective tape and clips that may have been removed during the repair.

CONNECTOR RECONNECTION - HEADLINER

Special Tools

EL-35616 Terminal Test Probe Kit

For equivalent regional tools, refer to [Special Tools](#) .

When the condition is not currently present, but is indicated in DTC history, the cause may be intermittent. An intermittent may also be the cause when there is a customer complaint, but the symptom cannot be duplicated. Refer to the Symptom Table of the system that is suspect of causing the condition before trying to locate an intermittent condition.

Most intermittent conditions are caused by faulty electrical connections or wiring. Inspect for the following items:

- Loose, corroded or painted terminal stud/fastener
- Wiring broken inside the insulation
- Poor connection between the male and female terminal at a connector
- A terminal not seated all the way into the connector body
- Poor terminal to wire connection - Some conditions which fall under this description are poor crimps, poor solder joints, crimping over the wire insulation rather than the wire itself and corrosion in the wire to terminal contact area, etc.
- Pierced or damaged insulation can allow moisture to enter the wiring causing corrosion. The conductor can corrode inside the insulation, with little visible evidence. Look for swollen and stiff sections of wire in the suspect circuits.
- Wiring which has been pinched, cut or its insulation rubbed through may cause an intermittent open or short as the bare area touches other wiring or parts of the vehicle.
- Wiring that comes in contact with hot or exhaust components
- Refer to [**Inducing Intermittent Fault Conditions**](#) in order to duplicate the conditions required, in order to verify the customer concern.
- Refer to [**Testing for Electrical Intermittents**](#) for test procedures to detect intermittent open, high resistance, short to ground and short to voltage conditions.
- Refer to [**Scan Tool Snapshot Procedure**](#) for advanced intermittent diagnosis and Vehicle Data Recorder operation.

Testing for Terminal Fretting

Some intermittent conditions can be caused by wire terminal fretting corrosion. Fretting corrosion is a build-up of insulating, oxidized wear debris that can form when there is a small motion between electrical contacts. The oxidized wear debris can pile up enough at the electrical contact spots that the electrical resistance across the connection increases. Movement between the contacting surfaces as small as 10 to 100 microns can cause fretting. To put this in perspective, a sheet of paper is about 100 microns thick, so fretting motion is small and hard to see. Vibration and thermal expansion/contraction are the main sources that create fretting motion. Since vehicles vibrate and can experience large temperature swings, they are a good source for fretting motion. Tin, copper, nickel and iron surfaces are all susceptible to fretting corrosion. Fretting corrosion can be difficult to see but it looks like small, dark smudges on the terminals contact surface.

To correct a fretting condition disconnect the suspect connector and add dielectric grease/lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to both sides of the connector terminals. Then reconnect the connector and wipe away any excess lubricant. This will correct the additional terminal contact resistance due to the terminal fretting corrosion.

Testing for Proper Terminal Contact

It is important to test terminal contact at the component and any inline connectors before replacing a suspect component. Mating terminals must be inspected to ensure good terminal contact. A poor connection between the male and female terminal at a connector may be the result of contamination or deformation.

Contamination may be caused by the connector halves being improperly connected. A missing or damaged connector seal, damage to the connector itself or exposing the terminals to moisture and dirt can also cause contamination. Contamination, usually in the underhood or underbody connectors, leads to terminal corrosion, causing an open circuit or intermittently open circuit.

Deformation is caused by probing the mating side of a connector terminal without the proper adapter. Always use the **EL-35616** kit when probing connectors. Other causes of terminal deformation are improperly joining the connector halves or repeatedly separating and joining the connector halves. Deformation, usually to the female terminal contact tang, can result in poor terminal contact causing an open or intermittently open circuit.

Testing for Proper Terminal Contact in Bussed Electrical Centers

It is very important to use the correct test adapter when testing for proper terminal contact of fuses and relays in a bussed electrical center. Use the **EL-35616** kit to test for proper terminal contact. Failure to use the **EL-35616** kit can result in improper diagnosis of the bussed electrical center.

Follow the procedure below in order to test terminal contact:

1. Separate the connector halves.
2. Visually inspect the connector halves for contamination. Contamination may result in a white or green build-up within the connector body or between terminals. This causes high terminal resistance, intermittent contact or an open circuit. An underhood or underbody connector that shows signs of contamination should be replaced in its entirety: terminals, seals and connector body.
3. Using an equivalent male terminal/terminated lead, verify that the retention force is significantly different between a known good terminal and the suspect terminal. Replace the female terminal in question.

Flat Wire Connectors

There are no serviceable parts for flat wire connectors on the harness side or the component side.

Follow the procedure below in order to test terminal contact:

1. Remove the component in question.
2. Visually inspect each side of the connector for signs of contamination. Avoid touching either side of the connector as oil from your skin may be a source of contamination as well.
3. Visually inspect the terminal bearing surfaces of the flat wire circuits for splits, cracks or other imperfections that could cause poor terminal contact. Visually inspect the component side connector to ensure that all of the terminals are uniform and free of damage or deformation.
4. Insert the appropriate adapter into the flat wire harness connector in order to test the circuit in question.

Control Module/Component Voltage and Grounds

Poor voltage or ground connections can cause widely varying symptoms.

- Test all control module voltage supply circuits. Many vehicles have multiple circuits supplying voltage to a control module. Other components in the system may have separate voltage supply circuits that may also need to be tested. Inspect connections at the module/component connectors, fuses and any intermediate connections between the voltage source and the module/component. A test lamp or a DMM may indicate that voltage is present, but neither tests the ability of the circuit to carry sufficient current. Operate the component to test the ability of the circuit to carry sufficient current. Refer to [Circuit Testing](#) and [Power Distribution Schematics](#).
- Test all control module ground and system ground circuits. The control module may have multiple ground circuits. Other components in the system may have separate grounds that may also need to be tested. Inspect grounds for clean and tight connections at the grounding point (screw or stud). Inspect the connections at the component and in splice packs, where applicable. Operate the component to test the ability of the circuit to carry sufficient current. Refer to [Circuit Testing](#) and [Ground Distribution Schematics](#).

Temperature Sensitivity

- An intermittent condition may occur when a component/connection reaches normal operating temperature. The condition may occur only when the component/connection is cold or only when the component/connection is hot.
- Freeze Frame, Failure Records, Snapshot or Vehicle Data Recorder data may help with this type of intermittent condition, where applicable.
- If the intermittent is related to heat, review the data for a relationship with the following:
 - High ambient temperatures
 - Underhood/engine generated heat
 - Circuit generated heat due to a poor connection or high electrical load

- Higher than normal load conditions, towing, etc.
- If the intermittent is related to cold, review the data for the following:
 - Low ambient temperatures - In extremely low temperatures, ice may form in a connection or component. Inspect for water intrusion.
 - The condition only occurs on a cold start.
 - The condition goes away when the vehicle warms up.
- Information from the customer may help to determine if the trouble follows a pattern that is temperature related.
- If temperature is suspected of causing an intermittent fault condition, attempt to duplicate the condition. Refer to [Inducing Intermittent Fault Conditions](#) in order to duplicate the conditions required.

Electromagnetic Interference and Electrical Noise

Some electrical components/circuits are sensitive to electromagnetic interference or other types of electrical noise. Inspect for the following conditions:

- A mis-routed harness that is too close to high voltage/high current devices such as secondary ignition components, motors, generator etc. - These components may induce electrical noise on a circuit that could interfere with normal circuit operation.
- Electrical system interference caused by a malfunctioning relay or a control module driven solenoid or switch - These conditions can cause a sharp electrical surge. Normally, the condition will occur when the malfunctioning component is operating.
- Installation of non-factory or aftermarket add on accessories such as lights, 2-way radios, amplifiers, electric motors, remote starters, alarm systems, cell phones, etc. - These accessories may create interference in other circuits while operating and the interference would disappear when the accessory is not operating. Refer to [Checking Aftermarket Accessories](#).
- Test for an open diode across the A/C compressor clutch and for other open diodes. Some relays may contain a clamping diode.
- The generator may be allowing AC noise into the electrical system.

Incorrect Control Module

- There are only a few situations where reprogramming a control module is appropriate:
 - A new service control module is installed.
 - A control module from another vehicle is installed.
 - Revised software/calibration files have been released for this vehicle.
- Verify that the control module contains the correct software/calibration. If incorrect programming is found, reprogram the control module with the most current software/calibration. Refer to [Control Module References](#) for replacement, setup and programming.

NOTE: DO NOT re-program the control module with the SAME software/calibration files that are already present in the control module. This is not an effective repair for any type of concern.

HEADLINER HARNESS REPLACEMENT

Removal Procedure

1. Remove the headlining trim panel. Refer to [Headlining Trim Panel Replacement \(Without C3U\)](#) and/or [Headlining Trim Panel Replacement \(With C3U\)](#).
2. Take note of the wiring harness locations and measure the harness lead length prior to removing. Mark harness routing locations on new headliner prior to harness removal.
3. Use fiber or plastic trim tool to assist in removing the wiring harness from the headliner, taking care not to damage the harness.

NOTE: Use a camera to take pictures and use a pencil to mark the new headliner.

4. Remove excess glue and material from the wiring harness and re-tape areas where the tape was removed or damaged.

Installation Procedure

1. Lay the wiring harness on the new headliner assembly to confirm correct routing and ensure harness leads are proper length for mating connections prior to gluing.
2. Use hot melt adhesive to install the wiring harness. Apply insulator tape over glued locations to prevent squeaks and rattles as needed.

WARNING: Do not change the wiring harness routing locations. Correct harness routing is critical for air bag deployment. Possible personal injury or vehicle damage could result if the harness routing is changed.

NOTE: When installing a new headliner harness, tape any unused connector to the headliner with a high adhesive tape.

3. Install the headlining trim panel. Refer to [Headlining Trim Panel Replacement \(Without C3U\)](#) and/or [Headlining Trim Panel Replacement \(With C3U\)](#).

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