



## CHEVROLET SONIC 2012 BODY REPAIR MANUAL



**CHEVROLET SONIC 2012**



# FOREWORD

## 2012 Chevrolet Aveo Service Manual

### Volume 1

This manual provides information on the diagnosis, the service procedures, the adjustments, and the specifications for the 2012 Chevrolet Aveo.

The technicians who understand the material in this manual and in the appropriate Dealer Service Bulletins better serve the vehicle owners.

When this manual refers to a brand name, a part number, or a specific tool, you may use an equivalent product in place of the recommended item. All information, illustrations, and specifications in this manual are based on the latest product information available at the time of publication approval. General Motors reserves the right to make changes at any time without notice.

Published by

**North American Operations**

**General Motors LLC**

**Warren, Michigan 48090**

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The information cutoff date is 09/28/09.

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# CHEVROLET SONIC BODY REPAIR MANUAL 2012



HATCHBACK



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## Definition of Danger, Warning, Caution, and Note

The diagnosis and repair procedures in a GM Service Manual contain both general and specific Dangers, Warnings, Cautions, Notes or Importants. GM is dedicated to the presentation of service information that helps the technician to diagnose and repair the systems necessary for the proper operation of the vehicle, however, certain procedures may present a hazard to the technician if they are not followed in the recommended manner . Dangers, Warnings, Cautions and Notes or Importants are elements designed to prevent these hazards, however, not all hazards can be foreseen. This information is placed at strategic locations within the service manual. This information is designed to prevent the following from occurring:

- Serious bodily injury or death to the technician
- Damage to the vehicle
- Unnecessary vehicle repairs
- Unnecessary component replacement
- Improper repair or replacement of vehicle components.
- Any warning or caution that appears in this service category is referenced from the individual service categories.

### DANGER Defined

When encountering a DANGER, you will be asked to take a necessary action or not to take a prohibited action. If a DANGER is not heeded, the following consequences may occur:

- Serious bodily injury or death to the technician
- Serious bodily injury or death to other technicians in the workplace area

### WARNING Defined

When encountering a WARNING, you will be asked to take a necessary action or not to take a prohibited action. If a WARNING is not heeded, the following consequences may occur:

- Serious bodily injury to the technician
- Serious bodily injury to other technicians in the workplace area
- Serious bodily injury to the driver and/or passenger(s) of the vehicle, if the vehicle has been improperly repaired

### CAUTION Defined

CAUTIONS call special attention to a necessary action or to a prohibited action. If a CAUTION is not heeded, the following consequences may occur:

- Damage to the vehicle
- Unnecessary vehicle repairs
- Unnecessary component replacement
- Improper operation or performance of the system or component under repair
- Damage to any systems or components which are dependent upon the proper operation of the system or component under repair
- Improper operation or performance of any systems or components which are dependent upon the proper operation or performance of the system or component under repair
- Damage to fasteners, basic tools, or special tools
- The leakage of coolant, lubricant, or other vital fluids

### NOTE or IMPORTANT Defined

NOTE and IMPORTANT statements emphasize a necessary characteristic of a diagnostic or repair procedure. NOTE or IMPORTANT statements are designed to do the following:

- Clarify a procedure
- Present additional information for accomplishing a procedure
- Give insight into the reason or reasons for performing a procedure in the manner recommended
- Present information that will help to accomplish a procedure in a more effective manner
- Present information that gives the technician the benefit of past experience in accomplishing a procedure with greater ease

## Approved Equipment for Collision Repair Warning

**Warning:** To avoid personal injury when exposed to welding flashes or to galvanized (Zinc Oxide) metal toxic fumes while grinding/cutting on any type of metal or sheet molded compound, you must work in a properly ventilated area, wearing an approved respirator, eye protection , earplugs, welding gloves, and protective clothing.

## Batteries Produce Explosive Gases Warning

**Warning:** Batteries produce explosive gases. Batteries contain corrosive acid. Batteries supply levels of electrical current high enough to cause burns. Therefore, in order to reduce the risk of personal injury while working near a battery, observe the following guidelines:

- Always shield your eyes.
- Avoid leaning over the battery whenever possible.
- Do not expose the battery to open flames or sparks.
- Do not allow battery acid to contact the eyes or the skin.
- Flush any contacted areas with water immediately and thoroughly.
- Get medical help.

## Battery Disconnect Warning

**Warning:** Unless directed otherwise, the ignition and start switch must be in the OFF or LOCK position, and all electrical loads must be OFF before servicing any electrical component. Disconnect the negative battery cable to prevent an electrical spark should a tool or equipment come in contact with an exposed electrical terminal. Failure to follow these precautions may result in personal injury and/or damage to the vehicle or its components. For Vehicles equipped with OnStar® (UE1) with Back Up Battery: The Back Up Battery is a redundant power supply to allow limited OnStar® functionality in the event of a main vehicle battery power disruption to the VCIM (OnStar® module). Do not disconnect the main vehicle battery or remove the OnStar® fuse with the ignition key in any position other than OFF. Retained accessory power (RAP) should be allowed to time out or be disabled (simply opening the driver door should disable RAP) before disconnecting power. Disconnecting power to the OnStar® module in any way while the ignition is On or with RAP activated may cause activation of the OnStar® Back-Up Battery (BUB) system and will discharge and permanently damage the back-up battery. Once the Back-Up Battery is activated it will stay on until it has completely discharged. The BUB is not rechargeable and once activated the BUB must be replaced.

## Brake Fluid Irritant Warning

**Warning:** Brake fluid may irritate eyes and skin. In case of contact, take the following actions:

- Eye contact—rinse thoroughly with water.
- Skin contact—wash with soap and water.
- If ingested—consult a physician immediately.

## Brake Fluid Warning

**Warning:** Use only Delco Supreme 11, GMP/N12377967 (Canadian P/N992667), or equivalent DOT3 brake fluid from a clean, sealed container. Do not use fluid from an open container that may be contaminated with water. Improper or contaminated fluid could result in damage to components, or loss of braking, with possible injury.

## Collision Sectioning Warning

**Warning:** Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle and cause personal injury if the vehicle is in a collision.



## Cracked Window Warning

**Warning:** If a window is cracked but still intact, crisscross the window with masking tape in order to reduce the risk of damage or personal injury.

## Defroster Outlet Warning

**Warning:** If broken glass falls into the defroster outlets, it can be blown into the passenger compartment and cause personal injury.

## Electric Coolant Fan Warning

**Warning:** An electric fan under the hood can start up even when the engine is not running and can injure you. Keep hands, clothing and tools away from any underhood electric fan.

## Exhaust Service Warning

**Warning:** In order to avoid being burned, do not service the exhaust system while it is still hot. Service the system when it is cool.

## Eye Protection Warning

**Warning:** Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

## Gasoline/ Gasoline Vapors Warning

**Warning:** Gasoline or gasoline vapors are highly flammable. A fire could occur if an ignition source is present. Never drain or store gasoline or diesel fuel in an open container, due to the possibility of fire or explosion. Have a dry chemical (Class B) fire extinguisher nearby.

## Glass and Sheet Metal Handling Warning

**Warning:** When working with any type of glass or sheet metal with exposed or rough edges, wear approved safety glasses and gloves in order to reduce the chance of personal injury.



## Halogen Bulb Warning

**Warning:** Halogen bulbs contain gas under pressure. Handling a bulb improperly could cause it to shatter into flying glass fragments. To help avoid personal injury:

- Turn off the lamp switch and allow the bulb to cool before changing the bulb.
- Leave the lamp switch OFF until the bulb change is complete.
- Always wear eye protection when changing a halogen bulb.
- Handle the bulb only by its base. Avoid touching the glass.
- Keep dirt and moisture off the bulb.
- Properly dispose of the used bulb.
- Keep halogen bulbs out of the reach of children.

## Hood Hold-Open Device Warning

**Warning:** When a hood hold open device is being removed or installed, provide alternate support to avoid the possibility of damage to the vehicle or personal injury.

## Parking Brake and Drive Wheels Warning

**Warning:** Apply the parking brake and block the drive wheels before performing this procedure in order to prevent bodily injury.

## Protective Goggles and Glove Warning

**Warning:** Always wear protective goggles and gloves when removing exhaust parts as falling rust and sharp edges from worn exhaust components could result in serious personal injury.

## Radiator Cap Removal Warning

**Warning:** To avoid being burned, do not remove the radiator cap or surge tank cap while the engine is hot. The cooling system will release scalding fluid and steam under pressure if radiator cap or surge tank cap is removed while the engine and radiator are still hot.

## Relieving Fuel Pressure Warning

**Warning:** Remove the fuel tank cap and relieve the fuel system pressure before servicing the fuel system in order to reduce the risk of personal injury. After you relieve the fuel system pressure, a small amount of fuel may be released when servicing the fuel lines, the fuel injection pump, or the connections. In order to reduce the risk of personal injury, cover the fuel system components with a shop towel before disconnection. This will catch any fuel that may leak out. Place the towel in an approved container when the disconnection is complete.

## Repair Material Curing Warning

**Warning:** At least 24 hours are required for complete curing of repair material. The repair area should not be physically disturbed until after that time. Insufficient curing of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.



## Safety Glasses and Compressed Air Warning

**Warning:** Wear safety glasses when using compressed air in order to prevent eye injury.

## Safety Glasses Warning

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

## Safety Goggles and Fuel Warning

**Warning:** Always wear safety goggles when working with fuel in order to protect the eyes from fuel splash.

## Sensing and Diagnostic Module Handling Warning

**Warning:** Be careful when you handle a sensing and diagnostic module (SDM). Do not strike or jolt the SDM. Before applying power to the SDM:

- Remove any dirt, grease, etc. from the mounting surface
- Position the SDM horizontally on the mounting surface
- Point the arrow on the SDM toward the front of the vehicle
- Tighten all of the SDM fasteners and SDM bracket fasteners to the specified torque value

Failure to follow the correct procedure could cause air bag deployment, personal injury, or unnecessary SIR system repairs.

# Sensing and Diagnostic Module Voltage after Ignition is Turned Off Warning

**Warning:** The sensing and the diagnosis module (SDM) can maintain sufficient voltage to deploy the airbags and pretensioners for up to 1 minute after the ignition has been turned OFF and the fuse has been removed. If the airbags and pretensioners are not disconnected, do not begin service until one minute has been passed after disconnecting power to the SDM. Failure to do so may cause personal injury.

## Servicing the SI R System Warning

**Warning:** When performing service on or around the SIR components or the SIR wiring, follow the procedures listed below in order to temporarily disable the SIR system. Failure to follow the procedures could result in the following:

- Air bag deployment
- Personal injury
- Otherwise unneeded SIR system repairs

## SI R Inflator Module Handling and Storage Warning

- Warning:** When carrying an undeployed inflator module:
- Do not carry the inflator module by the wires or connector.
  - Make sure the air bag opening points away from you.
  - When storing an undeployed inflator module:
  - Make sure the air bag opening points away from the surface on which the inflator module rests.
  - Provide free space for the air bag to expand in case of an accidental deployment.
  - When storing a steering column, do not rest the column with the air bag opening facing down and the column vertical. Lay the column on its side.
- Failure to observe these guidelines may result in personal injury.



## SI R Seatbelt Pretensioner Handling Warning

- Warning:** When carrying an undeployed inflatable restraint seat belt retractor pretensioner:
- Do not carry the seat belt pretensioner by the seat belt webbing or pigtail connector, if equipped.
  - Carry the seat belt pretensioner by the housing, keeping hands and fingers away from the seat belt webbing.
  - Make sure the opening, from which the seat belt webbing extends, faces downward and the seat belt webbing hangs freely.
- Failure to observe these guidelines may result in personal injury.

## SI R Warning

**Warning:** This vehicle is equipped with a Supplemental Inflatable Restraint (SIR) System. Failure to follow the correct procedure could cause the following conditions:

- Air bag deployment
- Personal injury
- Unnecessary SIR system repairs

In order to avoid the above conditions, observe the following guidelines:

- Refer to SIR Component Views in order to determine if you are performing service on or near the SIR components or the SIR wiring.
- If you are performing service on or near the SIR components or the SIR wiring, disable the SIR system. Refer to Disabling the SIR System.

## Torque-to-Yield Fastener Warning

**Warning:** This component is equipped with torque-to-yield fasteners. Install a NEW torque-to-yield fastener when installing this component. Failure to replace the torque-to-yield fastener could cause bodily injury and damage to the vehicle or component.

## Brake Fluid Damage to Electrical Connections Caution

**Caution:** Brake fluid will damage electrical connections and painted surfaces. Use shop cloths, suitable containers, and fender covers to prevent brake fluid from contacting these areas. Always re-seal and wipe off brake fluid containers to prevent spills.

## Brake Fluid Effects on Paint and Electrical Components Caution

**Caution:** Avoid spilling brake fluid onto painted surfaces, electrical connections, wiring, or cables. Brake fluid will damage painted surfaces and cause corrosion to electrical components. If any brake fluid comes in contact with painted surfaces, immediately flush the area with water. If any brake fluid comes in contact with electrical connections, wiring, or cables, use a clean shop cloth to wipe away the fluid.

## Catalytic Converter Movement Caution

**Caution:** To prevent internal damage to the flexible coupling of the catalytic converter assembly, the converter must be supported. The vertical movement at the rear of the catalytic converter assembly must not exceed 6 degrees up or down.

## Clearcoat/ Ultraviolet Screeners Caution

**Caution:** Removing more than 0.5mils of the clearcoat can result in early paint failure. The clearcoat contains ultraviolet screeners. Do not finesse sand more than what is required to remove the defect.

## Component Fastener Tightening Caution

**Caution:** Replacement components must be the correct part number for the application. Components requiring the use of the thread locking compound, lubricants, corrosion inhibitors, or sealants are identified in the service procedure. Some replacement components may come with these coatings already applied. Do not use these coatings on components unless specified. These coatings can affect the final torque, which may affect the operation of the component. Use the correct torque specification when installing components in order to avoid damage.



## Exterior Trim Emblem Removal Caution

**Caution:** Use a plastic, flat-bladed tool to prevent paint damage when removing an emblem/name plate.

## Fastener Caution

**Caution:** Use the correct fastener in the correct location. Replacement fasteners must be the correct part number for that application. Do not use paints, lubricants, or corrosion inhibitors on fasteners, or fastener joint surfaces, unless specified. These coatings affect fastener torque and joint clamping force and may damage the fastener. Use the correct tightening sequence and specifications when installing fasteners in order to avoid damage to parts and systems. When using fasteners that are threaded directly into plastic, use extreme care not to strip the mating plastic part(s). Use hand tools only, and do not use any kind of impact or power tools. Fastener should be hand tightened, fully seated, and not stripped.

## Fuel Tank Strap Fastener Caution

**Caution:** Tighten the strap fasteners by steps, alternating between the fasteners, until the specified torque is reached. A failure to tighten the strap fasteners as specified will cause the bottom of the tank to flex upward. This will result in the fuel gauge indicating that there is fuel remaining in the tank when the tank is empty.

# Ignition OFF When Disconnecting Battery Caution

**Caution:** Always turn the ignition OFF when connecting or disconnecting battery cables, battery chargers, or jumper cables. Failing to do so may damage the Powertrain Control Module (PCM) or other electronic components.

## Installing Hoses without Twists or Bends Caution

**Caution:** The inlet and outlet hoses must not be twisted during installation. Do not bend or distort the inlet or outlet hoses to make installation easier. Failure to follow these procedures could result in component damage.

## Liftgate Assist Rod Caution

**Caution:** Apply pressure only at the end of the liftgate/hood assist rod that you are removing or attaching. Do NOT apply pressure to the middle of the rod because damage or bending will result.

## Steering Column in Lock Position Caution

**Caution:** With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The steering shaft coupling
- The intermediate shaft(s)

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has became un-centered, refer to your specific SIR coil’s centering procedure to re-center SIR Coil.

## Steering Wheel in the Full Turn Position Caution

**Caution:** Do not hold the steering wheel in the full turn position longer than 5 seconds, as damage to the steering pump may result.



## Steering Wheel Straight and Column Locked Caution

**Caution:** With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has became un-centered, refer to your specific SIR coil’s centering procedure to re-center SIR Coil.

## Tape Corners of Panel Caution

**Caution:** When removing body panels, apply tape to corners of panel and adjacent surfaces to help prevent paint damage.

## Torque-to-Yield Fastener Caution

**Caution:** This component is equipped with torque-to-yield fasteners. Install a NEW torque-to-yield fastener when installing this component. Failure to replace the torque-to-yield fastener could cause damage to the vehicle or component.

## Vehicle Lifting and Jacking Caution

- Caution:** Perform the following steps before beginning any vehicle lifting or jacking procedure:
- Remove or secure all of the vehicle contents in order to avoid any shifting or any movement that may occur during the vehicle lifting or jacking procedure.
  - The lifting equipment or the jacking equipment weight rating must meet or exceed the weight of the vehicle and any vehicle contents.
  - The lifting equipment or the jacking equipment must meet the operational standards of the lifting equipment or jacking equipment manufacturer.
  - Perform the vehicle lifting or jacking procedure on a clean, hard, dry, level surface.
  - Perform the vehicle lifting or jacking procedure only at the identified lift points. DO NOT allow the lifting equipment or jacking equipment to contact any other vehicle components.

Failure to perform the previous steps could result in damage to the lifting equipment or the jacking equipment, the vehicle, and/or the vehicle contents.

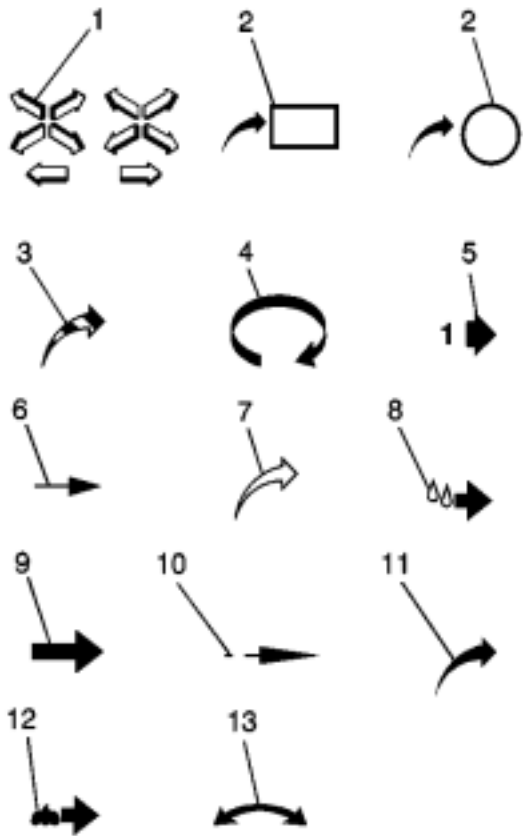
## Windshield Installation Caution

**Caution:** Do not use spacers when installing a windshield. The stress caused by the spacers may damage the windshield.



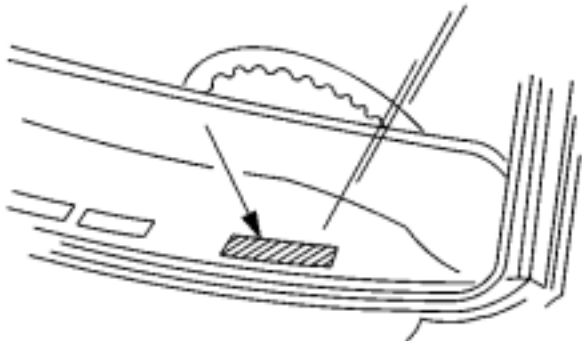
Arrows and Symbols	Interior Windnoise
Vehicle, Engine and Transmission ID and VIN Location, Derivative and Usage	Air Pressure Test
Vehicle Certification, Tire Placard, Anti-Theft, and Service Parts ID Label	Soap Suds or Bubble Test
RPO Code List	Tracing Powder or Chalk Test
Fasteners	Squeaks and Rattles
Thread Inserts	Waterleak Test Preparation
Door Lock and Ignition Lock Folding and Non-Folding Key Cutting	Recommended Materials (Waterleak Repair)
Front Side Door Lock Cylinder Coding (Free Wheeling)	Dust Leaks
Front Side Door Lock Cylinder Coding (Non Free Wheeling)	Water Hose Test
Lock Cylinder Coding - Ignition	Air Hose Test
Rear Compartment Lid Lock Cylinder Coding	Body Waterleak Repair
Lifting and Jacking the Vehicle	Stationary Window Waterleak Repair
Exterior Windnoise	Special Tools





- (1) Front of Vehicle
- (2) View Detail
- (2) View Detail
- (3) Ambient Air Mixed with Another Gas or Indicate Temperature Change
- (4) Motion or Direction
- (5) View Angle
- (6) Dimension (1:2)
- (7) Ambient/Clean Air Flow or Cool Air Flow
- (8) Lubrication Point– Oil or Fluid
- (9) Task Related
- (10) Sectioning (1:3)
- (11) Gas Other Than Ambient Air or Hot Air Flow
- (12) Lubrication Point– Grease or Jelly
- (13) Multidirectional Arrow

## Vehicle, Engine and Transmission ID and VIN Location, Derivative and Usage



The vehicle identification number (VIN) plate is the legal identifier of the vehicle. The VIN plate is located on the upper left corner of the instrument panel (I/P) and can be seen through the windshield from the outside of the vehicle:

Position	Definition	Character	Description
1	Country of Origin	K	Asia
2	Manufacturer	L	Korea
3	Make	1	Chevrolet
4	Carline	T	T100/T300 Series
5	Transmission	F	FWD (Forward Wheel Drive), MT
		A	FWD (Forward Wheel Drive), AT
6-7	Body Style	69	Sedan, 4–Door, 4 Window, Notchback
		48	Sedan, 4–Door, 4 Window, Hatchback
8	Engine Type	3	RPO LDC Engine - Gas, 4 Cylinder, 1.2L, MFI, DOHC, PT-JV, Variable Camshaft Phasing
		F	RPO LDD Engine - Gas, 4 Cylinder, 1.4L, MFI, DOHC, Variable Camshaft Phasing, FAM 0
		E	RPO LDE Engine - Gas, 4 Cylinder, 1.6L, MFI, DOHC, VVT, Variable Camshaft Phasing, Variable Intake Module (VIM)
		G	RPO LDV Engine - Diesel, 4 Cylinder, 1.3L, L4, DI, DOHC, Turbo, 55 KW, 190NM
		R	RPO LSF Engine - Diesel, 4 Cylinder, 1.3L, CRI, DOHC, Turbo-VGT
		0	RPO LFJ Engine - Flexible Fuel, (Gas/ALc), 4 Cylinder, 1.6L, MFI, E100
		H	RPO L2N Engine - Gas, 4 Cylinder, 1.4L, MFI, L4, DOHC, FAM O, 74 KW, E20 MAX, GME



9	Purpose	9	Emission System - EEC 09 (Euro-5)
10	Model Year	C	2012 (VZC)
11	Plant Location	B	Bupyung
12–17	Plant Sequence Number	—	Plant Sequence Number

1.2L (LDC) or 1.4L (L2N/ LDD) Engine ID and VIN Derivative Location

Refer to Engine Identification .

1.3L (LDV/ LSF) Engine ID and VIN Derivative Location

Refer to Engine Identification .

1.6L (LDE/ LFJ) Engine ID and VIN Derivative Location

Refer to Engine Identification .

6T30/ 6T40/ 6T45/ 6T50 (MH9) Transmission ID and VIN Derivative Location

Refer to Transmission Identification Information .

D16 (MFH/ MXP) Transmission ID and VIN Derivative Location

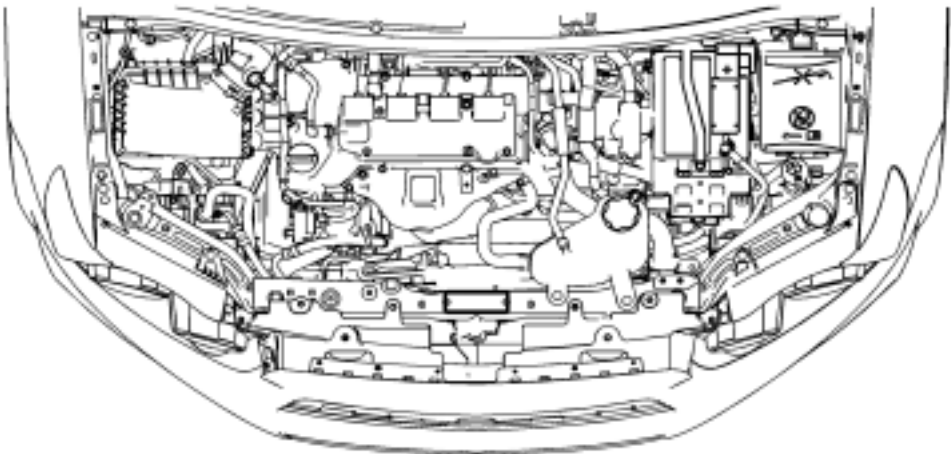
Refer to Transmission Identification Information .

M20–6 (MZ7) Transmission ID and VIN Derivative Location

Refer to Transmission Identification Information .

## Vehicle Certification, Tire Placard, Anti-Theft, and Service Parts I D Label

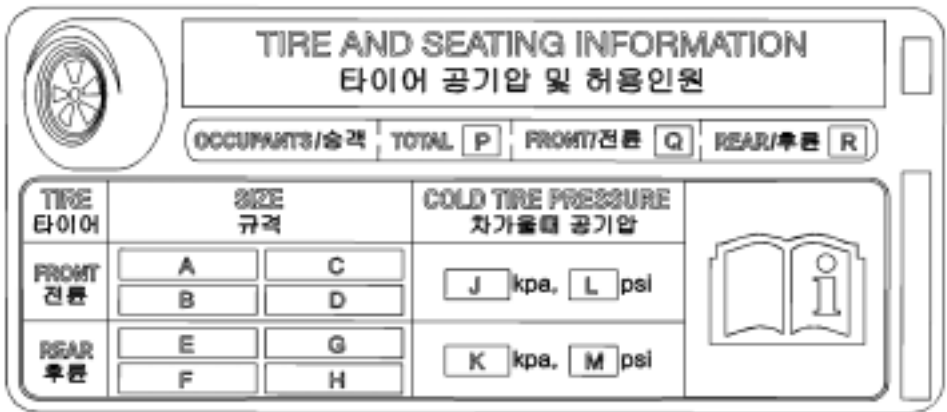
### Certification Plate Location



The vehicle identification number (VIN) plate is attached to the top of the front end upper tie bar which is located under the radiator opening upper cover.

### 10 Matiz - Identification Plate Location

### Tire Placard



The tire placard label is located on the driver side B- pillar and displays the following assessments:

- Tire size
- Tire pressure
  - Front
  - Rear
  - Various loading conditions

## RPO Code List

The following table provides the description of the Regular Production Option (RPO) codes that are available on the vehicle. The vehicle's RPO list is printed on the Service Parts Identification Label.

RPO	Description
01A	Trim Color Seat - Jet Black VAR 1
01E	Trim Color Seat - DK Titanium
01K	Trim Color Seat - Brick
01S	Trim Color Seat - MED Titanium
02R	Trim Color Seat - MED Cashmere
02Y	Trim Color Seat - Jet Black & Stitching Brick
1A9	Trim Color Door Panel - MED Cashmere
1AF	Trim Color Door Panel - DK Titanium
1BF	Trim Color Door Panel - Brick
4AA	Interior Trim - Jet Black
4AQ	Interior Trim – VDK Pewter
5EA	Equipment - Package, CO2 - Reduction
9L3	Tire Spare - None
A33	Window - Power Operated, Rear DRS
A55	Window - Power Operated, Driver

A60	Lock Control Right Rear Compartment – Lid, Tailgate, Key Activated
A66	Window - Power Operated, Passenger
A69	Restraint - Seat Belt Tensioner, Front, VAR. 2
A70	Restraint - Seat Belt Tensioner, Front
A90	Lock Control RR CMPT - LID, REM CONT ELEC Release
A94	Lock Control RR CMPT - LID, REM CONT Manual Release
AAL	Restraint - Knee, Bolster, LH / RH
ABR	Window - Manual Operated, Front Door
ADL	Restraint System - Seat, Inflatable, Driver & Passenger, Single Stage
AE2	Latch - Rear Compartment, Safety, Manual Release
AG5	Adjuster Passenger Seat - Manual, 2 Way
AH3	Adjuster Front Seat - Manual, 4 Way, Driver
AH9	Adjuster Front Seat – Manual, 2 Way, Driver
AHU	Restraint Provisions - Belts, Adjuster, Height, Front
AJ3	Restraint System – Seat, Inflatable, Driver, Front
AJC	Restraint - Head, Front Seat, Up / Down Adjustment
AJD	Restraint - Head, Front Seat, Up / Down, Fore / Aft Adjustment, Folding Passenger

AJG	Restraint System - Seat, Inflatable, Driver & Passenger, Front & Seat Side, Single Stage
AKJ	Windshield Style - Shade Band
AKM	Window Type - Clear
AKN	Window Type - Tinted
AKP	Window Type - Solar Absorbing
AL0	Sensor Indicator - Inflatable Restraint, Front Passenger / Child Presence Detector
AM7	Seat Rear – Folding
AMA	Seat Rear – Split Back, Folding, Headrest
AN1	Seat Rear - Bench
AQ2	Net – Convenience, Package
AQP	Restraint - Head, Rear Seat, Center
AR1	Restraint System – (None)
AR7	Seat - Front BKT, Standard
AT7	Restraint System Rear – Seat, SHLDR, RETR, 3 Point, 3 SHLDR
AU3	Lock Control – Side Door, Electronic
AWB	Restraint System Rear – Seat, LH and RH/ELR and CTR/2 Point
AXG	Window - Power Operated - Express Driver Up / Down

AY0	Restraint System – Seat, Inflatable, Driver and Passenger Front, Seat Side, Roof Side
AYC	Restraint System - Seat, Inflatable, Driver & Passenger Front, Seat Side, Roof Side, Single Stage
AYF	Restaint System - Seat, Inflatable, Driver & Passenger Front, Front Seat Side & Rear Seat Side, Roof Side, Knee
B37	Covering – Floor Mat, Front and Rear, Auxiliary
B9U	Lock Control RR CMPT - L/Gate REM CONT, ELEC Open / Close
BA8	Compartment – Stowage, Front Seat, Passenger
BAH	Equipment - Security System, Immobilization, Step Two
BCM	Covering - Load Compartment, Movable
BCO	Plant Code - Bogota, Colombia
BGY	Plant Code - Dong Yue, China
BPF	Bumper Provisions - Front, Lower Spoiler Edge
BTT	Alarm - Remote Panic
BTV	Remote Start - Engine
BUP	Plant Code - Bupyeong 1, Korea
BXQ	Ornamentation - EXTR, PLR APLQ, Reveal, Black
C25	Wiper System - Rear Window, Intermittent
C32	Heater - Heating / Defroster System, Reinforced, Electric

C35	Heater - Duct, RR PASS
C41	HVAC System - Heater, Outside Air, with Fan
C49	Defogger - RR Window, Electric
C60	HVAC System - Air Conditioner FRT, MAN Controls
C7B	HVAC System - Air Conditioner FRT, HTR Core Not Required, Fan Speed Control Only
C80	Switch - Directional Signal, Wiper, Reverse Mount, STRG WHL
C91	Lamp - INTR, Roof, Courtesy
C95	Lamp, INTR, Roof, Courtesy & Dual Reading
C99	Switch - INFL RST I/P MDL MAN Suppression
CAI	Lamp - Tail & Stop, w/o Fog, ECE
CD4	Wiper System - Windshield, Pulse, Variable Delay
CF5	Roof - Sun, Glass, Sliding, ELEC
D05	Arm Rest - Front Seat, Driver
D31	Mirror I/S R/V - Tilt
D6J	Mirror I/S Front VAN - Sunshade, w/o Mirror, Passenger, w/ Mirror
D7A	Handle O/S Door - Body Color, Chrome Strip
D72	Handle O/S Door - Black

D75	Handle O/S Door - Body Color
D87	Handle - O/S, L/Gate, R/CMPT, Black
D91	Handle - O/S, L/Gate, R/CMPT, Color
D9O	Sensor - Front Airbag (EFS) - Single
DC8	Mirror O/S - LH & RH, Remote Control, Manual Folding, Black
DG2	Mirror O/S - LH & RH, Remote Control, Manual Folding, Color
DG6	Mirror O/S - LH & RH, Remote Control, Electric, Manual Folding, Heated, Color
DHG	Mirror I/S Front VAN - Sunshade, Driver & Passenger, w/o Mirror
DL6	Mirror O/S - LH & RH, Remote Control, Electric, Manual Folding, Color
DL7	Mirror O/S - LH & RH, Remote Control, Electric, Heated, Power Folding, Color
DNJ	Mirror I/S Front VAN - Sunshade, w/Mirror, w/o Cover
DLV	Mirror I/S Front VAN - Sunshade, Driver & Passenger, w/Mirror & Cover
DUJ	Ashtray - Smoker's Package
E17	Bumper – 2.5 mph
E19	Bumper – 5.0 mph
E21	Handle - I/S, Door, Chrome
E22	Handle – Assist, Rear



E27	Handle – Assist, Passenger
E3E	Handle - O/S, L/Gate, R/CMPT, Chrome
E7Y	Fire Extinguisher – 2 kg
E91	Pocket – Front Seat Back, Passenger
EBL	Trim Seat - Cloth, Flash
EBM	Trim Seat - Cloth, Brevà
ECE	Trim Seat - Leather (TBD1-GSV)(GMDAT)
F77	Ratio - Transaxle Final Drive 4.11
FE1	Suspension System – Soft Ride
FE4	Suspension System – Special Ride and Handling
FE9	Certification - Emission, Federal
FHA	Fuel System - Electronic, Returnless
FHB	Ratio - Transaxle Final Drive 3.47
FHF	Trim Door - Hard Touch Paint
FHG	Trim Door - Soft Touch Paint
FHN	Vehicle Fuel - Gasoline E5
FHP	Vehicle Fuel - Gasoline E20

FHS	Vehicle Fuel - Gasoline E85
FHT	Vehicle Fuel - Gasoline E100
FHY	Vehicle Fuel - Diesel B10
FP9	Ratio - Transaxle Final Drive 3.55
FV1	Ratio - Transaxle Final Drive 3.72
FV2	Ratio - Transaxle Final Drive 4.18
FV5	Ratio – Transaxle Final Drive 4.19
FV7	Ratio - Transaxle Final Drive 4.29
FVE	Ratio - Transaxle Final Drive 4.63
FVG	Ratio - Transaxle Final Drive 4.64
FX1	Ratio - Transaxle Final Drive 3.94
FX3	Ride And Handling – Automatic Electronic Controlled
FXB	Ratio - Transaxle Final Drive 3.65
FY2	Ratio - Transaxle Final Drive 3.74
G83	Ratio - Transaxle Final Drive 4.47
GAN	Primary Color – Exterior, Switchblade Silver Met (G) 636R
GAR	Primary Color – Exterior, Carbon Flash Met (G) 501Q

GAZ	Primary Color – Exterior, Olympic White (G) 8624
GBA	Primary Color – Exterior, Black (G) 8555
GBE	Primary Color - Exterior, Crystal Claret Tintcoat (G) 505Q
GBV	Primary Color - Exterior, Cyber Gray MET (G) 637R
GCD	Primary Color - Exterior, Bright White (686H)
GCN	Primary Color - Exterior, Victory Red 9260
GCO	Primary Color - Exterior, SCO Yellow (9414)
GCR	Primary Color - Exterior, Inferno Orange MET (502Q)
GCW	Primary Color – Exterior, Misty Lake Met (683R)
GEL	Primary Color – Exterior, Dynamic Orange Met 728R
GGE	Primary Color – Exterior, Super Red (G) 717R
GIY	Primary Color - Exterior, Galaxy Silver MET (519F)
GJP	Primary Color - Exterior, Grenada Black (446P)
GLF	Primary Color - Exterior, Space Blue Metallic 819T
GMN	Primary Color - Exterior, Desert Bloom (876S)
GOB	Primary Color - Exterior, Cherry Red MET (G) 715J
GQJ	Primary Color - Exterior, Grand Canyon Brown MET (894T)

GQM	Primary Color - Exterior, Boracay Blue MET (895T)
GQV	Primary Color - Exterior, Flame Red
GQW	Primary Color - Exterior, Urban Grey (658R)
J93	Brake System - Power, FRT Disc, RR Drum, ABS, 15”
J94	Brake System - Power, FRT Disc, RR Drum, 15”
J97	Brake System - Power, FRT Disc, RR Drum, ABS, 14”
JBD	Booster - Brake, Single Rate
JBE	Booster - Brake, Dual Rate
JDE	Bumper - Front & Rear, Lightweight
JPW	Brake System - Power, FRT Disc, RR Drum, 14”
K12	Filter – Air, Pollutant
K33	Cruise Control - Automatic, Electronic, Speed Governor
K34	Cruise Control - Automatic, Electronic
K4E	Battery – LN3, AGM, 12V, 70AH, 760 ENCCA
K09	Generator – 120 Amp
K60	Generator – 100 Amp
K97	Generator – 80 Amp

KA1	Heater - Seat, Front
KE3	Knob - TRANS CONT Lever, Chrome
KG9	Generator – 140 Amp
KI2	Knob - TRANS CONT Lever, Polyurethane
KL7	Conversion – Propane Gas (LPGas)
KL9	ENG Control - Stop/Start SYS
KNV	Knob - TRANS CONT Lever, Satin Silver, Chrome
KPK	Heater - Oil Pan
KPL	Cap - Fuel Fill, Locking
KRK	Knob - TRANS CONT Lever, Leather, Satin Silver, Chrome
KTD	Key - Primary Rigid, Additional Rigid
KTF	Key - Primary Foldable, Additional Foldable
KTH	Lock Control - Side Door Lock / Unlock
KTI	Kit, Tire - Inflator
KTJ	Lock Control - Side Door Lock / Unlock, Trunk Release
KTK	Lock Control - Side Door Lock / Unlock, Remote Start
KTL	Lock Control - Side Door Lock / Unlock, Trunk Release, Remote Start

KTM	Key - Primary Foldable, Additional Rigid
KTN	Equipment - Additional Key (No Buttons)
L2I	Engine - Gas, 4 Cyl, 1.4L, MFI, L4, DOHC, FAM O, 74 KW, E85 MAX, GME
L2N	Engine - Gas, 4 Cyl, 1.4L, MFI, L4, DOHC, FAM O, 74 KW, E20 MAX, GME
LCU	Engine - Gas, 4 Cyl, 1.4L, MFI, DOHC, PDA, FAM A/B, GMDAT
LDC	Engine - Gas, 4 Cyl, 1.2L, MFI, DOHC, PT-JV, Variable Camshaft Phasing
LDD	Engine - Gas, 4 Cyl, 1.4L, MFI, DOHC, Variable Camshaft Phasing, FAM 0
LDE	Engine - Gas, 4 Cyl, 1.6L, MFI, DOHC, VVT, Variable Camshaft Phasing, Variable Intake Module (VIM)
LDV	Engine - Diesel, 4 Cyl, 1.3L, L4, DI, DOHC, Turbo, 55KW, 190NM
LED	Engine - Gas, 4Cyl, 1.6L, MFI, DOHC, VVT, Variable Intake Module (VIM), E85 MAX
LFJ	Engine - Gas, 4 Cyl, 1.6L, MFI, E100 MAX
LHD	Vehicle Drive – Left Hand Drive
LSF	Engine - Diesel, 4 Cyl, 1.3L, CRI, DOHC, Turbo-VGT
LUV	Engine - Gas, 4 Cyl, 1.4L, MFI, DOHC, Turbo, VVT, ALUM, GME, E85 MAX
LUW	Engine - Gas, 4 Cyl, 1.8L, MFI, 103KW, DOHC, E85 MAX
LWD	Engine - Gas, 4Cyl, 1.2L, MFI, DOHC, 51KW
LWE	Engine - Gas, 4 Cyl, 1.8L, MFI, DOHC, VVT, 103 KW, GME

M26	Transmission - Manual 5 Speed, Opel, 65 MM, 1.96 2ND, 1.323 3RD, 0.946 4TH, 0.756 5TH, F17 (WR)
M97	Shifter Interlock - Brake, TRANS
MDC	Molding B/S Upper - Bright
MEM	Transmission - Manual FWD 5 Speed, Brazil, 180MM, 3.909 1ST, 0.674 5TH (F17; UR)
MFH	Transmission - Manual 5 Speed, D16 M/CR
MH9	Transmission - Auto 6 Speed, HMD, X24F
MX3	Transmission – Manual 5 Speed, Y4M SHD, 1ST 3.667, 5TH 0.761
MXP	Transmission – Manual 5 Speed, GMDAT, D16 Intermediate Semi-wide, 72MM, 3.727 1ST, 0.763 5TH
MZ4	Transmission - Manual 6 Speed, Opel, 76.5 MM, 3.82 1ST, 0.615 6TH, (M32 WR)
MZ7	Transmission - Manual 6 Speed, Opel, 76.5 MM, 4.273 1ST, 0.614 6TH (M20)
N08	Lock Control - Fuel Filler Door, REM CONT
N12	Exhaust System - Rear Exit
N30	Steering Wheel – Deluxe
N33	Steering Column – Tilt Type
N34	Steering Wheel – Leather, 3 Spokes
N37	Steering Column - Tilt, Telescoping
N40	Steering – Power, Non-Variable Ratio

N45	Steering Wheel – 3 Spokes
N54	Steering Wheel – 3 Spokes, Sport
N81	Tire Spare - Full Size
NA3	Emission System – Japan
NCG	Lock - Electrical Child Lock System (Rear Door Latch)
NE1	Certification - Emission, Geographically Restricted Registration for Vehicles up to 14,000 LBS GVW
NE9	Emission System – EEC09
NF7	Emission System - Federal, NLEV
NJ1	Steering - Power, Non-variable Ratio, Electric
NPH	Exhaust System - Heavy Duty
NQU	Emission System – Korean, ULEV
NT3	Emission System – EEC00
NT4	Emission System – EEC05
NT7	Emission System - Federal, Tier 2
NU6	Emission System - California, PZEV
NZA	Control - Steering Wheel, Wireless Interface, Radio & Phone, Handsfree Controls
ORN	Plant Code - Orion, MI, USA



PZY	Plate - Skid Front & Rear
Q1G	Tire All - 185/75R14 SL 89H BW HW1
Q1H	Tire All - P195/65R15 SL 89H BW AL2
Q1W	Tire All - 195/65R15 SL 91H BW HW2
Q1X	Tire All - 205/55R16 SL 91H BW HW3
Q3O	Tire All - P205/50R17 SL 88V BW AL3
Q5I	Tire All - 205/50R17 SL 89V BW HW3
Q6K	Tire All - 195/65R15 SL 91H BW HW3
Q6L	Tire All - 205/55R16 SL 91H BW HW4
Q8E	Jack – Mechanical, with Tools
QB0	Tire All - P185/75R14 SL 89H BW ALS
QLG	Tire All - P205/55R16 SL 89H BW AL3
QZF	Tire All - P195/65R15 SL 89H BW AL2 (Low Resistance)
RHD	Vehicle Drive – Right Hand Drive
RQ4	Tire All - 195/65R15 SL 91H BW HW2 (Low Resistance)
RRB	Wheel - 14x5.5, J, Steel, Design 1
RRK	Wheel - 15x6.0, J, Aluminum, Design 1

RRL	Wheel - 15x6.0, J, Steel, Design 1
RRV	Wheel - 16x6.0, J, Aluminum, Design 1
RS7	Wheel - 17x6.5, J, Aluminum, Design 1
T39	Lamp - Turn Signal, AUX
T3U	Lamp – Front Fog
T3W	Lamp System - Daytime Running, Reduced Intensity Low Beam
T3X	Lamp System – Daytime Running, Regular Intensity Low Beam
T43	Spoiler - Rear
T44	Alarm – Overspeed Warning, Acoustical
T4A	Headlamps - Halogen
T67	Battery – LN3, FLA, 12V, 70AH, 512ENCCA
T83	Headlamps Control - Automatic On - Off
TB1	Lamp – Tail and Stop, Korea
TBU	Plant Code - 6 October City, Egypt
TCU	License Plate - Front & Rear Mounting, ECE
TD1	Reflector – Safety Triangle
TL6	Grille – Radiator, Black

TM7	Battery – LN2, FLA, 12V, 60AH, 438 ENCCA
TN9	Battery – LN1, FLA, 12V, 50AH, 375 ENCCA
TR1	Lamp - Tail & Stop
TR6	Headlamps Control – Leveling System, Manual
TS6	Lamp – Stop, High Level
TTV	Spoiler - Rear, LID / Liftgate, Sport
U04	Horn – Single Note
U18	Speedometer – Instrument, Kilometer
U25	Lamp – Interior, Rear Compartment, Courtesy
U2K	Digital Audio System - S-Band
U58	Radio Faceplate - Integrated Center Console
U68	Display - Driver Information Center
U71	Antenna – Roof, Radio
UBA	Antenna - Roof, Radio, GPS, Phone, S-Band XM
UC1	Speedometer – Instrument, Miles
UC3	Control - Steering Wheel, Radio & Phone, Redundant Controls
UD7	Sensor Indicator – Rear Parking Assist

UDB	Display Instrument – Driver Info Enhanced (Segmented)
UDG	Display Instrument – Trip Odometer (Segmented)
UE1	Communication System - Vehicle, G.P.S.1
UE3	Communication System - Vehicle, G.P.S.3
UG7	Theft Deterrent - Vehicle Tracking and Restart Prevention
UGM	Sensor Equipment - Outside Air Temperature Sensor
UH0	Indicator – Seat Belt Warning , LH
UH1	Indicator – Seat Belt Warning , RH
UH5	Indicator – Seat Belt Warning, Rear Seat
UH7	Radio - AM/FM Stereo, Seek / Scan, CD, ETR, Clock DSP, MP3 / WMA, USB, AUX / IN, Wireless Interface
UJ2	Indicator - Engine Oil Life
UJM	Tire Press Indicator - Manual Learn
UL5	Radio - (None)
UM7	Radio – AM/FM Stereo, Seek/Scan, Clock, ETR
UPF	Wireless Interface - Short Range, Voice REC
UQ9	Speaker System – (None)
UQJ	Restraint Provisions - Child, ISOFIX 2 Point Only

UQK	Restraint Provisions - Child, ISOFIX 2 Point Only, Point / LAT CH (INC 2 Top Tether Points)
UQL	Restraint Provisions - Child, ISOFIX 2 Point Only, Point / LAT CH (INC 3 Top Tether Points)
US8	Radio - AM/FM Stereo, Seek / Scan, CD, Auto Tone, Clock, ETR, MP3, RDS
USR	Receptacle - USB
UTJ	Theft Deterrent – Electrical, Unauthorized Entry
UTK	Theft Deterrent - Mechanical, Double Locking Latch
UW4	Speaker System – 4, Custom
UW6	Speaker System – 6, Custom
UY0	Battery – LN0, FLA, 12V, 40AH, 300 ENCCA
V22	Grille – Radiator, Chrome
V48	Coolant – Engine Maximum Protection
V5M	Calibration - TCM, Neutral Idle Control
VD1	Provision Options - Europe
VD8	Provisions – First Aid Kit
VEE	Bumper Front - Body Color, Front & Rear
VGC	Protector - Film, Paint Etch Preventive
VHY	Protector – Body Sheet Metal, High Corrosion Preventive

VK8	Holder – Eyeglasses
VKD	License Plate - Front & Rear Mounting, SAE
VMO	Panel Center - Instrument, Graphite Silver MET
VMT	Bumper - Front Low Speed, Rear Light Weight
VYK	Panel Center - Instrument, Jet Black
W1Y	Control - Steering Wheel, Radio, Redundant Controls
WU5	Switch – I/P LP Dimmer
XL4	Chassis – Protection Kit, Engine Compartment
XL7	Frequencies Rating - 315 MHZ, Long Distance
XL8	Frequencies Rating - 433 MHZ
XX7	Radio – Provisions, Installation, VAR3
YF5	Certification - Emission, California
YG3	Ornamentation - EXTR, Head & Tail Lamps, Chrome Bezel
YG5	Ornamentation - EXTR, Head & Tail Lamps, High Gloss Finish
ZAA	Tire Spare - Compact

## Fasteners

**Table 1:** [Metric Prevailing Torque Fastener Minimum Torque Development](#)  
**Table 2:** [English Prevailing Torque Fastener Minimum Torque Development](#)

### Metric Fasteners

This vehicle provides fastener dimensions using the metric system. Most metric fasteners are approximate in diameter to equivalent English fasteners. Make replacements using fasteners of the same nominal diameter, thread pitch, and strength.

A number marking identifies the OE metric fasteners except cross-recess head screws. The number also indicates the strength of the fastener material. A Posidrive® or Type 1A cross-recess identifies a metric cross-recess screw. For best results, use a Type 1A cross-recess screwdriver, or equivalent, in Posidrive® recess head screws.

GM Engineering Standards and North American Industries have adopted a portion of the ISO-defined standard metric fastener sizes. The purpose was to reduce the number of fastener sizes used while retaining the best thread qualities in each thread size. For example, the metric M6.0X1 screw, with nearly the same diameter and 25.4 threads per inch replaced the English 1/4–20 and 1/4–28 screws. The thread pitch is midway between the English coarse and fine thread pitches.

#### 10 Matiz General Information Figure 185363

The most commonly used metric fastener strength property classes are 9.8 and 10.9. The class identification is embossed on the head of each bolt. The English, inch strength classes range from grade2 to grade8. Radial lines are embossed on the head of each bolt in order to identify the strength class. The number of lines on the head of the bolt is 2lines less than the actual grade. For example, a grade8 bolt will have 6radial lines on the bolt head. Some metric nuts are marked with a single digit strength identification number on the nut face.

The correct fasteners are available through GM SPO. Many metric fasteners available in the aftermarket parts channels are designed to metric standards of countries other than the United States, and may exhibit the following:

- Lower strength
- No numbered head marking system
- Wrong thread pitch

The metric fasteners on GM products are designed to new, international standards. The following are the common sizes and pitches, except for special applications:

- M6.0 X 1
- M8 X 1.25
- M10 X 1.5
- M12 X 1.75
- M14 X 2.00
- M16 X 2.00

### Prevailing Torque Fasteners

Prevailing torque fasteners create a thread interface between the fastener and the fastener counterpart in order to prevent the fastener from loosening.

#### All Metal Prevailing Torque Fasteners

These fasteners accomplish the thread interface by a designed distortion or deformation in the fastener.

#### Nylon Interface Prevailing Torque Fasteners

These fasteners accomplish the thread interface by the presence of a nylon material on the fastener threads.

#### Adhesive Coated Fasteners

These fasteners accomplish the thread interface by the presence of a thread-locking compound on the fastener threads. Refer to the appropriate repair procedure in order to determine if the fastener may be reused and the applicable thread-locking compound to apply to the fastener.

#### 10 Matiz General Information Figure 185364

A prevailing torque fastener may be reused ONLY if:

- The fastener and the fastener counterpart are clean and not damaged
- There is no rust on the fastener
- The fastener develops the specified minimum torque against its counterpart prior to the fastener seating

#### [Metric Prevailing Torque Fastener Minimum Torque Development](#)

Application	Metric	English
All Metal Prevailing Torque Fasteners		
• 6 mm	0.4 N·m	4 lb in
• 8 mm	0.8 N·m	7 lb in
• 10 mm	1.4 N·m	12 lb in
• 12 mm	2.1 N·m	19 lb in
• 14 mm	3 N·m	27 lb in
• 16 mm	4.2 N·m	37 lb in
• 20 mm	7 N·m	62 lb in
• 24 mm	10.5 N·m	93 lb in
Nylon Interface Prevailing Torque Fasteners		
• 6 mm	0.3 N·m	3 lb in
• 8 mm	0.6 N·m	5 lb in
• 10 mm	1.1 N·m	10 lb in
• 12 mm	1.5 N·m	13 lb in
• 14 mm	2.3 N·m	20 lb in
• 16 mm	3.4 N·m	30 lb in
• 20 mm	5.5 N·m	49 lb in



• 24 mm	8.5 N·m	75 lb in
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English Prevailing Torque Fastener Minimum Torque Development

Application	Specification	
	Metric	English
All Metal Prevailing Torque Fasteners		
• 1/4 in	0.5 N·m	4.5 lb in
• 5/16 in	0.8 N·m	7.5 lb in
• 3/8 in	1.3 N·m	11.5 lb in
• 7/16 in	1.8 N·m	16 lb in
• 1/2 in	2.3 N·m	20 lb in
• 9/16 in	3.2 N·m	28 lb in
• 5/8 in	4 N·m	36 lb in
• 3/4 in	7 N·m	54 lb in
Nylon Interface Prevailing Torque Fasteners		
• 1/4 in	0.3 N·m	3 lb in
• 5/16 in	0.6 N·m	5 lb in
• 3/8 in	1 N·m	9 lb in
• 7/16 in	1.3 N·m	12 lb in
	1.8 N·m	16 lb in

• 1/2 in		
• 9/16 in	2.5 N·m	22 lbin
• 5/8 in	3.4 N·m	30 lbin
• 3/4 in	5 N·m	45 lbin

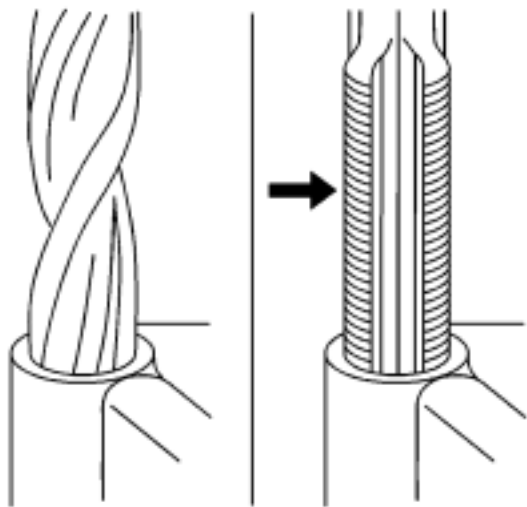
## Thread Inserts

General Purpose Thread Repair Kits.

These kits are available commercially.

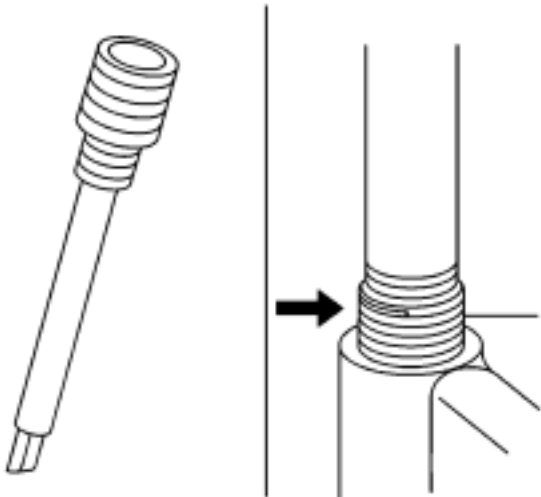
### Repair Procedure

**Warning:** Refer to [Safety Glasses Warning](#) .



**Note:** Refer to the thread repair kit manufacturer instructions regarding the size of the drill and tap to use. Avoid any buildup of chips. Back out the tap every few turns and remove the chips.

1. Determine the size, the pitch, and the depth of the damaged thread. If necessary, adjust the stop collars on the cutting tool and tap to the required depth.
2. Drill out the damaged threads. Clean out any chips.
3. Lubricate the tap with light engine oil. Tap the hole. Clean the threads.



4. Thread the thread insert onto the mandrel of the installer. Engage the tang of the insert onto the end of the mandrel.

**Note:** The insert should be flush to one turn below the surface.

5. Lubricate the insert with light engine oil, except when installing in aluminum and install the insert.
6. If the tang of the insert does not break off when backing out the installer, break the tang off with a drift.



## Door Lock and Ignition Lock Folding and Non-Folding Key Cutting

High Security keys are available from the service parts system.

Obtain the key code from the information card.

Ask the Parts Distribution Center for a new coded key (based off of the information card).

After receiving the new key, the dealer must program the immobilizer through the TECH 2.

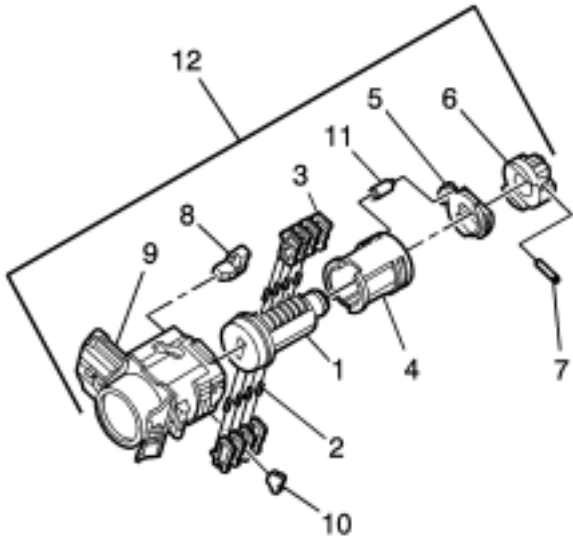
Inspect the new key operation in the lock cylinder. Ensure the new key operates effectively.



## Front Side Door Lock Cylinder Coding (Free Wheeling)

### Special Tools

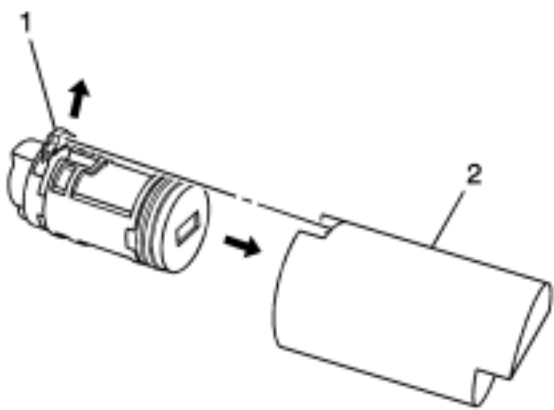
BO-49753 Assembly Tool



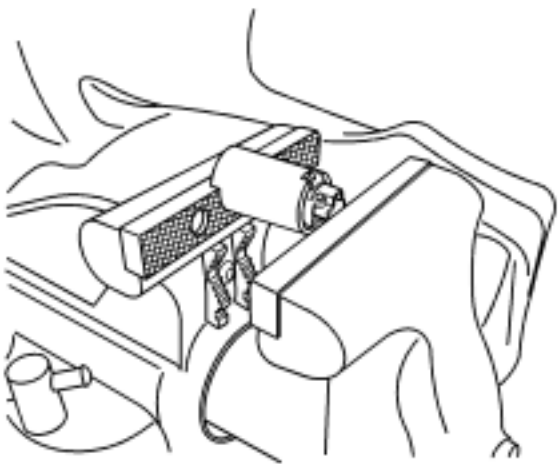
The door lock cylinder uses 8 of the 8 cut positions. The tumbler positions are staggered from side to side, 4 on one side and 4 on the other, are not self-retaining, and are not snap in.

**Note:** All lock cylinders for side milled keys have right and left tumblers. The location of the tooth of the tumbler determines whether it is right or left. Illustrations in this procedure show the right tumblers on the top and the left tumblers on the bottom. All tumblers are marked 1R, 1L, 2R, or 2L. The number being cut depth and the letter meaning right or left.

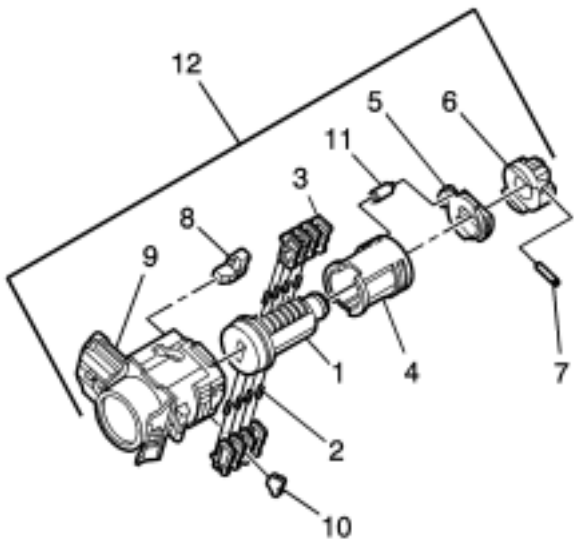
1. Hold the door lock cylinder (1) so the side with the 4 tumbler spring pockets faces up, pocket nearest to the cylinder head.
2. Insert the tumbler springs (2) into the 4 spring pockets. This side uses left tumblers.
3. Install the tumbler (3) for key cut position one in the slot nearest to the front of the lock cylinder. Install the remaining tumblers, key cut positions 3, 5, and 7, following the key code and same process. Press the tumblers in place until they are secure.
4. Check the correct loading of the tumblers by inserting the key into the cylinder. All tumblers should be flush with the lock cylinder body.
5. Turn the cylinder so the side with the 4 tumbler spring wells faces up. This side uses right tumblers.
6. Insert the tumbler springs into the 4 spring pockets.
7. The first tumbler closest to the front of the lock cylinder to be loaded will be the second key cut position, the second number in the key code. Install the remaining tumblers for the key cut positions 4, 6, and 8. Press the tumblers in place until they are secure.
8. Check the correct loading of the tumblers by inserting the key into the cylinder. All tumblers should be flush with the lock cylinder body.
9. Insert the key and lightly lubricate the cylinder body diameter and tumbler surfaces and a small amount in the head of the cylinder using the supplied grease.
10. Insert the sleeve (4) onto the cylinder assembly.
11. Insert the clutch (5) and driver (6) onto the cylinder (1).



12. Load the cylinder into the *BO-49753* assembly tool so that the clutch (1) indexes with the notch in the opening of the tool (2).

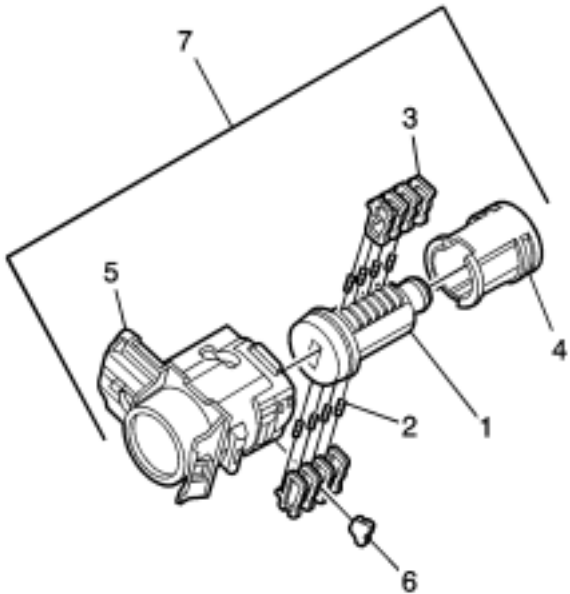


13. Load the assembly tool with the lock cylinder into a vice and tighten the vice **ONLY** enough to hold the tool and lock the cylinder in place.



14. Insert the roll pin (7) into the driver (6) and install it using a 1/16 inch pin punch.  
15. Insert the buffer (8) in the case (9), verify the buffer is properly seated.  
16. Install the free wheel pin (11) in the sleeve (4) and clutch (5) and insert the assembly into the case (9).  
17. With the lock cylinder assembly installed in the case (9), install the retainer (10) and stake the retainer in place using a small punch and hammer to peen the case material onto the exposed ends of the installed retainer (10).  
18. Insert the key into the lock and function the lock to check for proper assembly and smooth operation.

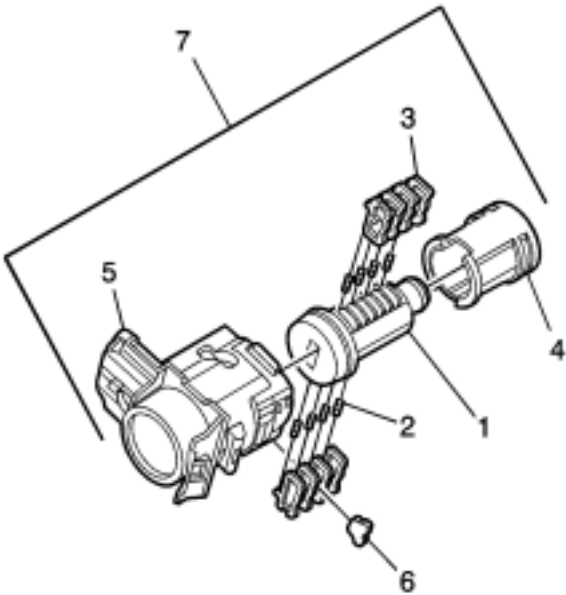
## Front Side Door Lock Cylinder Coding (Non Free Wheeling)



The door lock cylinder uses 8 of the 8cut positions. The tumbler positions are staggered from side to side, 4 on one side and 4 on the other, are not self-retaining, and are not snap in.

**Note:** All lock cylinders for side milled keys have right and left tumblers. The location of the tooth of the tumbler determines whether it is right or left. Illustrations in this procedure show the right tumblers on the top and the left tumblers on the bottom. All tumblers are marked 1R, 1L, 2R, or 2L. The number being cut depth and the letter meaning right or left.

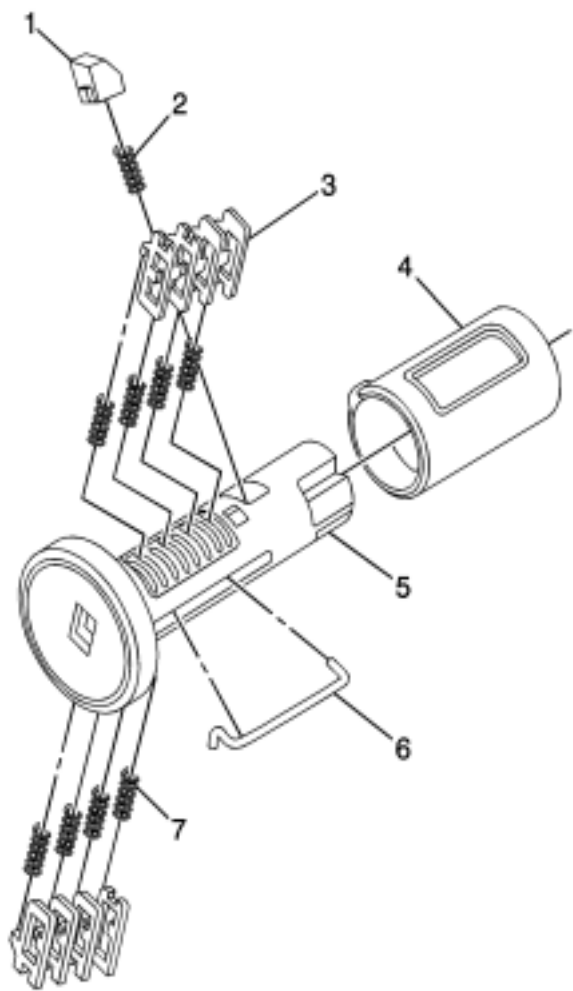
1. Hold the door lock cylinder (1) so the side with the 4 tumbler spring pockets faces up, pocket nearest to the cylinder head.
2. Insert the tumbler springs (2) into the 4 spring pockets. This side uses left tumblers.
3. Install the tumbler (3) for key cut position one in the slot nearest to the front of the lock cylinder. Install the remaining tumblers, key cut positions 3, 5, and 7, following the key code and same process. Press the tumblers in place until they are secure.
4. Check the correct loading of the tumblers by inserting the key into the cylinder. All tumblers should be flush with the lock cylinder body.
5. Turn the cylinder so the side with the 4 tumbler spring wells faces up. This side uses right tumblers.
6. Insert the tumbler springs into the 4 spring pockets.
7. The first tumbler closest to the front of the lock cylinder to be loaded will be the second key cut position, the second number in the key code. Install the remaining tumblers for the key cut positions 4, 6, and 8. Press the tumblers in place until they are secure.
8. Check the correct loading of the tumblers by inserting the key into the cylinder. All tumblers should be flush with the lock cylinder body.
9. Insert the key and lightly lubricate the cylinder body diameter and tumbler surfaces and a small amount in the head of the cylinder using the supplied grease.
10. Insert the sleeve (4) onto the cylinder assembly.



- 11. Insert the assembly into the case(5).
- 12. With the lock cylinder assembly installed in the case(5), install the retainer(6) and stake the retainer in place using a small punch and hammer to peen the case material onto the exposed ends of the installed retainer(6).
- 13. Insert the key into the lock and function the lock to check for proper assembly and smooth operation.



## Lock Cylinder Coding - Ignition

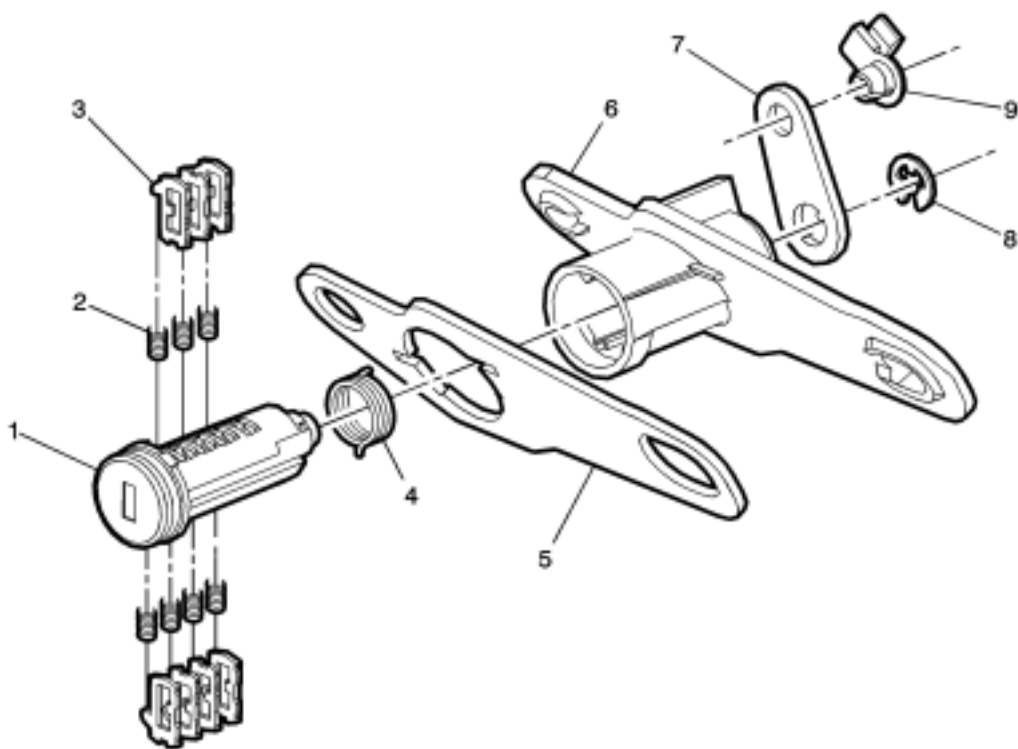


The ignition lock cylinder uses 8 key cut positions, 1–8. The ignition cylinder tumblers(3) are located on alternate sides of the cylinder(5). They are not snap-in and are not self-retaining. It follows the key code with the first tumbler being the first depth of the key code, closest to the head of the key.

**Note:** All lock cylinders for side milled keys have right and left tumblers. The location of the tooth of the tumbler determines whether it is right of left. Illustrations in this procedure show the right tumblers on the top and the left tumblers on the bottom. All tumblers are marked 1R, 1L, 2R, or 2L. The number being cut depth and the letter meaning right or left.

1. Hold the ignition cylinder assembly (5) so the side with the tumbler spring pocket located closest to the head of the cylinder is facing up.
2. Insert the tumbler spring (7) into each of the 4 spring pockets of the cylinder assembly. This side of the cylinder used left tumblers.
3. The first tumbler (3) to be loaded will be the first key cut position, which is the first number in the key code. Install the tumbler in the slot over the spring. Install the remaining right tumblers following the key code and same process, pressing the tumblers in place until they are secure.
4. Rotate the cylinder assembly. Insert the tumbler spring into each of the spring pockets of the cylinder assembly. This side of the cylinder used right tumblers.
5. The first tumbler (3) to be loaded will be the second key cut position, the second number in the key code. Install the first tumbler in the slot over the spring. Install the remaining left tumblers following the key code and same process, pressing the tumblers in place until they are secure.
6. Inspect for correct loading of the tumblers by inserting the key into the cylinder. All tumblers should drop flush with the lock cylinder body diameter.
7. With the key in the cylinder assembly insert the round connector (6), insert the retainer spring (2) in the retainer slot located in the cylinder assembly. Insert the retainer (1) lining it up in the slot over the spring. Depress the retainer and hold.
8. Insert the cylinder into the sleeve (4) as shown in the print. Make sure the actuator stays located properly in the cylinder.
9. When the key is removed, the lock should stay together.
10. Lightly lubricate the outside surface in the tumbler area of in the lock body and down the key slot using the provided grease. Insert and extract the key 5times to lubricate the keyway.
11. Insert the key and function the lock 3times to distribute the grease inside the sleeve.
12. Verify the key position for inserting the lock into the column.

## Rear Compartment Lid Lock Cylinder Coding



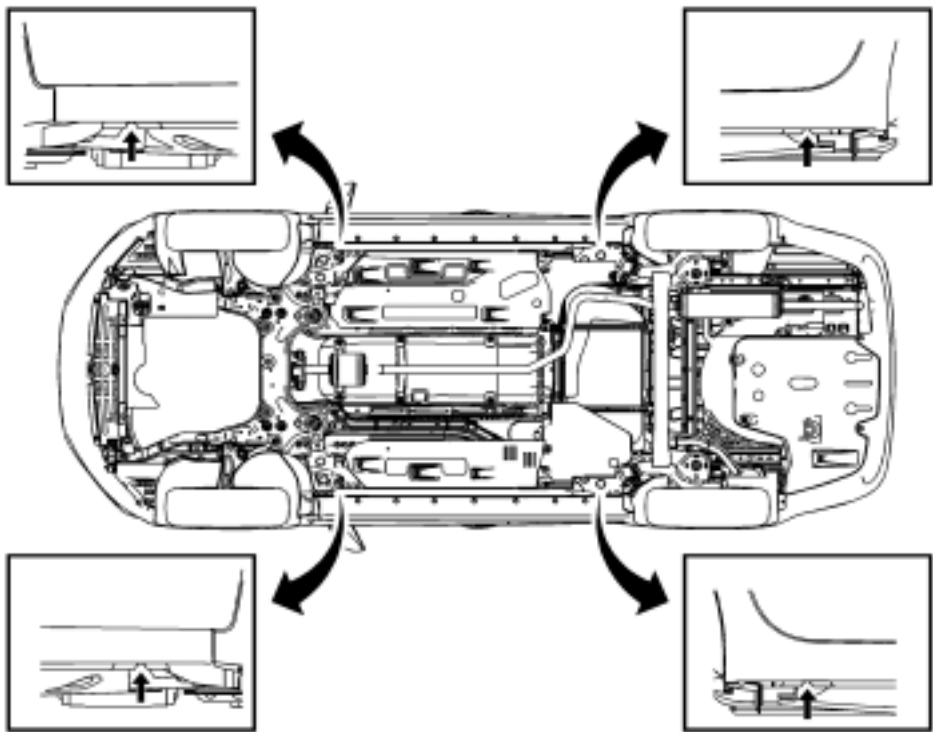
The rear compartment lid lock cylinder uses 7 of the 7 cut positions. The tumbler positions are staggered from side to side, 4 on one side and 3 on the other, are not self-retaining, and are not snap in.

**Note:** All lock cylinders for side milled keys have right and left tumblers. The location of the tooth of the tumbler determines whether it is right or left. Illustrations in this procedure show the right tumblers on the top and the left tumblers on the bottom. All tumblers are marked 1R, 1L, 2R, or 2L. The number being cut depth and the letter meaning right or left.

1. Tumbler spring (2) and tumbler (3) are to be assembled into the cylinder (1). In this case start with the tumbler nearest the cylinder head and work through until the last tumbler at the base. Use the key as a tool by pushing it in step by step to hold the already assembled tumblers in place.
2. Check the correct loading of the tumblers by inserting the key into the cylinder. All tumblers should be flush with the lock cylinder body.
3. Assemble the restoring spring (4) onto the rear of the cylinder.
4. Tape the pad (5) onto the housing (6).
5. Grease the housing.
6. Insert the lock cylinder (1) into the housing (6). Remove the key from the cylinder.
7. Install the lever (7) onto the end of the cylinder (1).
8. Attach the E-ring (8) to the cylinder, then crimp it to retain the lever assembly.
9. Snap the rod retainer (9) into the hole in the lever (7).
10. Insert the key into the lock and function the lock to check for proper assembly and smooth operation.

## Lifting and Jacking the Vehicle

**Note:** The use of a LOW PROFILE LIFT ARMS SYSTEM may be required to avoid unwanted contact with the vehicle body and structure depending on lifting equipment used. Refer to the manufacturer recommendation for their applications of low profile lift arms system for their lifting equipment.



**Danger:** To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

**Danger:** To avoid any vehicle damage, serious personal injury or death, always use the jackstands to support the vehicle when lifting the vehicle with a jack.

**Caution:** Perform the following steps before beginning any vehicle lifting or jacking procedure:

- Remove or secure all of the vehicle contents in order to avoid any shifting or any movement that may occur during the vehicle lifting or jacking procedure.
- The lifting equipment or the jacking equipment weight rating must meet or exceed the weight of the vehicle and any vehicle contents.
- The lifting equipment or the jacking equipment must meet the operational standards of the lifting equipment or jacking equipment manufacturer.
- Perform the vehicle lifting or jacking procedure on a clean, hard, dry, level surface.
- Perform the vehicle lifting or jacking procedure only at the identified lift points. DO NOT allow the lifting equipment or jacking equipment to contact any other vehicle components.

Failure to perform the previous steps could result in damage to the lifting equipment or the jacking equipment, the vehicle, and/or the vehicle contents.

### Vehicle Lifting– Frame Contact Lift

#### Front Lift Pads

When lifting the vehicle with a frame-contact lift, place the front lift pads on the rocker outer panel weld flange, as shown.

#### Rear Lift Pads

When lifting the vehicle with a frame-contact lift, place the rear lift pads on the rocker outer panel weld flange, as shown.

### Vehicle Jacking

**Caution:** When you are jacking the vehicle at the front locations, be certain that the jack or the jack lift pad does not contact the front fascia, front fascia air dam, or the front fenders. If such contact occurs, vehicle damage may result. When jacking at selected front locations additional clearance may be required for the jacking points.



**Note:** When you are lifting a vehicle with a service jack, block the wheels at the opposite end from which you are lifting. Use jack stands to provide additional support.

When using a service jack under the front of the vehicle use one of the following locations:

**Front of Vehicle**

Place the service jack pad in the same location as shown for the front lift pads.

**Rear of Vehicle**

**Note:** Place jackstands **ONLY** under strong and stable vehicle structures. Place the service jack pad in the same location as shown for the rear lift pads.





## Exterior Windnoise

**Warning:** An assistant should drive the vehicle while the technician checks for the location of the reported condition. Otherwise, personal injury could result.

Exterior windnoise is louder when the vehicle is driven with one or more windows down. Exterior windnoise occurs when air passes over the body panels, the seams, or the openings. Use the following items during the test drive in order to aid in the detection of leaks:

- Mechanic's stethoscope or heater hose
  - Masking tape—51 mm (2 in) width
  - Strip caulk
  - A water soluble marking pencil
1. While driving, determine the location of the exterior windnoise by lowering one window at a time. If the location corresponds with the condition in step 2, pull over and make a temporary repair with 51 mm (2 in) wide masking tape.
  2. Tape over the gaps and the moldings one at a time. Test between each taping. Taping over the gaps and moldings will correct the condition.
  3. Temporarily repair the condition with masking tape. Adjust the tape when needed.
  4. Continue testing in order to determine if the noise has been eliminated or other leak areas exist.
  5. When all the reported leak conditions are located, make permanent repairs using the proper alignment techniques and the sealing materials.





## Interior Windnoise

**Warning:** An assistant should drive the vehicle while the technician checks for the location of the reported condition. Otherwise, personal injury could result.

Interior windnoise is not heard when the window is lowered. Interior windnoise is caused by the air leaving the inside of the vehicle through a seal or a seam.

1. Tape over the relief valves to cause added air pressure within the vehicle.
2. Test drive the vehicle and listen for windnoise or a whistle.
3. Pull the vehicle over and make the temporary repairs using masking tape. If you cannot determine the source of the windnoise, perform one or more of the following diagnostic tests:
  - [Air Pressure Test](#)
  - [Soap Suds or Bubble Test](#)
  - [Tracing Powder or Chalk Test](#)





## Air Pressure Test

1. Mask off both the pressure relief valves.
2. Close all the windows.
3. Turn the vehicles ventilation fan to the on position, with the selector on high speed and in the defrost mode.
4. Unlock and close the doors.
5. Listen for escaping air along the door and the window seals with a stethoscope or a length of heater hose.





## Soap Suds or Bubble Test

1. Mask off the pressure relief valves.
2. Close all the windows and the doors.
3. Turn the vehicles ventilation fan to the on position, with the selector on high speed and in the defrost mode.
4. Unlock and close the doors.
5. Apply the soap solution to the potential leak areas.
6. Look for bubbles revealing escaping air.





## Tracing Powder or Chalk Test

Clean the weatherstrips and the contact surfaces with cleaning solvent.

1. Apply powder or chalk in an unbroken line to the contact surface of the weatherstrip surrounding the perimeter of the suspected areas.
2. Close the panel completely without slamming the panel. Closing the panel completely presses the weatherstrip firmly against the mating surface.
3. Inspect the applied line on the weatherstrip. The applied line is marred where contact is good. A corresponding imprint is on the mating surfaces.
4. Gaps or irregularities in the powder or the chalk line on the mating surfaces indicate the areas with a poor seal.

## Squeaks and Rattles

### Special Tools

- *J 39570* Chassis Ear
- *J 41416* Ultrasonic Leak Detector

For equivalent regional tools, refer to Special Tools .

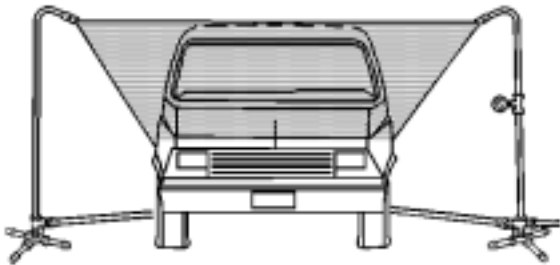
#### Note:

- This procedure is not used in Brazil.
- Squeaks and rattles are caused by improperly controlled relative motion between vehicle components. There are 4 ways to prevent squeaks and rattles.  
To aid in diagnosing, use *J 39570* chassis ear or *J 41416* ultrasonic leak detector.
- Attach the component that squeaks or rattles securely.
- Separate the components that squeak or rattle to prevent contact.
- Insulate the components that squeak or rattle.
- Insulate low uniform friction surfaces to eliminate stickslip motion.

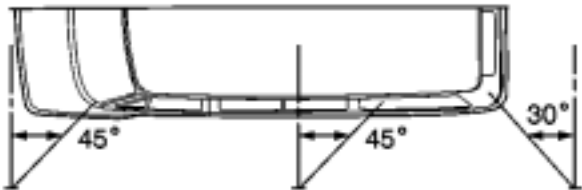
## Waterleak Test Preparation

**Note:** This procedure is not used in Brazil.

- GM vehicles are designed to operate under normal environmental conditions.
  - The design criteria for sealing materials and components takes into consideration the sealing forces required to withstand the natural elements. These specifications cannot take into consideration any artificial conditions, i.e., high pressure car washes.
  - The water leak test procedure has been correlated to the natural elements and will determine the ability of a vehicle to perform under normal operating conditions.
  - The first step in diagnosing a leak is determining the conditions under which a leak occurs. If the general leak area can be found, the exact entry point can be isolated using a water hose or an air hose. Some trim panels or components may need to be removed in order to repair the leak.
  - If leaks are found around a door, door window, rear compartment lid or liftgate area this does not necessarily indicate a bad weatherstrip. An adjustment to these areas may resolve the condition.
1. Assemble the water test stand as shown.



2. Position the stands as shown.  
The water spray from the stands should overlap the vehicle as shown.
3. Have an assistant inside of the vehicle during the test in order to locate any leaks.
4. The water pressure at the nozzle should maintain a 155 kPa (22 psi), for at least 4 minutes.



5. In order to check the windshield, aim the water spray 30 degrees down and 45 degrees toward the rear.  
Aim the water towards the corner of the windshield.
6. In order to check the side windows for leaks, position the water stand towards the center of the rear quarter, aiming the water spray 30 degrees down and 45 degrees toward the rear.
7. In order to check the back window, aim the water spray 30 degrees down and 30 degrees toward the front.

Recommended Materials (Waterleak Repair)

Leak Areas	Repair Materials
Bolts, Studs, and Screws	Strip caulk
Large Holes	3M™ Automotive Joint and Seam Sealer
Metal joints	Brushable seam sealer which can be painted
Small Cracks and Pin Holes	3M™ Drip-Check Sealer or equivalent
Ventilation Ducts	3M™ Auto Bedding and Glazing Compound or equivalent
Weatherstrips	3M™ 08011 Weatherstrip Adhesive or equivalent
Windshield, Rear Window	Urethane adhesive, caulking kit, or equivalent

## Dust Leaks

Dust may leak into the vehicle where water will not. This happens particularly in the lower portion of the interior.

Forward motion of the vehicle can create a slight vacuum which pulls air and dust into the vehicle.

In order to determine the location of dust leaks, perform the following steps:

1. Remove the mats from the floor.
2. Remove the mats from the kick panel.
3. Remove the insulation from the floor.
4. Remove the insulation from the kick panel.
5. Drive the vehicle on a dusty road.
6. Examine the interior.

Dust in the shape of a small cone or slit will usually be found at the point of leakage.

7. Mark the points of leakage.

**Note:** Ensure that the interior is darkened when performing this step.

8. Shine bright lamps on the underside of the floor and the cowl.
9. Have an assistant mark any points inside of the vehicle for any points where the light shines through.
  - Inspect the weld joints.
  - Inspect the body mounts.
10. Seal any leaks with an air-drying, body-sealing compound.

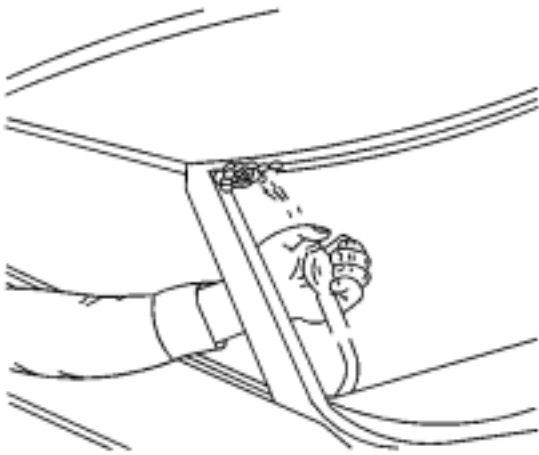
## Water Hose Test



**Note:** Use a water hose without the nozzle attached.

1. Have an assistant inside of the vehicle in order to locate the leak.
2. Begin testing at the base of the window or the windshield.
3. Slowly move the hose upward and across the top of the vehicle.

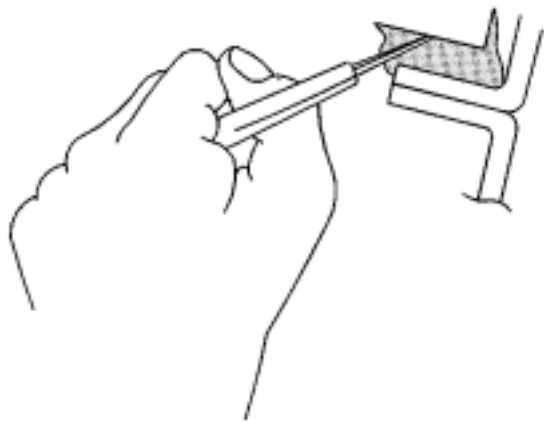
## Air Hose Test



**Caution:** The air hose test should only be used on fully cured urethane adhesive. Otherwise, damage to the urethane adhesive bead could result in additional leaks.

1. Using a liquid detergent, diluted with water in a spray bottle, spray the window at the edges. Begin at the bottom and gradually move up and across the top.  
**Note:** The compressed air should not exceed 205 kPa (30 psi).
2. Have an assistant inside of the vehicle with an air hose.
3. Have the assistant aim the compressed air at the suspected areas.  
Bubbles will form in the soap solution at the location of the leak.

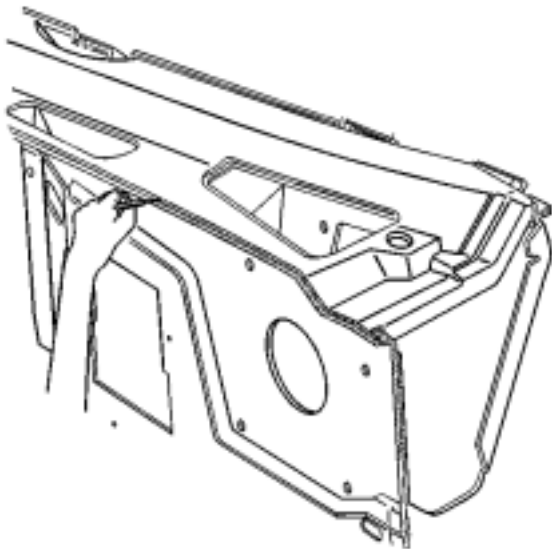
## Body Waterleak Repair



**Warning:** If the vehicle interior is exposed to moisture and becomes soaked up to the level of the sensing and diagnostic module (SDM), the SDM and SDM harness connector must be replaced. The SDM could be activated when powered, which could cause airbag deployment and result in personal injury.

Depending on the location of the waterleak, you may have to remove certain interior components in order to repair the leak.

1. If the floor carpet is wet, refer to [Floor Carpet Drying](#) .



2. Cut out a portion of the adhesive caulking in the leak area from inside or outside of the vehicle.
3. Clean and remove all loose particles of the adhesive old caulking from the area.
4. Apply joint body and seam sealer where the old adhesive caulking was removed.
5. Allow the adhesive caulking to dry for several hours.
6. Test for leaks.
7. Install the trim, if removed.



## Stationary Window Waterleak Repair

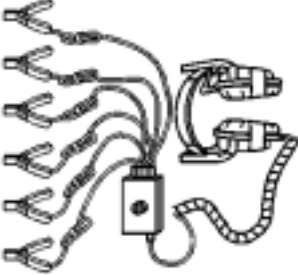

**Warning:** If any water enters the vehicle interior up to the level of the carpet or higher and soaks the carpet, the sensing and diagnostic module (SDM) and the SDM harness connector may need to be replaced. The SDM could be activated when powered, which could cause deployment of the air bag(s) and result in personal injury. Before attempting these procedures, the SIR system must be disabled. Refer to Disabling the SIR System. With the ignition OFF, inspect the SDM mounting area, including the carpet. If any significant soaking or evidence of significant soaking is detected, you must perform the following tasks:

- Remove all water.
- Repair the water damage.
- Replace the SDM harness connector.
- Replace the SDM.

Failure to follow these tasks could result in possible air bag deployment, personal injury, or otherwise unneeded SIR system repairs.

1. If the floor carpet is wet refer to [Floor Carpet Drying](#) .
2. Remove the trim moldings or the headliner in order to repair the leak, if needed.
3. Determine the source of water entry.
4. If water is leaking at the edge of the windshield, reseal the windshield using Urethane Adhesive Caulking Kit GMP/N12346392 or the equivalent.
5. If water leaks into the vehicle at the sides of the stationary windows, reseal the window using Urethane Adhesive Caulking Kit GMP/N12346392 or the equivalent.

Special Tools

Illustration	Tool Number/ Description
	CH-39570 J-39570 Chassis Ear
	GE-41416 J-41416 Ultrasonic Leak Detector



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**BODY HARDWARE AND TRIM**

**0-2**

Exterior Trim

Instrument Panel and Console Trim

Floor Coverings and Headlinings

Interior Trim and Paneling





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Emblem/Nameplate Replacement	Rear Compartment Lid Nameplate Replacement (Sedan)	
Body Panel Paint Protector Replacement (VGC)	Radiator Upper Grille Replacement	
Body Side Upper Front Applique Replacement	Radiator Lower Grille Replacement	
Liftgate Side Applique Replacement (Hatchback)	Radiator Grille Opening Cover Replacement (Upper Grille Cover)	
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Front License Plate Bracket Replacement	Roof Panel Joint Finish Molding Replacement	
Front Bumper Fascia Front Tow Eye Access Hole Cover Replacement	Rear End Spoiler Replacement (Hatchback TTV)	
Rear Bumper Fascia Rear Tow Eye Access Hole Cover Replacement		
Radiator Grille Emblem/Nameplate Replacement		



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Liftgate Applique Nut	5.0 N·m	44 lb in
Radiator Grille Bumper Bolt	1.5 N·m	13 lb in
Rear Compartment Lid Applique Nut	5.0 N·m	44 lb in
Rear End Spoiler Nut	5.0 N·m	44 lb in
Rear End Spoiler Bolt, for Cross Bar Indicator	1.5 N·m	13 lb in
Rear End Spoiler Screw	1.5 N·m	13 lb in

## Emblem/ Nameplate Replacement

**Caution:** Refer to [Exterior Trim Emblem Removal Caution](#) .

1. The part and vehicle surface should be 21°C (70°F) prior to installation. The vehicle should remain inside in a temperature range of 21°C (70°F) for 1 hour after assembly to allow the adhesive to develop sufficient bond strength.
2. Using masking tape, mark two sides of the placement where the old emblem/nameplate was placed.
3. Use a heat gun or equivalent, to heat the adhesive backed emblem/nameplates.
4. A flat-bladed plastic tool can assist in the removal process.
5. Wipe the vehicle surface area with a 50/50 solution by volume of isopropyl alcohol and clean drinkable water.
6. Dry the area with a clean lint-free cotton cloth.
7. Close any doors, liftgates, endgates and rear compartment lids where emblem/nameplates are to be placed.
8. When removing protective liners from adhesive backed emblem/nameplates, be careful not to touch the adhesive tape or allow the tape to come in contact with dirt or any foreign matter prior to the placement and adhesion.
9. Remove the protective liner from the emblem/nameplate.
10. Position, align and press the emblem/nameplate to the previously marked location.
11. Using a clean towel and the palm of the hand, press firmly for approximately 30 seconds, the emblem/nameplate to the vehicle body panel surface.
12. Ensure the emblem/nameplate is attached firmly to the body panel surface.
13. Remove the masking tape and clean all tape residue from the vehicle body panel surface around the emblem/nameplate attachment location.

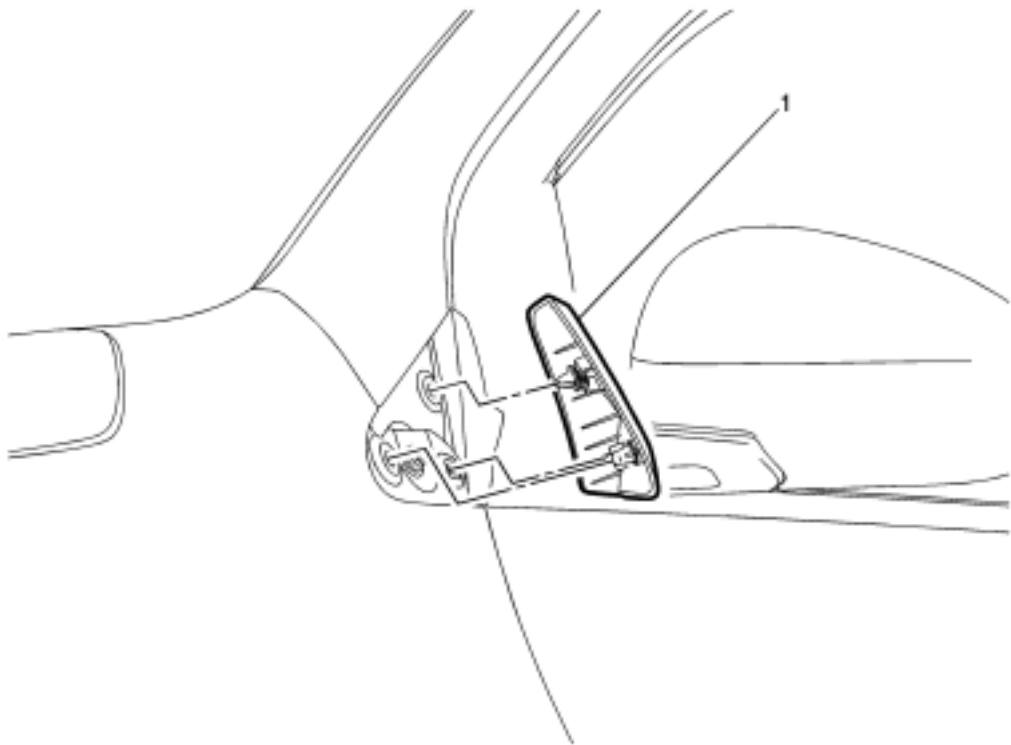


## Body Panel Paint Protector Replacement (VGC)

1. The paint protective film and vehicle surface temperature should be 13–32°C (55–90°F) for best results.
2. Automatic car washes should be avoided for at least 24 hours after the paint protective film application.
3. Wipe the vehicle surface with isopropyl alcohol or flash naptha at the application area.
4. Dry the surface with a clean lint-free cloth.
5. Create a mixture of 25 percent isopropyl alcohol and 75 percent water and two drops of baby shampoo per 16 oz of fluid mixture.
6. Remove the backing liner from the protective film patch.
7. Use the solution to liberally spray the adhesive side of the protective patch, the mounting location along with your hands.
8. Position the paint protective film patch to the desired location on the vehicle.
9. Spray the surface of the film with the alcohol, water and soap solution.
10. Using a dampened squeegee, start at the center of the protective patch, working outward in order to remove the air and solution from under the protective patch.
11. Release any air bubbles with a pin.
12. Dry the surface with a clean, lint-free cotton cloth.



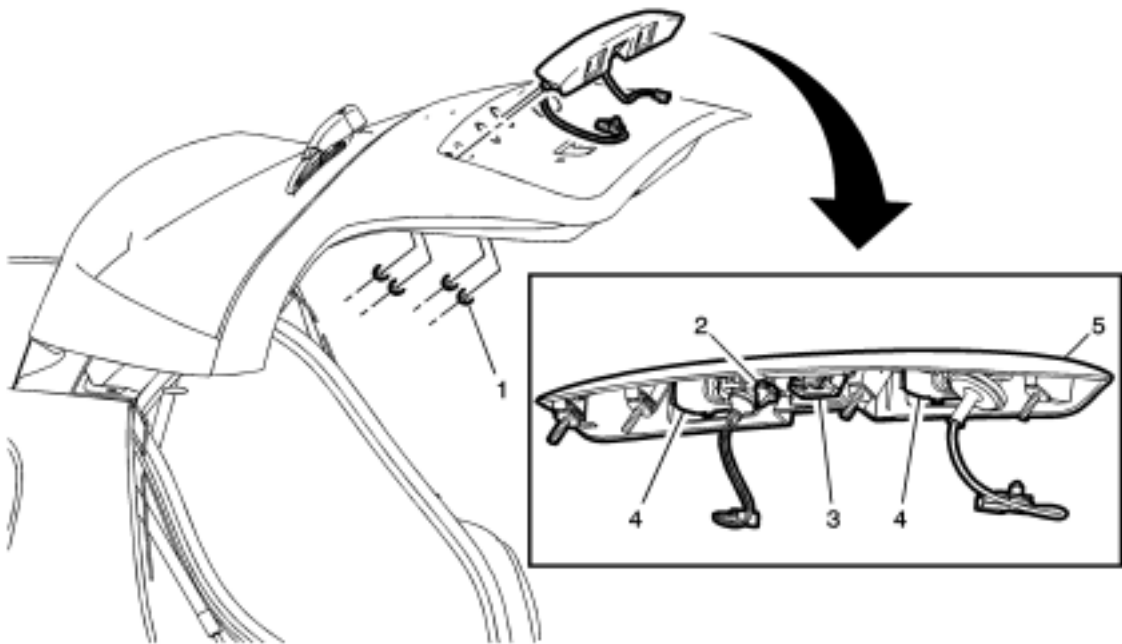
Body Side Upper Front Applique Replacement



Callout	Component Name
<p><b>Caution:</b> Refer to <a href="#">Exterior Trim Emblem Removal Caution</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Open either the left front or right front door in order to access the backside of the body side upper front applique.</p>	
1	Body Side Upper Front Applique

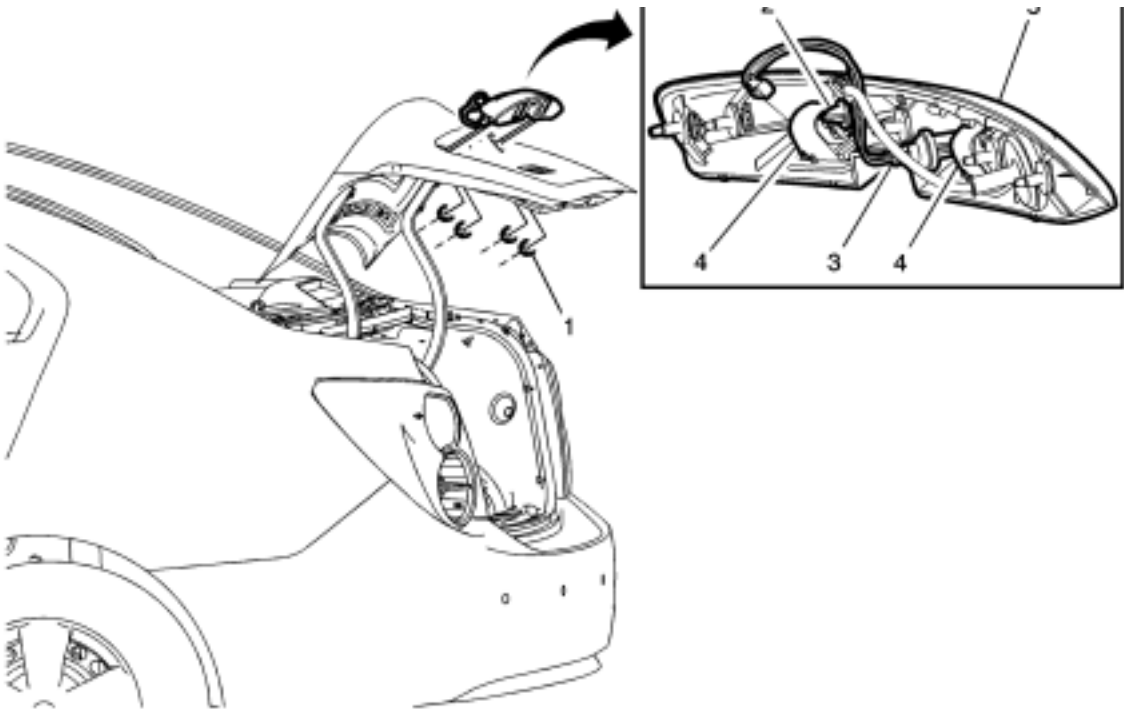


Liftgate Side Applique Replacement (Hatchback)



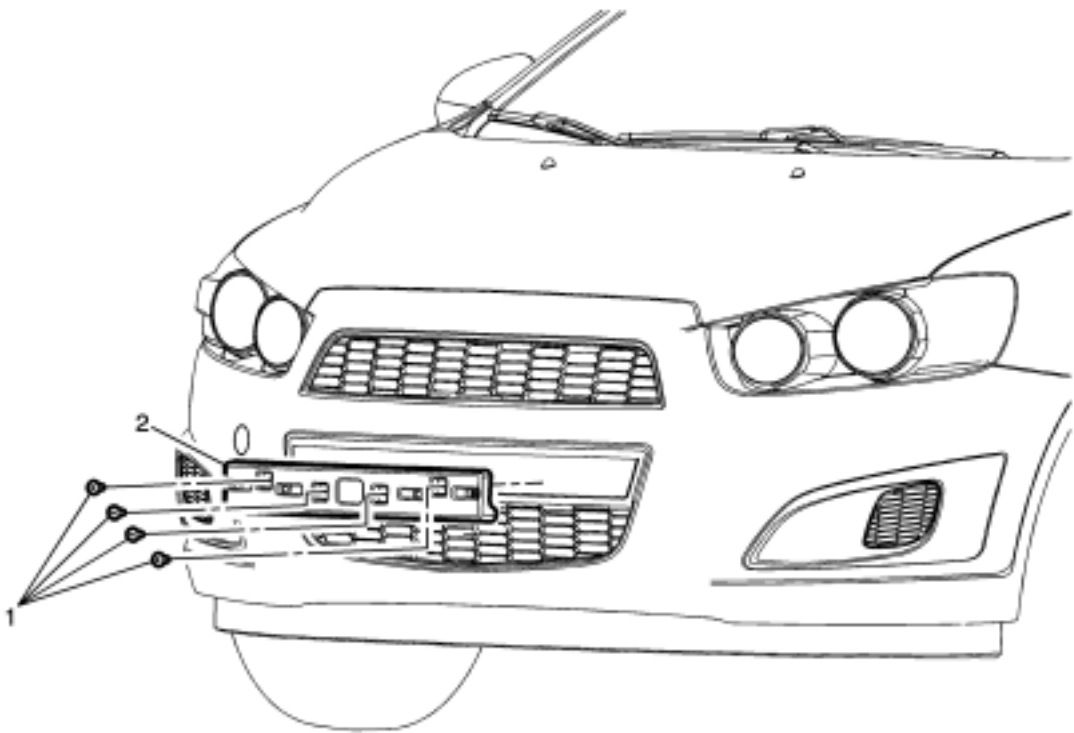
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Open and support the rear liftgate assembly.</p> <p>2. Remove the liftgate trim finish panel. Refer to <a href="#">Liftgate Trim Finish Panel Replacement</a> .</p> <p>3. Disconnect the electrical connectors.</p> <p>4. Remove the four nuts securing the liftgate side applique to the rear liftgate outer panel.</p> <p>5. Release the liftgate side applique center retainer from the liftgate panel.</p>	
1	<p>Liftgate Side Applique Nut (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 5 N·m (44 lbin)</p>
2	<p>Liftgate Side Applique Retainer</p>
3	<p>Liftgate Release Switch</p> <p><b>Procedure</b></p> <p>Remove the liftgate release switch. Refer to <a href="#">Liftgate Release Switch Replacement</a></p>
4	<p>Rear License Plate Lamp (Qty: 2)</p> <p><b>Procedure</b></p> <p>Remove the rear license plate lamps. Refer to <a href="#">Rear License Plate Lamp Replacement</a> .</p>
5	<p>Liftgate Side Applique</p>

Rear Compartment Lid Applique Replacement



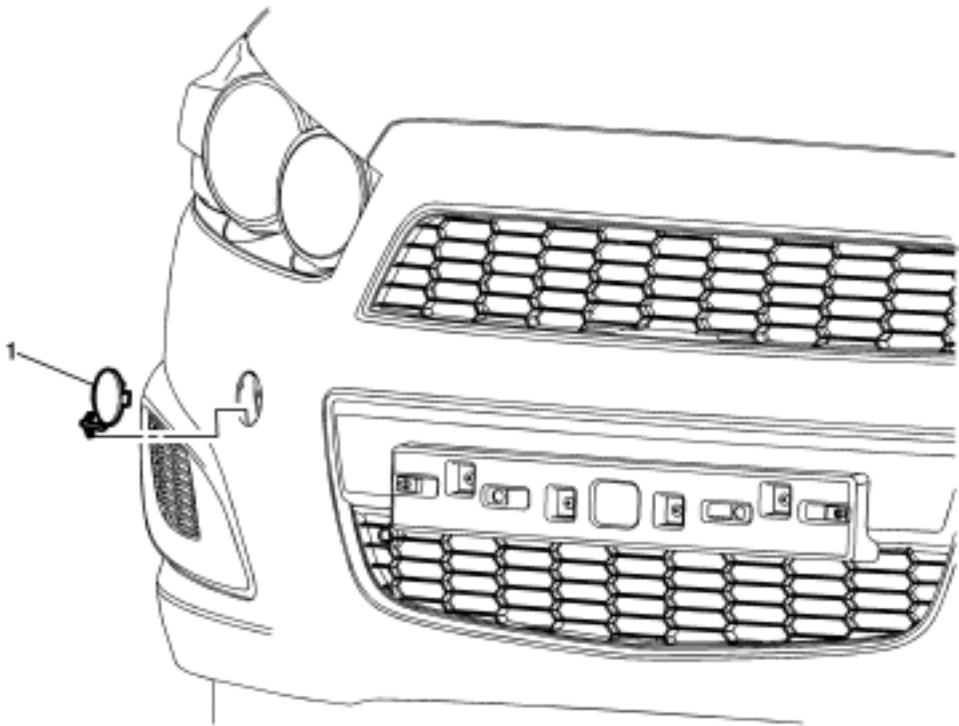
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Open and support the rear compartment lid.</p> <p>2. Remove the rear compartment lid inner panel trim. Refer to <a href="#">Rear Compartment Lid Inner Panel Trim Replacement</a> .</p> <p>3. Disconnect the electrical connectors.</p> <p>4. Remove the four nuts securing the rear compartment lid applique to the rear compartment lid.</p> <p>5. Release the center retainer from the rear compartment lid.</p>	
1	<p>Rear Compartment Lid Applique Nut (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 5 N·m (44 lbin)</p>
2	<p>Rear Compartment Lid Retainer</p>
3	<p>Liftgate Release Switch</p> <p><b>Procedure</b></p> <p>Remove the liftgate release switch. Refer to <a href="#">Liftgate Release Switch Replacement</a></p>
4	<p>Rear License Plate Lamp (Qty: 2)</p> <p><b>Procedure</b></p> <p>Remove the rear license plate lamps. Refer to <a href="#">Rear License Plate Lamp Replacement</a> .</p>
5	<p>Rear Compartment Lid Applique</p>

Front License Plate Bracket Replacement



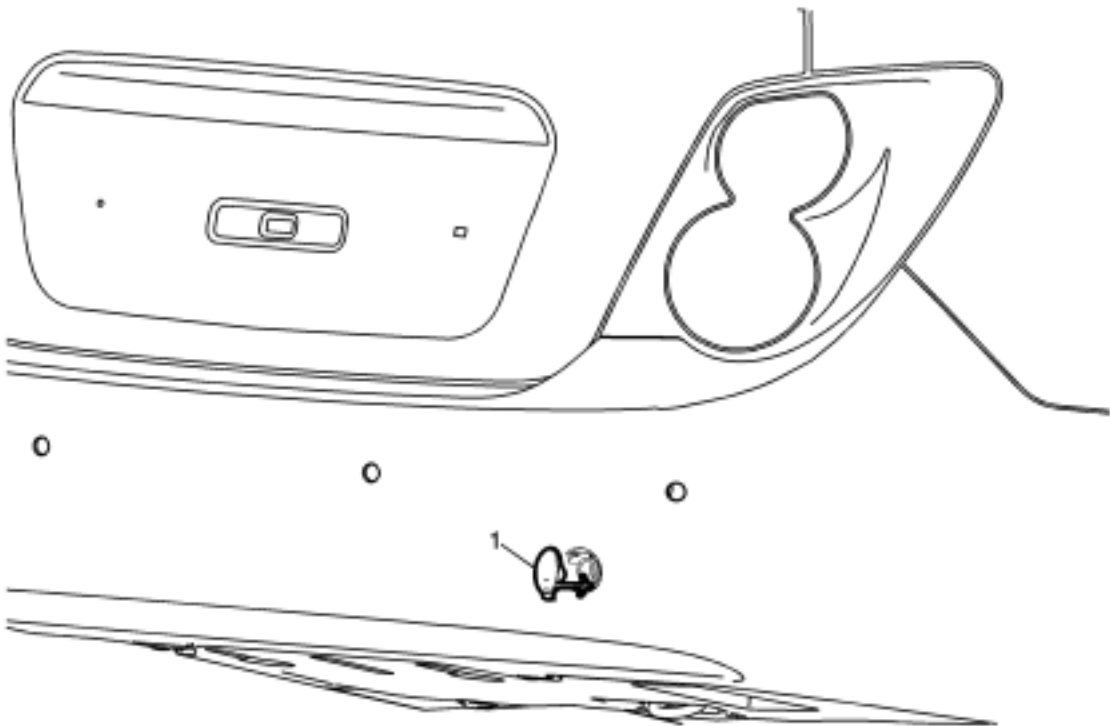
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front license plate if equipped.</p>	
1	<p>Front License Plate Bracket Screw (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 1.5 N·m (13 lb in)</p>
2	<p>Front License Plate Bracket</p>

Front Bumper Fascia Front Tow Eye Access Hole Cover Replacement



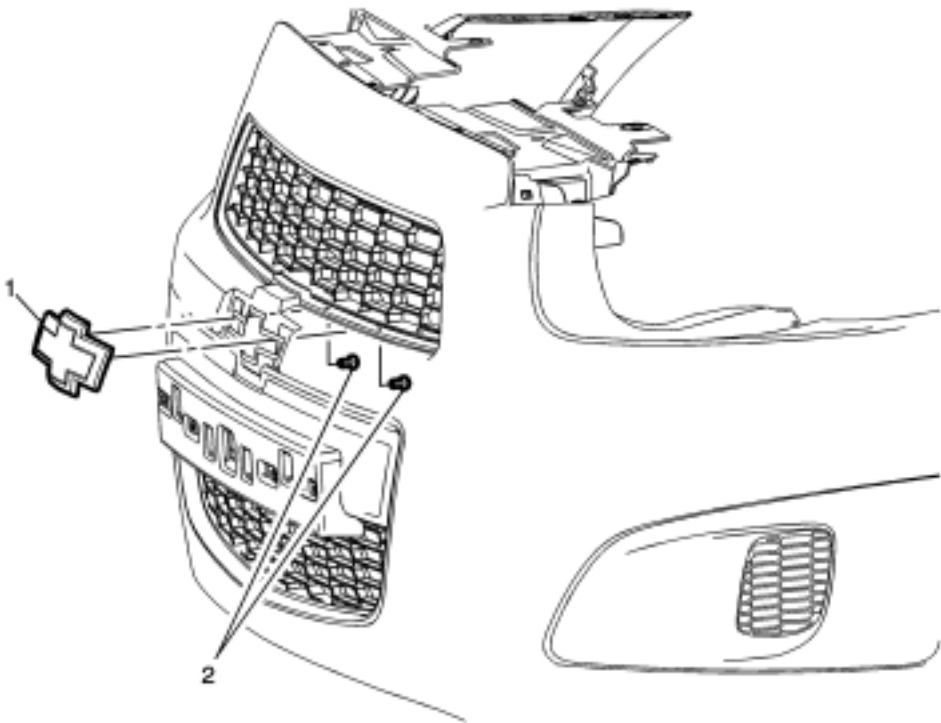
Callout	Component Name
1	<div>Front Bumper Fascia Front Tow Eye Access Hole Cover</div> <div><b>Procedure</b><div><div>1. Using a small flat-bladed tool, release the cover from the front bumper fascia.</div><div>2. Using needle nose pliers, release the v-notch hook from the square in the front fascia and remove.</div></div></div>

Rear Bumper Fascia Rear Tow Eye Access Hole Cover Replacement



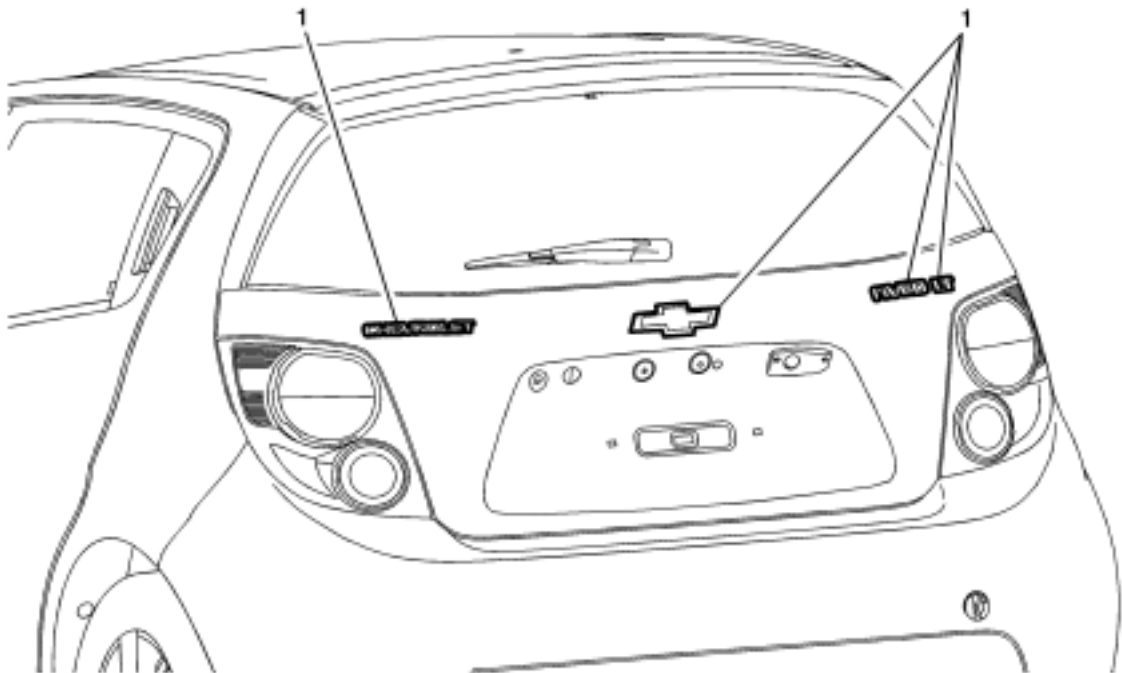
Callout	Component Name
1	<div>Rear Bumper Fascia Rear Tow Eye Access Hole Cover</div> <div><b>Procedure</b><div><div>1. Using a small flat-bladed tool, release the cover from the rear bumper fascia.</div><div>2. Using needle nose pliers, release the v-notch hook from the square in the rear fascia and remove.</div></div></div>

Radiator Grille Emblem / Nameplate Replacement



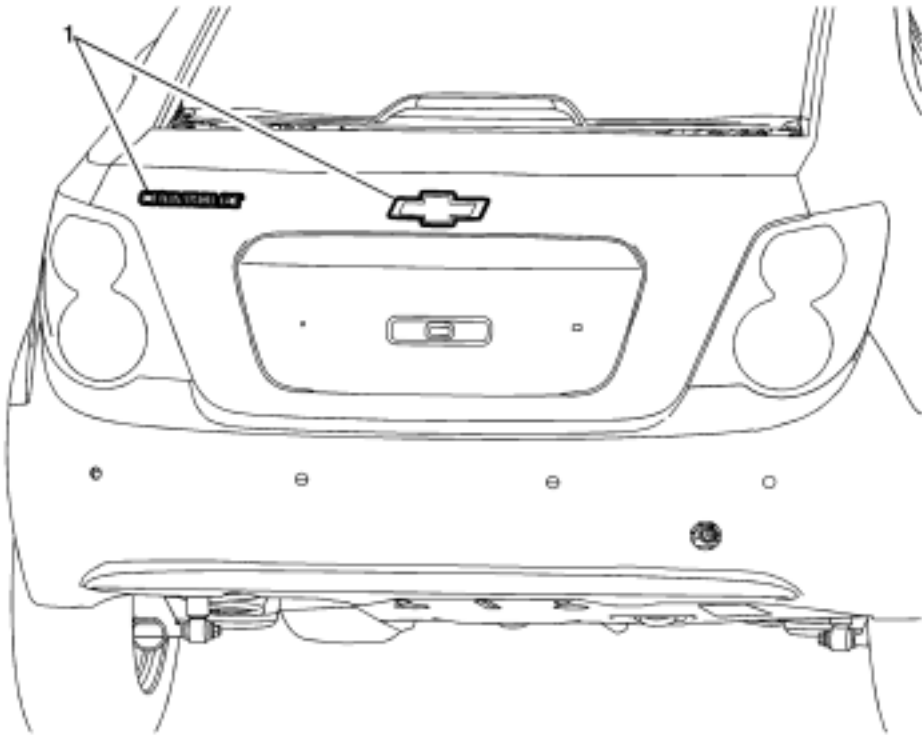
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p> <p>2. Remove the front bumper energy absorber. Refer to <a href="#">Front Bumper Energy Absorber Replacement</a> .</p>	
1	Radiator Grille Emblem / Nameplate
2	Radiator Grille Emblem / Nameplate Screw (Qty: 2)

Liftgate Emblem/ Nameplate Replacement (Hatchback)



Callout	Component Name
1	<p>Liftgate Emblem / Nameplate Assembly</p> <ul style="list-style-type: none"><li>• CHEVROLET</li><li>• BOWTIE</li><li>• AVEO</li><li>• LT</li></ul> <p><b>Caution:</b> Refer to <a href="#">Exterior Trim Emblem Removal Caution</a> .</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. The part and surface should be 21°C (70°F) prior to installation. The vehicle should remain 21°C (70°F) for one hour after assembly to allow adhesive to develop sufficient bond strength.</li><li>2. Use a Heat Gun or equivalent to remove the old nameplate. Clean all adhesive from the liftgate panel and wipe the surface dry with a clean lint-free towel prior to installing the new nameplate.</li><li>3. When removing protective liners from the adhesive tape, be careful not to touch tape with hands and do not allow tape to come in contact with dirt or any foreign matter prior to adhesion.</li><li>4. Using the previous witness marks of the old emblem / nameplate or making measurements from another alike vehicle, use masking tape to reference the alignment of the new emblem/nameplate to the liftgate panel.</li><li>5. Close the rear liftgate panel prior to adhesion.</li><li>6. Using the palm of the hand, wet out the emblem/nameplate to the rear liftgate panel to ensure full adhesion of the emblem is made.</li></ol>

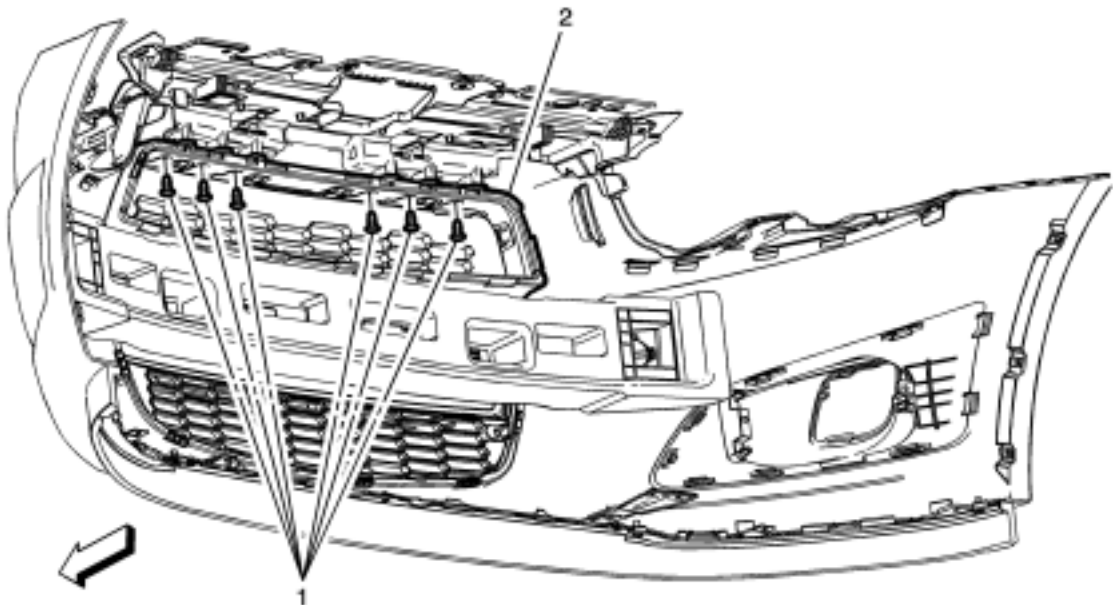
Rear Compartment Lid Nameplate Replacement (Sedan)



Callout	Component Name
1	<div>Rear Compartment Lid Name Plate</div> <div><div><div><div>CHEVROLET</div><div>BOWTIE</div></div></div></div> <div><div>Caution:</div><div>Refer to</div><div>Exterior Trim Emblem Removal Caution .</div></div> <div><div>Procedure</div><div><div>1. The part and surface should be 21°C (70°F) prior to installation. The vehicle should remain 21°C (70°F) for one hour after assembly to allow adhesive to develop sufficient bond strength.</div><div>2. Use a Heat Gun or equivalent to remove the old nameplate. Clean all adhesive from the rear compartment panel and wipe the surface dry with a clean lint-free towel prior to installing the new nameplate.</div><div>3. When removing protective liners from the adhesive tape, be careful not to touch tape with hands and do not allow tape to come in contact with dirt or any foreign matter prior to adhesion.</div><div>4. Close the rear compartment lid prior to adhesion.</div><div>5. Using the palm of the hand, wet out the emblem to the rear compartment lid to ensure full adhesion of the emblem is made.</div></div></div>

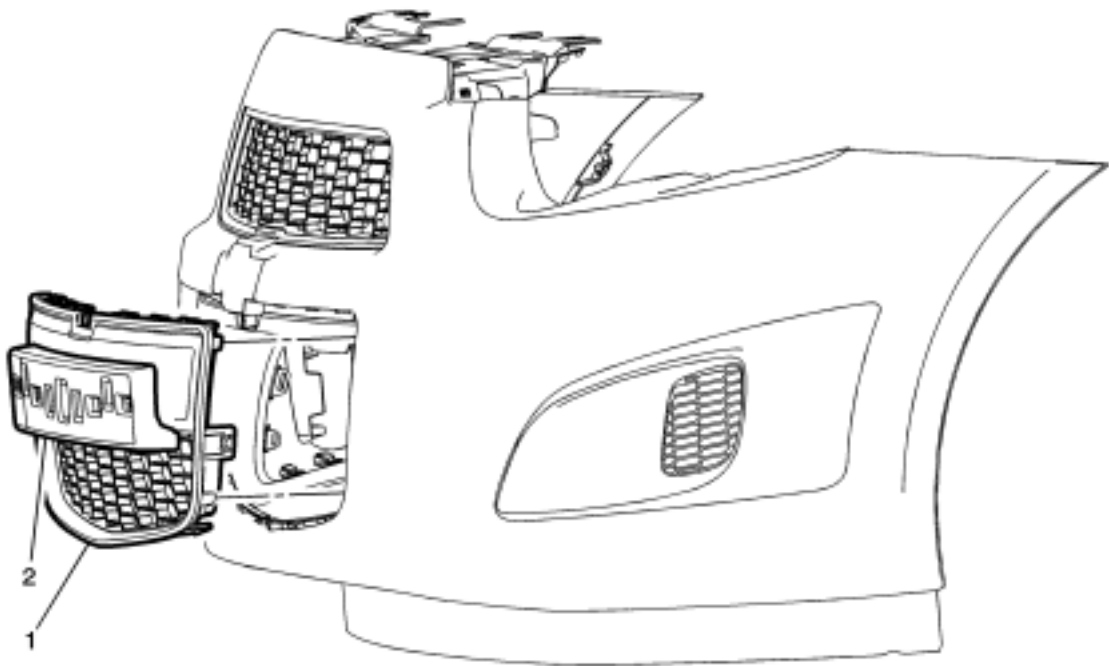


Radiator Upper Grille Replacement



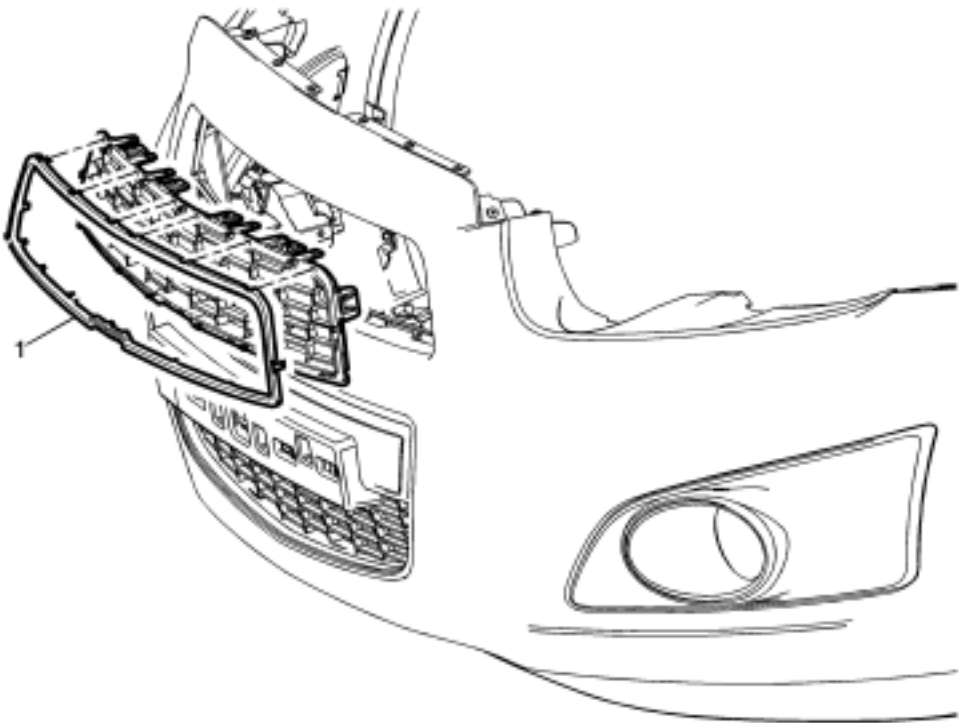
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	<p>Radiator Upper Grille Assembly Screw (Qty: 6)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Radiator Upper Grille Assembly</p> <p><b>Procedure</b></p> <p>Release the outer upper grille locking tabs from the front bumper fascia and push the grille assembly outward away from the front bumper fascia assembly.</p>

Radiator Lower Grille Replacement



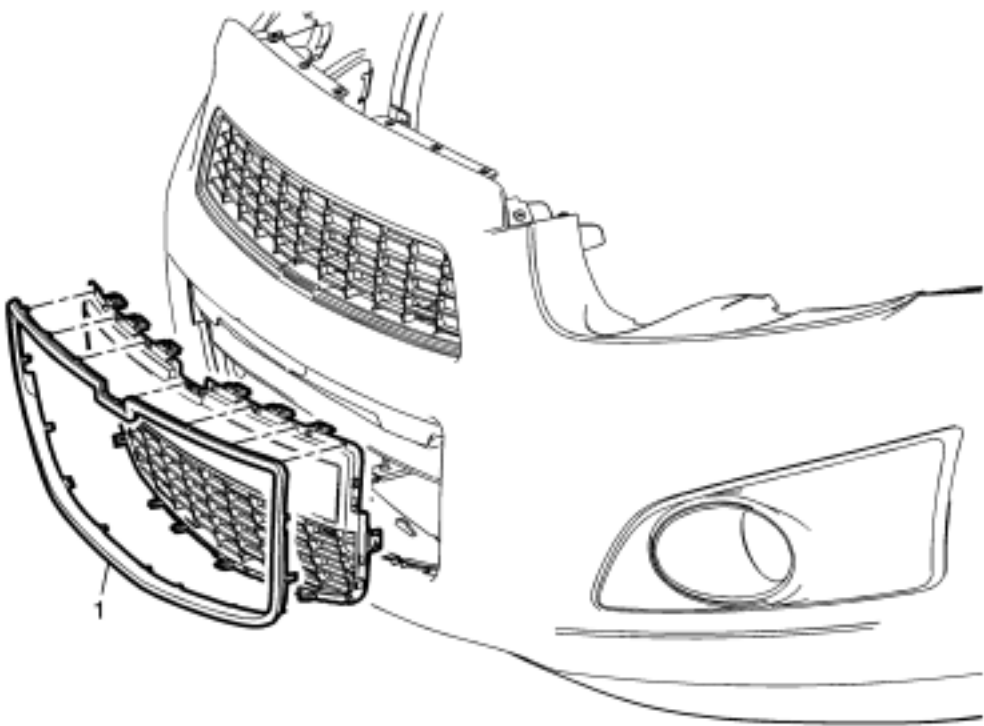
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the front bumper fascia assembly. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p> <p>2. Remove the front bumper fascia energy absorber. Refer to <a href="#">Front Bumper Energy Absorber Replacement</a> .</p>	
1	<p>Radiator Lower Front Grille</p> <p><b>Procedure</b></p> <p>1. Release the four upper tabs from the front bumper fascia.</p> <p>2. Release the two outer center tabs from the front bumper fascia.</p> <p>3. Release the four lower tabs from the front bumper fascia.</p> <p>4. Push the lower grille assembly outward, from the front bumper fascia in order to remove.</p> <p>5. Upon installation, index the right center alignment pin to the front bumper fascia first, followed by the ten locking tabs on the lower grille assembly to the front bumper fascia.</p> <p>6. Push the locking tabs inward at all ten locations, in order to secure the radiator lower front grille to the front bumper fascia.</p>
2	<p>Front License Plate Bracket Assembly</p> <p><b>Procedure</b></p> <p>Remove the four screws and the front license plate bracket to transfer to the new lower front grille assembly, (if equipped).</p>

Radiator Grille Opening Cover Replacement (Upper Grille Cover)



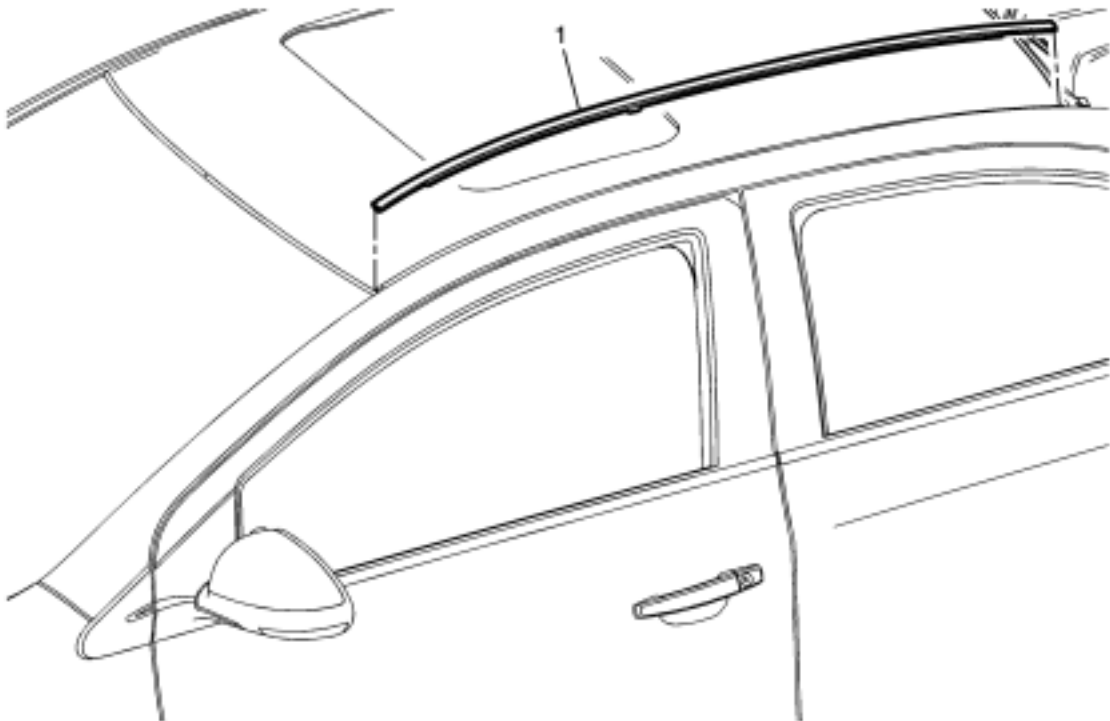
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the radiator upper grille. Refer to <a href="#">Radiator Upper Grille Replacement</a> .</p>	
1	<p>Radiator Grille Opening Cover (Upper)</p> <p><b>Procedure</b></p> <p>Release the locking tabs securing the radiator opening grille cover to the radiator upper grille and remove.</p>

Radiator Grille Opening Cover Replacement (Lower Grille Cover)



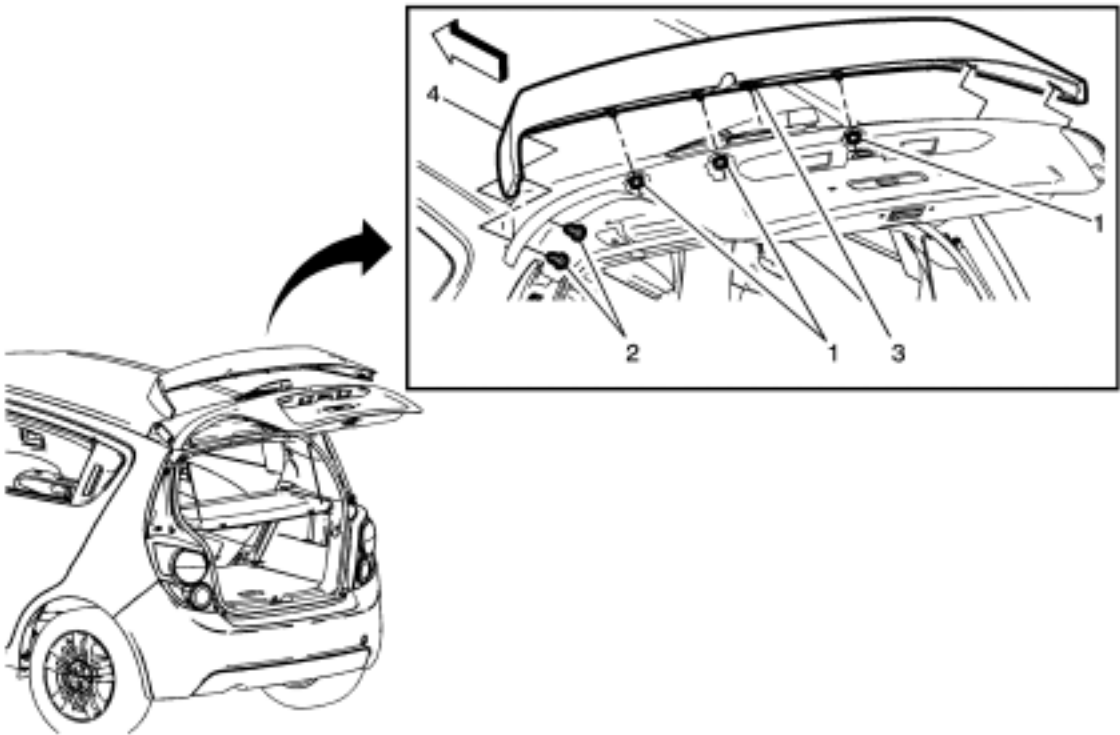
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the radiator lower grille. Refer to <a href="#">Radiator Lower Grille Replacement</a> .</p>	
1	<p>Radiator Grille Opening Cover (Lower)</p> <p><b>Procedure</b></p> <p>Release the locking tabs securing the radiator opening grille cover to the radiator lower grille and remove.</p>

Roof Panel Joint Finish Molding Replacement



Callout	Component Name
<p><b>Caution:</b> Refer to <a href="#">Exterior Trim Emblem Removal Caution</a> .</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Begin at the rear edge of the roof panel joint finish molding and carefully pry the molding from the roof ditch clip.</li><li>2. Pull the molding forward out of the ditch.</li><li>3. Carefully lift the front edge from the second roof ditch clip.</li><li>4. Clean any adhesive residue from the ditch using a 50/ 50 mixture by volume of isoproypl alcohol and clean drinkable water.</li><li>5. Dry the ditch with a lint free cotton towel.</li></ol>	
1	<p>Roof Panel Joint Finish Molding</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Insert the front edge of the finish molding to the edge of glass.</li><li>2. Using a roller-type tool, roll the molding into the ditch front to rear to ensure full adhesion is made.</li><li>3. Tuck the rear lip of the finish molding to the edge of glass at the rear of the roof panel.</li><li>4. Inspect the molding to roof ditch fit.</li></ol>

Rear End Spoiler Replacement (Hatchback TTV)



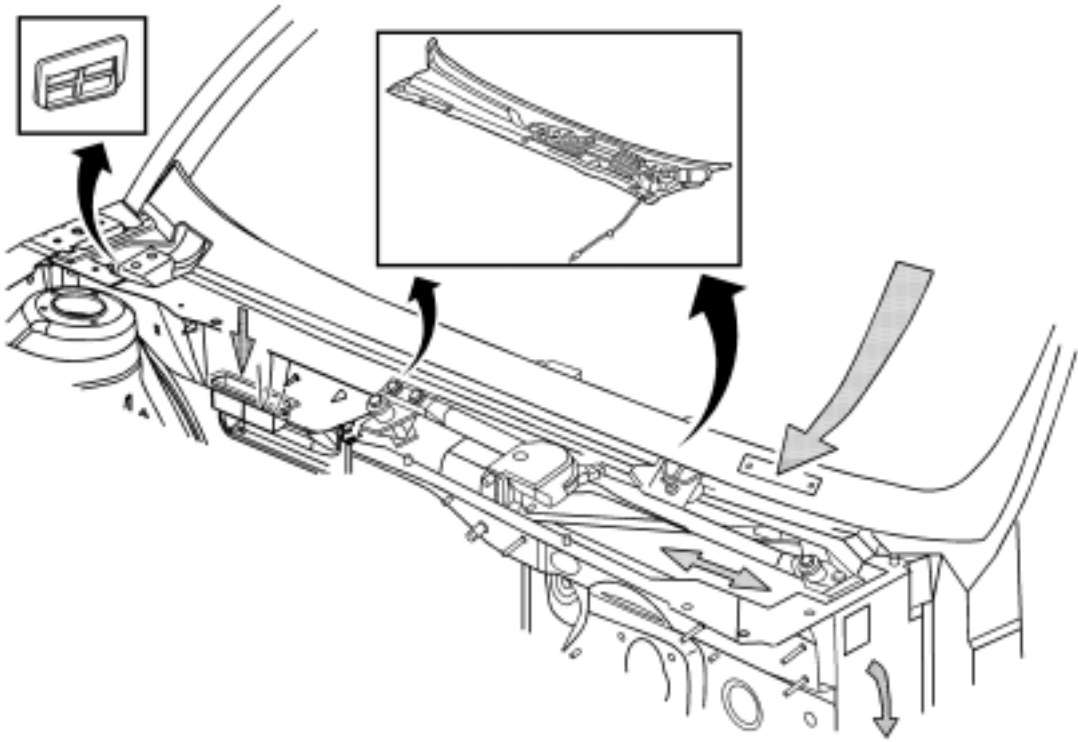
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the liftgate trim finish panel. Refer to <a href="#">Liftgate Trim Finish Panel Replacement</a> .</p>	
1	<p>Rear End Spoiler Nut (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 5.0 N·m (44 lbin)</p>
2	<p>Rear End Spoiler Screw (Qty: 4)</p> <p><b>Tighten</b> 1.5 N·m (13 lbin)</p>
3	<p>Clip Button</p> <p><b>Tip</b> Upon assembly of the rear spoiler to the liftgate, position and secure the clip button to the rear liftgate spoiler to liftgate outer panel first.</p>
4	<p>Rear End Spoiler Assembly</p>

## Water Management Description and Operation

### Plenum Water Flow Direction and Cleaning

A large percentage of water will flow off the windshield area into the plenum chamber drain system and then down the outside on the plenum to the underside of the vehicle. To ensure that the plenum chamber water management system performs properly, the air inlet grille panel, plenum chamber, and drains must not be blocked with debris.

In the graphic below the gray arrows show the water flow direction in the plenum chamber and drains system.



### Plenum Chamber and Drain Valve-Cleaning

The plenum chamber is located in front of the windshield and below the air inlet grille panel.

1. Remove the air inlet grille panel. Refer to [Air Inlet Grille Panel Replacement](#) .
2. Clean the plenum chamber, drains and the air inlet grille panel of debris blockage.
3. Flush the plenum chamber, drains and the air inlet grille panel with clean water.
4. Install the air inlet grille panel. Refer to [Air Inlet Grille Panel Replacement](#)



Specifications	Rear Compartment Floor Panel Carpet Replacement (Sedan)
Eliminating Unwanted Odors in Vehicles	Rear Compartment Floor Panel Carpet Replacement (Hatchback)
Floor Carpet Drying	Headlining Trim Panel Replacement (Hatchback with Sunroof)
Floor Panel Carpet Replacement	Headlining Trim Panel Replacement (Hatchback without Sunroof)
Front Side Door Opening Floor Carpet Retainer Replacement	Headlining Trim Panel Replacement (Sedan with Sunroof)
Rear Side Door Opening Floor Carpet Retainer Replacement	Headlining Trim Panel Replacement (Sedan without Sunroof)





## Adhesives, Fluids, Lubricants, and Sealers

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

## 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

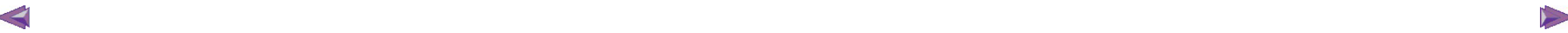
You may safely use GM Vehicle Care Odor Eliminator on fabrics, vinyl, leather, carpet, and sound deadening materials. You may also induce this product into HVAC modules and instrument panel ducts for the control of non-bacterial related odors.

**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:

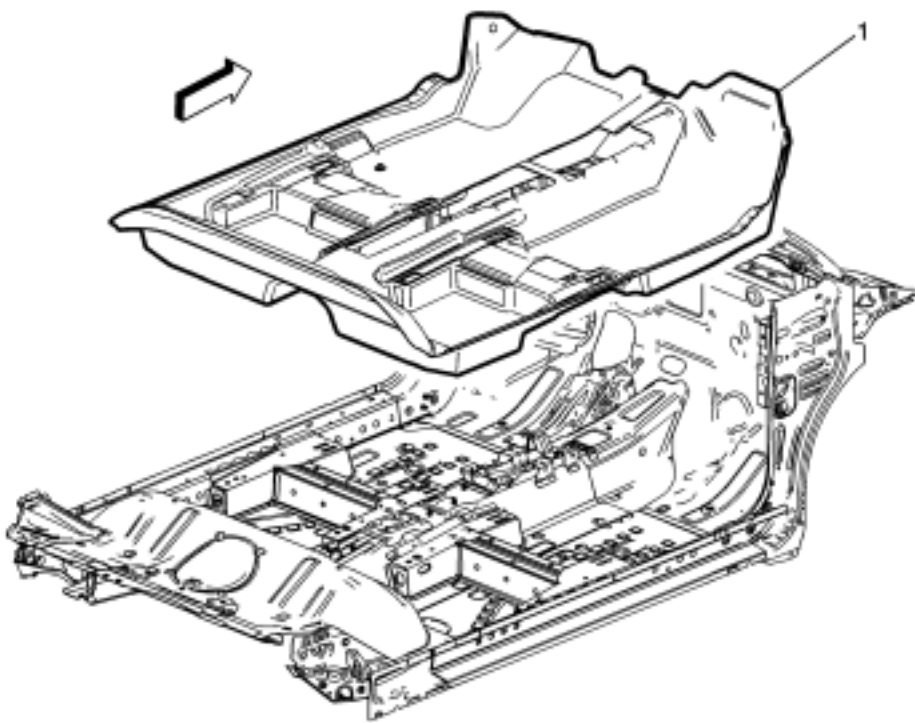
- For a 1-piece carpet assembly bonded to a cotton or a fiber padding, replace the entire assembly.
- For a 2-piece carpet assembly with a cotton or a fiber padding, replace the padding only. While the carpet is out of the vehicle, dry the carpet using the method described below.
- For a 1-piece carpet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

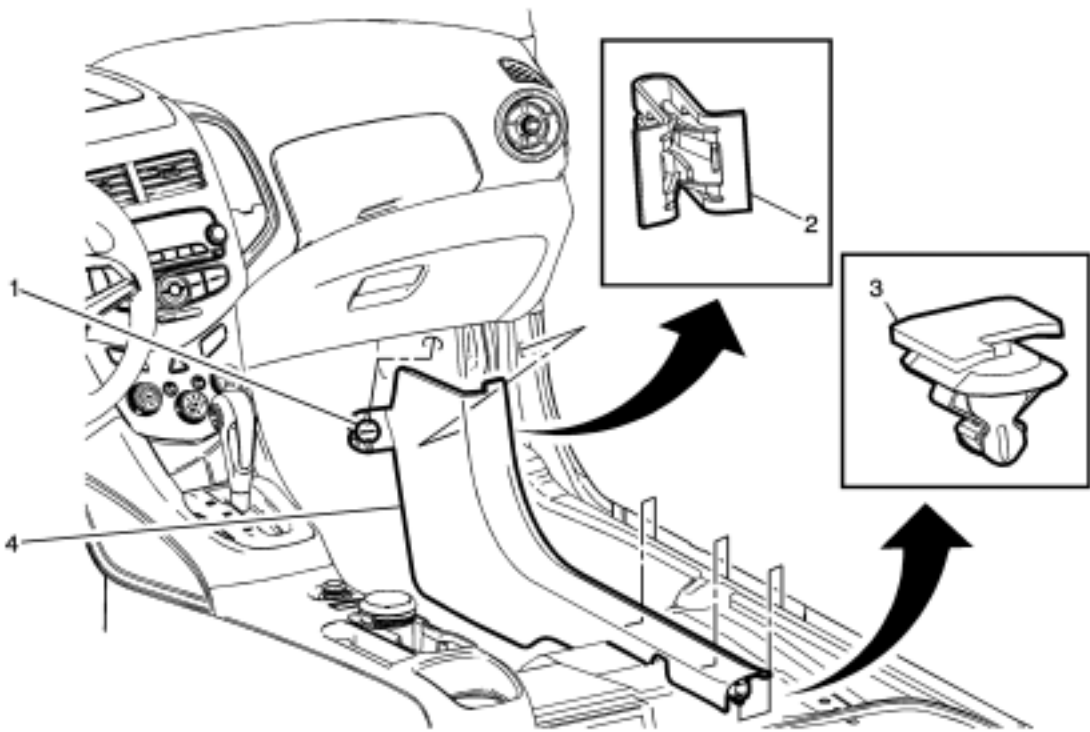


Floor Panel Carpet Replacement



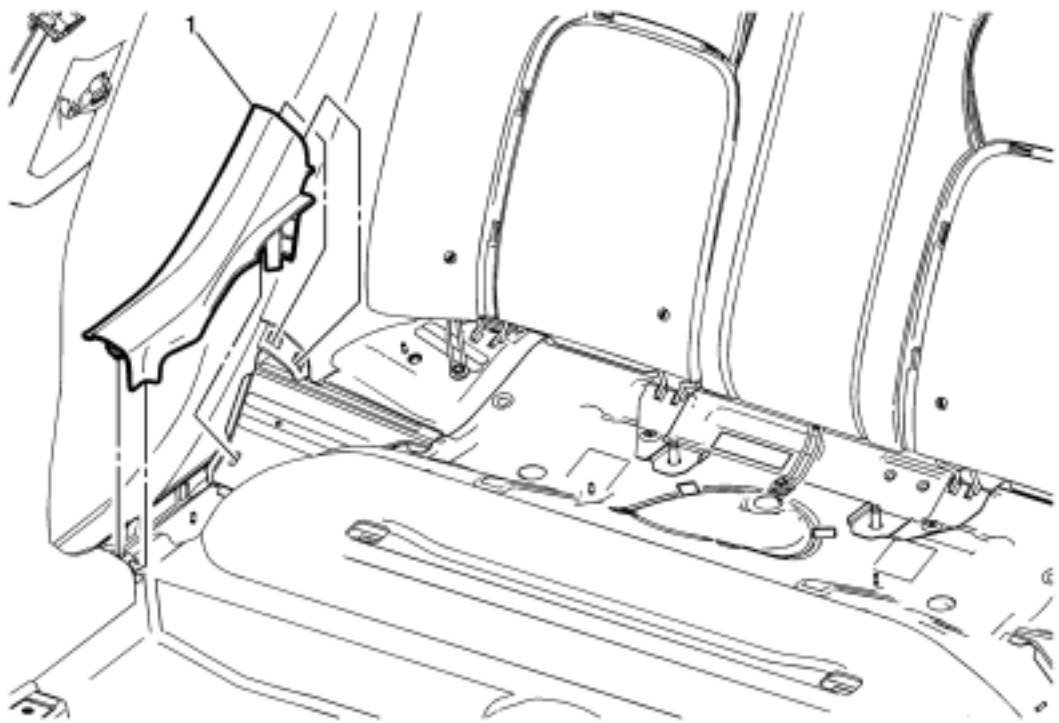
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove front seats. Refer to <a href="#">Driver or Passenger Seat Replacement</a> .</p> <p>2. Remove rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a> .</p> <p>3. Remove the front floor console. Refer to <a href="#">Front Floor Console Replacement</a> .</p> <p>4. Remove the front side door opening floor carpet retainer. Refer to <a href="#">Front Side Door Opening Floor Carpet Retainer Replacement</a> .</p> <p>5. Remove the rear side door opening floor carpet retainer. Refer to <a href="#">Rear Side Door Opening Floor Carpet Retainer Replacement</a> .</p> <p>6. Remove the center pillar lower trim panels. Refer to <a href="#">Center Pillar Lower Trim Panel Replacement</a> .</p>	
1	Front Floor Panel Carpet Assembly

Front Side Door Opening Floor Carpet Retainer Replacement



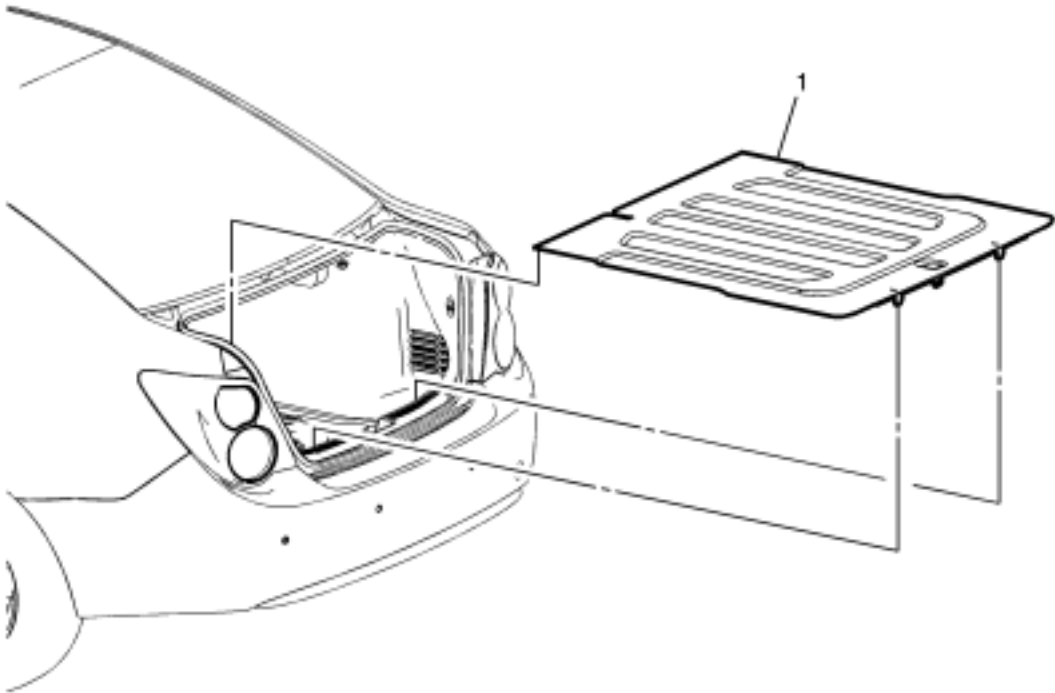
Callout	Component Name
1	Front Side Door Opening Floor Carpet Retainer Retainer
2	Front Side Door Opening Floor Carpet Retainer Clip
3	Front Side Door Opening Floor Carpet Retainer Clip (Qty: 3)
4	Front Side Door Opening Floor Carpet Retainer Assembly

Rear Side Door Opening Floor Carpet Retainer Replacement



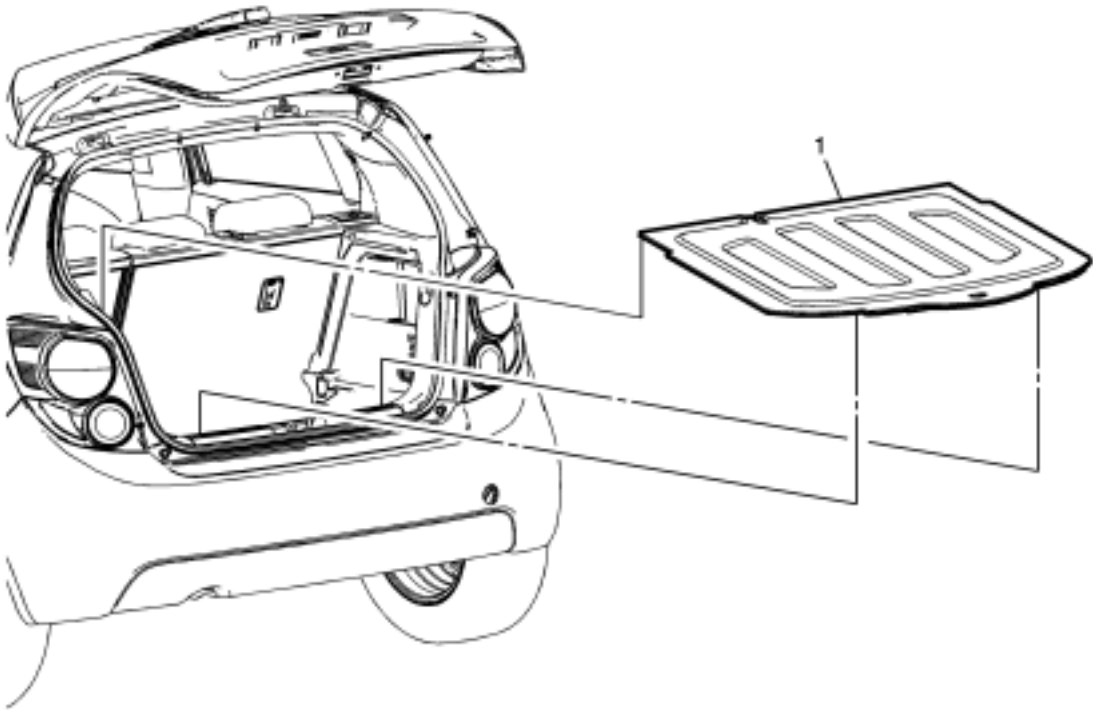
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a> .</p>	
1	Rear Side Door Opening Floor Carpet Retainer Assembly

Rear Compartment Floor Panel Carpet Replacement (Sedan)



Callout	Component Name
1	Rear Compartment Floor Panel Carpet Assembly

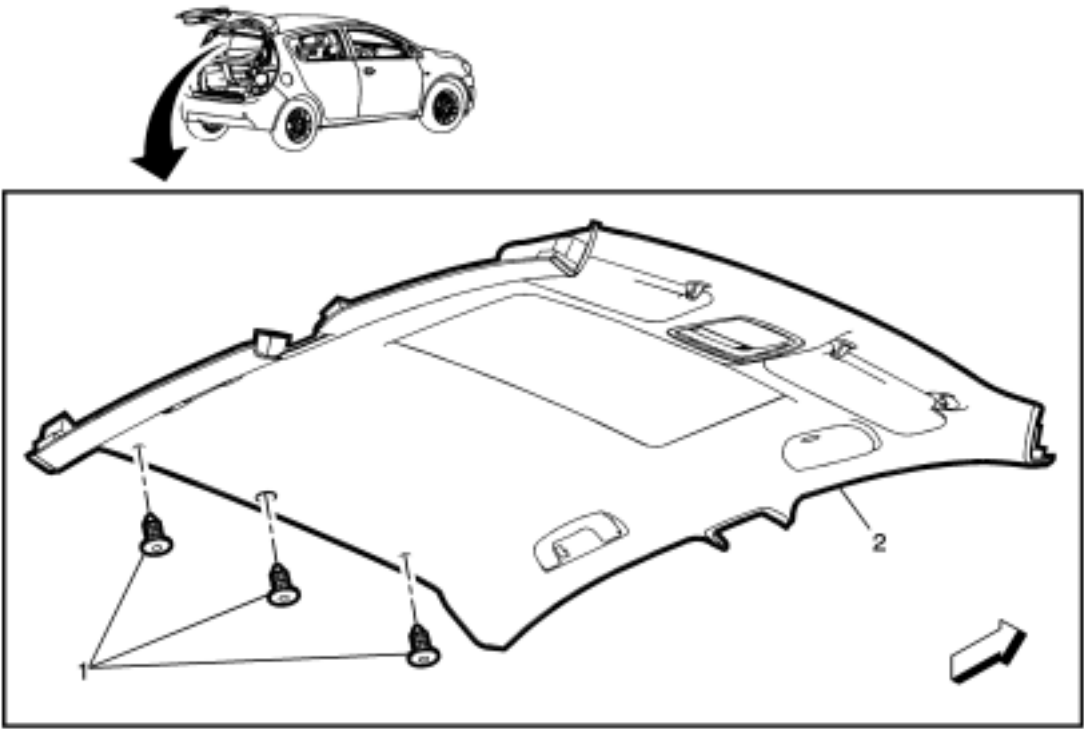
Rear Compartment Floor Panel Carpet Replacement (Hatchback)



Callout	Component Name
1	Rear Compartment Floor Panel Carpet Assembly

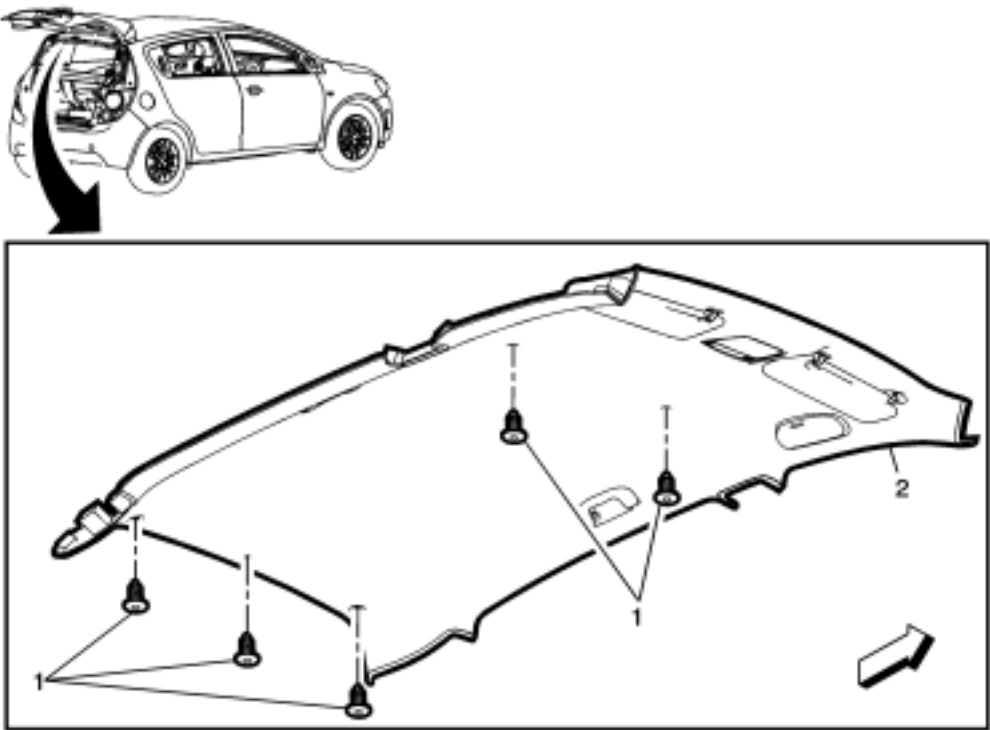


Headlining Trim Panel Replacement (Hatchback with Sunroof)



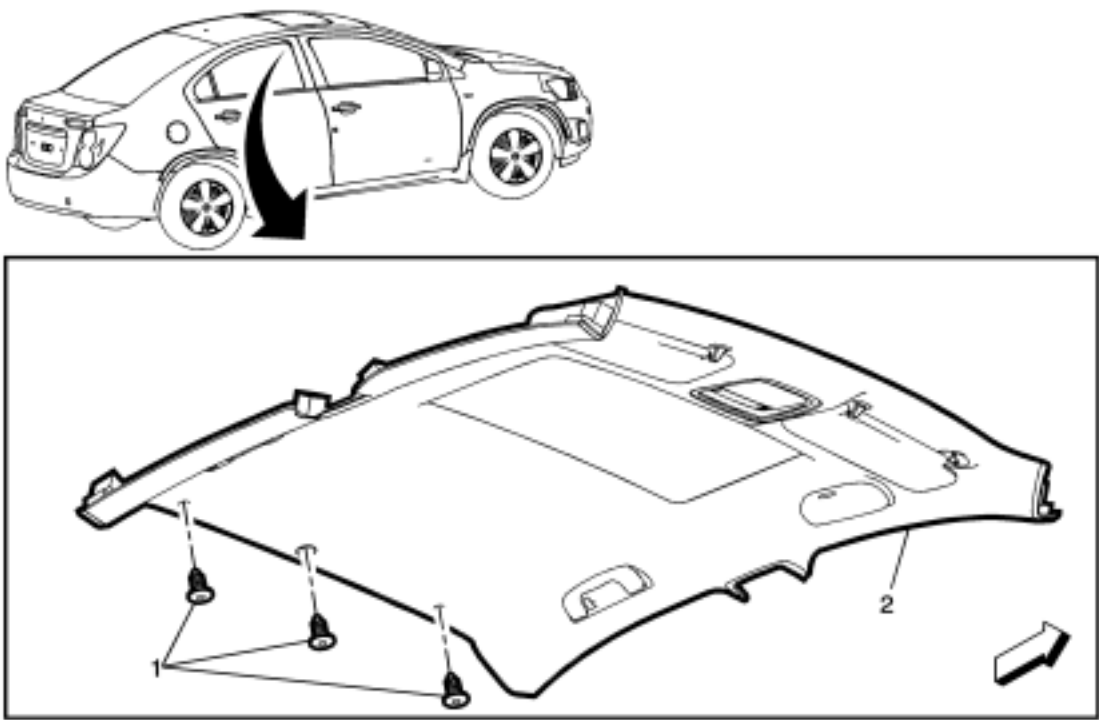
Callout	Component Name
<p><b>Warning:</b> Do not attempt to repair or alter the head impact energy-absorbing material glued to the headliner or to the garnish trims. If the material is damaged, replace the headliner and/or the garnish trim. Failure to do so could result in personal injury.</p> <p><b>Caution:</b> 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.</p> <p><b>Caution:</b> 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.</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>2. Remove the sunshade. Refer to <a href="#">Sunshade Replacement</a> .</li><li>3. Remove the sunshade support. Refer to <a href="#">Sunshade Support Replacement</a> .</li><li>4. Remove the roof rail front assist handle. Refer to <a href="#">Roof Rail Front Assist Handle Replacement</a> .</li><li>5. Remove the roof rail rear assist handle. Refer to <a href="#">Roof Rail Rear Assist Handle Replacement</a> .</li><li>6. Remove the dome lamp bezel. Refer to <a href="#">Dome Lamp Bezel Replacement</a> .</li><li>7. Remove the roof rail front stowage compartment. Refer to <a href="#">Roof Rail Front Stowage Compartment Replacement</a> .</li><li>8. Remove the windshield side garnish molding. Refer to <a href="#">Windshield Side Garnish Molding Replacement</a> .</li><li>9. Remove the body lock pillar upper trim panel. Refer to <a href="#">Body Lock Pillar Upper Trim Panel Replacement</a> .</li><li>10. Remove the center pillar upper trim panel. Refer to <a href="#">Center Pillar Upper Trim Panel Replacement</a> .</li><li>11. Remove the sunroof trim ring, if equipped. This will give the headliner added flexibility during removal.</li><li>12. Move the front seat fully forward and recline.</li></ol>	
1	Headliner Trim Panel Retainer (Qty: 3)
2	<p>Headliner Trim Panel Assembly</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connectors.</p> <p><b>Tip</b></p> <p>When installing a new headliner, tape any unused connector to the headliner with a high adhesive tape.</p>

Headlining Trim Panel Replacement (Hatchback without Sunroof)



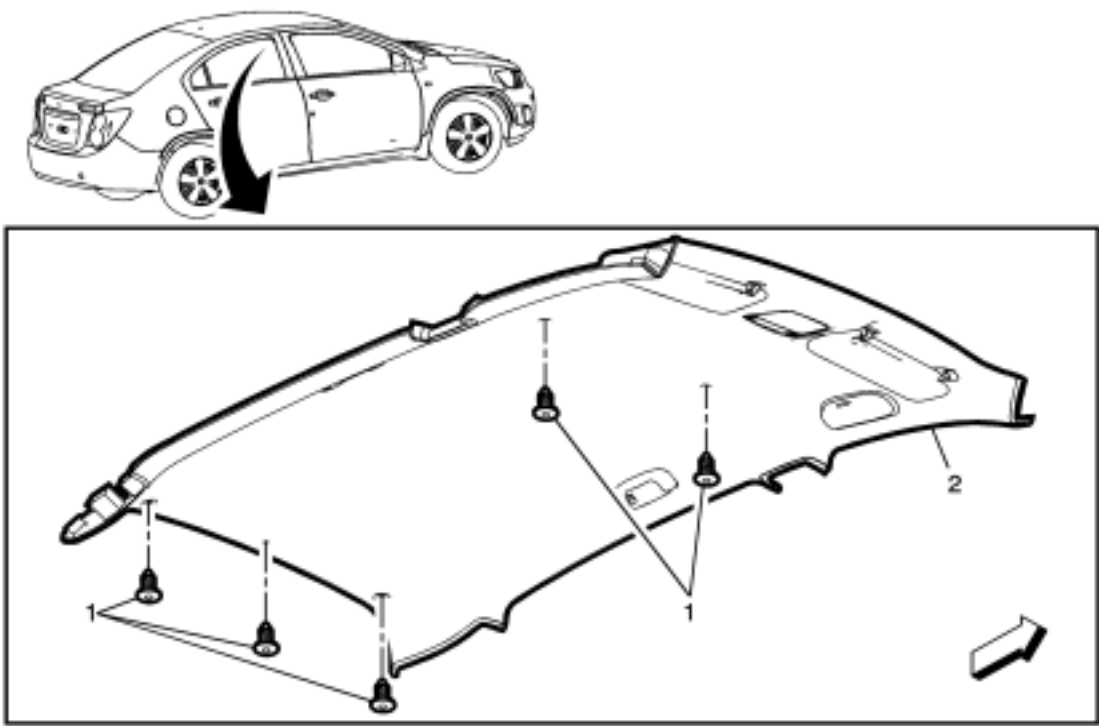
Callout	Component Name
<p><b>Warning:</b> Do not attempt to repair or alter the head impact energy-absorbing material glued to the headliner or to the garnish trims. If the material is damaged, replace the headliner and/or the garnish trim. Failure to do so could result in personal injury.</p> <p><b>Caution:</b> 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.</p> <p><b>Caution:</b> 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.</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>2. Remove the sunshade. Refer to <a href="#">Sunshade Replacement</a> .</li><li>3. Remove the sunshade support. Refer to <a href="#">Sunshade Support Replacement</a> .</li><li>4. Remove the roof rail front assist handle. Refer to <a href="#">Roof Rail Front Assist Handle Replacement</a> .</li><li>5. Remove the roof rail rear assist handle. Refer to <a href="#">Roof Rail Rear Assist Handle Replacement</a> .</li><li>6. Remove the dome lamp bezel. Refer to <a href="#">Dome Lamp Bezel Replacement</a> .</li><li>7. Remove the roof rail front stowage compartment. Refer to <a href="#">Roof Rail Front Stowage Compartment Replacement</a> .</li><li>8. Remove the windshield side garnish molding. Refer to <a href="#">Windshield Side Garnish Molding Replacement</a> .</li><li>9. Remove the body lock pillar upper trim panel. Refer to <a href="#">Body Lock Pillar Upper Trim Panel Replacement</a> .</li><li>10. Remove the center pillar upper trim panel. Refer to <a href="#">Center Pillar Upper Trim Panel Replacement</a> .</li><li>11. Move the front seat fully forward and recline.</li></ol>	
1	Headliner Trim Panel Retainer (Qty: 5)
2	<p>Headliner Trim Panel Assembly</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connectors.</p> <p><b>Tip</b></p> <p>When installing a new headliner, tape any unused connector to the headliner with a high adhesive tape.</p>

Headlining Trim Panel Replacement (Sedan with Sunroof)



Callout	Component Name
<p><b>Warning:</b> 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.</p> <p><b>Caution:</b> 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.</p> <p><b>Caution:</b> 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.</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>2. Remove the sunshade. Refer to <a href="#">Sunshade Replacement</a> .</li><li>3. Remove the sunshade support. Refer to <a href="#">Sunshade Support Replacement</a> .</li><li>4. Remove the roof rail front assist handle. Refer to <a href="#">Roof Rail Front Assist Handle Replacement</a> .</li><li>5. Remove the roof rail rear assist handle. Refer to <a href="#">Roof Rail Rear Assist Handle Replacement</a> .</li><li>6. Remove the dome lamp bezel. Refer to <a href="#">Dome Lamp Bezel Replacement</a> .</li><li>7. Remove the roof rail front stowage compartment. Refer to <a href="#">Roof Rail Front Stowage Compartment Replacement</a> .</li><li>8. Remove the windshield side garnish molding. Refer to <a href="#">Windshield Side Garnish Molding Replacement</a> .</li><li>9. Remove the body lock pillar upper trim panel. Refer to <a href="#">Body Lock Pillar Upper Trim Panel Replacement</a> .</li><li>10. Remove the center pillar upper trim panel. Refer to <a href="#">Center Pillar Upper Trim Panel Replacement</a> .</li><li>11. Remove the sunroof trim ring, if equipped. This will give the headliner added flexibility during removal.</li><li>12. Move the front seat fully forward and recline.</li></ol>	
1	Headliner Trim Panel Retainer (Qty: 3)
2	<p>Headliner Trim Panel Assembly</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connectors.</p> <p><b>Tip</b></p> <p>When installing a new headliner, tape any unused connector to the headliner with a high adhesive tape.</p>

Headlining Trim Panel Replacement (Sedan without Sunroof)



Callout	Component Name
<p><b>Warning:</b> 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.</p> <p><b>Caution:</b> 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.</p> <p><b>Caution:</b> 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.</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>2. Remove the sunshade. Refer to <a href="#">Sunshade Replacement</a> .</li><li>3. Remove the sunshade support. Refer to <a href="#">Sunshade Support Replacement</a> .</li><li>4. Remove the roof rail front assist handle. Refer to <a href="#">Roof Rail Front Assist Handle Replacement</a> .</li><li>5. Remove the roof rail rear assist handle. Refer to <a href="#">Roof Rail Rear Assist Handle Replacement</a> .</li><li>6. Remove the dome lamp bezel. Refer to <a href="#">Dome Lamp Bezel Replacement</a> .</li><li>7. Remove the roof rail front stowage compartment. Refer to <a href="#">Roof Rail Front Stowage Compartment Replacement</a> .</li><li>8. Remove the windshield side garnish molding. Refer to <a href="#">Windshield Side Garnish Molding Replacement</a> .</li><li>9. Remove the body lock pillar upper trim panel. Refer to <a href="#">Body Lock Pillar Upper Trim Panel Replacement</a> .</li><li>10. Remove the center pillar upper trim panel. Refer to <a href="#">Center Pillar Upper Trim Panel Replacement</a> .</li><li>11. Move the front seat fully forward and recline.</li></ol>	
1	Headliner Trim Panel Retainer (Qty: 5)
2	<p>Headliner Trim Panel Assembly</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connectors.</p> <p><b>Tip</b></p> <p>When installing a new headliner, tape any unused connector to the headliner with a high adhesive tape.</p>



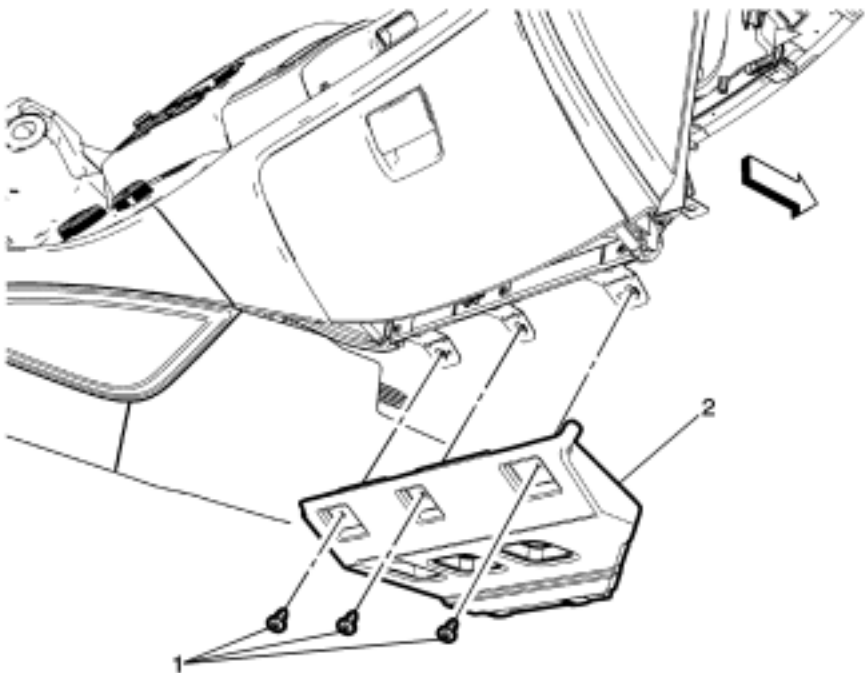
Specifications	Instrument Panel Lower Compartment Replacement
Instrument Panel Insulator Replacement	Instrument Panel Compartment Door Latch Replacement
Instrument Panel Accessory Upper Trim Plate Replacement	Instrument Panel Compartment Door Dampener Replacement
Instrument Panel Center Trim Panel Replacement	Instrument Panel Center Molding Replacement (With U58)
Instrument Panel Center Upper Molding Replacement	Instrument Panel Center Molding Replacement (Without U58)
Instrument Panel Upper Trim Panel Replacement - Right Side (Without AR1)	Instrument Panel Assembly Replacement
Instrument Panel Upper Trim Panel Replacement - Right Side (With AR1)	Instrument Panel Tie Bar Replacement
Instrument Panel Upper Trim Panel Replacement - Left Side	Front Floor Console Cover Replacement (Automatic Transmission)
Instrument Panel Fuse Block Access Hole Cover Replacement	Front Floor Console Cover Replacement (Manual Transmission)
Instrument Panel Outer Trim Cover Replacement	Front Floor Console Cup Holder Replacement
Instrument Cluster Upper Bezel Replacement	Automatic Transmission Control Indicator Opening Cover Replacement
Instrument Panel Lower Trim Pad Cover Replacement	Front Floor Console Extension Replacement - Right Side
Instrument Panel Upper Compartment Door Latch Replacement	Front Floor Console Extension Replacement - Left Side
Instrument Panel Compartment Housing Replacement (RHD)	Front Floor Console Replacement
Instrument Panel Compartment Replacement	Instrument Cluster Replacement



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Instrument Panel Inflatable Restraint Module Fasteners	10 N·m	89 lb in
Instrument Panel Tie Bar Assembly to Vehicle Body Bolts	22 N·m	16 lb ft
Instrument Panel Tie Bar Assembly to HVAC Module Fasteners	9 N·m	80 lb in
Instrument Panel Tie Bar Lower Support Bracket to Front Floor Tunnel Bolts	22 N·m	16 lb ft
Instrument Panel Tie Bar to Brake Pedal Bracket Bolts	9 N·m	80 lb in
Instrument Panel Tie Bar to Brake Pedal Mounting Bracket Bolt	22 N·m	16 lb ft
Instrument Panel Tie Bar to Cowl Nut	22 N·m	16 lb ft

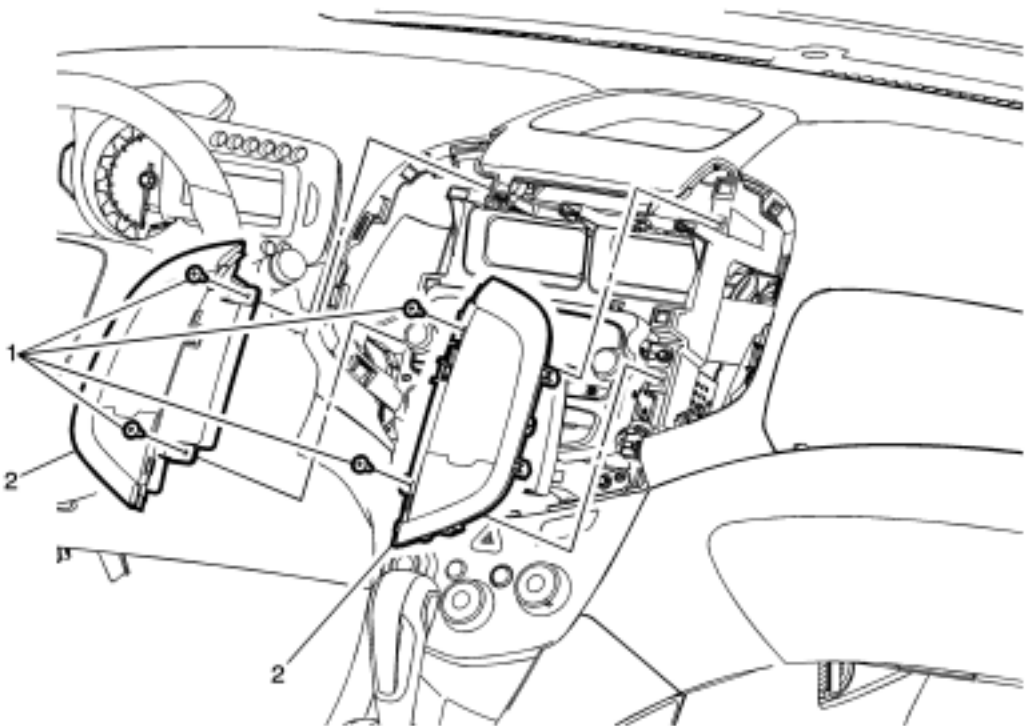
Instrument Panel Insulator Replacement



Callout	Component Name
1	Instrument Panel Insulator Fastener (Qty: 3) <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .
2	Instrument Panel Insulator



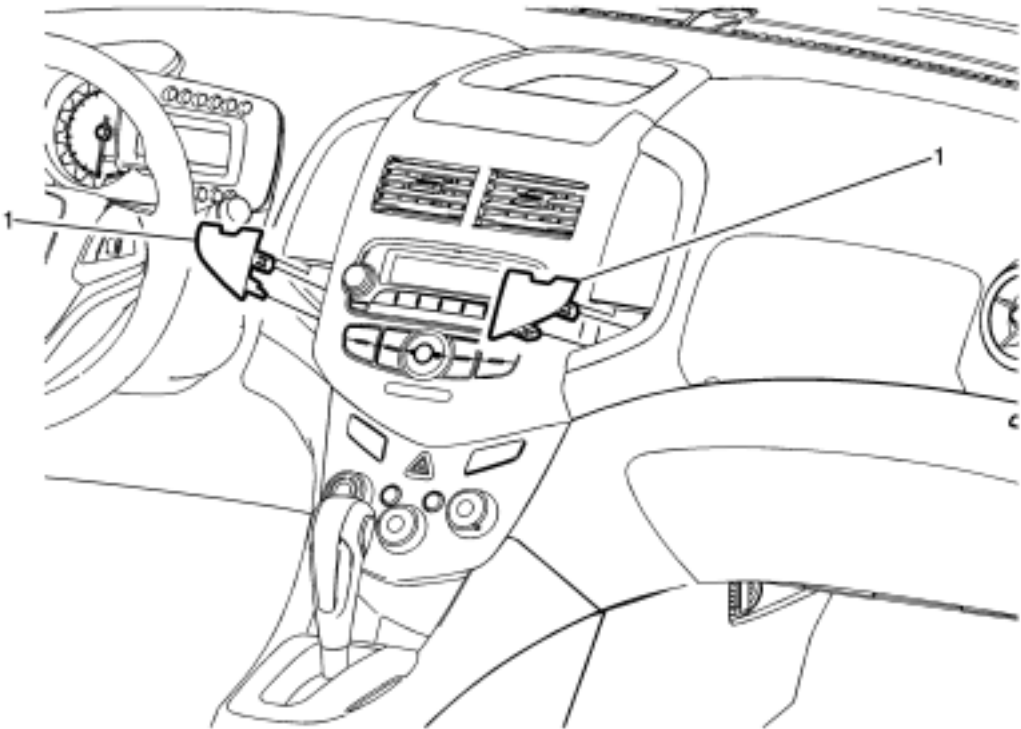
Instrument Panel Accessory Upper Trim Plate Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the instrument panel center molding. Refer to <a href="#">Instrument Panel Center Molding Replacement</a> .</p>	
1	<p>Instrument Panel Accessory Upper Trim Plate Fastener (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Instrument Panel Accessory Upper Trim Plate (Qty: 2)</p> <p><b>Procedures</b></p> <p>1. Use a flat bladed plastic trim tool in order to disengage the retainers securing the accessory upper trim plates to the instrument panel assembly.</p> <p>2. When replacing the accessory trim plates, transfer all necessary components.</p>

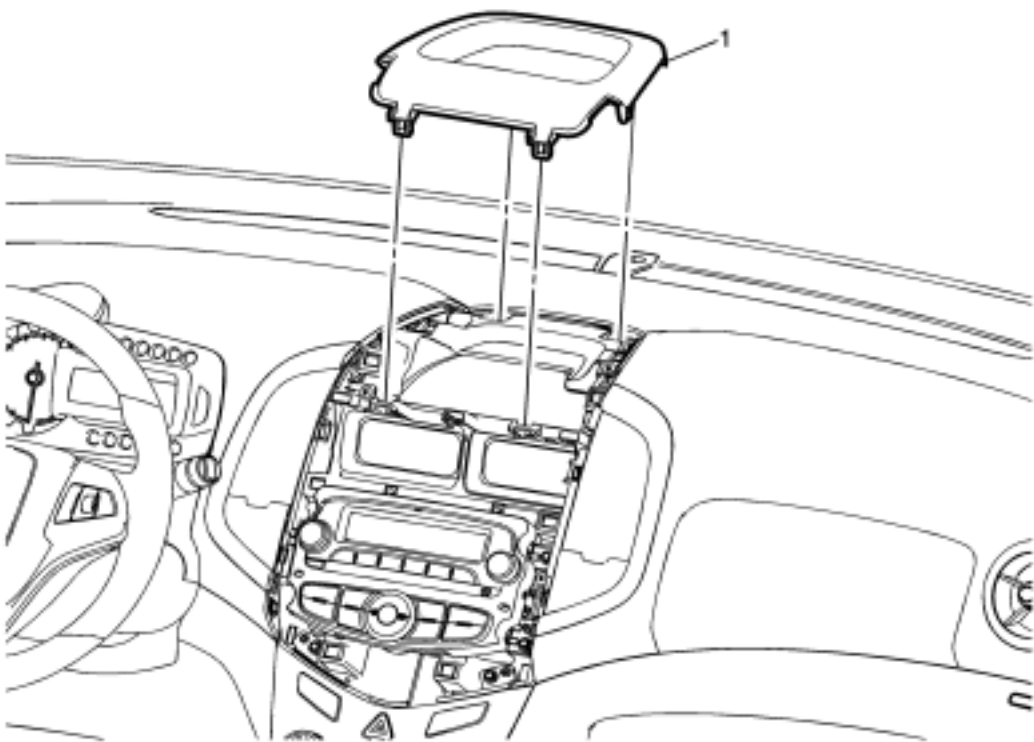


Instrument Panel Center Trim Panel Replacement



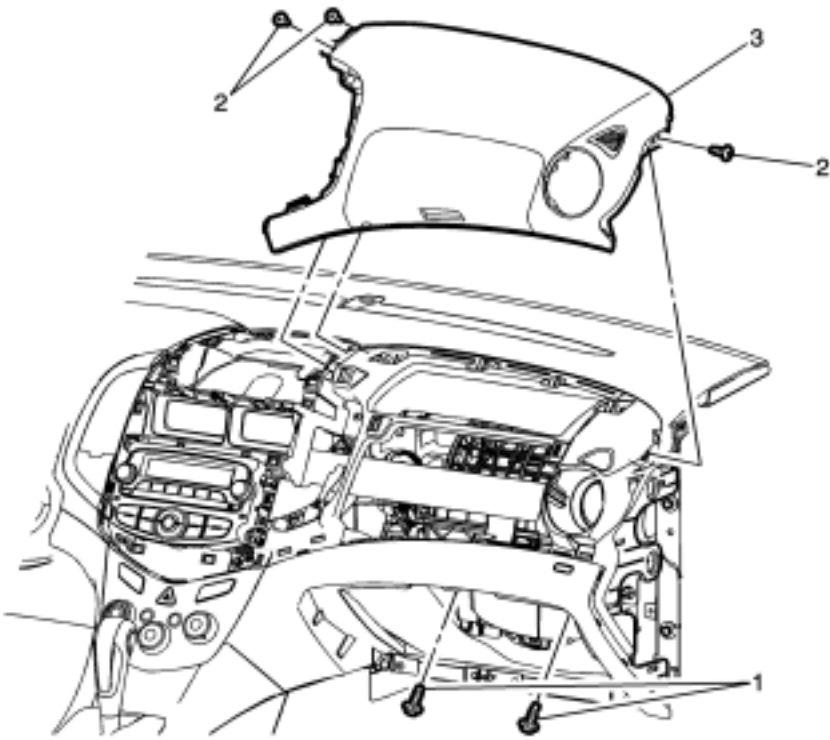
Callout	Component Name
1	<div>Instrument Panel Center Trim Panel (Qty: 2)</div> <div><b>Procedure</b></div> <div>Use a flat bladed plastic trim tool in order to disengage the retainers securing the center trim plates to the instrument panel accessory upper trim plates.</div>

Instrument Panel Center Upper Molding Replacement



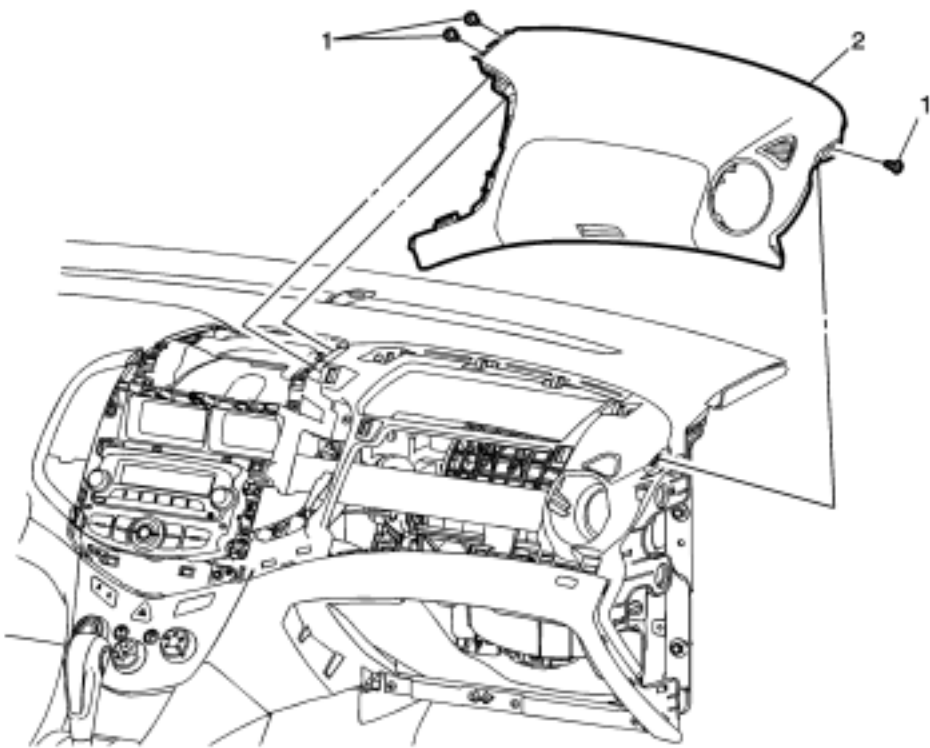
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the instrument panel center molding. Refer to <a href="#">Instrument Panel Center Molding Replacement</a> .</p>	
1	<p>Instrument Panel Center Upper Molding</p> <p><b>Procedures</b></p> <p>1. Use a flat bladed plastic trim tool in order to disengage the retainers securing the center upper trim molding to the instrument panel assembly.</p> <p>2. Disconnect electrical connections.</p>

Instrument Panel Upper Trim Panel Replacement - Right Side (Without AR1)



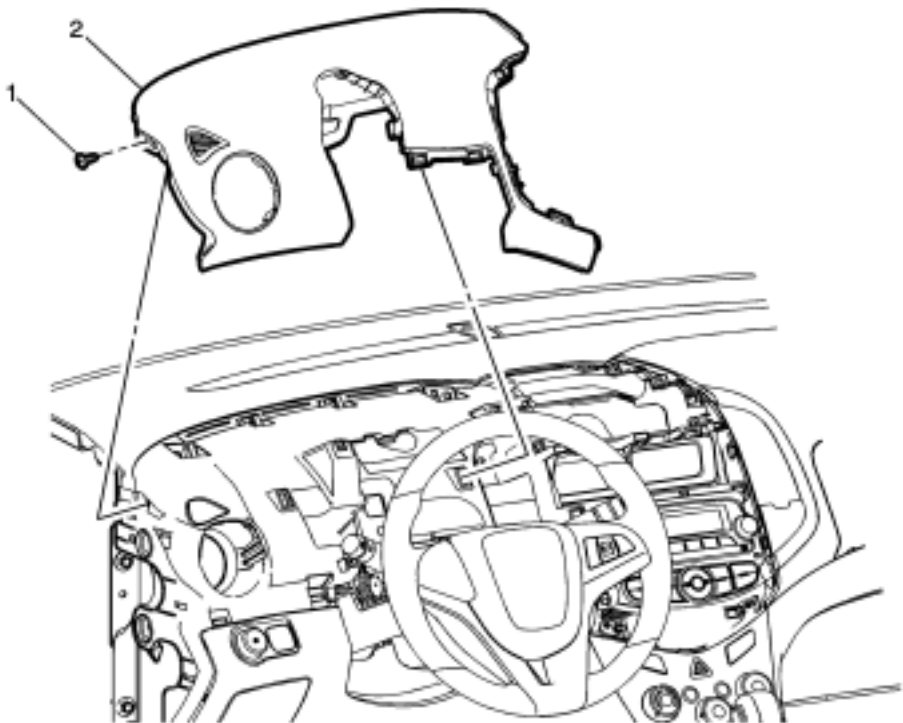
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</p> <p>2. Remove the instrument panel center molding. Refer to <a href="#">Instrument Panel Center Molding Replacement</a> .</p> <p>3. Remove the instrument panel center upper molding. Refer to <a href="#">Instrument Panel Upper Trim Panel Replacement - Left Side</a> .</p> <p>4. Remove the instrument panel lower compartment. Refer to <a href="#">Instrument Panel Lower Compartment Replacement</a> .</p> <p>5. Remove the right instrument panel accessory upper trim plate. Refer to <a href="#">Instrument Panel Accessory Upper Trim Plate Replacement</a> .</p> <p>6. Remove the right instrument panel outer trim cover. Refer to <a href="#">Instrument Panel Outer Trim Cover Replacement</a> .</p> <p>7. Remove the right instrument panel outer air outlet. Refer to <a href="#">Instrument Panel Outer Air Outlet Replacement - Right Side</a> .</p>	
1	<p>Instrument Panel Inflatable Restraint Module Fasteners (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 10N·m89 lbin</p>
2	<p>Instrument Panel Upper Trim Panel Fastener (Qty: 3)</p>
3	<p>Instrument Panel Upper Trim Panel</p> <p><b>Procedures</b></p> <p>1. Use a flat bladed plastic trim tool in order to disengage the retainers securing the upper trim panel to the instrument panel assembly.</p> <p>2. Disconnect the electrical connections.</p> <p>3. When replacing the instrument panel upper trim panel, transfer all necessary components.</p>

Instrument Panel Upper Trim Panel Replacement - Right Side (With AR1)



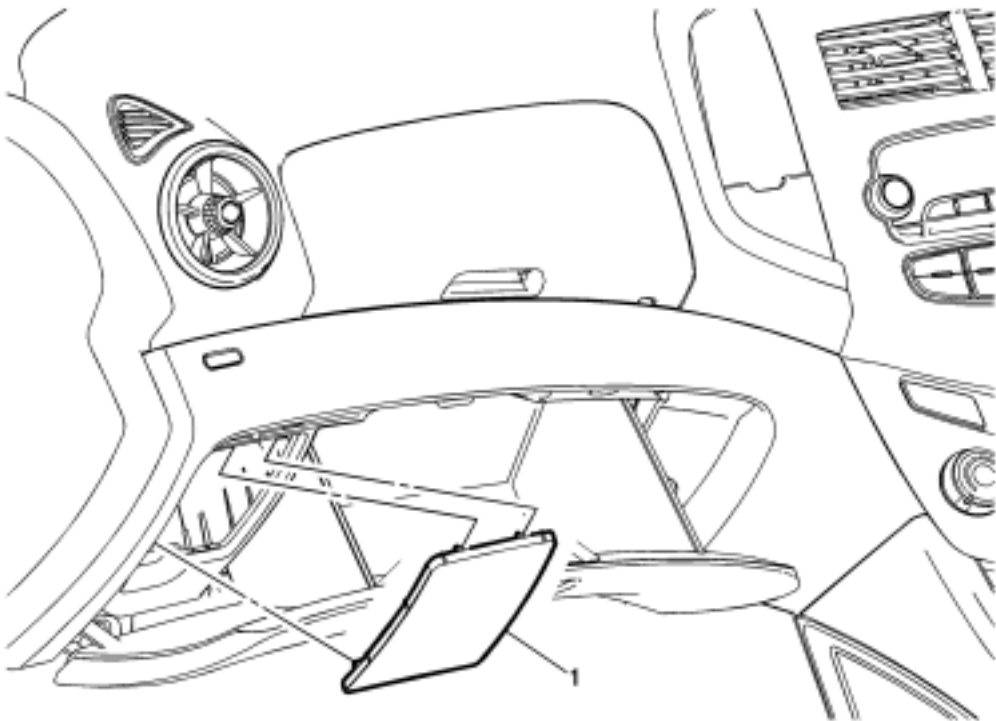
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the instrument panel center molding. Refer to <a href="#">Instrument Panel Center Molding Replacement</a> .</p> <p>2. Remove the instrument panel center upper molding. Refer to <a href="#">Instrument Panel Upper Trim Panel Replacement - Left Side</a> .</p> <p>3. Remove the instrument panel lower compartment. Refer to <a href="#">Instrument Panel Lower Compartment Replacement</a> .</p> <p>4. Remove the right instrument panel accessory upper trim plate. Refer to <a href="#">Instrument Panel Accessory Upper Trim Plate Replacement</a> .</p> <p>5. Remove the right instrument panel outer trim cover. Refer to <a href="#">Instrument Panel Outer Trim Cover Replacement</a> .</p> <p>6. Remove the right instrument panel outer air outlet. Refer to <a href="#">Instrument Panel Outer Air Outlet Replacement - Right Side</a> .</p>	
1	<p>Instrument Panel Upper Trim Panel Fastener (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Instrument Panel Upper Trim Panel</p> <p><b>Procedures</b></p> <p>1. Use a flat bladed plastic trim tool in order to disengage the retainers securing the upper trim panel to the instrument panel assembly.</p> <p>2. Disconnect the electrical connections.</p> <p>3. When replacing the instrument panel upper trim panel, transfer all necessary components.</p>

Instrument Panel Upper Trim Panel Replacement - Left Side



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the instrument cluster assembly. Refer to <a href="#">Instrument Cluster Replacement</a> .</p> <p>2. Remove the instrument panel center molding. Refer to <a href="#">Instrument Panel Center Molding Replacement</a> .</p> <p>3. Remove the instrument panel center upper molding. Refer to <a href="#">Instrument Panel Center Upper Molding Replacement</a> .</p> <p>4. Remove the left instrument panel accessory upper trim plate. Refer to <a href="#">Instrument Panel Accessory Upper Trim Plate Replacement</a> .</p> <p>5. Remove the left instrument panel outer trim cover. Refer to <a href="#">Instrument Panel Outer Trim Cover Replacement</a> .</p>	
1	<p>Instrument Panel Upper Trim Panel Fastener</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Instrument Panel Upper Trim Panel</p> <p><b>Procedures</b></p> <p>1. Use a flat bladed plastic trim tool in order to disengage the retainers securing the upper trim panel to the instrument panel assembly.</p> <p>2. When replacing the instrument panel upper trim panel, transfer all necessary components.</p>

Instrument Panel Fuse Block Access Hole Cover Replacement



Callout	Component Name
1	<div>Instrument Panel Fuse Block Access Hole Cover</div> <div><b>Procedure</b></div> <div>Grasp the lower edge of the fuse block cover and pull outward disengaging the retainers securing the fuse block cover to the instrument panel compartment housing.</div>

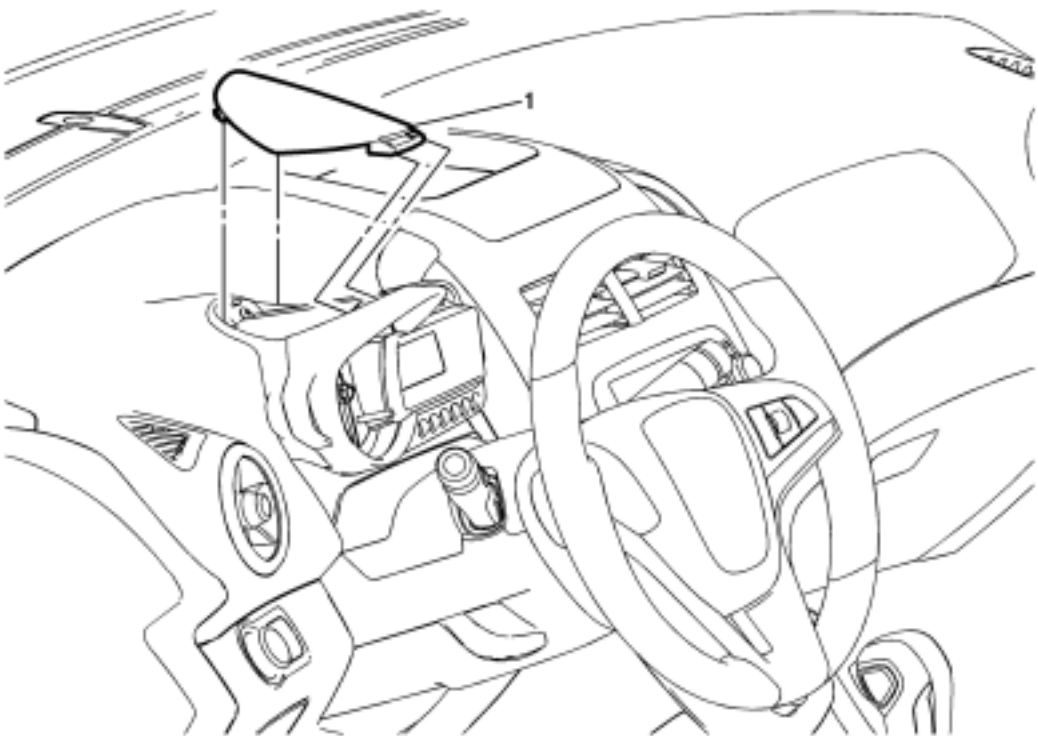
Instrument Panel Outer Trim Cover Replacement



Callout	Component Name
1	<div>Instrument Panel Outer Trim Cover (Left)</div> <div><b>Procedures</b></div> <div>Use a flat bladed plastic trim tool in order to disengage the retainers securing the instrument panel outer trim covers to the instrument panel assembly.</div>
2	<div>Instrument Panel Outer Trim Cover (Right)</div> <div><b>Procedure</b></div> <div><div>1. Use a flat bladed plastic trim tool in order to disengage the retainers securing the instrument panel outer trim covers to the instrument panel assembly.</div><div>2. Disconnect the electrical connections.</div><div>3. When replacing the instrument panel outer trim cover, transfer all necessary components.</div></div>



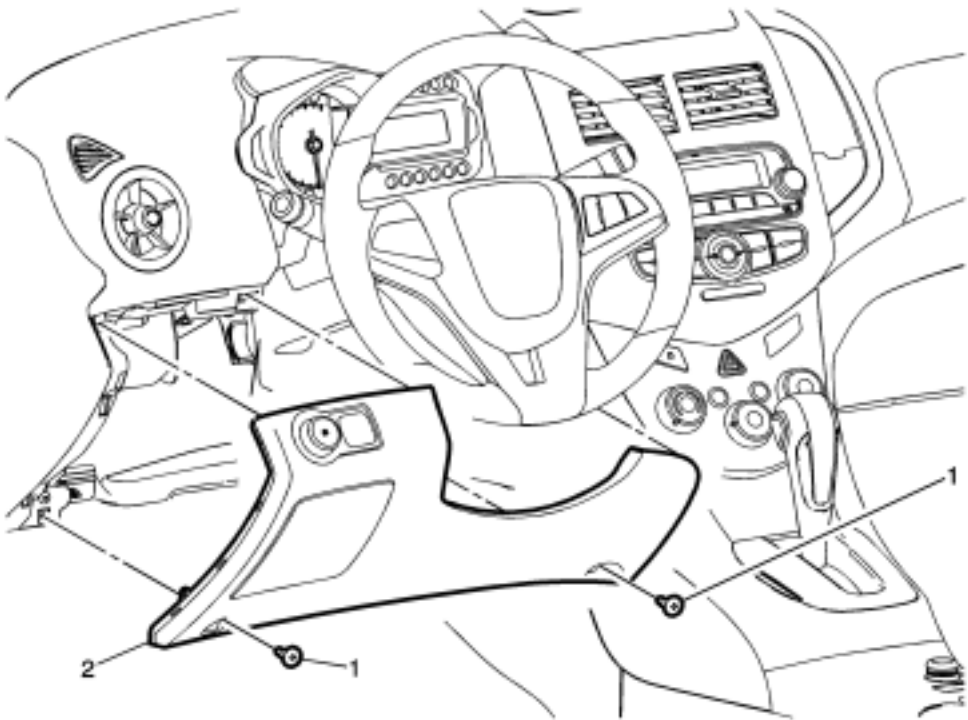
Instrument Cluster Upper Bezel Replacement



Callout	Component Name
1	<div>Instrument Panel Cluster Upper Bezel</div> <div><b>Procedures</b></div> <div>Use a flat bladed plastic trim tool in order to disengage the retainers securing the instrument panel cluster upper bezel to the instrument cluster assembly.</div>

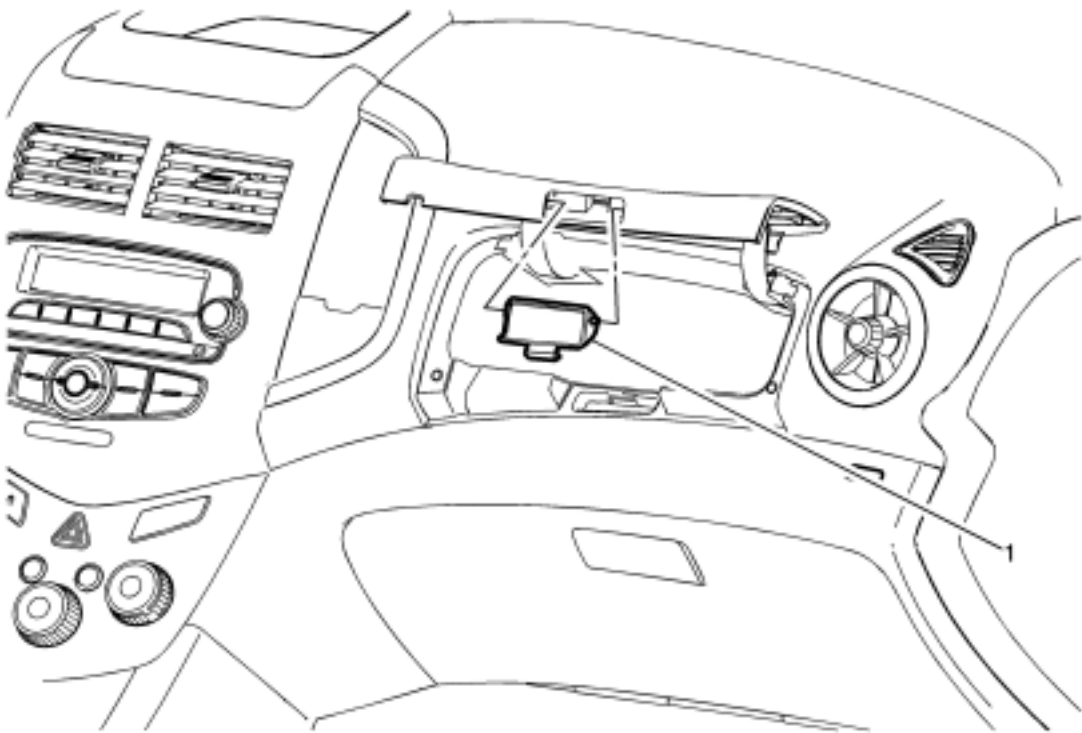


Instrument Panel Lower Trim Pad Cover Replacement



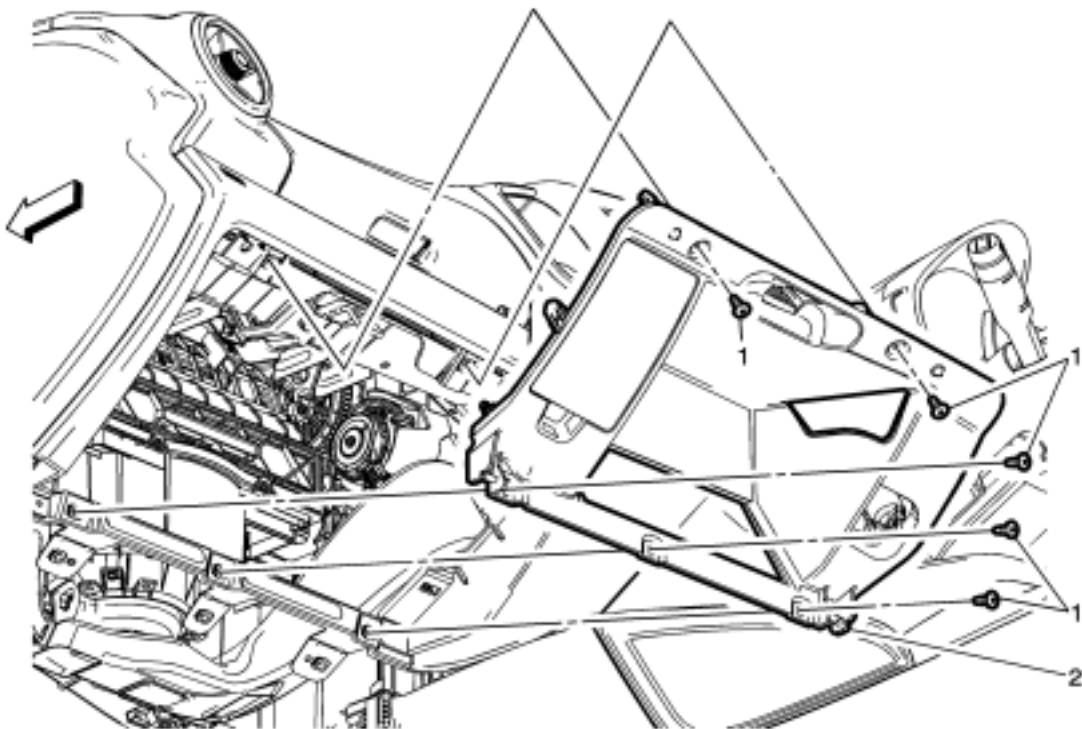
Callout	Component Name
1	<div>Instrument Panel Lower Trim Pad Fastener (Qty: 2)</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div>
2	<div>Instrument Panel Lower Trim Pad Assembly</div> <div><b>Procedures</b><div><div>1. Use a flat bladed plastic trim tool in order to disengage the retainers securing the lower trim pad to the instrument panel assembly.</div><div>2. Disconnect the electrical connectors.</div><div>3. When replacing the instrument panel lower trim pad, transfer all necessary components.</div></div></div>

Instrument Panel Upper Compartment Door Latch Replacement



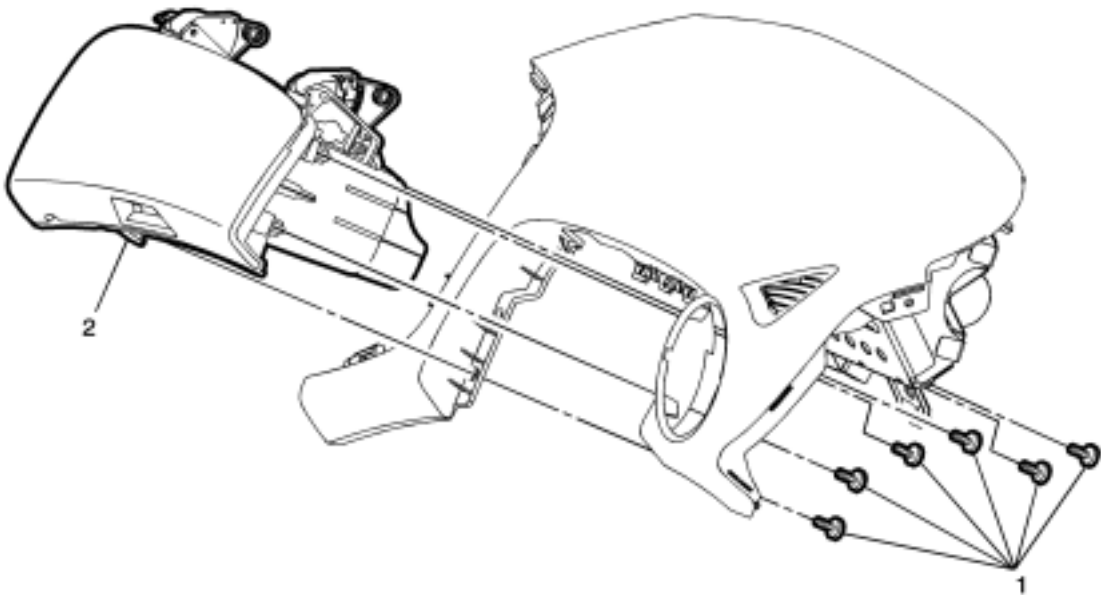
Callout	Component Name
1	<div>Instrument Panel Upper Compartment Door Latch</div> <div><b>Procedures</b><div><div>1. Open the instrument panel compartment door.</div><div>2. Unsnap the instrument compartment door latch from the door assembly.</div></div></div>

Instrument Panel Compartment Housing Replacement (RHD)



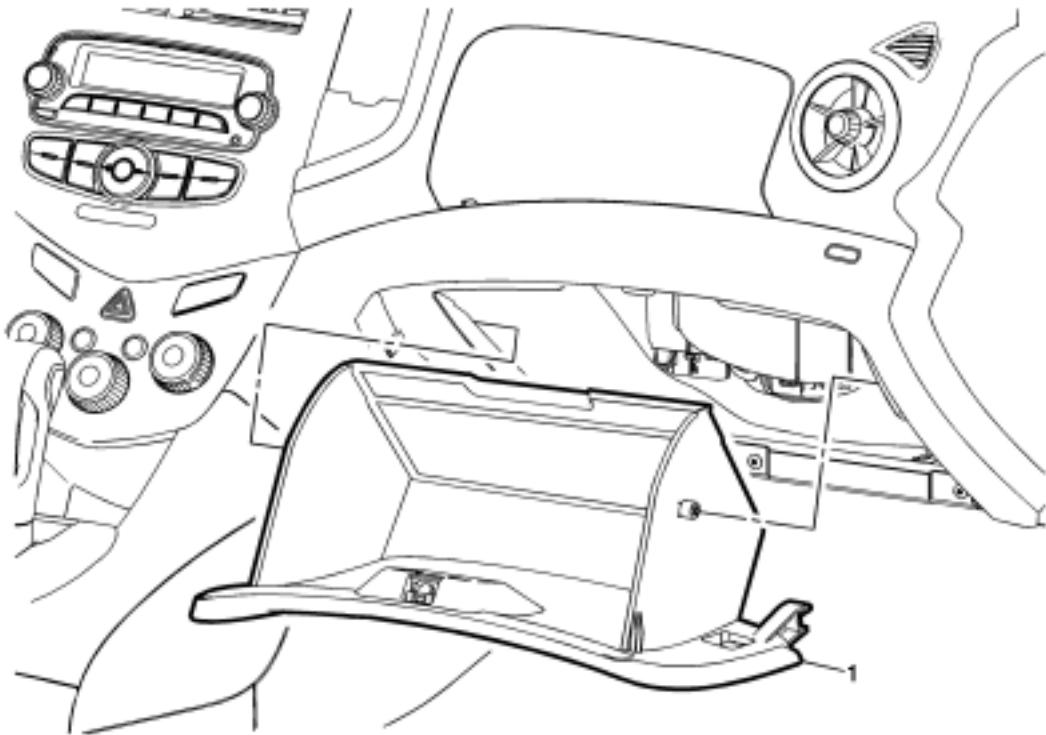
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the instrument panel lower compartment. Refer to <a href="#">Instrument Panel Lower Compartment Replacement</a> .</p>	
1	<p>Instrument Panel Compartment Housing Fastener (Qty: 5)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Instrument Panel Compartment Housing</p> <p><b>Procedure</b></p> <p>Grasp the housing and pull downward disengaging the retainer clips securing the housing to the instrument panel.</p>

Instrument Panel Compartment Replacement



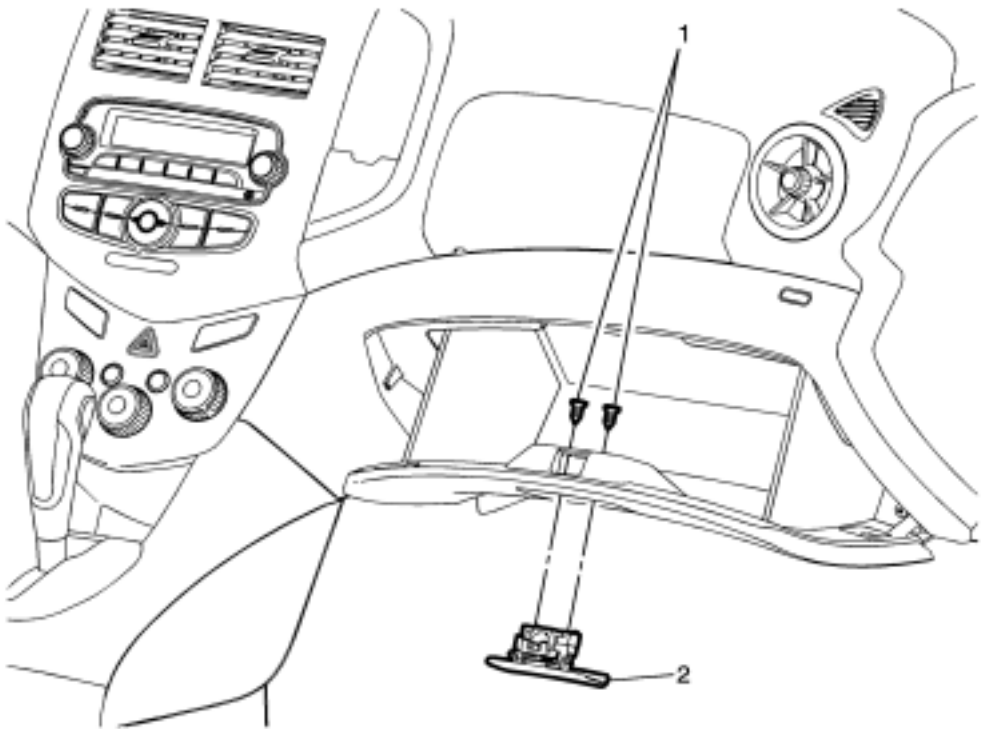
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the right instrument panel upper trim panel. Refer to <a href="#">Instrument Panel Upper Trim Panel Replacement - Right Side</a> .</p>	
1	<p>Instrument Panel Compartment Fastener (Qty: 6)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Instrument Panel Compartment</p> <p><b>Procedure</b></p> <p>When replacing the instrument panel compartment, transfer all necessary components if applicable.</p>

Instrument Panel Lower Compartment Replacement



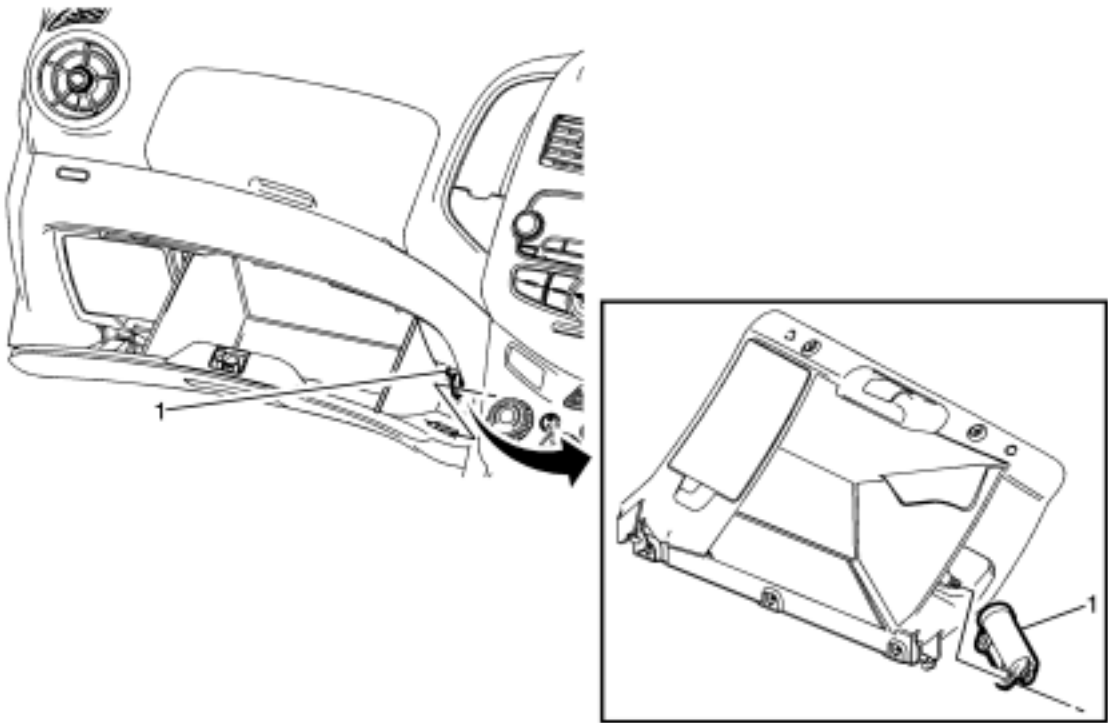
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Open the instrument panel lower compartment to the full open position.</p> <p>2. Disconnect the instrument panel compartment dampener from the compartment assembly.</p>	
1	<p>Instrument Panel Lower Compartment Assembly</p> <p><b>Procedures</b></p> <p>1. Squeeze the sides of the compartment assembly and allow the compartment to move past the compartment stops.</p> <p>2. Unsnap the compartment assembly from the instrument panel assembly.</p> <p>3. When replacing the instrument panel lower compartment, transfer all necessary components.</p>

Instrument Panel Compartment Door Latch Replacement



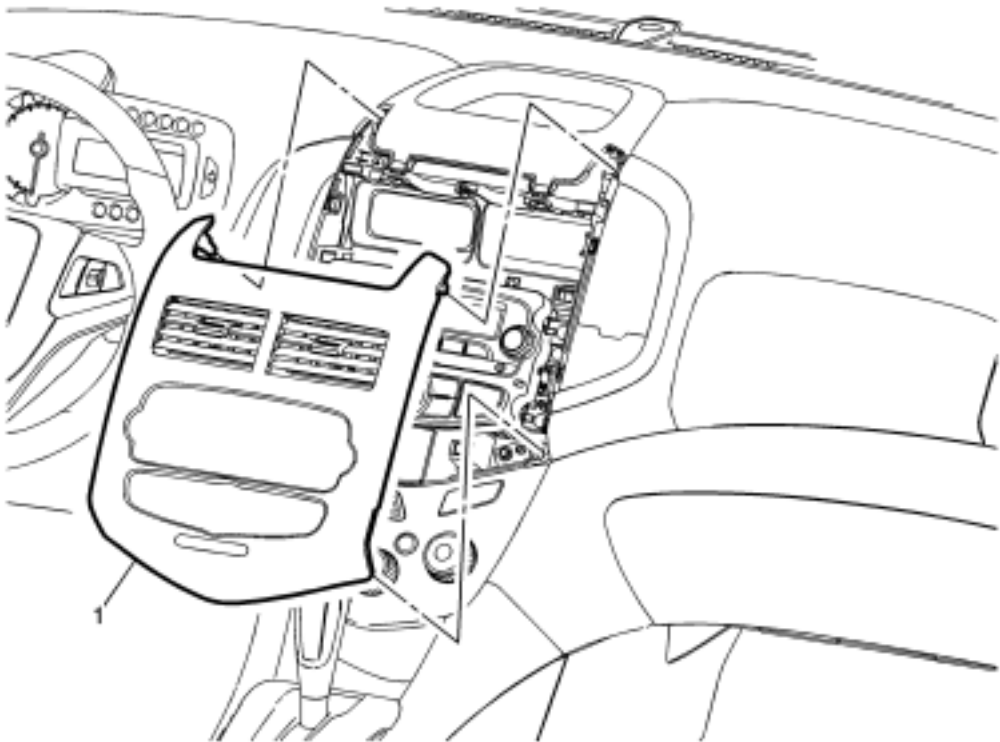
Callout	Component Name
1	Instrument Panel Compartment Door Latch Fasteners (Qty: 2)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .
2	Instrument Panel Compartment Door Latch Assembly

Instrument Panel Compartment Door Dampener Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the instrument panel lower compartment. Refer to <a href="#">Instrument Panel Lower Compartment Replacement</a> .</p>	
1	<p>Instrument Panel Compartment Door Dampener</p> <p><b>Procedure</b></p> <p>Unsnap the dampener assembly from the instrument panel compartment housing.</p>

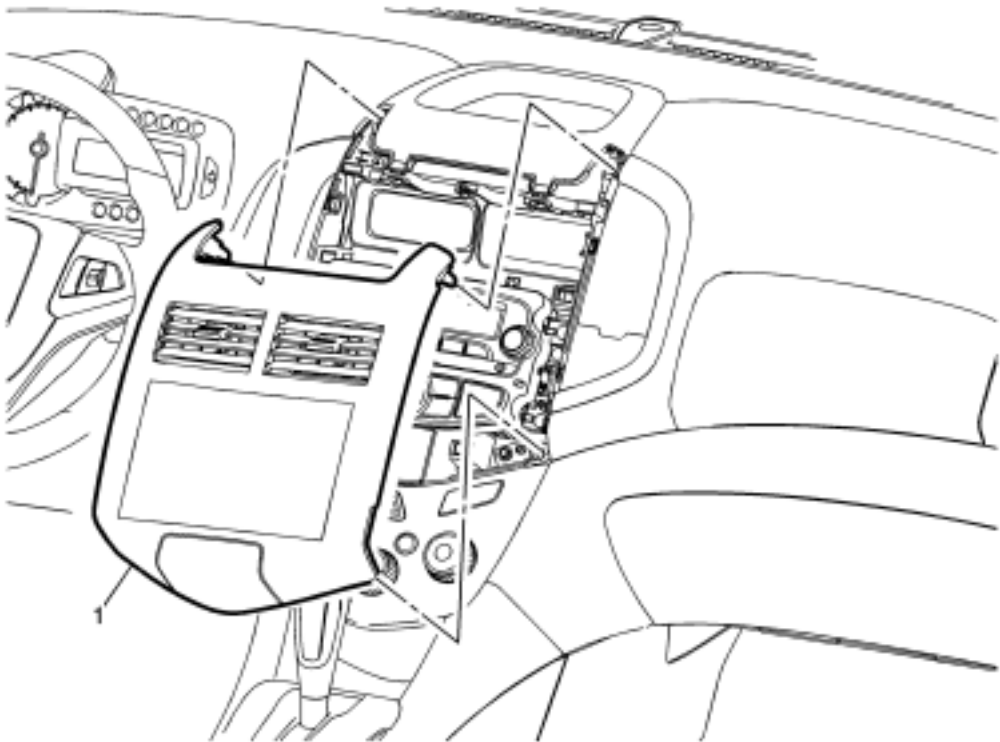
Instrument Panel Center Molding Replacement (With U58)



Callout	Component Name
1	<div>Instrument Panel Center Molding Assembly</div> <div><b>Procedure</b><div><div>1. Use a flat bladed plastic trim tool in order to release the retainers securing the center molding to the instrument panel assembly.</div><div>2. When replacing the center molding assembly, transfer all necessary components.</div></div></div>

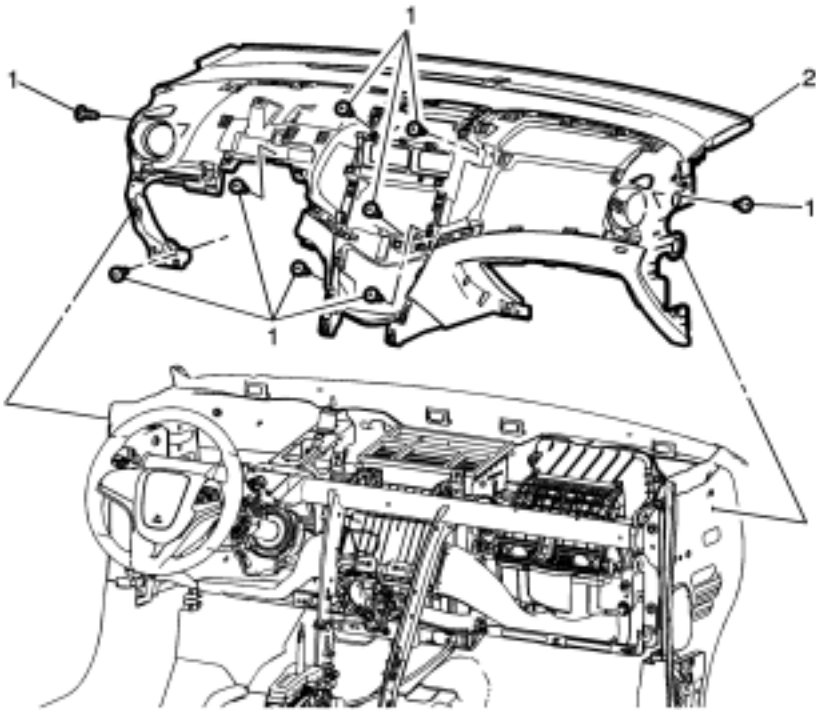


Instrument Panel Center Molding Replacement (Without U58)



Callout	Component Name
1	<div>Instrument Panel Center Molding Assembly</div> <div><b>Procedure</b><div><div>1. Use a flat bladed plastic trim tool in order to release the retainers securing the center molding to the instrument panel assembly.</div><div>2. When replacing the center molding assembly, transfer all necessary components.</div></div></div>

Instrument Panel Assembly Replacement

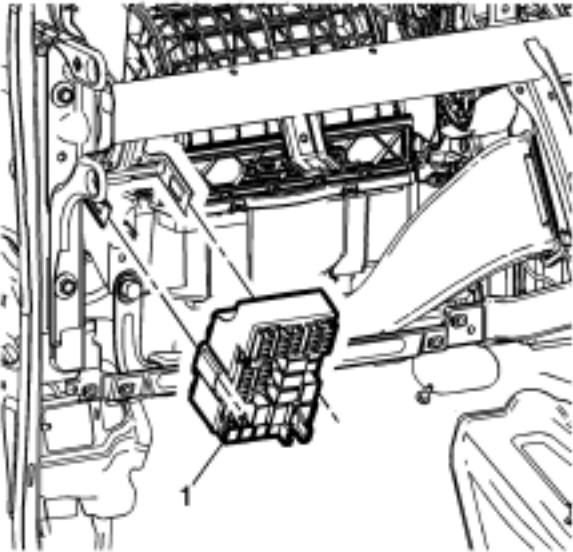


Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the right and left windshield side garnish moldings. Refer to <a href="#">Windshield Side Garnish Molding Replacement</a> .</p> <p>2. Remove the front floor console assembly. Refer to <a href="#">Front Floor Console Replacement</a> .</p> <p>3. Remove the right and left instrument panel upper trim panels. Refer to <a href="#">Instrument Panel Upper Trim Panel Replacement - Right Side</a> and <a href="#">Instrument Panel Upper Trim Panel Replacement - Left Side</a> .</p> <p>4. Remove the radio assembly. Refer to <a href="#">Radio Replacement</a> .</p> <p>5. Remove the heater and air conditioning control assembly. Refer to <a href="#">Heater and Air Conditioning Control Replacement</a> .</p> <p>6. Remove the instrument panel lower trim pad cover. Refer to <a href="#">Instrument Panel Lower Trim Pad Cover Replacement</a> .</p> <p>7. Remove the instrument panel insulator. Refer to <a href="#">Instrument Panel Insulator Replacement</a> .</p> <p>8. Note location and routing of the instrument panel electrical harness assembly in order to ensure proper installation.</p>	
1	<p>Instrument Panel Fastener (Qty: 9)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Instrument Panel Assembly</p> <p><b>Procedures</b></p> <p>1. With the aid of an assistant lift the instrument panel assembly rearward and upward away from the tie bar assembly.</p> <p>2. Disconnect the electrical connectors.</p> <p>3. Remove the instrument panel assembly from the vehicle.</p> <p>4. When replacing the instrument panel assembly, transfer all necessary components.</p>

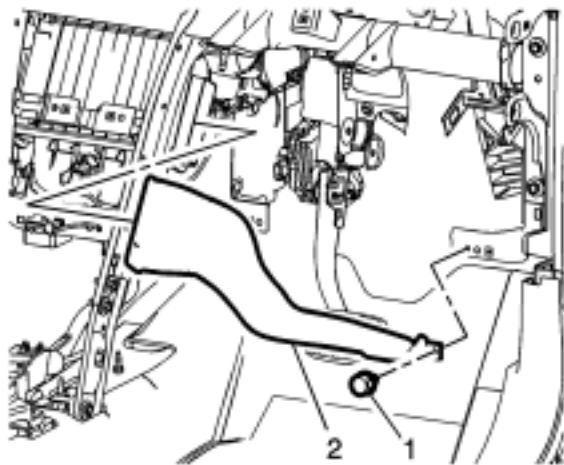
## Instrument Panel Tie Bar Replacement

### Removal Procedure

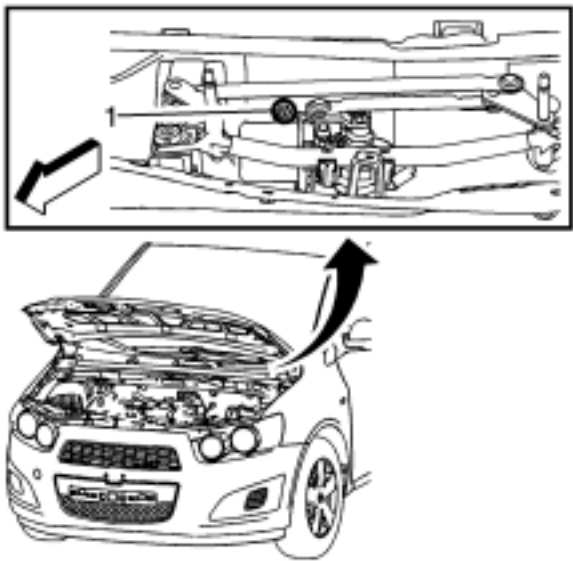
1. Remove the Instrument panel assembly. Refer to [Instrument Panel Assembly Replacement](#) .
2. Remove the steering column and wheel from the vehicle. Refer to [Steering Column Replacement](#) .
3. Remove the air inlet grill panel. Refer to [Air Inlet Grille Panel Replacement](#) .



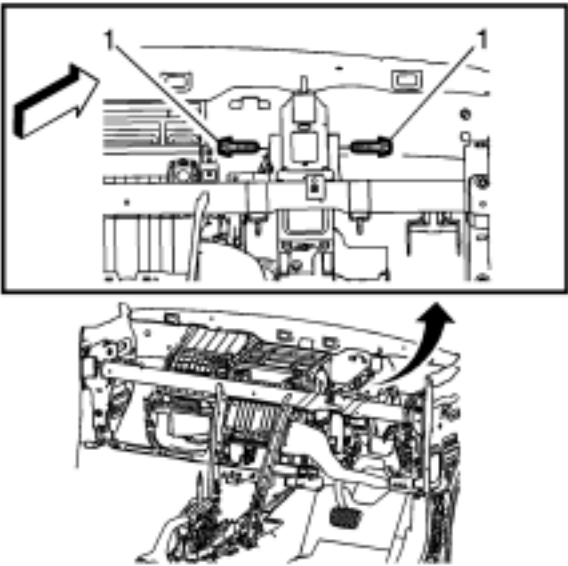
4. Unsnap the instrument panel fuse block (1) from the instrument panel tie bar assembly and position out of the way.



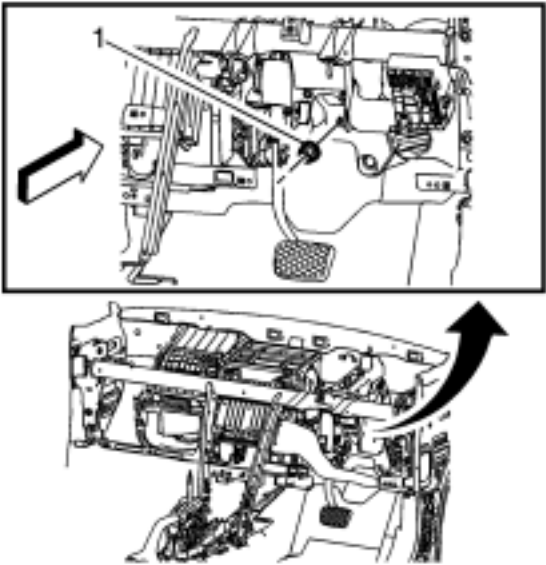
5. Remove the push-pin fastener (1) securing the left floor air outlet duct (2) to the instrument panel tie bar assembly.
6. Remove the left floor air outlet duct (2) from the vehicle.



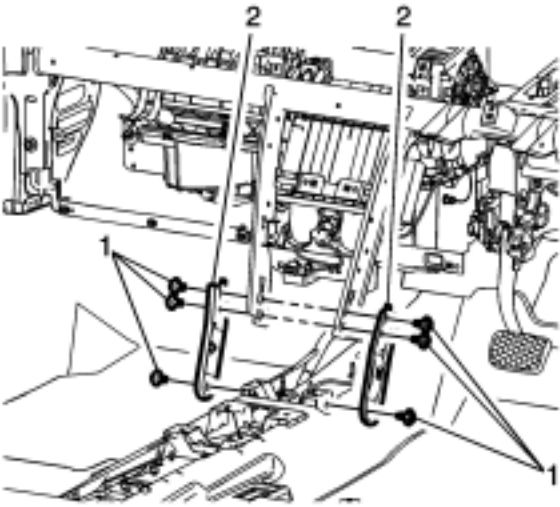
7. Remove the nut (1) securing the instrument panel tie bar assembly to the cowl panel.



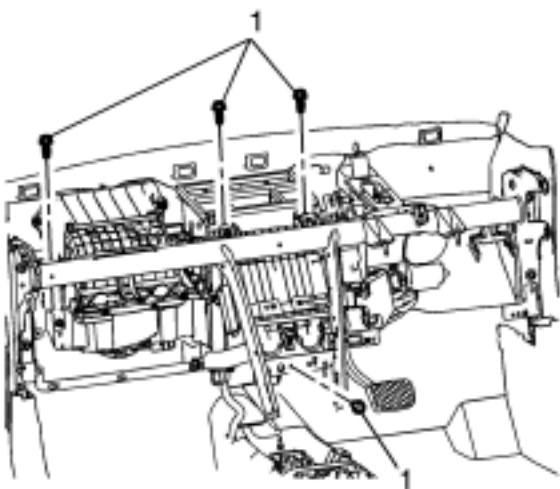
8. Remove the bolts(1) securing the instrument panel tie bar assembly to the brake pedal bracket.



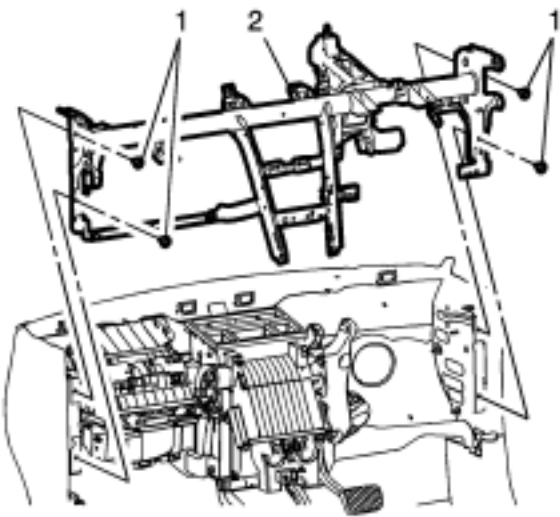
9. Remove nut (1) securing the instrument panel tie bar to the brake pedal mounting bracket.



10. Remove the bolts(1) securing the right and left instrument panel tie bar lower support brackets(2) to the front floor tunnel panel.



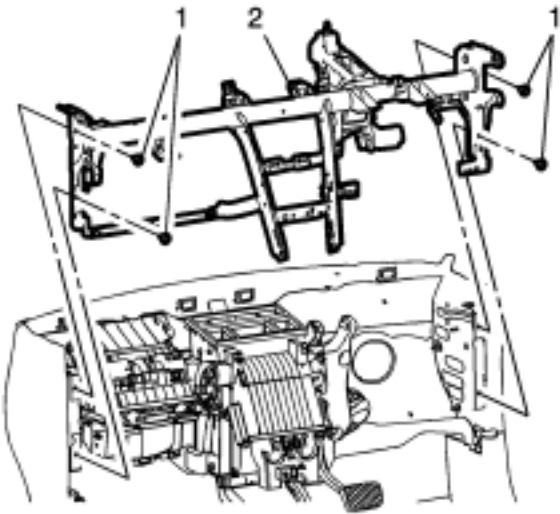
11. Remove the fasteners(1) securing the instrument panel tie bar assembly to the HVAC module.



- 12. Remove the bolts(1) securing the instrument panel tie bar assembly to the vehicle body.
- 13. Note the location and routing of the instrument panel wiring harness in order to ensure proper installation.
- 14. Support the HVAC module in order to prevent damage.
- 15. With the aid of an assistant remove the instrument panel tie bar assembly (2) from the vehicle.

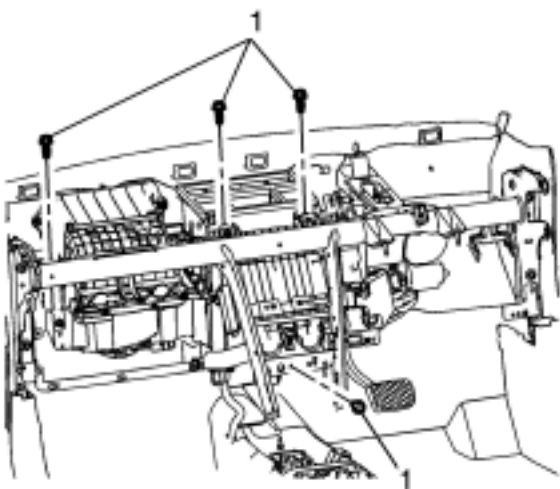
Installation Procedure

- 1. With the aid of an assistant position the instrument panel tie bar assembly (2) into the vehicle.
- 2. Install the instrument panel wiring harness assembly to its in vehicle position as it was noted in the removal procedure.

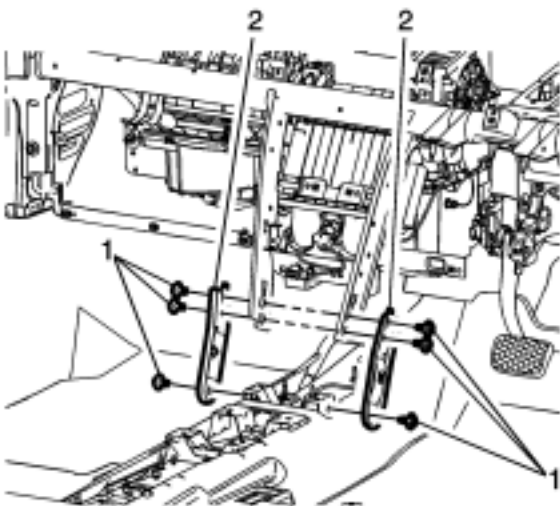


3. Loosely install the bolts(1) securing the instrument panel tie bar assembly to the vehicle body.

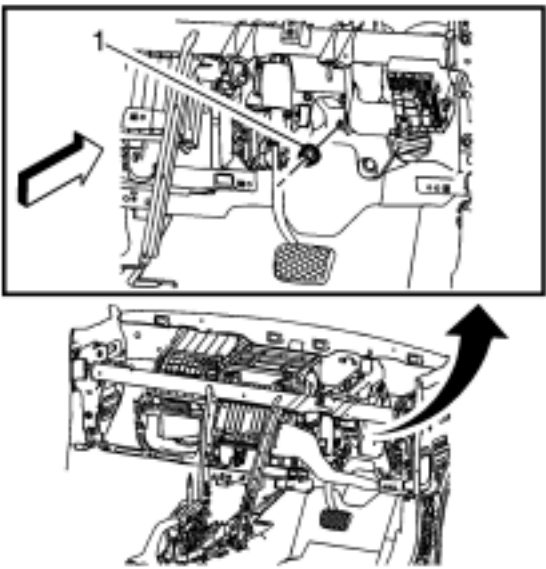




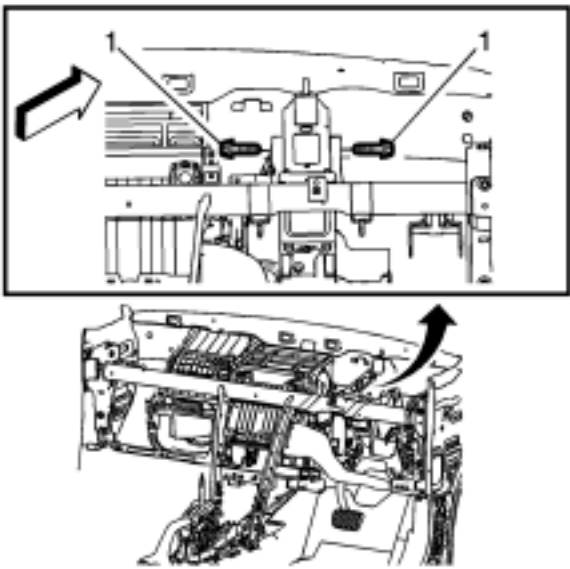
4. Loosely install the fasteners(1) securing the instrument panel tie bar assembly to the HVAC module.



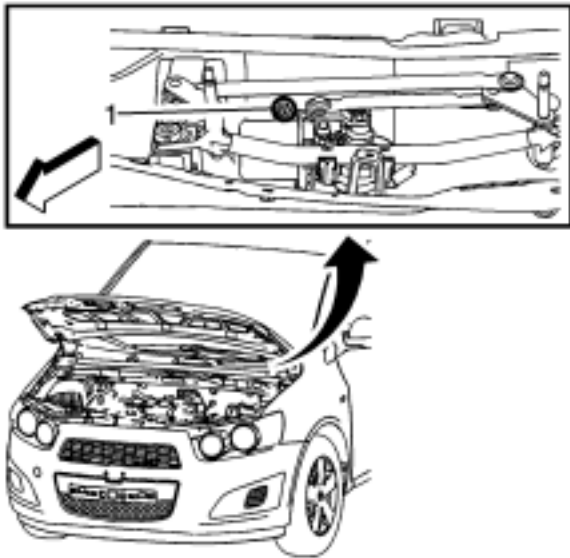
5. Loosely install the bolts(1) securing the right and left instrument panel tie bar lower support brackets(2) to the front floor tunnel panel.



6. Loosely install the nut (1) securing the instrument panel tie bar to the brake pedal mounting bracket.



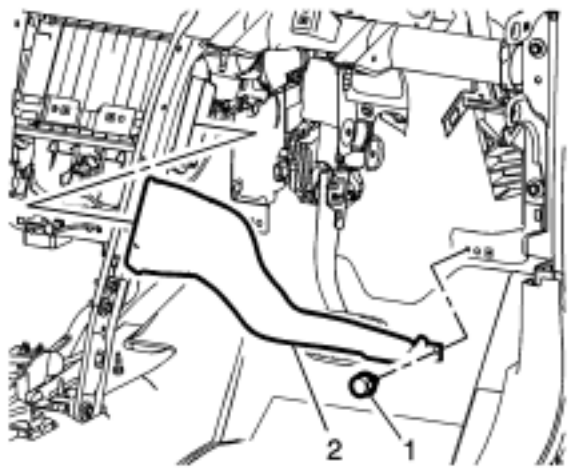
7. Loosely install the bolts(1) securing the instrument panel tie bar assembly to the brake pedal bracket.



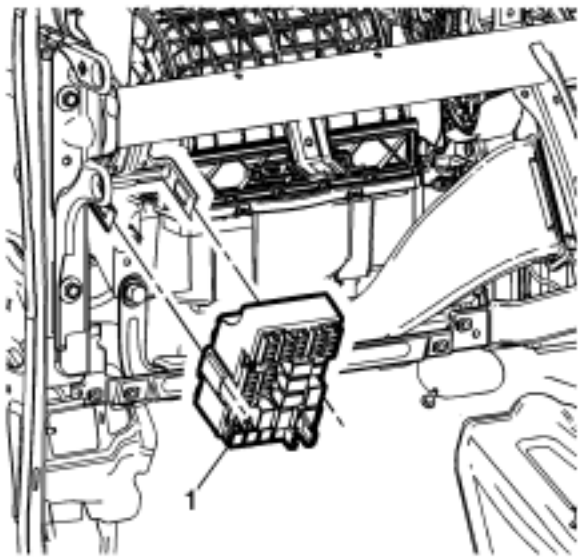
8. Loosely install the nut (1) securing the instrument panel tie bar assembly to the cowl panel.

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

- 9. Tighten the instrument panel tie bar to vehicle body bolts to **22N·m (16 lb ft)**.
- 10. Tighten the instrument panel tie bar to HVAC module fasteners to **9N·m (80 lb in)**.
- 11. Tighten the instrument panel tie bar lower support bracket to front floor tunnel panel bolts to **22N·m (16 lb ft)**.
- 12. Tighten the instrument panel tie bar to brake pedal mounting bracket nut to **22N·m (16 lb ft)**.
- 13. Tighten the instrument panel tie bar assembly to the brake pedal bracket bolts to **9N·m (80 lb in)**.
- 14. Tighten the instrument panel tie bar assembly to the cowl panel nut to **22N·m (16 lb ft)**.



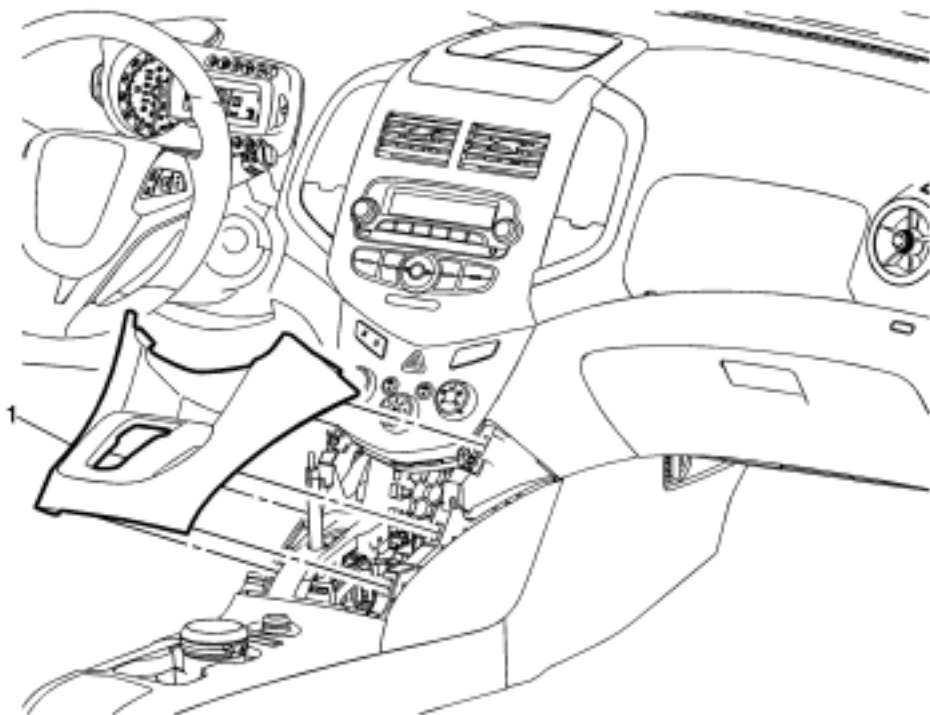
- 15. Install the left floor air outlet duct (2) into the vehicle.
- 16. Install the push-pin fastener (1) securing the left floor air outlet duct (2) to the instrument panel tie bar assembly.



- 17. Install the instrument panel fuse block (1) onto the instrument panel tie bar assembly.
- 18. Install the air inlet grill panel. Refer to [Air Inlet Grille Panel Replacement](#) .
- 19. Install the steering column and wheel from the vehicle. Refer to [Steering Column Replacement](#) .
- 20. Install the Instrument panel assembly. Refer to [Instrument Panel Assembly Replacement](#) .



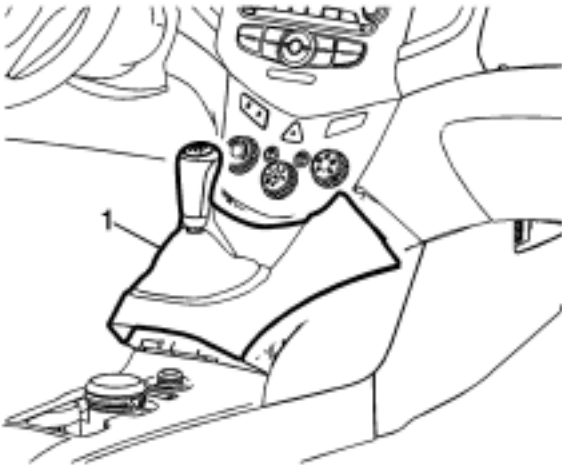
Front Floor Console Cover Replacement ( Automatic Transmission)



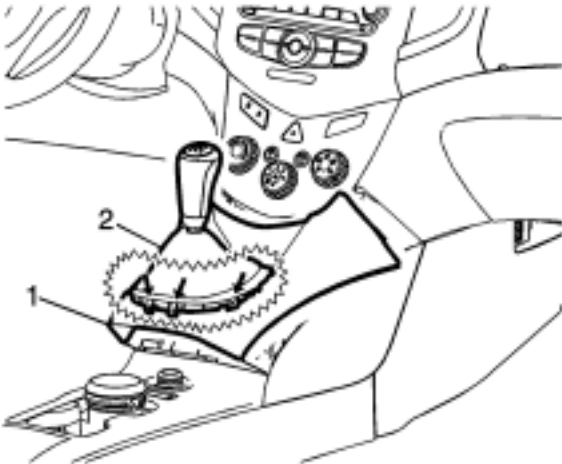
Callout	Component Name
1	<div>Front Floor Console Cover Assembly</div> <div>Procedures</div> <div><div>1. Apply the parking brake.</div><div>2. Move the shifter from “Park” to the “Neutral” position.</div><div>3. Use a flat-bladed plastic trim tool in order to release the retainers securing the console cover to the console assembly.</div><div>4. Disconnect the electrical connections.</div><div>5. When replacing the console cover, transfer all necessary components.</div></div>

## Front Floor Console Cover Replacement ( Manual Transmission)

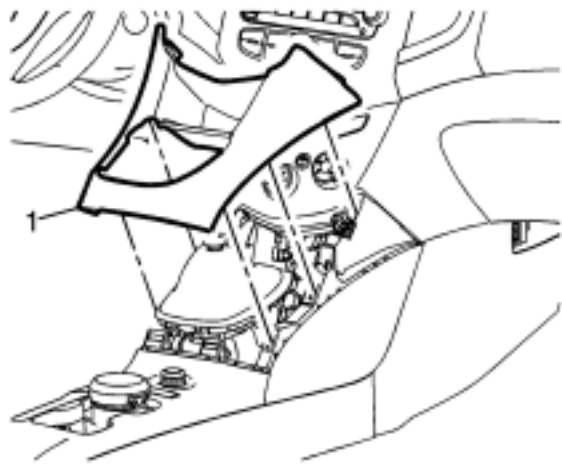
### Removal Procedure



1. Use a flat bladed plastic trim tool in order to release the retainers securing the console cover (1) to the console assembly.



2. Reach under the console cover assembly (1) and release the retainer tabs securing the transmission shift lever boot (2) to the console cover assembly.

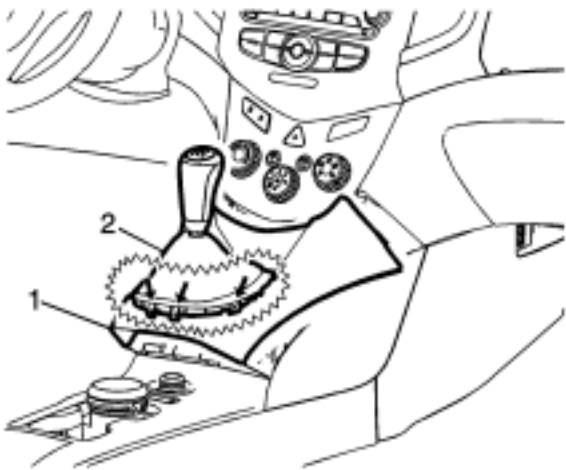


3. Feed the transmission control lever boot assembly thru the opening in the console cover assembly (1).  
4. Remove the console cover assembly (1) from the vehicle.

Installation Procedure

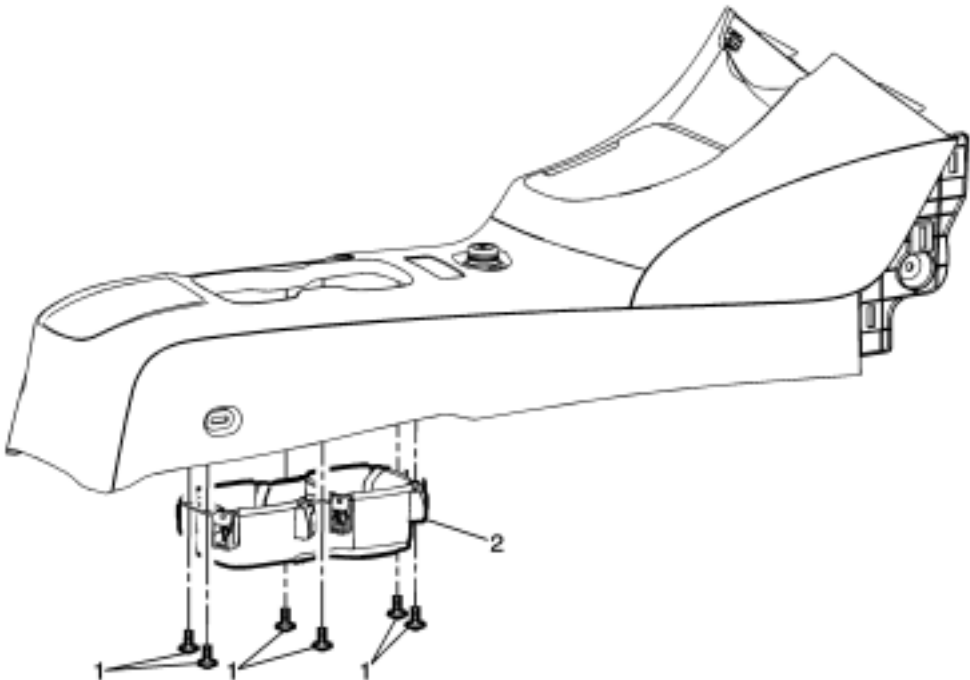


- 1. Position the console cover assembly (1) to the console assembly.
- 2. Feed the transmission control lever boot assembly thru the opening in the console cover assembly (1).



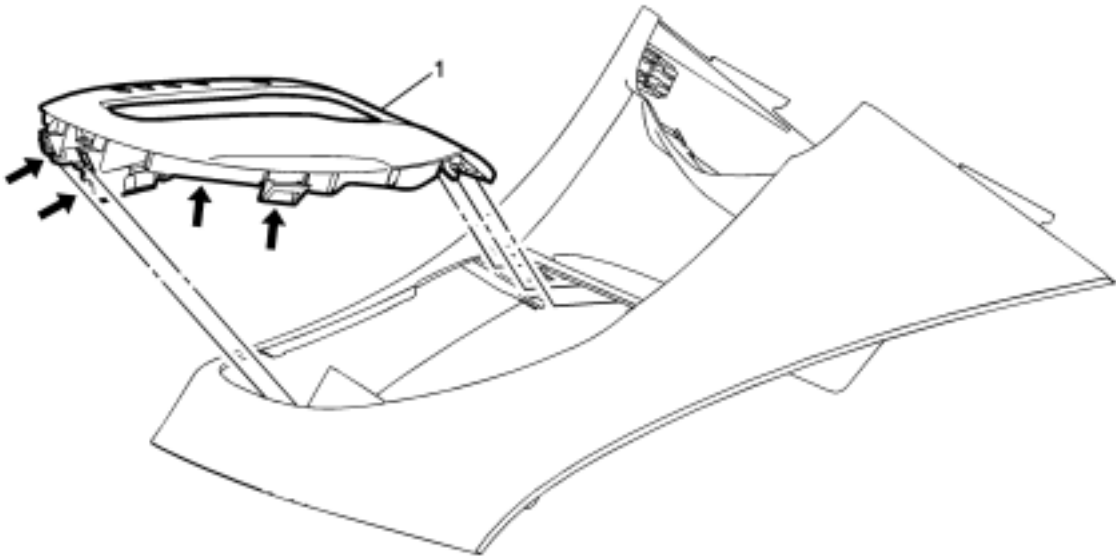
- 3. Snap the transmission control lever boot assembly (2) to the console cover (1) ensuring the retainer tabs lock the boot assembly to the cover.
- 4. Install the cover assembly to the console.

Front Floor Console Cup Holder Replacement



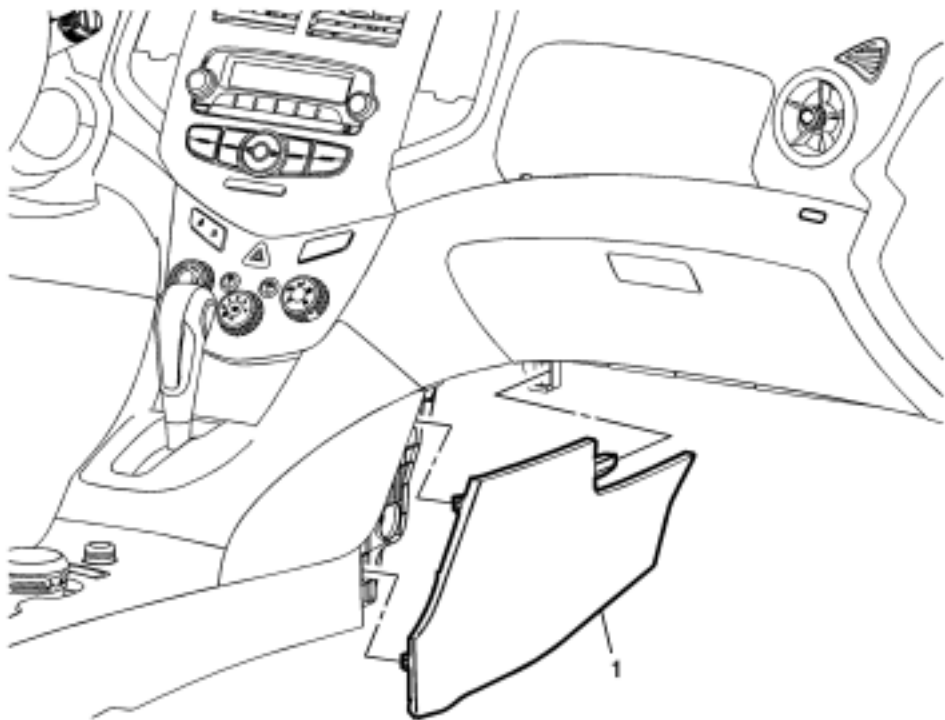
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front floor console assembly. Refer to <a href="#">Front Floor Console Replacement</a> .</p>	
1	<p>Front Floor Console Cup Holder Fasteners (Qty: 6)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Front Floor Console Cup Holder Assembly</p>

Automatic Transmission Control Indicator Opening Cover Replacement



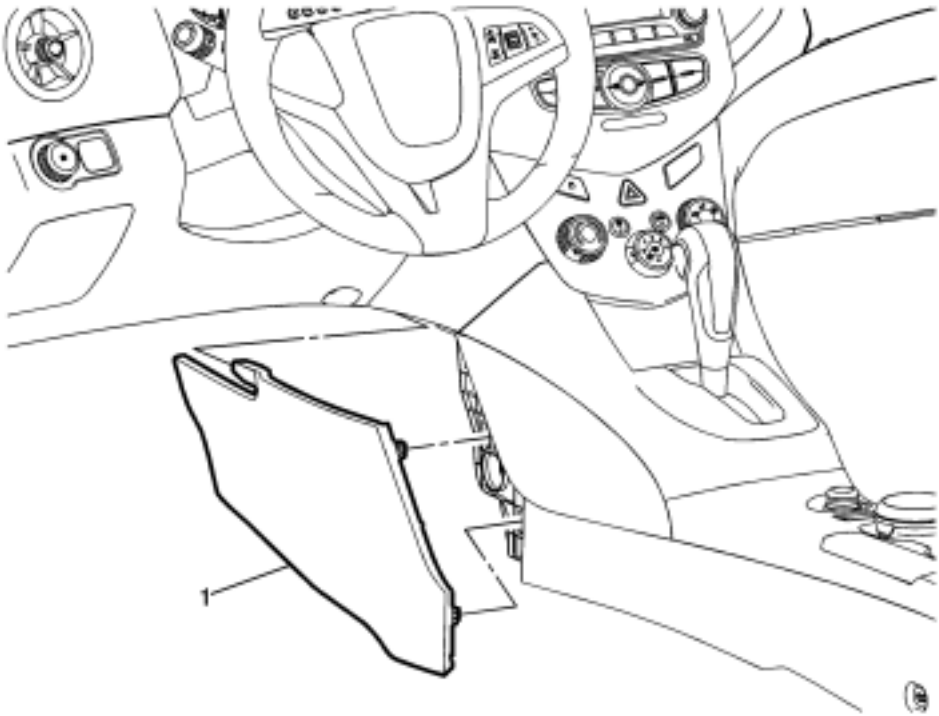
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front floor console cover. Refer to <a href="#">Front Floor Console Cover Replacement</a> .</p>	
1	<p>Automatic Transmission Control Indicator Opening Cover Assembly</p> <p><b>Procedure</b></p> <p>Release the retainer clips securing the transmission control indicator to the front floor console cover.</p>

Front Floor Console Extension Replacement - Right Side



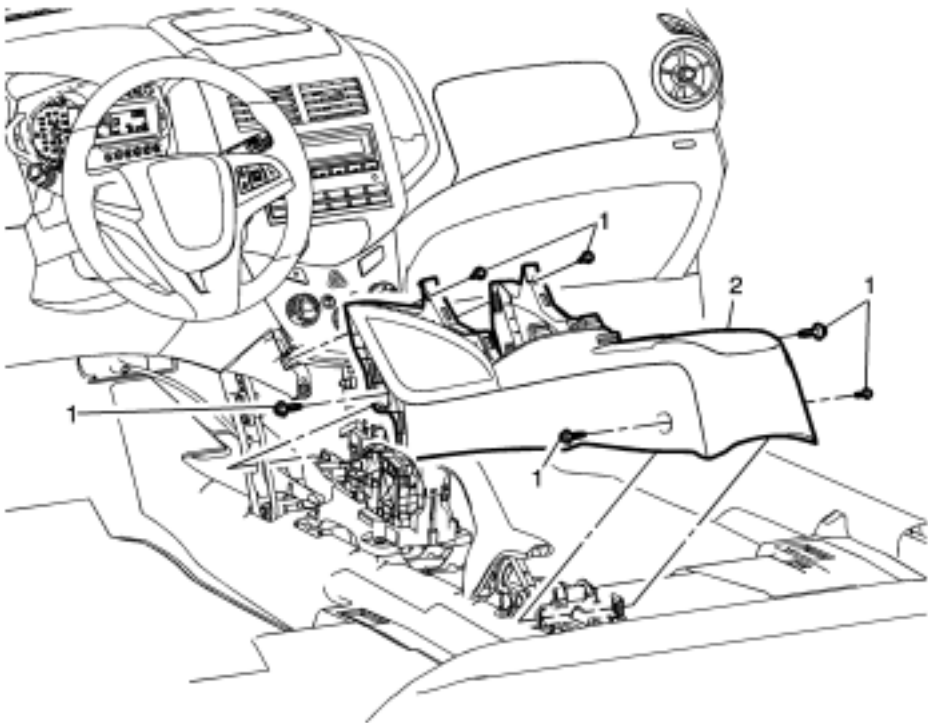
Callout	Component Name
1	<div>Front Floor Console Extension</div> <div><b>Procedure</b></div> <div>Use a flat bladed plastic trim tool in order to release the retainers securing the extension to the console assembly.</div>

Front Floor Console Extension Replacement - Left Side



Callout	Component Name
1	<div>Front Floor Console Extension</div> <div><b>Procedure</b></div> <div>Use a flat bladed plastic trim tool in order to release the retainers securing the extension to the console assembly.</div>

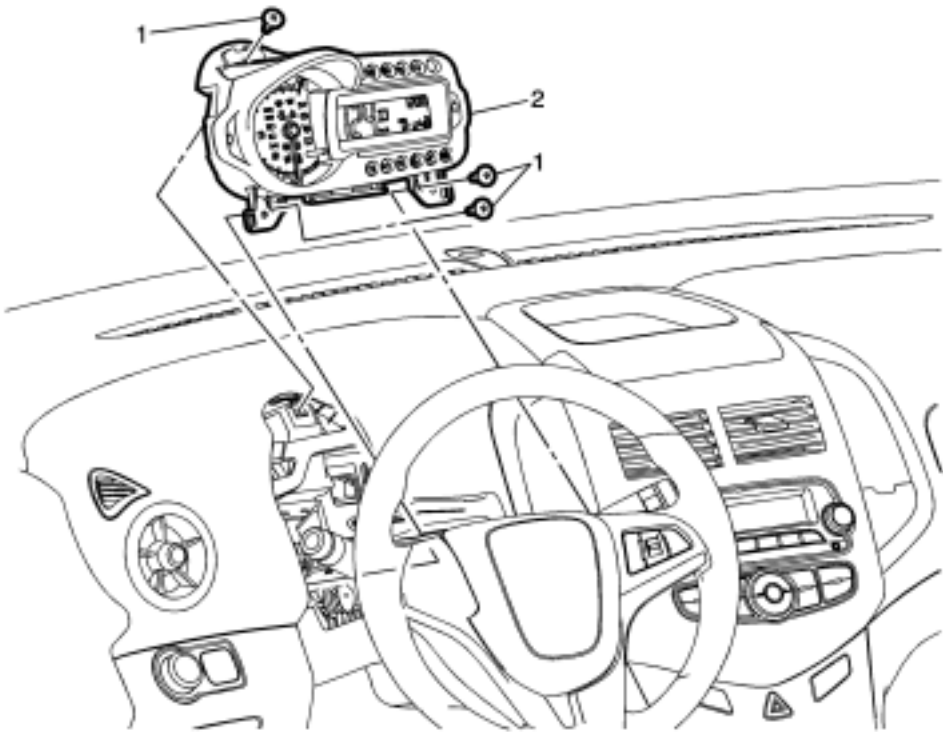
Front Floor Console Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the right and left front floor console extensions. Refer to <a href="#">Front Floor Console Extension Replacement - Right Side</a> and <a href="#">Front Floor Console Extension Replacement - Left Side</a> .</p> <p>2. Remove the front floor console cover assembly. Refer to <a href="#">Front Floor Console Cover Replacement</a> .</p>	
1	<p>Front Floor Console Fasteners (Qty: 6)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Move the front seats to the full forward position to access the front floor console rear fasteners.</p>
2	<p>Front Floor Console</p> <p><b>Procedures</b></p> <p>1. Disconnect the electrical connections.</p> <p>2. When replacing the console, transfer all necessary components.</p>



Instrument Cluster Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the instrument panel cluster upper bezel. Refer to <a href="#">Instrument Cluster Upper Bezel Replacement</a> .</p> <p>2. Remove the instrument panel steering column upper trim cover. Refer to <a href="#">Steering Column Upper Trim Cover Replacement</a> .</p>	
1	<p>Instrument Cluster Fasteners (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Instrument Cluster Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connector.</p> <p>2. Refer to <a href="#">Control Module References</a> for programming and set up information.</p>



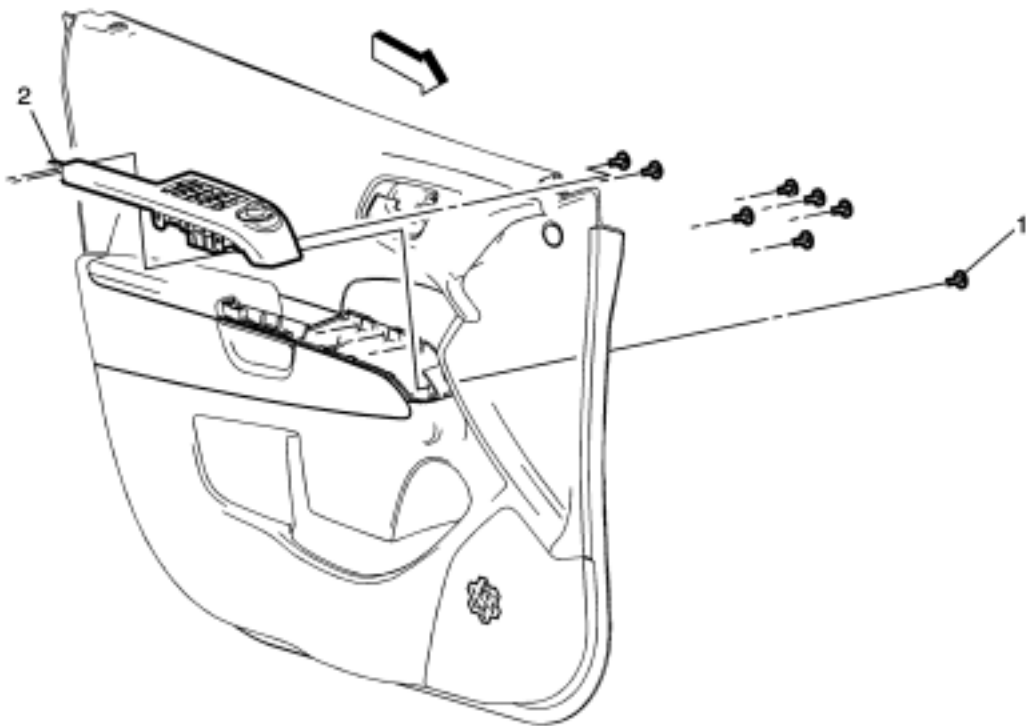
Specifications	Center Pillar Lower Trim Panel Replacement
Front Side Door Window Switch Bezel Replacement (Left Side)	Body Lock Pillar Upper Trim Panel Replacement (Sedan)
Front Side Door Window Switch Bezel Replacement (Right Side)	Body Lock Pillar Upper Trim Panel Replacement (Hatchback)
Rear Side Door Window Switch Bezel Replacement	Quarter Inner Trim Finish Panel Replacement (Hatchback)
Front Side Door Upper Front Trim Panel Replacement	Body Side Trim Panel Replacement (Sedan)
Front Side Door Trim Replacement	Rear Window Panel Trim Replacement (Sedan)
Rear Side Door Upper Rear Trim Panel Replacement (Hatchback)	Rear Compartment Stowage Shelf Replacement (Hatchback)
Roof Rail Front Stowage Compartment Replacement	Rear Side Door Trim Replacement (Hatchback)
Roof Rail Front Assist Handle Replacement	Rear Side Door Trim Replacement (Sedan)
Roof Rail Rear Assist Handle Replacement	Luggage Shade Replacement (Hatchback)
Sunshade Replacement	Liftgate Trim Finish Panel Replacement (Hatchback)
Sunshade Support Replacement	Rear Compartment Sill Trim Plate Replacement
Windshield Side Garnish Molding Replacement	Rear Compartment Lid Inner Panel Trim Replacement (Sedan)
Body Rear Seat Back Trim Panel Replacement (Sedan with AN1)	Rear Compartment Side Trim Replacement - Left Side (Sedan)
Body Rear Seat Back Trim Panel Replacement (Sedan with AMA)	Rear Compartment Side Trim Replacement - Right Side (Sedan)
Center Pillar Upper Trim Panel Replacement (With AHU)	Quarter Outer Panel Pressure Relief Valve Replacement
Center Pillar Upper Trim Panel Replacement (Without AHU)	



Fastener Tightening Specifications

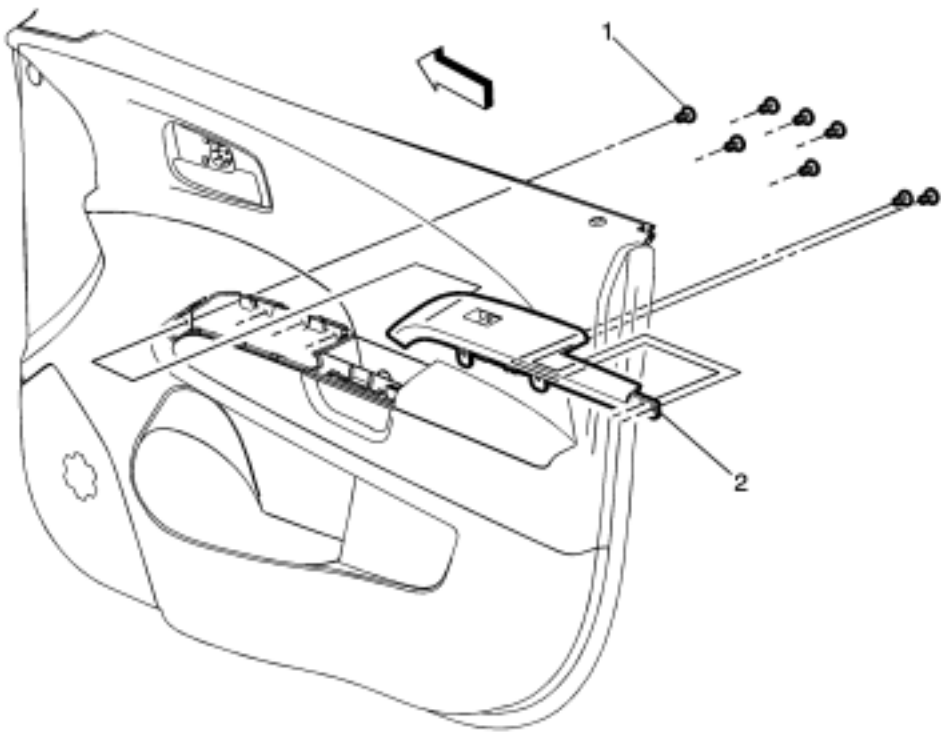
Application	Specification	
	Metric	English
Cargo Tie Down Hook Fastener	9 N·m	80 lb in
Roof Rail Front Assist Handle Fastener	6 N·m	53 lb in
Roof Rail Front Stowage Compartment Fastener	6 N·m	53 lb in
Roof Rail Rear Assist Handle Fastener	6 N·m	53 lb in

Front Side Door Window Switch Bezel Replacement ( Left Side)



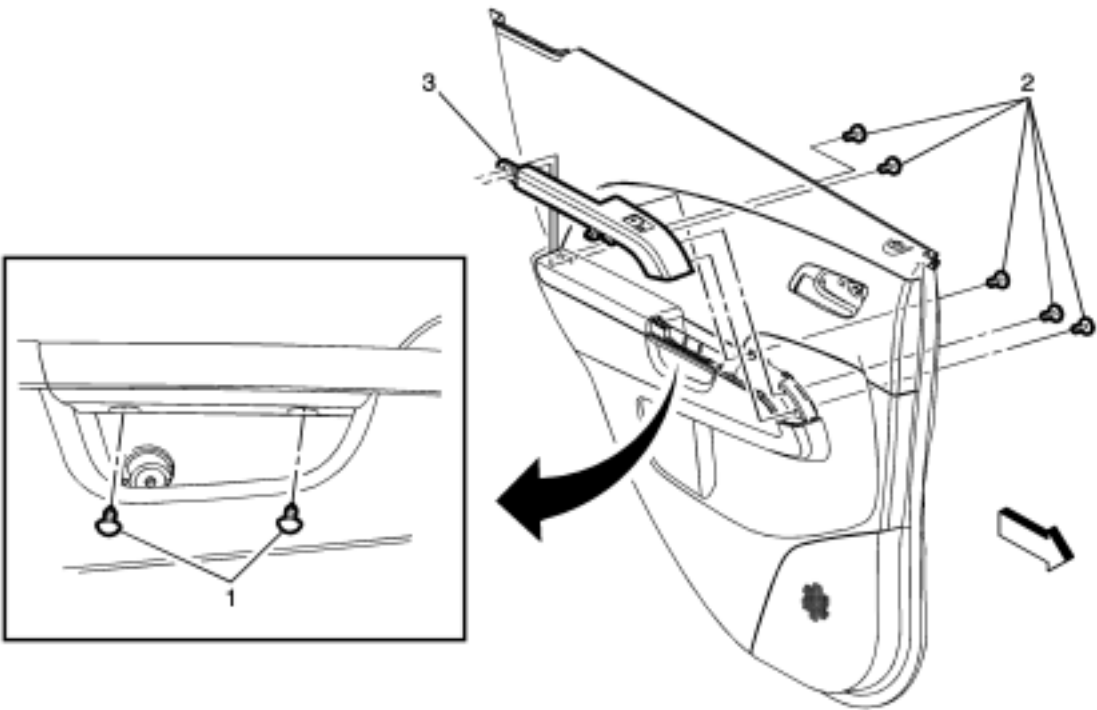
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door trim. Refer to <a href="#">Front Side Door Trim Replacement</a> .</p>	
1	<p>Front Side Door Window Switch Bezel Screw (Qty: 8)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Front Side Door Window Switch Bezel Assembly</p>

Front Side Door Window Switch Bezel Replacement ( Right Side)



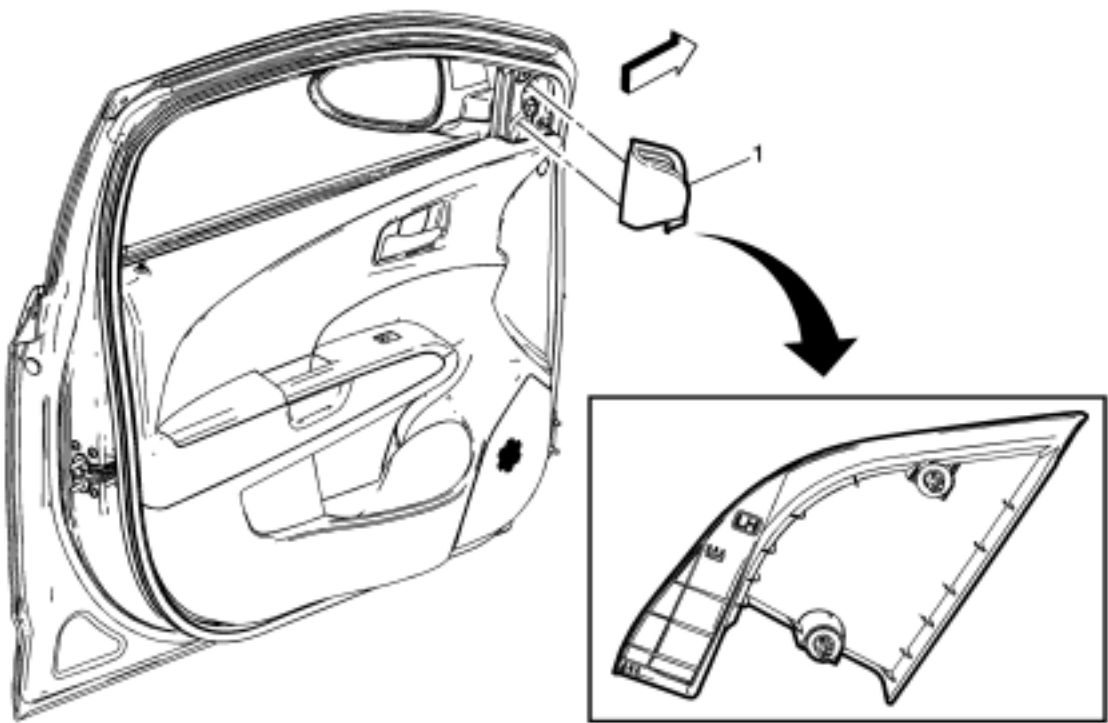
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door trim. Refer to <a href="#">Front Side Door Trim Replacement</a> .</p>	
1	<p>Front Side Door Window Switch Bezel Screw (Qty: 8)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Front Side Door Window Switch Bezel Assembly</p>

Rear Side Door Window Switch Bezel Replacement



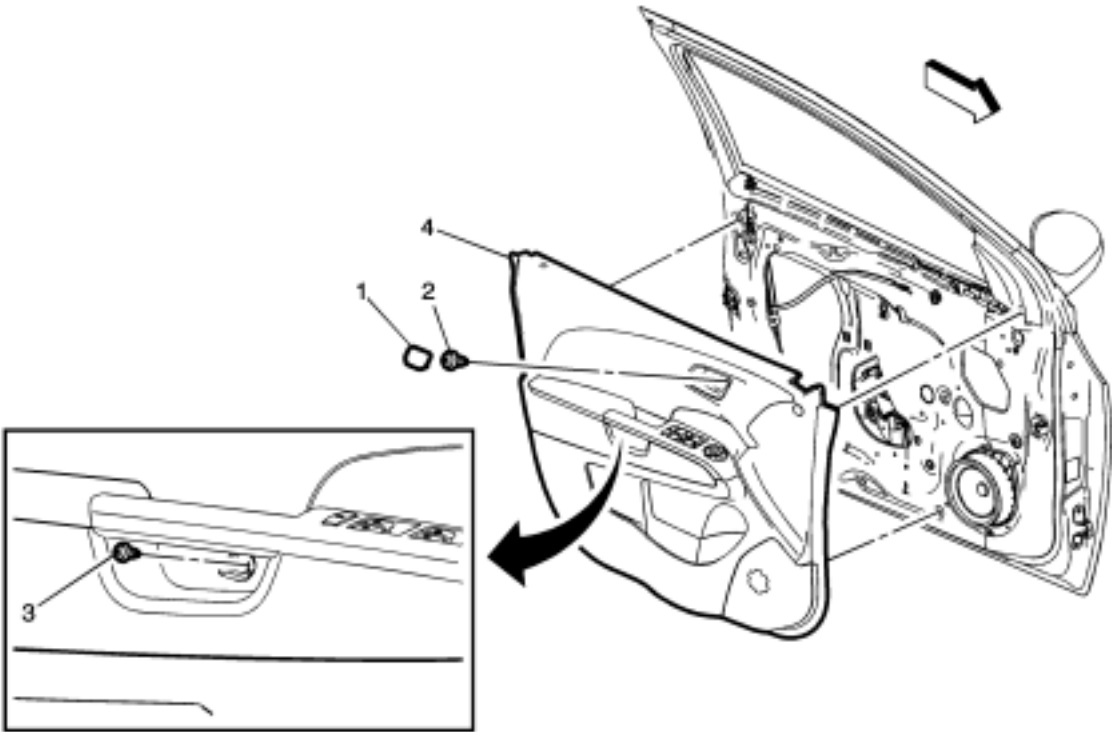
Callout	Component Name
<b>Preliminary Procedure</b> Remove the rear side door trim. Refer to <a href="#">Rear Side Door Trim Replacement</a> .	
1	Rear Side Door Pull Handle Fastener (Qty: 2)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .
2	Rear Side Door Window Switch Bezel Fastener (Qty: 5)
3	Rear Side Door Window Switch Bezel Assembly

Front Side Door Upper Front Trim Panel Replacement



Callout	Component Name
1	<div>Front Side Door Upper Front Trim Panel Assembly</div> <div><b>Procedure</b></div> <div>Use the appropriate plastic trim tool to aid in the removal of the door trim.</div>

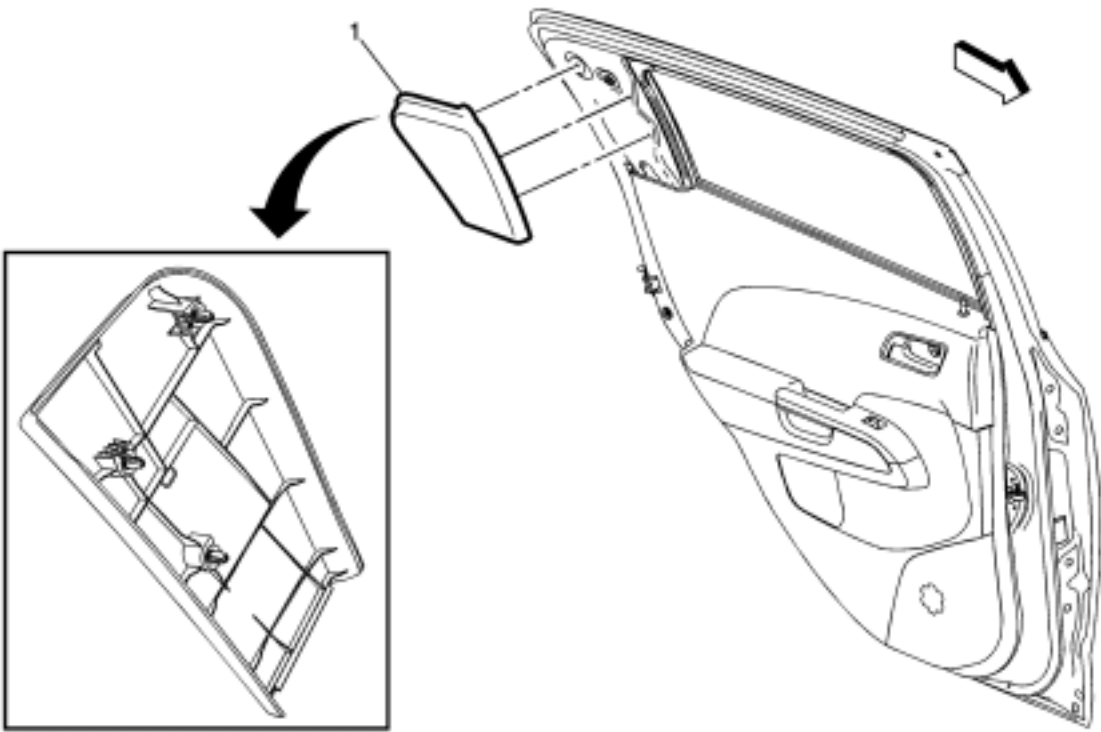
Front Side Door Trim Replacement



Callout	Component Name
1	Front Side Door Inside Handle Bolt Finish Cap
2	Front Side Door Inside Handle Fastener <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .
3	Front Side Door Trim Fastener  <b>Procedure</b> Use a small flat-bladed tool to open the front side door trim integral cap to access the fastener.
4	Front Side Door Trim Assembly  <b>Procedure</b>  1. Use the appropriate plastic trim tool to aid in the removal of the door trim. 2. Pull upwards on the door lock retainer cable to disengage. 3. Disconnect the electrical connector.

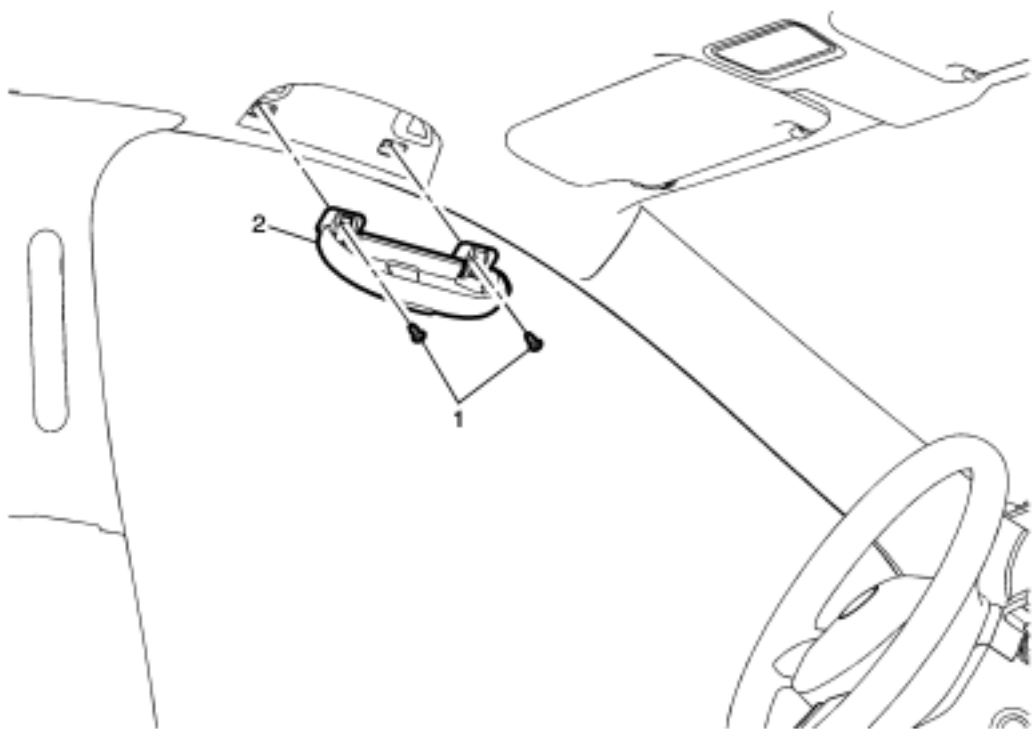


Rear Side Door Upper Rear Trim Panel Replacement (Hatchback)



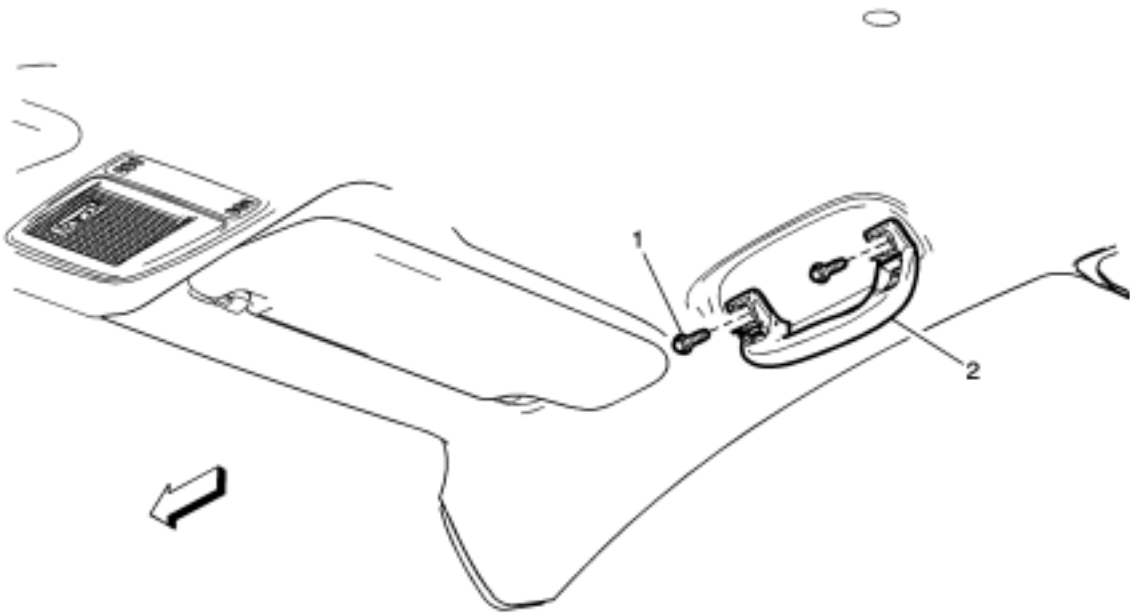
Callout	Component Name
1	<div>Rear Side Door Upper Rear Trim Panel Assembly</div> <div><b>Procedure</b></div> <div>Pull the door upper rear trim panel away from the rear side door.</div>

Roof Rail Front Stowage Compartment Replacement



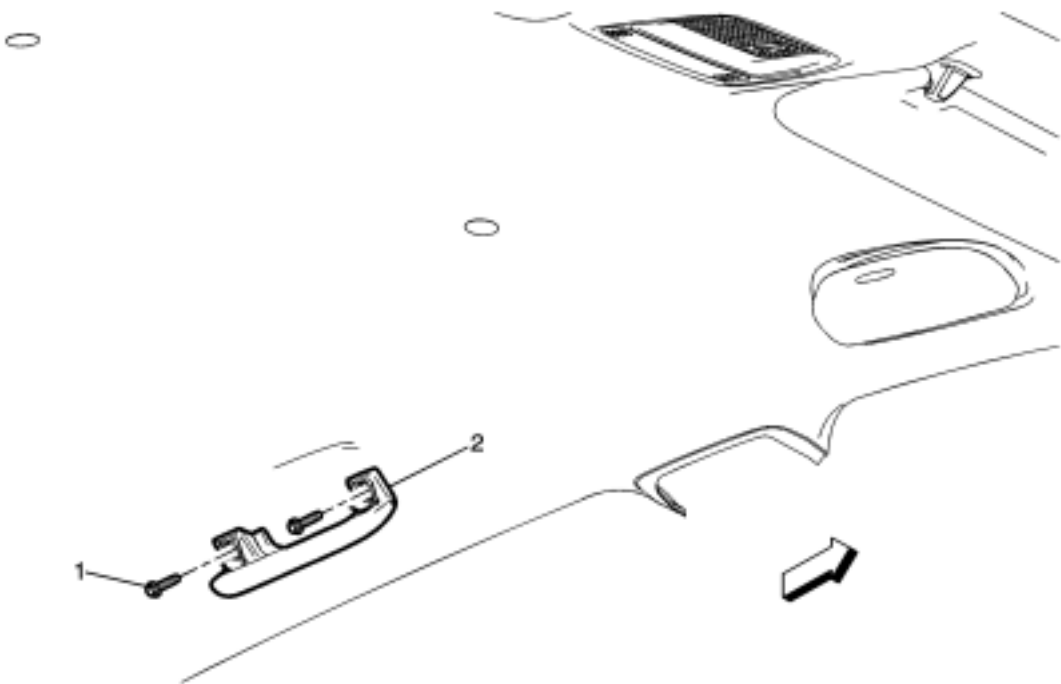
Callout	Component Name
1	<p>Roof Rail Front Stowage Compartment Fastener (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Fold the assist handle downward and hold. 2. Use a small flat-bladed tool to release the cover to access the fastener.</p> <p><b>Tighten:</b> 6 N·m (53 lb in)</p>
2	<p>Roof Rail Front Stowage Compartment Assembly</p>

Roof Rail Front Assist Handle Replacement



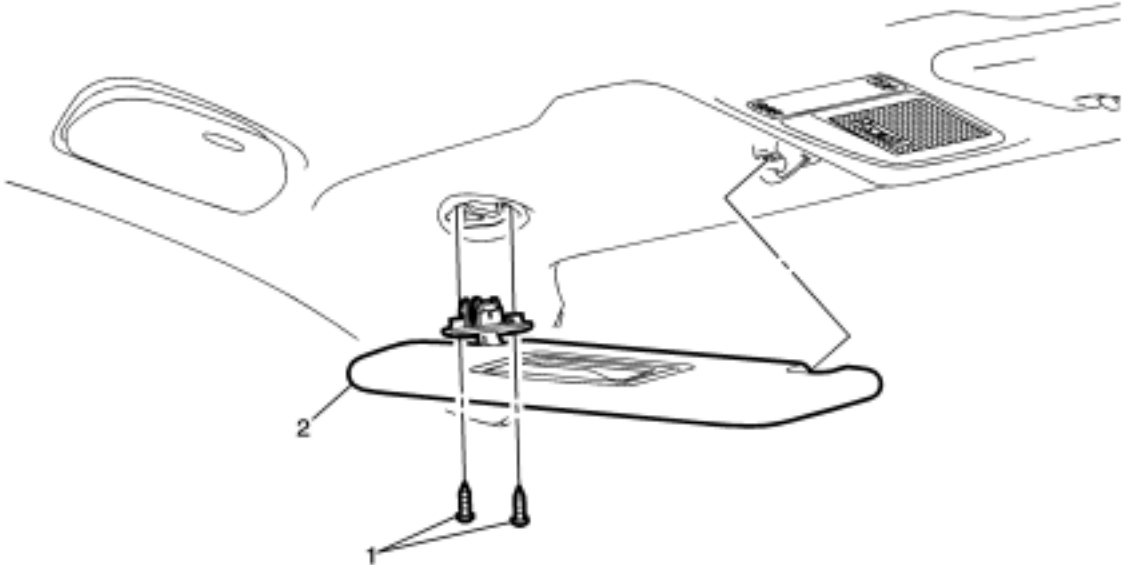
Callout	Component Name
1	<div>Roof Rail Front Assist Handle Fastener (Qty: 2)</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Procedure</b></div> <div><div>1. Fold the assist handle downward and hold.</div><div>2. Use a small flat-bladed tool to open the assist handle covers to access the screws.</div></div> <div><b>Tighten</b> 6 N·m (53 lbin)</div>
2	Roof Rail Front Assist Handle Assembly

Roof Rail Rear Assist Handle Replacement



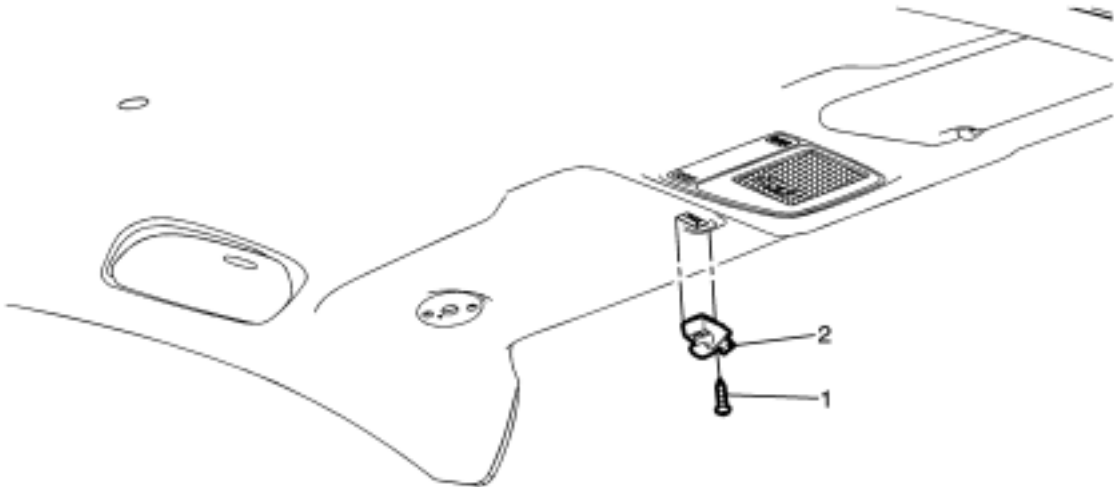
Callout	Component Name
1	<div>Roof Rail Rear Assist Handle Fastener (Qty: 2)</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Procedure</b></div> <div><div>1. Fold the assist handle downward and hold.</div><div>2. Use a small flat-bladed tool to open the assist handle covers to access the screws.</div></div> <div><b>Tighten</b> 6 N·m (53 lbin)</div>
2	Roof Rail Rear Assist Handle Assembly

Sunshade Replacement



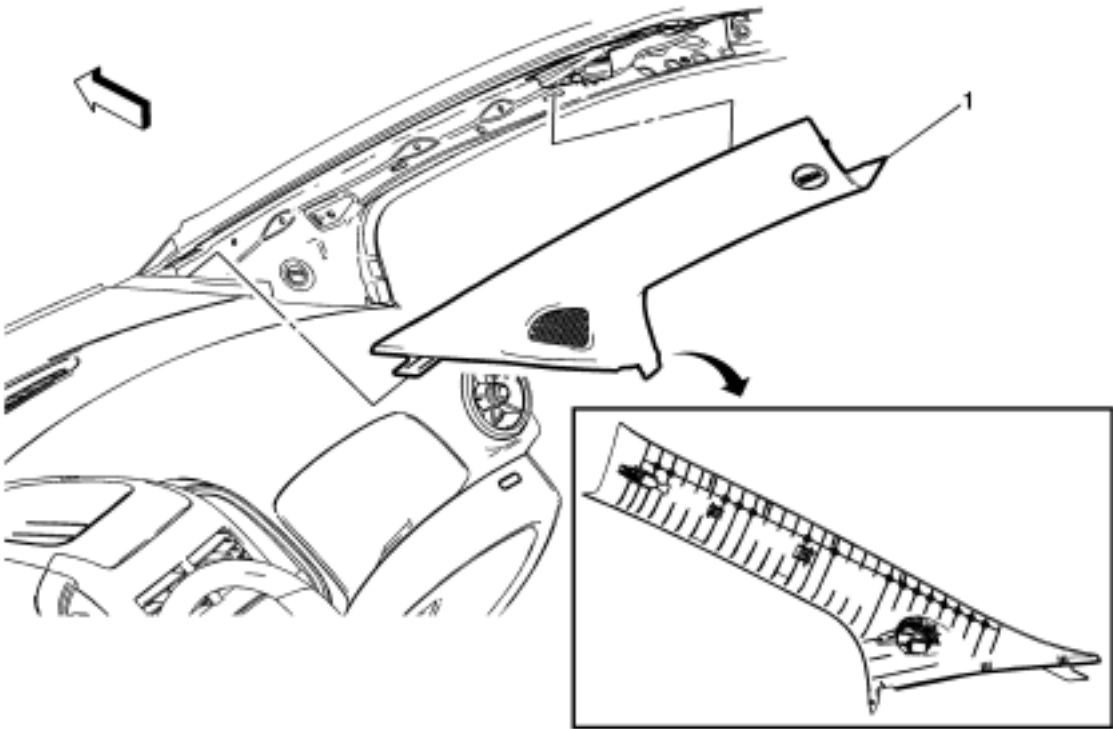
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Lower the front of the headliner to access the sunshade electrical connector, if necessary. Refer to <a href="#">Headlining Trim Panel Replacement</a> .</p>	
1	<p>Sunshade Fastener (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Sunshade Assembly</p> <p><b>Procedure</b></p> <p>1. Squeeze the tabs at the base of the sunshade assembly to remove from the headliner. 2. Disconnect the electrical connector.</p>

Sunshade Support Replacement



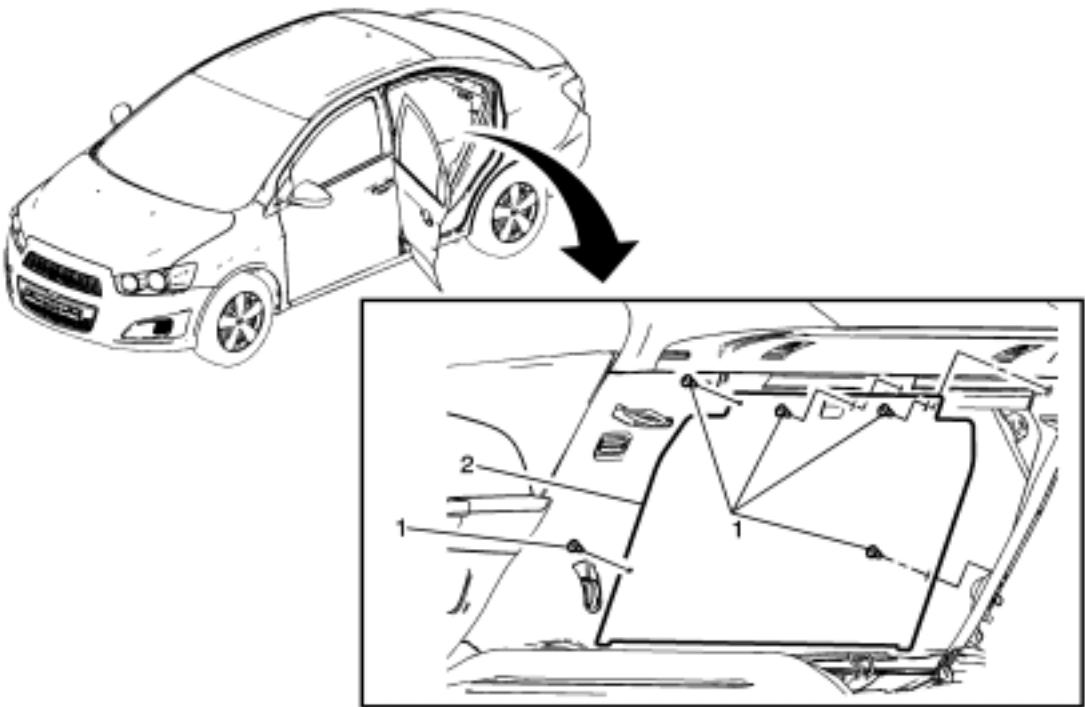
Callout	Component Name
1	<div>Sunshade Support Fastener</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Note:</b> Pull the cover downward to access the fastener.</div>
2	<div>Sunshade Support Assembly</div> <div><b>Procedure</b></div> <div>Unclip the sunshade from the support and reposition.</div>

Windshield Side Garnish Molding Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Disable the SIR system, if equipped. Refer to <a href="#">SIR Disabling and Enabling</a> .</p>	
1	<p>Windshield Side Garnish Molding Assembly</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Tabs must be installed prior to retainers.</li><li>2. Tabs to be fully seated in the instrument panel (I/P) trim panel retainer and valance panel.</li><li>3. Disconnect the electrical connectors.</li><li>4. Ensure the tether is reattached when installed.</li></ol>

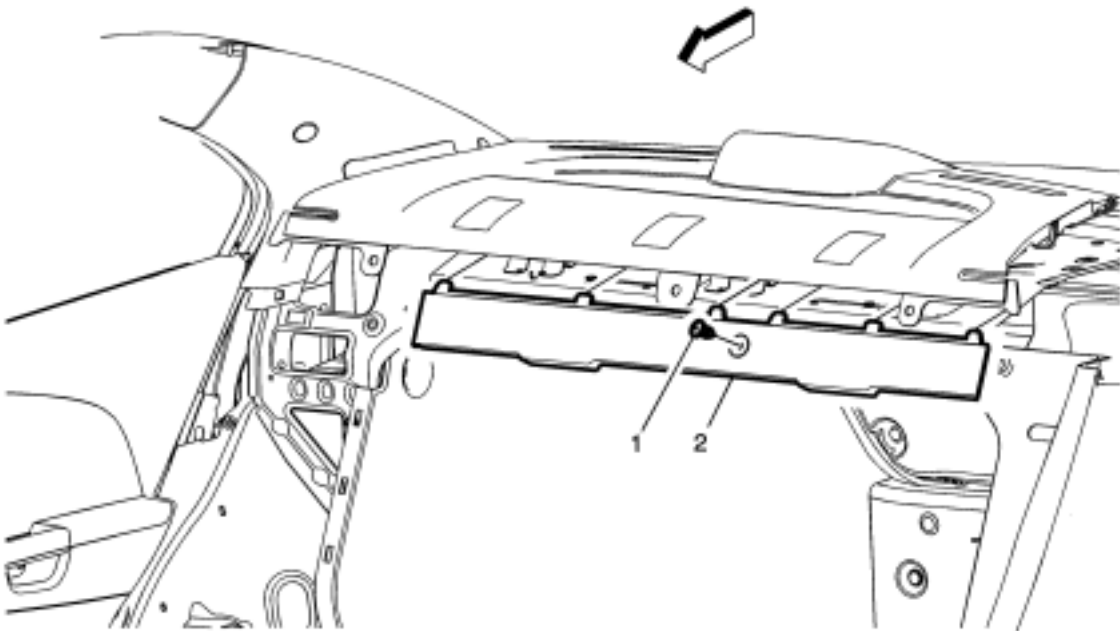
Body Rear Seat Back Trim Panel Replacement (Sedan with AN1)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the rear seat back cushion. Refer to <a href="#">Rear Seat Back Cushion Replacement</a> .</p>	
1	Body Rear Seat Back Trim Panel Retainer (Qty: 5)
2	Body Rear Seat Back Trim Panel Assembly

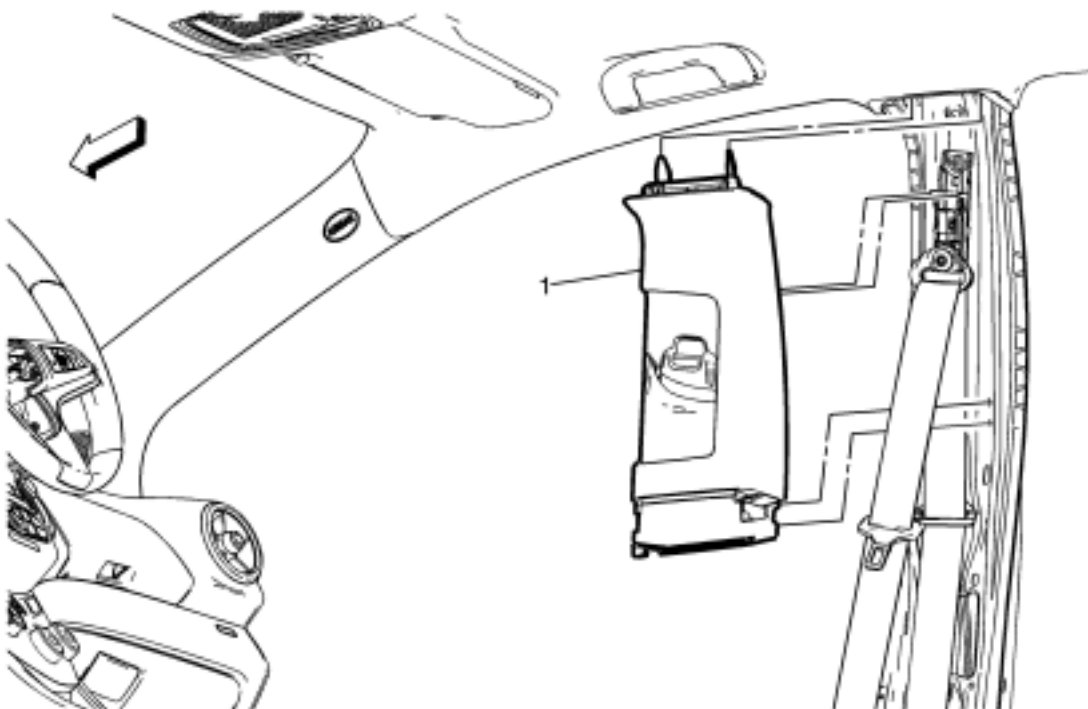


Body Rear Seat Back Trim Panel Replacement (Sedan with AMA)



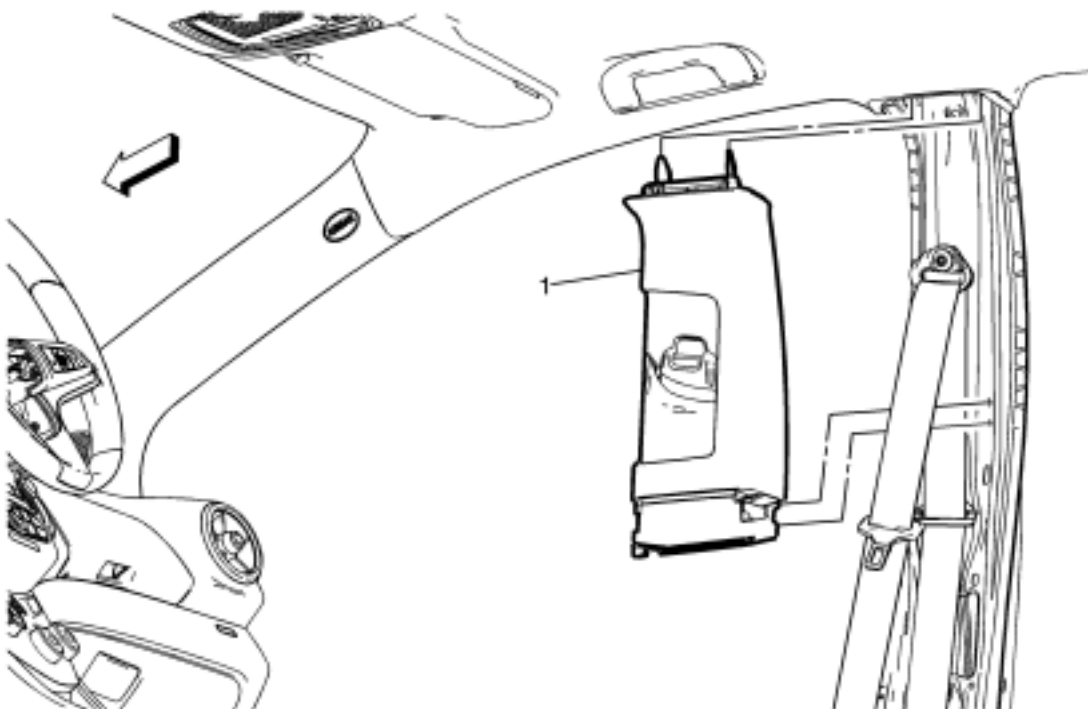
Callout	Component Name
1	<div>Body Rear Seat Back Trim Panel Retainer</div> <div><b>Procedure</b></div> <div>Pull the rear seat back cushion latch release located on the top of the rear seat back cushion, and fold the rear seat back cushion forward.</div>
2	Body Rear Seat Back Trim Panel Assembly

Center Pillar Upper Trim Panel Replacement (With AHU)



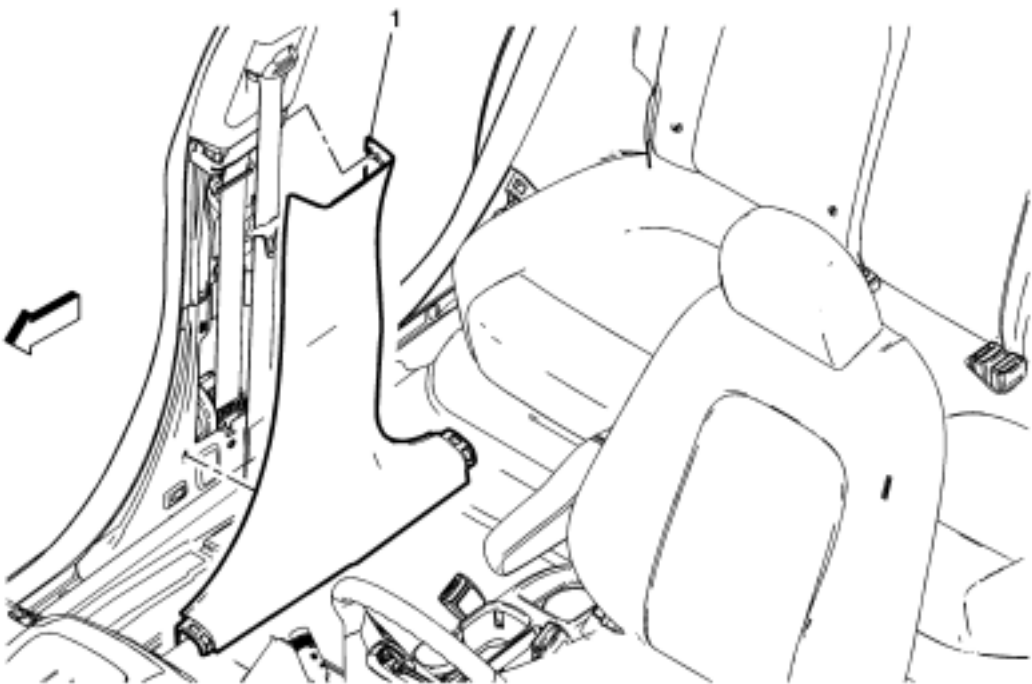
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the center pillar lower trim panel. Refer to <a href="#">Center Pillar Lower Trim Panel Replacement</a> .</p> <p>2. Remove the seat belt from the front seat. Refer to <a href="#">Driver or Passenger Seat Shoulder Belt Replacement</a> .</p>	
1	<p>Center Pillar Upper Trim Panel Assembly</p> <p><b>Procedure</b></p> <p>When replacing the center pillar upper trim panel, feed the seat belt through the panel.</p>

Center Pillar Upper Trim Panel Replacement (Without AHU)



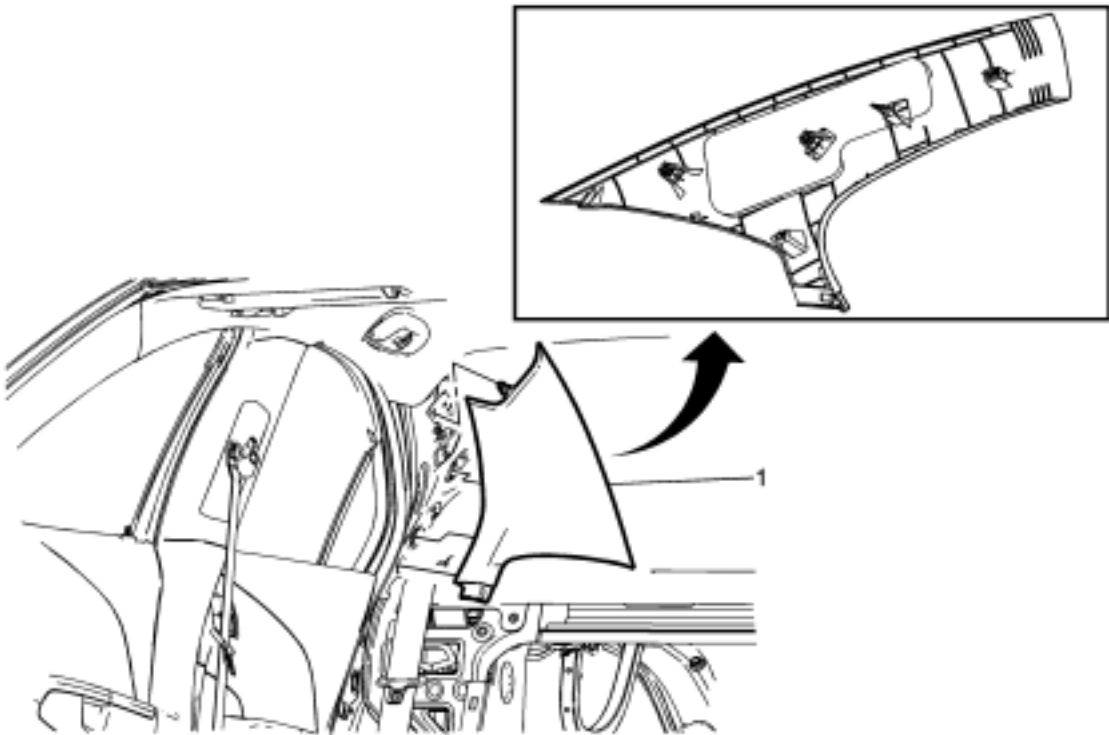
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the center pillar lower garnish molding. Refer to <a href="#">Center Pillar Lower Trim Panel Replacement</a> .</p> <p>2. Remove the seat belt from the front seat. Refer to <a href="#">Driver or Passenger Seat Shoulder Belt Replacement</a> .</p>	
1	<p>Center Pillar Upper Trim Panel Assembly</p> <p><b>Procedure</b></p> <p>When replacing the center pillar upper trim panel, feed the seat belt through the panel.</p>

Center Pillar Lower Trim Panel Replacement



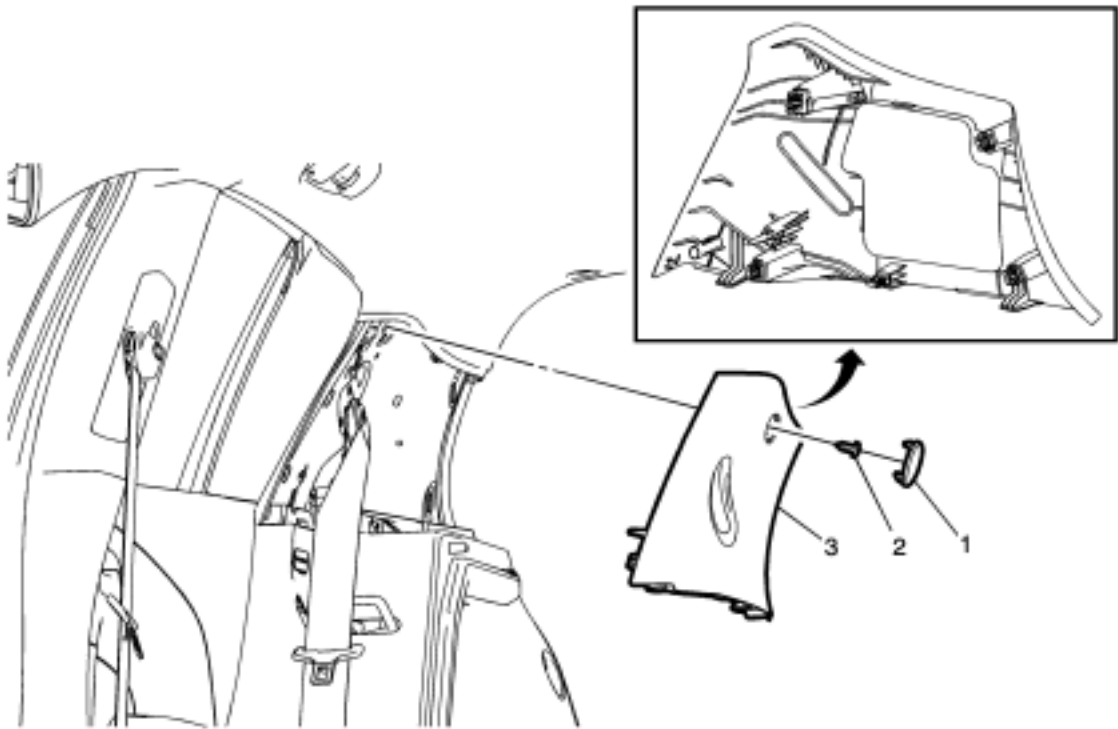
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the front side door opening floor carpet retainer. Refer to <a href="#">Front Side Door Opening Floor Carpet Retainer Replacement</a> .</p> <p>2. Remove the rear side door opening floor carpet retainer. Refer to <a href="#">Rear Side Door Opening Floor Carpet Retainer Replacement</a> .</p> <p>3. Move seat to full forward position.</p>	
1	<p>Center Pillar Lower Trim Panel Assembly</p> <p><b>Procedure</b></p> <p>Ensure the seat belt webbing does not become trapped during installation.</p>

Body Lock Pillar Upper Trim Panel Replacement (Sedan)



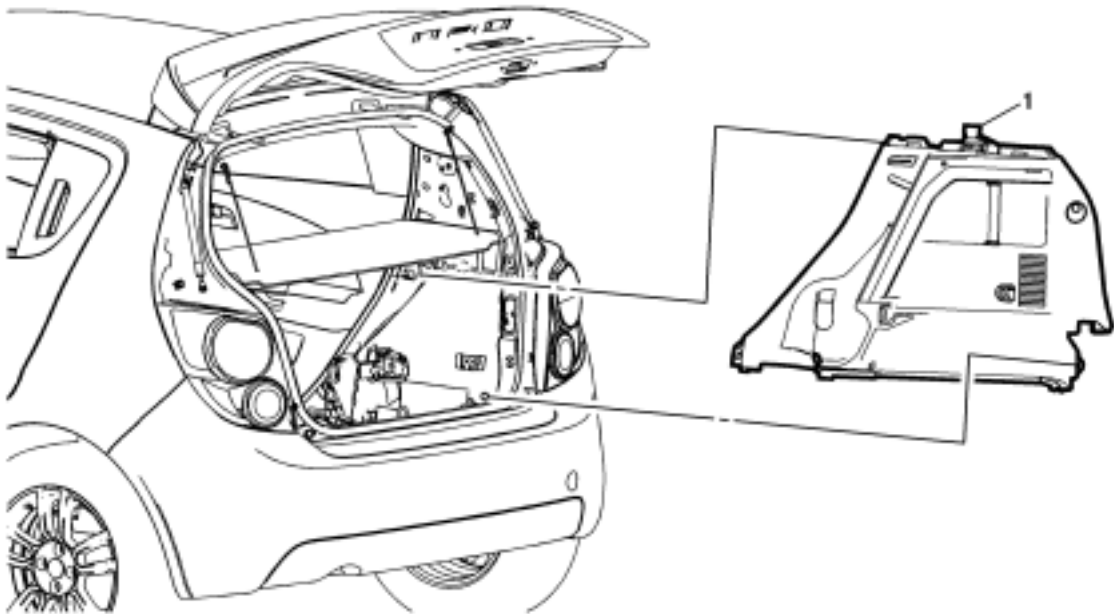
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</p> <p>2. Remove the body side trim panel. Refer to <a href="#">Body Side Trim Panel Replacement</a> .</p>	
1	<p>Body Lock Pillar Upper Trim Panel Assembly</p> <p><b>Procedure</b></p> <p>Pull outward from the top front to disengage clips.</p>

Body Lock Pillar Upper Trim Panel Replacement (Hatchback)



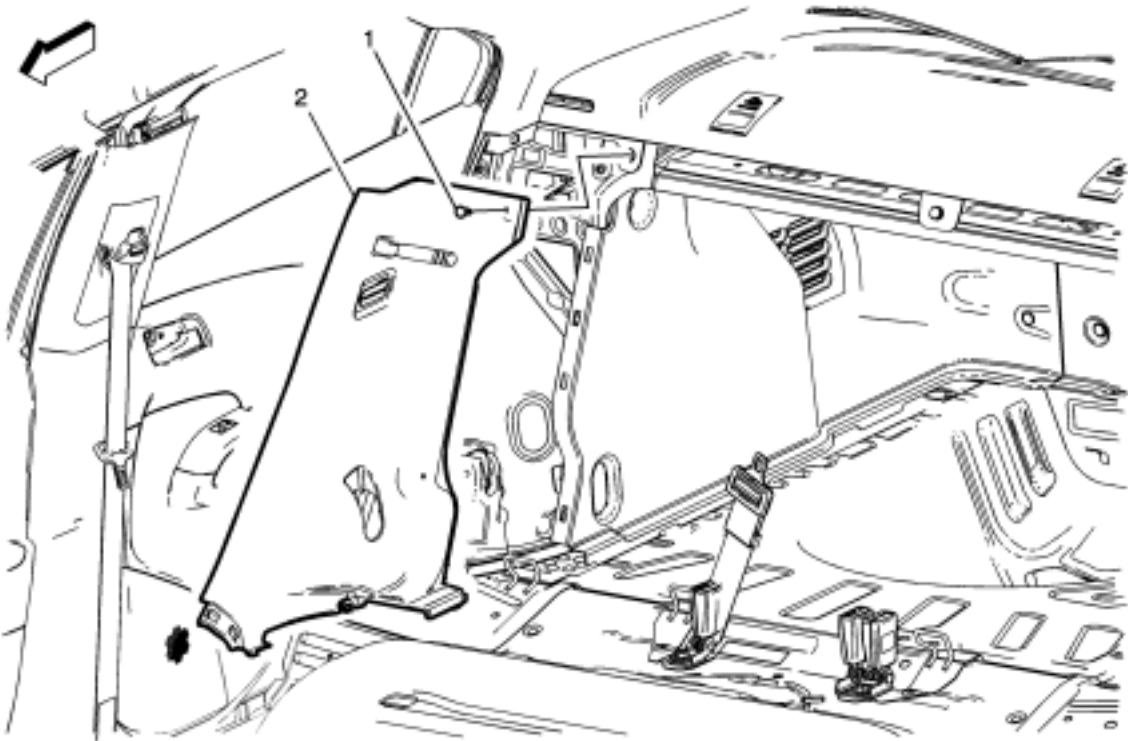
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</p>	
1	Inflatable Restraint Airbag Cover
2	Body Lock Pillar Upper Trim Panel Fastener <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .
3	Body Lock Pillar Upper Trim Panel Assembly <b>Procedure</b>  1. Grasp the molding and pull outward to disengage the integral retainers. 2. Disconnect the electrical connector, if equipped.

Quarter Inner Trim Finish Panel Replacement (Hatchback)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear side door opening floor carpet retainer. Refer to <a href="#">Rear Side Door Opening Floor Carpet Retainer Replacement</a> .</p> <p>2. Remove the rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a> .</p> <p>3. Remove rear seat back. Refer to <a href="#">Rear Seat Back Cushion Replacement</a> .</p> <p>4. Remove the body lock pillar upper trim panel. Refer to <a href="#">Body Lock Pillar Upper Trim Panel Replacement</a> .</p> <p>5. Remove the rear compartment stowage shelf. Refer to <a href="#">Rear Compartment Stowage Shelf Replacement</a> .</p> <p>6. Remove the rear compartment sill trim plate . Refer to <a href="#">Rear Compartment Sill Trim Plate Replacement</a> .</p> <p>7. Remove the rear shoulder belt. Refer to <a href="#">Shoulder Belt Replacement - Rear</a> .</p>	
1	<p>Quarter Inner Trim Finish Panel Assembly</p> <p><b>Procedure</b></p> <p>Use a trim tool or equivalent to aid in removal.</p> <p><b>Note:</b> After installation of the quarter inner trim panel, ensure the rear seat belt is not trapped under the trim panel. Pull up on the belt to verify full movement of the belt.</p>

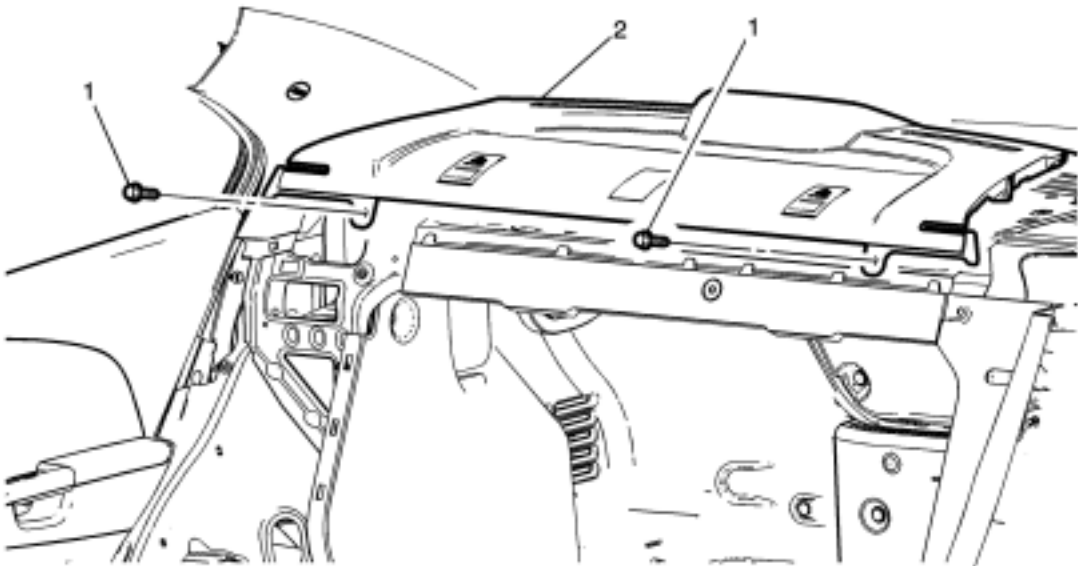
Body Side Trim Panel Replacement (Sedan)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove rear side door opening floor carpet retainer. Refer to <a href="#">Rear Side Door Opening Floor Carpet Retainer Replacement</a> .</p> <p>2. Remove body rear seat back trim panel. Refer to <a href="#">Body Rear Seat Back Trim Panel Replacement</a> .</p> <p>3. Remove lower rear shoulder belt fastener. Refer to <a href="#">Shoulder Belt Replacement - Rear</a> .</p>	
1	Body Side Trim Panel Push-In Retainer
2	<p>Body Side Trim Panel Assembly</p> <p><b>Note:</b> Ensure seat belt assembly is routed over and through opening in panel assembly.</p>

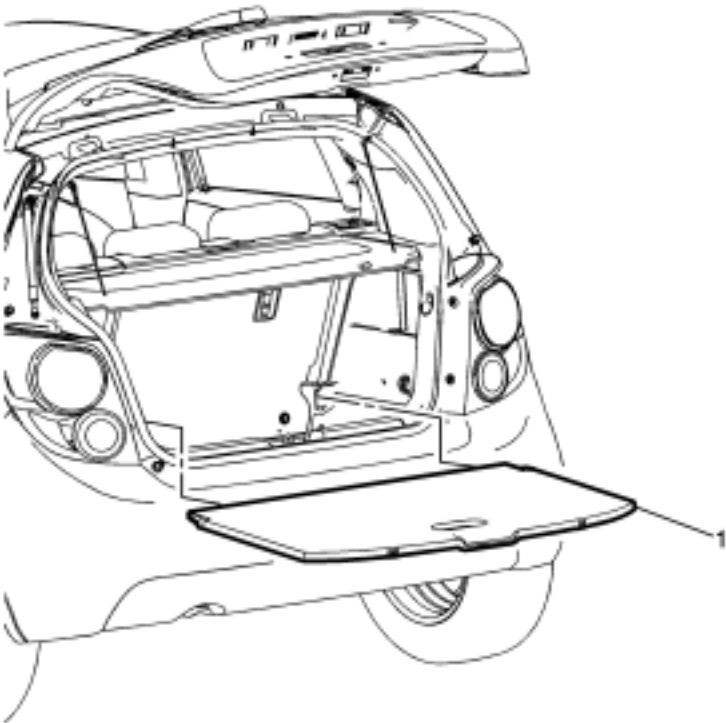


Rear Window Panel Trim Replacement (Sedan)



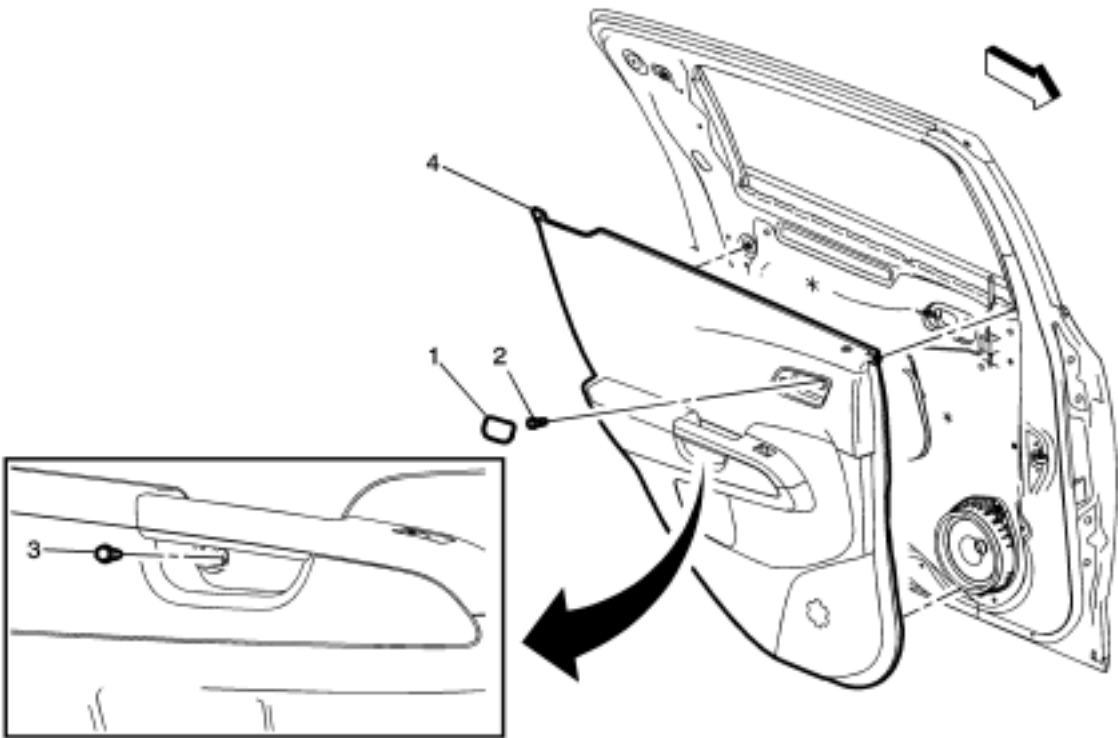
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the body lock pillar upper trim panel. Refer to <a href="#">Body Lock Pillar Upper Trim Panel Replacement</a> .</p> <p>2. Remove the body rear seat back trim panel. Refer to <a href="#">Body Rear Seat Back Trim Panel Replacement</a> .</p>	
1	Rear Window Panel Trim Fastener (Qty: 2)
2	<p>Rear Window Panel Trim Assembly</p> <p><b>Procedure</b></p> <p>When replacing the rear window panel trim assembly, transfer all necessary components.</p>

Rear Compartment Stowage Shelf Replacement (Hatchback)



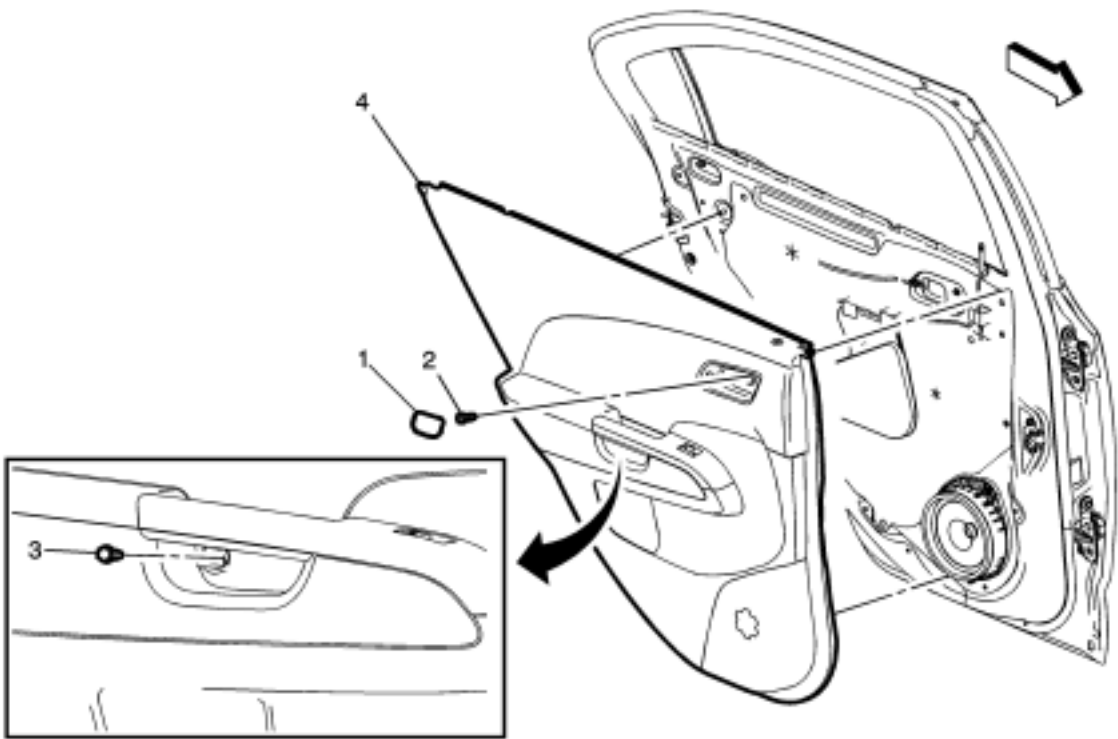
Callout	Component Name
1	Rear Compartment Stowage Shelf Assembly

Rear Side Door Trim Replacement (Hatchback)



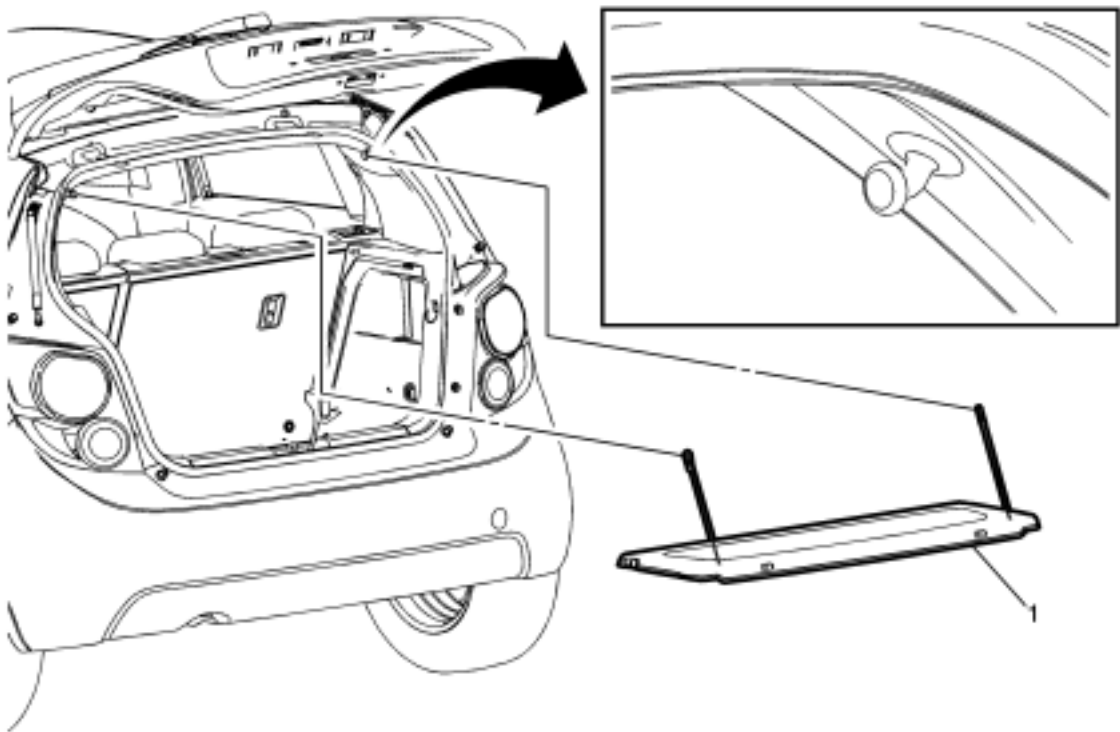
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear side door upper rear trim panel. Refer to <a href="#">Rear Side Door Upper Rear Trim Panel Replacement</a> .</p>	
1	Rear Side Door Inside Handle Bolt Cap
2	<p>Rear Side Door Inside Handle Fastener</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Pull handle back to remove cap. Use suitable tool to unsnap.</p>
3	<p>Rear Side Door Trim Fastener</p> <p><b>Procedure</b></p> <p>Use a small flat-bladed tool to open the rear side door trim integral cap to access the fastener.</p>
4	<p>Rear Side Door Trim Assembly</p> <p><b>Procedure</b></p> <p>1. Use the appropriate plastic trim tool to aid in the removal of the door trim. 2. Pull upwards on the door lock retainer cable to disengage. 3. Disconnect the electrical connector.</p>

Rear Side Door Trim Replacement (Sedan)



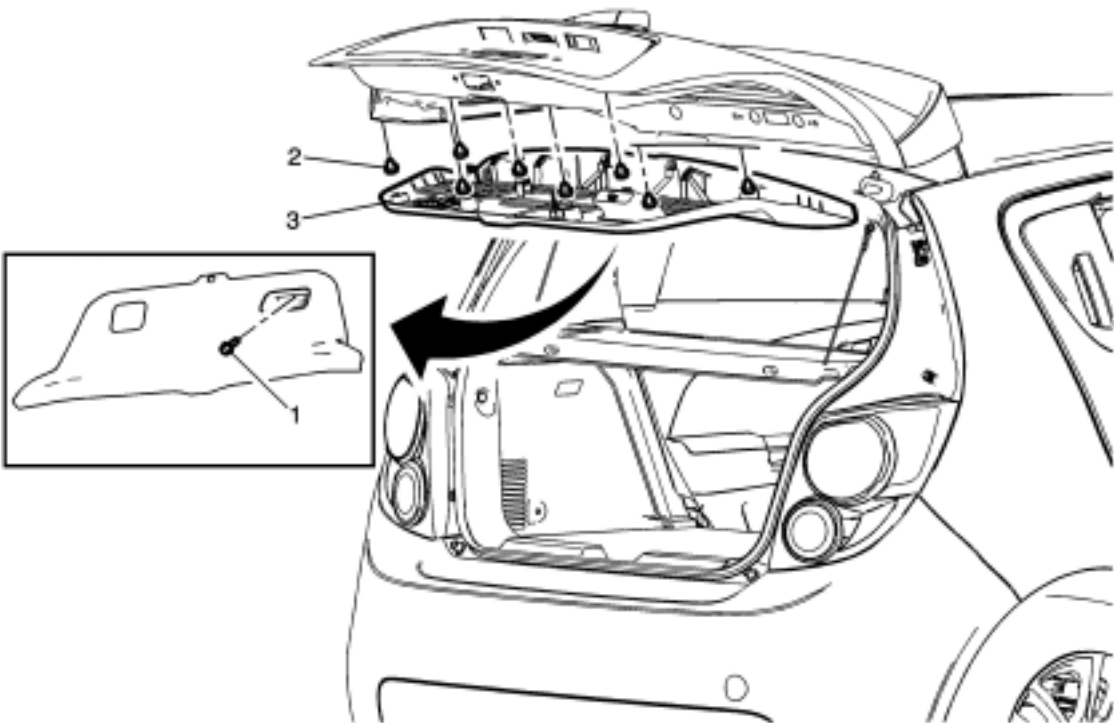
Callout	Component Name
1	Rear Side Door Inside Handle Bolt Cap
2	<div>Rear Side Door Inside Handle Fastener</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Procedure</b></div> <div>Pull handle back to remove cap. Use suitable tool to unsnap.</div>
3	<div>Rear Side Door Trim Fastener</div> <div><b>Procedure</b></div> <div>Use a small flat-bladed tool to open the rear side door trim integral cap to access the fastener.</div>
4	<div>Rear Side Door Trim Assembly</div> <div><b>Procedure</b></div> <div><div>1. Use the appropriate plastic trim tool to aid in the removal of the door trim.</div><div>2. Pull upwards on the door lock retainer cable to disengage.</div><div>3. Disconnect the electrical connector.</div></div>

Luggage Shade Replacement (Hatchback)



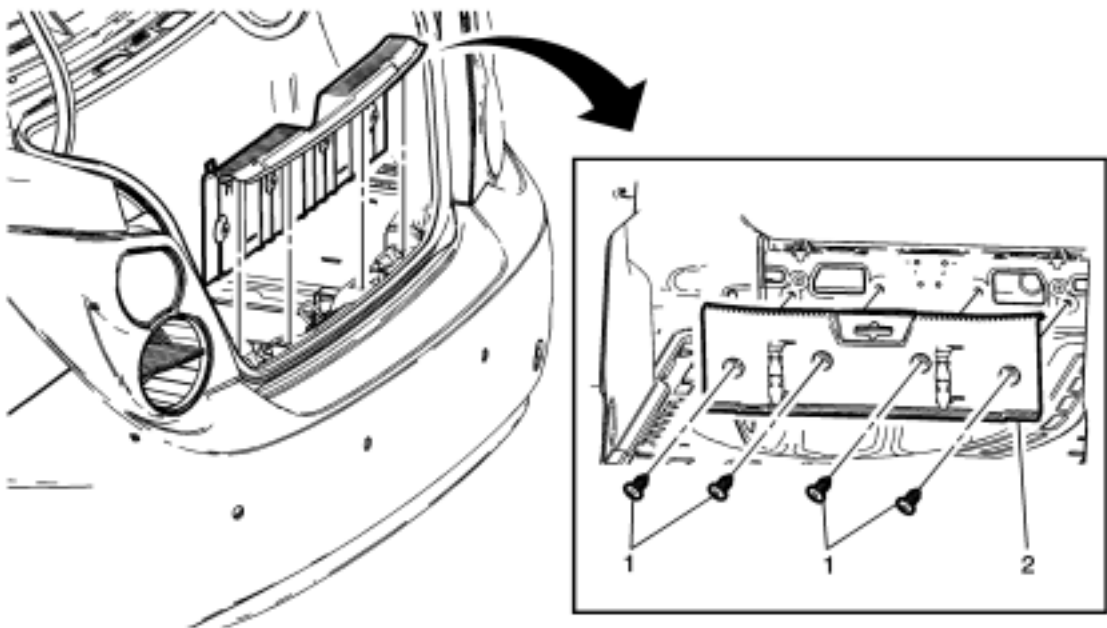
Callout	Component Name
1	<div>Luggage Shade Assembly</div> <div><b>Procedure</b></div> <div>Detach luggage shade from upper support.</div>

Liftgate Trim Finish Panel Replacement (Hatchback)



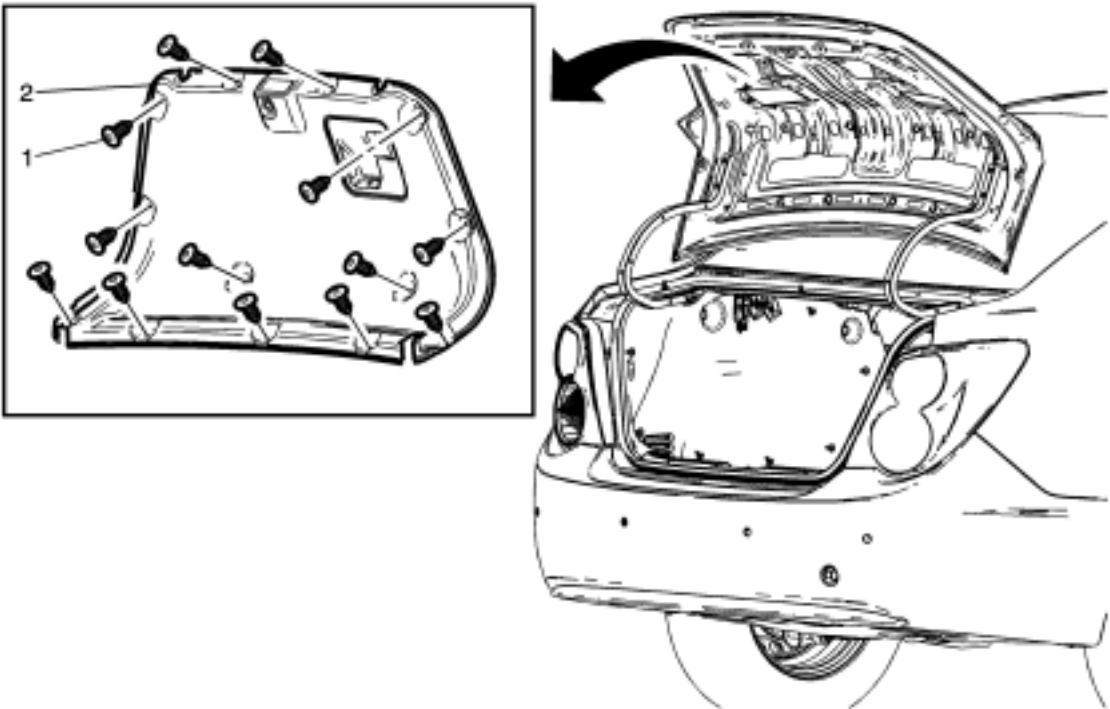
Callout	Component Name
1	Liftgate Trim Finish Panel Fastener <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .
2	Liftgate Trim Finish Panel Retainer (Qty: 8)
3	Liftgate Trim Finish Panel Assembly <b>Procedure</b> Use a trim tool or equivalent to aid in removal.

Rear Compartment Sill Trim Plate Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Partially remove the rear compartment opening weatherstrip. Refer to <a href="#">Rear Compartment Lid Weatherstrip Replacement</a> .</p>	
1	Rear Compartment Sill Trim Plate Retainer (Qty: 4)
2	Rear Compartment Sill Trim Plate Assembly

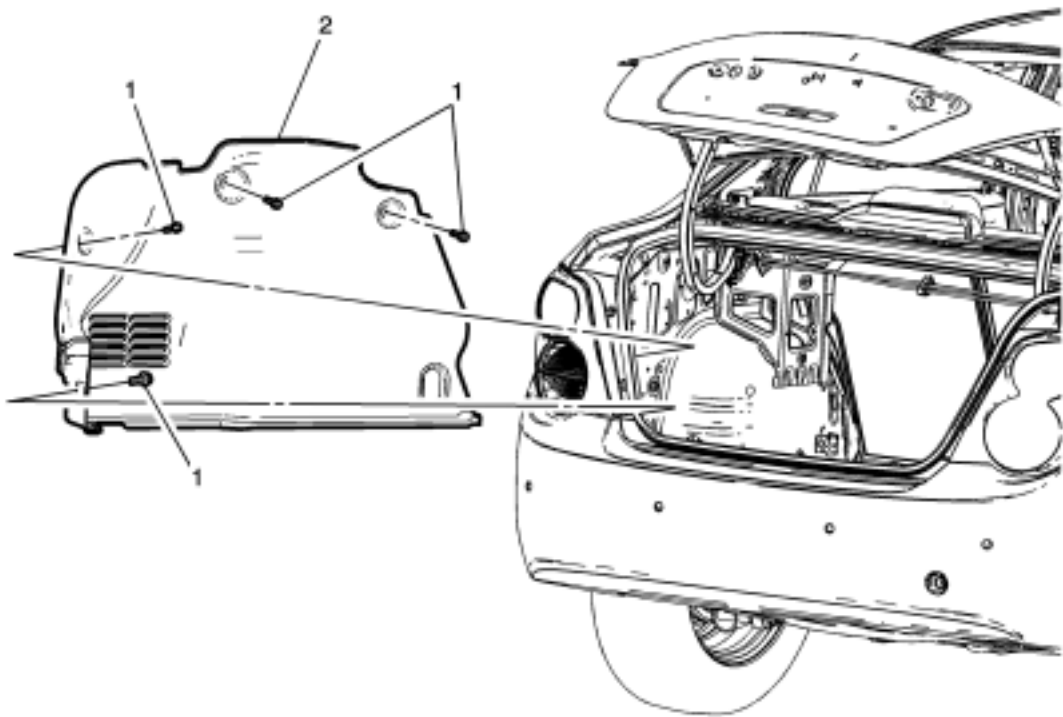
Rear Compartment Lid Inner Panel Trim Replacement (Sedan)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear compartment lid outer bumpers.</p> <p>2. Remove the latch cover.</p>	
1	<p>Rear Compartment Lid Inner Panel Trim Retainer (Qty: 13)</p> <p><b>Procedure</b></p> <p>Use a trim removal tool to aid in the removal of the rear compartment trim panel.</p>
2	<p>Rear Compartment Lid Inner Panel Trim</p>

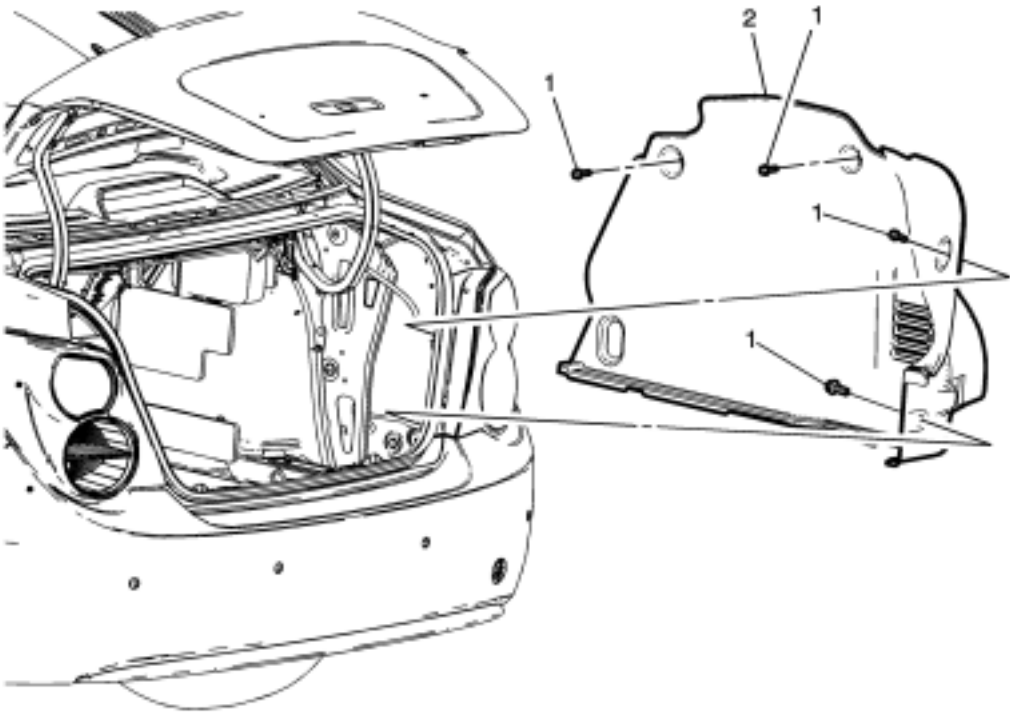


Rear Compartment Side Trim Replacement - Left Side (Sedan)



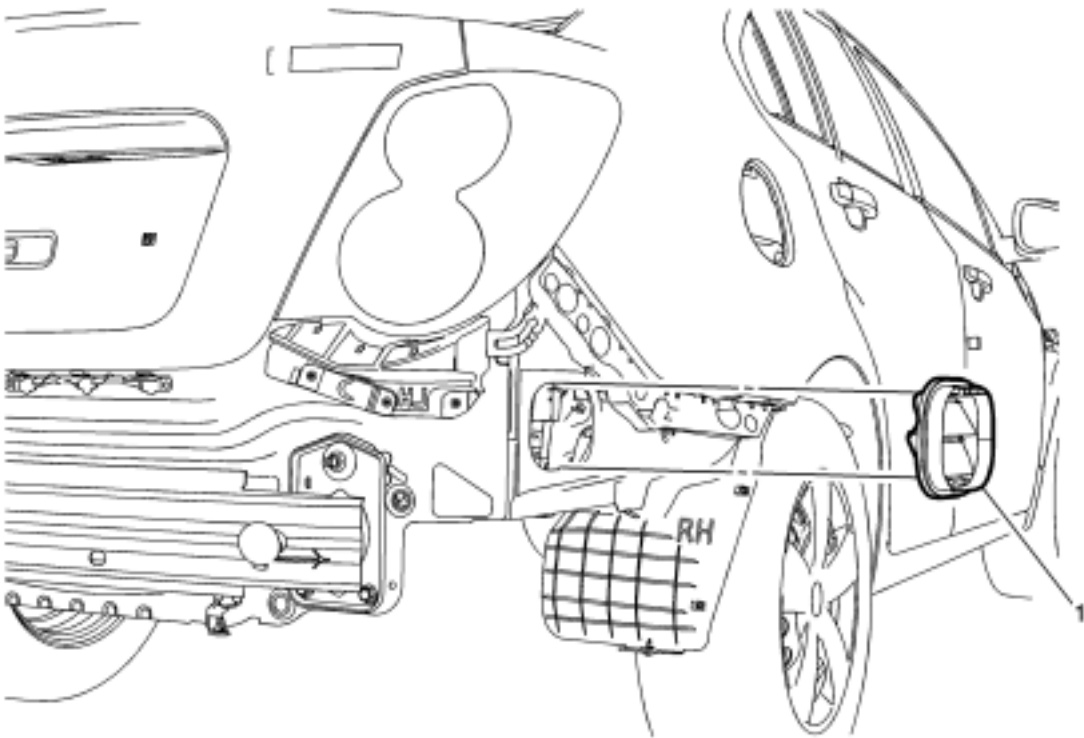
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear compartment floor panel carpet. Refer to <a href="#">Rear Compartment Floor Panel Carpet Replacement</a> .</p> <p>2. Remove the rear compartment sill trim plate. Refer to <a href="#">Rear Compartment Sill Trim Plate Replacement</a> .</p>	
1	Rear Compartment Side Trim Retainer (Qty: 4)
2	Rear Compartment Side Trim

Rear Compartment Side Trim Replacement - Right Side (Sedan)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear compartment floor panel carpet. Refer to <a href="#">Rear Compartment Floor Panel Carpet Replacement</a> .</p> <p>2. Remove the rear compartment sill trim plate. Refer to <a href="#">Rear Compartment Sill Trim Plate Replacement</a> .</p>	
1	Rear Compartment Side Trim Retainer (Qty: 4)
2	Rear Compartment Side Trim

Quarter Outer Panel Pressure Relief Valve Replacement



Callout	Component Name
<b>Preliminary Procedures</b> Remove the rear bumper fascia. Refer to <a href="#">Rear Bumper Fascia Replacement</a>	
1	Pressure Relief Valve



Bolted Exterior Body Panels and Closures  
Bumpers and Fascias  
Collision Repair

Frame and Underbody  
Paint and Coatings  
Plastic Panel Information and Repair





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Hood Insulator Replacement	Rear Side Door Weatherstrip Replacement - Door Side	
Hood Primary and Secondary Latch Replacement	Rear Side Door Weatherstrip Replacement - Body Side	
Rear Compartment Lid Adjustment	Description and Operation	
	Special Tools	

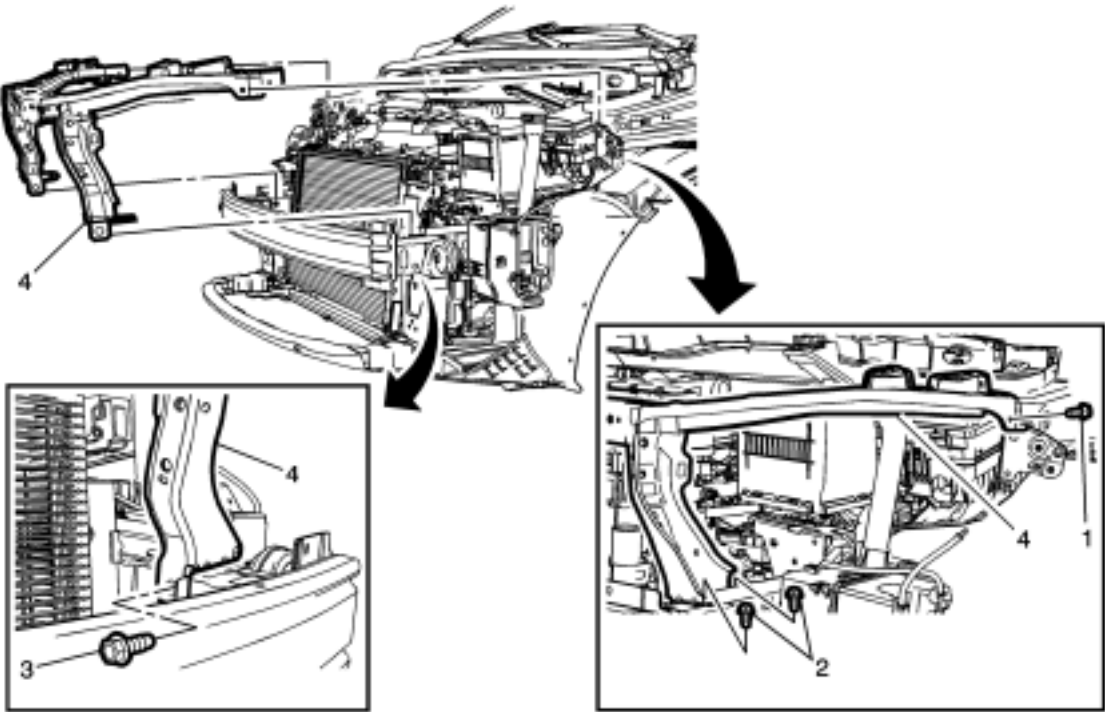


Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Bumper Impact Bar Bolt	100 N·m	74 lb in
Front End Upper Tie Bar Bolt	9 N·m	80 lb in
Front End Upper Tie Bar Lower Bolt	22 N·m	16 lb in
Front Fender Bolts	9 N·m	80 lb in
Front Fender Nut	9 N·m	80 lb in
Front Side Door Check Link Bolt to Body	22 N·m	16 lb in
Front Side Door Check Link Nut	9 N·m	80 lb in
Front Side Door Lower Hinge to Body Bolt	32 N·m	24 lb ft
Front Side Door Lower Hinge to Door Bolt	25 N·m	18 lb ft
Front Side Door Upper Hinge to Body Bolt	32 N·m	24 lb ft
Front Side Door Upper Hinge to Door Bolt	25 N·m	18 lb ft
Hood Hinge Bolts	22 N·m	16 lb ft
Hood Hinge Nuts	22 N·m	16 lb ft
Hood Primary and Secondary Latch Bolts	22 N·m	16 lb ft

Liftgate Hinge Bolts	22 N·m	16 lb ft
Liftgate Hinge Nuts	40 N·m	30 lb ft
Radiator Opening Upper Cover Bolts	9 N·m	80 lb in
Rear Compartment Lid Bolt	9 N·m	80 lb ft
Rear Compartment Lid Rear Hinge Bolt	9 N·m	80 lb in
Rear Side Door Check Link Bolt to Body	22 N·m	16 lb in
Rear Side Door Check Link Nut	9 N·m	80 lb in
Rear Side Door Lower Hinge to Body Bolts	32 N·m	24 lb ft
Rear Side Door Lower Hinge to Door Bolts	25 N·m	18 lb ft
Rear Side Door Upper Hinge to Body Bolts	32 N·m	24 lb ft
Rear Side Door Upper Hinge to Door Bolts	25 N·m	18 lb ft

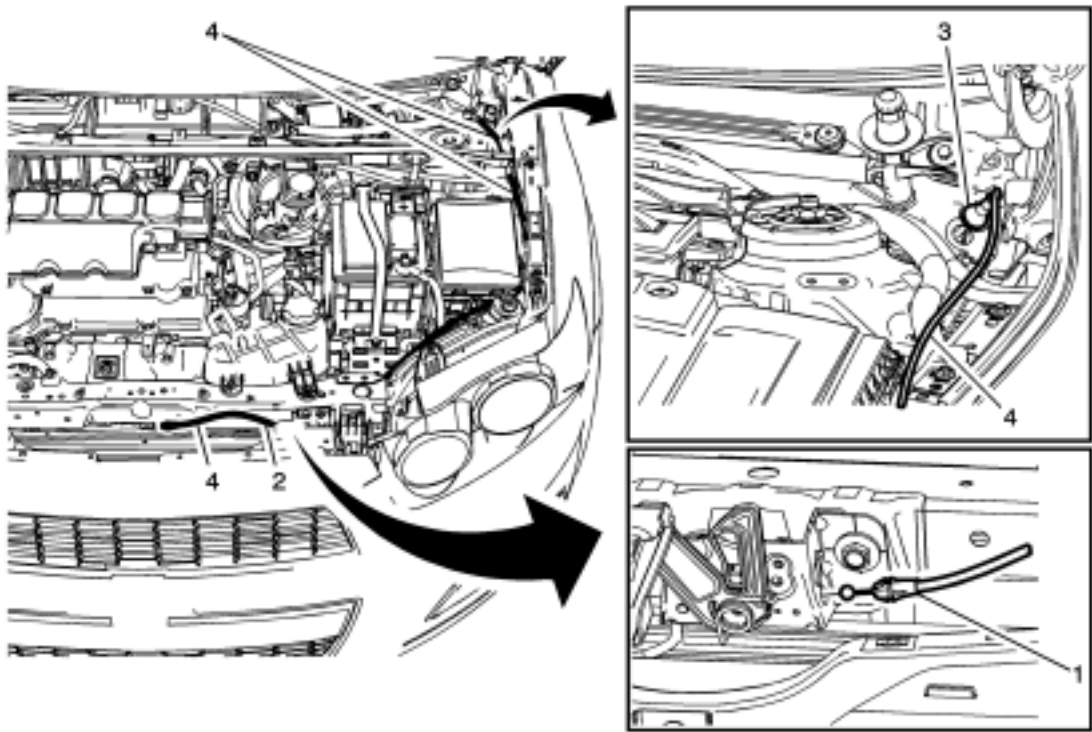
Front End Upper Tie Bar Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</p> <p>2. Remove the front fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p> <p>3. Remove the headlamps. Refer to <a href="#">Headlamp Replacement</a> .</p> <p>4. Remove the front fenders. Refer to <a href="#">Front Fender Replacement</a> .</p> <p>5. Reposition the radiator with the A/C condenser from the upper tie bar. Refer to <a href="#">Radiator Replacement</a> .</p> <p>6. Remove the hood primary and secondary latch. Refer to <a href="#">Hood Primary and Secondary Latch Replacement</a> .</p> <p>7. Remove the front end inflatable restraint discriminating sensor. Refer to <a href="#">Front End Inflatable Restraint Discriminating Sensor Replacement</a> .</p>	
1	<p>Front End Upper Tie Bar Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Front End Upper Tie Bar Lower Bolt (Qty: 4)</p> <p><b>Tighten</b> 22 N·m (16 lb ft)</p>
3	<p>Front Bumper Impact Bar Bolt (Qty: 2)</p> <p><b>Tighten</b> 100 N·m (74 lb ft)</p>
4	<p>Front End Upper Tie Bar</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connectors/harnesses as needed.</p> <p>2. Disconnect the hood latch cable from the tie bar.</p> <p>3. Transfer any parts as needed.</p>

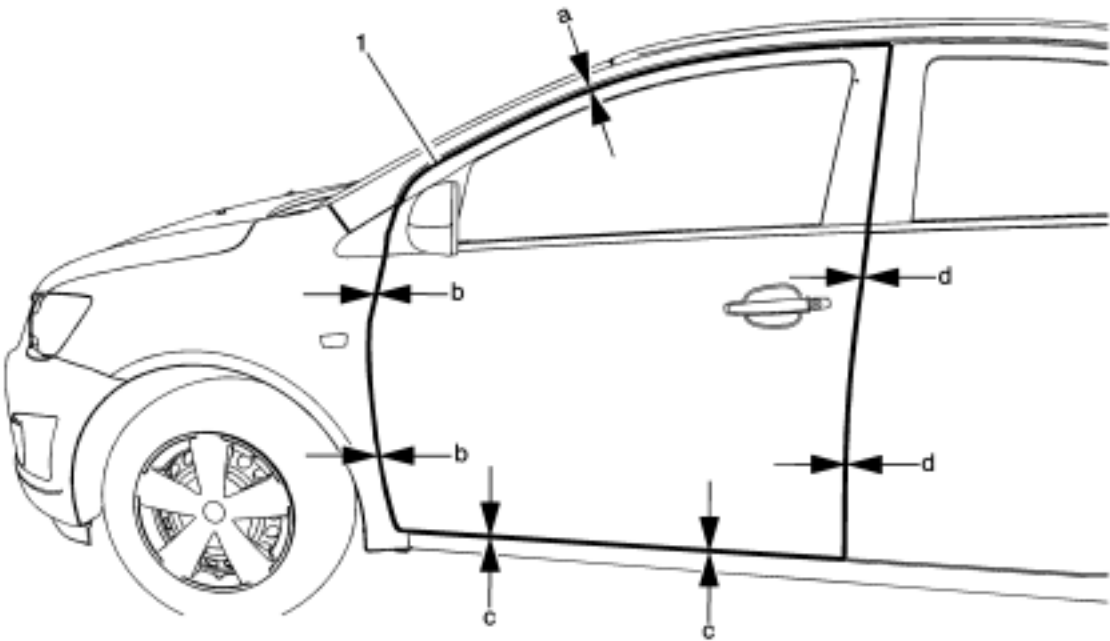


Hood Primary Latch Release Cable Replacement



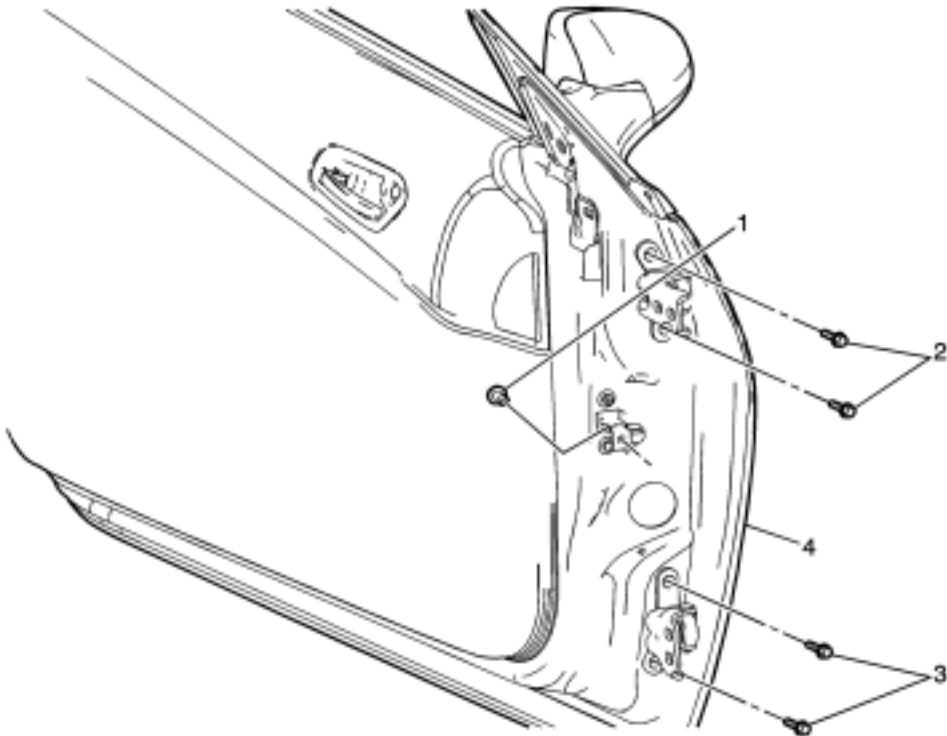
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the radiator opening upper cover. Refer to <a href="#">Radiator Opening Upper Cover Replacement</a> .</p> <p>2. Remove the air inlet grille. Refer to <a href="#">Air Inlet Grille Panel Replacement</a> .</p>	
1	<p>Hood Primary Latch Cable</p> <p><b>Procedure</b></p> <p>Disconnect the hood primary latch release cable from the primary hood latch.</p>
2	<p>Hood Primary Latch Release Cable Retainer</p> <p><b>Procedure</b></p> <p>Disconnect the hood release cable retainers from the hood release cable.</p>
3	<p>Hood Primary Latch Release Cable Grommet</p>
4	<p>Hood Primary Latch Release Cable</p> <p><b>Procedure</b></p> <p>Disconnect the hood primary latch release cable handle from the hood latch cable. Refer to <a href="#">Hood Primary Latch Release Cable Handle Replacement</a> .</p>

Front Side Door Adjustment



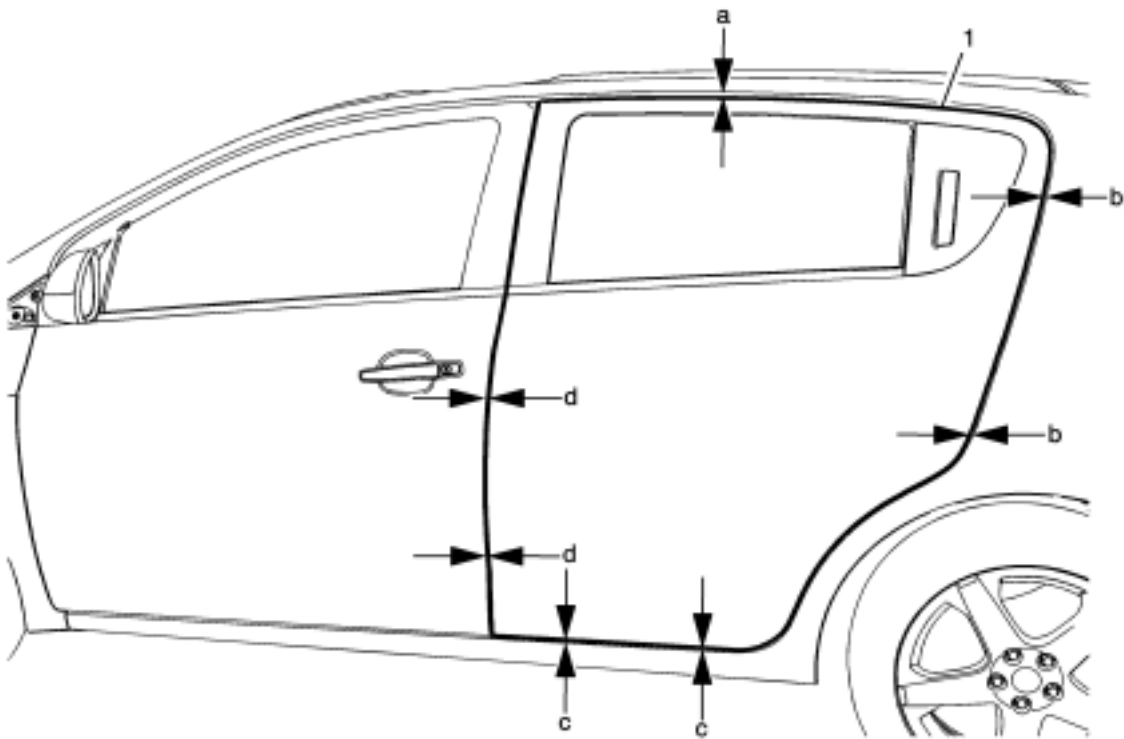
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front wheelhouse liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p>	
1	<p>Front Side Door</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Loosen the front side door hinge bolt (Qty: 4) to adjust the front side door.</p> <p>2. Adjust the front side door in order to obtain an even gap between the front side door and the roof, the rear door, the rocker panel and the front fender and so that the front side door is flush with the roof, the rear door, the rocker panel and the front fender.</p> <p><b>Adjustment</b></p> <ul style="list-style-type: none"><li>• Front side door to roof (a) 4.5 mm ± 1.0 mm (0.18 in ± 0.04 in)</li><li>• Front side door to rear door (b) 3.5 mm ± 0.75 mm (0.14 in ± 0.03 in)</li><li>• Front side door to rocker panel (c) 5.0 mm ± 1.0 mm (0.20 in ± 0.04 in)</li><li>• Front side door to front fender (d) 3.5 mm ± 0.75 mm (0.14 in ± 0.03 in)</li></ul> <p><b>Tighten</b> 25 N·m (19 lbft)</p>

Front Side Door Replacement



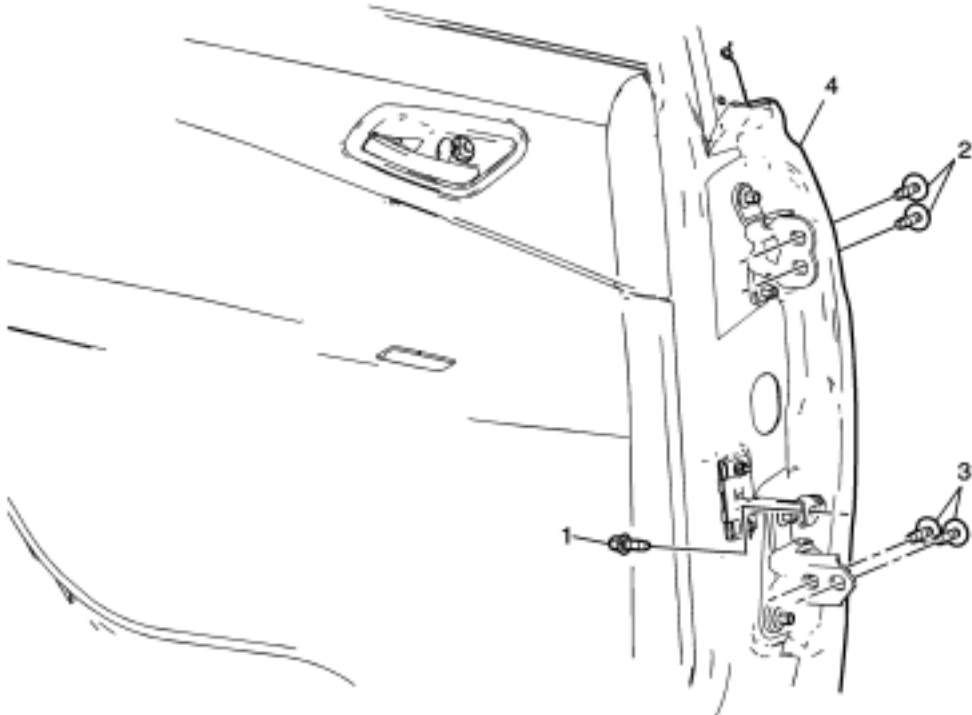
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Preliminary Procedures</b></p> <p>1. Mark the location of the hinge before removing the bolts with a grease pencil. 2. Remove the front door trim panel. Refer to <a href="#">Front Side Door Trim Replacement</a> .</p>	
1	<p>Front Side Door Check Link Bolt to Body</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the water deflector. 2. Disconnect the door electrical connector. 3. Support the door before removing the hinge bolts. 4. With an assistant, remove the door. 5. After the door has been removed, ensure that the dome lamp is off. If the dome lamp is on remove the fuse.</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Front Side Door Upper Hinge Bolt to Door (Qty: 2)</p> <p><b>Tighten</b> 25 N·m (18 lbft)</p>
3	<p>Front Side Door Lower Hinge Bolt to Door (Qty: 2)</p> <p><b>Tighten</b> 25 N·m (18 lbft)</p>
4	<p>Front Side Door Assembly</p> <p><b>Procedure</b></p> <p>1. When replacing the door it is necessary to transfer all of the internal components. 2. If the door striker needs adjust. Refer to <a href="#">Front Side Door Lock Striker Adjustment</a> . 3. Front door adjustment. Refer to <a href="#">Front Side Door Adjustment</a> .</p>

Rear Side Door Adjustment (4 Door Notch Back 69)



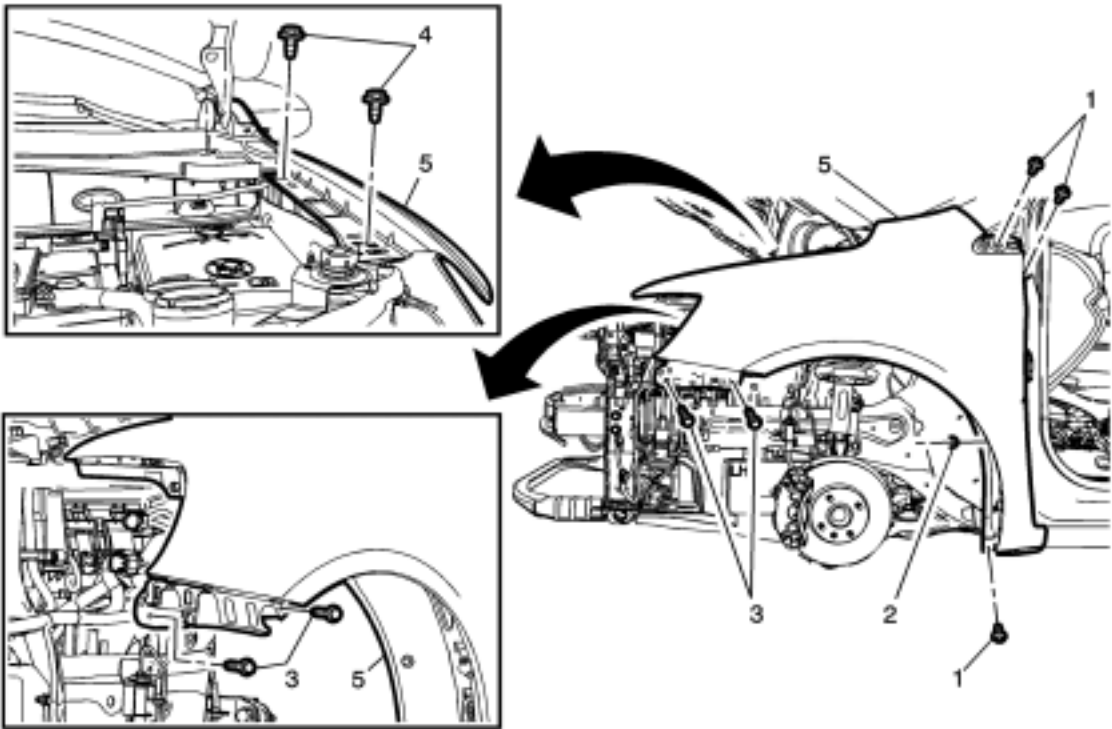
Callout	Component Name
1	<p>Rear Side Door</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Loosen the rear door hinge bolt (Qty: 4) to adjust the rear door.</p> <p>2. Adjust the rear door in order to obtain an even gap between the rear door and the roof, the quarter outer panel, the rocker panel and the front side door and so that the rear door is flush with the roof, the quarter outer panel, the rocker panel and the front side door.</p> <p>Adjustment Rear side door to roof (a) 4.5 mm ± 1.0 mm (0.18 in ± 0.04 in) Rear side door to quarter outer panel (b) 3.8 mm ± 0.75 mm (0.15 in ± 0.03 in) Rear side door to rocker panel (c) 5.0 mm ± 1.0 mm (0.20 in ± 0.04 in) Rear side door to front side door (d) 3.5 mm ± 0.75 mm (0.14 in ± 0.03 in)</p> <p><b>Adjustment</b></p> <ul style="list-style-type: none"><li>• Rear side door to roof (a) 4.5 mm ± 1.0 mm (0.18 in ± 0.04 in)</li><li>• Rear side door to quarter outer panel (b) 3.8 mm ± 0.75 mm (0.15 in ± 0.03 in)</li><li>• Rear side door to rocker panel (c) 5.0 mm ± 1.0 mm (0.20 in ± 0.04 in)</li><li>• Rear side door to front side door (d) 3.5 mm ± 0.75 mm (0.14 in ± 0.03 in)</li></ul> <p><b>Tighten</b> 25 N·m (19 lb ft)</p>

Rear Side Door Replacement



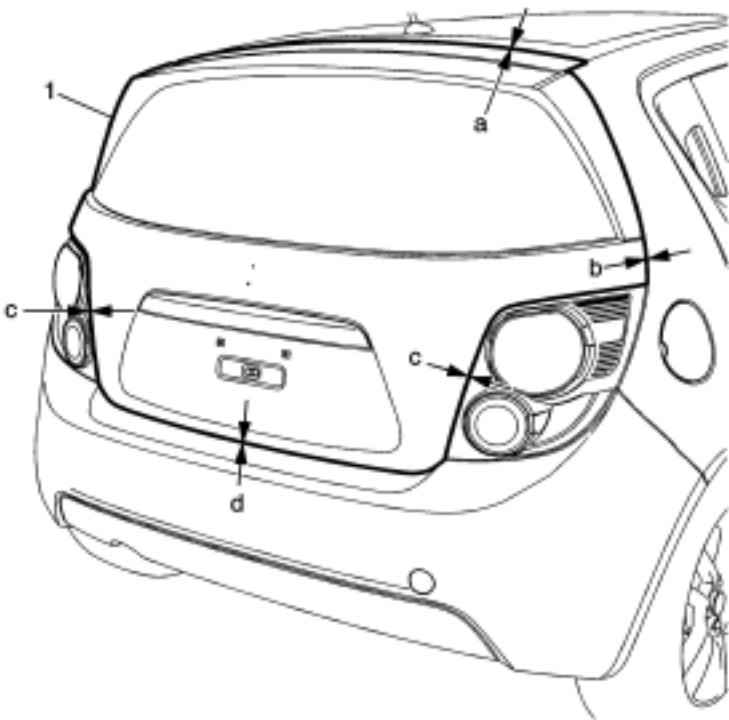
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Preliminary Procedures</b></p> <p>1. Mark the location of the hinge before removing the bolts with a grease pencil. 2. Remove the rear door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</p>	
1	<p>Rear Side Door Check Link Bolt to Body</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the water deflector. 2. Disconnect the door electrical connector. 3. Support the door before removing the hinge bolts. 4. With an assistant, remove the door. 5. After the door has been removed, ensure that the dome lamp is off. If the dome lamp is on remove the fuse.</p> <p><b>Tighten</b> 22 N·m (16 lb ft)</p>
2	<p>Rear Side Door Hinge Bolt to Door (Qty: 2)</p> <p><b>Tighten</b> 32 N·m (24 lb ft)</p>
3	<p>Rear Side Door Hinge Bolt to Door (Qty: 2)</p> <p><b>Tighten</b> 32 N·m (24 lb ft)</p>
4	<p>Rear Side Door Assembly</p> <p><b>Procedure</b></p> <p>1. When replacing the door it is necessary to transfer all of the internal components. 2. If the door striker needs adjust. Refer to <a href="#">Rear Side Door Lock Striker Adjustment</a> . 3. Rear door adjustment. Refer to <a href="#">Rear Side Door Adjustment</a> .</p>

Front Fender Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p> <p>2. Remove the headlamp. Refer to <a href="#">Headlamp Replacement</a> .</p> <p>3. Remove the front wheelhouse liner front and rear. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p> <p>4. Remove the body side upper front applique. Refer to <a href="#">Body Side Upper Front Applique Replacement</a> .</p> <p>5. Remove the front bumper fascia guide. Refer to <a href="#">Front Bumper Fascia Guide Replacement</a> .</p>	
1	<p>Front Fender Bolt (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Front Fender Nut</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
3	<p>Front Fender Bolt (Qty: 2)</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
4	<p>Front Fender Bolt (Qty: 2)</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
5	<p>Front Fender</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connectors.</p> <p>2. Transfer parts as needed.</p>

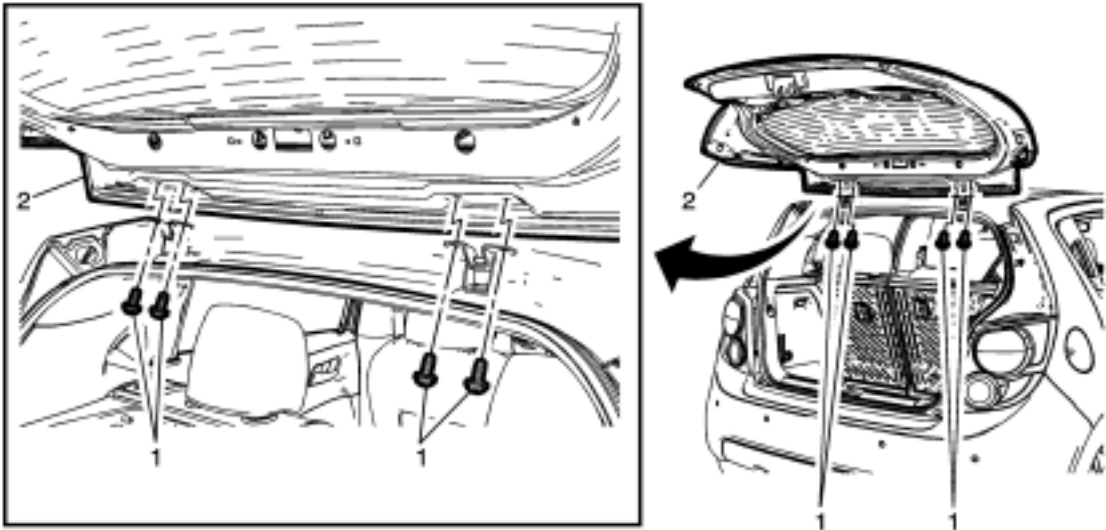
Liftgate Adjustment



Callout	Component Name
1	<p>Liftgate</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Loosen the 4 liftgate hinge bolts to adjust the liftgate. 2. Adjust the liftgate in order to obtain an even gap between the liftgate and the roof, the quarter outer panel, the tail lamp and rear bumper fascia and so that the liftgate is flush with the roof, the quarter outer panel, the tail lamp and rear bumper fascia.</p> <p><b>Adjustment:</b></p> <ul style="list-style-type: none"><li>• Liftgate to roof (a) 5.5 mm ± 1.0 mm (0.22 in ± 0.04 in)</li><li>• Liftgate to quarter outer panel (b) 4.0 mm ± 1.0 mm (0.16 in ± 0.04 in)</li><li>• Liftgate to tail lamp (c) 3.5 mm ± 1.0 mm (0.14 in ± 0.04 in)</li><li>• Liftgate to rear bumper fascia (d) 5.0 mm ± 1.0 mm (0.20 in ± 0.04 in)</li></ul> <p><b>Tighten</b> 22 N·m (16 lbft)</p>



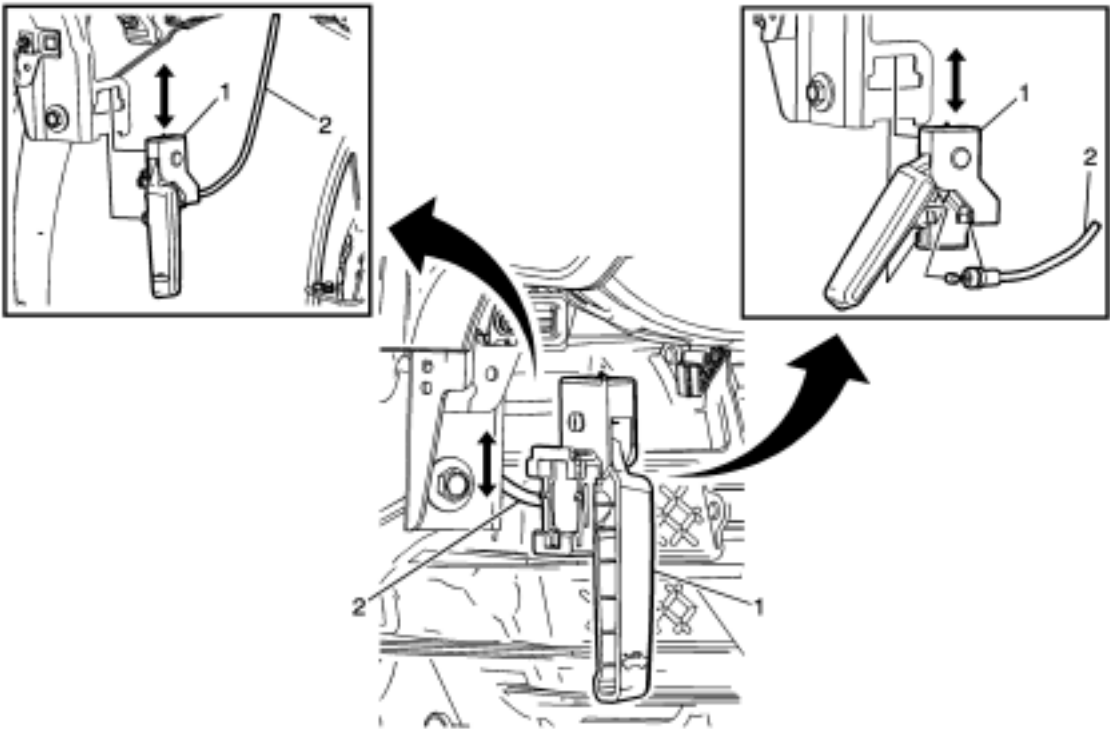
Liftgate Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Disconnect the electrical connectors.</p> <p>2. Disconnect the liftgate struts. Refer to <a href="#">Liftgate Strut Replacement</a> .</p> <p>3. Remove the body lock pillar upper trim. Refer to <a href="#">Body Lock Pillar Upper Trim Panel Replacement</a> .</p>	
1	<p>Liftgate Hinge Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lb ft)</p>
2	<p>Liftgate</p> <p><b>Procedure</b></p> <p>1. Transfer parts as needed.</p> <p>2. Adjust the liftgate if needed. Refer to <a href="#">Liftgate Adjustment</a> .</p>

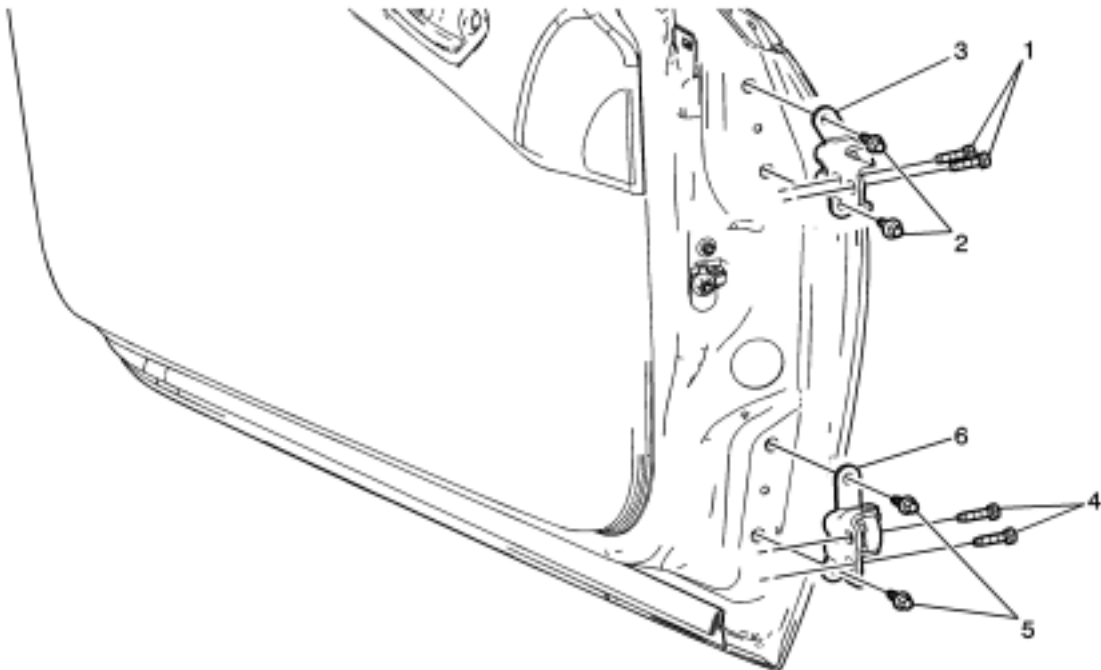


Hood Primary Latch Release Cable Handle Replacement



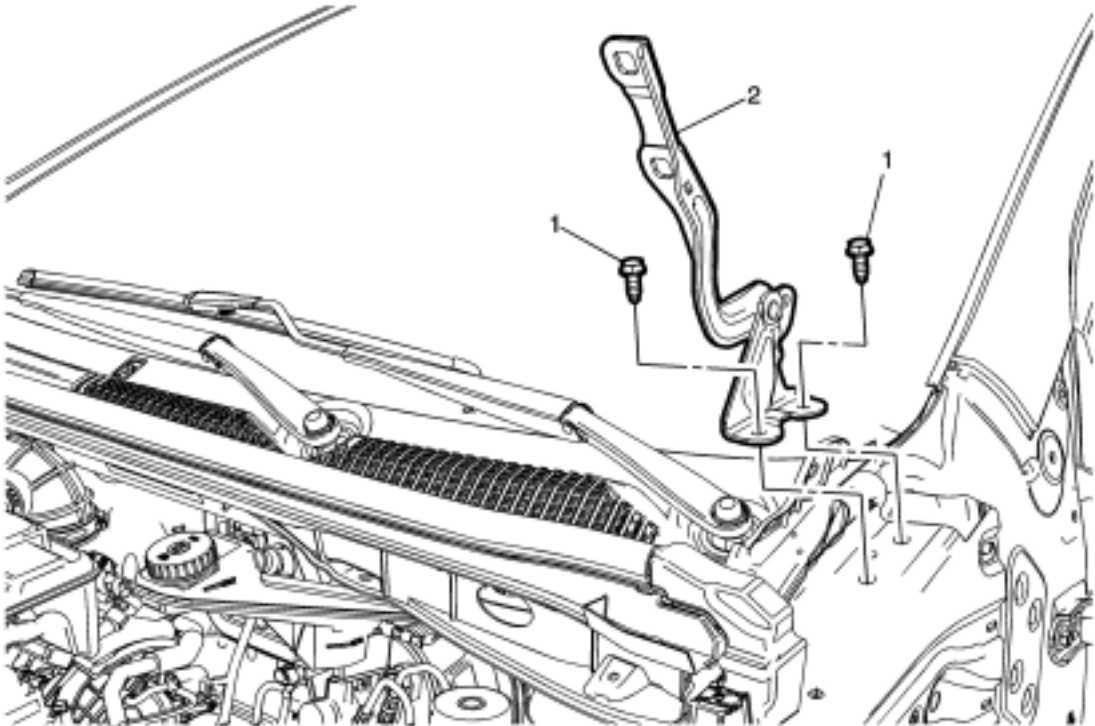
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door opening floor carpet retainer. Refer to <a href="#">Front Side Door Opening Floor Carpet Retainer Replacement</a> .</p>	
1	<p>Hood Primary Latch Release Cable Handle</p> <p><b>Procedure</b></p> <p>Press the release cable handle upward to release the retainers from the instrument panel bracket.</p>
2	<p>Hood Primary Latch Release Cable</p> <p><b>Procedure</b></p> <p>Disconnect the hood release cable from the hood release handle.</p>

Front Side Door Upper Hinge and Lower Hinge Replacement



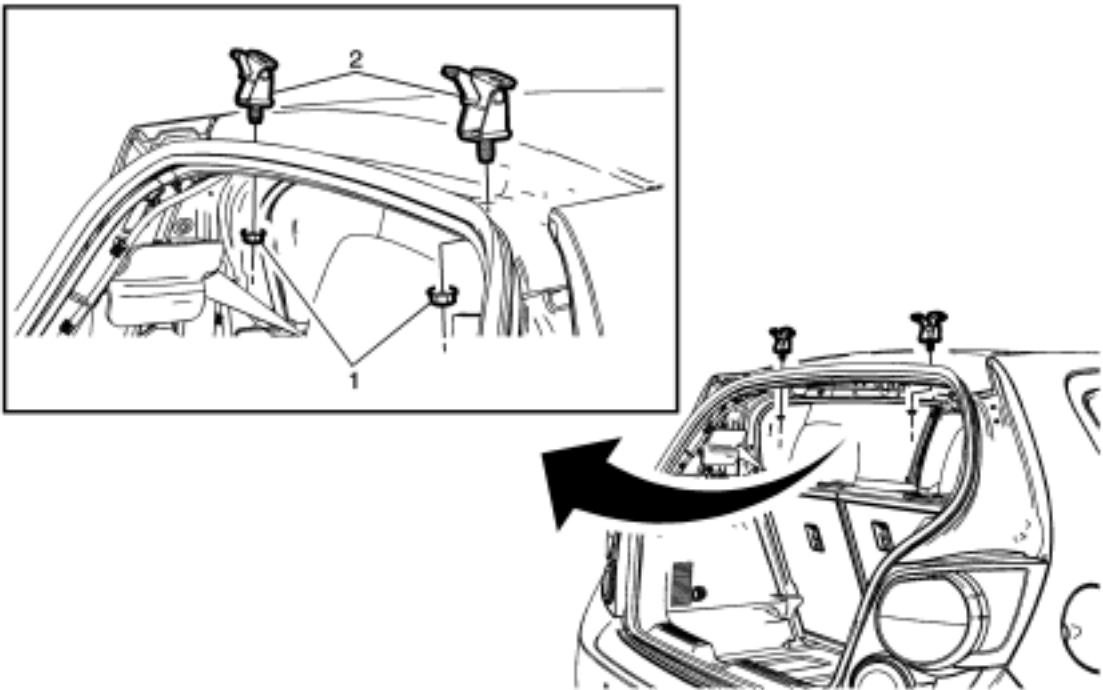
Callout	Component Name
1	<p>Front Side Door Upper Hinge to Body Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedures</b></p> <p>1. Before removing the door, apply a double layer of masking tape around the perimeter of the painted surfaces.</p> <p>2. Mark the location of the hinge being removed.</p> <p>3. Remove the front wheelhouse liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p> <p>4. Support the door before removing the hinge bolts.</p> <p><b>Tighten</b> 32 N·m (24 lbft)</p>
2	<p>Front Side Door Upper Hinge to Door Bolt (Qty: 2)</p> <p><b>Tighten</b> 25 N·m (18 lbft)</p>
3	<p>Front Side Door Upper Hinge</p>
4	<p>Front Side Door Lower Hinge to Body Bolt (Qty: 2)</p> <p><b>Tighten</b> 32 N·m (24 lbft)</p>
5	<p>Front Side Door Lower Hinge to Door Bolt (Qty: 2)</p> <p><b>Tighten</b> 25 N·m (18 lbft)</p>
6	<p>Front Side Door Lower Hinge</p> <p><b>Procedure</b></p> <p>If the door striker needs adjust. Refer to <a href="#">Front Side Door Lock Striker Adjustment</a> .</p>

Hood Hinge Replacement



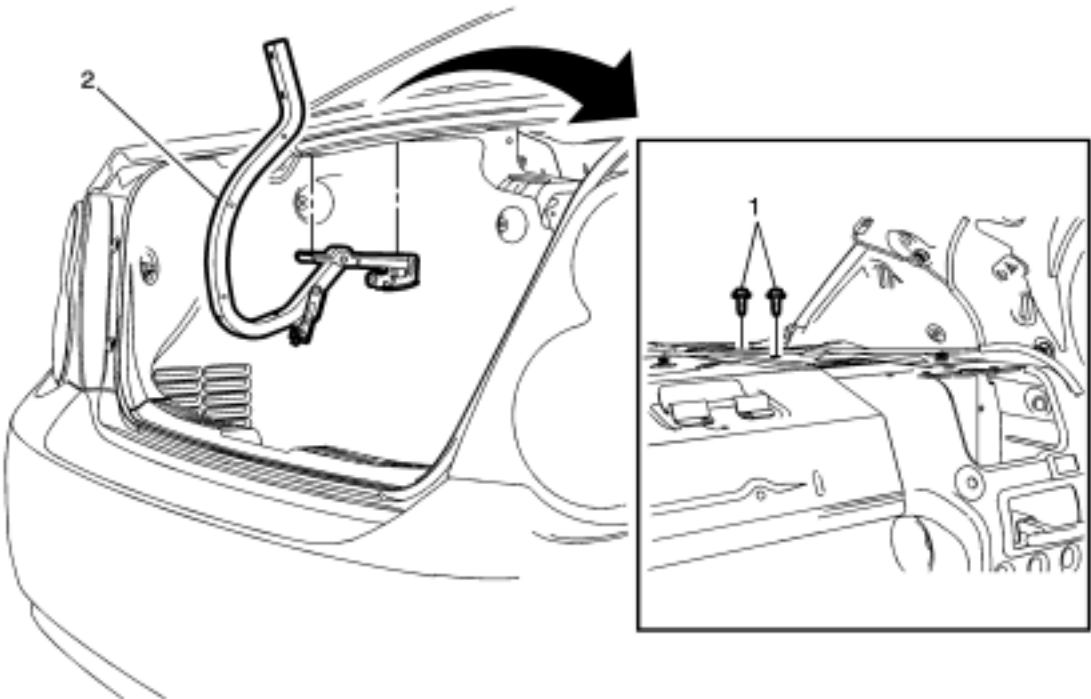
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the hood. Refer to <a href="#">Hood Replacement</a> .</p> <p>2. Remove the front fender. Refer to <a href="#">Front Fender Replacement</a> .</p>	
1	<p>Hood Hinge Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Hood Hinge</p> <p><b>Procedure</b></p> <p>Adjust the hood and hinge if needed. Refer to <a href="#">Hood Adjustment</a> .</p>

Liftgate Hinge Replacement



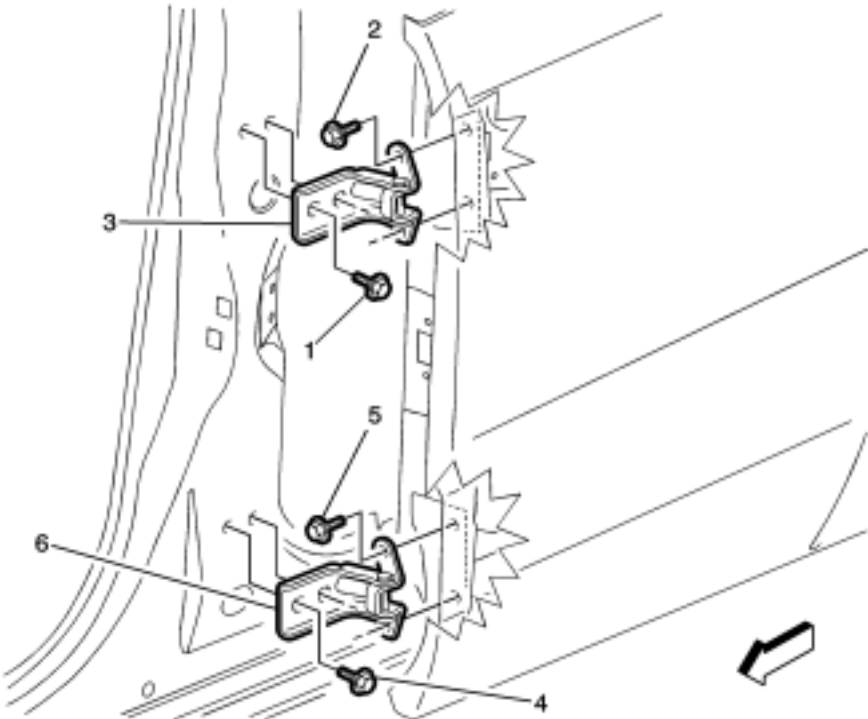
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the liftgate. Refer to <a href="#">Liftgate Replacement</a> .</p> <p>2. Lower the rear of the headliner to access the inner bolts. Refer to <a href="#">Headlining Trim Panel Replacement</a> .</p> <p>3. Use a grease pencil to mark the liftgate hinge position to the body prior to removal.</p>	
1	<p>Liftgate Hinge Nut (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 40 N·m (30 lb ft)</p>
2	<p>Liftgate Hinge (Qty: 2)</p> <p><b>Procedure</b></p> <p>Adjust the liftgate if needed.</p>

Rear Compartment Lid Rear Hinge Replacement



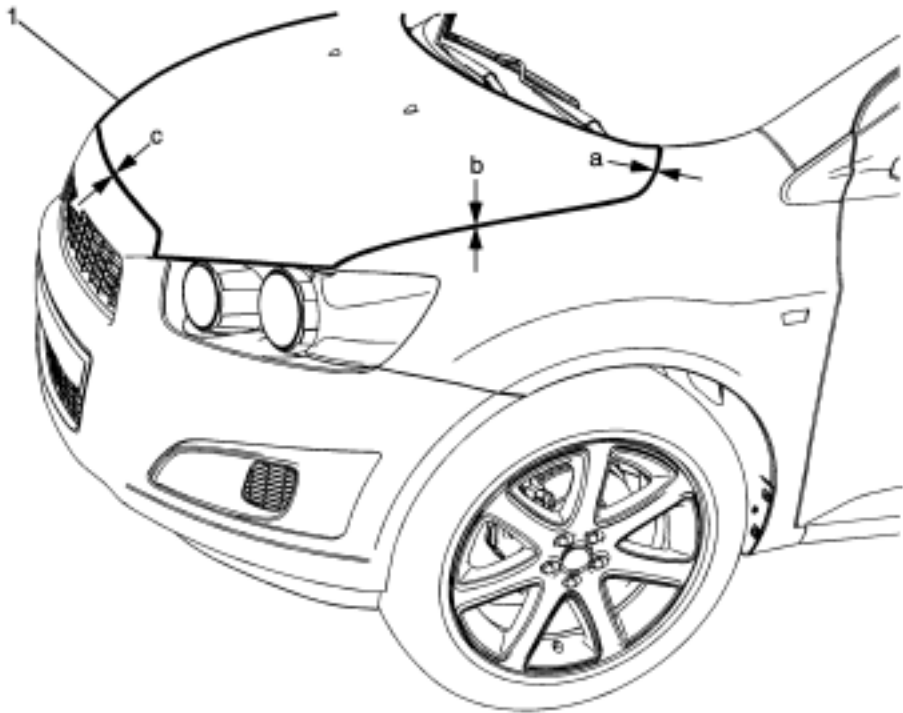
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear window trim panel. Refer to <a href="#">Rear Window Panel Trim Replacement</a> .</p> <p>2. Remove the rear compartment lid. Refer to <a href="#">Rear Compartment Lid Replacement</a> .</p> <p>3. Disconnect the rear compartment lid hinge torque rods. Refer to <a href="#">Rear Compartment Lid Hinge Torque Rod Replacement</a> .</p>	
1	<p>Rear Compartment Lid Rear Hinge Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Rear Compartment Lid Rear Hinge</p> <p><b>Procedures</b></p> <p>1. Transfer parts as needed.</p> <p>2. Adjust the rear compartment lid if needed. Refer to <a href="#">Rear Compartment Lid Adjustment</a> .</p>

Rear Side Door Upper Hinge and Lower Hinge Replacement



Callout	Component Name
1	<p>Rear Side Door Upper Hinge to Body Bolts (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedures</b></p> <p>1. Before removing the door, apply a double layer of masking tape around the perimeter of the painted surfaces.</p> <p>2. Mark the location of the hinge being removed.</p> <p>3. Support the door before removing the hinge bolts.</p> <p><b>Tighten</b> 32 N·m (24 lbft)</p>
2	<p>Rear Side Door Upper Hinge to Door Bolts (Qty: 2)</p> <p><b>Tighten</b> 25 N·m (18 lbft)</p>
3	<p>Rear Side Door Upper Hinge</p>
4	<p>Rear Side Door Lower Hinge to Body Bolts (Qty: 2)</p> <p><b>Tighten</b> 32 N·m (24 lbft)</p>
5	<p>Rear Side Door Lower Hinge to Door Bolts (Qty: 2)</p> <p><b>Tighten</b> 25 N·m (18 lbft)</p>
6	<p>Rear Side Door Lower Hinge</p> <p><b>Procedure</b></p> <p>If the door striker needs adjust. Refer to <a href="#">Rear Side Door Lock Striker Adjustment</a> .</p>

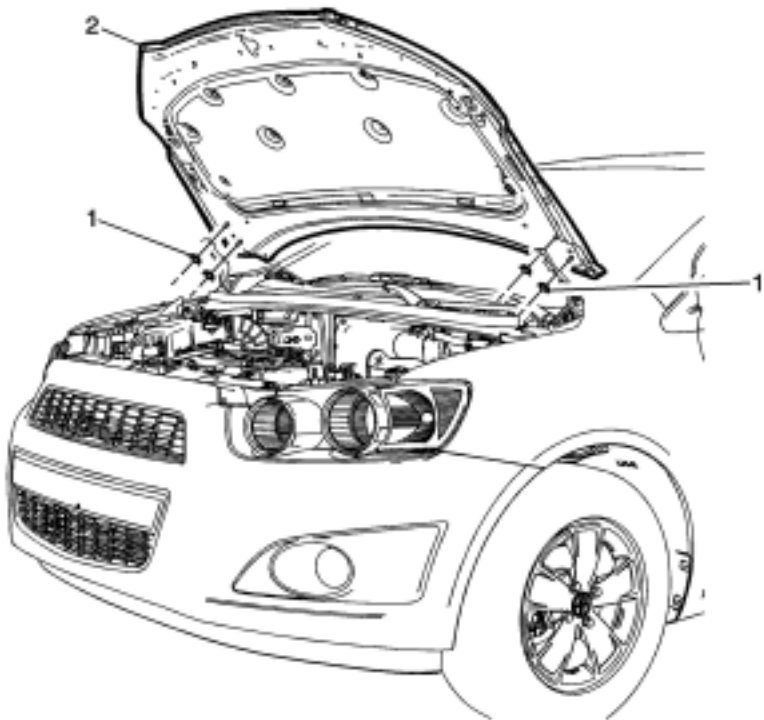
Hood Adjustment



Callout	Component Name
1	<div>Hood</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Procedure</b><div><div>1. Loosen the 4 hood hinge nuts.</div><div>2. Adjust the hood in order to obtain an even gap on both sides between the hood and the fenders, the headlamps and the front bumper fascia and so that the hood is flush with both fenders on the front edge, the front bumper fascia and the headlamps.</div></div></div> <div><b>Adjustment:</b><ul style="list-style-type: none"><li>Hood to front fender (a) 3.0 mm ± 0.75 mm (0.12 in ± 0.03 in)</li><li>Hood to headlamp (b) 3.0 mm ± 1.0 mm (0.12 in ± 0.04 in)</li><li>Hood to front bumper fascia (c) 3.0 mm ± 1.0 mm (0.12 in ± 0.04 in)</li></ul></div> <div><b>Tighten</b> 22 N·m (16 lbft)</div>



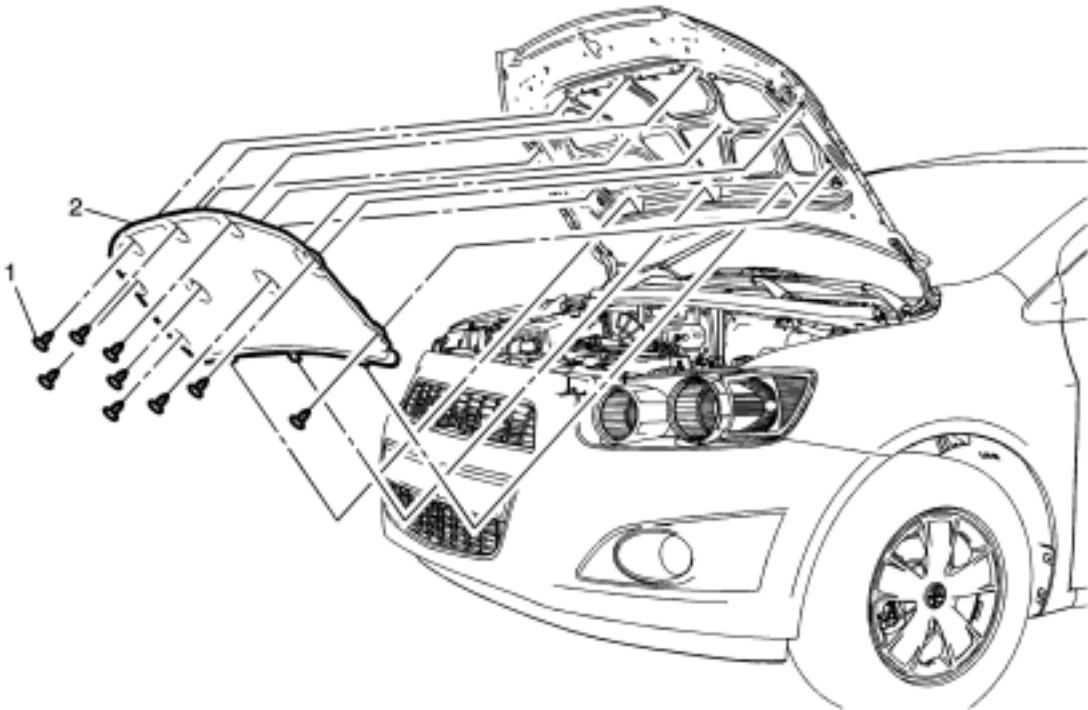
Hood Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Disconnect the windshield washer nozzle hose.</p>	
1	<p>Hood Hinge Nut (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Mark the location of the hinge to the hood with a grease pencil to aid in alignment.</p> <p><b>Tighten</b> 22 N·m (16 lb ft)</p>
2	<p>Hood</p> <p><b>Procedure</b></p> <p>1. Transfer parts as needed. 2. Adjust the hood if needed. Refer to <a href="#">Hood Adjustment</a> .</p>

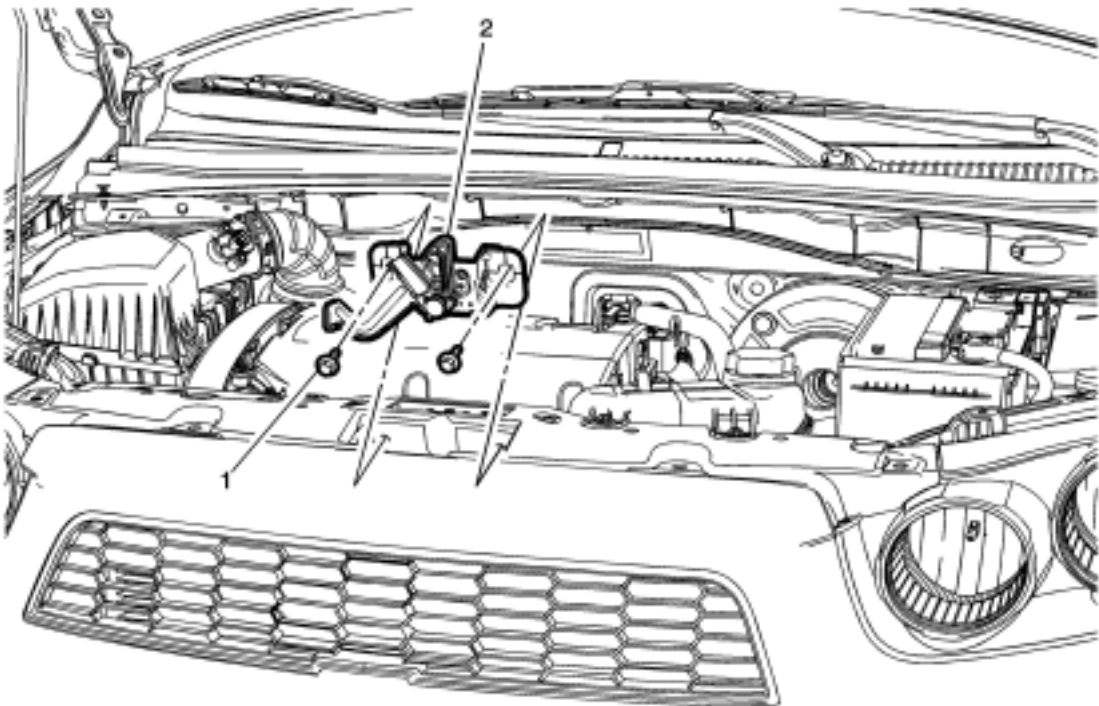


Hood Insulator Replacement



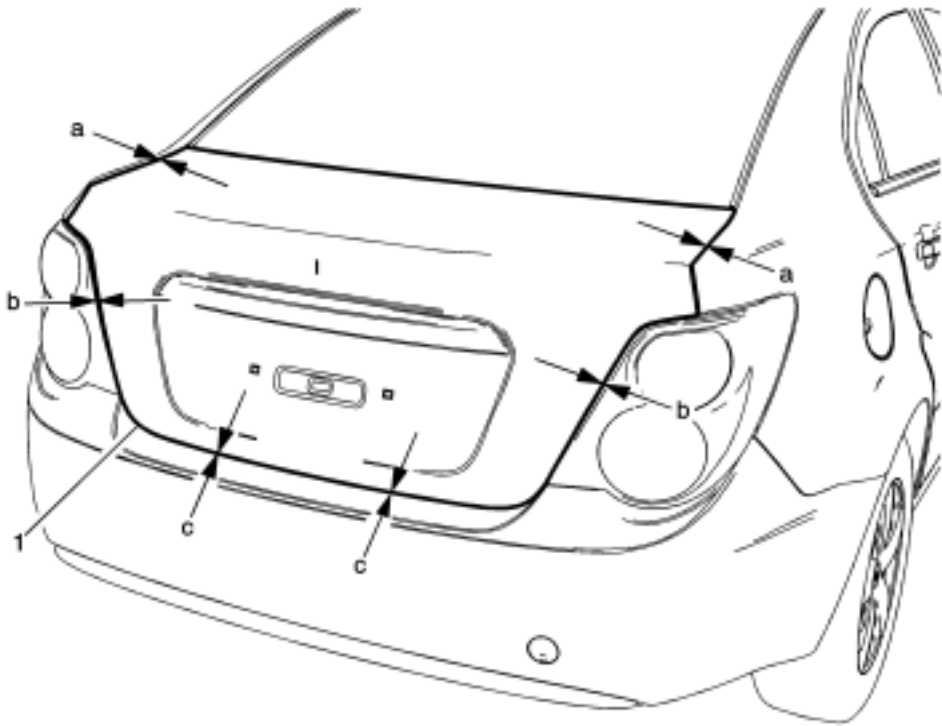
Callout	Component Name
1	Hood Insulator Plastic Retainer (Qty: 9)
2	<div>Hood Insulator</div> <div><b>Procedure</b></div> <div>Ensure the 3 integral tabs are secured to the hood.</div>

Hood Primary and Secondary Latch Replacement



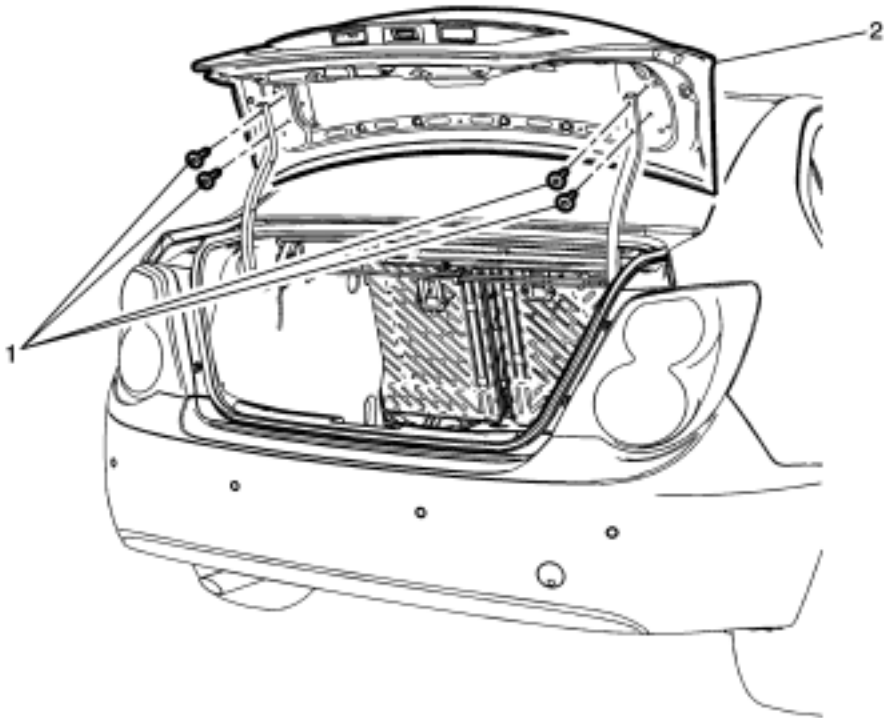
Callout	Component Name
1	<div>Hood Primary and Secondary Latch Bolt (Qty: 2)</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Tighten</b> 22 N·m (16 lbft)</div>
2	<div>Hood Primary and Secondary Latch</div> <div><b>Procedure</b></div> <div>Disconnect the release cable from the hood primary latch.</div>

Rear Compartment Lid Adjustment



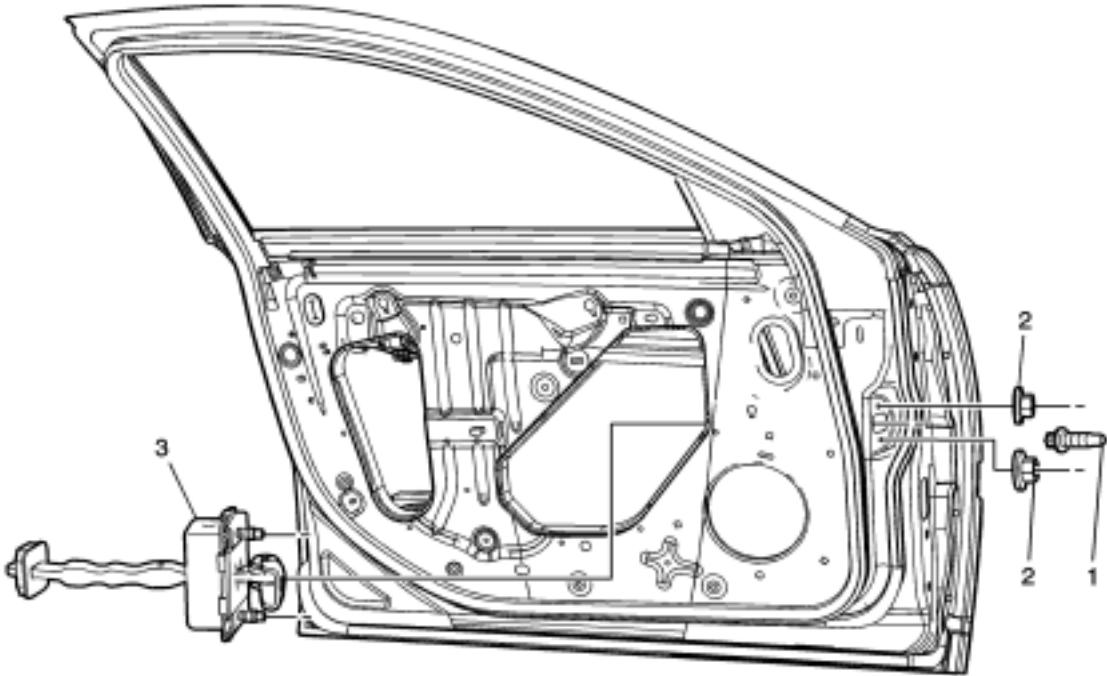
Callout	Component Name
1	<div>Rear Compartment Lid</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a></div> <div><b>Procedure</b><div><div>1. Loosen the rear compartment lid hinge bolts (Qty: 4) to adjust the rear compartment lid.</div><div>2. Adjust the rear compartment lid in order to obtain an even gap between the rear compartment lid and the quarter outer pan the rear fog lamp and the rear bumper fascia and so that the rear compartment lid is flush with the quarter outer panel, the rear fog lamp and the rear bumper fascia.</div></div>Adjustment Rear compartment lid to quarter outer panel (a) 3.0 mm ± 0.75 mm (0.12 in ± 0.03 in) Tail lamp to rear compartment lid (b) 3.0 mm ± 1.0 mm (0.12 in ± 0.04 in) Rear compartment lid to rear bumper fascia (c) 5.5 mm ± 1.5 mm (0.22 in ± 0.06 in)</div> <div><b>Adjustment</b><ul style="list-style-type: none"><li>Rear compartment lid to quarter outer panel (a) 3.0 mm ± 0.75 mm (0.12 in ± 0.03 in)</li><li>Tail lamp to rear compartment lid (b) 3.0 mm ± 1.0 mm (0.12 in ± 0.04 in)</li><li>Rear compartment lid to rear bumper fascia (c) 5.5 mm ± 1.5 mm (0.22 in ± 0.06 in)</li></ul></div> <div><b>Tighten</b> 22 N·m (16 lbft)</div>

Rear Compartment Lid Replacement



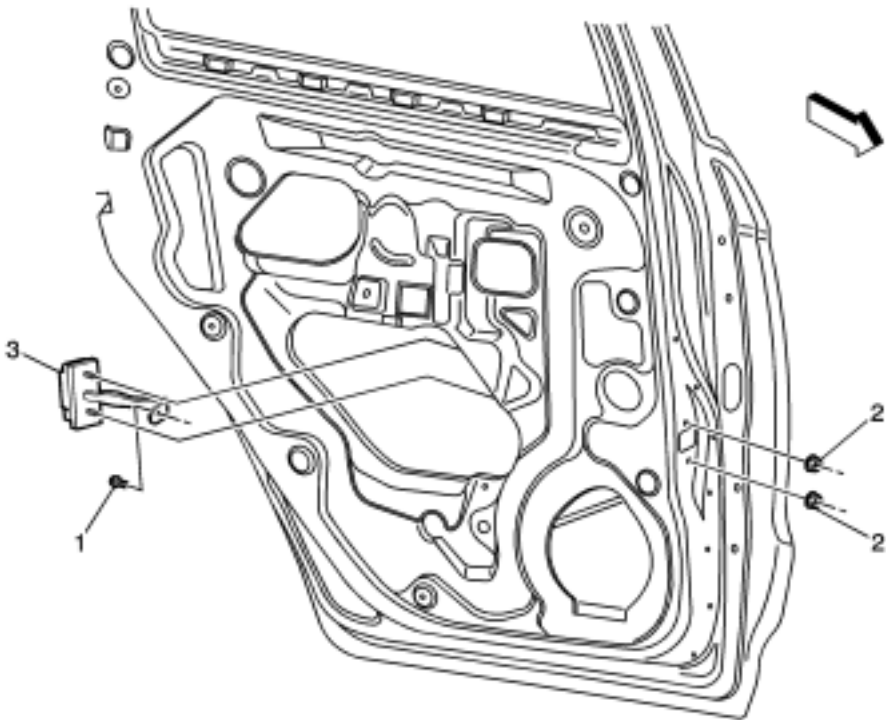
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear compartment lid inner panel trim. Refer to <a href="#">Rear Compartment Lid Inner Panel Trim Replacement</a> .</p>	
1	<p>Rear Compartment Lid Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lb ft)</p>
2	<p>Rear Compartment Lid</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connector. 2. Adjust the rear compartment lid as needed. Refer to <a href="#">Rear Compartment Lid Adjustment</a> . 3. Transfer components as necessary.</p>

Front Side Door Check Link Replacement



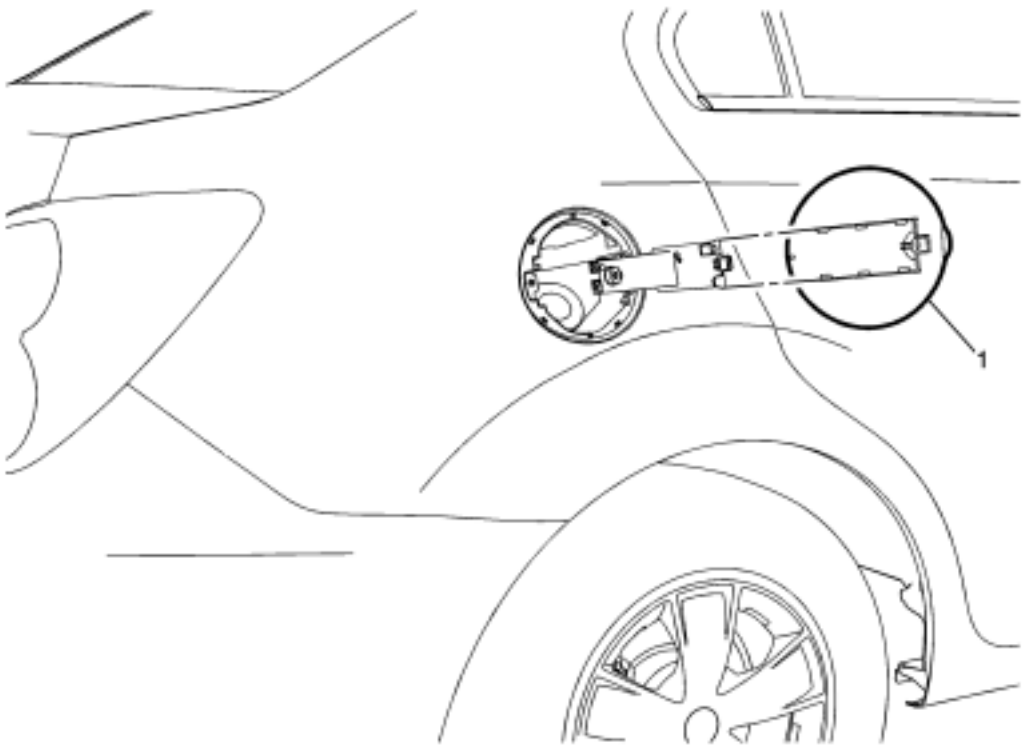
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door trim panel. Refer to <a href="#">Front Side Door Trim Replacement</a> .</p>	
1	<p>Front Side Door Check Link Bolt to Body</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Note:</b> Place the door window in the full open position.</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Front Side Door Check Link Nut (Qty: 2)</p> <p><b>Procedure</b></p> <p>Remove the water deflector.</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
3	<p>Front Side Door Check Link</p>

Rear Side Door Check Link Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Move the window to the full up position.</p> <p>2. Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a></p>	
1	<p>Rear Side Door Check Link Bolt to Body</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a></p> <p><b>Tighten</b> 22 N·m (16 lb ft)</p>
2	<p>Rear Side Door Check Link Nut (Qty: 2)</p> <p><b>Procedure</b></p> <p>Remove the water deflector.</p> <p><b>Tighten</b> 9 N·m (80 lb in)</p>
3	<p>Rear Side Door Check Link Assembly</p>

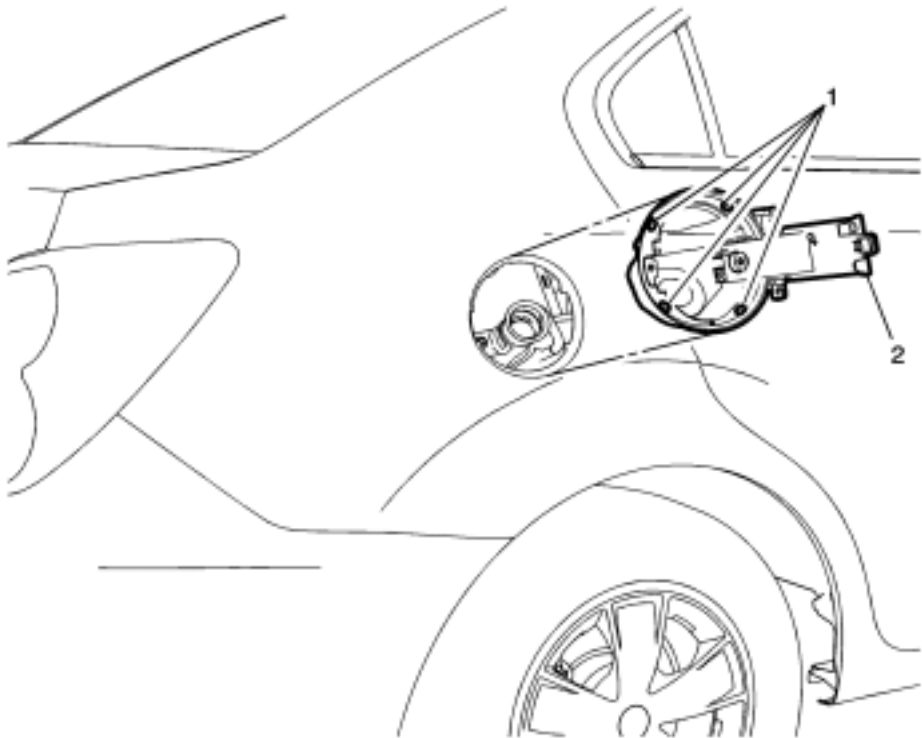
Fuel Tank Filler Door Replacement



Callout	Component Name
1	<div>Fuel Tank Filler Door</div> <div><b>Procedure</b></div> <div>Position the fuel tank filler door to the full open position. Using light outward sliding pressure on the filler door, release the retainer on the fuel tank filler door from the hinge.</div>



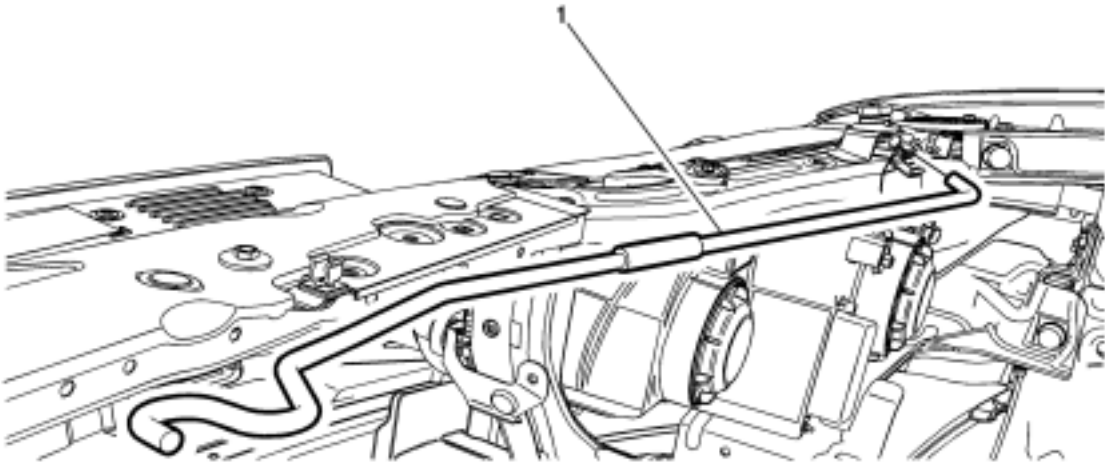
Fuel Tank Filler Door Latch Housing Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear wheelhouse panel liner. Refer to <a href="#">Rear Wheelhouse Panel Liner Replacement</a> .</p> <p>2. Remove the fuel tank filler door. Refer to <a href="#">Fuel Tank Filler Door Replacement</a> .</p>	
1	<p>Fuel Tank Filler Door Latch Housing Retainer (Qty: 4)</p> <p><b>Procedure</b></p> <p>Release the 4 filler door latch housing retainers on the back of the housing.</p>
2	<p>Fuel Tank Filler Door Latch Housing</p> <p><b>Procedure</b></p> <p>Press the fuel tank filler housing outward from the fuel filler pipe and the quarter panel.</p>

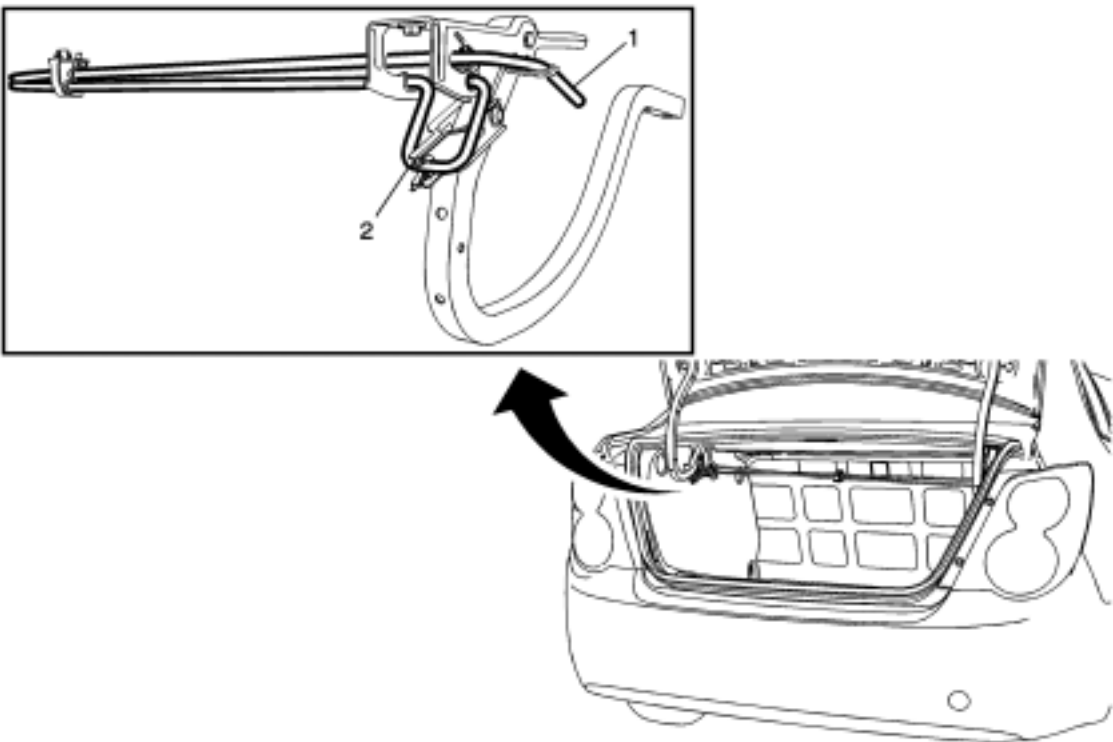


Hood Hold-Open Rod Replacement



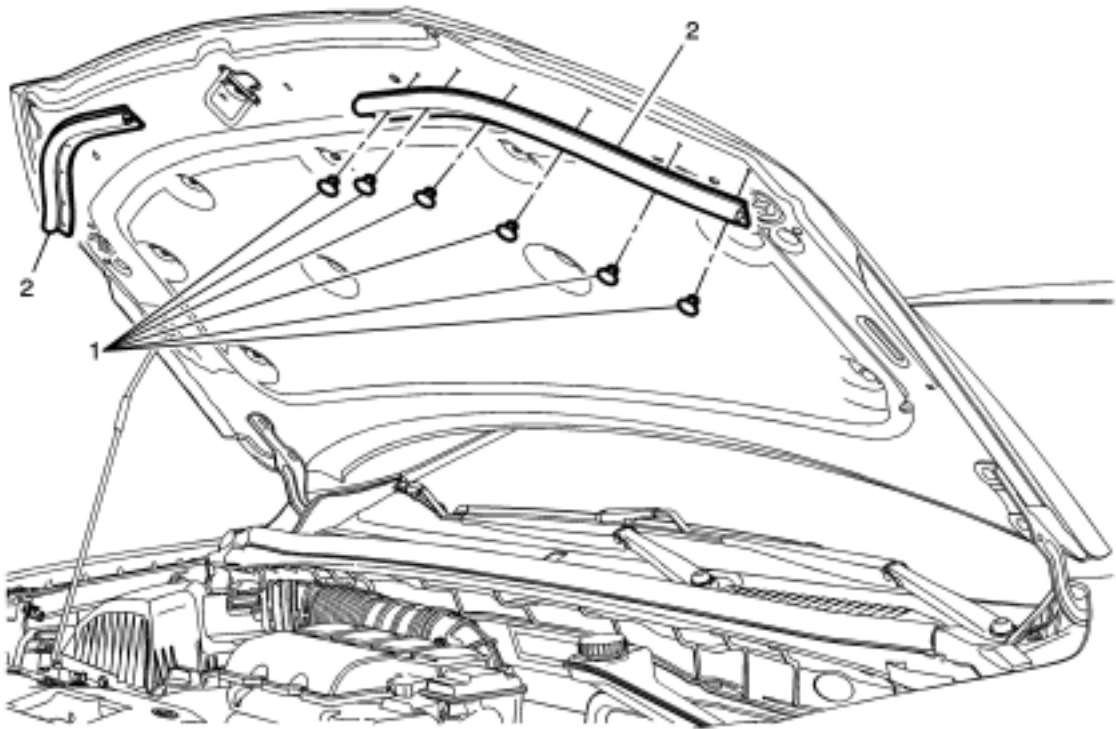
Callout	Component Name
1	<div>Hood Hold-Open Rod</div> <div><b>Warning:</b> When a hood hold open device is being removed or installed, provide alternate support to avoid the possibility of damage to the vehicle or personal injury.</div> <div><b>Procedure</b></div> <div>Open the retainer and remove the hood hold-open rod.</div>

Rear Compartment Lid Hinge Torque Rod Replacement



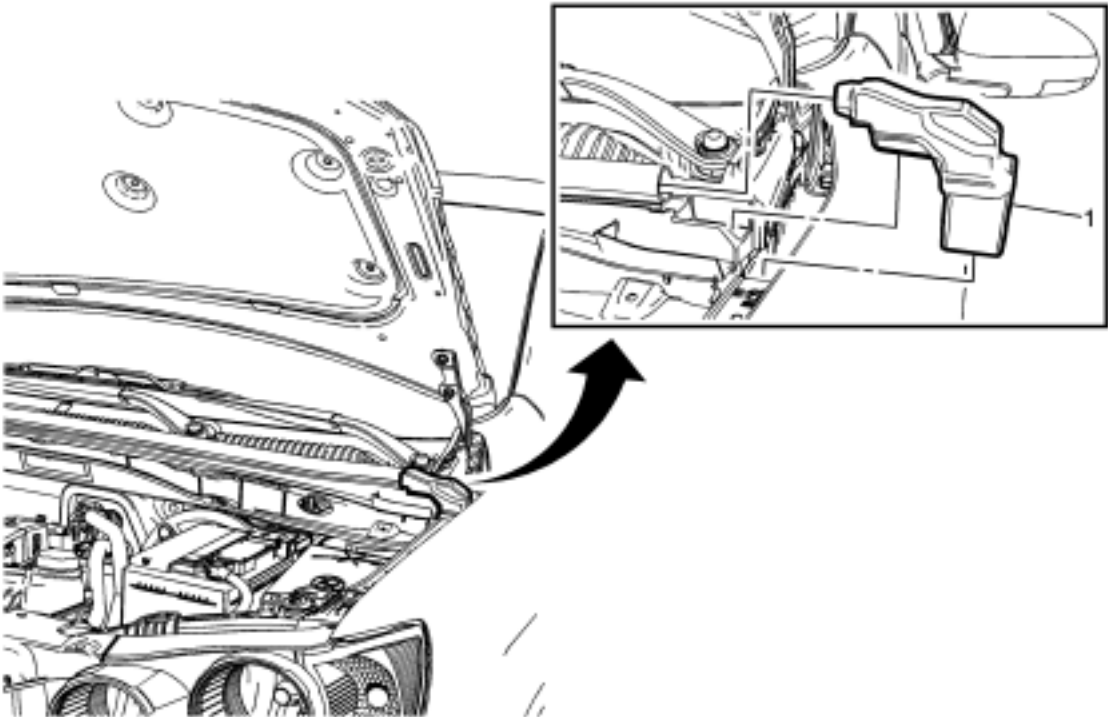
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Hood Hold-Open Device Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Open and support the rear compartment lid.</p> <p><b>Special Tools</b></p> <p>BO-125 Torque Rod Lifter</p> <p>For equivalent regional tools, refer to <a href="#">Special Tools</a> .</p>	
1	<p>Rear Compartment Lid Hinge Torque Rod– Right Side</p> <p><b>Note:</b> Only use the special tool to remove and install the rear compartment lid hinge torque rod.</p>
2	<p>Rear Compartment Lid Hinge Torque Rod– Left Side</p> <p><b>Note:</b> Only use the special tool to remove and install the rear compartment lid hinge torque rod.</p>

Hood Side Seal Replacement



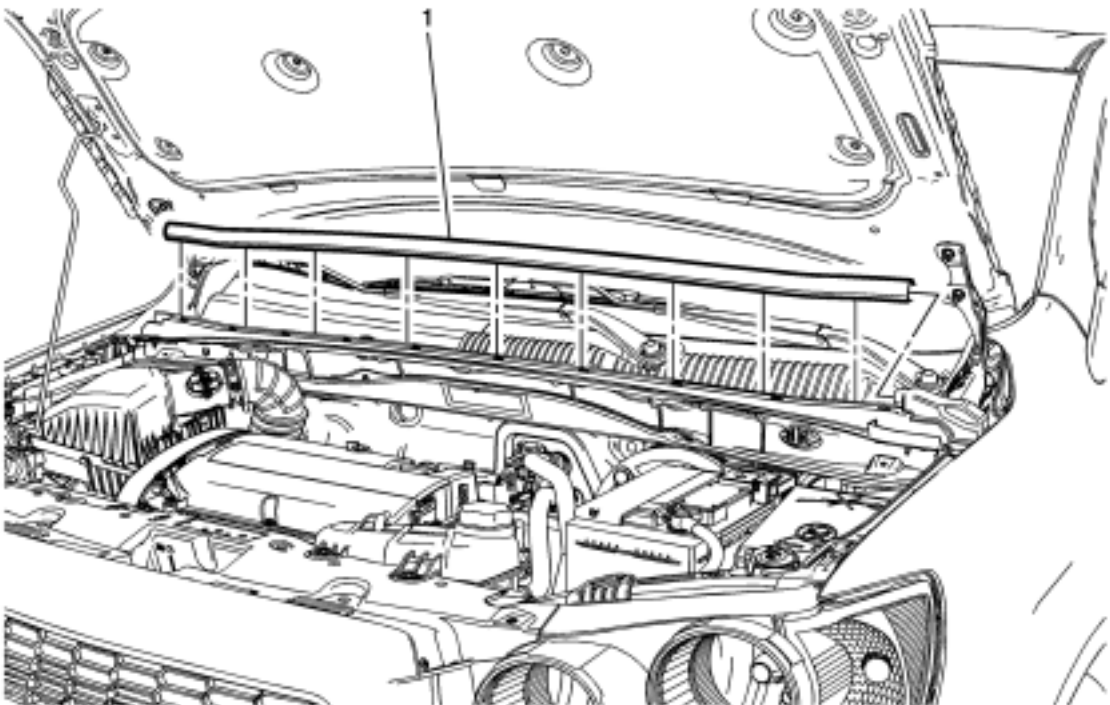
Callout	Component Name
1	Hood Side Seal Push-In Retainer (Qty: 6)
2	Hood Side Seal

Hood Rear Seal Replacement



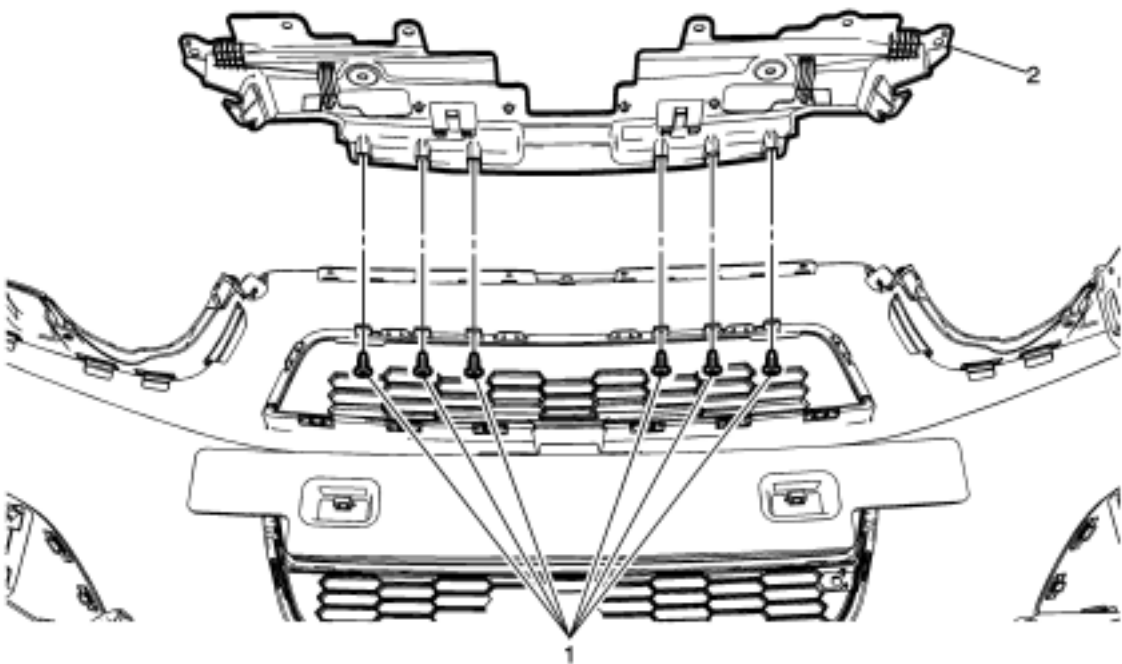
Callout	Component Name
1	<div>Hood Rear Seal</div> <div><b>Procedure</b><ol style="list-style-type: none"><li>1. Clean the area where the seal will be mounted. Use a suitable solvent with a mixture of 50 percent isopropyl alcohol and 50 percent water by volume, or high-flash naphtha.</li><li>2. Warm the air inlet panel using a heat gun, to a minimum, prior to the hood rear outer seal installation.</li><li>3. Do NOT touch the adhesive surface when tape is removed. Peel the tape liner off and install the outer rear hood seal.</li><li>4. Position the end of the seal into the end of the hood rear weatherstrip.</li></ol></div>

Hood Rear Weatherstrip Replacement



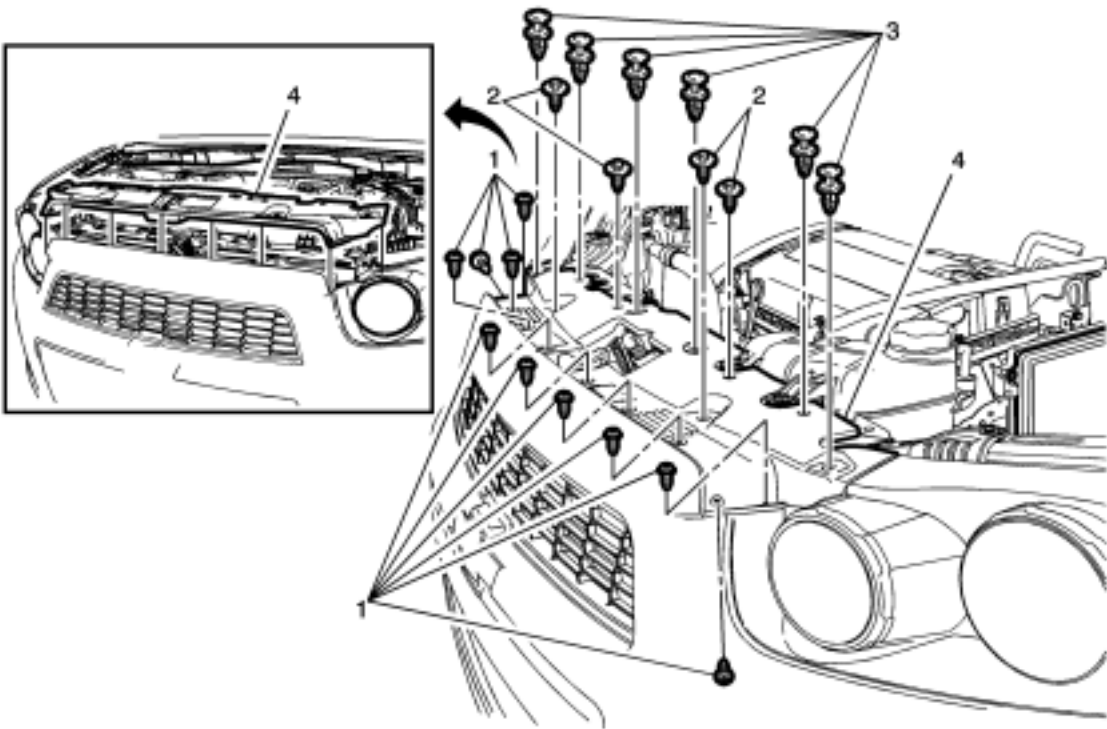
Callout	Component Name
1	<div>Hood Rear Weatherstrip</div> <div><b>Procedure</b></div> <div>The hood rear weatherstrip is held in place with 10 plastic retainers that are part of the air inlet grille. Carefully pull the weatherstrip to the right/left to release from the retainers on the air inlet grille.</div>

Radiator Grille Bumper Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	<p>Radiator Grille Bumper Screw (Qty: 6)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Radiator Grille Bumper</p> <p><b>Procedure</b></p> <p>Pull gently on each side of the radiator grille bumper to disengage from the front bumper fascia.</p>

Radiator Opening Upper Cover Replacement



Callout	Component Name
1	Radiator Opening Upper Cover Screw (Qty: 10) <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .
2	Radiator Opening Upper Cover Bolt (Qty: 4) <b>Tighten</b> 9 N·m (80 lbin)
3	Radiator Opening Upper Cover Push-In Retainer (Qty: 6)
4	Radiator Opening Upper Cover



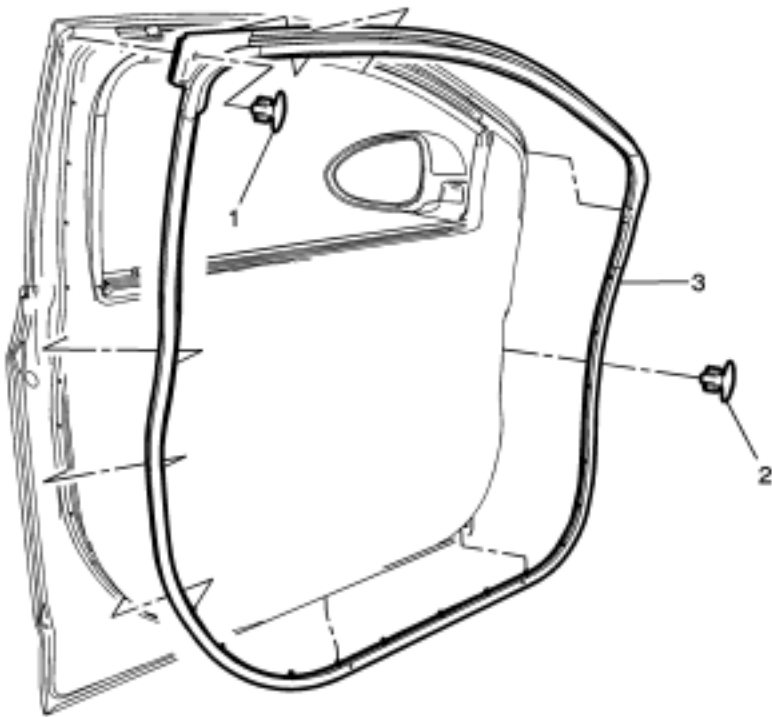
Liftgate Strut Replacement



Callout	Component Name
1	<p>Liftgate Strut</p> <p><b>Warning:</b> When a lift gate hold open device is being removed or installed, provide alternate support to avoid the possibility of damage to the vehicle or personal injury.</p> <p><b>Caution:</b> Apply pressure only at the end of the liftgate/hood assist rod that you are removing or attaching. Do NOT apply pressure to the middle of the rod because damage or bending will result.</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Release the locking tabs on the strut.</li><li>2. Ensure the clip is fully seated when the strut is reinstalled. If the clip cannot be fully seated, a new strut should be installed.</li></ol>

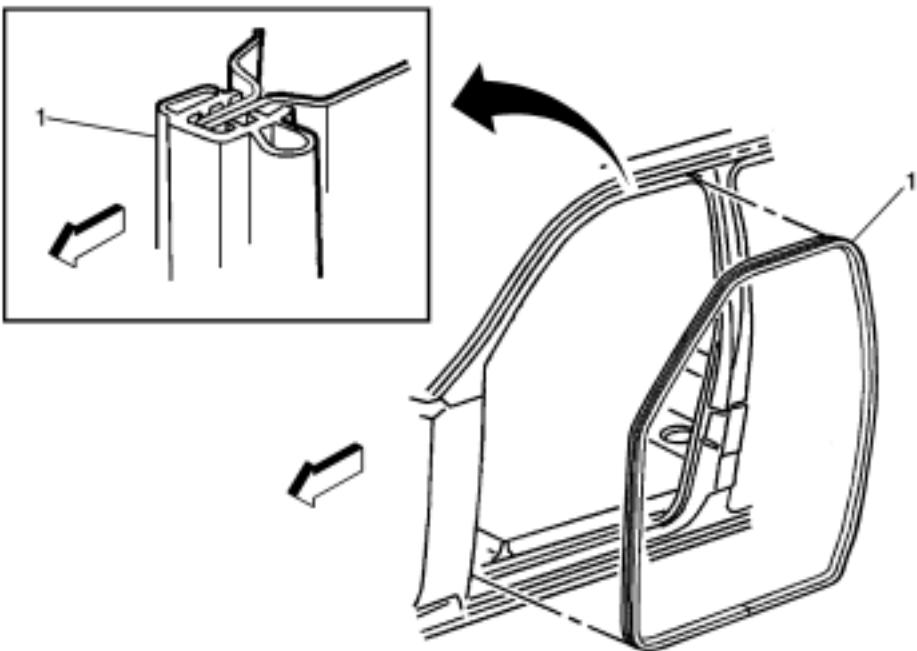


Front Side Door Weatherstrip Replacement - Door Side



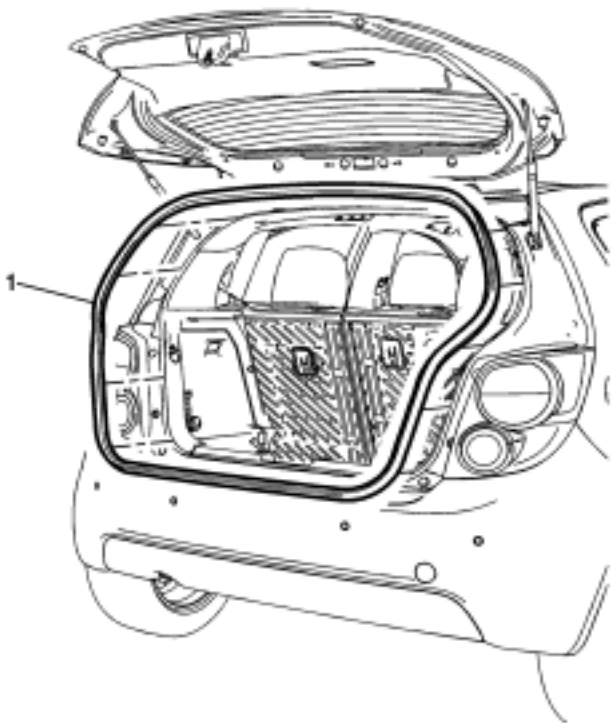
Callout	Component Name
1	<div>Front Side Door Weatherstrip Upper Retainer</div> <div><b>Procedure</b><div><div>1. Open the front side door to the fully open position.</div><div>2. Remove the front side door check link bolt from the body side only . Refer to <a href="#">Front Side Door Check Link Replacement</a> .</div><div>3. Use a suitable tool, remove the push-in retainer from the upper rear corner of the door.</div><div>4. Pull the weatherstrip out of the door retainer.</div></div></div>
2	<div>Front Side Door Weatherstrip Retainers (Qty :21)</div>
3	<div>Front Side Door Weatherstrip</div> <div><b>Procedure</b><div><div>1. Ensure that the weatherstrip is fully seated in the door frame retainer.</div><div>2. Verify proper door operation.</div></div></div>

Front Side Door Weatherstrip Replacement - Body Side



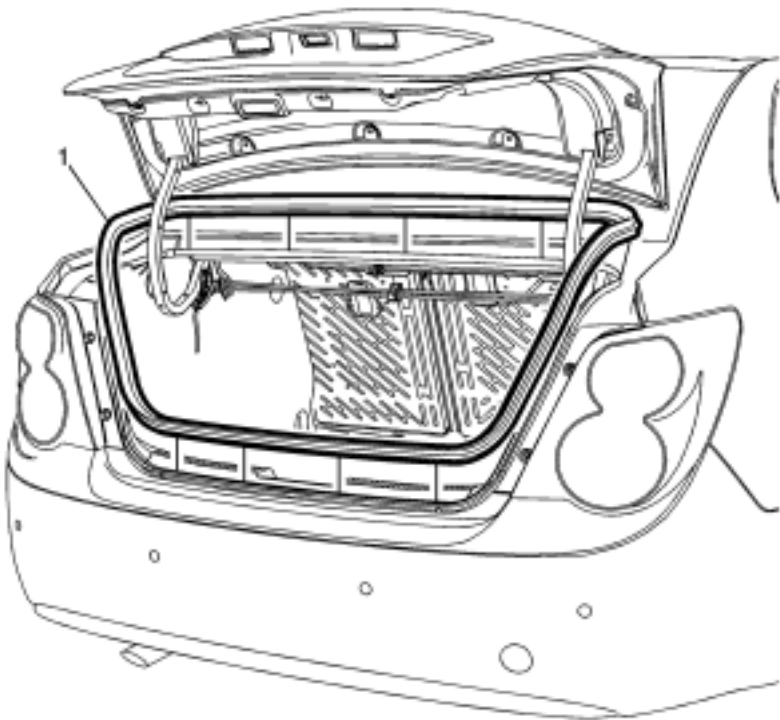
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the upper center pillar trim. Refer to <a href="#">Center Pillar Upper Trim Panel Replacement</a> .</p> <p>2. Remove the lower center pillar trim. Refer to <a href="#">Center Pillar Lower Trim Panel Replacement</a> .</p> <p>3. Remove the carpet retainer. Refer to <a href="#">Front Side Door Opening Floor Carpet Retainer Replacement</a> .</p>	
1	<p>Front Side Door Weatherstrip Body Side</p> <p><b>Preliminary Procedure</b></p> <p>1. Starting in the center bottom of the weatherstrip, pull the weatherstrip upward and away from the pinch-weld flange.</p> <p>2. Start in the center bottom of the pinch-weld flange.</p> <p>3. Ensure that the weatherstrip and retainers are fully seated on the flange before installing the front carpet retainer.</p> <p>4. Inspect the door for proper operation.</p>

Liftgate Weatherstrip Replacement



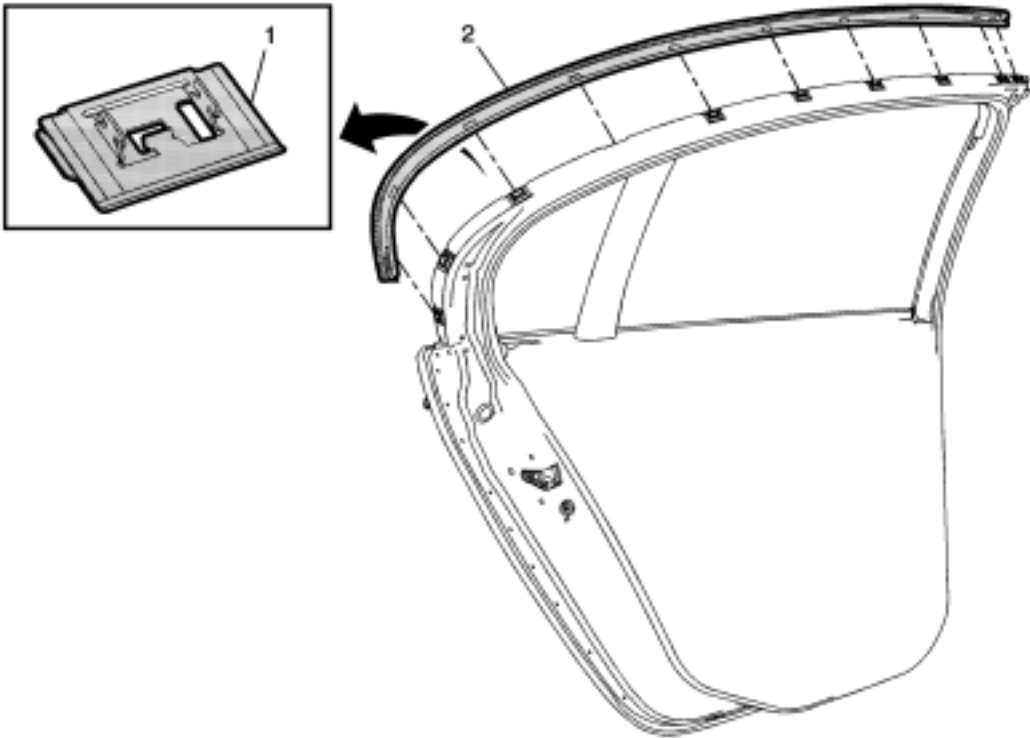
Callout	Component Name
1	<div>Liftgate Weatherstrip</div> <div><b>Procedure</b></div> <div>Clean the area where the seal will be mounted. Use a suitable solvent with a mixture of 50 percent isopropyl alcohol and 50 percent water by volume, or high-flash naphtha.</div>

Rear Compartment Lid Weatherstrip Replacement



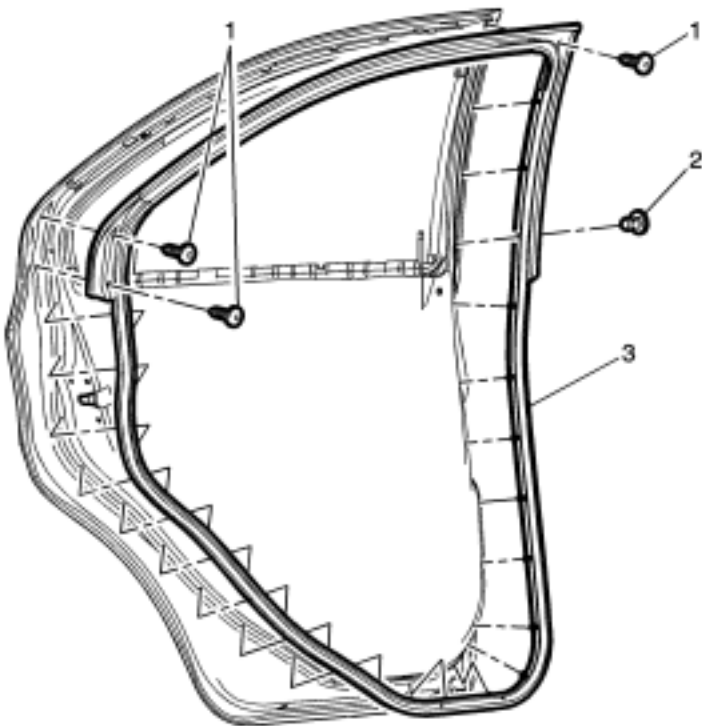
Callout	Component Name
1	<div>Rear Compartment Lid Weatherstrip</div> <div><b>Procedure</b><div><div>1. Disconnect any electrical connector.</div><div>2. Clean the area where the seal will be mounted. Use a suitable solvent with a mixture of 50 percent isopropyl alcohol and 50 percent water by volume, or high-flash naphtha.</div></div></div>

Rear Side Door Upper Front Auxiliary Weatherstrip Retainer Replacement



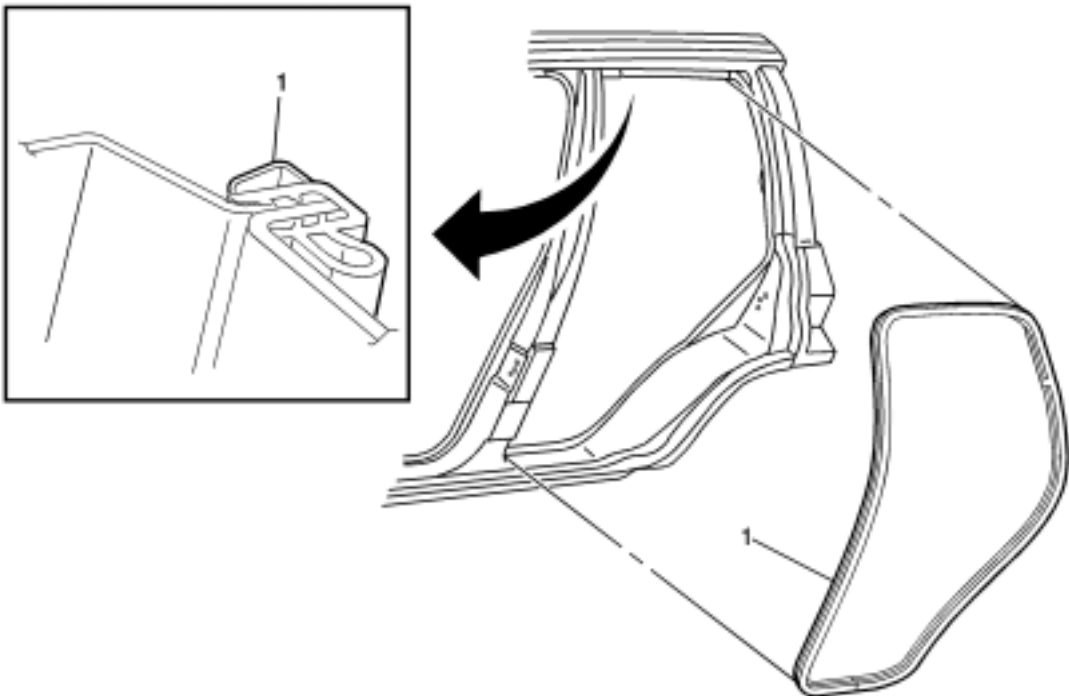
Callout	Component Name
1	Front Side Door Upper Front Auxiliary Weatherstrip Retainer (Qty : 10)  <b>Note:</b> If the retainers are damaged when removing they must be replaced.
2	Front Side Door Upper Front Auxiliary Weatherstrip Retainer  <b>Preliminary Procedure</b>  1. Rear side door weatherstrip door side. Refer to <a href="#">Rear Side Door Weatherstrip Replacement - Door Side</a> . It is only necessary to remove the upper second of the weatherstrip from the door to replace the weatherstrip retainer. 2. Starting in the center top of the weatherstrip, pull the weatherstrip upward and away from the door retainer. 3. Inspect the door for proper operation and sealing.

Rear Side Door Weatherstrip Replacement - Door Side



Callout	Component Name
1	<p>Rear Side Door Weatherstrip Upper Retainers (Qty :3)</p> <p><b>Procedure</b></p> <p>1. Open the front side door to the fully open position.</p> <p>2. Remove the front side door check link bolt from the body side only . Refer to <a href="#">Front Side Door Check Link Replacement</a> .</p> <p>3. Use a suitable tool, remove the push-in retainers from the corners of the door.</p> <p>4. Pull the weatherstrip out of the door retainer.</p>
2	<p>Rear Side Door Weatherstrip Retainers (Qty :21)</p>
3	<p>Rear Side Door Weatherstrip</p> <p><b>Procedure</b></p> <p>1. Ensure that the weatherstrip is fully seated in the door frame retainer.</p> <p>2. Verify proper door operation.</p>

Rear Side Door Weatherstrip Replacement - Body Side



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the upper center pillar trim. Refer to <a href="#">Center Pillar Upper Trim Panel Replacement</a> .</p> <p>2. Remove the lower center pillar trim. Refer to <a href="#">Center Pillar Lower Trim Panel Replacement</a> .</p> <p>3. Remove the carpet retainer. Refer to <a href="#">Rear Side Door Opening Floor Carpet Retainer Replacement</a> .</p>	
1	<p>Rear Side Door Weatherstrip Body Side</p> <p><b>Preliminary Procedure</b></p> <p>1. Starting in the center bottom of the weatherstrip, pull the weatherstrip upward and away from the pinch-weld flange.</p> <p>2. Start in the center bottom of the pinch-weld flange.</p> <p>3. Ensure that the weatherstrip and retainers are fully seated on the flange before installing the front carpet retainer.</p> <p>4. Inspect the door for proper operation.</p>



## Hood Ajar Indicator Description and Operation

### Hood Ajar Switch

The body control module (BCM) applies B+ to the hood ajar signal circuit and monitors the voltage to determine the position of the hood. When the hood is closed, the switch is open and voltage remains high. When the hood is open, the switch is closed and the voltage is pulled low.

The BCM uses the hood ajar switch as a content theft deterrent alarm trigger.


### Hood Ajar Indicator/ Message

When the hood is ajar, a message is displayed on the DIC or the hood ajar indicator will be illuminated.





Special Tools

Illustration	Tool Number/ Description
	BO-125 KM-125 Torque Rod Lifter



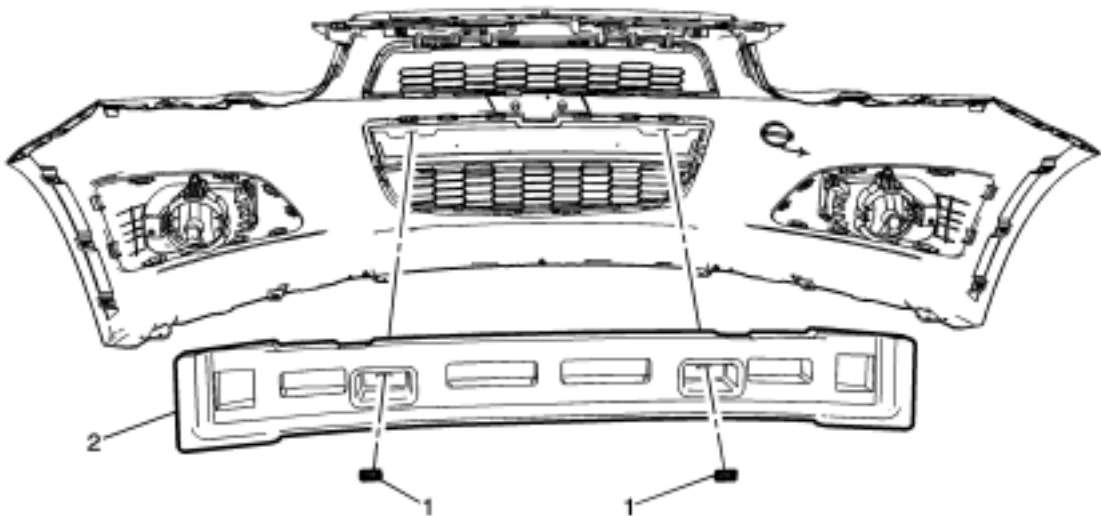
Specifications	Front Air Deflector Replacement
Front Bumper Energy Absorber Replacement	Front Bumper Fascia Air Deflector Replacement
Front Bumper Upper Impact Bar Replacement	Rear Bumper Fascia Replacement (Sedan)
Front Bumper Lower Impact Bar Replacement	Rear Bumper Fascia Replacement (Hatchback)
Front Bumper Impact Bar Lower Bracket Replacement	Rear Bumper Fascia Outer Guide Replacement (Sedan)
Front Bumper Fascia Replacement	Rear Bumper Fascia Outer Guide Replacement (Hatchback)
Front Bumper Fascia Guide Replacement	Rear Bumper Impact Bar Replacement (Hatchback)
Front Bumper Fascia Center Support Bracket Replacement	Rear Bumper Impact Bar Replacement (Sedan)
Front Bumper Fascia Opening Lower Cover Replacement	Special Tools
Front Bumper Fascia Bracket Replacement	



Fastener Tightening Specifications

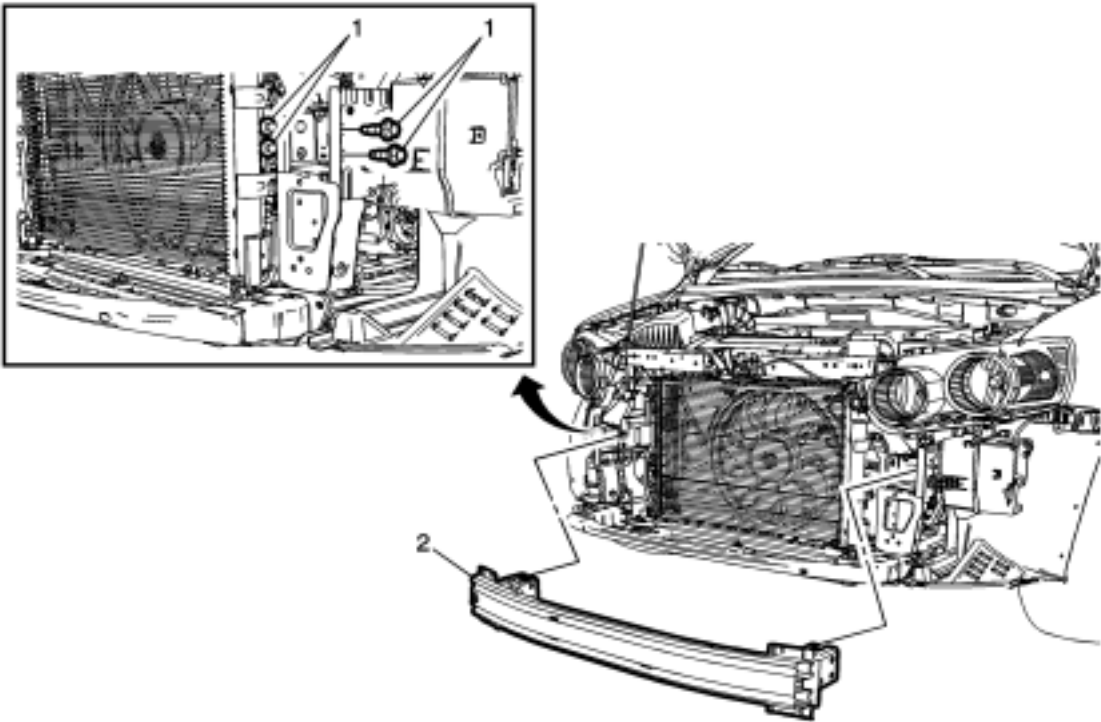
Application	Specification	
	Metric	English
Front Air Deflector Bolts	8 N·m	71 lb in
Front Bumper Fascia Air Deflector Screws	2.5 N·m	22 lb in
Front Bumper Fascia Bracket Bolts	9 N·m	80 lb in
Front Bumper Fascia Center Support Bolts	9 N·m	80 lb in
Front Bumper Fascia Lower Screws	2.5 N·m	22 lb in
Front Bumper Fascia Opening Lower Cover Bolts	22 N·m	16 lb ft
Front Bumper Fascia Opening Lower Cover Screws	2.5 N·m	22 lb in
Front Bumper Fascia Screws	2.5 N·m	22 lb in
Front Bumper Impact Bar Bolts	100 N·m	74 lb in
Front Bumper Impact Bar Lower Bracket Screws	2.5 N·m	22 lb in
Front Bumper Lower Impact Bracket Bolts	22 N·m	16 lb ft
Headlamp Bolt	2.5 N·m	22 lb in
Rear Bumper Impact Bar Bolts	40 N·m	30 lb ft
Rear Bumper Impact Bar Nuts	40 N·m	30 lb ft
Rear Fascia Screws	2.5 N·m	22 lb in

Front Bumper Energy Absorber Replacement



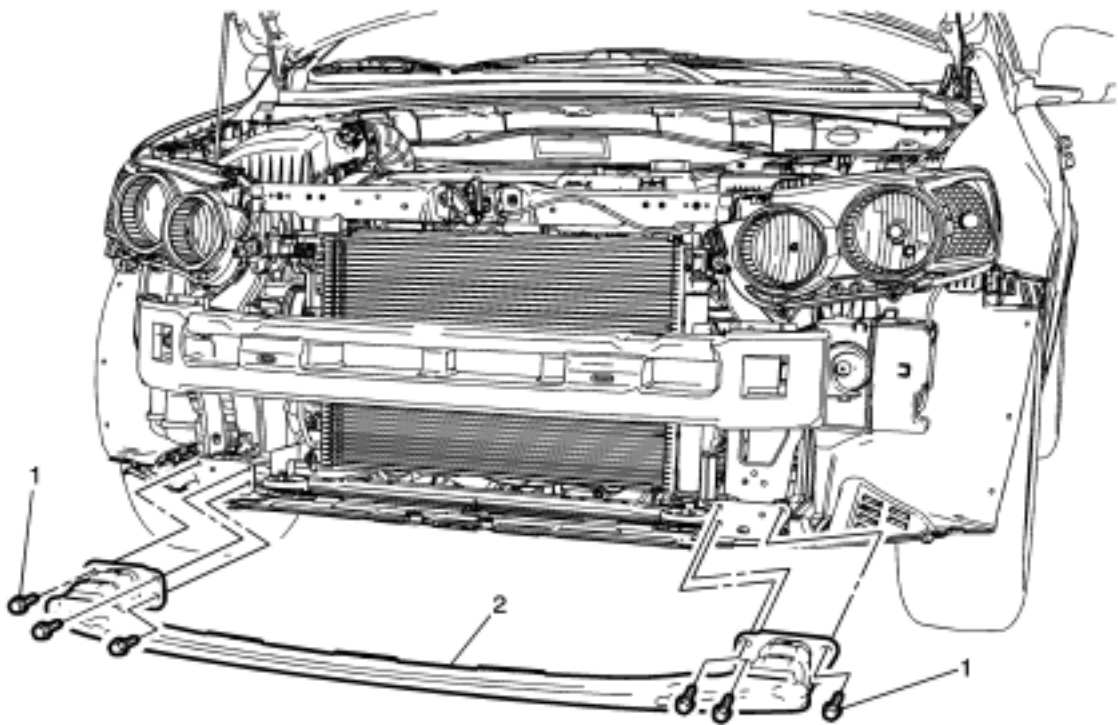
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	Front Bumper Energy Upper Absorber Push-On Retainer (Qty: 2)
2	<p>Front Bumper Energy Upper Absorber</p> <p><b>Procedure</b></p> <p>Reposition the electrical harness from the absorber.</p>

Front Bumper Upper Impact Bar Replacement



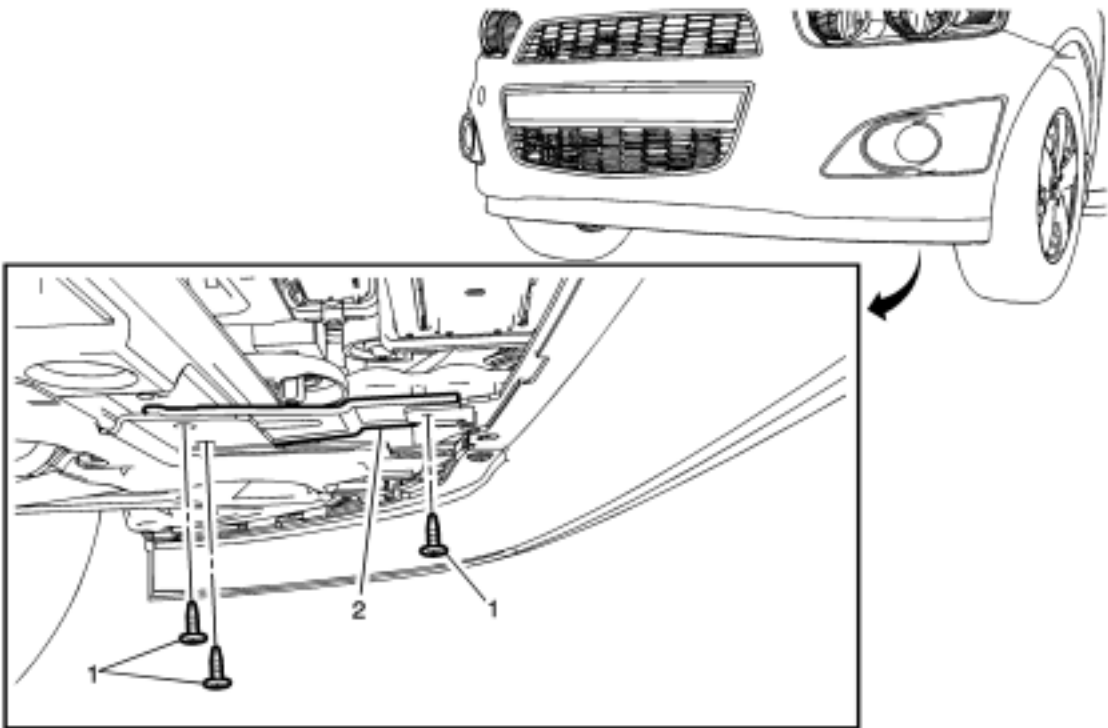
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	<p>Front Bumper Impact Bar Bolt (Qty: 8)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 100 N·m (74 lb ft)</p>
2	<p>Front Bumper Impact Bar</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connectors/harnesses as needed. 2. Transfer any parts as needed.</p>

Front Bumper Lower Impact Bar Replacement



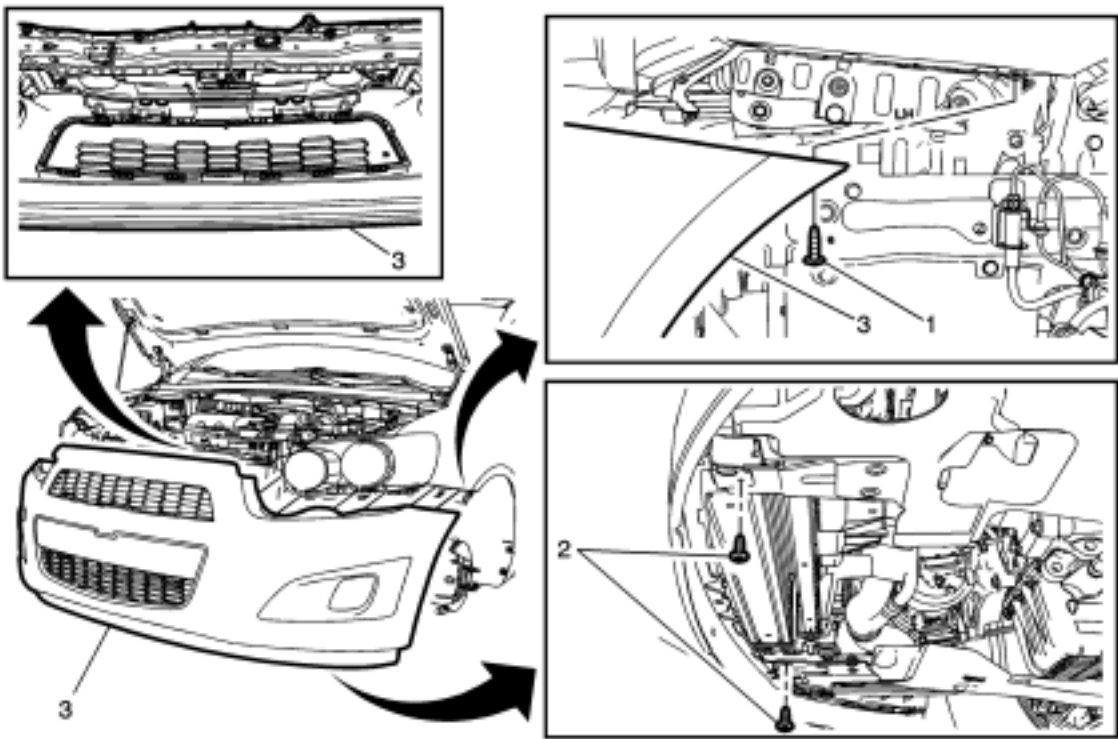
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	<p>Front Bumper Lower Impact Bar Bracket Bolt (Qty: 6)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Front Bumper Lower Impact Bar</p>

Front Bumper Impact Bar Lower Bracket Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper opening cover. Refer to <a href="#">Front Bumper Fascia Opening Lower Cover Replacement</a> .</p>	
1	<p>Front Bumper Impact Bar Lower Bracket Screw (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 8 N·m (71 lbin)</p>
2	<p>Front Bumper Impact Bar Lower Bracket</p> <p><b>Procedure</b></p> <p>Lift up the front of the lower bracket enough to release the front guide tab from the front fascia.</p>

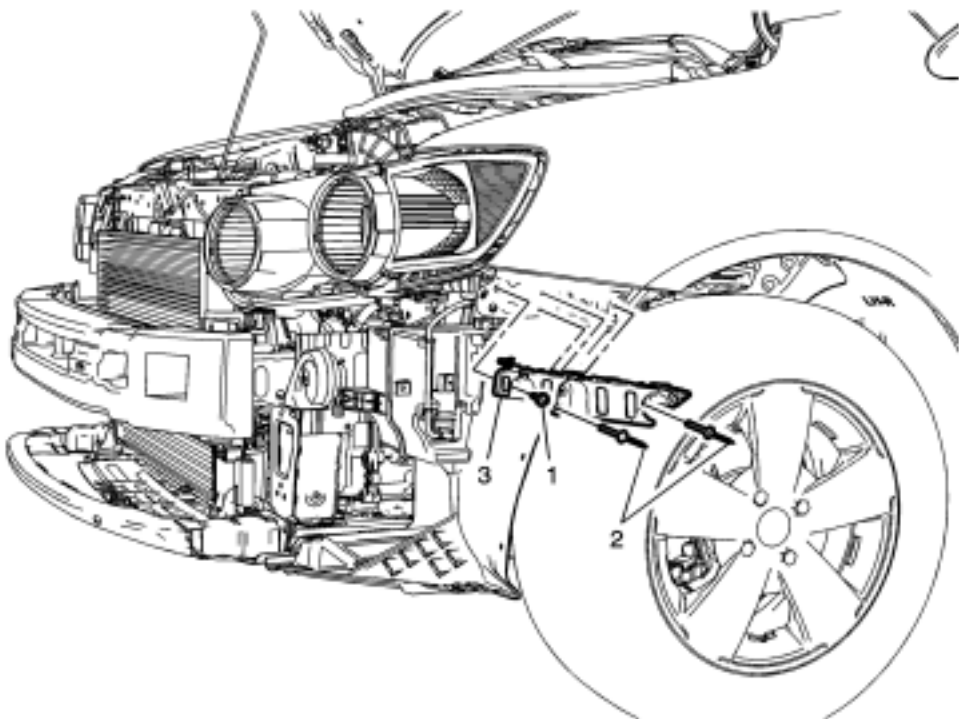
Front Bumper Fascia Replacement



Callout	Component Name
<b>Preliminary Procedures</b>  1. Remove the radiator opening upper cover. Refer to <a href="#">Radiator Opening Upper Cover Replacement</a> . 2. Remove the front bumper opening lower cover. Refer to <a href="#">Front Bumper Fascia Opening Lower Cover Replacement</a> . 3. Remove the front wheelhouse front liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> . 4. Disconnect the ambient air temperature sensor from the lower grille.	
1	Front Bumper Fascia Screw (Qty: 2)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 6 N·m (53 lbin)
2	Front Bumper Fascia Lower Screw (Qty: 2)  <b>Tighten</b> 6 N·m (53 lbin)
3	Front Bumper Fascia  <b>Procedure</b>  1. Carefully push a small nylon wedge between the fascia and the bracket. Insert a small flat-bladed tool into the fascia slot and depress the tabs one at a time and pull the fascia wings off in the forward direction rather than outboard to gradually remove the fascia from the bracket. 2. Disconnect the electrical connectors. 3. On reassembly of the front fascia to the vehicle, ensure the 4 support retainers on the inside of the radiator grille bumper are in position to the front bumper fascia center support bracket.

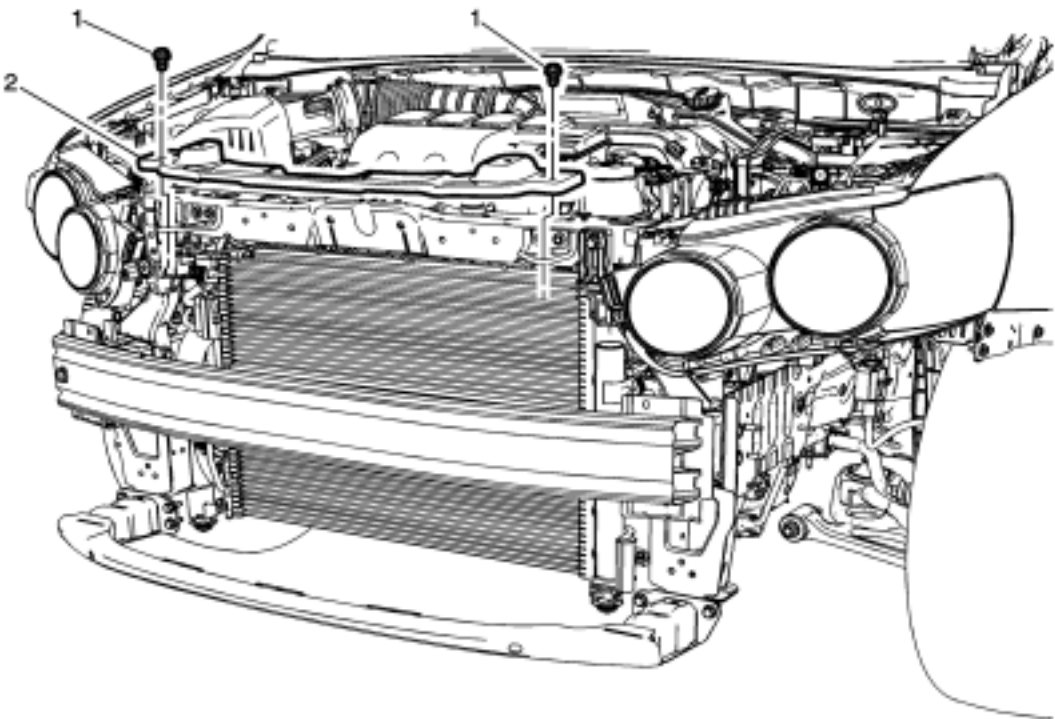


Front Bumper Fascia Guide Replacement



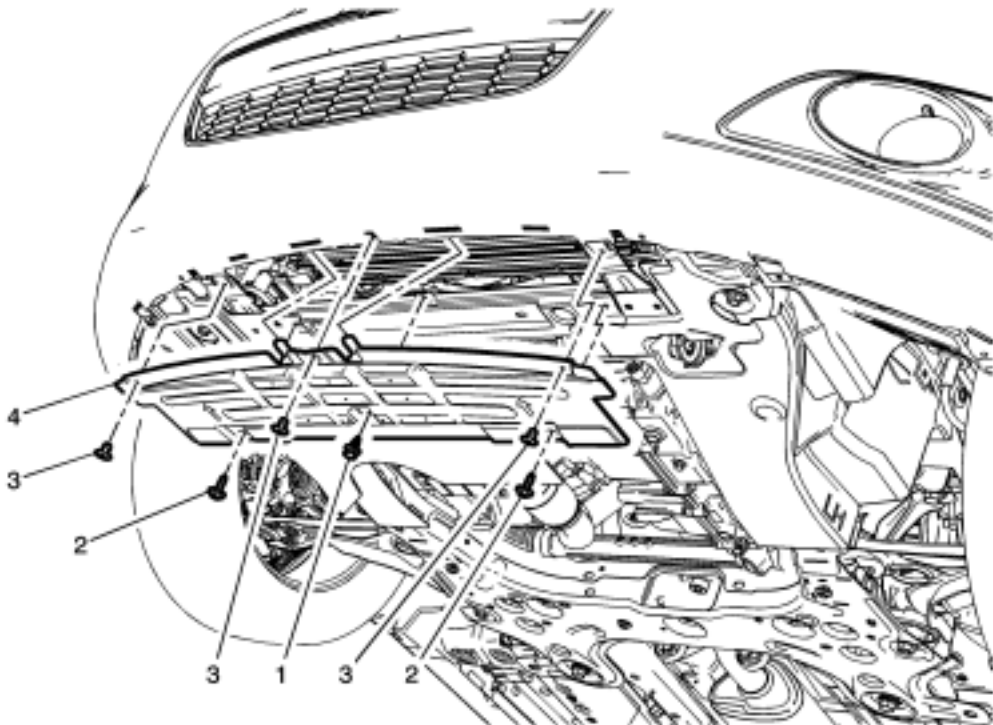
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Eye Protection Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	<p>Headlamp Bolt</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 10 N·m (89 lbin)</p>
2	<p>Front Bumper Fascia Guide Rivet (Qty: 2)</p> <p><b>Special Tools</b></p> <p>BO-594-A Hand Rivet Tongs</p> <p>For equivalent regional tools, refer to <a href="#">Special Tools</a> .</p>
3	<p>Front Bumper Fascia Guide</p> <p><b>Procedure</b></p> <p>Slide the guide forward to release the front retainer from the fender.</p>

Front Bumper Fascia Center Support Bracket Replacement



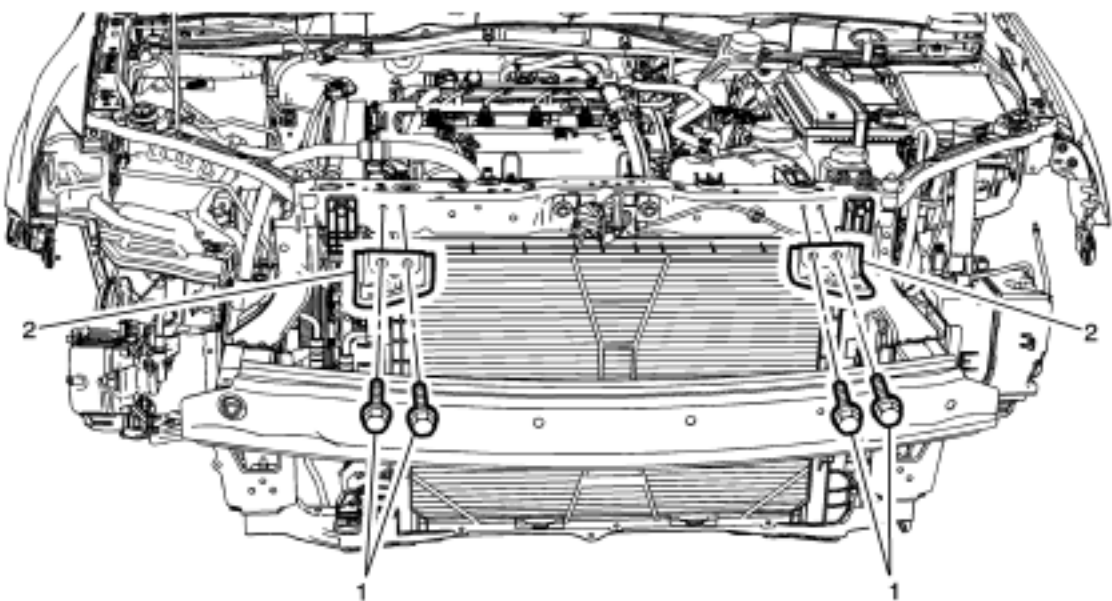
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	<p>Front Bumper Fascia Center Support Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Front Bumper Fascia Center Support</p>

Front Bumper Fascia Opening Lower Cover Replacement



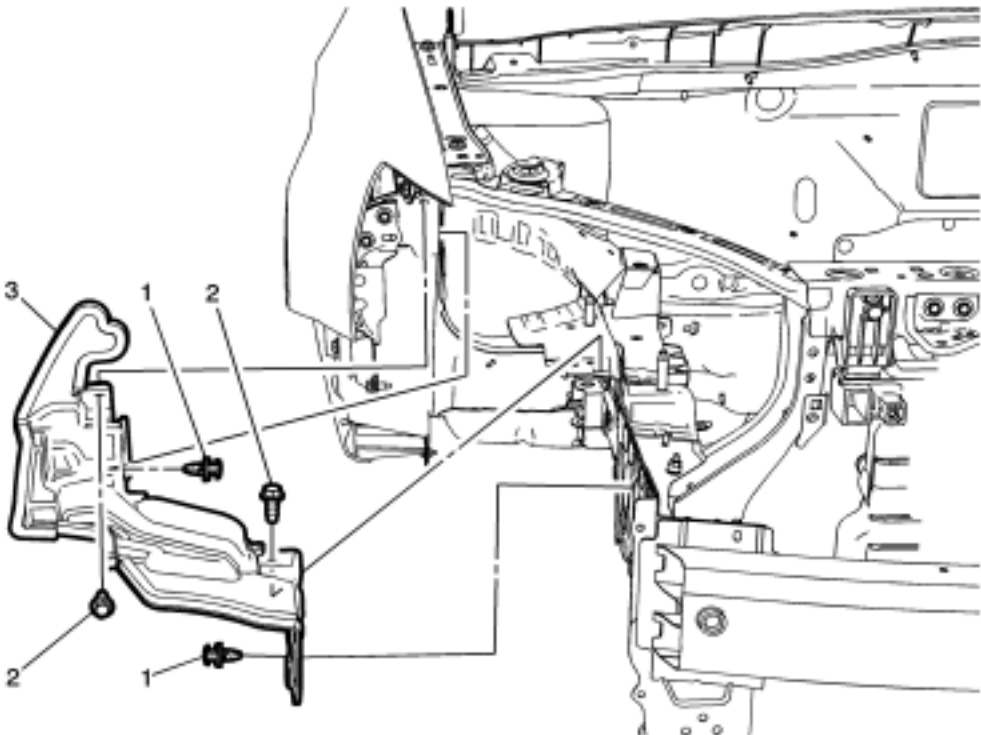
Callout	Component Name
1	Front Bumper Fascia Opening Lower Cover Push-In Retainer
2	Front Bumper Fascia Opening Lower Cover Bolt (Qty: 2)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 22 N·m (16 lb ft)
3	Front Bumper Fascia Opening Lower Cover Screw (Qty: 3)  <b>Tighten</b> 2.5 N·m (22 lb in)
4	Front Bumper Fascia Opening Lower Cover

Front Bumper Fascia Bracket Replacement



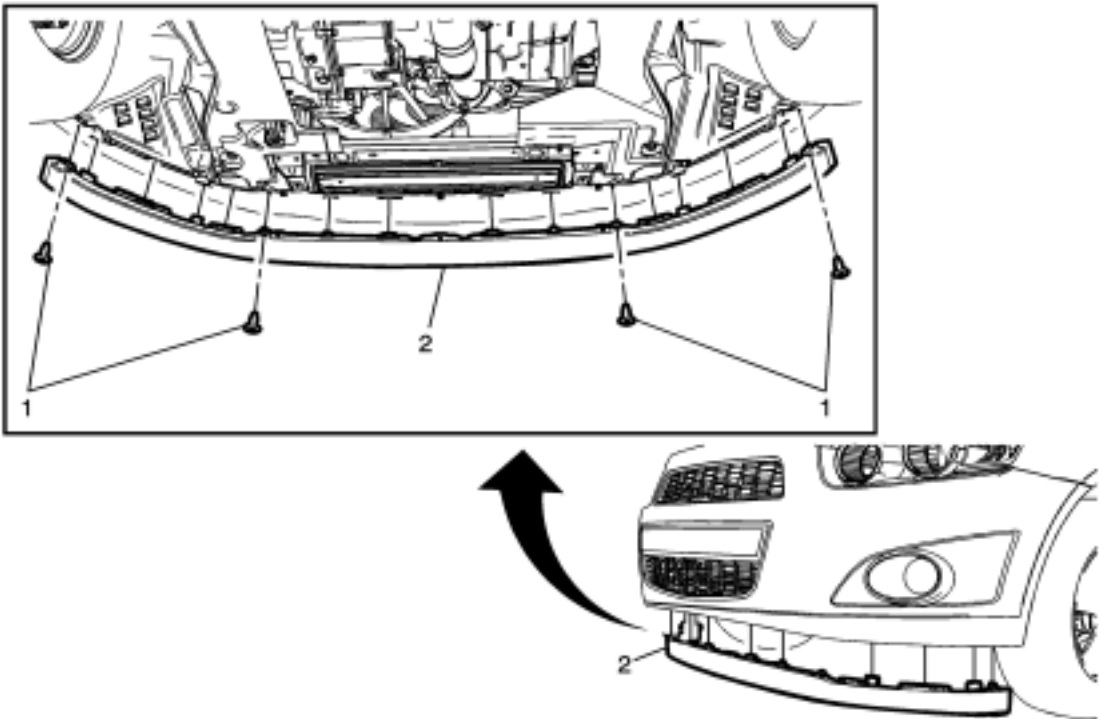
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p> <p>2. Remove the front bumper fascia center support bracket. Refer to <a href="#">Front Bumper Fascia Center Support Bracket Replacement</a> .</p>	
1	<p>Front Bumper Fascia Bracket Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Front Bumper Fascia Bracket</p> <p><b>Note:</b> Transfer any parts as needed.</p>

Front Air Deflector Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a></p> <p>2. Remove the headlamp. Refer to <a href="#">Headlamp Replacement</a> .</p>	
1	Front Air Deflector Retainers (Qty :2)
2	Front Air Deflector Bolts (Qty :2)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 8 N·m (71 lbin)
3	Front Air Deflector

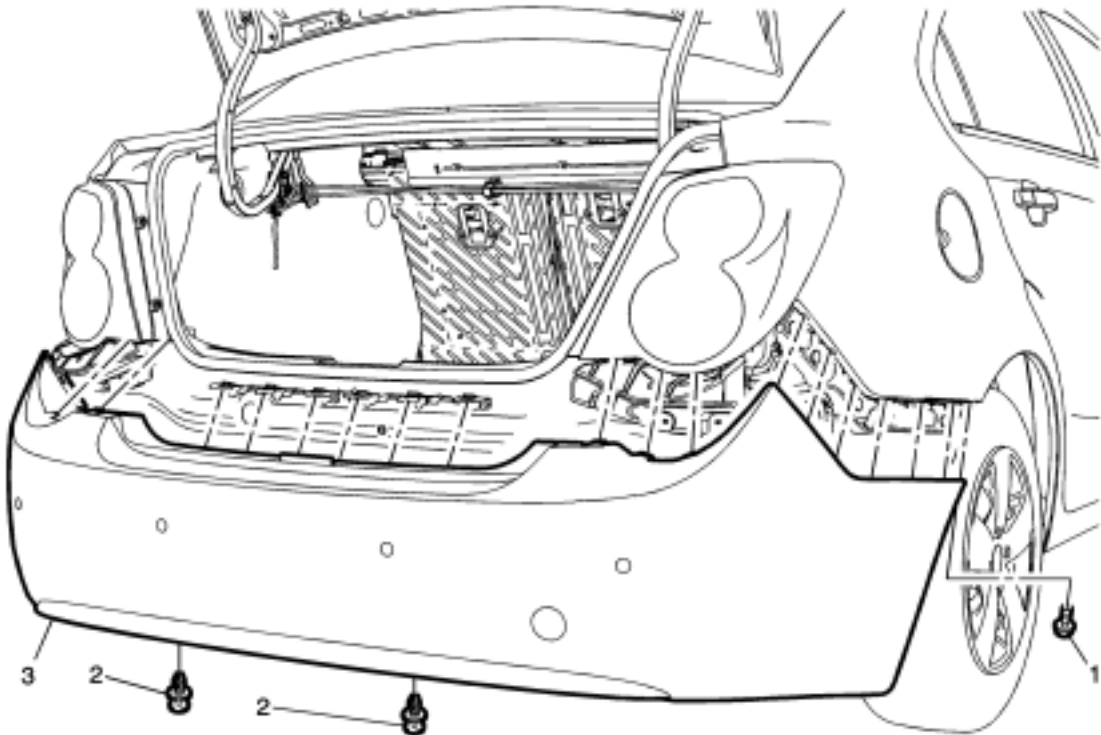
Front Bumper Fascia Air Deflector Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia opening lower cover. Refer to <a href="#">Front Bumper Fascia Opening Lower Cover Replacement</a> .</p>	
1	<p>Front Bumper Fascia Air Deflector Screw (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 8 N·m (71 lbin)</p>
2	<p>Front Bumper Fascia Air Deflector</p>

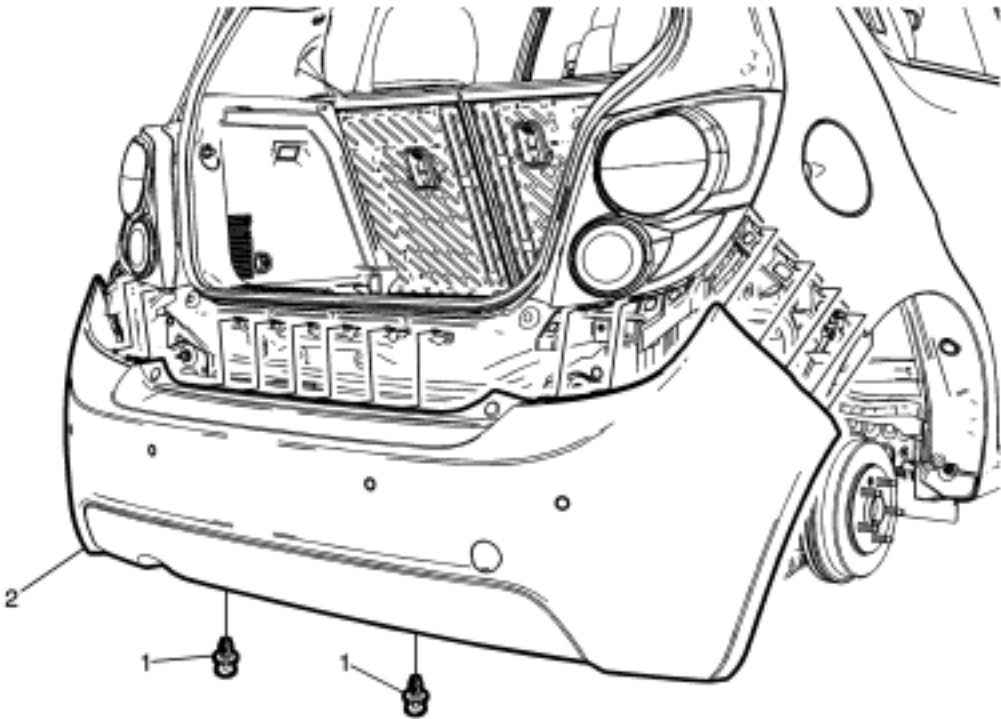


Rear Bumper Fascia Replacement (Sedan)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the screws from the rear wheelhouse liners to the rear fascia. Refer to <a href="#">Rear Wheelhouse Panel Liner Replacement</a> .</p> <p>2. Disconnect the rear electrical connectors.</p>	
1	<p>Rear Fascia Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 10 N·m (89 lbin)</p>
2	<p>Rear Fascia Lower Push-In Retainer (Qty: 2)</p>
3	<p>Rear Fascia</p> <p><b>Procedure</b></p> <p>1. Carefully push a small nylon wedge between the fascia and the rear fascia guide. Insert a small flat-bladed tool into the fascia slot and depress the snaps one at a time and pull on the fascia at the same time to gradually remove the fascia from the rear fascia guide.</p> <p>2. Transfer parts as needed.</p>

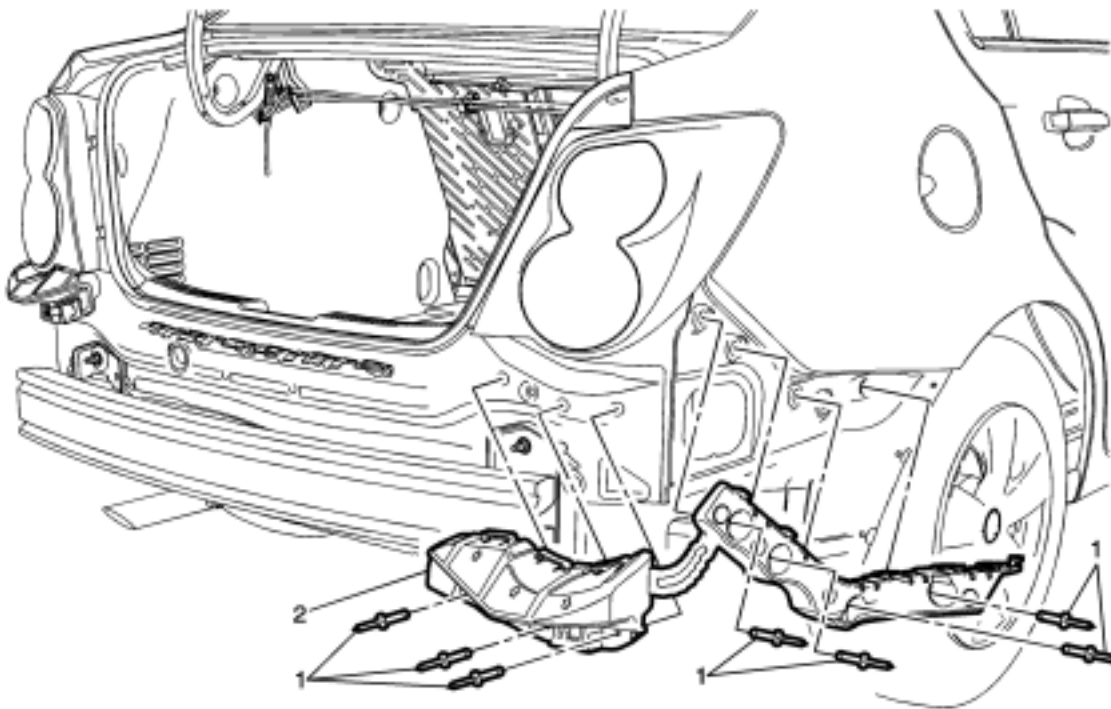
Rear Bumper Fascia Replacement (Hatchback)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the screws from the rear wheelhouse liners to the rear fascia. Refer to <a href="#">Rear Wheelhouse Panel Liner Replacement</a> .</p> <p>2. Disconnect the rear electrical connectors.</p>	
1	Rear Fascia Lower Push-In Retainer (Qty: 2)
2	<p>Rear Fascia</p> <p><b>Procedure</b></p> <p>1. Carefully push a small nylon wedge between the fascia and the rear fascia guide. Insert a small flat-bladed tool into the fascia slot and depress the snaps one at a time and pull on the fascia at the same time to gradually remove the fascia from the rear fascia guide.</p> <p>2. Transfer parts as needed.</p>

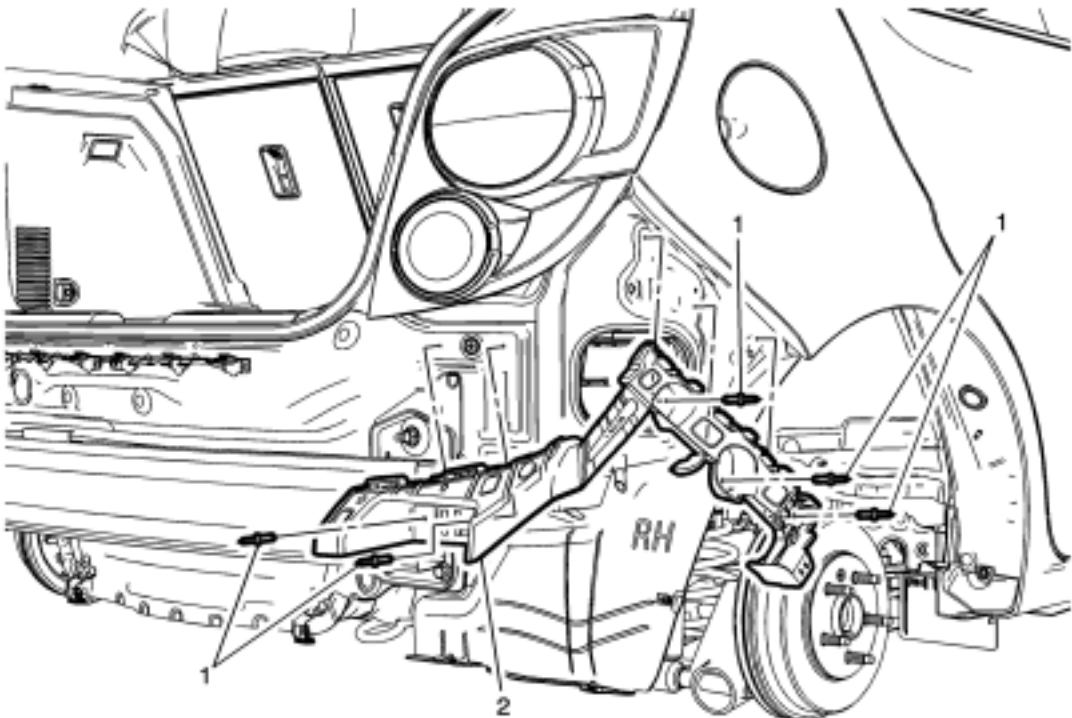


Rear Bumper Fascia Outer Guide Replacement (Sedan)



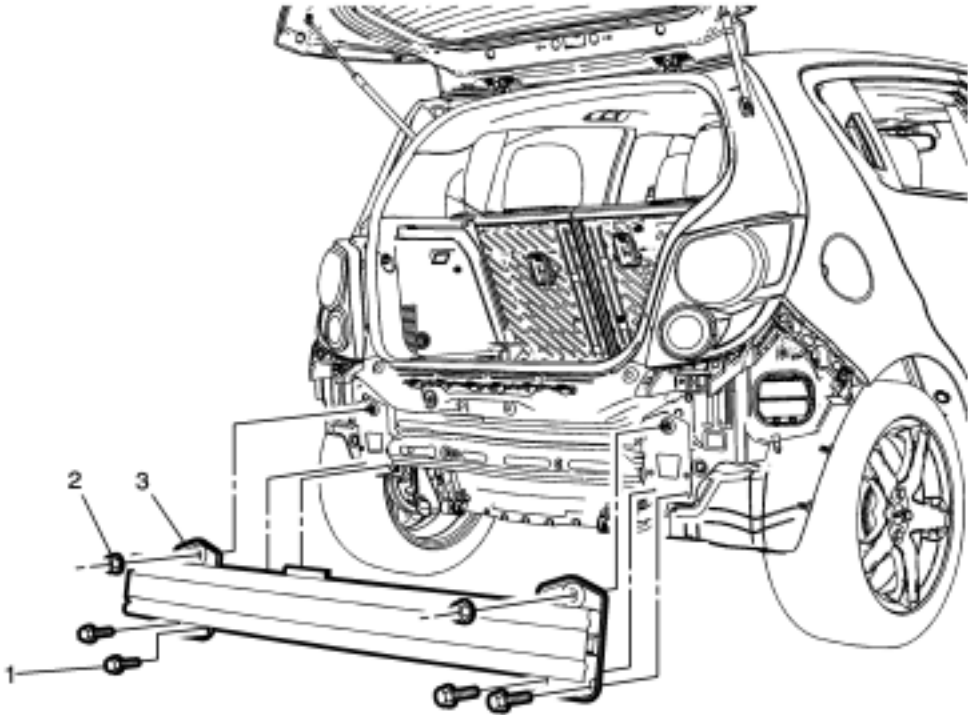
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Eye Protection Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Remove the rear bumper fascia. Refer to <a href="#">Rear Bumper Fascia Replacement</a> .</p>	
1	<p>Rear Bumper Fascia Outer Guide Rivet (Qty: 7)</p> <p><b>Special Tools</b></p> <p><i>BO-594-A</i> Hand Rivet Tongs</p> <p>For equivalent regional tools, refer to <a href="#">Special Tools</a> .</p>
2	<p>Rear Bumper Fascia Outer Guide</p>

Rear Bumper Fascia Outer Guide Replacement (Hatchback)



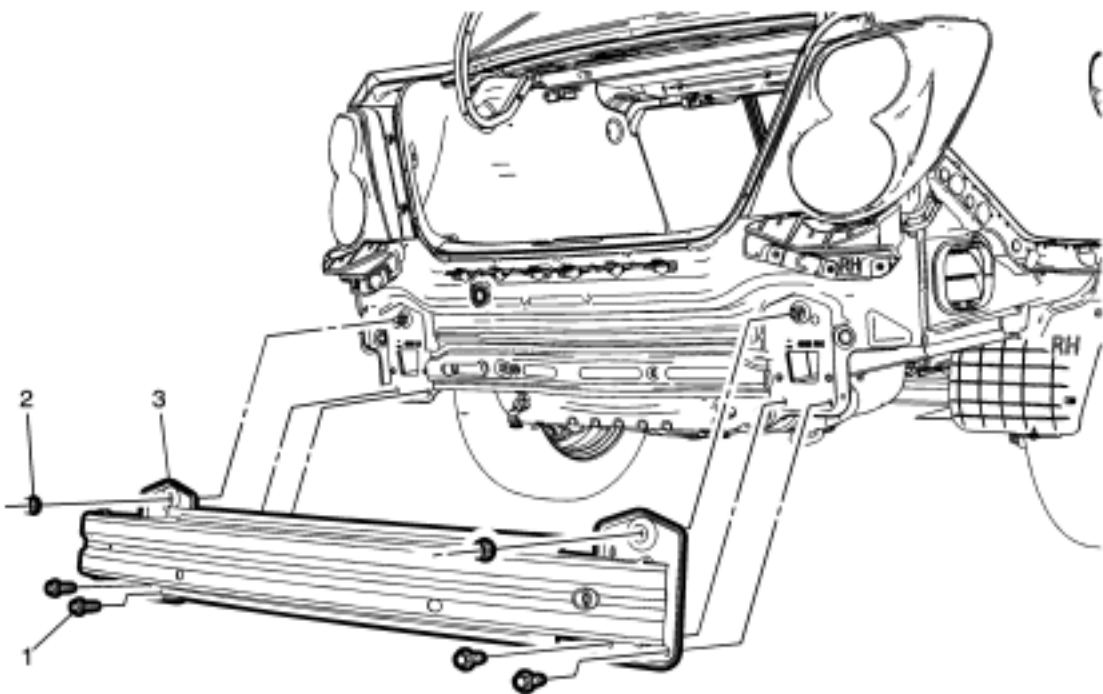
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Eye Protection Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Remove the rear bumper fascia. Refer to <a href="#">Rear Bumper Fascia Replacement</a> .</p>	
1	<p>Rear Bumper Fascia Outer Guide Rivet (Qty: 5)</p> <p><b>Special Tools</b></p> <p><i>BO-594-A</i> Hand Rivet Tongs</p> <p>For equivalent regional tools, refer to <a href="#">Special Tools</a> .</p>
2	<p>Rear Bumper Fascia Outer Guide</p>

Rear Bumper Impact Bar Replacement (Hatchback)



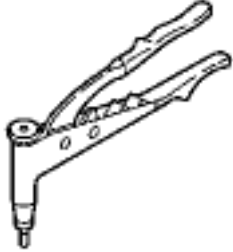
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear bumper fascia. Refer to <a href="#">Rear Bumper Fascia Replacement</a> .</p>	
1	<p>Rear Bumper Impact Bar Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 40 N·m (30 lb ft)</p>
2	<p>Rear Bumper Impact Bar Nut (Qty: 2)</p> <p><b>Tighten</b> 40 N·m (30 lb ft)</p>
3	<p>Rear Bumper Impact Bar</p> <p><b>Procedure</b></p> <p>Transfer any parts as needed.</p>

Rear Bumper Impact Bar Replacement (Sedan)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear bumper fascia. Refer to <a href="#">Rear Bumper Fascia Replacement</a> .</p>	
1	<p>Rear Bumper Impact Bar Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 40 N·m (30 lb ft)</p>
2	<p>Rear Bumper Impact Bar Nut (Qty: 2)</p> <p><b>Tighten</b> 40 N·m (30 lb ft)</p>
3	<p>Rear Bumper Impact Bar</p> <p><b>Procedure</b></p> <p>Transfer any parts as needed.</p>

Special Tools

Illustration	Tool Number/ Description
	BO-594-A Hand Rivet Tongs



Specifications	Rear Compartment Floor Panel Replacement
Front Wheelhouse Front Panel Replacement	Quarter Outer Panel Sectioning (5HB)
Front Wheelhouse Panel Reinforcement Replacement	Quarter Outer Panel Sectioning (4NB)
Front Compartment Side Rail Replacement	Quarter Inner Panel Replacement (4NB)
Front Hinge Pillar Body Sectioning	Quarter Inner Panel Sectioning (5HB)
Body Hinge Pillar Lower Reinforcement Replacement	Center Pillar Inner Panel Replacement
Roof Outer Panel Replacement (5HB)	Center Pillar Reinforcement Replacement
Roof Outer Panel Replacement (4NB)	Center Pillar Sectioning - Outer
Roof Front Header Panel Replacement	Rear Rail Sectioning
Roof Rear Header Panel Replacement (5HB)	Underbody Rear Side Rail Extension Replacement
Rocker Inner Panel Replacement	Rear End Panel Replacement
Rocker Outer Panel Sectioning	Tail Lamp Pocket Replacement (5HB)
Body Side Frame Rocker Reinforcement Replacement	Tail Lamp Pocket Replacement (4NB)
Front Side Door Outer Panel Replacement	Description and Operation
Rear Side Door Outer Panel Replacement	Special Tools





Dimensions - Body (5HB)

Dimensions - Body (4NB)





## Dimensions - Body (5HB)

Point-to-point measurements are for reference only. All measurements are given in millimeters. Use these measurements for diagnosing and estimating. Point-to-point measurements are duplicated with tram bar pointers set at equal lengths. All die marks, holes, slots, and fasteners are measured to the center. All dimensions are symmetrical unless otherwise specified.

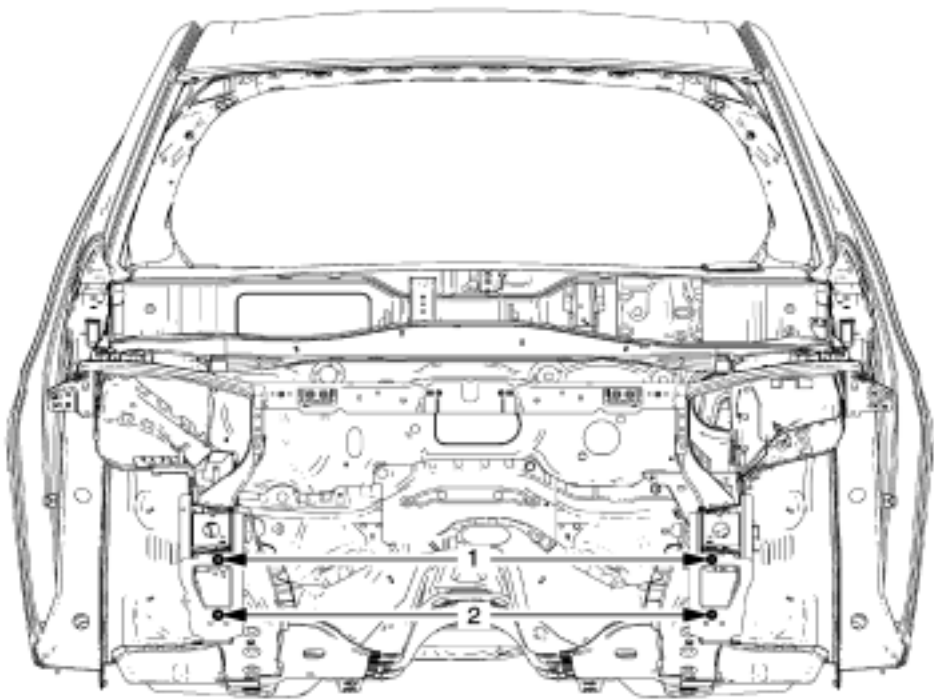
### [Point-to-Point Measurements](#)

[Front End Engine Compartment](#) [Front End Lower](#) [Rear End Lower](#) [Rear End Side](#)



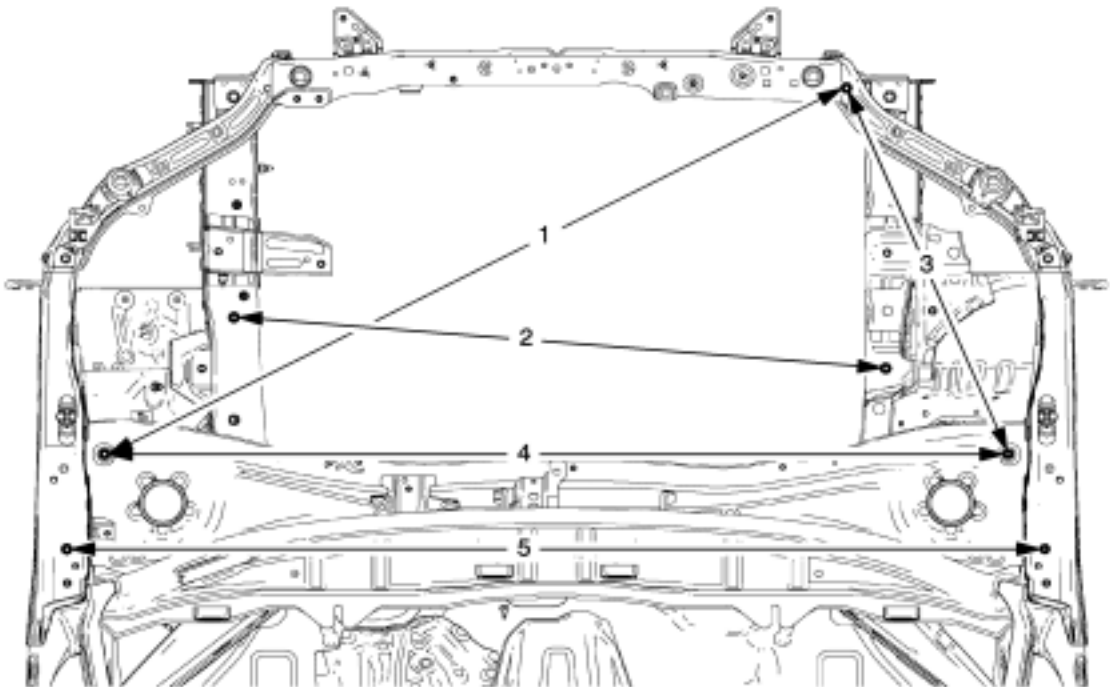


Front End



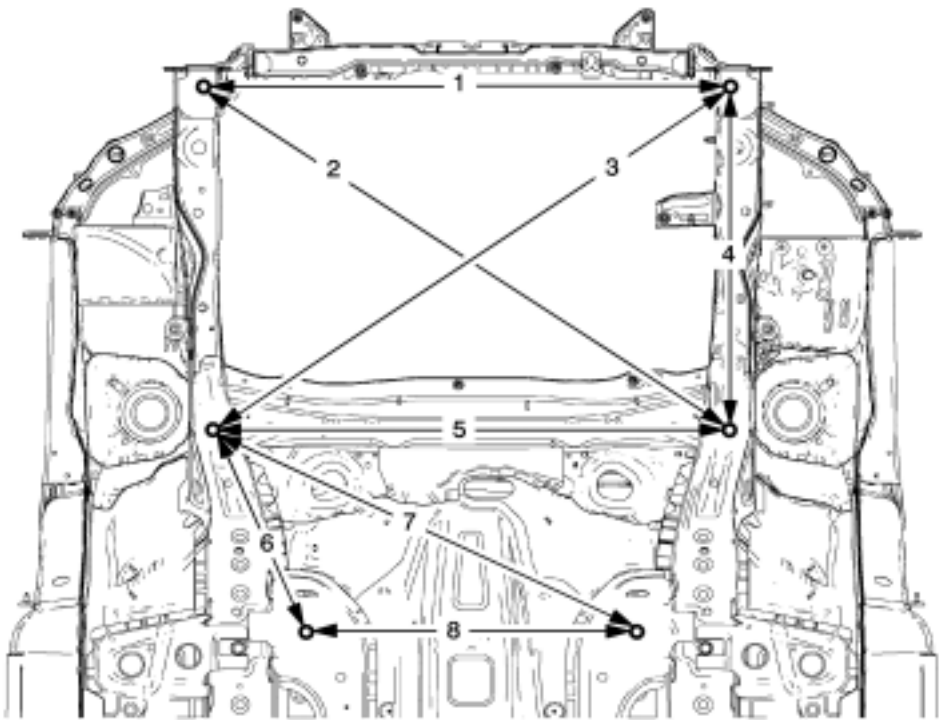
- (1) 926 mm
- (2) 926 mm

Engine Compartment



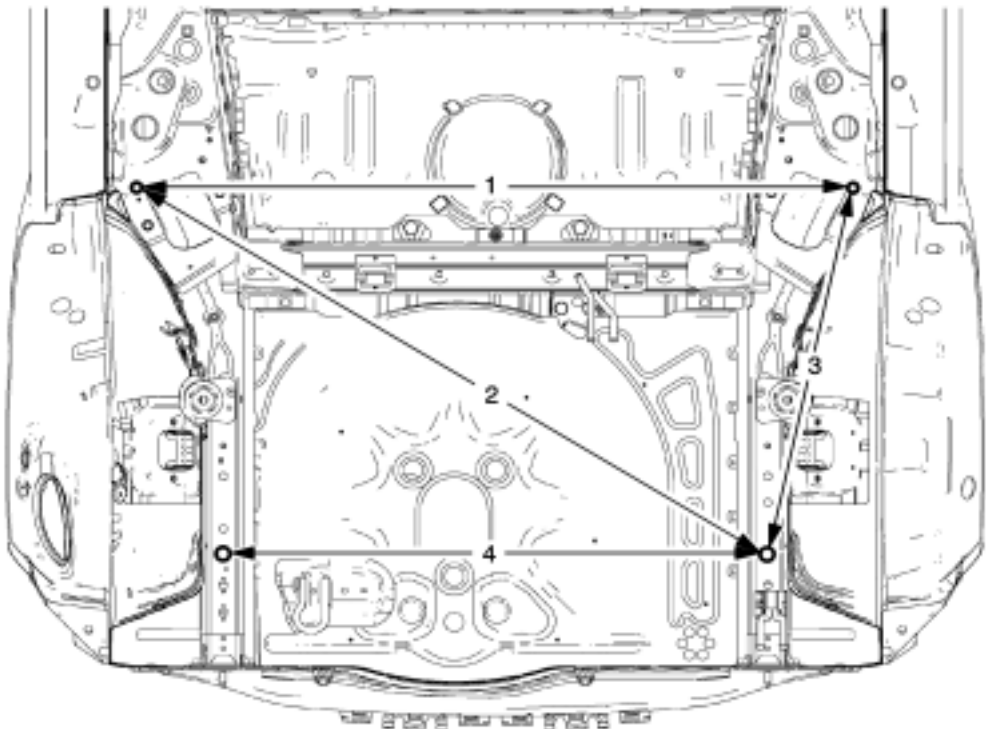
- (1) 1201 mm
- (2) 944 mm
- (3) 599 mm
- (4) 1300 mm
- (5) 1409 mm

Front End Lower



- (1) 928 mm
- (2) 1122 mm
- (3) 1110 mm
- (4) 633 mm
- (5) 910 mm
- (6) 440 mm
- (7) 852 mm
- (8) 584 mm

Rear End Lower



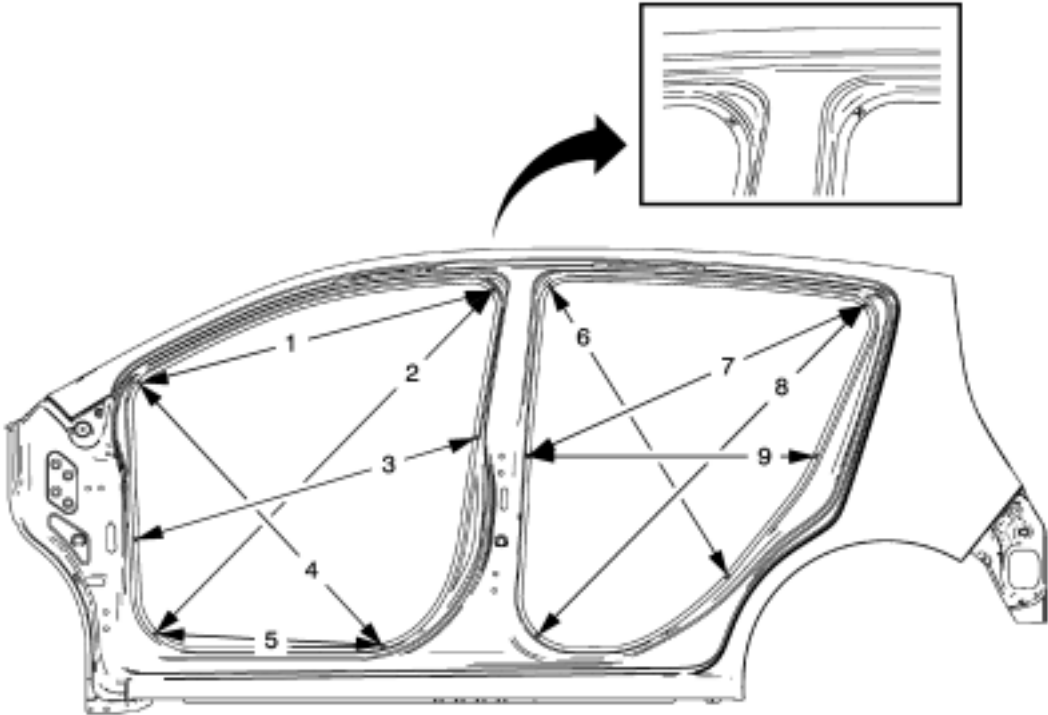
- (1) 1233 mm
- (2) 1259 mm
- (3) 627 mm
- (4) 966 mm

Rear End



- (1) 1425 mm
- (2) 1132 mm

Side



- (1) 985 mm
- (2) 1319 mm
- (3) 955 mm
- (4) 981 mm
- (5) 611 mm
- (6) 946 mm
- (7) 1005 mm
- (8) 1277 mm
- (9) 772 mm



## Dimensions - Body (4NB)

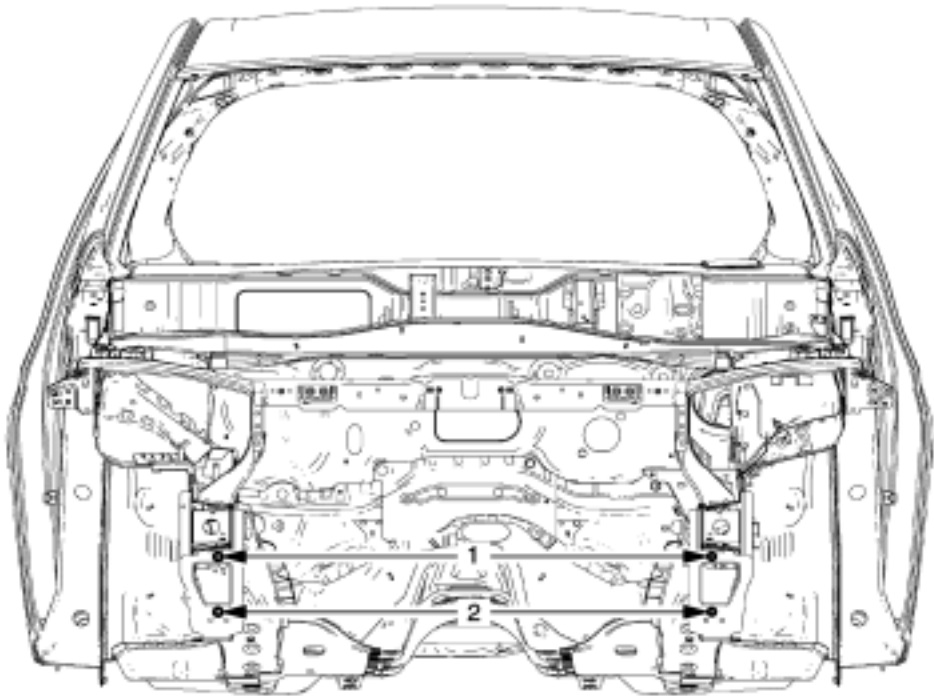
Point-to-point measurements are for reference only. All measurements are given in millimeters. Use these measurements for diagnosing and estimating. Point-to-point measurements are duplicated with tram bar pointers set at equal lengths. All die marks, holes, slots, and fasteners are measured to the center. All dimensions are symmetrical unless otherwise specified.

[Point-to-Point Measurements](#)

[Front End Engine Compartment](#) [Front End Lower](#) [Rear End Lower](#) [Rear End Side](#)



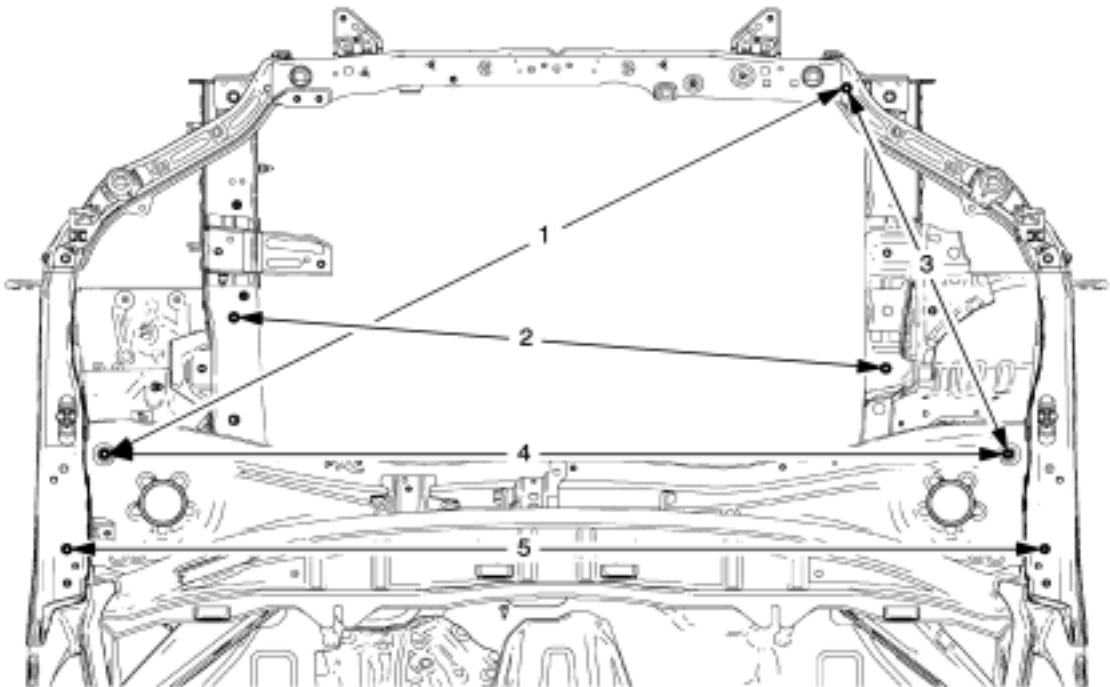
Front End



- (1) 926 mm
- (2) 926 mm

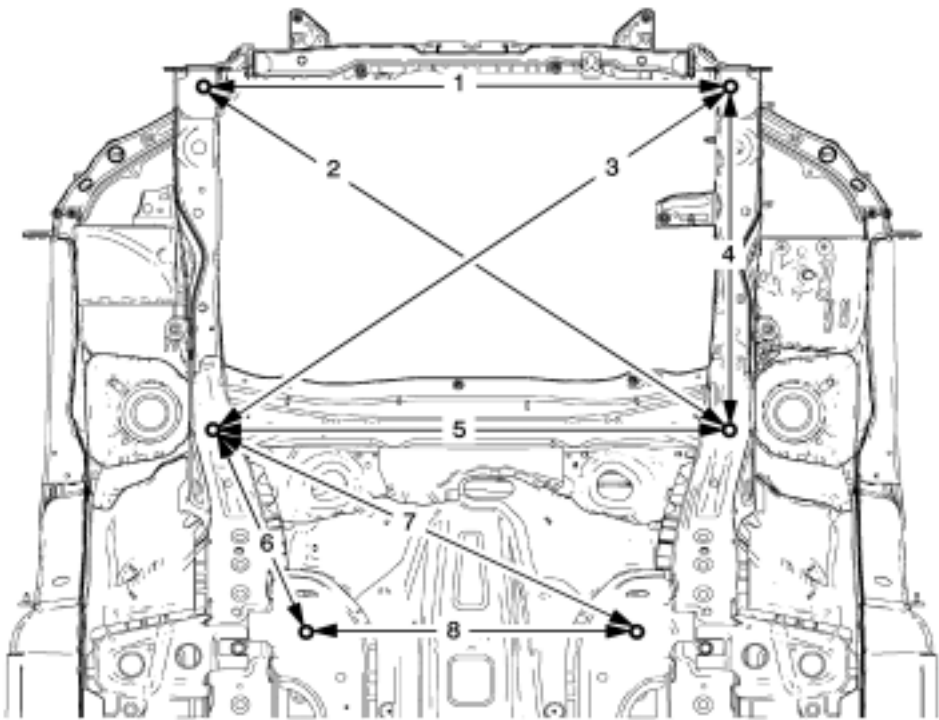


Engine Compartment



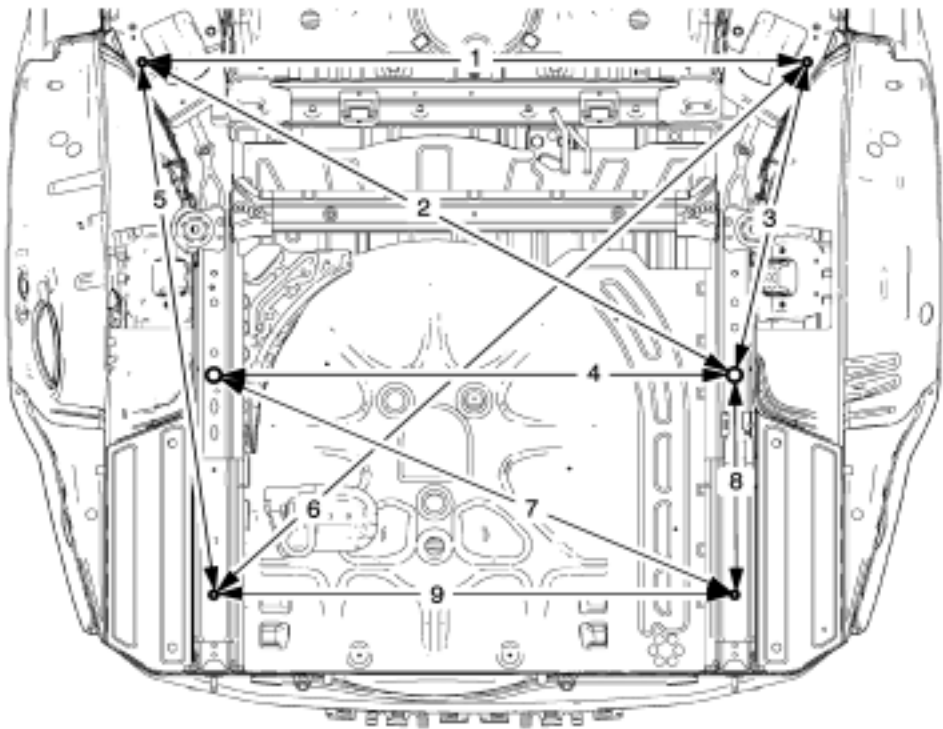
- (1) 1201 mm
- (2) 944 mm
- (3) 599 mm
- (4) 1300 mm
- (5) 1409 mm

Front End Lower



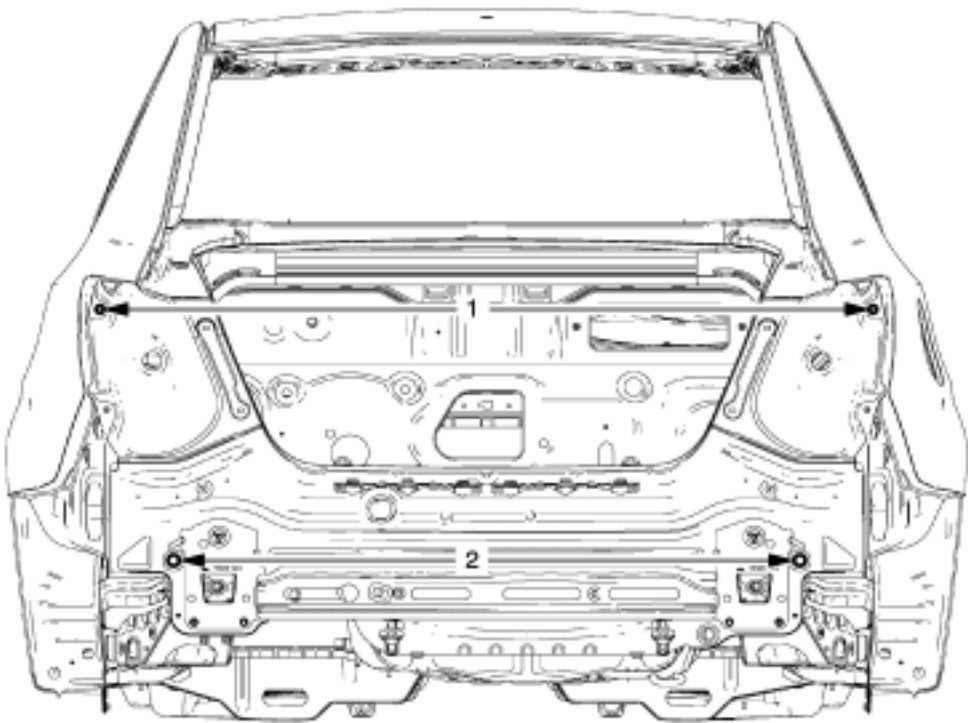
- (1) 928 mm
- (2) 1122 mm
- (3) 1110 mm
- (4) 633 mm
- (5) 910 mm
- (6) 440 mm
- (7) 852 mm
- (8) 584 mm

Rear End Lower



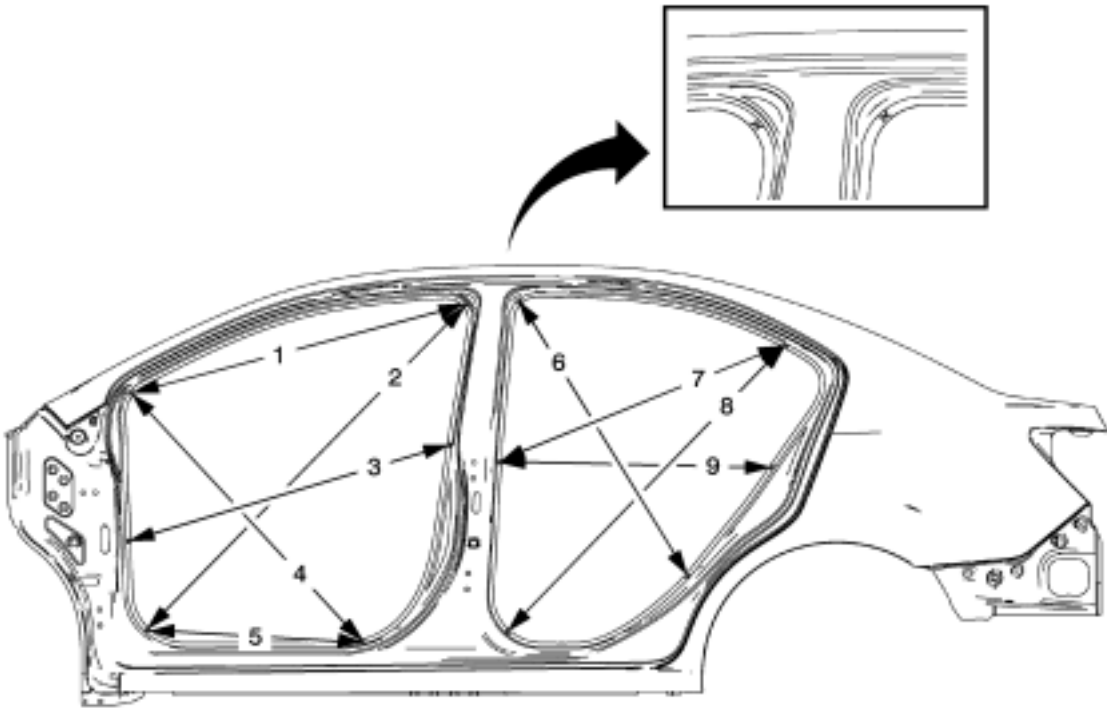
- (1) 1233 mm
- (2) 1259 mm
- (3) 627 mm
- (4) 966 mm
- (5) 1035 mm
- (6) 1504 mm
- (7) 1052 mm
- (8) 417 mm
- (9) 965 mm

Rear End



- (1) 1396 mm
- (2) 1130 mm

Side

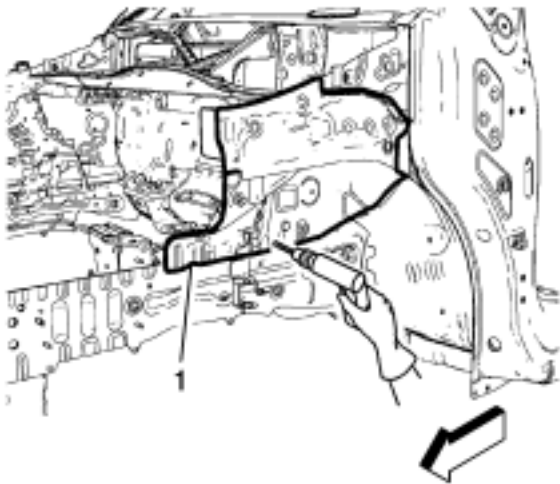


- (1) 985 mm
- (2) 1319 mm
- (3) 955 mm
- (4) 981 mm
- (5) 611 mm
- (6) 946 mm
- (7) 886 mm
- (8) 1155 mm
- (9) 776 mm

## Front Wheelhouse Front Panel Replacement

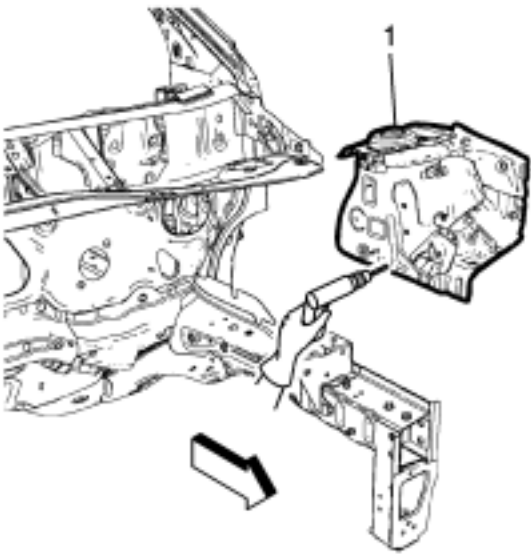
### Removal Procedure

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .  
**Note:** Sectioning of the front wheelhouse assembly is not recommended. The front wheelhouse service panel is serviced as a complete assembly, which includes the upper front strut mounting surface. The upper strut mounting surface is a dimensionally critical area.
3. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .  
**Note:** Inspect the front of the cowl for damage. If the metal surface is damaged, the cowl panel must be repaired to restore the structural integrity of the vehicle.
4. Repair as much of the damage as possible.



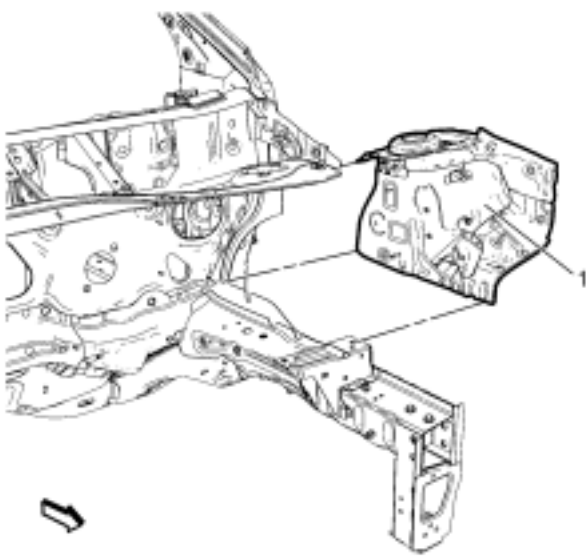
5. Locate, mark, and drill out all factory welds(1). Note the number and location of welds for installation of the service assembly.
6. Remove the front wheelhouse from the vehicle.

### Installation Procedure

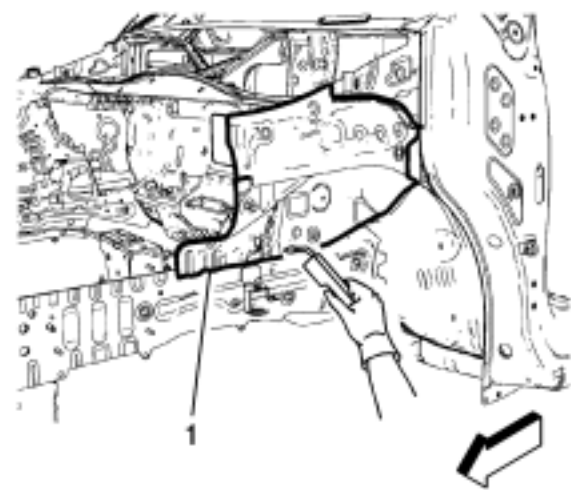


**Note:** If the location of the original plug weld holes cannot be determined, or if structural weld-thru adhesive is present, space the plug weld holes every **40 mm (1 in)** .

1. Drill **8 mm (5/ 16 in)** plug weld holes as necessary on service part, in the locations noted from the original assembly(1).
2. Clean and prepare the mating surfaces for welding, as necessary.
3. Apply GM-approved weld-thru coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#) .



4. Position the service front wheelhouse front panel to the vehicle (1). Clamp the front wheelhouse in place.



5. When the service assembly is correctly positioned, plug weld accordingly (1).
6. Measure frequently to ensure proper fit and alignment.
7. Clean and prepare all welded surfaces.
8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
9. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
10. Install all related panels and components.
11. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
12. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

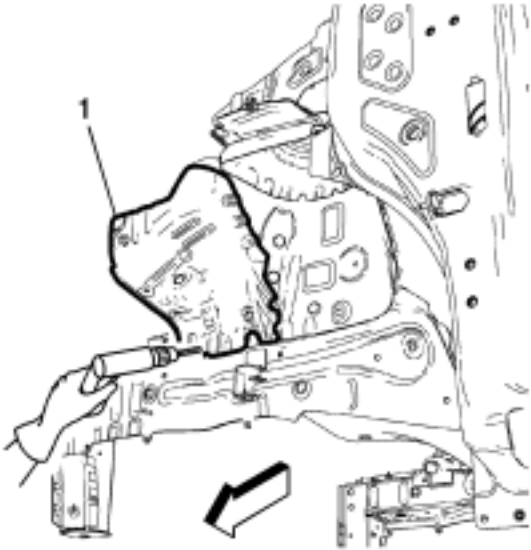
## Front Wheelhouse Panel Reinforcement Replacement

### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

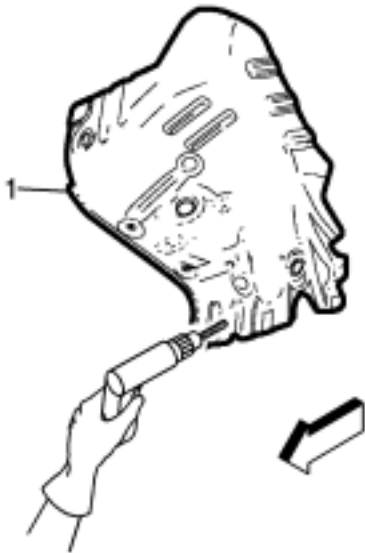
**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .



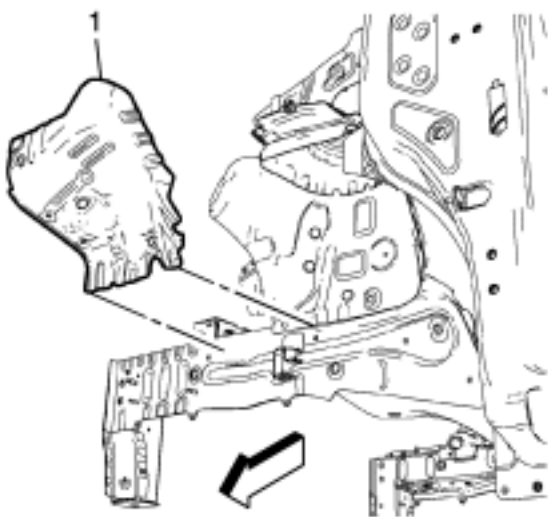
6. Locate and mark all the necessary factory welds of the front wheelhouse panel reinforcement.
7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.
8. Remove the front wheelhouse panel reinforcement.

### Installation Procedure

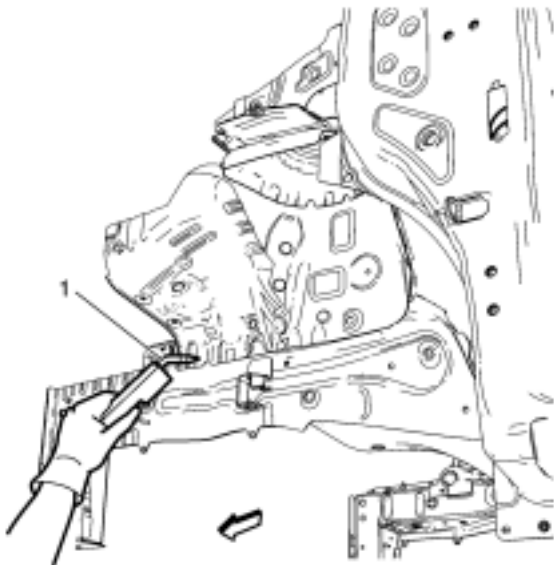


1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the front wheelhouse panel reinforcement as noted from the original panel(1).
2. Clean and prepare the attaching surfaces for welding.





- 3. Position the front wheelhouse panel reinforcement on the vehicle(1).
- 4. Verify the fit of the front wheelhouse panel reinforcement.
- 5. Clamp the front wheelhouse panel reinforcement into position.



- 6. Plug weld accordingly (1).
- 7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 8. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 9. Install all related panels and components.
- 10. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 11. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

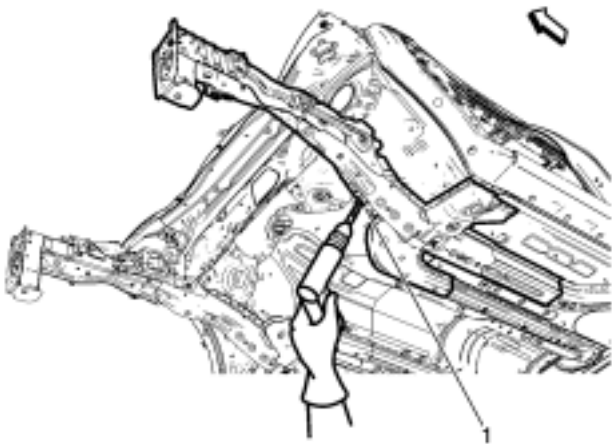
## Front Compartment Side Rail Replacement

### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

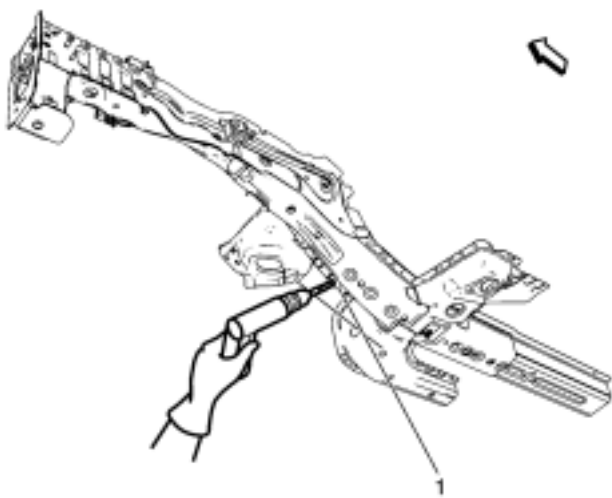
**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

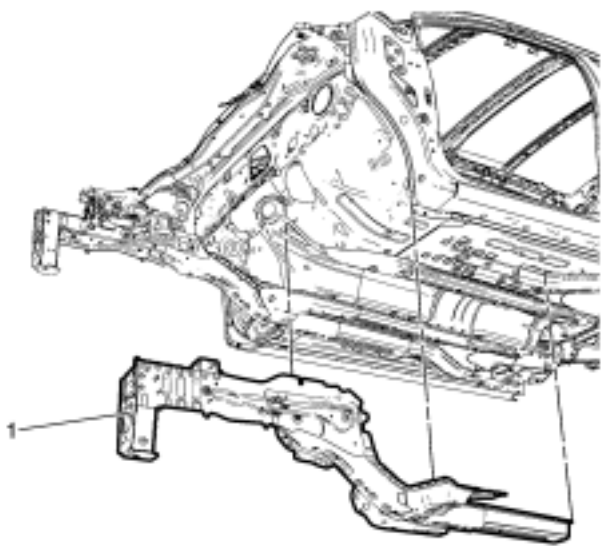


6. Locate and mark all the necessary factory welds of the front compartment side rail.
7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.
8. Remove the front compartment side rail.

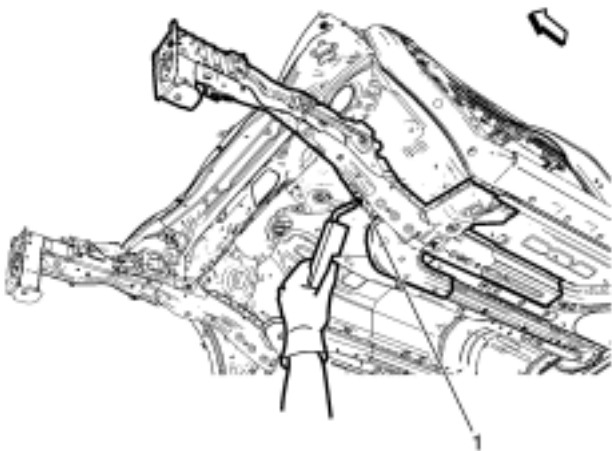
### Installation Procedure



1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the front compartment side rail as noted from the original panel(1).
2. Clean and prepare the attaching surfaces for welding.



- 3. Position the front compartment side rail on the vehicle(1).
- 4. Verify the fit of the front compartment side rail.
- 5. Clamp the front compartment side rail into position.



- 6. Plug weld accordingly (1).
- 7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 8. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 9. Install all related panels and components.
- 10. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 11. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Front Hinge Pillar Body Sectioning

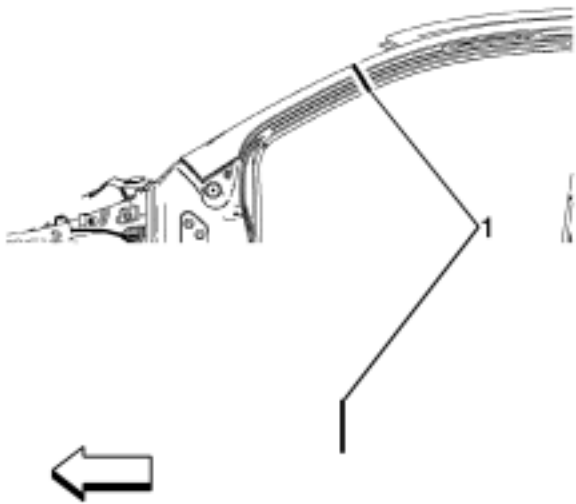
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Warning:** Refer to [Collision Sectioning Warning](#) .

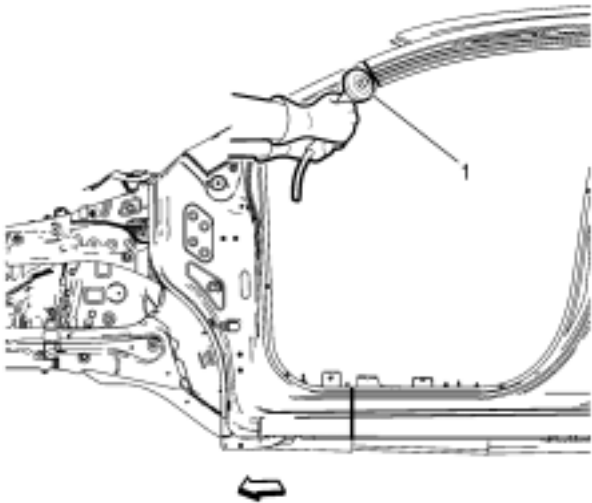
**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all the related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .



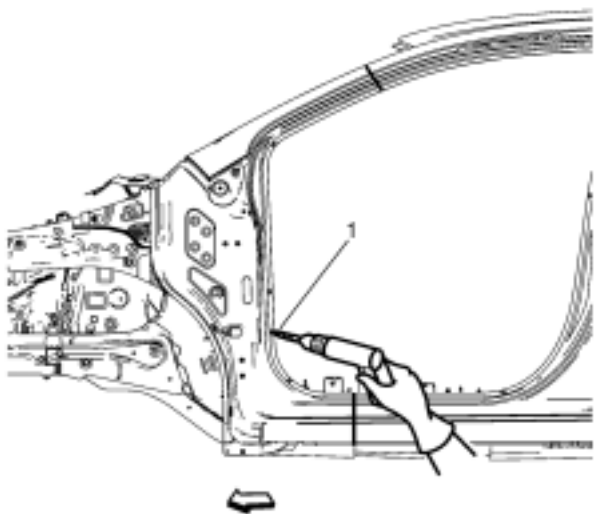
**Note:** Sectioning can be done anywhere in the straight area along the rocker panel.

6. Create cut lines (1) on the front hinge pillar body.

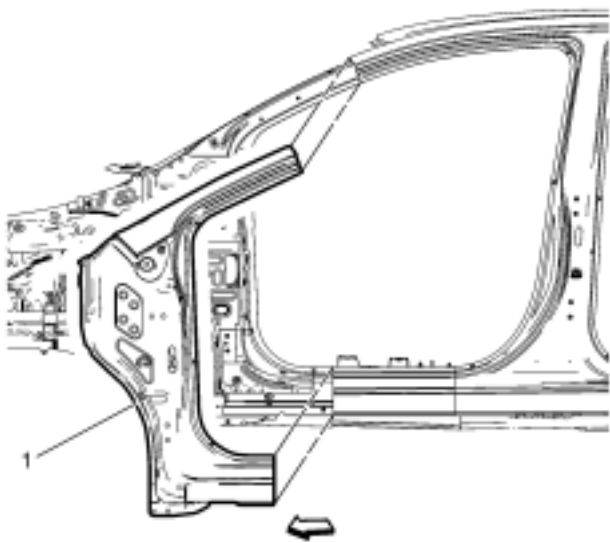


**Note:** Do not damage any inner panels or reinforcements.

7. Cut the panel where sectioning is to be performed (1).
8. Locate and mark all the necessary factory welds of the front hinge pillar body.

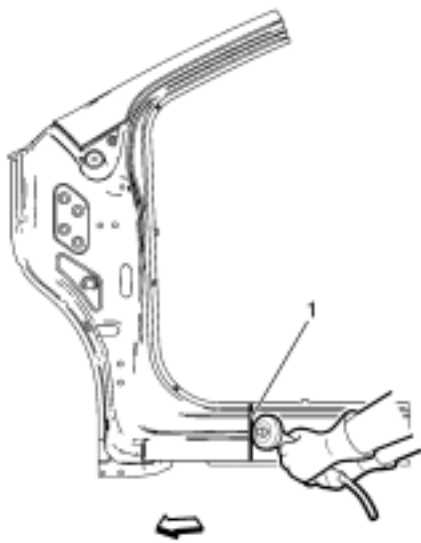


9. Drill all the factory welds (1). Note the number and location of welds for installation of the service assembly.

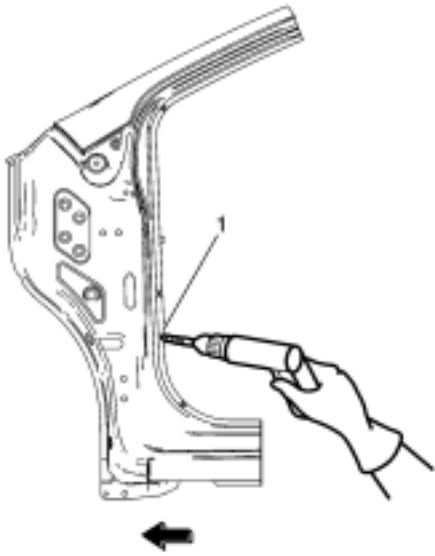


10. Remove the damaged front hinge pillar body (1).

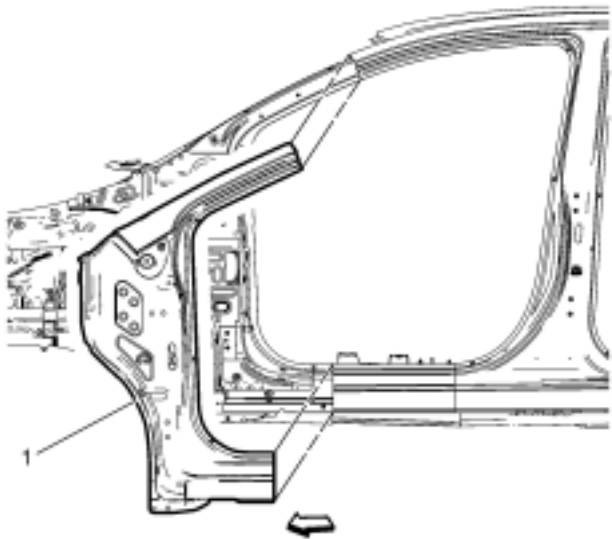
Installation Procedure



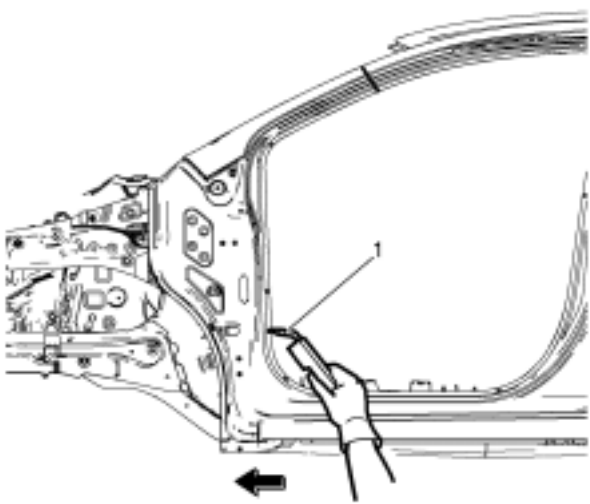
1. Cut the front hinge pillar body in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to overlap the remaining original panel by **25 mm (1 in)** at each joint location (1).
2. Prepare all mating surfaces as necessary.



- 3. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the front hinge pillar body as noted from the original panel (1).
- 4. Clean and prepare the attaching surfaces for welding.



- 5. Position the front hinge pillar body on the vehicle (1).
- 6. Verify the fit of the front hinge pillar body.
- 7. Clamp the front hinge pillar body into position.



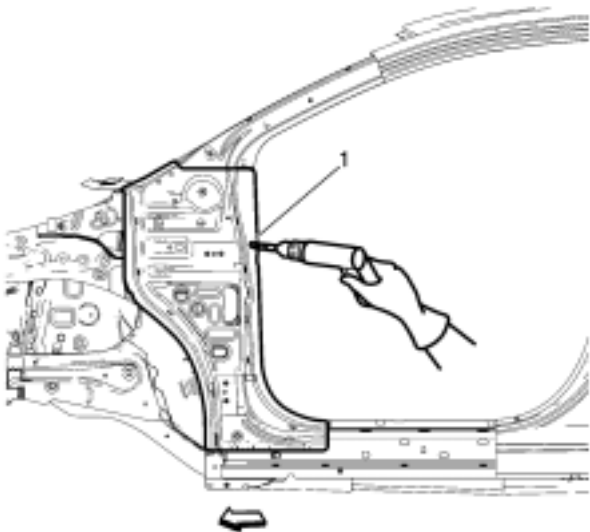
- 8. Plug weld accordingly (1).
- 9. To create a solid weld at the sectioning joint, with minimum heat distortion, make **25 mm (1 in)** stitch welds along the seam with **25 mm (1 in)** gaps between them. Then go back and complete the stitch weld.
- 10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
- 11. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 12. Install all related panels and components.
- 13. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 14. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Body Hinge Pillar Lower Reinforcement Replacement

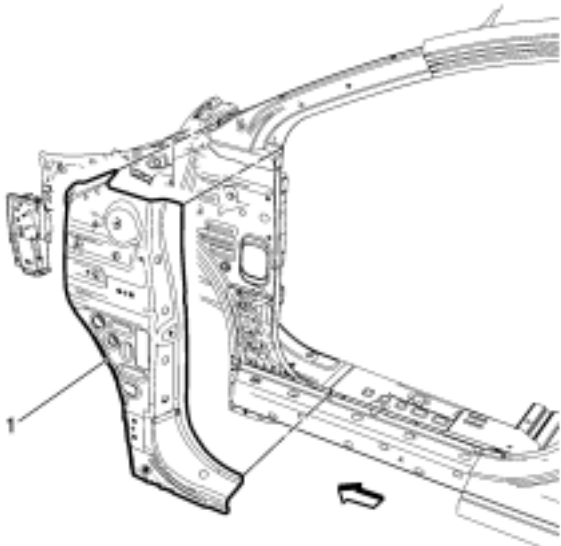
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Repair as much of the damage as possible. Refer to [Dimensions - Body](#) .
5. Remove the sealers and anti-corrosion materials from the repair area. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all the necessary factory welds of the front hinge pillar body.



7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

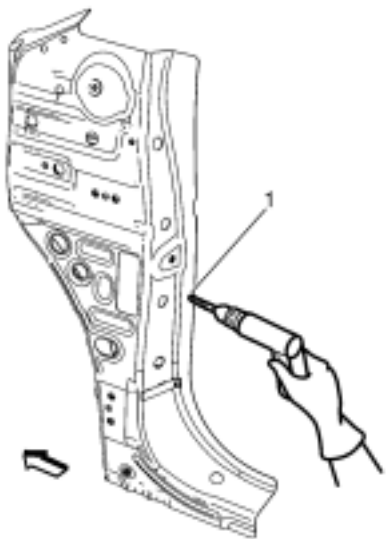


8. Remove the damaged front hinge pillar body reinforcement (1).

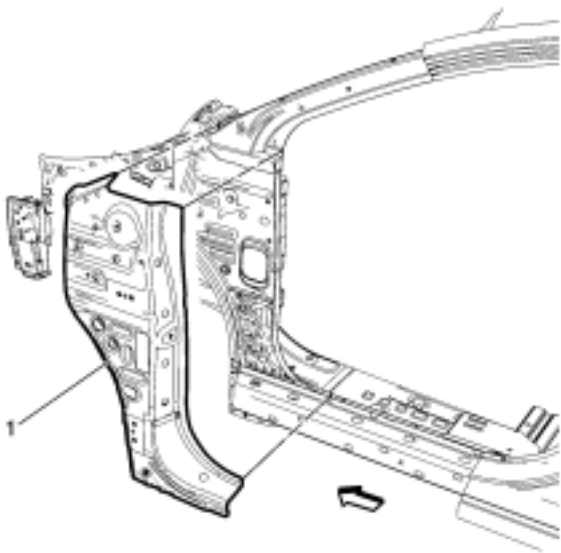
### Installation Procedure

1. Prepare all mating surfaces as necessary.
2. Align the front hinge pillar body reinforcement.

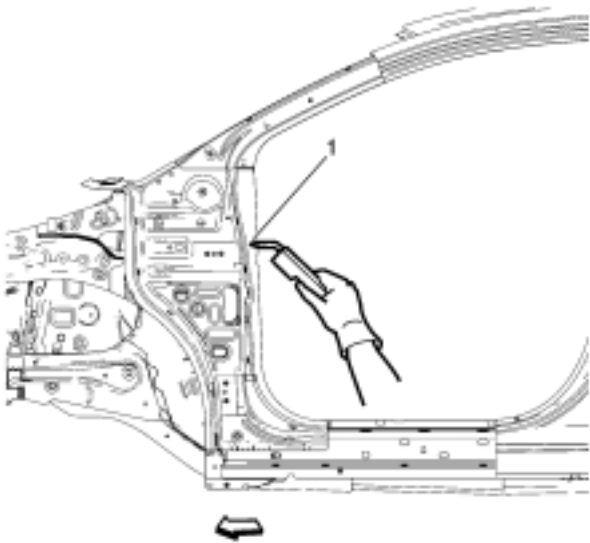




- 3. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the front hinge pillar body as noted from the original panel (1).
- 4. Clean and prepare the attaching surfaces for welding.



- 5. Position the front hinge pillar body reinforcement on the vehicle (1).
- 6. Verify the fit of the front hinge pillar body reinforcement.
- 7. Clamp the front hinge pillar body reinforcement into position.



- 8. Plug weld accordingly (1).
- 9. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 10. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 11. Install all related panels and components.
- 12. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 13. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

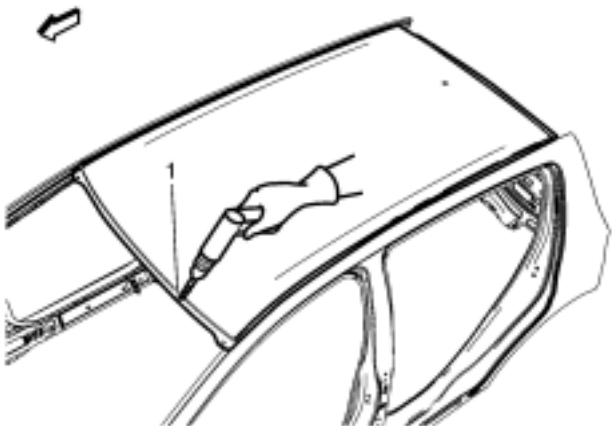


## Roof Outer Panel Replacement (5HB)

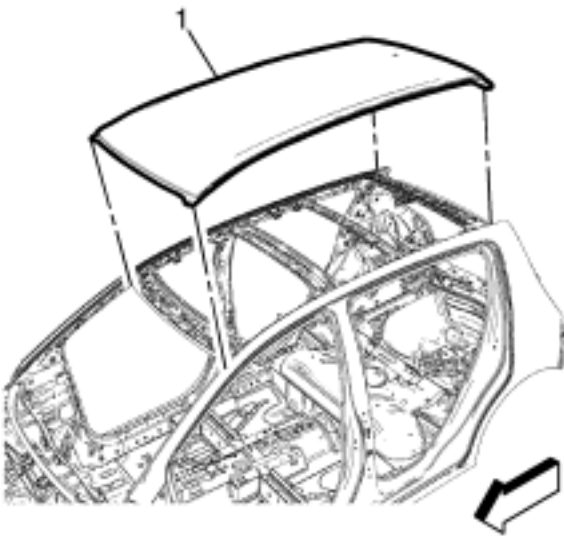
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all factory welds.

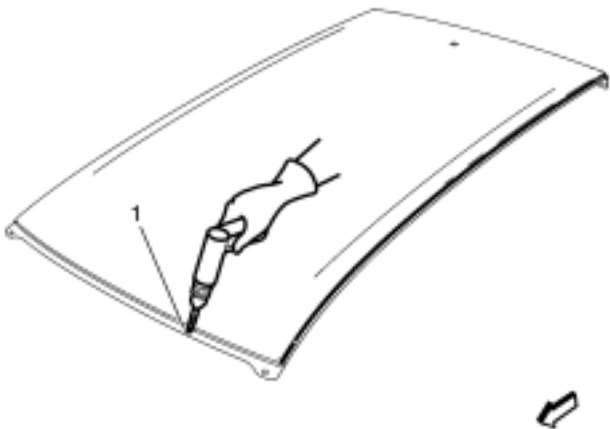


7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.
8. Cut the adhesive with an appropriate tool.

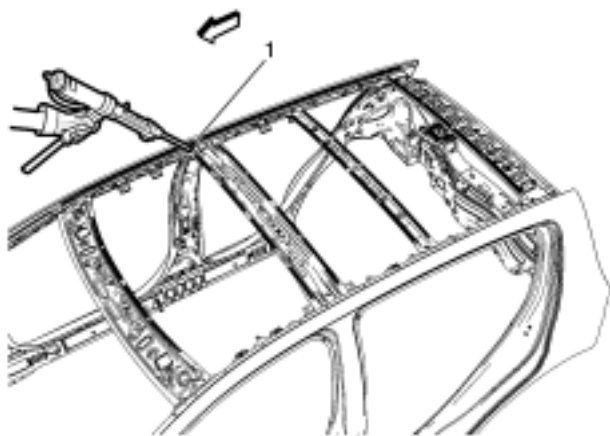


9. Remove the damaged roof panel(1).

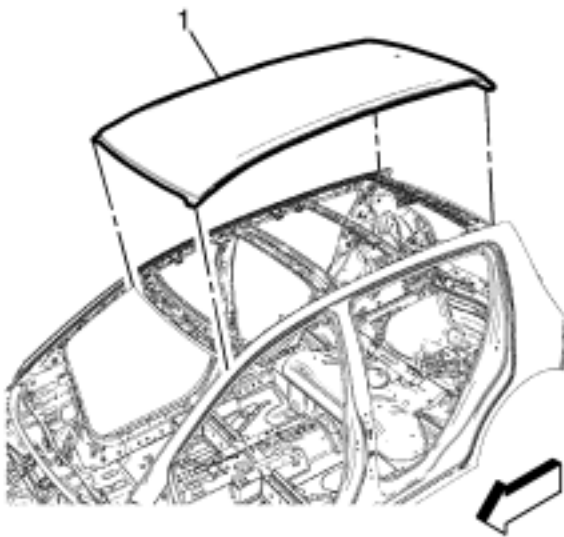
Installation Procedure



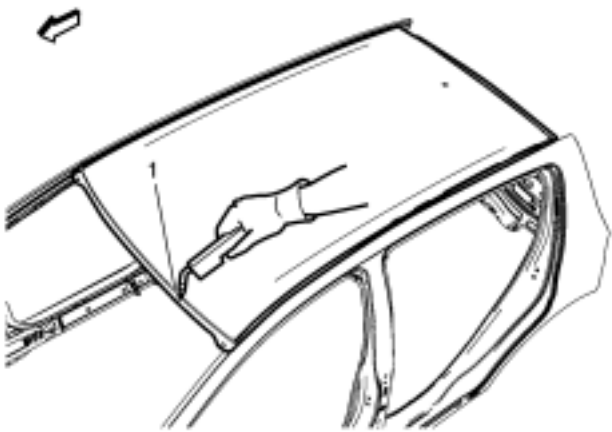
- 1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the service panel as noted from the original panel (1).
- 2. Clean and prepare the attaching surfaces for welding.



- 3. Apply one-part windshield urethane adhesive as noted from the original panel (1).



- 4. Position the roof panel(1) on the vehicle.
- 5. Verify the fit of the panel.
- 6. Clamp the panel into position.



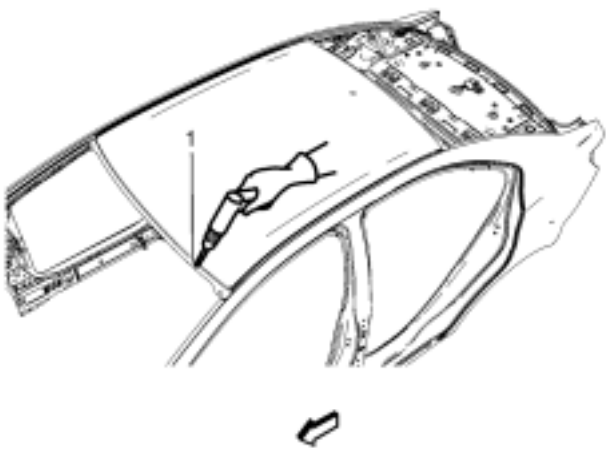
- 7. Plug weld accordingly (1).
- 8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 9. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 10. Install all related panels and components.
- 11. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 12. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Roof Outer Panel Replacement (4NB)

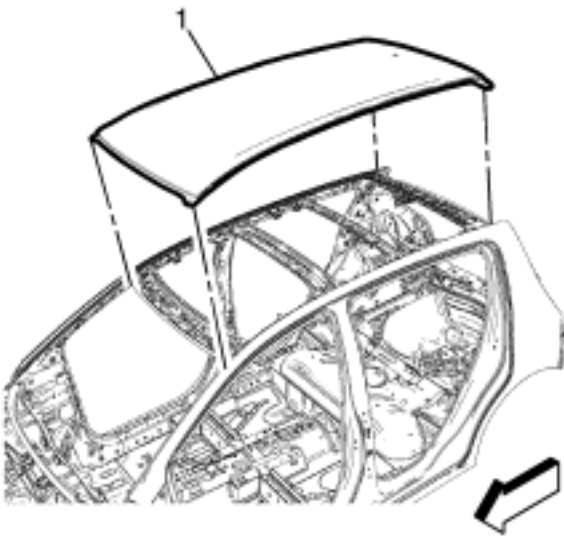
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all factory welds.

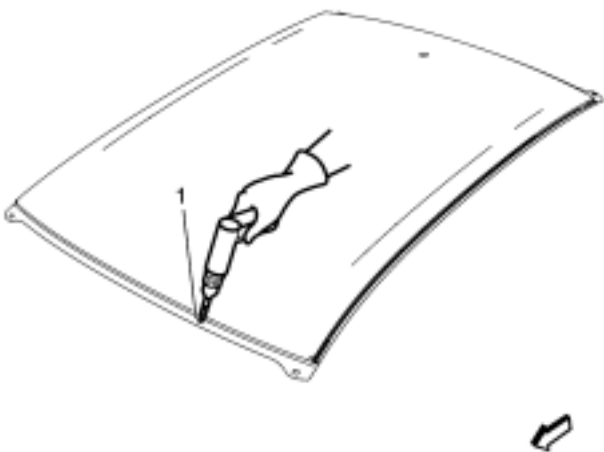


7. Drill all factory welds(1). Note the number and location of welds for installation of the service assembly.
8. Cut the adhesive with an appropriate tool.

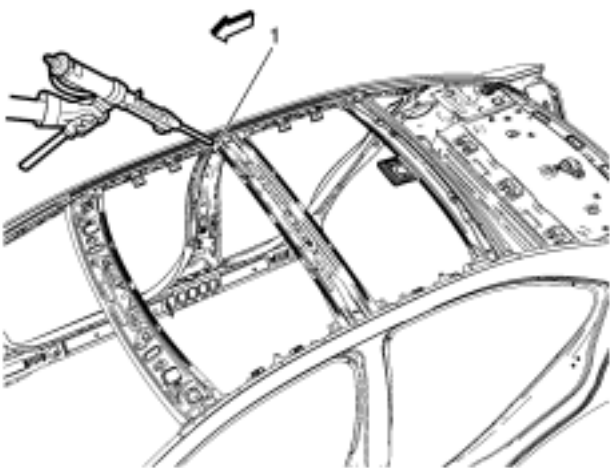


9. Remove the damaged roof panel(1).

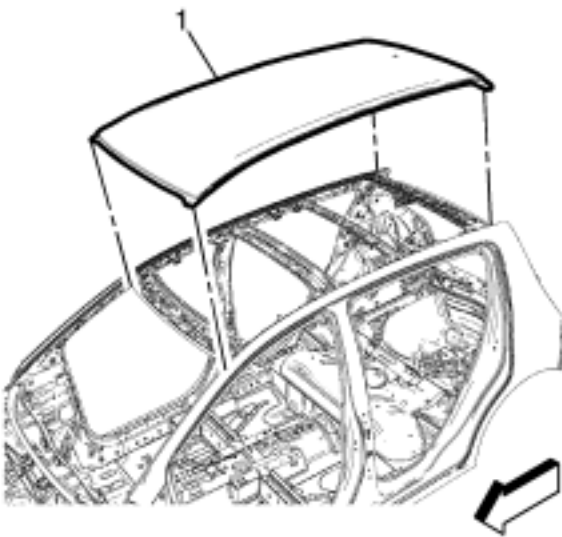
Installation Procedure



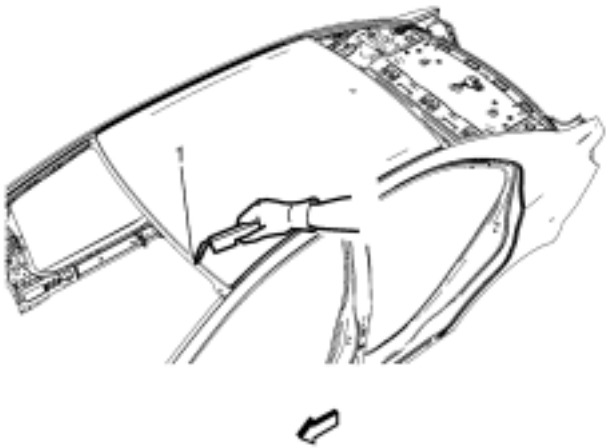
- 1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the service panel as noted from the original panel(1).
- 2. Clean and prepare the attaching surfaces for welding.



- 3. Apply one-part windshield urethane adhesive(1) as noted from the original panel.



- 4. Position the roof panel(1) on the vehicle.
- 5. Verify the fit of the panel.
- 6. Clamp the panel into position.



- 7. Plug weld accordingly (1).
- 8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 9. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 10. Install all related panels and components.
- 11. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 12. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

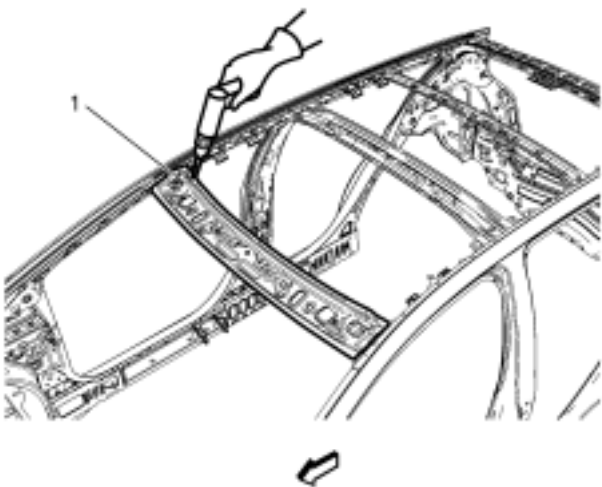
## Roof Front Header Panel Replacement

### Removal Procedure

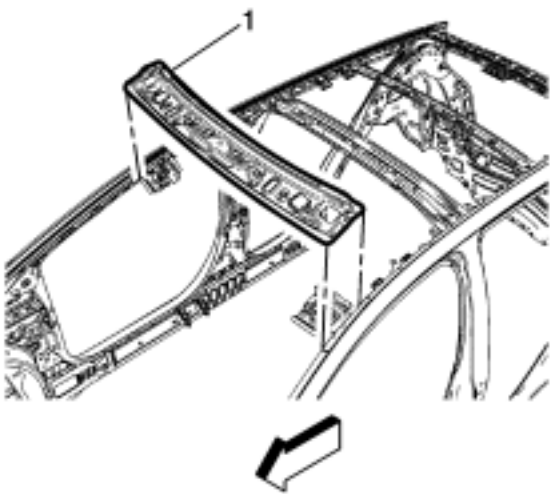
**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Note:** The roof front header panel is made of Ultra High Strength Steel and should be replaced only at factory joints. Repairing or sectioning of this part is not recommended. Refer to [Ultra High Strength Steel](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications. Refer to [Dimensions - Body](#) .
5. Remove the sealers and anti-corrosion materials from the repair area. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all factory welds.



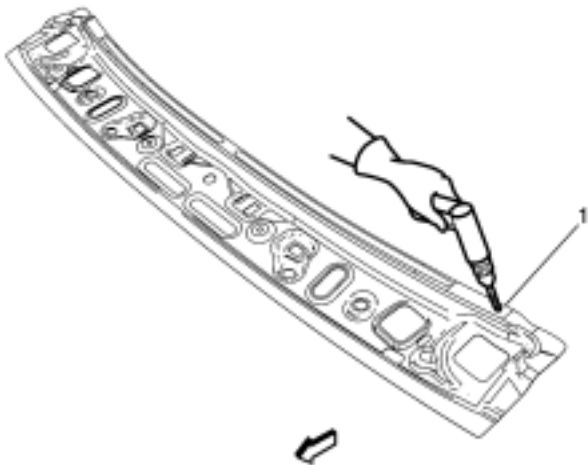
7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.



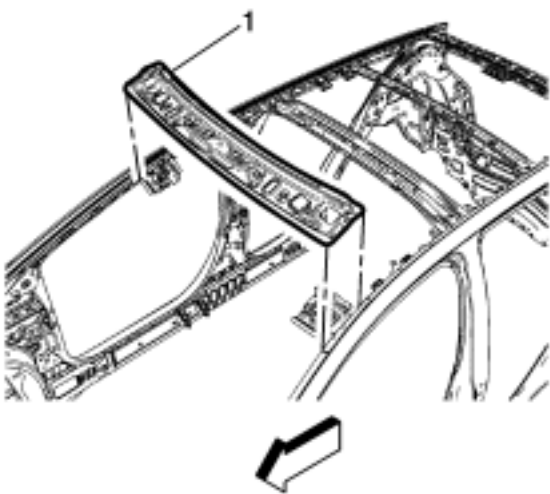
8. Remove the damaged roof front header panel (1).



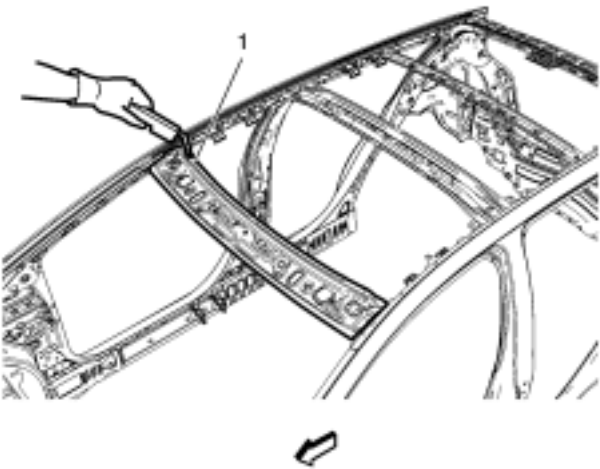
Installation Procedure



- 1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the service panel as noted from the original panel (1).
- 2. Clean and prepare the attaching surfaces for welding.



- 3. Position the roof front header (1) panel on the vehicle.
- 4. Verify the fit of the panel.
- 5. Clamp the roof front header panel into position.



- 6. Plug weld accordingly (1).
- 7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 8. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 9. Install all related panels and components.
- 10. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 11. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

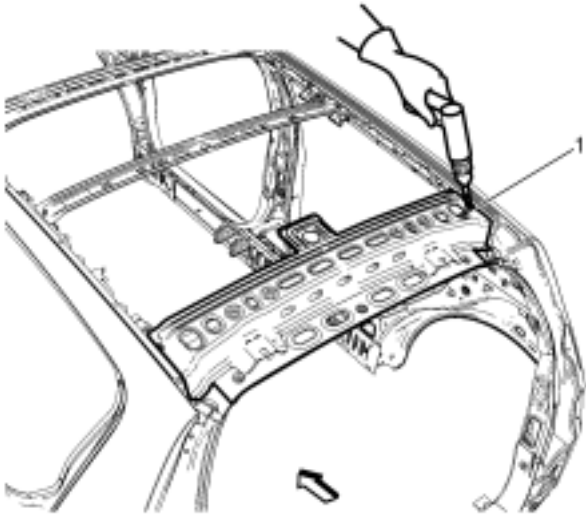


## Roof Rear Header Panel Replacement (5HB)

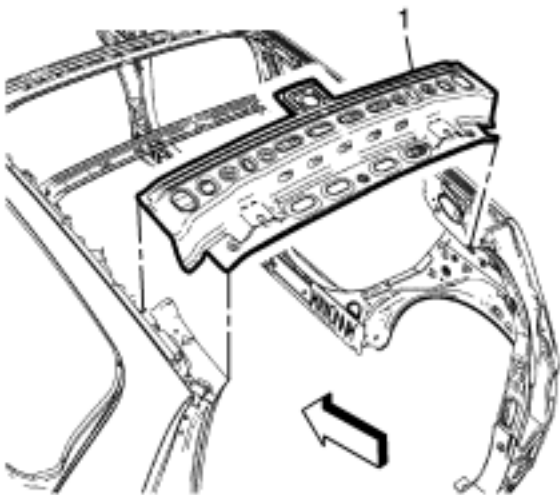
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications. Refer to [Dimensions - Body](#) .
5. Remove the sealers and anti-corrosion materials from the repair area. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all factory welds.

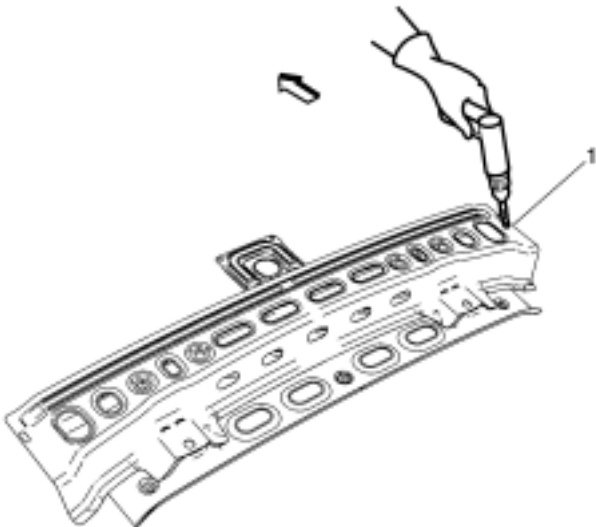


7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

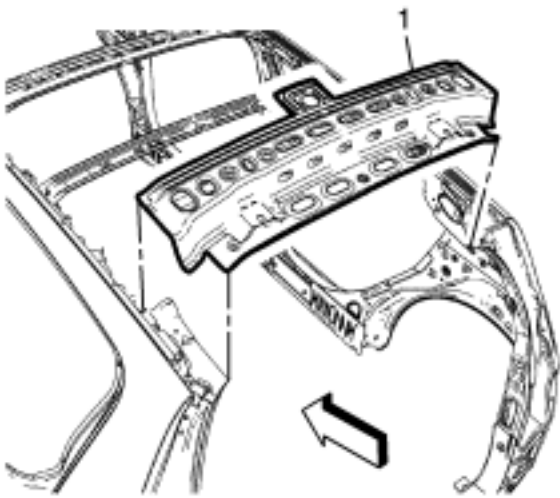


8. Remove the damaged rear header panel(1).

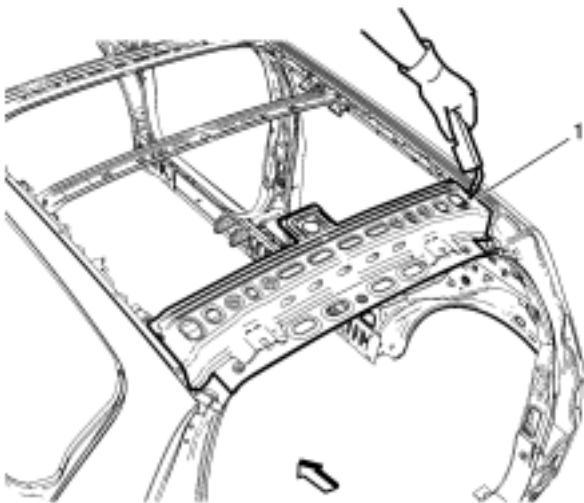
### Installation Procedure



1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the service panel (1) as noted from the original panel.
2. Clean and prepare the attaching surfaces for welding.



- 3. Position the roof rear header (1) panel on the vehicle.
- 4. Verify the fit of the panel.
- 5. Clamp the roof rear header panel into position.



- 6. Plug weld accordingly (1).
- 7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 8. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 9. Install all related panels and components.
- 10. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 11. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

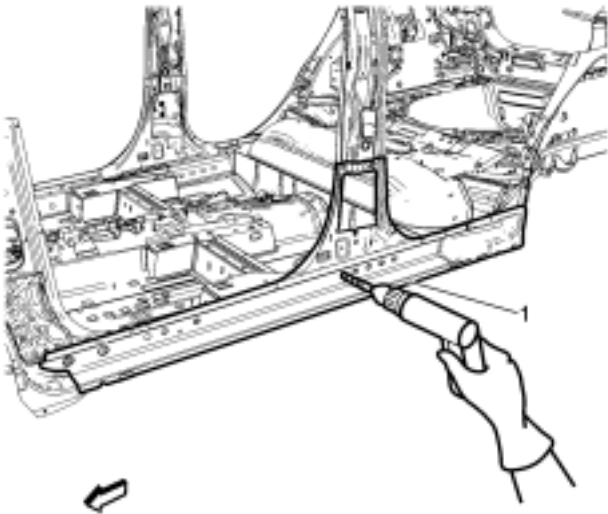
## Rocker Inner Panel Replacement

### Removal Procedure

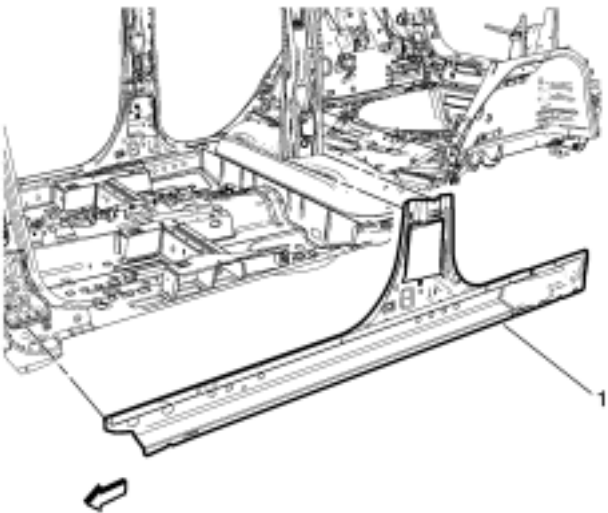
**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Note:** The rocker inner panel is made of Ultra High Strength Dual Phase Steel and should be replaced only at factory joints. Repairing or sectioning of this part is not recommended. Refer to [Ultra High Strength Dual Phase Steel](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications. Refer to [Dimensions - Body](#) .
5. Remove the sealers and anti-corrosion materials from the repair area. Refer to [Anti-Corrosion Treatment and Repair](#) .

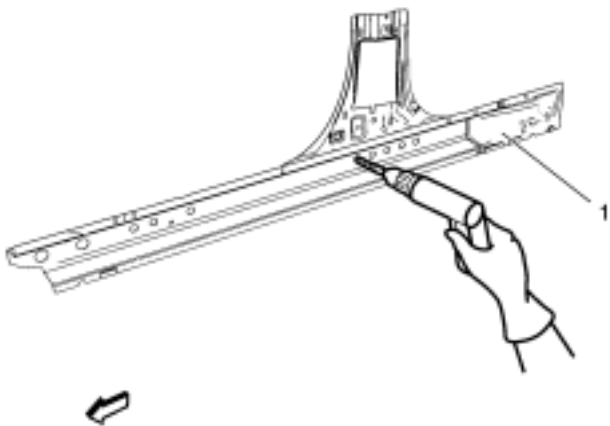


6. Locate and mark all the necessary factory welds of the rocker inner panel.
7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

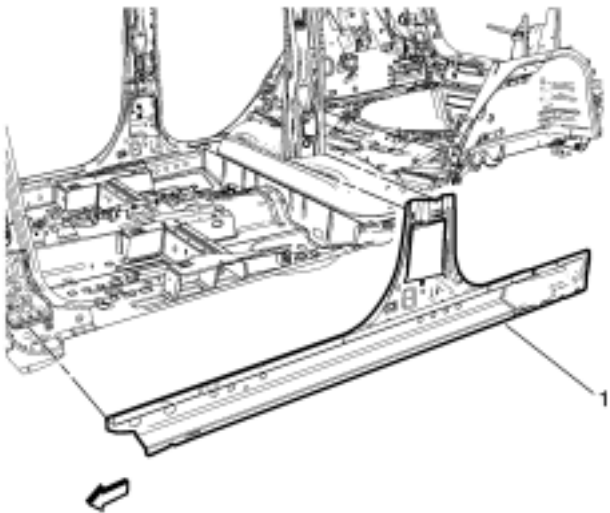


8. Remove the damaged rocker inner panel (1).

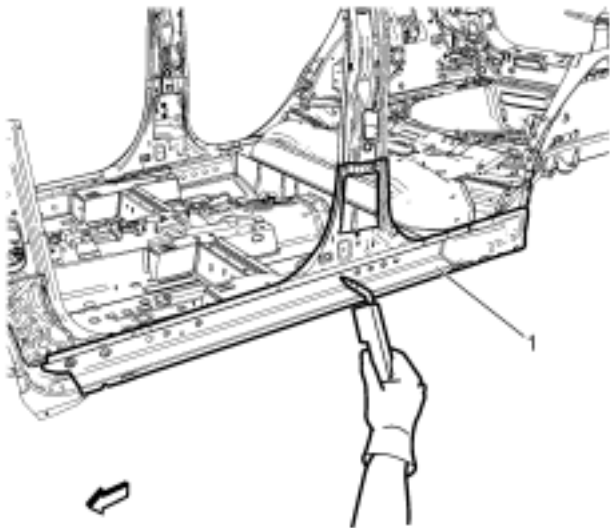
Installation Procedure



- 1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the quarter outer panel (1) as noted from the original panel.
- 2. Clean and prepare the attaching surfaces for welding.



- 3. Position the rocker inner panel on the vehicle (1).
- 4. Verify the fit of the panel.
- 5. Clamp the rocker inner panel into position.



- 6. Plug the weld accordingly (1).
- 7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 8. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 9. Install all related panels and components.
- 10. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 11. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Rocker Outer Panel Sectioning

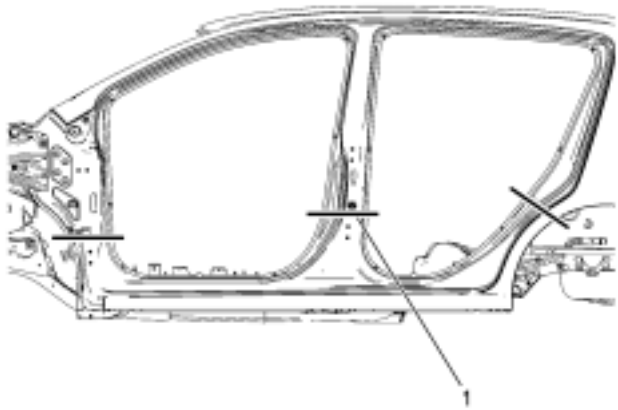
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

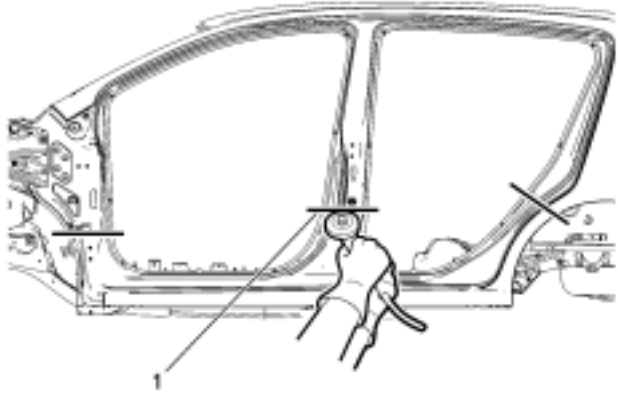
**Warning:** Refer to [Collision Sectioning Warning](#) .

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

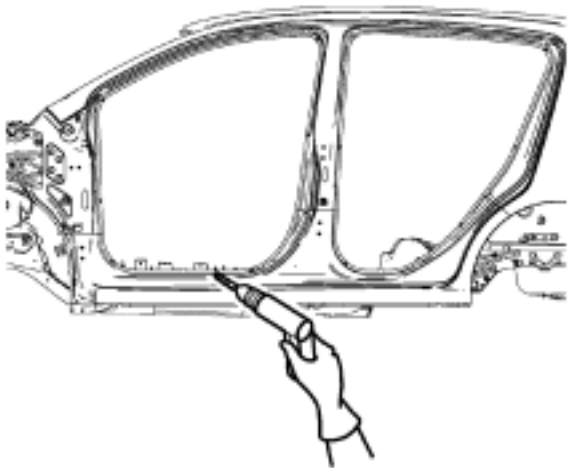


6. Create cut lines on the rocker outer panel (1).

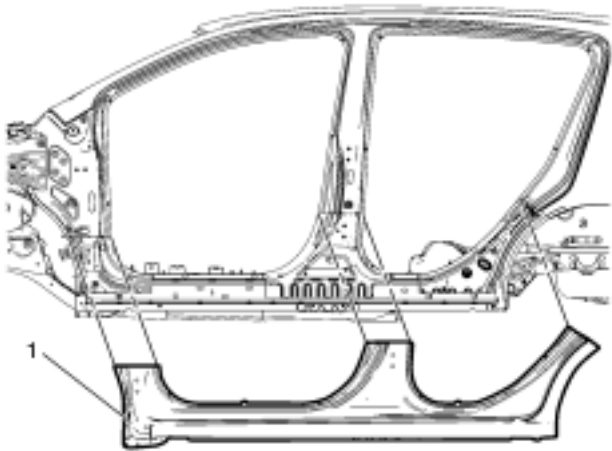


**Note:** Do not damage any inner panels or reinforcements.

7. Cut the panel where sectioning is to be performed (1).

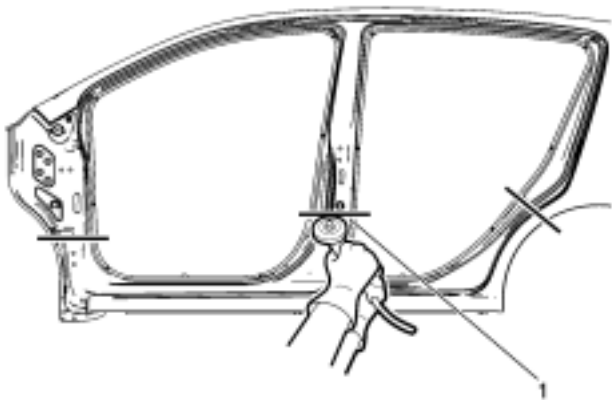


- 8. Locate and mark all the necessary factory welds of the rocker outer panel.
- 9. Drill all factory welds. Note the number and location of welds for installation of the service assembly.



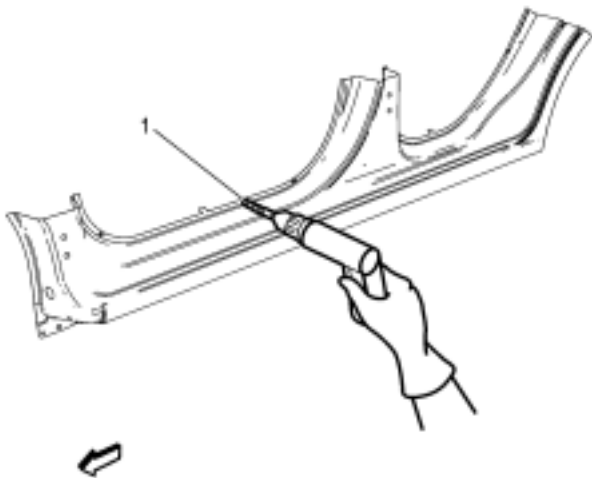
- 10. Remove the damaged rocker outer panel (1).

Installation Procedure

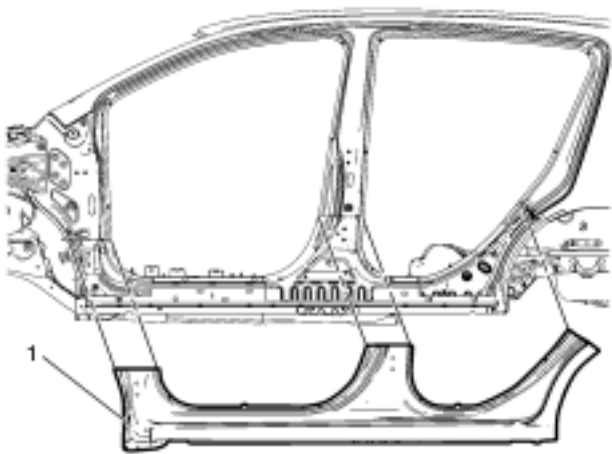


- 1. Cut the rocker outer panel in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to overlap the remaining original panel by **25 mm (1 inch)** at each joint location (1).
- 2. Prepare all mating surfaces as necessary.

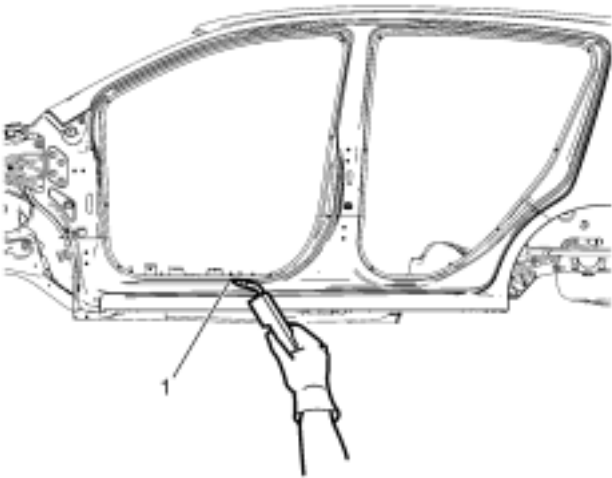




- 3. Drill a **8 mm (5/ 16 in)**holes for plug welding along the edges of the rocker outer panel as noted from the original panel (1).
- 4. Clean and prepare the attaching surfaces for welding.



- 5. Position the rocker outer panel on the vehicle (1).
- 6. Verify the fit of the rocker outer panel.
- 7. Clamp the rocker outer panel into position.



- 8. Plug weld accordingly (1).
- 9. To create a solid weld with minimum heat distortion, make **25 mm (1 in)**stitch welds along the seam with **25 mm (1 in)**gaps between them. Then go back and complete the stitch weld.
- 10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 11. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 12. Install all related panels and components.
- 13. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 14. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Body Side Frame Rocker Reinforcement Replacement

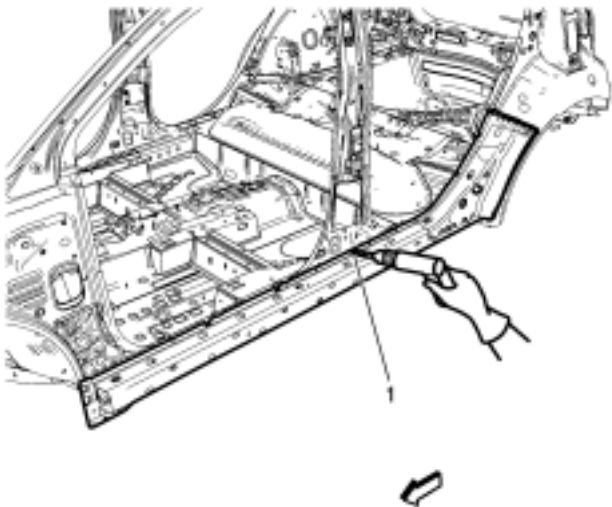
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

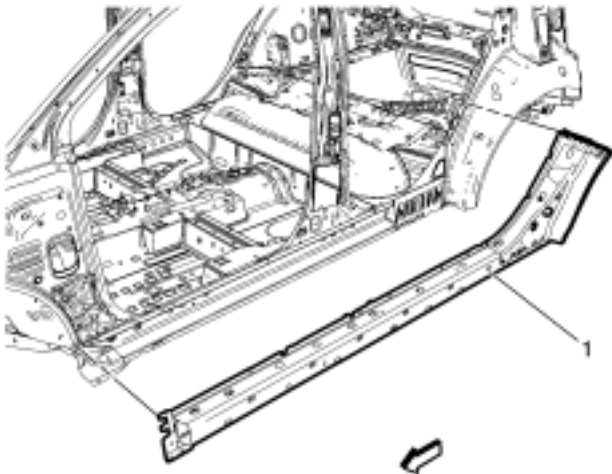
**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

**Note:** The body side frame rocker reinforcement is made of Ultra High Strength Dual Phase Steel and should be replaced only at factory joints. Repairing or sectioning of this part is not recommended. Refer to [Ultra High Strength Dual Phase Steel](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications. Refer to [Dimensions - Body](#) .
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all the necessary factory welds of the body side frame rocker reinforcement.



7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

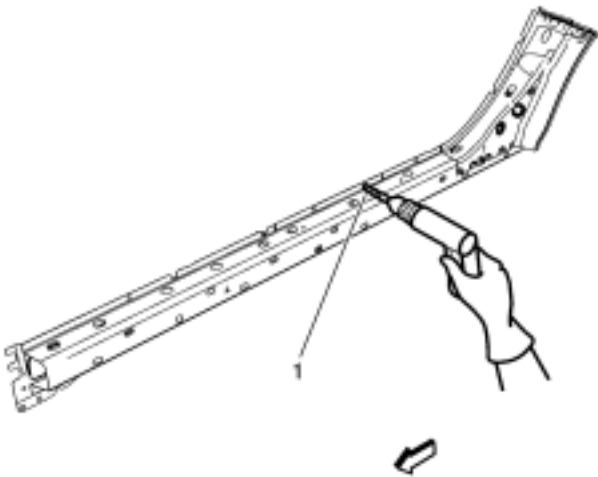


8. Remove the damaged body side frame rocker reinforcement (1).

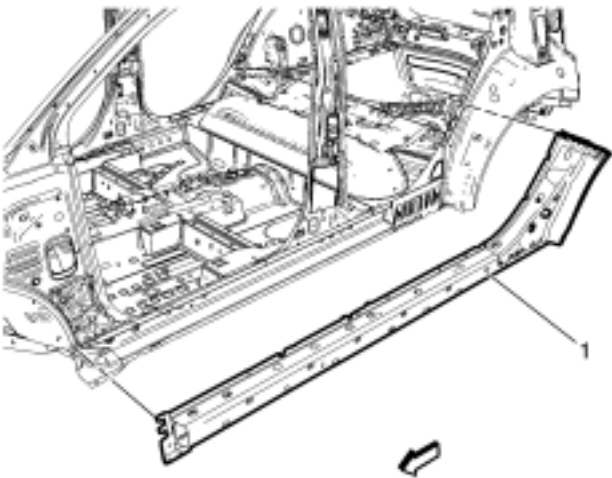
### Installation Procedure

1. Align the body side frame rocker reinforcement.

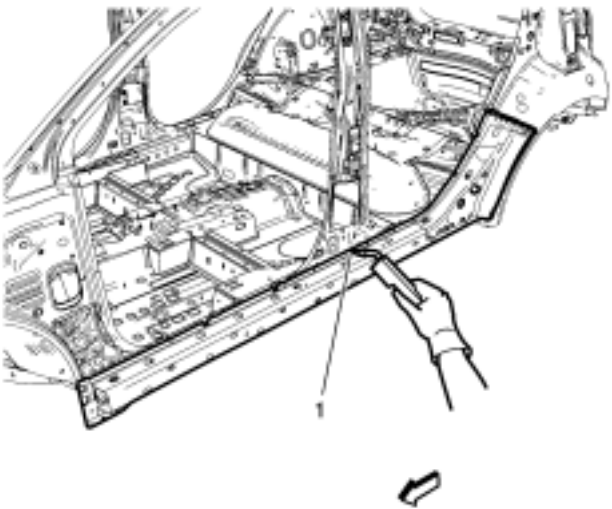




- 2. Drill a **8 mm (5/ 16 in)**holes for plug welding along the edges of the quarter outer panel (1) as noted from the original panel.
- 3. Clean and prepare the attaching surfaces for welding.



- 4. Position the body side frame rocker reinforcement on the vehicle (1).
- 5. Verify the fit of the body side frame rocker reinforcement.
- 6. Clamp the body side frame rocker reinforcement into position.



- 7. Plug the weld accordingly (1).
- 8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 9. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 10. Install all related panels and components.
- 11. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 12. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Front Side Door Outer Panel Replacement

### Special Tools

- *BO-6392* Flanging Tool Kit
- *BO-6396* Bonding Pliers

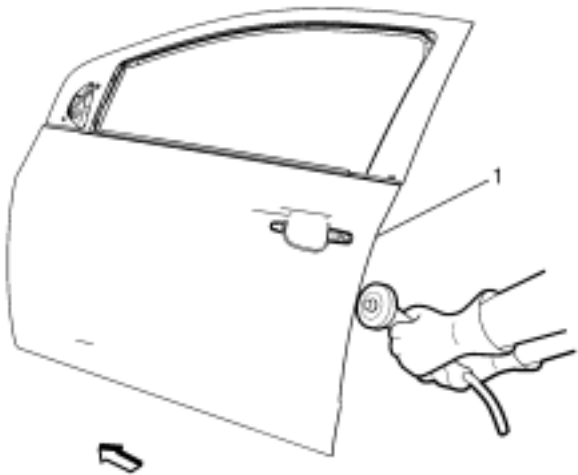
For equivalent regional tools, refer to [Special Tools](#) .

**Note:** According to different corrosion warranties, only the regional mandatory joining methods are allowed.

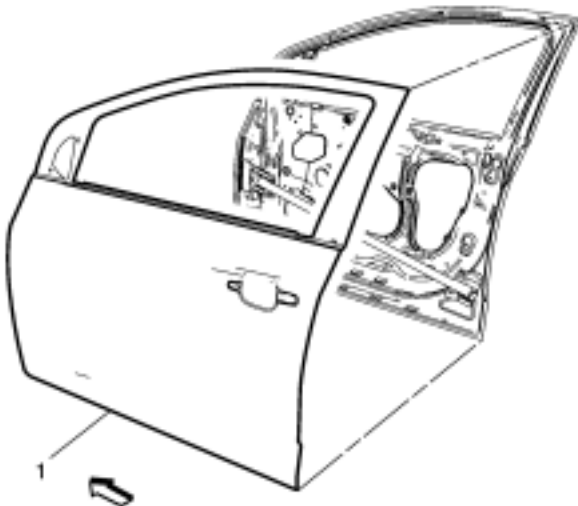
### Removal Procedure

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove the front side door. Refer to [Front Side Door Replacement](#) .
4. Remove the front side door outside handle. Refer to [Front Side Door Outside Handle Replacement](#) .
5. Remove the outside rearview mirror. Refer to [Outside Rearview Mirror Replacement](#) .
6. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .



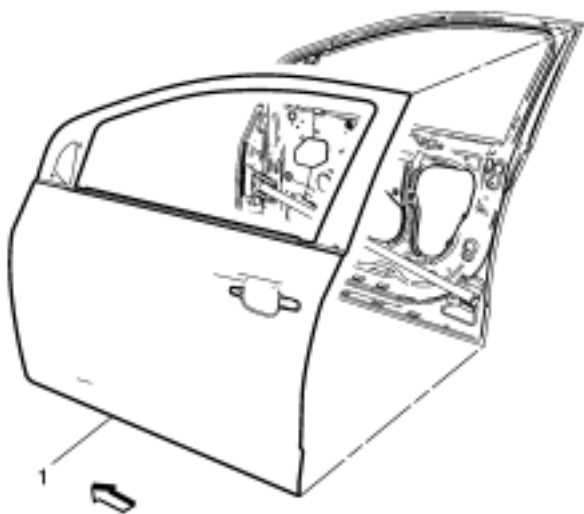
7. Grind the edges of the front side door outer panel (1) to separate the outer door panel from the door shell.



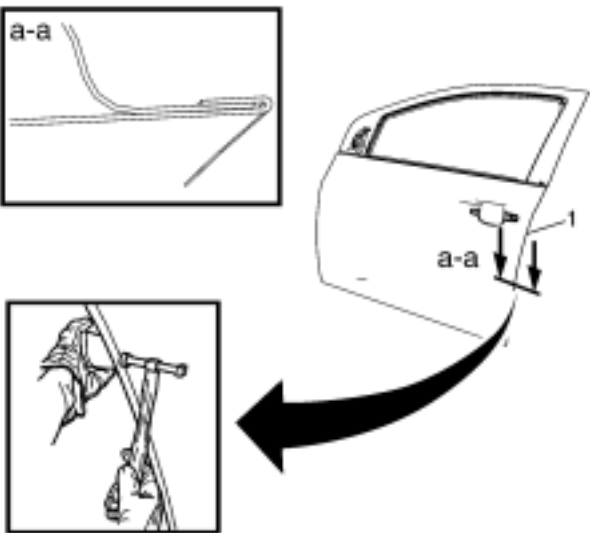
8. Remove the front side door outer door panel (1).
9. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
10. Straighten the edges of the door shell.

### Installation Procedure

1. Align the front side door outer panel.
2. Verify the fit of the front side door outer panel.



- 3. Clamp the front side door outer panel (1) into position.
- 4. Pre-flanging the flange with *BO-6396* pliers and *BO-6392* tool kit .



- 5. Continue to hammer in stages along the hem flanges (1).
- 6. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 7. Install the outside rearview mirror. Refer to [Outside Rearview Mirror Replacement](#) .
- 8. Install the front side door outside handle. Refer to [Front Side Door Outside Handle Replacement](#) .
- 9. Install the front side door. Refer to [Front Side Door Replacement](#) .
- 10. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 11. Install all related panels and components.
- 12. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 13. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Rear Side Door Outer Panel Replacement

### Special Tools

- *BO-6392* Flanging Tool Kit
- *BO-6396* Bonding Pliers

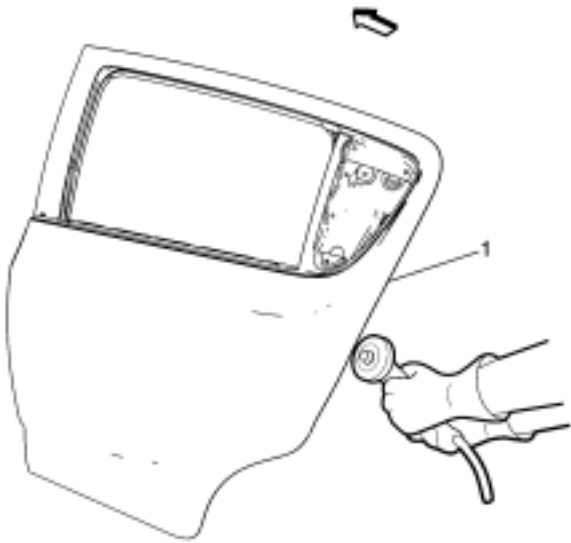
For equivalent regional tools, refer to [Special Tools](#) .

**Note:** According to different corrosion warranties, only the regional mandatory joining methods are allowed.

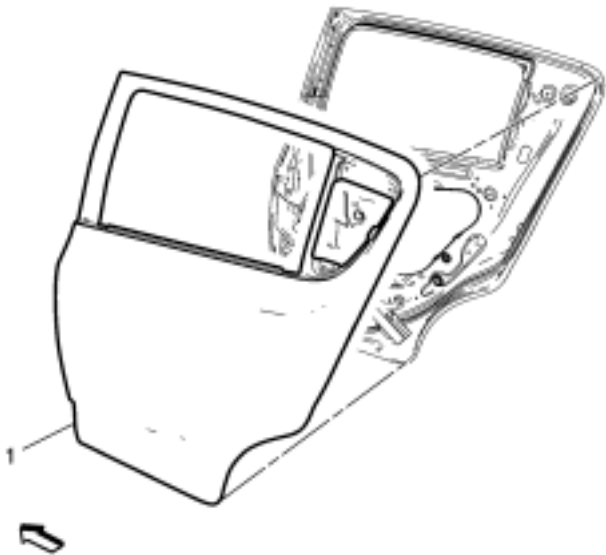
### Removal Procedure

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove the rear side door. Refer to [Rear Side Door Replacement](#) .
4. Remove the rear side door outside handle. Refer to [Rear Side Door Outside Handle Replacement](#) .
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .



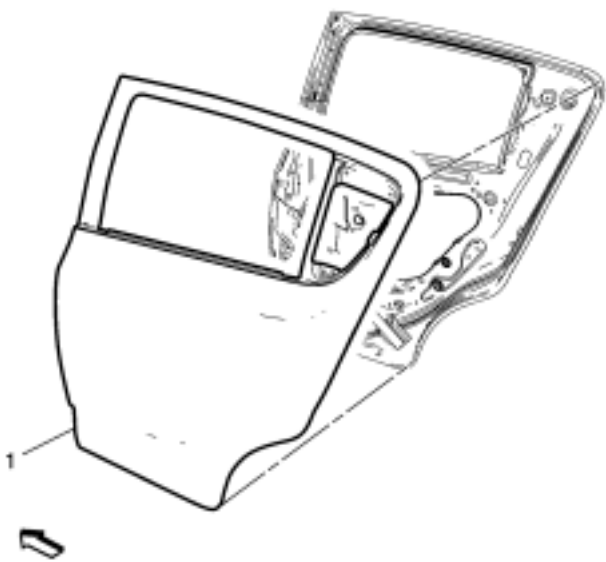
6. Grind the edges of the rear side door outer panel (1) to separate the outer door panel from the door shell.



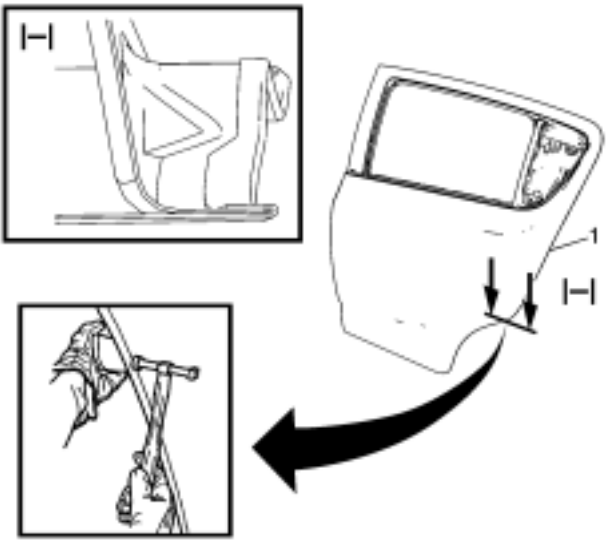
7. Remove the rear side door outer door panel (1).
8. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
9. Straighten the edges of the door shell

### Installation Procedure

1. Align the rear side door outer panel.
2. Verify the fit of the rear side door outer panel.



- 3. Clamp the rear side door outer panel (1) into position.
- 4. Pre-flanging the flange with *BO-6396* pliers and *BO-6392* tool kit .



- 5. Continue to hammer in stages along the hem flanges (1).
- 6. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 7. Install the rear side door outside handle. Refer to [Rear Side Door Outside Handle Replacement](#) .
- 8. Install the rear side door. Refer to [Rear Side Door Replacement](#) .
- 9. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 10. Install all related panels and components.
- 11. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 12. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

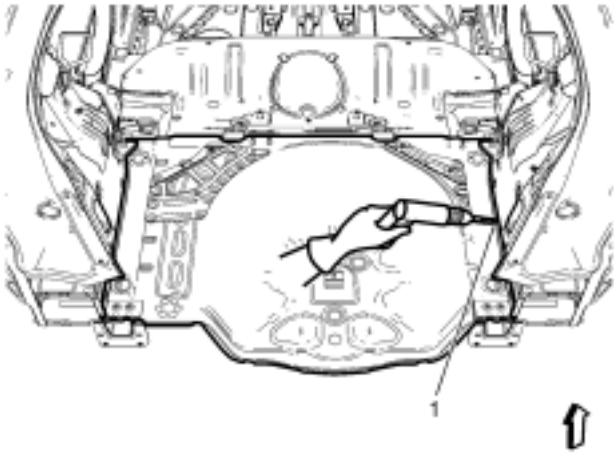
## Rear Compartment Floor Panel Replacement

### Removal Procedure

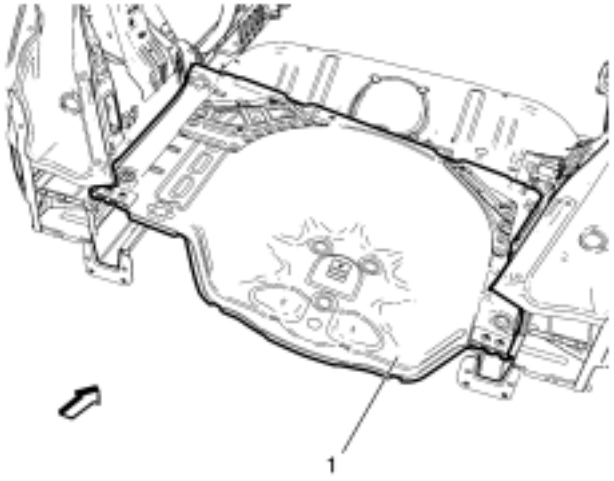
**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all the necessary factory welds of the rear compartment floor panel.
7. Note the number and location of weld studs for installation of the service assembly.



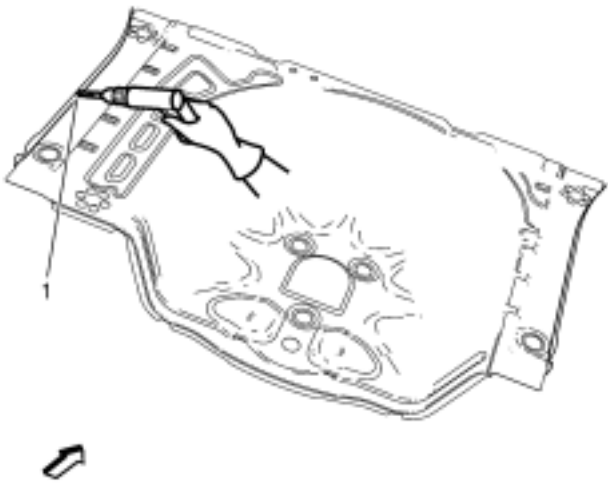
8. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.



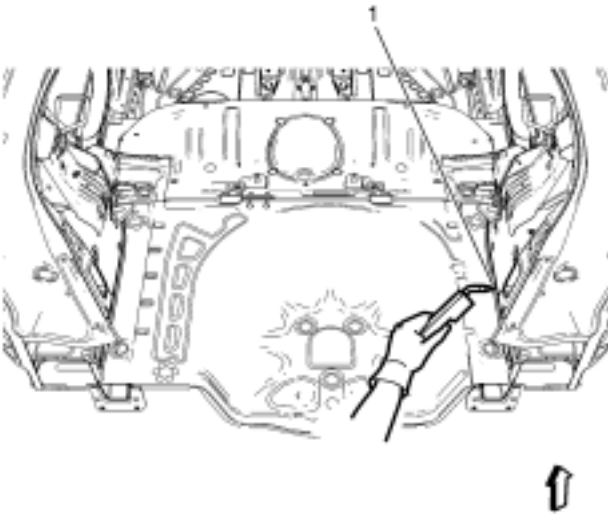
9. Remove the damaged rear compartment floor panel (1).

### Installation Procedure

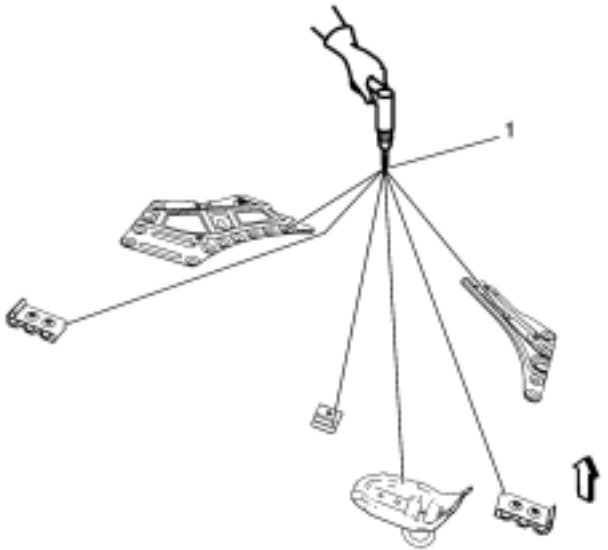
1. Align the rear compartment floor panel.



- 2. Drill a **8 mm (5/ 16 in)**holes for plug welding along the edges of the rear compartment floor panel as noted from the original panel (1).
- 3. Clean and prepare the attaching surfaces for welding.
- 4. Position the rear compartment floor panel on the vehicle.
- 5. Verify the fit of the rear compartment floor panel.
- 6. Clamp the rear compartment floor panel into position.

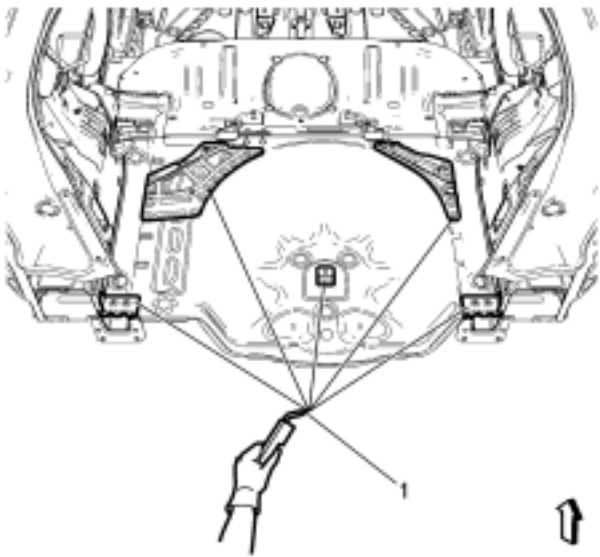


- 7. Plug the weld accordingly (1).



- 8. Drill **8 mm (5/ 16 in)**for plug welding along the edges of the floor panel rear reinforcement, the spare wheel carrier bracket, the shipping device and the floor panel reinforcement as noted from the original panel (1).
- 9. Clean and prepare the attaching surfaces for welding.
- 10. Position the floor panel rear reinforcement, the spare wheel carrier bracket, the shipping device and the floor panel reinforcement on the vehicle.
- 11. Verify the fit of the floor panel rear reinforcement, the spare wheel carrier bracket, the shipping device and the floor panel reinforcement.





- 12. Plug weld accordingly (1).
- 13. Weld accordingly the weld studs as noted.
- 14. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 15. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 16. Install all related panels and components.
- 17. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 18. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .



## Quarter Outer Panel Sectioning (5HB)

- *BO-6392* Flanging Tool Kit
- *BO-6396* Bonding Pliers

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

**Note:** According to different corrosion warranties, only the regional mandatory joining methods are allowed.

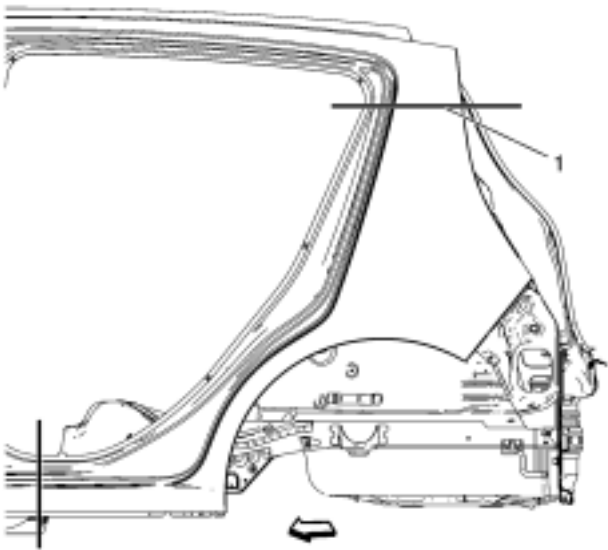
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

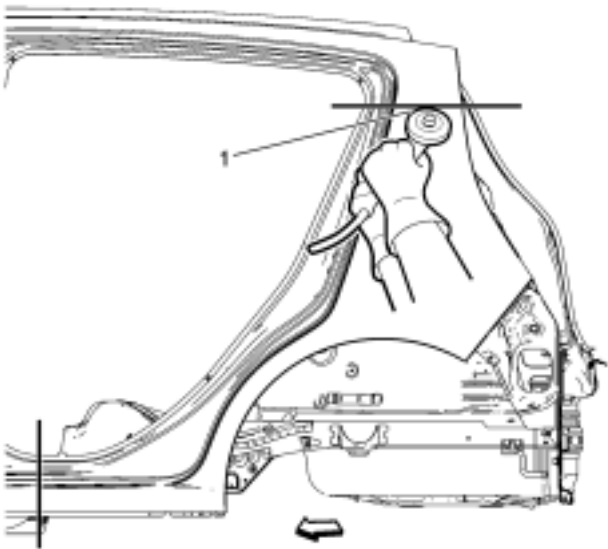
**Warning:** Refer to [Collision Sectioning Warning](#) .

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

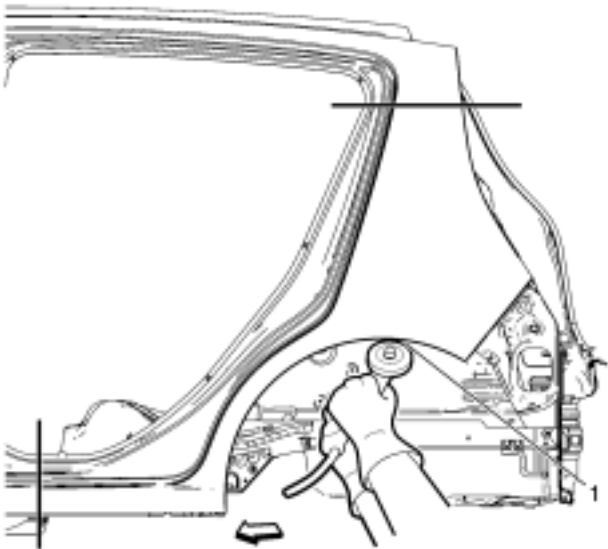


6. Create cut lines on the quarter outer panel (1).

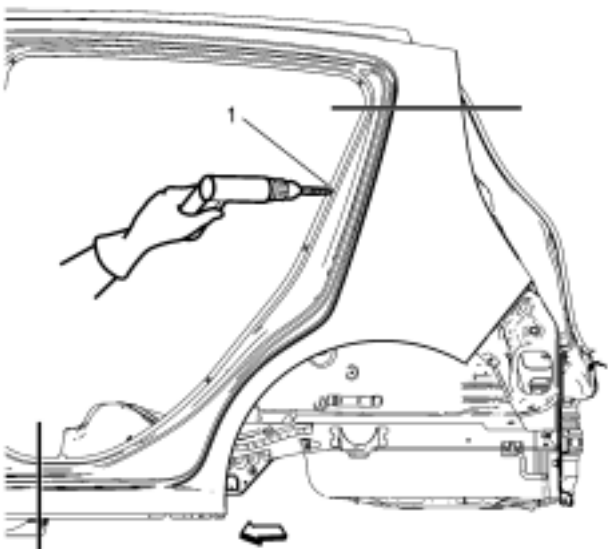


**Note:** Do not damage any inner panels or reinforcements.

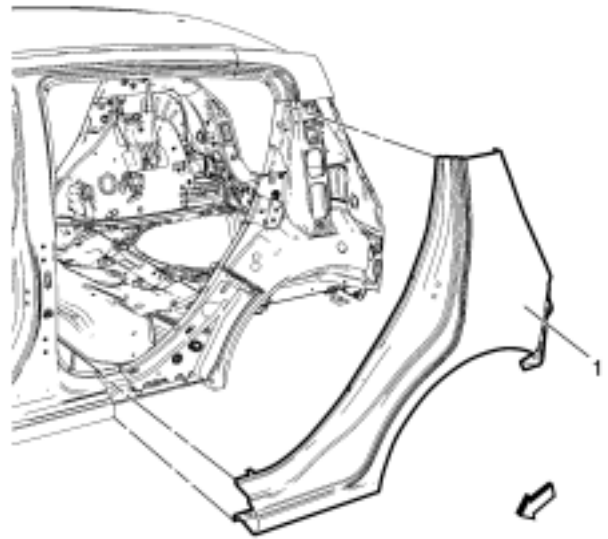
7. Cut the panel where sectioning is to be performed (1).



- 8. Open the wheelhouse flanging (1).
- 9. Locate and mark all the necessary factory welds of the quarter outer panel.

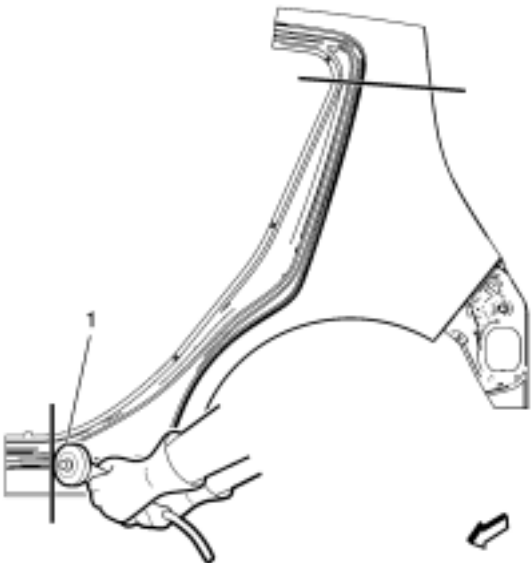


- 10. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

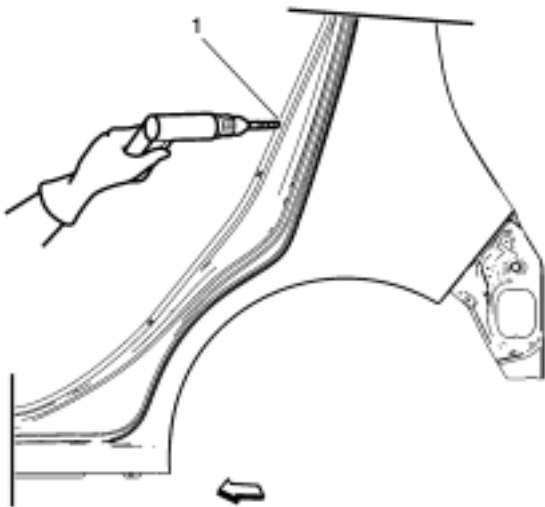


- 11. Remove the damaged quarter outer panel (1).

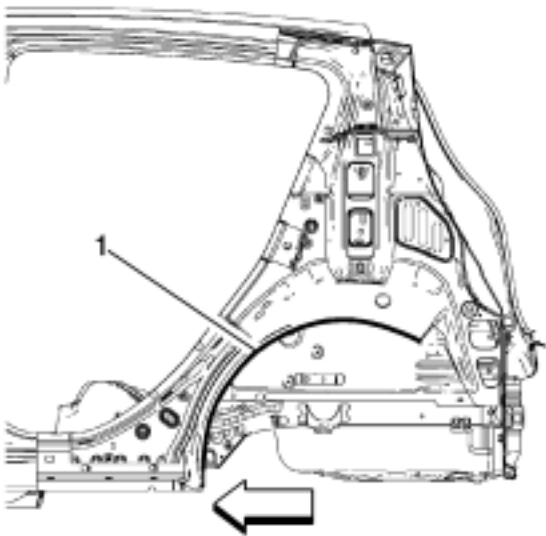
Installation Procedure



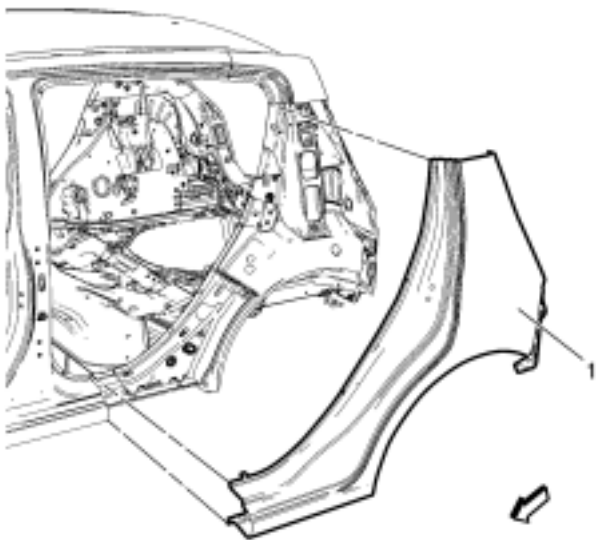
1. Cut the quarter outer panel in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to overlap the remaining original panel by 25 mm (1 inch) at each joint location (1).
2. Prepare all mating surfaces as necessary.



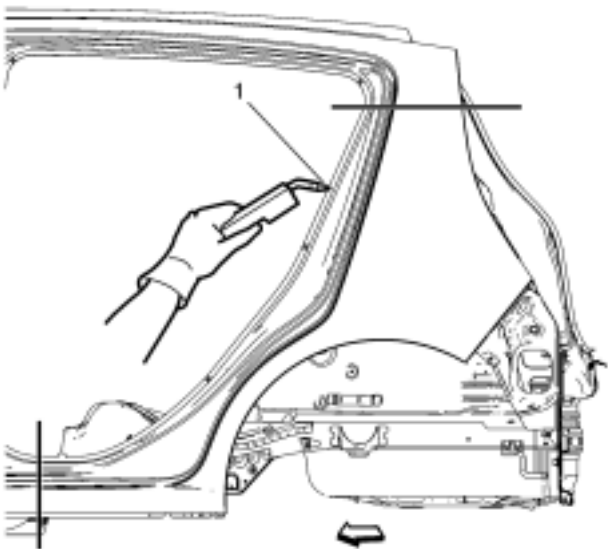
3. Drill 8 mm (5/16 in) holes for plug welding along the edges of the quarter outer panel as noted from the original panel (1).
4. Clean and prepare the attaching surfaces for welding.



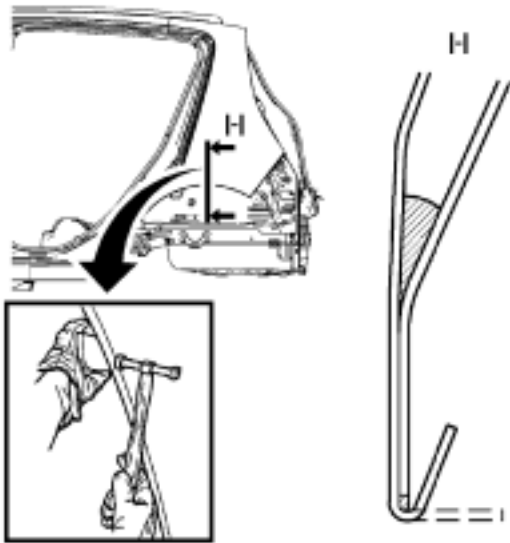
5. Apply one-part windshield urethane adhesive(1) as noted from the original panel.



- 6. Position the quarter outer panel on the vehicle (1).
- 7. Verify the fit of the quarter outer panel.
- 8. Clamp the quarter outer panel into position.



- 9. Plug weld accordingly (1).
- 10. To create a solid weld with minimum heat distortion, make **25 mm (1 in)** stitch welds along the seam with **25 mm (1 in)** gaps between them. Then go back and complete the stitch weld.
- 11. Pre-flanging the flange with *BO-6396* pliers and *BO-6392* tool kit .



- 12. Finish closing the wheelhouse flanging.
- 13. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 14. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 15. Install all related panels and components.
- 16. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 17. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Quarter Outer Panel Sectioning (4NB)

### Special Tools

- *BO-6392* Flanging Tool Kit
- *BO-6396* Bonding Pliers

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

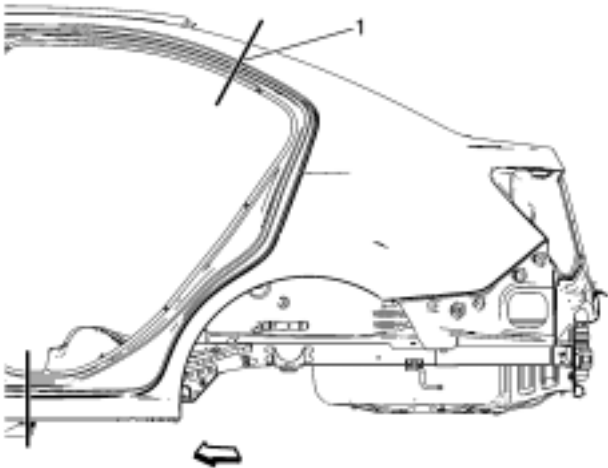
### Removal Procedure

**Warning:**Refer to [Approved Equipment for Collision Repair Warning](#) .

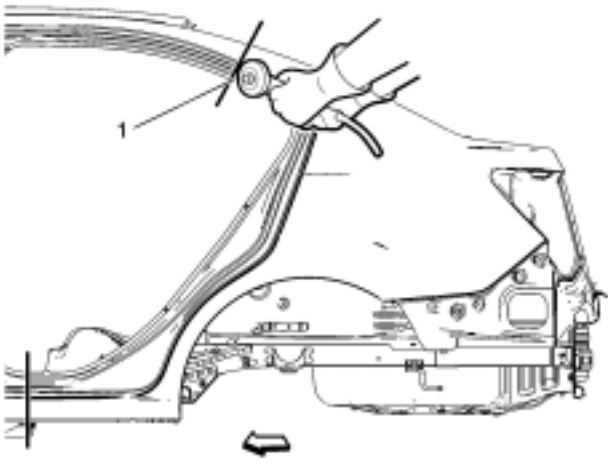
**Warning:**Refer to [Collision Sectioning Warning](#) .

**Warning:**Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

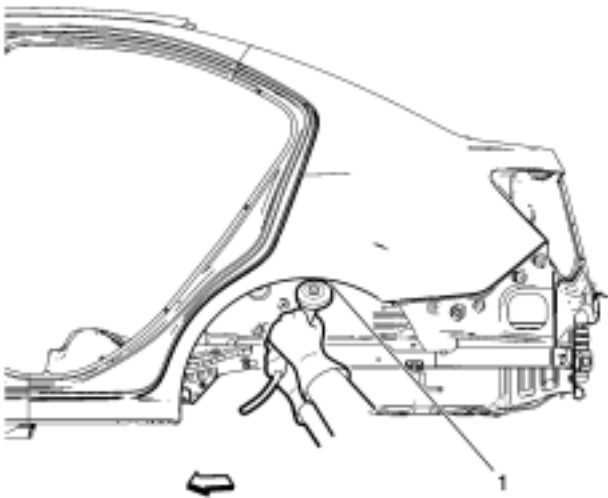


6. Create cut lines on the quarter outer panel (1).

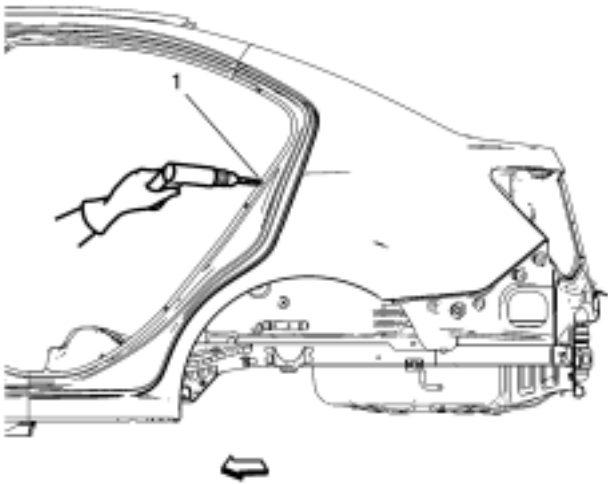


**Note:** Do not damage any inner panels or reinforcements.

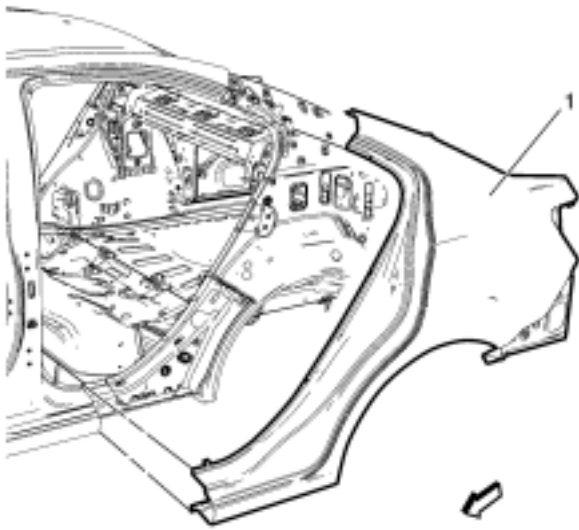
7. Cut the panel where sectioning is to be performed (1).



- 8. Open the wheelhouse flanging (1).
- 9. Locate and mark all the necessary factory welds of the quarter outer panel.

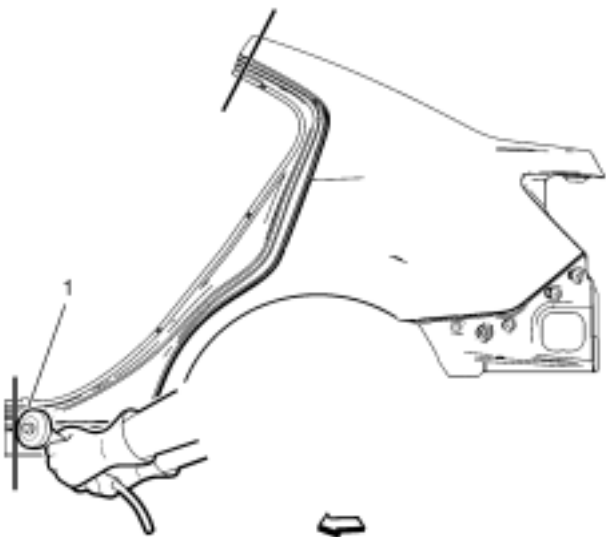


- 10. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

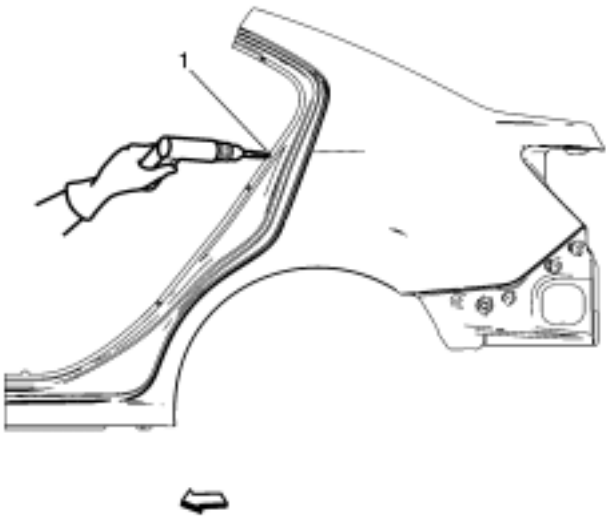


- 11. Remove the damaged quarter outer panel (1).

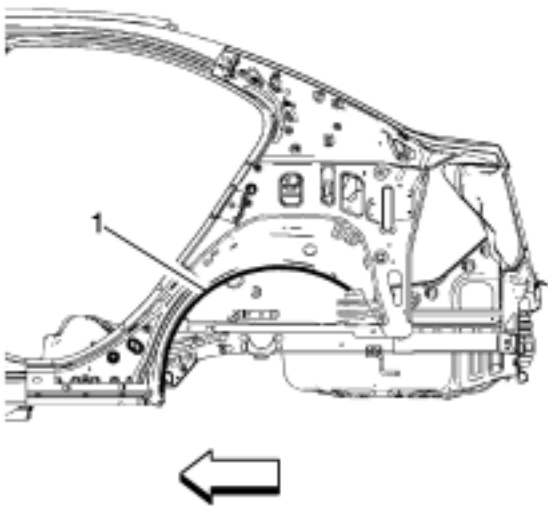
Installation Procedure



1. Cut the quarter outer panel in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to overlap the remaining original panel by 25 mm (1 inch) at each joint location (1).
2. Prepare all mating surfaces as necessary.

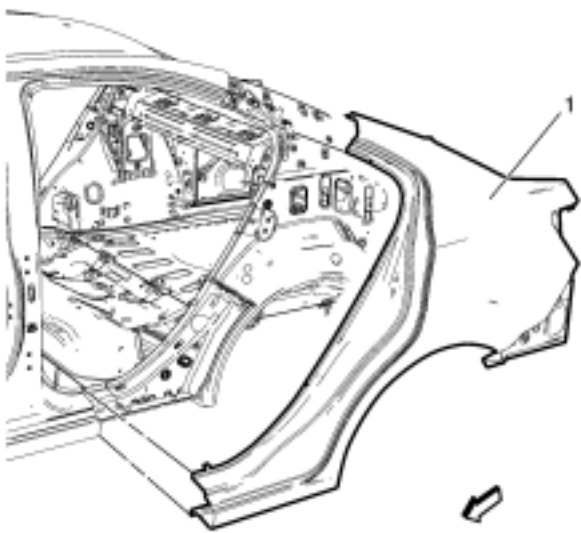


3. Drill a **8 mm (5/ 16 in)** holes for plug welding along the edges of the quarter outer panel as noted from the original panel (1).
4. Clean and prepare the attaching surfaces for welding.

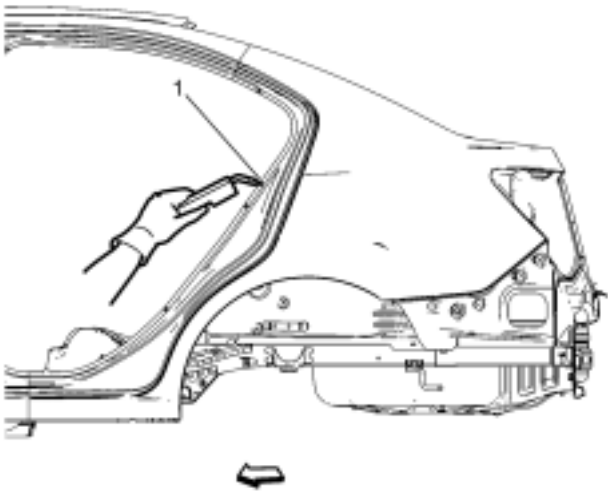


5. Apply one-part windshield urethane adhesive(1) as noted from the original panel.

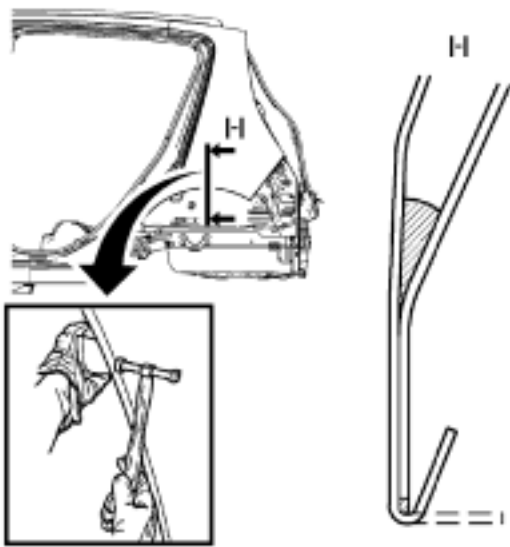




- 6. Position the quarter outer panel on the vehicle (1).
- 7. Verify the fit of the quarter outer panel.
- 8. Clamp the quarter outer panel into position.



- 9. Plug weld accordingly (1).
- 10. To create a solid weld with minimum heat distortion, make **25 mm (1 in)** stitch welds along the seam with **25 mm (1 in)** gaps between them. Then go back and complete the stitch weld.
- 11. Pre-flange the flange with *BO-6396* pliers and *BO-6392* tool kit.



- 12. Finish closing the wheelhouse flanging.
- 13. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 14. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 15. Install all related panels and components.
- 16. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 17. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .



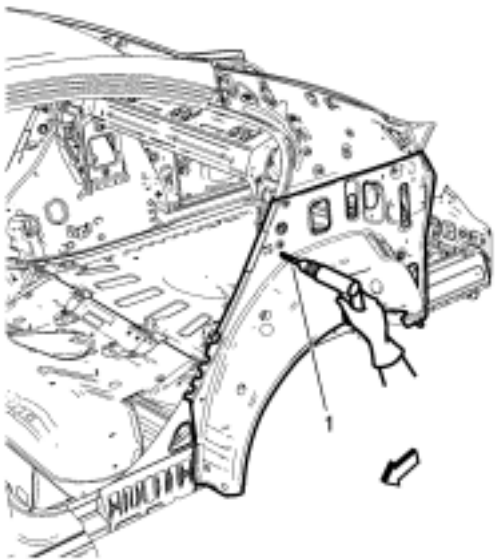
## Quarter Inner Panel Replacement (4NB)

### Removal Procedure

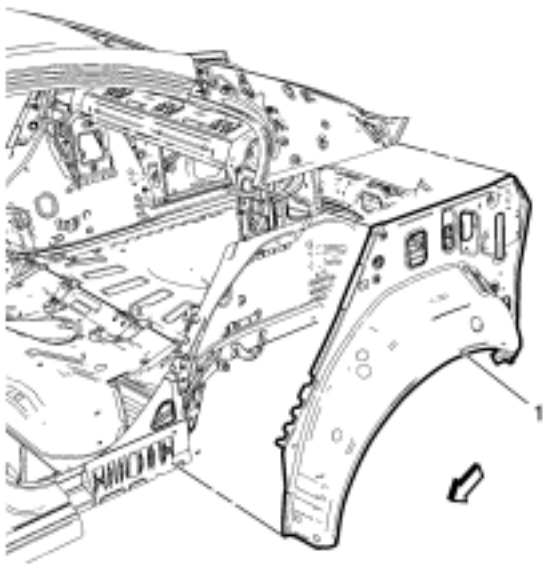
**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all the necessary factory welds of the rear wheelhouse outer panel.



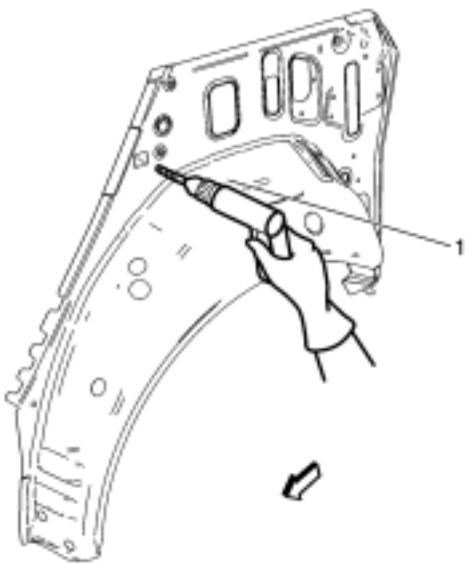
7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.



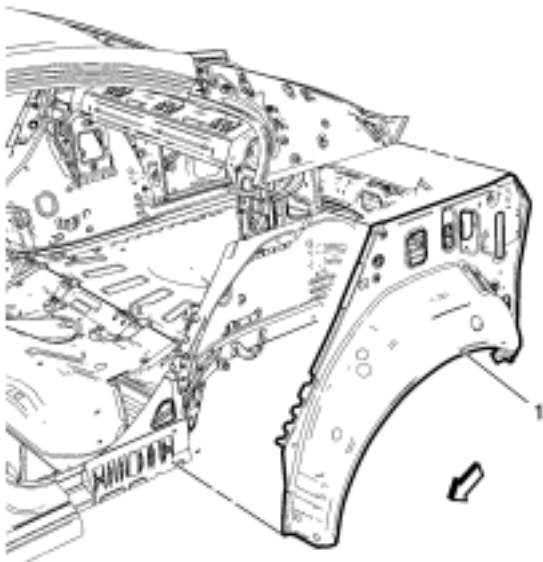
8. Remove the damaged rear wheelhouse outer panel (1).

### Installation Procedure

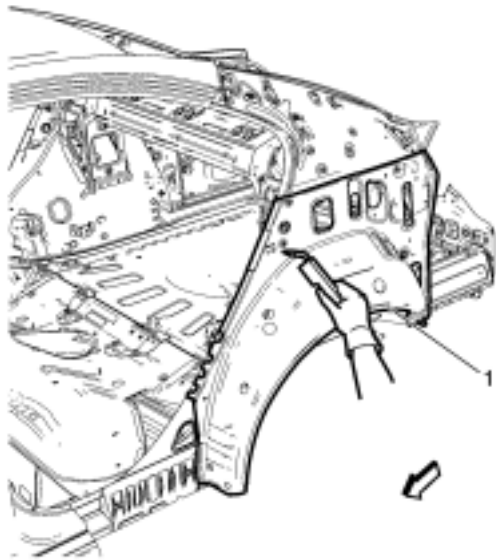
1. Prepare all mating surfaces as necessary.
2. Align the rear wheelhouse outer panel.



- 3. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the rear wheelhouse outer panel as noted from the original panel (1).
- 4. Clean and prepare the attaching surfaces for welding.



- 5. Position the rear wheelhouse outer panel on the vehicle (1).
- 6. Verify the fit of the rear wheelhouse outer panel.
- 7. Clamp the rear wheelhouse outer panel into position.



- 8. Plug weld accordingly (1).
- 9. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 10. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 11. Install all related panels and components.
- 12. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 13. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Quarter Inner Panel Sectioning (5HB)

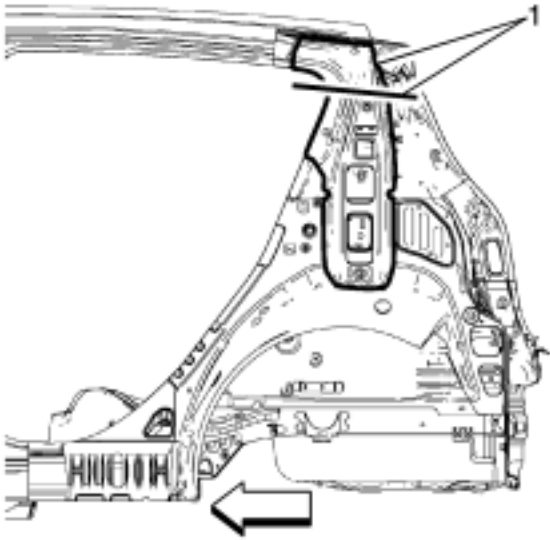
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

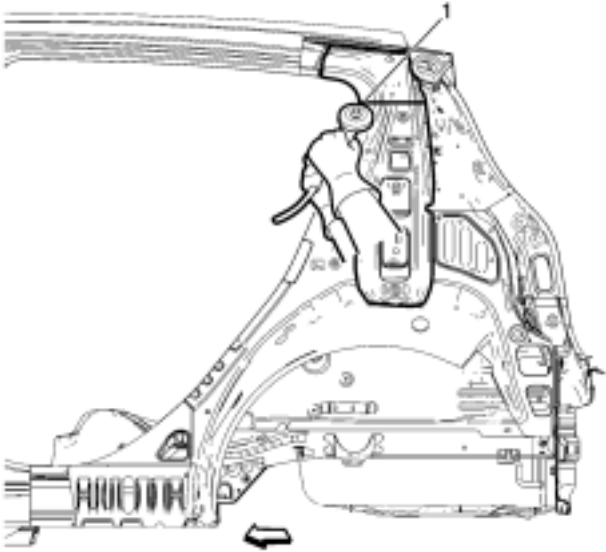
**Warning:** Refer to [Collision Sectioning Warning](#) .

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

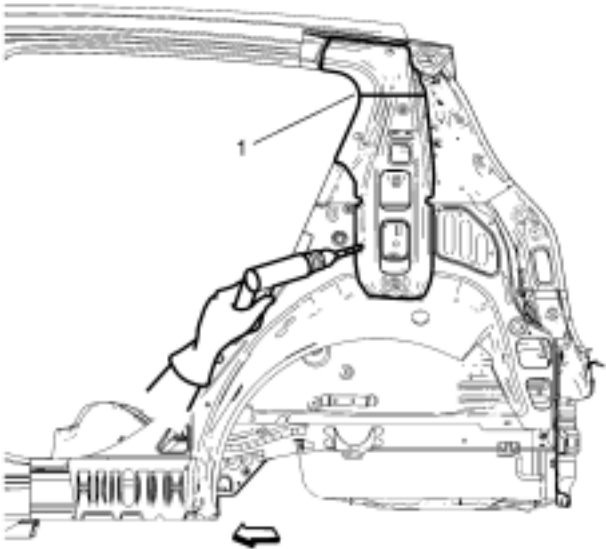


6. Create cut lines on the body lock pillar inner reinforcement (1).

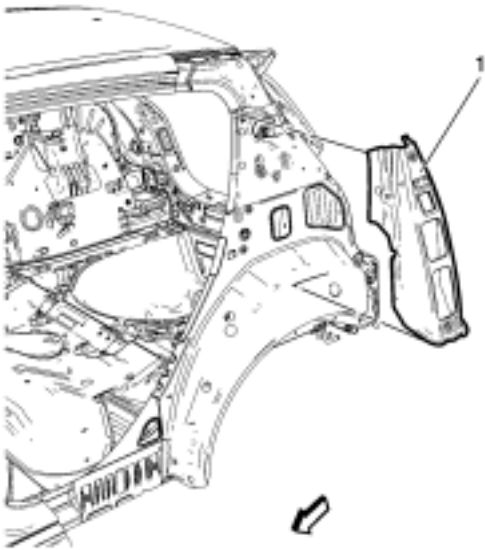


**Note:** Do not damage any inner panels or reinforcements.

7. Cut the panel where sectioning is to be performed (1).
8. Locate and mark all the necessary factory welds of the body lock pillar inner reinforcement.



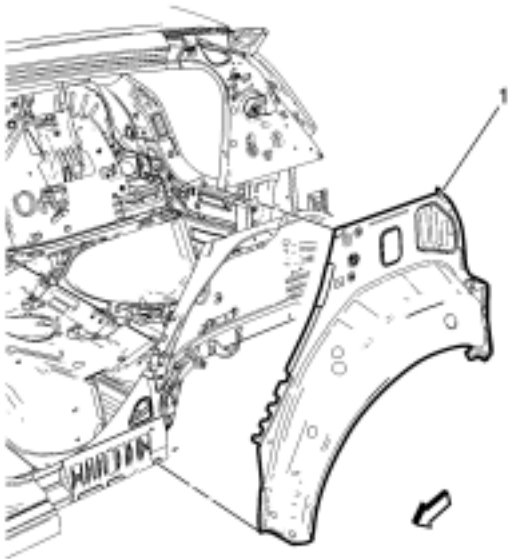
9. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.



10. Remove the damaged body lock pillar inner reinforcement (1).

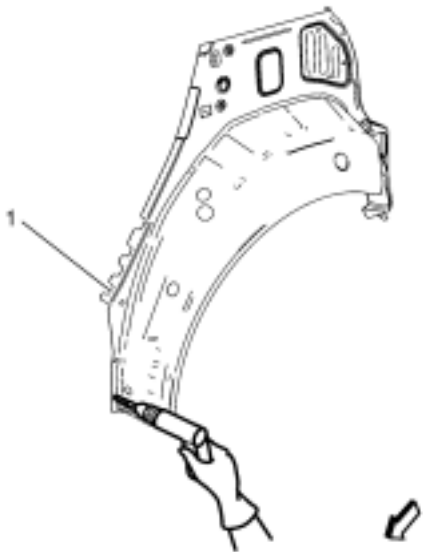


11. Locate and mark all the necessary factory welds of the rear wheelhouse outer panel.
12. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

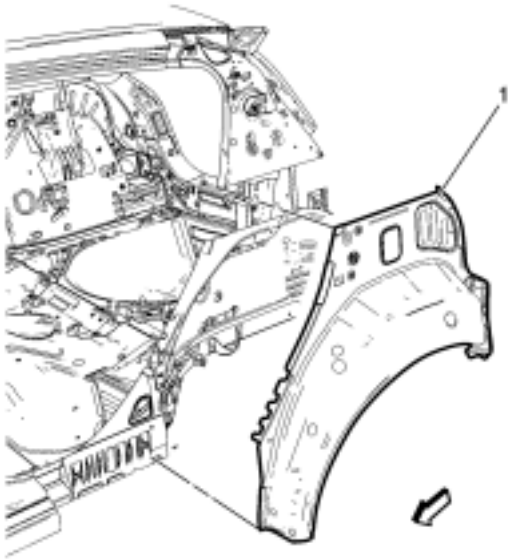


13. Remove the damaged rear wheelhouse outer panel (1).

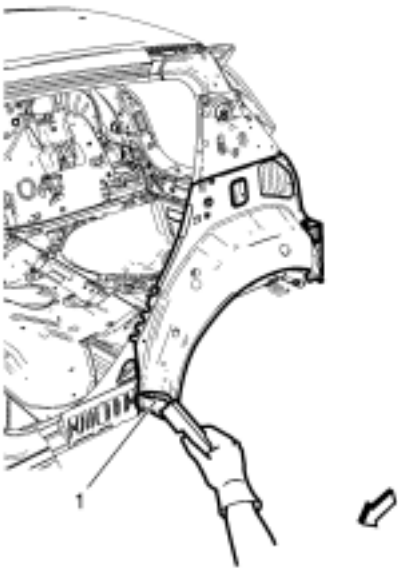
Installation Procedure



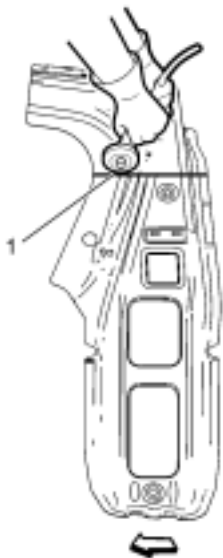
1. Drill **8 mm (5/ 1 in)** holes for plug welding along the edges of the rear wheelhouse outer panel as noted from the original panel (1).
2. Clean and prepare the attaching surfaces for welding.



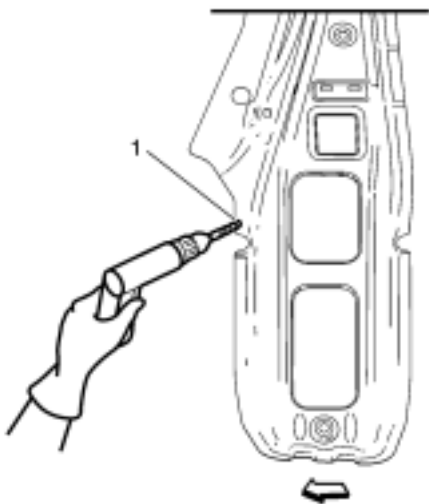
3. Position the rear wheelhouse outer panel (1).
4. Verify the fit of the panel.
5. Clamp the rear wheelhouse outer panel into position.



6. Plug weld accordingly (1).

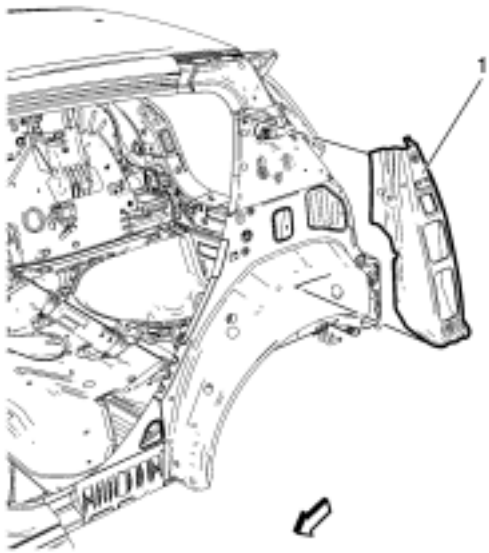


- 7. Cut the body lock pillar inner reinforcement in corresponding locations to fit the remaining original panel (1). The sectioning joint should be trimmed to allow a gap of one-and-one-half-times the metal thickness at the sectioning joint.
- 8. Create a **50 mm (2 in)** backing plate from the unused portion of the service part.
- 9. Drill **8 mm (5/ 16 in)** along the sectioning cut on the remaining original part. Locate these holes **13 mm (1/ 2 in)** from the edge of part and spaced **40 mm (1 1/ 2 in)** apart.
- 10. Prepare all mating surfaces as necessary.
- 11. Fit the backing plates halfway into the sectioning joints, clamp in place and plug weld to the vehicle.
- 12. Align the body lock pillar inner reinforcement.

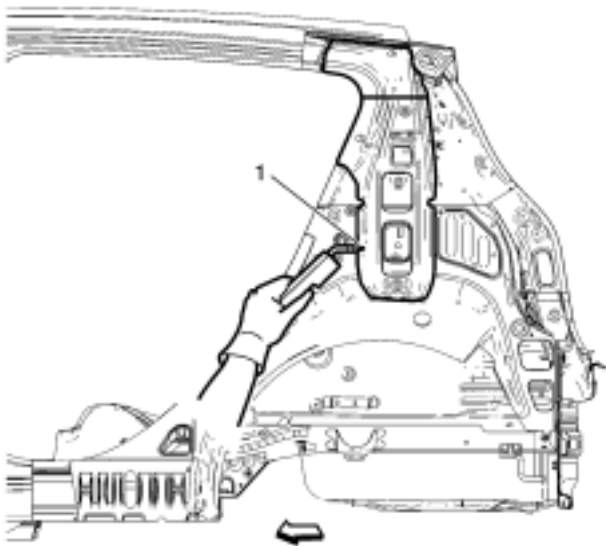


- 13. Drill **8 mm (5/ 1 in)** holes for plug welding along the edges of the body lock pillar inner reinforcement as noted from the original panel (1).
- 14. Clean and prepare the attaching surfaces for welding.





- 15. Position the body lock pillar inner reinforcement (1).
- 16. Verify the fit of the panel.
- 17. Clamp the body lock pillar inner reinforcement into position.



- 18. Plug weld accordingly (1).
- 19. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 20. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 21. Install all related panels and components.
- 22. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 23. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

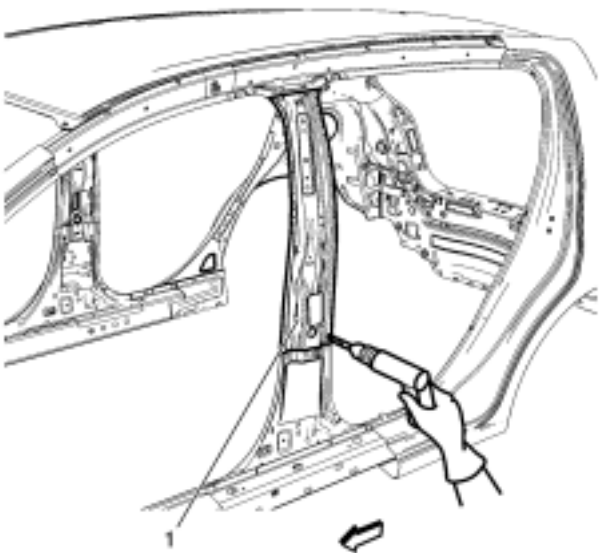
## Center Pillar Inner Panel Replacement

### Removal Procedure

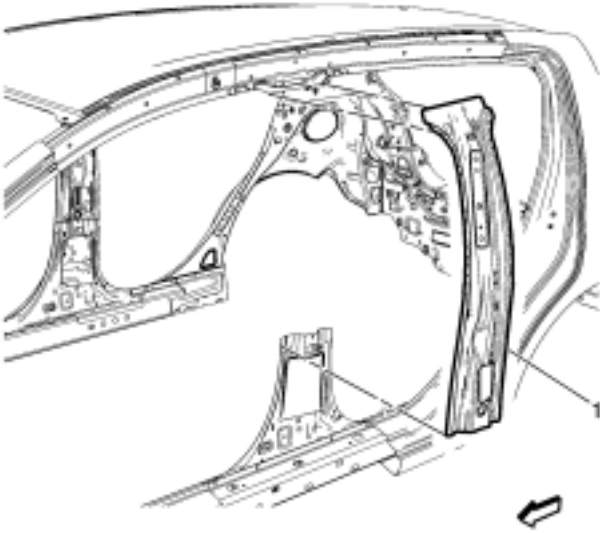
**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all factory welds.



7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

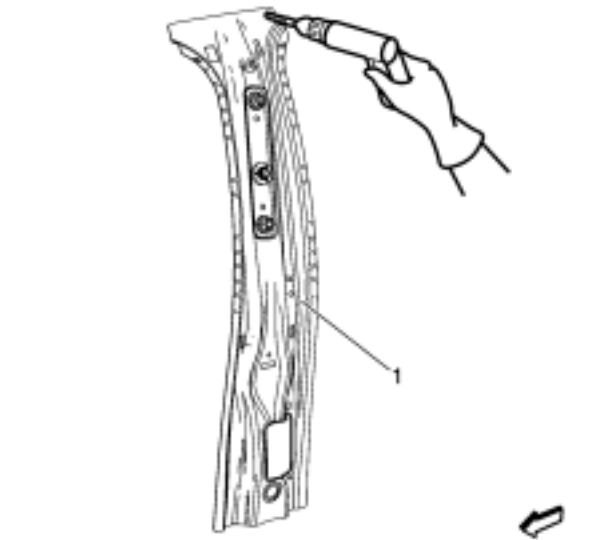


8. Remove the damaged center pillar inner panel (1).

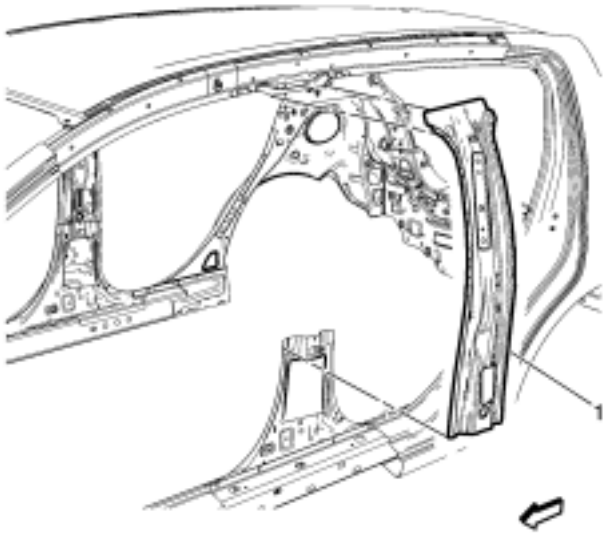
### Installation Procedure

1. Prepare all mating surfaces as necessary.
2. Align the center pillar inner panel.

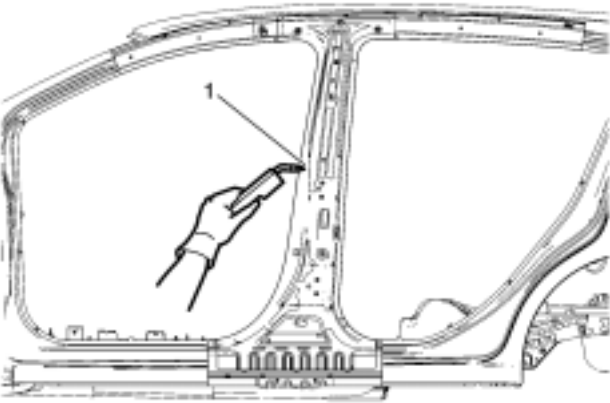




- 3. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the center pillar inner panel (1) as noted from the original panel.
- 4. Clean and prepare the attaching surfaces for welding.



- 5. Position the center pillar inner panel on the vehicle (1).
- 6. Verify the fit of the center pillar inner panel.
- 7. Clamp the center pillar inner panel into position.



- 8. Plug weld accordingly (1).
- 9. To create a solid weld with minimum heat distortion, make **25 mm (1 in)** stitch welds along the seam with **25 mm (1 in)** gaps between them. Then go back and complete the stitch weld.
- 10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 11. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 12. Install all related panels and components.
- 13. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 14. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Center Pillar Reinforcement Replacement

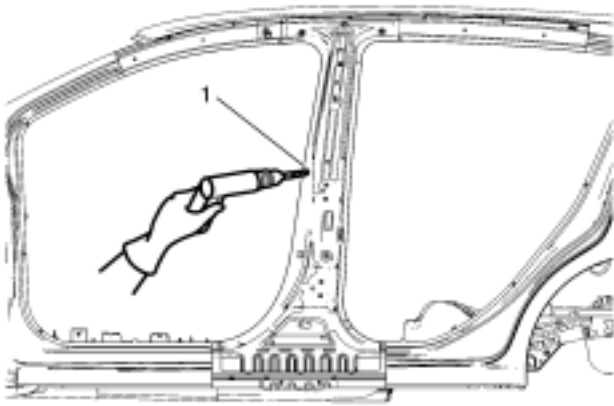
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

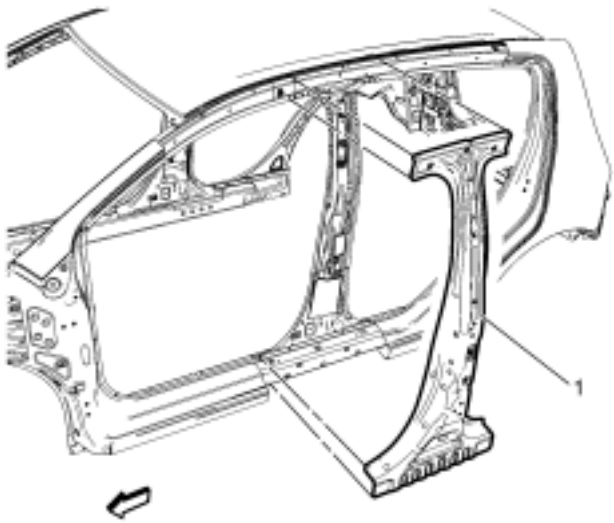
**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

**Note:** The center pillar upper stiffener is made of Dual Phase Steel and should be replaced only at factory joints. Repairing or sectioning of this part is not recommended. Refer to [Dual Phase Steel](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all the necessary factory welds of the center pillar reinforcement.



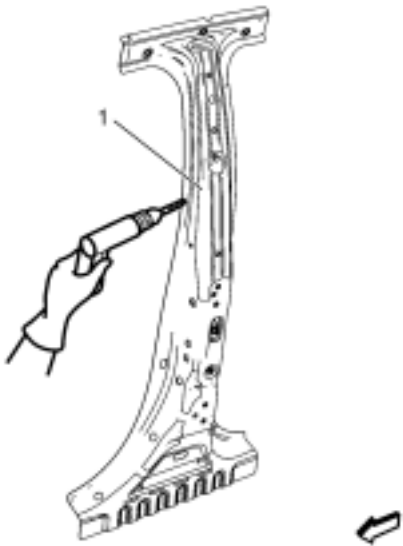
7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.



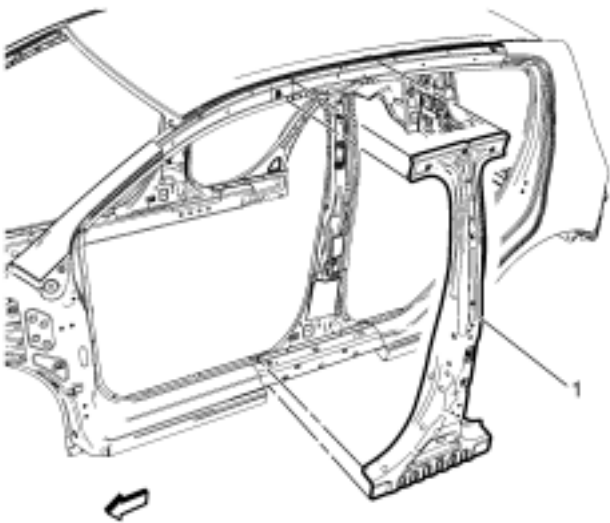
8. Remove the damaged center pillar reinforcement (1).

### Installation Procedure

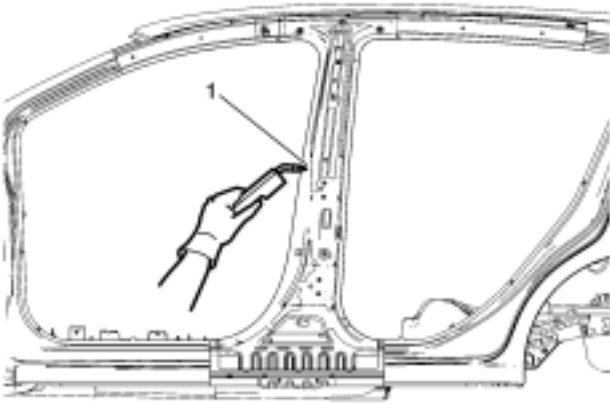
1. Prepare all mating surfaces as necessary.
2. Align the center pillar reinforcement.



- 3. Drill a **8 mm (5/ 16 in)**holes for plug welding along the edges of the center pillar reinforcement as noted from the original panel (1).
- 4. Clean and prepare the attaching surfaces for welding.



- 5. Position the center pillar reinforcement on the vehicle (1).
- 6. Verify the fit of the center pillar reinforcement.
- 7. Clamp the center pillar reinforcement into position.



- 8. Plug weld accordingly (1).
- 9. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 10. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 11. Install all related panels and components.
- 12. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 13. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Center Pillar Sectioning - Outer

### Removal Procedure

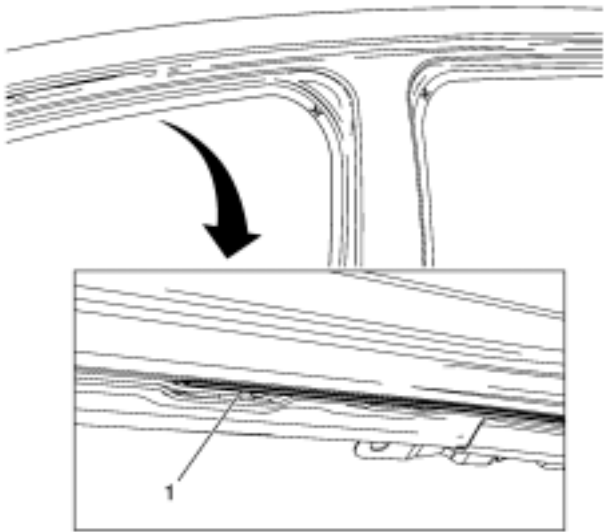
**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Warning:** Refer to [Collision Sectioning Warning](#) .

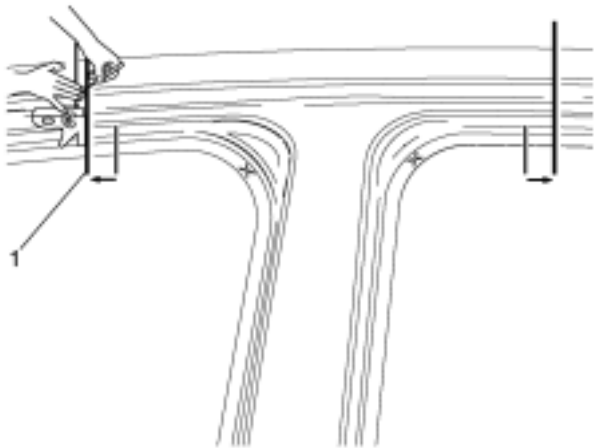
**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

**Note:** This procedure was developed to allow full access for the replacement of the center pillar reinforcement replacement since sectioning is not endorsed or recommended to the reinforcement due to the [Ultra High Strength Steel](#) .

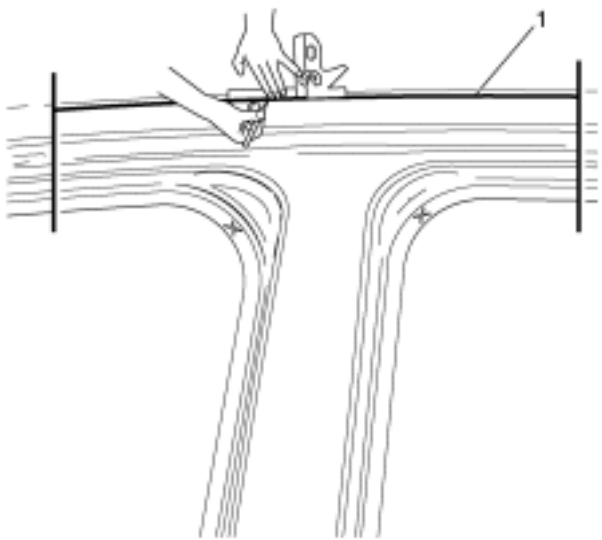
1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .



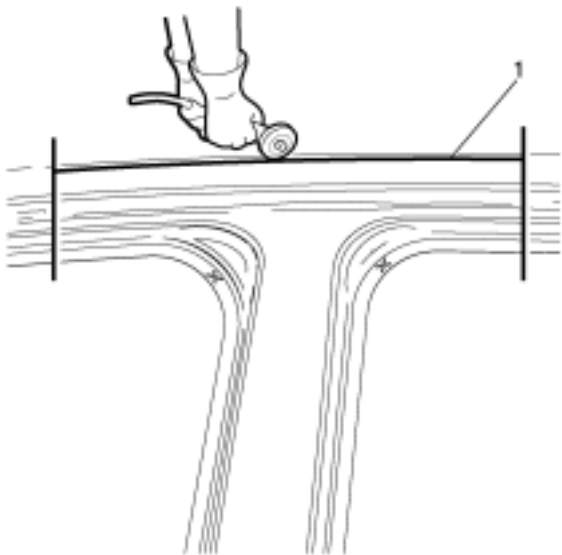
6. Remove the weather-strip, observe the flange in the center pillar area. There will be a 3-metal stack-up. The center layer is the center pillar reinforcement (1).



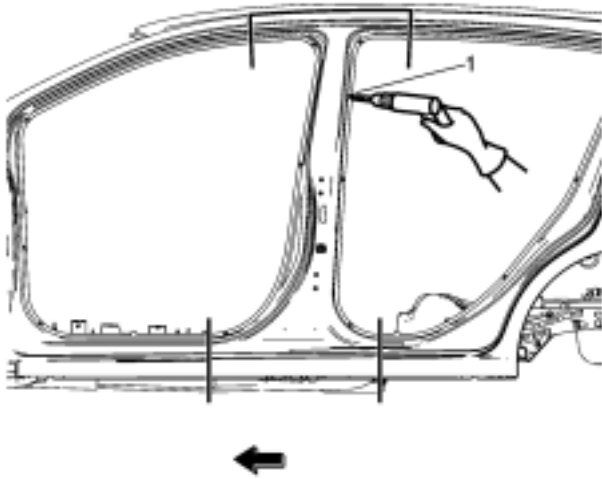
7. Measure **13 mm (1 / 2 in)** from the forward and rearward edges of the center pillar reinforcement and mark a vertical line (1).



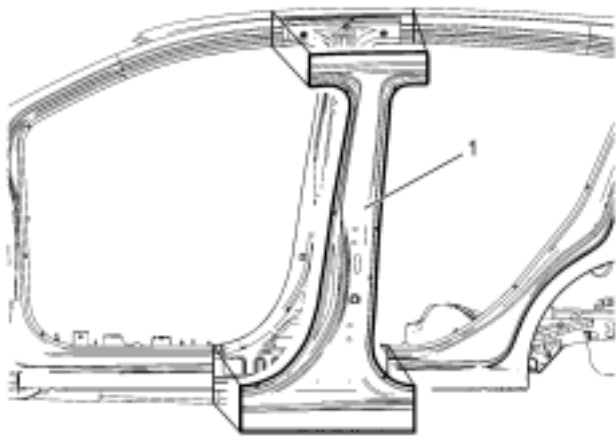
8. Measure up 1 inch from the door opening feature line (1) and mark a horizontal line.



9. Cut access window (1) in the center pillar outer.
10. Perform additional sectioning procedures as needed depending on damage to vehicle. Refer to [Rocker Outer Panel Sectioning](#) or [Front Hinge Pillar Body Sectioning](#) .



11. Locate and drill out all factory welds (1). Note the number and location of welds for installation of the service part.

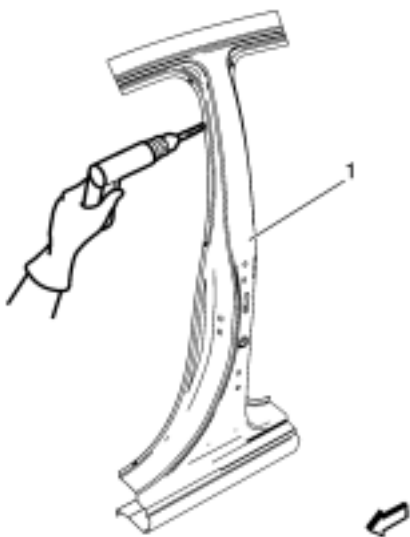


12. Remove the damaged center pillar outer panel section (1).

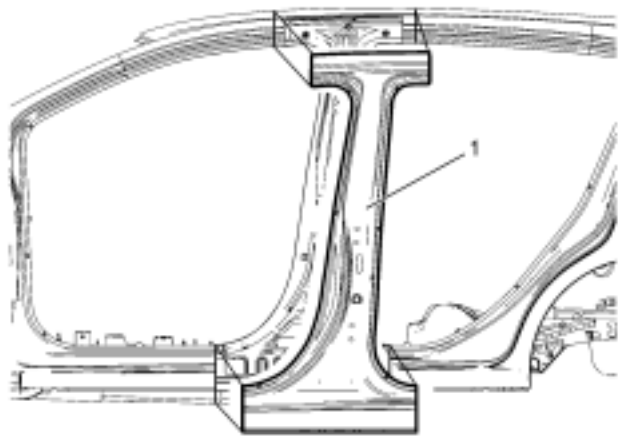
Installation Procedure



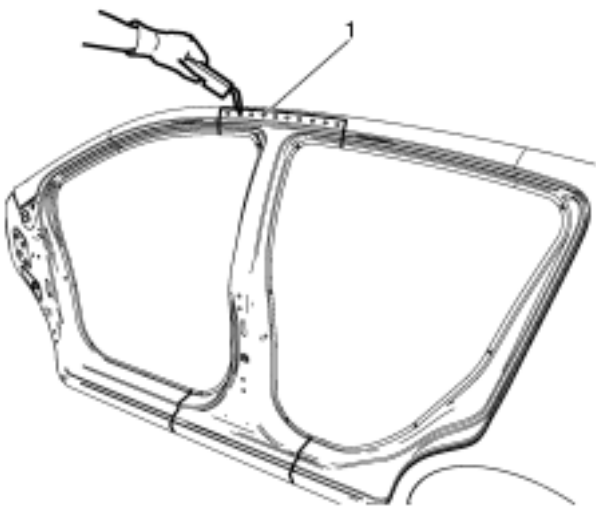
1. From the service part, cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 in) at each joint location (1).



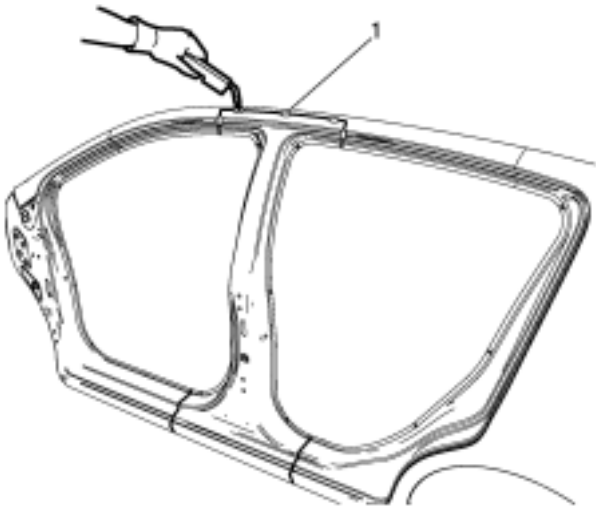
2. Drill 8 mm (5/16 in) holes for plug welding in the service part (1), as necessary, in the corresponding locations noted on the original panel and along sectioned joint.
3. Clean and prepare the attaching surfaces for welding.



4. Position the center pillar outer panel (1) to the vehicle. Clamp the pillar in place.



5. Plug weld accordingly (1).



- 6. To create a solid weld with minimum heat distortion, make a 25 mm (1 in) stitch weld along the seam with gaps of 25 mm (1 in) gaps between them. Go back and complete the stitch weld (1).
- 7. Clean and prepare all of the welded surfaces
- 8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 9. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 10. Install all related panels and components.
- 11. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 12. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .



## Rear Rail Sectioning

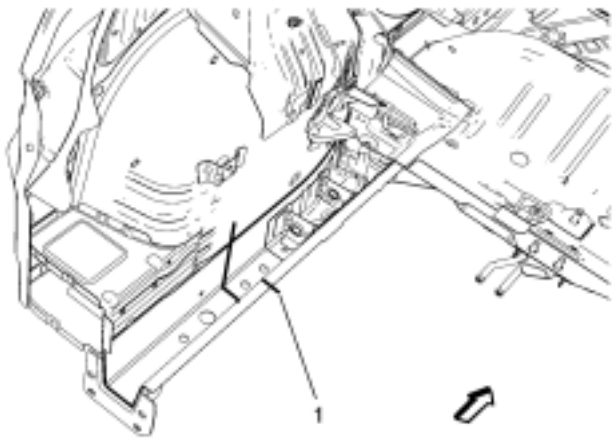
### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

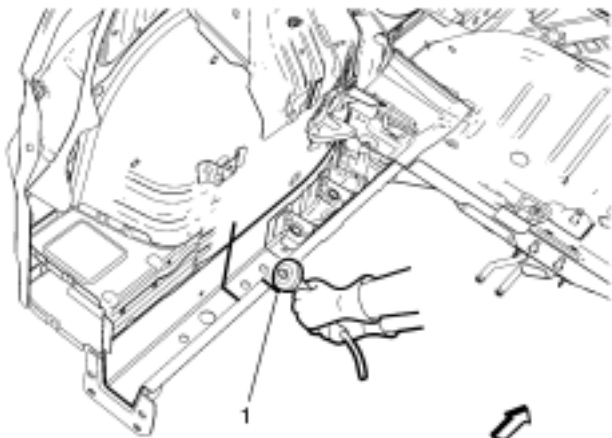
**Warning:** Refer to [Collision Sectioning Warning](#)

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .



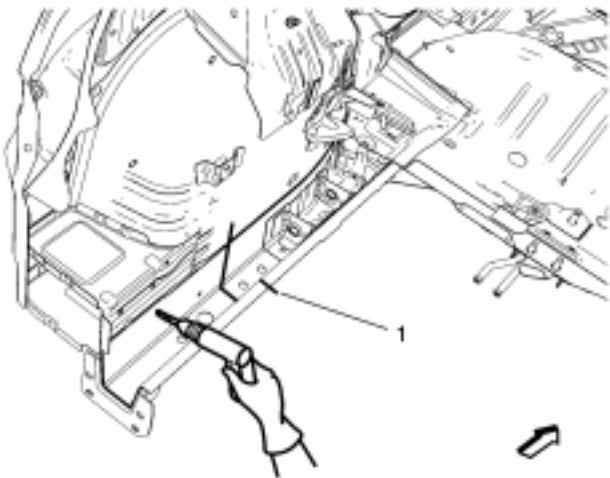
6. Create cut lines on the rear side rail (1).



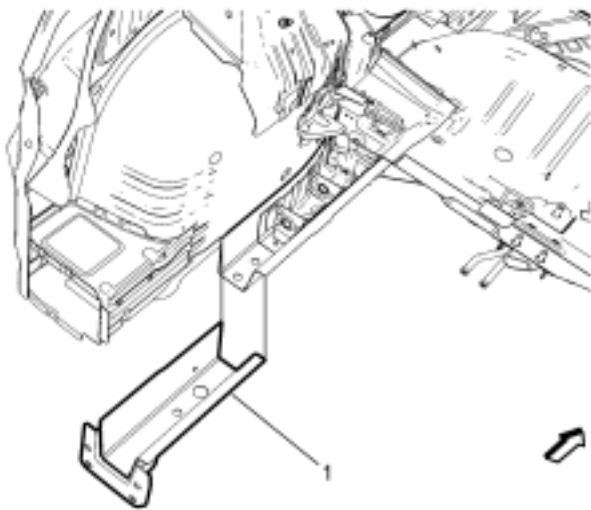
**Note:** Do not damage any other panels or reinforcements.

7. Cut the panel where sectioning is to be performed (1).
8. Locate and mark all the necessary factory welds of the rear side rail.

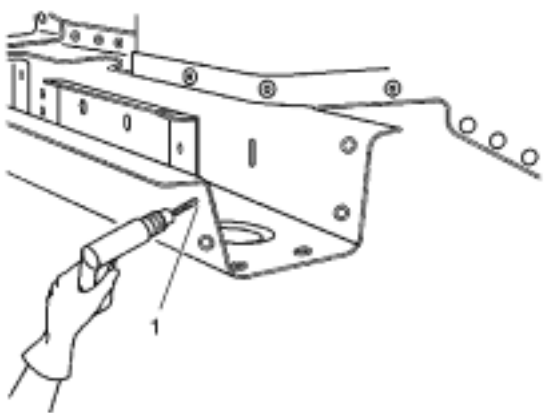




9. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.



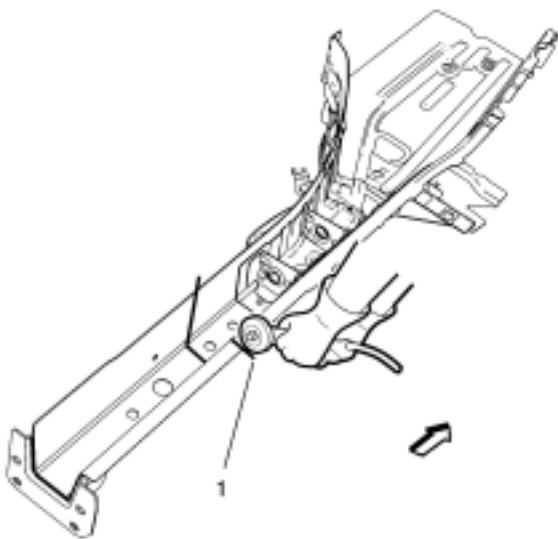
10. Remove the damaged rear side rail (1).



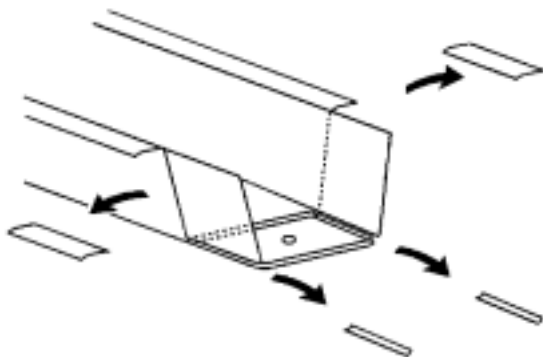
11. Drill two **8 mm (5/ 16 in)** plug weld holes on each of the 3 sides of the rear rail (1). Position the center of the holes **10 mm (3/ 8 in)** from the cut edge.

Installation Procedure

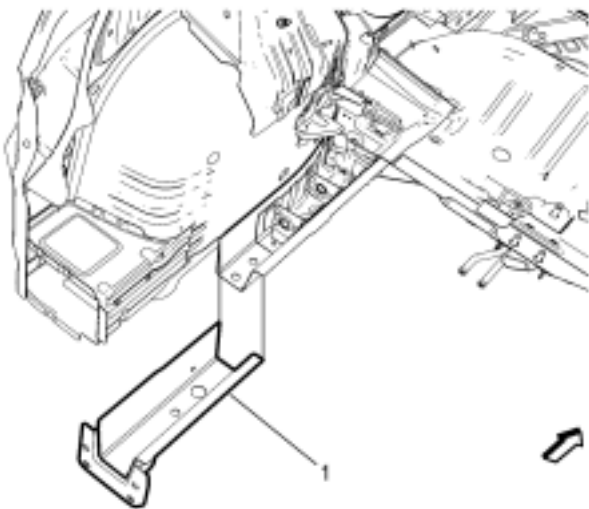
- 1. Locate the original cutting line on the service part rear rail.
- 2. Align a sliding square or similar tool to the original cutting line and scribe a line across the rail.
- 3. Use the same tool to transfer this scribed line onto the sides and the weld flanges of the rail.
- 4. Place a mark forward, **25 mm (1 in)** from the scribed line on all 3 sides of the service rail.
- 5. Use the tool to scribe a line on all 3 sides and weld flanges of the rail.



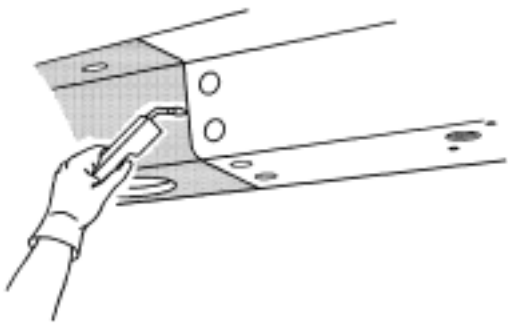
- 6. Cut at the scribe line (1).
- 7. Remove the rear portion of the rail.



- 8. Cut the upper outer flanges of the rear portion of the rear rail service part. Cut the flanges back to the first scribe line and remove the tabs
- 9. Cut the lower radius corners of the service part back to the first scribe line and remove the small corners.
- 10. Bend the bottom side of the service part at the sectioning location inward slightly by aligning a vice grip flanging tool or similar tool at the first scribed line.
- 11. Clean and prepare the attaching surfaces for welding.



- 12. Position the rear side rail (1) on the vehicle.



13. Tack weld the part into position.
14. Inspect the service rear rail for proper dimensions, using 3-dimensional measuring equipment.
15. Plug weld at each **8 mm (5/ 16 in)** plug weld hole location.
16. Stitch weld along the entire sectioning joint. Make welds along the seam with **25 mm (1 in)** gaps between. Weld the gaps.
17. Clean and prepare the welded surfaces.
18. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
19. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
20. Install all related panels and components.
21. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
22. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

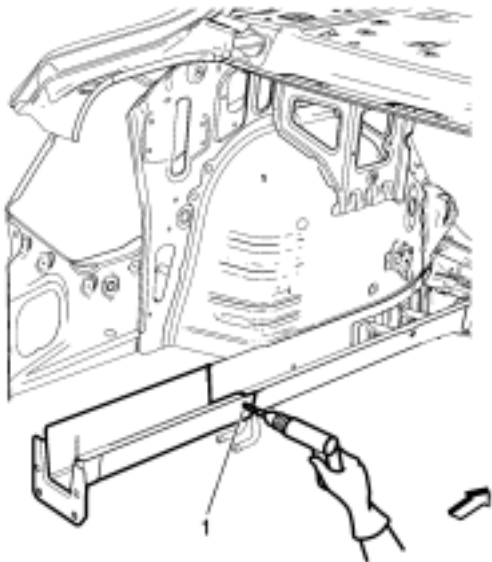
## Underbody Rear Side Rail Extension Replacement

### Removal Procedure

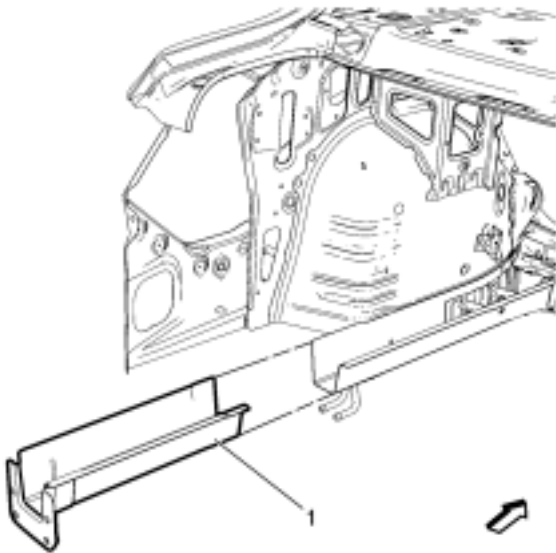
**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all factory welds.

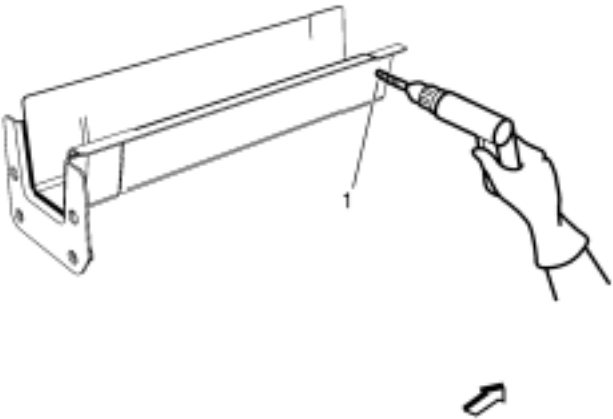


7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

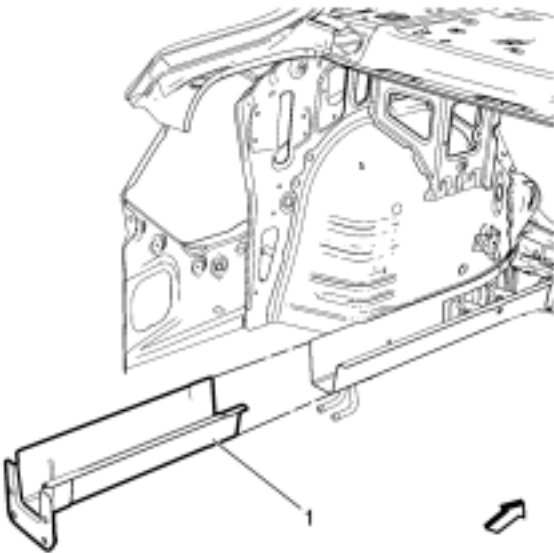


8. Remove the damaged rear side rail extension (1).

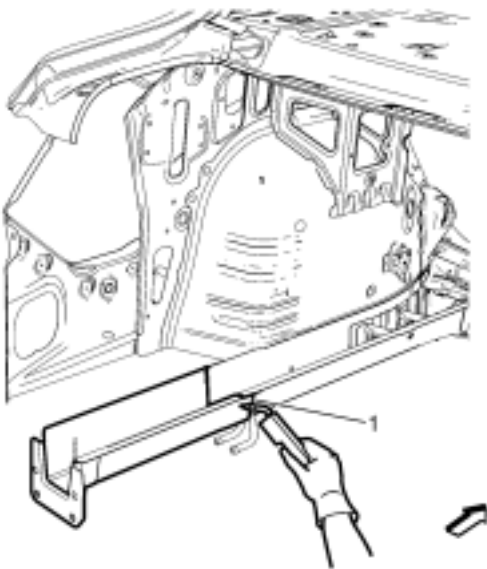
Installation Procedure



1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the rear side rail extension (1) as noted from the original panel.
2. Clean and prepare the attaching surfaces for welding.



3. Position the rear side rail extension on the vehicle (1).
4. Verify the fit of the rear side rail extension.
5. Clamp the rear side rail extension into position.



6. Plug weld accordingly (1).
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
8. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
9. Install all related panels and components.
10. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
11. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

## Rear End Panel Replacement

### Removal Procedure

**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

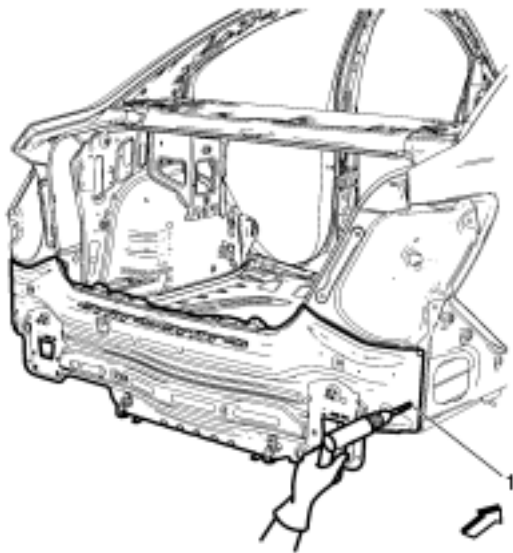
**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

**Note:** The rear end lower panel reinforcement extension is made of Ultra High Strength Dual Phase Steel and should be replaced only at factory joints. Repairing or sectioning of this part is not recommended. Refer to [Ultra High Strength Dual Phase Steel](#) .

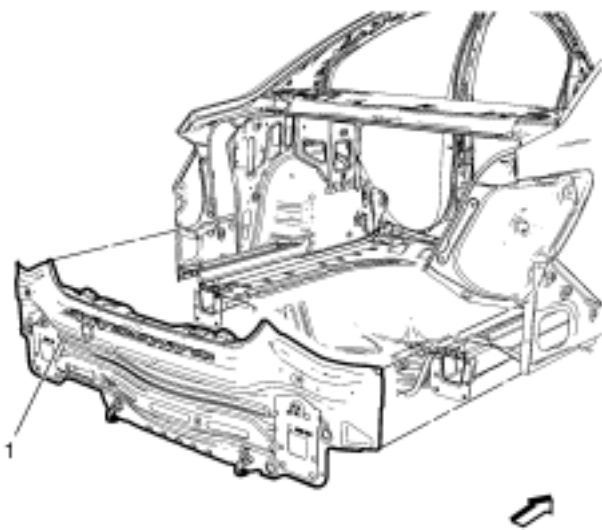
1. Disable the SIR System. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

**Note:** Note the number and location of welds for installation of the service assembly.

6. Locate and mark all the necessary factory welds of the body rear end panel.



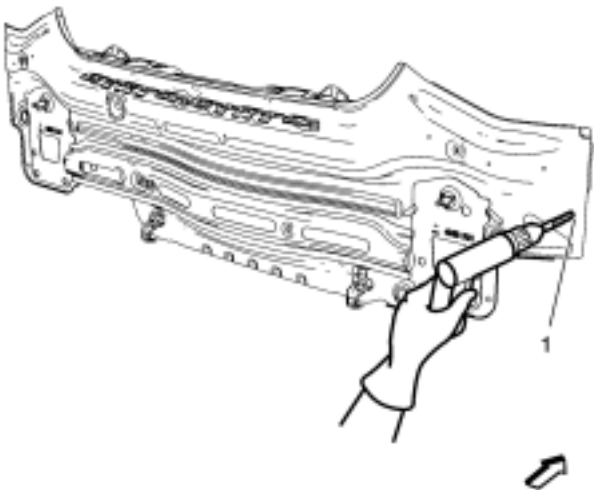
7. Drill all factory welds (1).



8. Remove the body rear end panel (1).

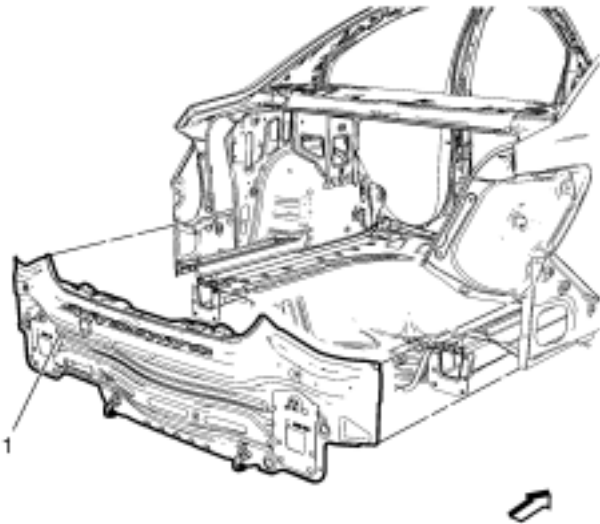


Installation Procedure

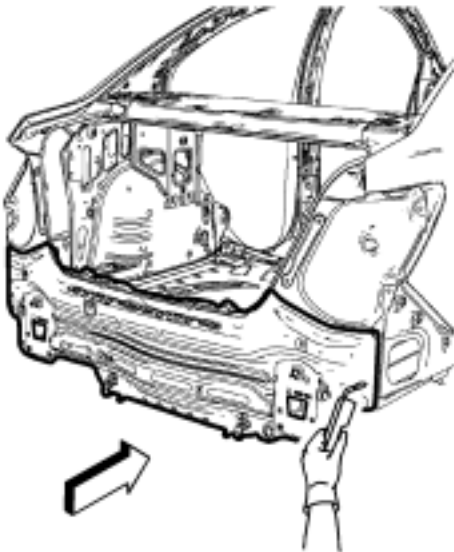


**Note:** If the location of the original plug weld holes can not be determined, space the plug weld holes every **40 mm (1 1/2 in)**.

- 1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the body rear end panel (1) as noted from the original panel.
- 2. Clean and prepare the attaching surfaces for welding.



- 3. Position the body rear end panel on the vehicle (1).
- 4. Verify the fit of the body rear end panel.
- 5. Clamp the body rear end panel into position.



- 6. Plug weld accordingly.
- 7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 8. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 9. Install all related panels and components.
- 10. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 11. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

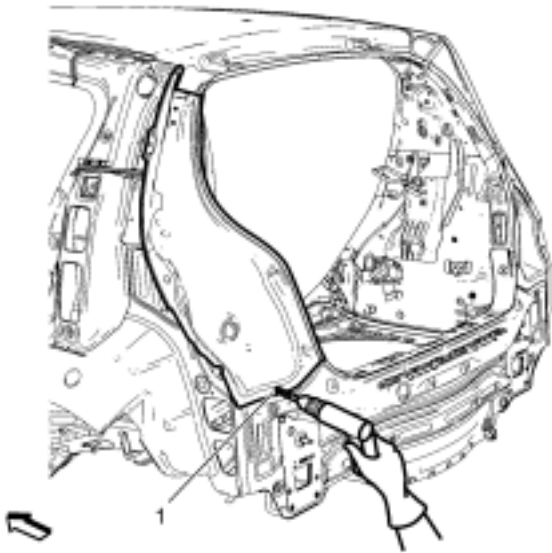
## Tail Lamp Pocket Replacement (5HB)

### Removal Procedure

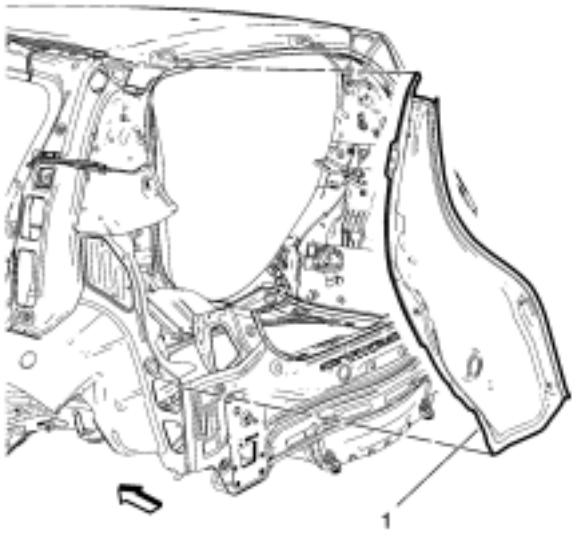
**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all the necessary factory welds of the body rear end panel.



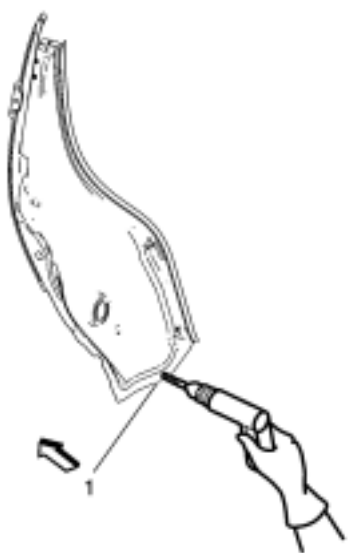
7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.



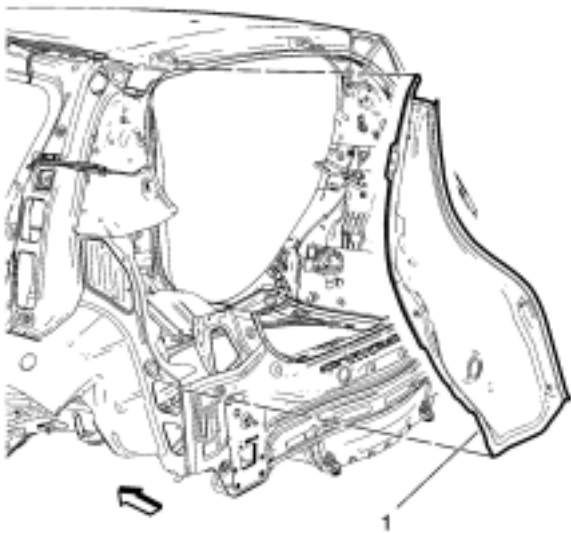
8. Remove the tail lamp pocket (1).



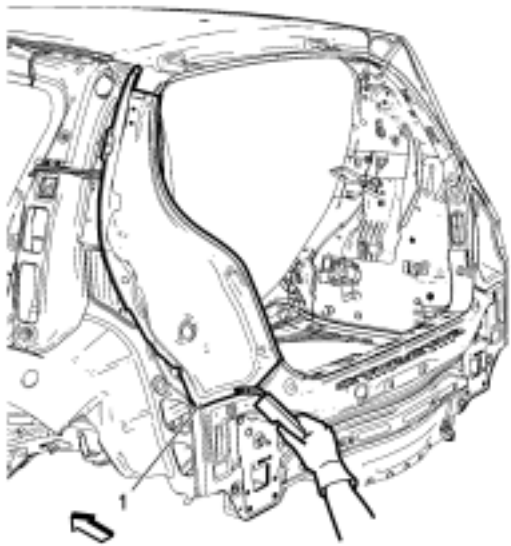
Installation Procedure



- 1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the tail lamp pocket (1) as noted from the original panel.
- 2. Clean and prepare the attaching surfaces for welding.



- 3. Position the tail lamp pocket on the vehicle (1).
- 4. Verify the fit of the tail lamp pocket.
- 5. Clamp the tail lamp pocket into position.



- 6. Plug the weld accordingly (1).
- 7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 8. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 9. Install all related panels and components.
- 10. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 11. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

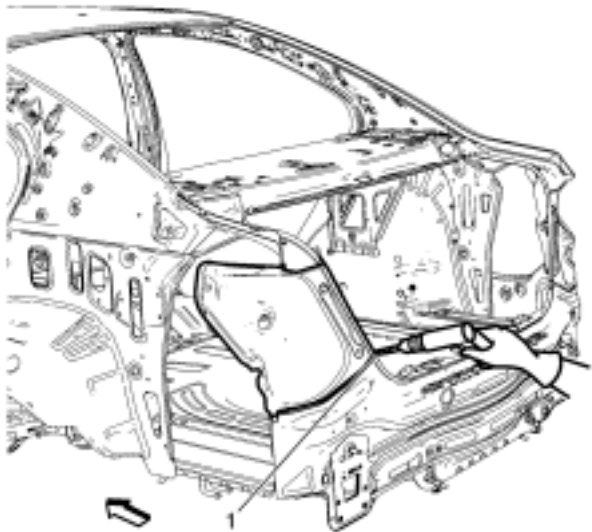
## Tail Lamp Pocket Replacement (4NB)

### Removal Procedure

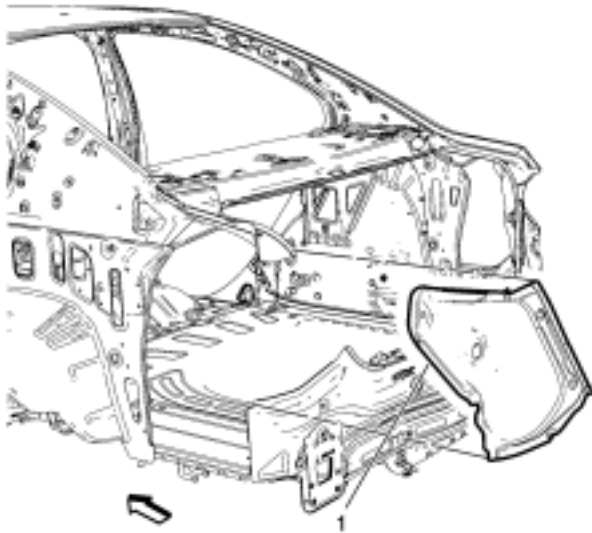
**Warning:** Refer to [Approved Equipment for Collision Repair Warning](#) .

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all the necessary factory welds of the body rear end panel.

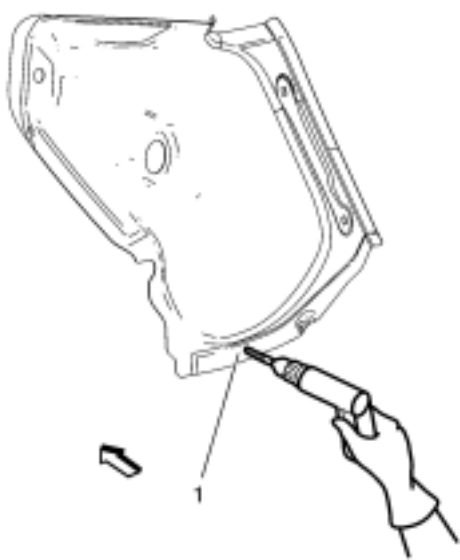


7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

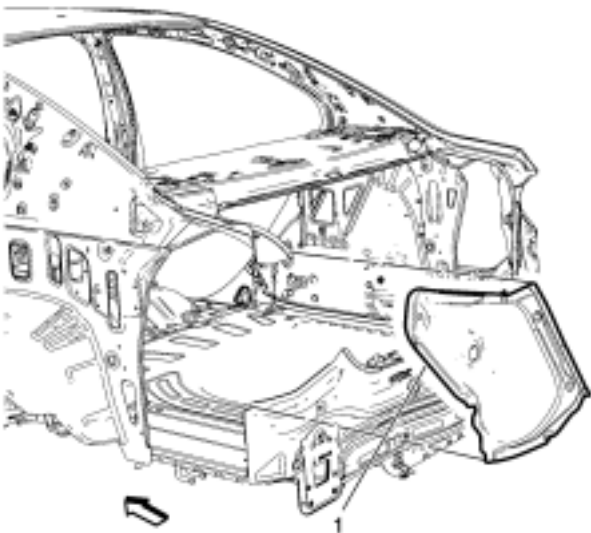


8. Remove the tail lamp pocket (1).

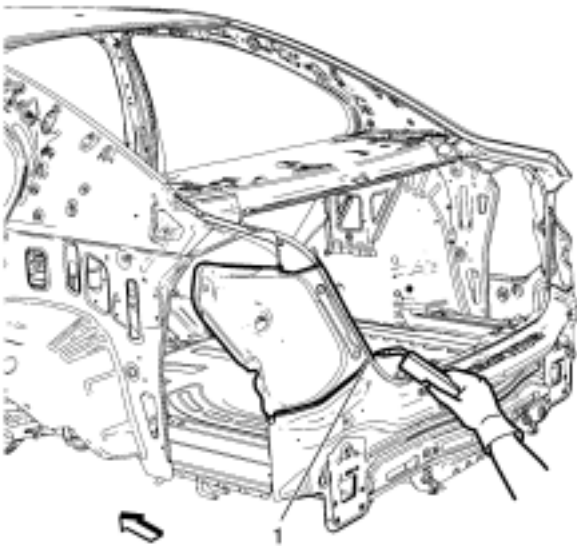
Installation Procedure



- 1. Drill **8 mm (5/ 16 in)** holes for plug welding along the edges of the tail lamp pocket (1) as noted from the original panel.
- 2. Clean and prepare the attaching surfaces for welding.



- 3. Position the tail lamp pocket on the vehicle (1).
- 4. Verify the fit of the tail lamp pocket.
- 5. Clamp the tail lamp pocket into position.



- 6. Plug the weld accordingly (1).
- 7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
- 8. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
- 9. Install all related panels and components.
- 10. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- 11. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .



Collision Repair

BODY REPAIR

0-3

Dual Phase Steel  
High Strength Low Alloy Steel  
Mild Steel

Ultra High Strength Dual Phase Steel  
Ultra High Strength Steel





## Dual Phase Steel

This information provides repair recommendations and general guidelines for steel classified as Dual Phase Steel (dual phase steel with a tensile strength up to and including 800 MPa), also known as DP.

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

**Note:** The use of heat to repair damage is not recommended for this classification of steel.

### Recommended Repairs

- Cold repairs can be performed on this type of steel, unless the damage includes kinks. If the damage includes kinks, the part should be replaced.
- Sectioning or partial replacement of this type of steel is recommended only at approved locations, in a specific sectioning procedure.
- This type of steel can be used as a sleeve, or backer plate, when recommended in a specific sectioning procedure.
- Squeeze resistance spot welding can be used to replace factory spot welds, where applicable.
- MIG plug welding and MIG stitch welding can be used on this type of steel.
- MIG brazing can be used on this type of steel.





## High Strength Low Alloy Steel

This information provides repair recommendations and general guidelines for steel classified as High Strength Low Alloy Steel, also known as HSLA. This type of steel normally has a tensile strength range from 300–700 MPa.

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

### Recommended Repairs

- Cold repairs can be performed on this type of steel, unless the damage includes kinks. If the damage includes kinks, the part should be replaced.
- Controlled use of heat can be used to repair damage, if the heat does not exceed 650° C (1200° F). The heat should be applied a maximum of 2 times, for up to 90 seconds.
- Sectioning or partial replacement of this type of steel is recommended only at approved locations, in a specific sectioning procedure.
- This type of steel can be used as a sleeve, or backer plate, during sectioning procedures.
- Squeeze resistance spot welding can be used to replace factory spot welds, where applicable.
- MIG plug welding and MIG stitch welding can be used on this type of steel.
- MIG brazing can be used on this type of steel.





## Mild Steel

This information provides repair recommendations and general guidelines for steel classified as Mild Steel. This type of steel normally has a tensile strength less than 270 MPa. This includes the common steel names of:

- Mild Steel
- Bake Hardenable Steel (BH)
- Solid Solution Strengthened Steel

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

### Recommended Repairs

- Cold repairs can be performed on this type of steel, unless the damage includes kinks. If the damage includes kinks, the part should be replaced.
- Controlled use of heat can be used to repair damage, if the heat does not exceed 650° C (1200° F). The heat should be applied a maximum of 2 times, for up to 90 seconds.
- Sectioning or partial replacement of this type of steel is recommended only at approved locations, in a specific sectioning procedure.
- This type of steel can be used as a sleeve, or backer plate, when recommended in a specific sectioning procedure.
- Squeeze resistance spot welding can be used to replace factory spot welds, where applicable
- MIG plug welding and MIG stitch welding can be used on this type of steel.
- MIG brazing can be used on this type of steel.





## Ultra High Strength Dual Phase Steel

This information provides repair recommendations and general guidelines for steel classified as Ultra High Strength Dual Phase Steel (dual phase steel with a tensile strength greater than 800 MPa), also known as DPX.

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

**Note:**

- Repair of this type of steel is not recommended.
- This type of steel should be replaced at factory joints only. Sectioning or partial replacement is not recommended.
- The use of heat to repair damage is not recommended for this type of steel.
- Stitch welding is not recommended for this type of steel.
- This classification of steel cannot be used as a backing reinforcement or a sleeve for a sectioning joint, unless a specific procedure is available.

**Recommended Repairs**

- Squeeze resistance spot welding can be used to replace factory spot welds, where applicable.
- MIG plug welding can be used to replace factory spot welds.
- MIG brazing can be used to replace factory spot welds.







## Ultra High Strength Steel

This information provides repair recommendations and general guidelines for steel classified as Ultra High Strength Steel, also know as UHSS. This type of steel normally has a tensile strength greater than 700 MPa.

This includes the common steel names of:

- Ultra High Strength Steel (UHSS)
- Martensitic Steel (MS)
- Press Hardened Steel (PHS)
- Boron Steel

**Note:**



- Repair of this type of steel is not recommended.
- This type of steel should be replaced at factory joints only. Sectioning or partial replacement is not recommended.
- The use of heat to repair damage is not recommended for this type of steel.
- Stitch welding is not recommended for this type of steel.
- This type of steel can not be used as a backing reinforcement or a sleeve for a sectioning joint.

**Recommended Repairs**

- Squeeze resistance spot welding can be used to replace factory spot welds, where applicable.
- MIG plug welding can be used to replace factory spot welds.
- MIG brazing can be used to replace factory spot welds.



Special Tools

Illustration	Tool Number/ Description
	BO-6392 MKM-6392 Flanging Tool Kit
	BO-6396 MKM-6396 Bonding Pliers



Specifications	Rear Wheelhouse Panel Liner Replacement (Hatchback - Left)
Drivetrain and Front Suspension Frame Skid Plate Replacement	Rear Wheelhouse Panel Liner Replacement (Hatchback - Right)
Drivetrain and Front Suspension Frame Replacement	Rear Wheelhouse Panel Liner Replacement (Sedan - Left)
Front Wheelhouse Liner Inner Front Extension Replacement	Rear Wheelhouse Panel Liner Extension Replacement
Front Wheelhouse Liner Replacement (Front)	Front Compartment Front Insulator Cover Replacement
Front Wheelhouse Liner Replacement (Rear)	Special Tools
Rear Wheelhouse Panel Liner Replacement (Sedan - Right)	



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Drivetrain and Front Suspension Frame Bolt Center	135 N·m	100 lb ft
Drivetrain and Front Suspension Frame Bolt Front	58 N·m	43 lbft
Drivetrain and Front Suspension Frame Bolt Rear	135 N·m	100 lb ft
Front Compartment Front Insulator Cover Bolts	22 N·m	16 lb ft
Front Compartment Front Insulator Cover Screws– Europe Only	2.5 N·m	22 lb in
Front Wheelhouse Liner Inner Front Extension Screws	3 N·m	27 lb in
Front Wheelhouse Liner Screw– Front	3 N·m	27 lb in
Front Wheelhouse Rear Liner Nut	3 N·m	27 lb in
Front Wheelhouse Rear Liner Screw	3 N·m	27 lb in
Power Steering Fluid Cooling Pipe Bolt, if equipped	9 N·m	80 lb in
Power Steering Inlet and Outlet Hose Bolt, if equipped	9 N·m	80 lb in
Rear Wheelhouse Panel Liner Nut	2 N·m	18 lb in
Rear Wheelhouse Panel Liner Screw	3 N·m	27 lb in
Skid Plate Fasteners	22 N·m	16 lb ft
Steering Gear Fasteners	70 N·m	52 lb ft



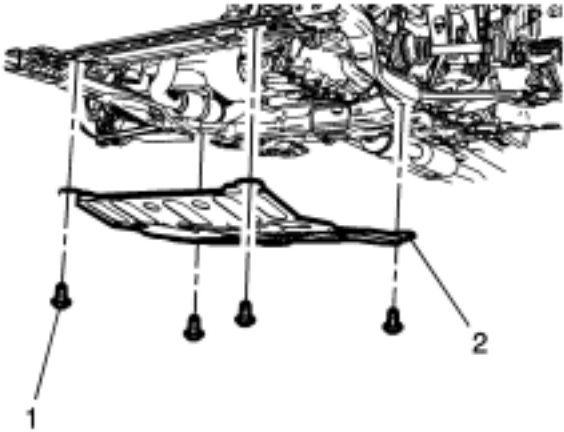
Steering Linkage Tie Rod Nut	65 N·m	48 lb ft
Transmission Rear Mount Bracket Bolts	100 N·m	74 lb ft



## Drivetrain and Front Suspension Frame Skid Plate Replacement

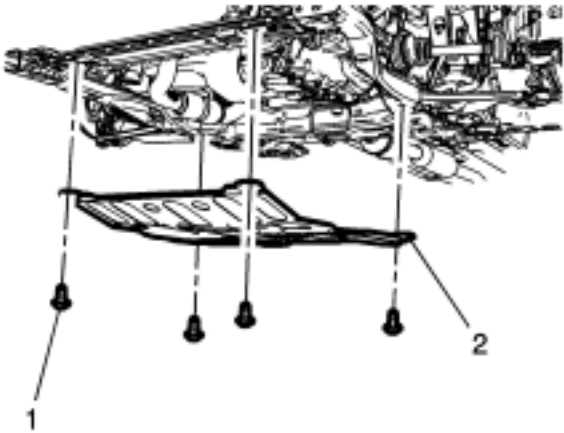
### Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .



2. Remove the mounting bolts(1) for the front suspension frame skid plate.
3. Remove the front suspension frame skid plate(2).

### Installation Procedure



1. Position the front suspension frame skid plate(2) on the frame.

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

2. Install the front suspension frame skid plate mounting bolts(2) and tighten to **22 N·m (16 lb ft)** .

## Drivetrain and Front Suspension Frame Replacement

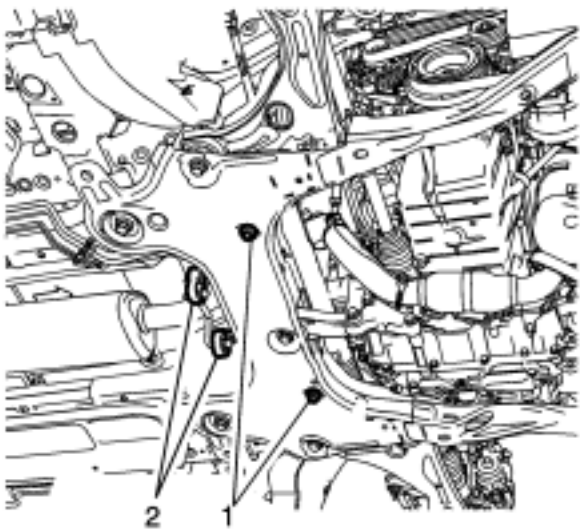
### Special Tools

- *EN-45059* Angle Meter
- *CH-50619* Front Suspension Frame Adjusting Pins

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

### Removal Procedure

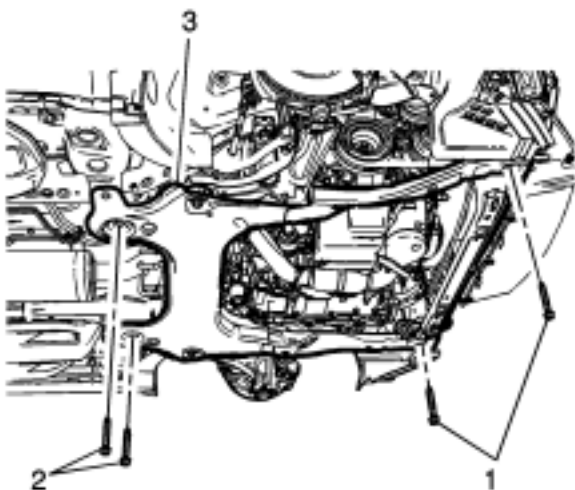
1. Support the radiator and condenser from above using the upper brackets on each side.
2. Raise the vehicle on a hoist. Refer to [Lifting and Jacking the Vehicle](#) .
3. Remove the front tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
4. Remove the skid plate from the front frame, if equipped. Refer to [Drivetrain and Front Suspension Frame Skid Plate Replacement](#) .
5. Remove the left and right front wheel house liner inner front extensions. Refer to [Front Wheelhouse Liner Inner Front Extension Replacement](#) .
6. Remove the front bumper impact bar lower bracket. Refer to [Front Bumper Impact Bar Lower Bracket Replacement](#) .
7. Disconnect the steering linkage tie rod end from the steering knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#) .
8. Disconnect the lower ball joints from the steering knuckles. Refer to [Lower Control Arm Replacement](#) .
9. Disconnect the stabilizer links from the strut assemblies.



10. Remove the steering rack retaining bolts(1) and discard.
11. Using mechanics wire, secure the power steering gear to the vehicle.
12. Disconnect the hydraulic power steering hoses from the front frame, if equipped.
13. Disconnect the exhaust isolators(2) from the front suspension frame.
14. Disconnect the power brake booster pump hose and connector, if equipped.
15. Remove the rear transmission mount bracket to rear mount through bolt (1).
16. Using a suitable support table or equivalent, support the front suspension frame.



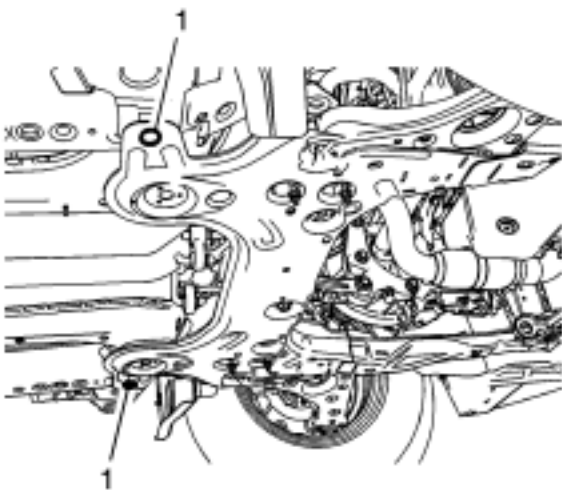
17. Remove the upper frame suspension retaining bolts(1).



18. Remove the frame front bolts(1).
19. Remove the frame rear bolts(2).
20. Remove the frame(3) from the vehicle.
21. Remove the following components, if replacing the frame:
  - The lower control arms—Refer to [Lower Control Arm Replacement](#) .
  - The stabilizer shaft—Refer to [Stabilizer Shaft Replacement](#) .
  - The front bumper lower impact bar—Refer to [Front Bumper Lower Impact Bar Replacement](#) .
  - The power brake booster pump, if equipped—Refer to [Power Brake Booster Pump Replacement](#) .

Installation Procedure

1. Install the following components on the drivetrain and front suspension frame if removed:
  - The power brake booster pump, if equipped—Refer to [Power Brake Booster Pump Replacement](#) .
  - The front bumper lower impact bar—Refer to [Front Bumper Lower Impact Bar Replacement](#) .
  - The stabilizer shaft—Refer to [Stabilizer Shaft Replacement](#) .
  - The lower control arms—Refer to [Lower Control Arm Replacement](#) .
2. Install the frame(3) into the vehicle.

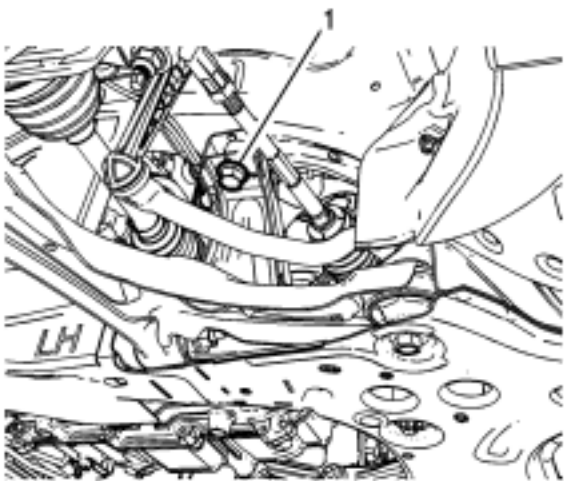


3. Using the CH-50619 front suspension frame adjusting pins, have an assistant vertically insert and hold the pins through the front suspension frame and floor panel(1).

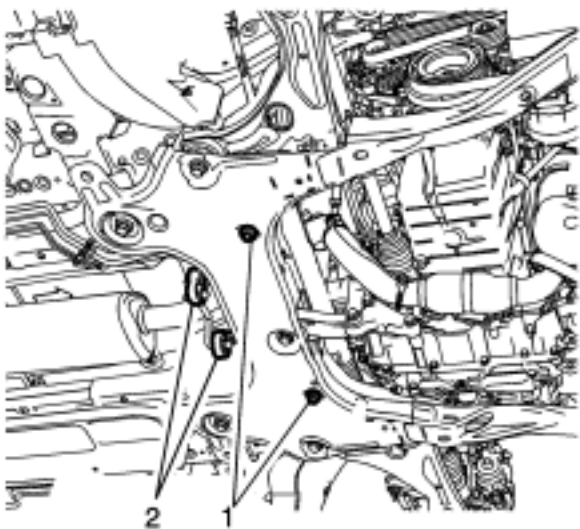
**Caution:** Refer to [Fastener Caution](#) .

4. Install the frame rear bolts(2) and tighten to **135 N·m (100 lb ft)**.
5. Install the frame front bolts(1) and tighten to **58 N·m (43 lb ft)**.

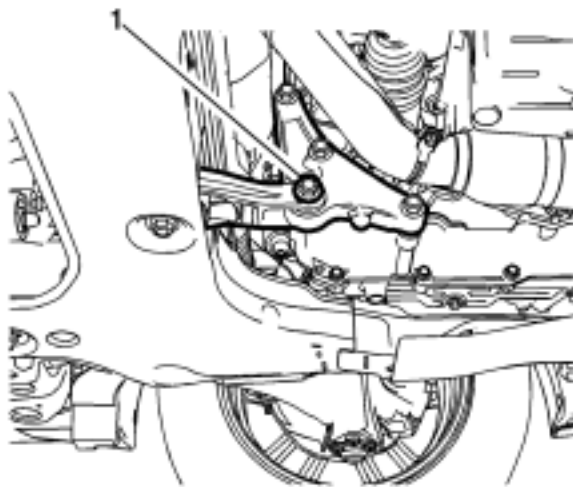




- 6. Install the upper frame suspension retaining bolts(1) and tighten to **135 N·m (100 lb ft)**
- 7. Remove the support for the power steering gear.

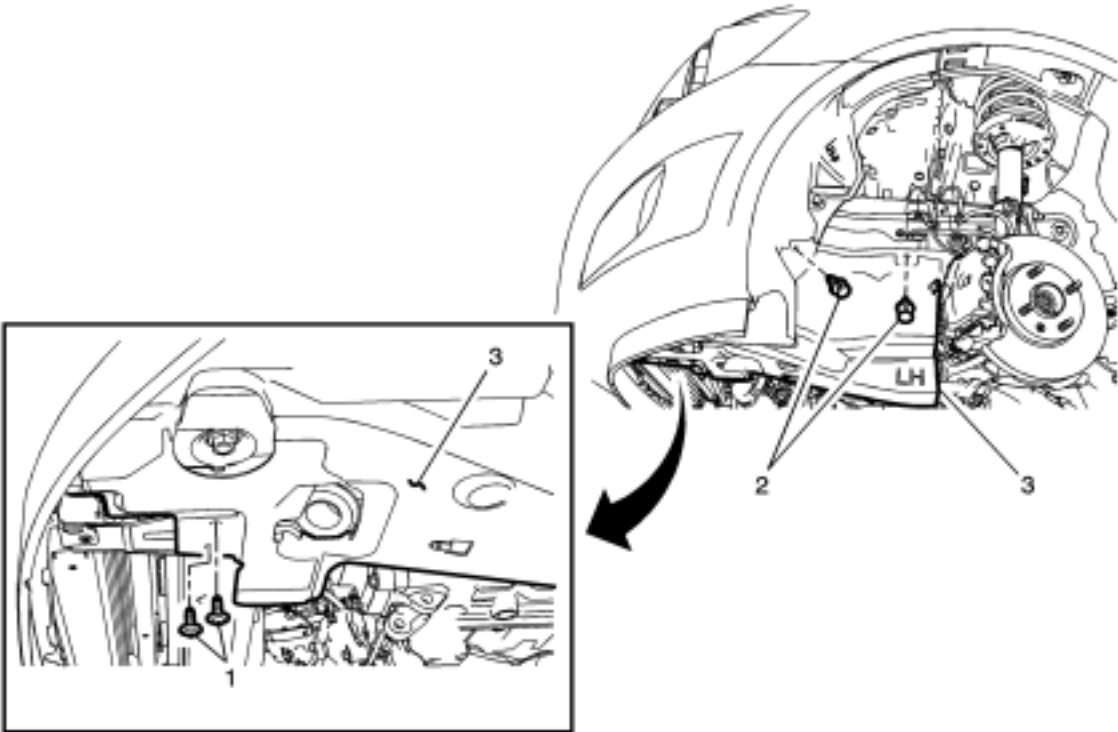


- 8. Install the steering gear retaining fasteners(1). Refer to [Steering Gear Boot Replacement](#) .
- 9. Connect the hydraulic power steering hoses to the front frame, if equipped.
- 10. Connect the exhaust isolators(2) to the front suspension frame.



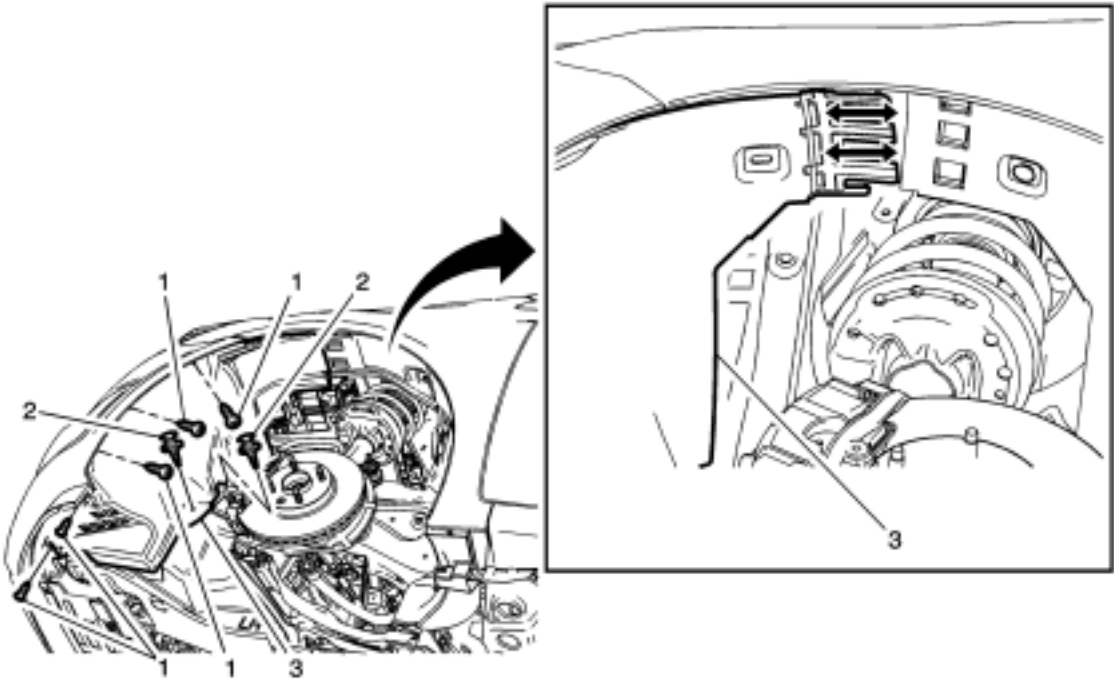
- 11. Install the rear transmission mount bracket to rear mount through bolt(1). Refer to [Transmission Rear Mount Replacement](#) .
- 12. Connect the power brake booster pump hose and connector, if equipped.
- 13. Connect the lower ball joints to the steering knuckles. Refer to [Lower Control Arm Replacement](#) .
- 14. Connect the stabilizer links to the strut assemblies. Refer to [Stabilizer Shaft Link Replacement](#) .
- 15. Connect the steering linkage tie rod end to the steering knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#) .
- 16. Install the front bumper impact bar lower bracket. Refer to [Front Bumper Impact Bar Lower Bracket Replacement](#) .
- 17. Install the left and right front wheel house liner inner front extensions. Refer to [Front Wheelhouse Liner Inner Front Extension Replacement](#) .
- 18. Install the skid plate to the front frame, if equipped. Refer to [Drivetrain and Front Suspension Frame Skid Plate Replacement](#) .
- 19. Install the front tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
- 20. Lower the vehicle.
- 21. Remove the support of the radiator and condenser.

Front Wheelhouse Liner Inner Front Extension Replacement



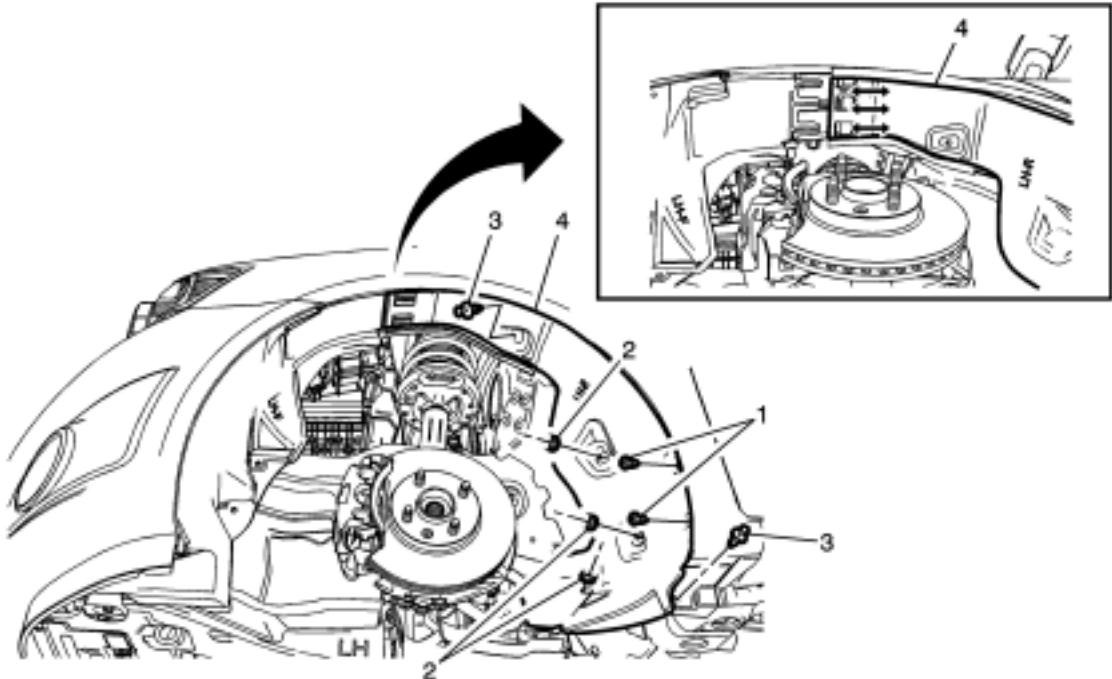
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Front Wheelhouse Liner Inner Front Extension Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 3 N·m (27 lbin)</p>
2	<p>Front Wheelhouse Liner Inner Front Extension Push-In Retainer (Qty: 2)</p>
3	<p>Front Wheelhouse Liner Inner Front Extension</p>

Front Wheelhouse Liner Replacement (Front)



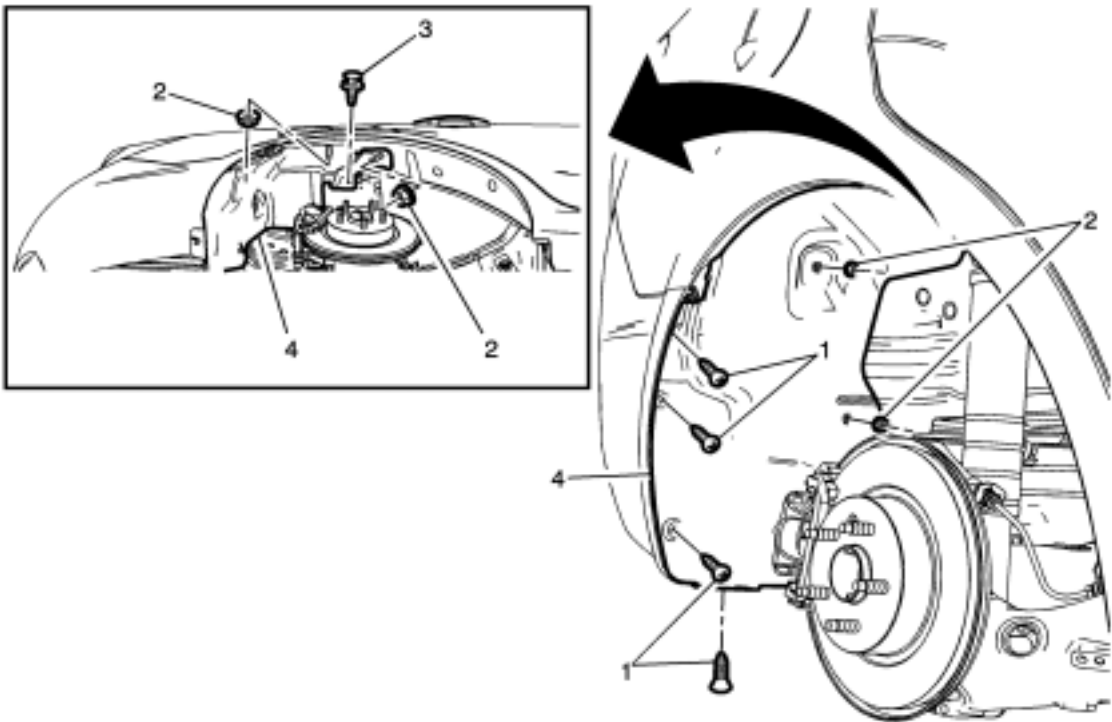
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Front Wheelhouse Liner Screw – Front (Qty: 5)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 2.5 N·m (22 lb in)</p>
2	<p>Front Wheelhouse Liner Push-In Retainer – Front (Qty: 2)</p>
3	<p>Front Wheelhouse Liner – Front</p> <p><b>Procedure</b></p> <p>Disengage the upper interlocking retainers.</p>

Front Wheelhouse Liner Replacement ( Rear)



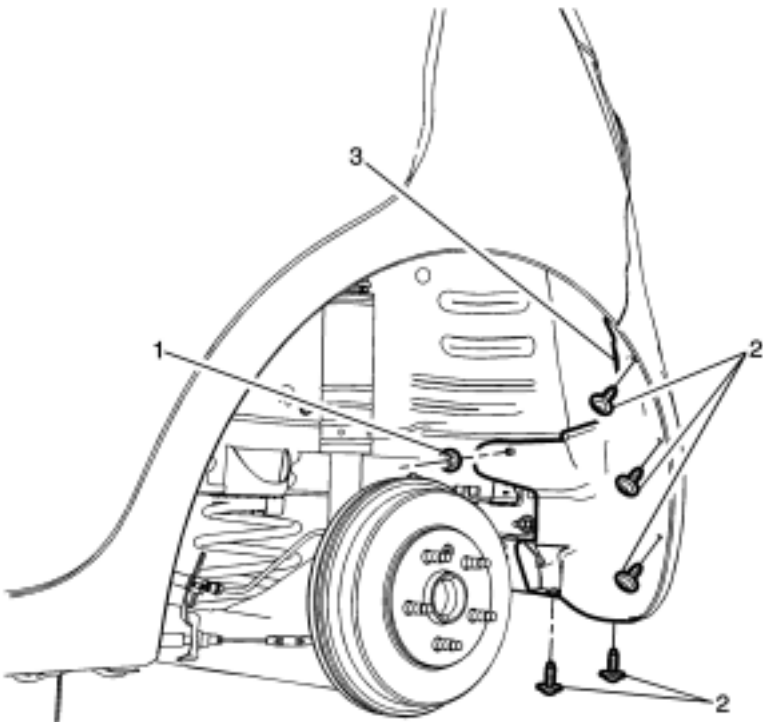
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Front Wheelhouse Rear Liner Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 3 N·m (27 lbin)</p>
2	<p>Front Wheelhouse Rear Liner Nut (Qty: 3)</p> <p><b>Tighten</b> 3 N·m (27 lbin)</p>
3	<p>Front Wheelhouse Rear Liner Push-In Retainer (Qty: 2)</p>
4	<p>Front Wheelhouse Rear Liner</p> <p><b>Procedure</b></p> <p>Disengage the upper interlocking retainers.</p>

Rear Wheelhouse Panel Liner Replacement (Sedan - Right)



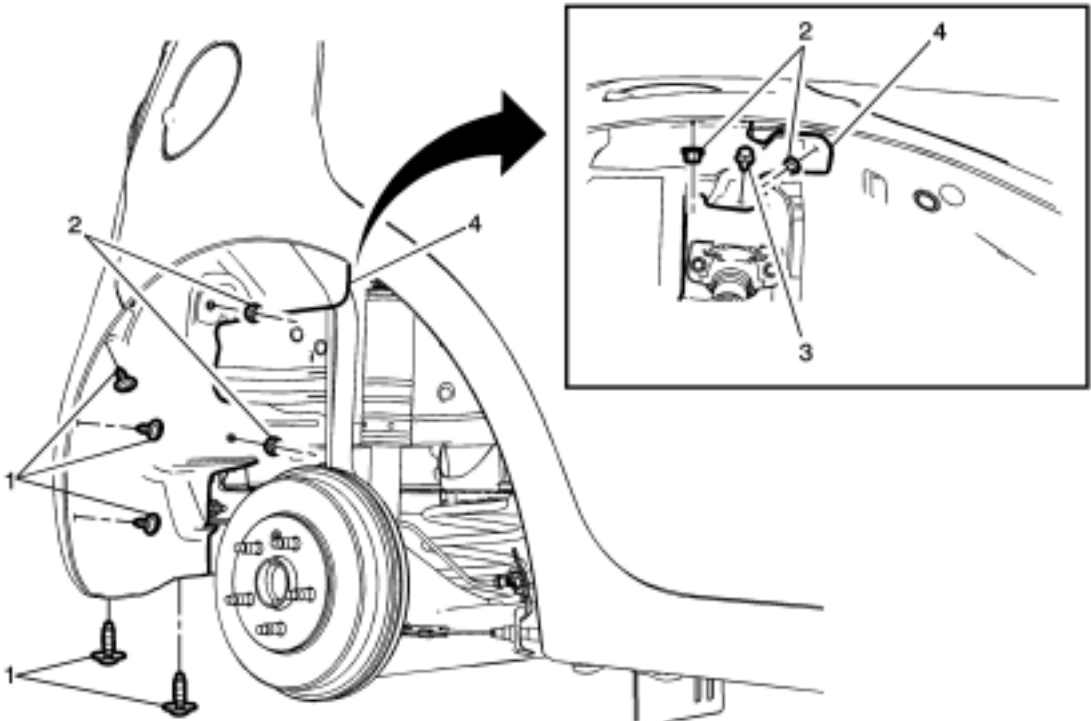
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Rear Wheelhouse Panel Liner Screw (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 3 N·m (27 lbin)</p>
2	<p>Rear Wheelhouse Panel Liner Nut (Qty: 4)</p> <p><b>Tighten</b> 2 N·m (18 lbin)</p>
3	<p>Rear Wheelhouse Panel Liner Push-In Retainer</p>
4	<p>Rear Wheelhouse Panel Liner</p>

Rear Wheelhouse Panel Liner Replacement (Hatchback - Left)



Callout	Component Name
<b>Preliminary Procedure</b>  Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .	
1	Rear Wheelhouse Panel Liner Nut  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 2 N·m (18 lbin)
2	Rear Wheelhouse Panel Liner Screw (Qty: 5)  <b>Tighten</b> 3 N·m (27 lbin)
3	Rear Wheelhouse Panel Liner

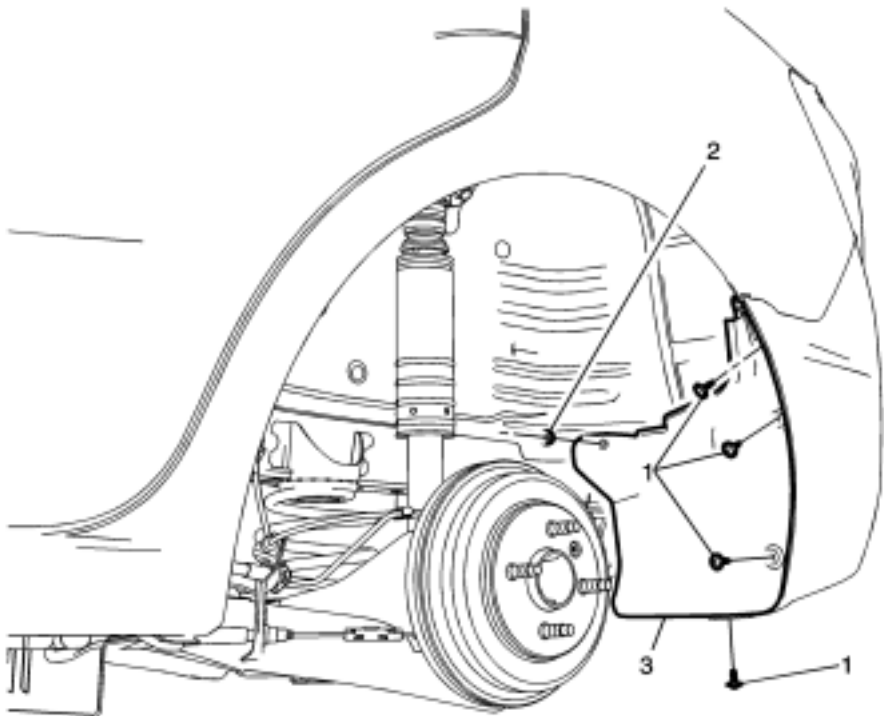
Rear Wheelhouse Panel Liner Replacement (Hatchback - Right)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Rear Wheelhouse Panel Liner Screw (Qty: 5)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 3 N·m (27 lbin)</p>
2	<p>Rear Wheelhouse Panel Liner Nut (Qty: 4)</p> <p><b>Tighten</b> 2 N·m (18 lbin)</p>
3	<p>Rear Wheelhouse Panel Liner Push-In Retainer</p>
4	<p>Rear Wheelhouse Panel Liner</p>



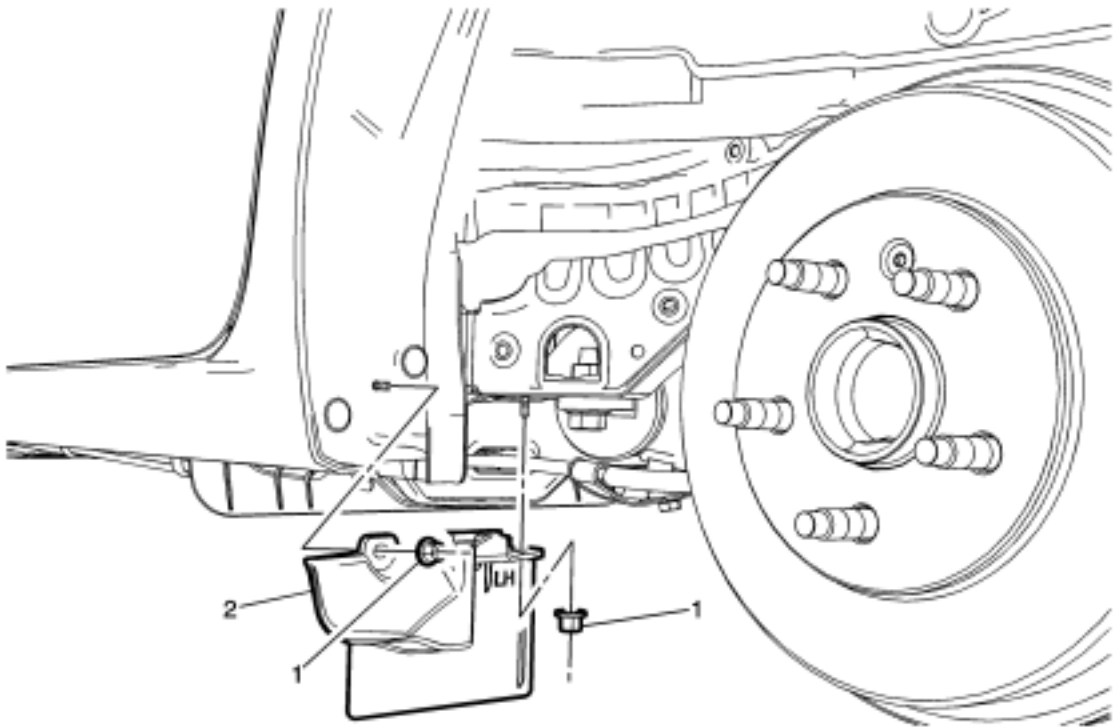
Rear Wheelhouse Panel Liner Replacement (Sedan - Left)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Rear Wheelhouse Panel Liner Screw (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 3 N·m (27 lbin)</p>
2	<p>Rear Wheelhouse Panel Liner Push-In Retainer</p>
3	<p>Rear Wheelhouse Panel Liner</p>

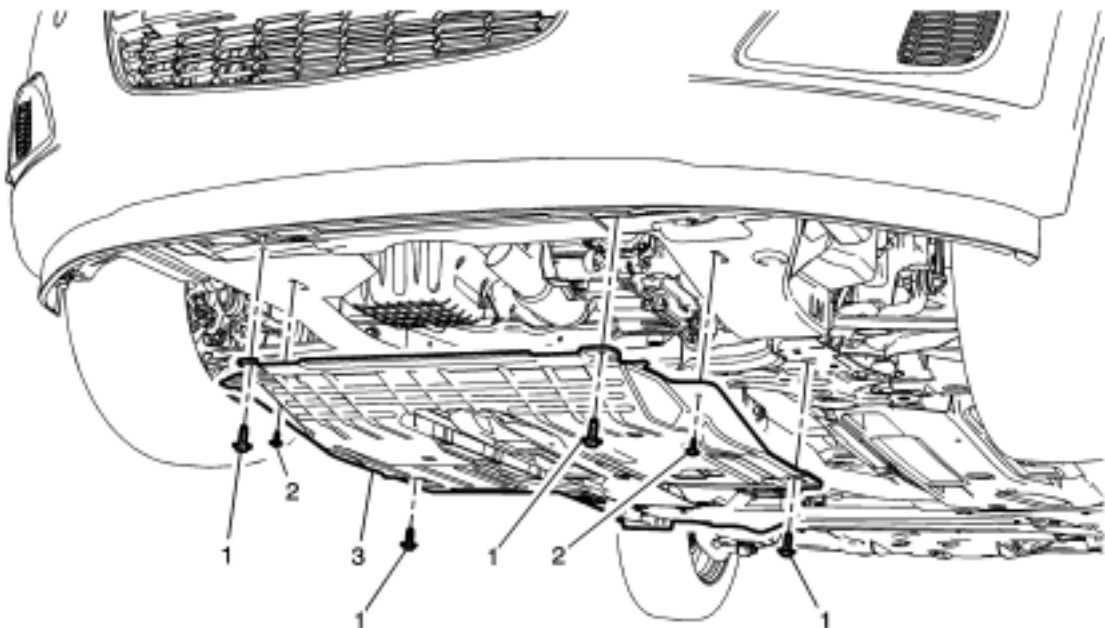


Rear Wheelhouse Panel Liner Extension Replacement



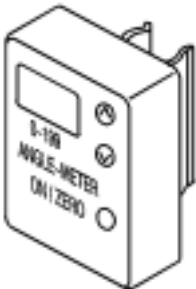
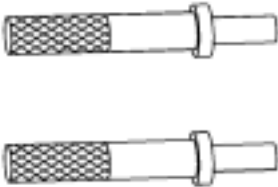
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Rear Wheelhouse Panel Liner Extension Nut (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Rear Wheelhouse Panel Liner Extension</p>

Front Compartment Front Insulator Cover Replacement



Callout	Component Name
1	Front Compartment Front Insulator Cover Screw (Qty: 2)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 2.5 N·m (22 lbin)
2	Front Compartment Front Insulator Cover Bolt (Qty: 4)  <b>Tighten</b> 22 N·m (16 lbft)
3	Front Compartment Front Insulator Cover

Special Tools

Illustration	Tool Number/ Description
	EN-45059 J-45059 Angle Meter
	CH-50619 Front Suspension Frame Adjusting Pins



Paint and Coatings

BODY REPAIR

0-3

- Basecoat/ Clearcoat Paint Systems
- Anti-Corrosion Treatment and Repair (Base)
- Clearcoat Repair without Repainting
- Environmental Fallout (Acid Rain)

- Paint Gauges
- Clearcoat Thickness
- Rail Dust Damage Repair





## Basecoat/ Clearcoat Paint Systems

**Warning:** Exposure to isocyanates during paint preparation and application processes can cause severe breathing problems. Read and follow all of the instructions from the manufacturers of painting materials, equipment, and protective gear.

All paint finish repairs of rigid exterior surfaces must meet GM standards. Refer to the latest revision of the GM Approved Refinish Materials book to identify the paint systems you may use that have been engineered to meet GM standards. The GM Approved Refinish Materials book supplies all approved products, including volatile organic compound (VOC) compliant regulations recommended by the individual manufacturer, and detailed procedures for materials used in their paint system.

The latest revision of the GM Approved Refinish Materials booklet is located on the Genuine GM Parts website at [www.genuinegmparts.com](http://www.genuinegmparts.com).



## Anti-Corrosion Treatment and Repair (Base)

**Warning:** When applying sound deadeners, or anti-corrosion materials due care and preventative measures must be exercised to prevent any material from being sprayed into door and quarter panel mechanisms such as door locks, window run channels, window regulators and seat belt retractors, as well as any moving or rotating mechanical or suspension parts on the underbody, particularly the parking brake cable. After material application, be sure that all body drain holes are open. Improper application may increase chance of corrosion damage or limit the operation of moving parts, resulting in personal injury.

Any procedure that disturbs these special treatments, such as panel replacement or collision damage repair operations, may leave the metal unprotected and result in corrosion. Proper recoating of these surfaces with service-type anti-corrosion material is essential.

After repair and/or replacement parts are installed, all accessible bare metal surfaces must be treated with metal conditioner and reprimed. Refer to the GM Approved Refinish Materials book which identifies the paint systems you may use.

The latest revision of the GM Approved Refinish Materials booklet is located on the Goodwrench website at [www.gmgoodwrench.com](http://www.gmgoodwrench.com).

Anti-corrosion compounds are light-bodied materials designed to penetrate between metal-to-metal surfaces, such as pinch-weld joints, hem flanges, and integral panel attaching points where metal surfaces are difficult to coat with conventional undercoating materials, and are inaccessible for painting. The materials that are suitable for interior and exterior are listed in the chart below. Conventional undercoating is recommended in order to coat large areas, such as replacement door and quarter outer panels, floor pan sections, lids, hoods, fenders, etc. During undercoating operations, care should be taken to prevent the material from being sprayed into door and quarter panel hardware mechanisms, such as door locks, window run channels, window regulators, and seat belt retractors. On the underbody, the material should not be applied to any moving or rotating part, energy absorbing bumper components, or shock absorbers. After undercoating, ensure that all body drain holes are open.

### Interior Protectant

The following products are available from GM Dealer Equipment. For technical information, call 187-Permatex (1-877-376-2839):

Permatex Part Number	Description
310-JDI-UCA1	Permatex Canister and Wand Assembly
310-81881	Permatex Amber Rust Proofing (24 oz) (Qty of 12)
310-81882	Permatex Amber Rust Proofing (1 gal)

### Exterior Protectants

The following product is available from \*ECP, Inc. Contact them at 1-800-323-3521 or [www.ecpinc.net](http://www.ecpinc.net).

Part Number	Description
178660	Nox Rust X-121B (12 cans per case)

The following products are available from your local \*3M® distributor, or call 1-800-521-8180, ext. 779-5165.

3M® Part Number	Description
08804	Water-Based Undercoat
08801	No Clean-Up Applicator Gun

05917	Weld-Thru Coating
08891	Rust Fighter-I

The following product is available from \* Transtar Autobody Technologies. Contact the company at 1-800-824-2843 or [www.tat-co.com](http://www.tat-co.com)

Part Number	Description
4353	Weld-Through Primer

\* We believe these sources and their products to be reliable. There may be additional manufacturers of such material. General Motors does not endorse, indicate any preference for, or assume any responsibility for the products from these firms, or for any such items which may be available from other sources.

These sealers are intended to prevent water and dust from entering the vehicle and also are anti-corrosion barriers. Sealers are applied to such areas as rear compartment lid hem flanges, wheelhouse, quarter outer, floor, cowl, roof, and various other panel to panel attaching points. The originally sealed joints are obvious and any damage to these sealed locations should be corrected by resealing. Attaching points of new replacement panels should be resealed. Replacement lids and doors will also require sealing in the hem flange areas.

Flanged joints, overlap joints, and seams should be sealed using a quality sealer of medium-bodied consistency. The sealer used must retain its flexible characteristics after curing and be paintable.

Open joints which require bridging of the sealer in order to close a gap should be sealed using a heavy-bodied caulking material. Follow the label directions for the material selected.

Color application may be required in order to restore repaired areas such as hood, fenders, doors, quarters, lid, roof, engine compartment, underbody, and inner panels to original appearance. When this is necessary, conventional refinishing preparation, undercoat buildup, and color application techniques should be followed.

Deadener materials, spray-on type, are used on various metal panels in order to provide corrosion resistance and joint sealing. They control the general noise level inside the passenger area of the vehicle. When deadeners are disturbed because of damage, are removed during repair operations, or a new replacement panel is installed, the deadener material must be replaced by a service equivalent material. The application pattern and location of deadener materials can be determined by observing the original production installation.

Cleaning of the interior and underbody panel surfaces is necessary when original galvanized or other anti-corrosion materials have been burned off during welding or heating operations. Removal of the residue from burning will require additional care in such areas as interior surfaces of box-type construction and when configurations of the metal panels limit access to interior surfaces.



## Clearcoat Repair without Repainting

### Repair Procedure

1. Thoroughly wash the repair area with Liquid Wash and Wax GMP/N1052870 or the equivalent.
2. Environmental damage may be corrected. Refer to [Environmental Fallout \(Acid Rain\)](#) or [Rail Dust Damage Repair](#) .

**Important:** Follow all of the instructions from the manufacturer of the polishing material.

3. Use a paint gauge before, during, and after sanding and/or polishing, to avoid removing too much clearcoat. Refer to [Paint Gauges](#) .





## Environmental Fallout ( Acid Rain)

**Caution:** Refer to [Clearcoat/Ultraviolet Screeners Caution](#) .

**Note:** Always refer to the manufacturer's packaged instructions for the detailed procedures of materials used for compounding and/or polishing.

Since the severity of the condition varies from area to area, proper diagnosis of the contamination extent is critical to the success of the repairs. Perform the diagnosis under high intensity fluorescent lighting on the horizontal surfaces (hood, roof panel, rear compartment lid), after the surfaces have been properly cleaned by washing the vehicle with a GM approved Liquid Wash and Wax kit.

There are 3 basic types of acid rain damage:

**Surface Level Contamination:** May be repaired by simply washing the vehicle, cleaning the surface with a silicone wax and grease remover, neutralizing acidic residue, and finesse polishing—Refer to Surface Level Contamination Repair.

**Clearcoat Etching:** Slight etching is still noticeable after the above washing and finesse polishing procedure. Refer to Slight Clearcoat Damage – Wet Sanding, Finesse Polishing.

**Basecoat Etching:** Severe etching beyond the clearcoat into the basecoat in the affected areas will require refinishing. Refer to [Basecoat/Clearcoat Paint Systems](#) .

### Surface Level Contamination Repair

1. Thoroughly wash and dry the contaminated area with a GM approved Liquid Wash and Wax kit.
2. Clean the affected area with silicone, wax and grease remover.
3. Remove and neutralize acidic residue by cleaning the contaminated areas with a mixture of baking soda and water (1 tablespoon of baking soda per 1 liter or 1 quart of water). Rinse thoroughly and dry the panel completely.
4. Apply finesse-type polish with a foam panel. If damage has been repaired, remove any swirl marks with a dual action orbital polisher and foam pad.
5. If some damage remains, refer to Slight Clearcoat Damage – Wet Sanding, Finesse Polishing.

### Slight Clearcoat Damage – Wet Sanding, Finesse Polishing

1. Select a small contaminated test area.
2. Film thickness should be taken prior to the sanding and polishing. Refer to [Paint Gauges](#) .
3. Wet sand and finesse polish the contaminated test area. If during the polishing you suspect or observe that etching has penetrated into the basecoat, too much clearcoat has been removed during sanding, or base color is transferred to the polishing pad during polishing, then the affected areas will require refinishing. Refer to [Basecoat/Clearcoat Paint Systems](#) .

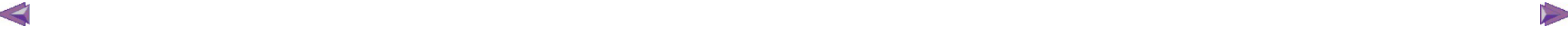


## Paint Gauges

Paint thickness gauges measure the total thickness of the vehicle finish. It is important to accurately measure the thickness of the finish on each vehicle as the thickness of the finish will vary on each vehicle. Use a paint gauge before the sanding process in order to accurately measure how much finish there is to remove before, during, and after the sanding process. Paint gauges range from magnetic pull type to sophisticated electronic types, and are available from a variety of sources. The older magnetic type gauges, at best have a 5percent accuracy range and are not sensitive enough to detect removal of 0.02mm 0.5 mil (0.0005in) clearcoat. The newer type magnetic gauges have improved accuracy ranges. Most gauges are confined to checking either ferrous metal, steel, non-ferrous metal, or aluminum panel. At this time, there are no viable gauges for reading film thickness on composite (SCM doors, RIM fenders) panels. The more sophisticated (ETG) electronic paint thickness gauges digital type gauges are able to read film thickness on both ferrous and non-ferrous metal panel. Digital ETG gauges may have an accuracy range of 1 percent and include thickness standards for recalibration. The following paint thickness gauges are available. Call 1-800-GM-TOOLS for information:

### Paint Thickness Gauges

- 147-5437-ETG Standard model
- 147-5437-ETG-P Standard model with print option
- 147-5437-N-ETG-N Non-ferrous model for aluminum panels
- 147-5437-NP-ETG-NP Non-ferrous model with print option
- 147-54437-SD-ETG Steel and aluminum gauge





## Clearcoat Thickness

The clearcoat on the vehicle is typically 0.059–0.078 mm (1.5–2 mils [0.0015–0.0020 in]) thick. The clearcoat contains ultraviolet screeners. Removing more than 0.5 mils (0.019 in) of the clearcoat may result in early paint failure.



## Rail Dust Damage Repair

**Warning:** Refer to [Eye Protection Warning](#) .

**Note:** If rail dust has penetrated into the basecoat, the panel requires refinishing. Ensure all the rail dust has been removed prior to refinishing or the rust spots will return.

Rail dust damage comes from the tiny iron particles produced from the friction between the train wheels and the track. It can also be deposited on vehicles if stored near any operation producing iron dust (i.e., steel ore yards). This dust can either lay on top of, or embed into the paint surface. It is usually diagnosed as bumps in the paint surface or rust colored spots in the paint.

1. Move the vehicle to a cool shaded area and ensure the vehicle surfaces are cool during the removal process.
2. Thoroughly wash the repair area with a GM approved Liquid Wash and Wax kit
3. Wipe the area dry.
4. Clean the affected area with silicone, wax and grease remover.
5. Perform the removal process according to the manufacturer's directions of the type of repair material used (Gel Type Oxalic Acid or Clay Type Non-Acid Based). If, upon inspection, some particles are still present, the process may be repeated. If the damage has been repaired, complete the repair to the entire panel.
6. Polish the entire panel after the removal process. If small pits remain in the clearcoat after all of the damage has been repaired, refer to [Clearcoat Repair without Repainting](#) .



## General Plastic Repair

**Warning:** In order to reduce the risk of personal injury when exposed to toxic fumes while grinding, cutting, or applying repair material on any type of sheet molded compound or RIM rigid plastic, observe the following guidelines:

- Work in a properly ventilated area
- Apply protective cream to any exposed skin
- Remove any mixture that comes into contact with skin
- Wash skin with cold water to remove glass and resin dust
- Use a sander with a vacuum attachment
- Follow the repair material manufacturer's instructions

Also, always wear the following:

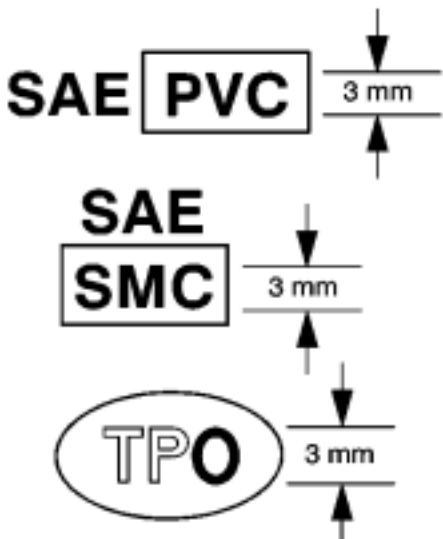
- An approved respirator, or air supplied respirator
- Eye protection
- Rubber gloves
- Earplugs
- Protective clothing

The following procedures should be followed when repairing all types of thermoset plastic:

- Follow the manufacturer's application and curing recommendations.
- Do not intermix systems. Use the supplies and the repair materials from the same manufacturer.
- Clean the inner and outer surfaces of the repair area with a soap impregnated scouring pad in order to remove any dirt or mold release agent.
- Clean the area with a wax and grease remover, using only enough of the remover to dampen a cloth. Allow the panel to dry thoroughly.
- Remove the surface finish from the area to be repaired. Adhesives are designed to adhere to the plastic substrate, not the finish.
- Prime a metal surface before applying the repair material.
- Inspect the rear side of the work area before making repairs in order to avoid possible damage to wires, motors, etc.



## How to Identify Plastic Parts



Plastic parts can be identified by the SAE code, which is usually found on the rear of the part, and/or by the characteristics of the plastic. Knowing the type of plastic aids in selecting the proper repair materials and in selecting the proper repair procedure.

Look for the SAE code stamped into the part.

### Code Found

Match the code to those in the plastic identification chart to determine whether the plastic is thermoplastic or thermoset plastic, and whether the plastic is rigid or flexible. Refer to [Plastic Identification and Refinishing Systems](#) .

### No Code Found

**Warning:** Do NOT use a plastic burn test to distinguish the type of plastic. The burn test produces vapors which are harmful.

Perform one or both of the following tests to determine if the part is thermoplastic polyolefin or thermoset non-polyolefin.

### Float Test

1. Cut a shaving of plastic from the back of the part.  
The shaving should be free of mold release agents and paint.
2. Place the shaving in a container of water.
  - Thermoplastic polyolefin floats.
  - Thermoset non-polyolefin sinks.

### Abrasion Test

- Sand a spot near the damaged area with Grade36 Roloc Disc.
- Thermoplastic polyolefin material melts or frays when sanded.
- Thermoset non-polyolefin material sands cleanly.

Thermoplastic and thermoset plastics can be either rigid or flexible. Thermoplastic plastic parts are best repaired with a hot iron plastic material-feed welder, but are usually replaced. Thermoset plastic can be repaired with epoxy or other more rigid 2 package repair material.

For general repair instructions, refer to [General Plastic Repair](#) .

Plastic Identification and Refinishing Systems

Identifying Symbol– Old Symbol in ( ) s	Chemical Composition or Plastic Family Name	Typical Area(s) Where Part is Used	Examples of Common / Trade Names	Type of Plastic
ABS	Acrylonitrile / Butadiene-Styrene	Armrest Support, Console, IPC, Steering Column Bracket / Jacket, Trim Molding	ABS, Absafil, Magnum, Cycolac, Dyel, Kralastic, Lustran	Thermoplastic
ABS + PC	Acrylonitrile / Butadiene-Styrene + Polycarbonate	Instrument Panel, IPC	Bayblend, Cycoloy, KHA, Pulse	Rigid
ABS / PVC	ABS/Vinyl (Soft)	Head Rest Cover, Instrument Panel Pad, Trim Molding / Panel	ABS Vinyl	Flexible, Vinyl
EPDM	Ethylene Propylene Diene Monomer	Body Panel, Bumper Impact Strip	EPDM, Nordel	Rigid
EVA (EVAC)	Ethylene / Vinyl Acetate	Head Rest Cover, Misc Soft Trim	Elvax, Microthane	Flexible
PA	Polyamide	Headlamp Bezels, Quarter Panel Extensions, Exterior Finish Trim Panels	Nylon, Capron, Zytel, Rilsan, Minion, Vydye, Welland	Rigid
PA, PAG, PAGG	Polyamide	Exterior Finish Trim Panel, Headlamp Bezel, Quarter Panel Extension	Capron, Minlon, Nylon, Rilsan, Vydye, Wellamid, Zytel	Rigid, Thermoset
PA + PPE	Polymide + Polyphenylene Ether	Exterior Trim, Fender	GTX	Rigid, Thermoset
PBT + TEEE (PBTP + EEBC)	Polybutylene, Terephthalate + Ether, Ester Block Compound	Fascia, Rocker Panel Molding	Bexloy M	Rigid
PC	Polycarbonate	Interior Rigid / Hard Trim Panel, Valance Panel	Calibre, Lexan, Merlon, Makrolon	Rigid, Thermoset
PC + PETP	Polycarbonate + Polybutylene, Terephthalate	Bumper Fascia	Macroblend, Valox, Xenoy	Flexible, Thermoset
PE	Polyethylene	Fuel Tank Shield, Inner Fender Panel, Interior Trim Panel, Seat Belt Cover,	Alathon, Dylan, Foriflex, Hi-fax, Hosalen, Marlex,	Rigid, Thermoplastic

PF	Phenol Formaldehyde	Ashtray	Amberol, Bakelite, Durez, Genal, Phenolic, Plyophen, Resinox	Rigid, Thermoset
PP	Polypropylene	Bumper Fascia, Cowl Panel, Deflector Panel, Door Panel, Inner Fender, Interior Molding, Kick Panel, Load Floor, Radiator Shroud, Wheel Cover	Azdel, Daplen, Escorene, Marlex, Novolen, Oleflo, Profax, Tenite	Flexible, Thermoplastic
PPE (PPO)	Polyphenylene Ether	Bezels, Chromed Plastic, Headlamp Door, Ornaments	Noryl, Oleflo, Prevex	Rigid, Thermoset
PS	Polystyrene	Dash Panel, Door Panel	Durathon, Dylan, Lustrex, Polystyrol, Styron	Flexible, Soft
PUR	Polyurethane, Thermoset (Unsaturated)	Bumper Fascia, Filler Panel, Front/Rear Body Panel, Pickup Box	Bayflex, Castethane, RIM, RRIM, SRIM	Thermoset
PVC	Polyvinyl Chloride (Vinyl)	Interior Soft Trim, I/P Skins, Roof Cover	Geon, Pliovic, Unichem, Vinoflex, Vinyl, Vinylite	Flexible, Vinyl
SAN (SA)	Styrene Acrylonitrile	Center Console, Glove Box Door, Interior Trim Panel	Foracryl, Lustran, Tyril	Rigid
TEO (EP, EPM, TPO)	Ethylene / Propylene (Rubber)	Air Dam, Bumper Fascia, Valance Panel	EPI, EPII, TPO, TPR (Thermoplastic Rubber)	Flexible, Thermoplastic
TPO	Thermal Plastic Oletin	Bumper Covers	TPO	Flexible Thermoplastic
TPU (TPUR)	Polyurethane, Polyolefin	Bumper Fascia, Gravel Deflector, Soft Filler Panel, Window Molding	Estane, Pellethane, Roylar, Toxin	Flexible, Thermoplastic
UP	Polyester / Thermoset	Air Scoop, Air Spoiler, Fascia Extension, Hood, Instrument Housing, Rear Compartment Lid, Roof, Ventilation Grid	Fiberglass, Premi-glass, Selectron, SMC, Vibrinmat	Rigid, Thermoset
For symbols not listed in this table, contact the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001.				





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0-4

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Fixed and Movable Windows

BODY SYSTEMS

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Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Side Door Window Guide Nuts	11 N·m	97 lb in
Front Side Door Window Rear Guide Bolts	11 N·m	97 lb in
Front Side Door Window Regulator Power/ Manual Screws	11 N·m	97 lb in
Front Side Door Window Regulator Motor Bolts	5 N·m	44 lb in
Rear Side Door Window Guide Nuts	11 N·m	96 lb in
Front Side Door Window Regulator Power/ Manual Screws	11 N·m	97 lb in
Rear Side Door Window Rear Guide Bolts	11 N·m	97 lb in
Rear Side Door Window Regulator Motor Bolts	5 N·m	44 lb in
Rear Side Door Window Weatherstrip Lower Screw	9 N·m	80 lb in
Rear Side Door Window Weatherstrip Upper Screw	3 N·m	27 lb in

## Windshield Replacement

### Special Tools

- *BO-24402-A* Glass Sealant Remover (Cold Knife)
- *BO-39032* Stationary Glass Removal Tool
- Use an adhesive that is approved by GM

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

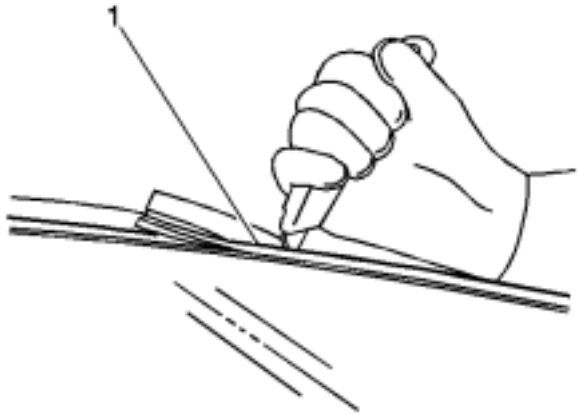
### Removal Procedure

1. Open the hood.
2. Remove the windshield wiper arms. Refer to [Windshield Wiper Arm Replacement](#) .
3. Remove the air inlet grille. Refer to [Air Inlet Grille Panel Replacement](#) .
4. Remove the inside rearview mirror. Refer to [Inside Rearview Mirror Replacement](#) .
5. Remove the interior windshield garnish moldings. Refer to [Windshield Side Garnish Molding Replacement](#) .

**Warning:** If broken glass falls into the defroster outlets, it can be blown into the passenger compartment and cause personal injury.

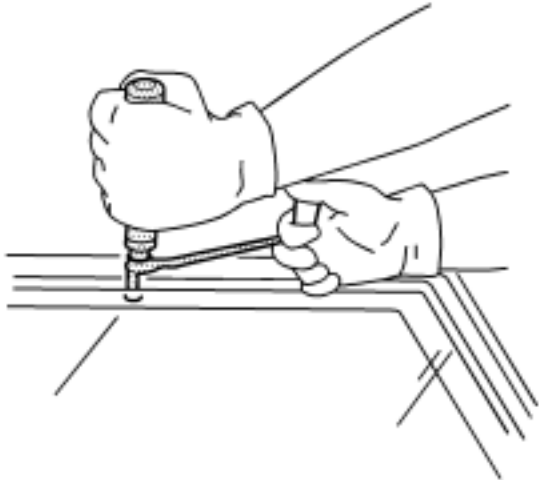
6. Cover to protect the following parts from broken glass:
  - Upper dash pad
  - Defroster outlets and A/C outlets
  - Seats and carpeting

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .



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

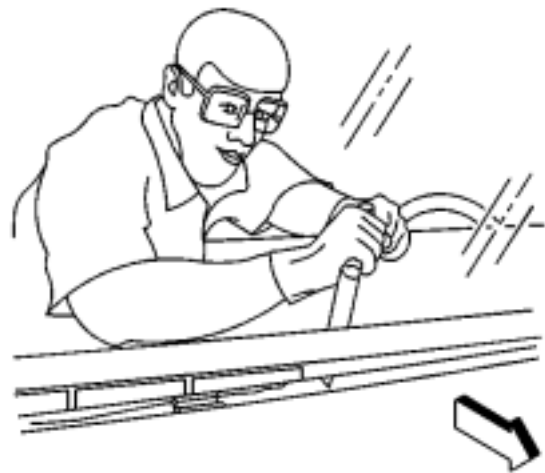
7. Using the appropriate tool, carefully cut the windshield reveal molding (1) in order to access the auto-adhesive bead. Refer to [Windshield Upper Reveal Molding Replacement](#) .



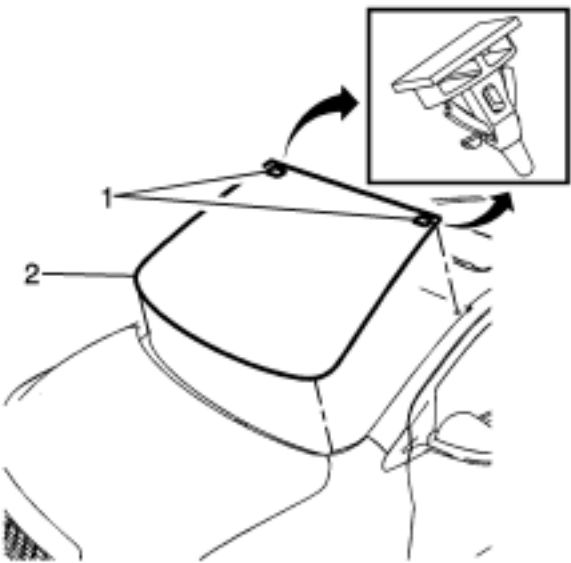
**Note:** Keep the cutting edge of the appropriate tool against the window. There are window locating pins, one in each upper corner of the window. Use care Not to remove or cut them off when removing the window. If the window locator pins are cut, it will be necessary to tape the window in place.

8. This will allow the auto-adhesive to be separated from the window.

- Leave a base of auto-adhesive on the pinchweld flange.
- The only suitable lubrication is clean water.
- Use *BO-24402-A* Glass Sealant Remover (Cold Knife) .
- *BO-39032* Stationary Glass Removal Tool , or equivalent in order to remove the window.



9. Use the appropriate tool to remove the bottom of the window from the auto-adhesive. Keep the cutting edge of the tool against the window. Do this from inside the vehicle.

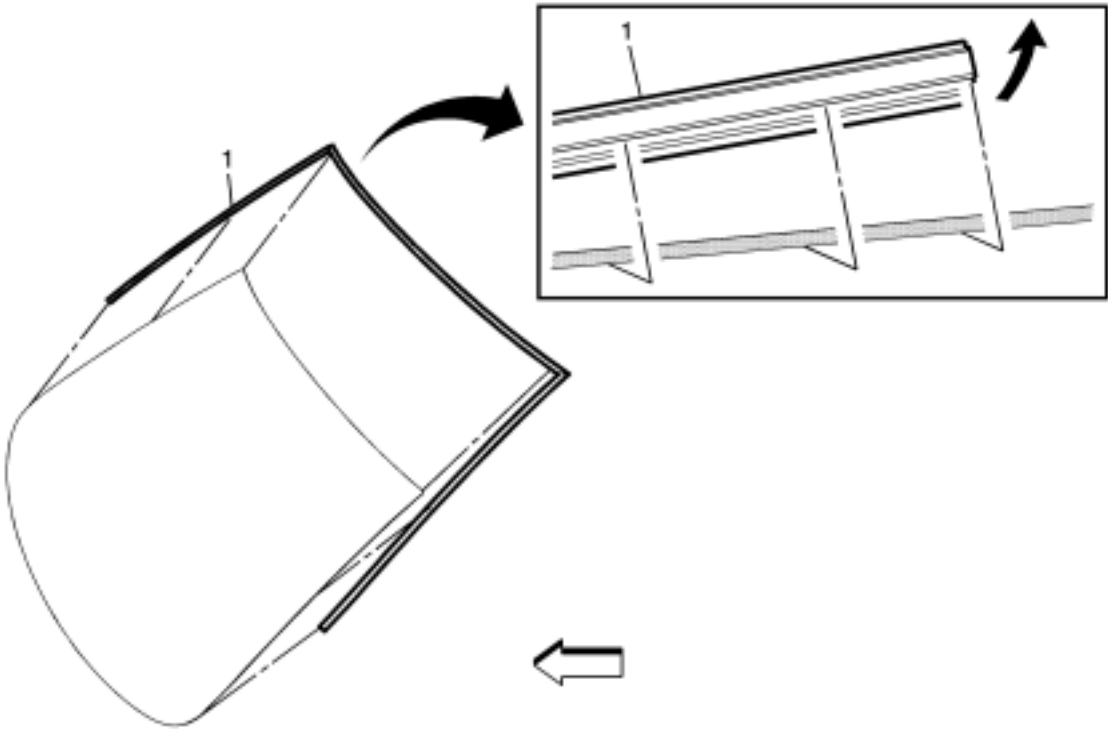


10. With an assistant, remove the window (2) from the vehicle. Check that the retainers (1) are still attached to the window before installing.

Installation Procedure

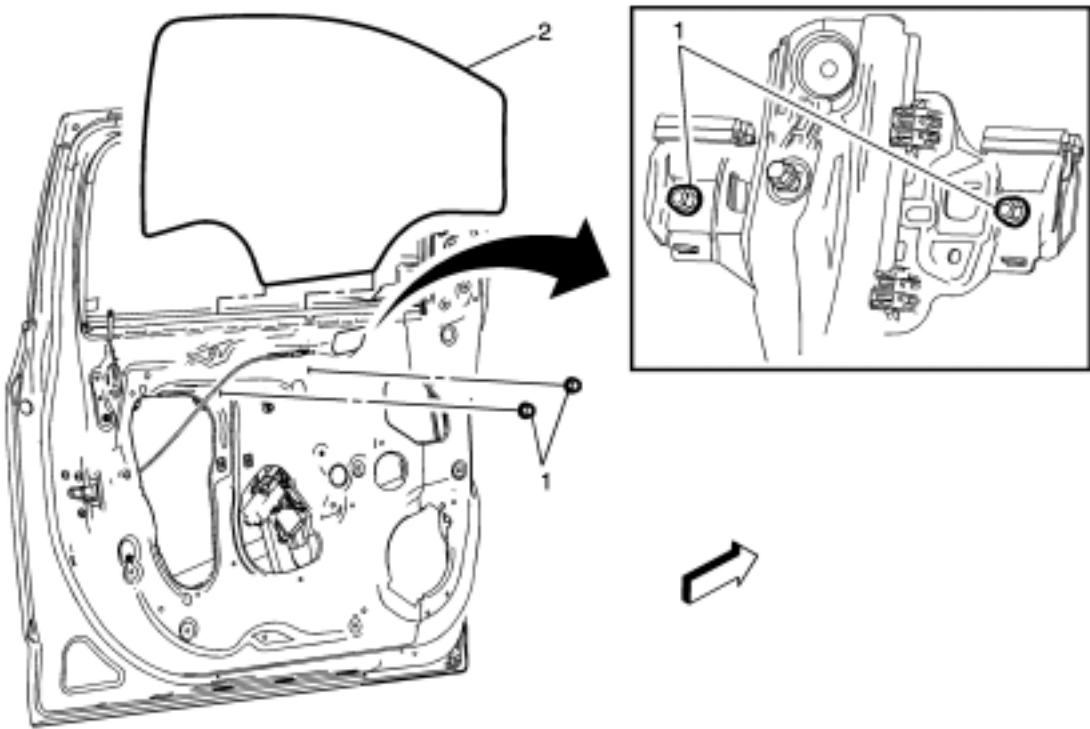
1. Install the windshield into the opening. Refer to [Adhesive Installation of Windshields](#) .
2. Install the rearview mirror. Refer to [Inside Rearview Mirror Replacement](#) .
3. Install the interior windshield garnish moldings. Refer to [Windshield Side Garnish Molding Replacement](#) .
4. Install the air inlet grille. Refer to [Air Inlet Grille Panel Replacement](#) .
5. Install the windshield wipers arms. Refer to [Windshield Wiper Arm Replacement](#) .
6. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.
7. Close the hood.

Windshield Upper Reveal Molding Replacement



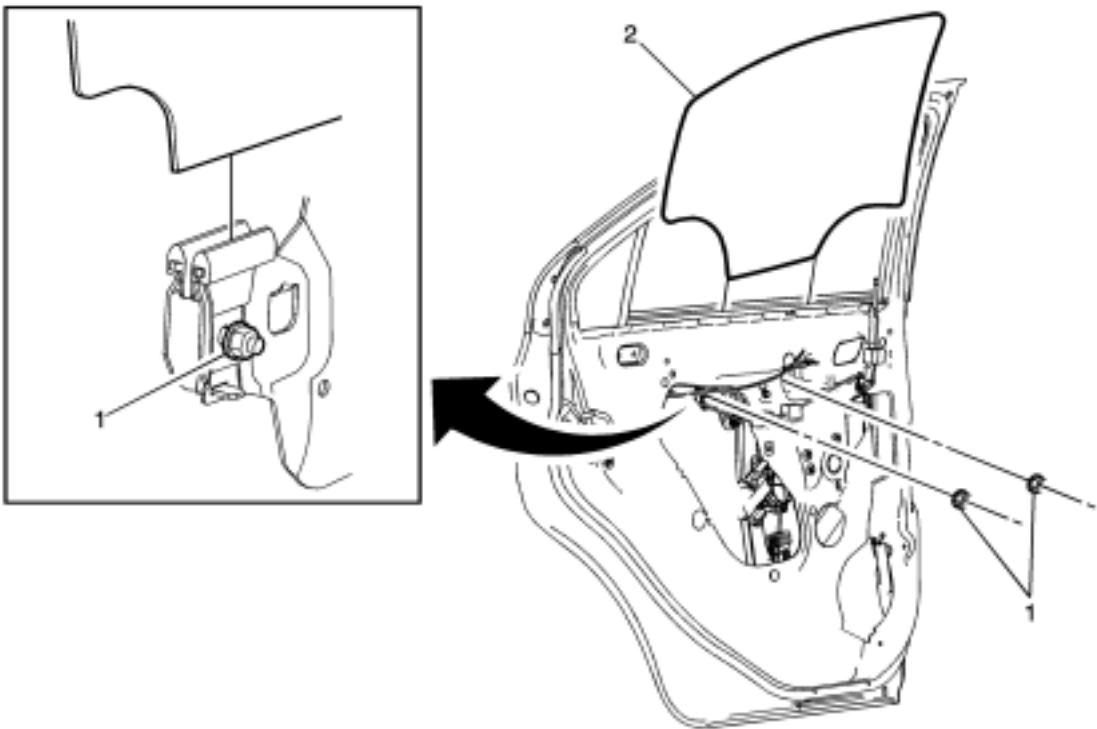
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the windshield to replace the reveal molding. Refer to <a href="#">Windshield Replacement</a> .</p>	
1	<p>Windshield Reveal Molding</p> <p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Mark the window at both ends before remove the reveal molding for installing.</li><li>2. Place the window on a clean and dry surface.</li><li>3. Use a suitable plastic tool, use care when releasing the reveal molding not to pry on the window.</li><li>4. Clean around the edges and surface of the window and molding with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint free cloth.</li></ol>

Front Side Door Window Replacement



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Preliminary Procedures</b></p> <p>1. Remove the front side door trim panel. Refer to <a href="#">Front Side Door Trim Replacement</a> .</p> <p>2. Remove the front side door rear guide. Refer to <a href="#">Front Side Door Window Rear Guide Replacement</a></p> <p>3. Remove the front side door window outer sealing strip. Refer to <a href="#">Front Side Door Window Outer Sealing Strip Replacement</a> .</p>	
1	<p>Front Side Door Window Regulator Guide Nuts(Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Use masking tape, tape off the outer door frame and applique to prevent scratching.</p> <p>2. Remove the front side door water deflector.</p> <p>3. Loosen nuts so that the window can be removed from the guides.</p> <p>4. In order to remove the window out of the frame, carefully grasp and tilt the window as you guide the window up and forward.</p> <p><b>Tighten</b> 11 N·m (97 lbin)</p>
2	<p>Front Side Door Window</p> <p><b>Procedure</b></p> <p>1. Lower the window to align the guide nuts with the access holes in the inner door panel.</p> <p>2. Do not operate the regulator motor without supporting the window. Ensure that the window remains in the guide when operating the regulator motor.</p> <p>3. Carefully move the regulator upward for short slow intervals, while ensuring that the window remains in the guide.</p> <p>4. Inspect the window for proper operation before installing the trim panel.</p>

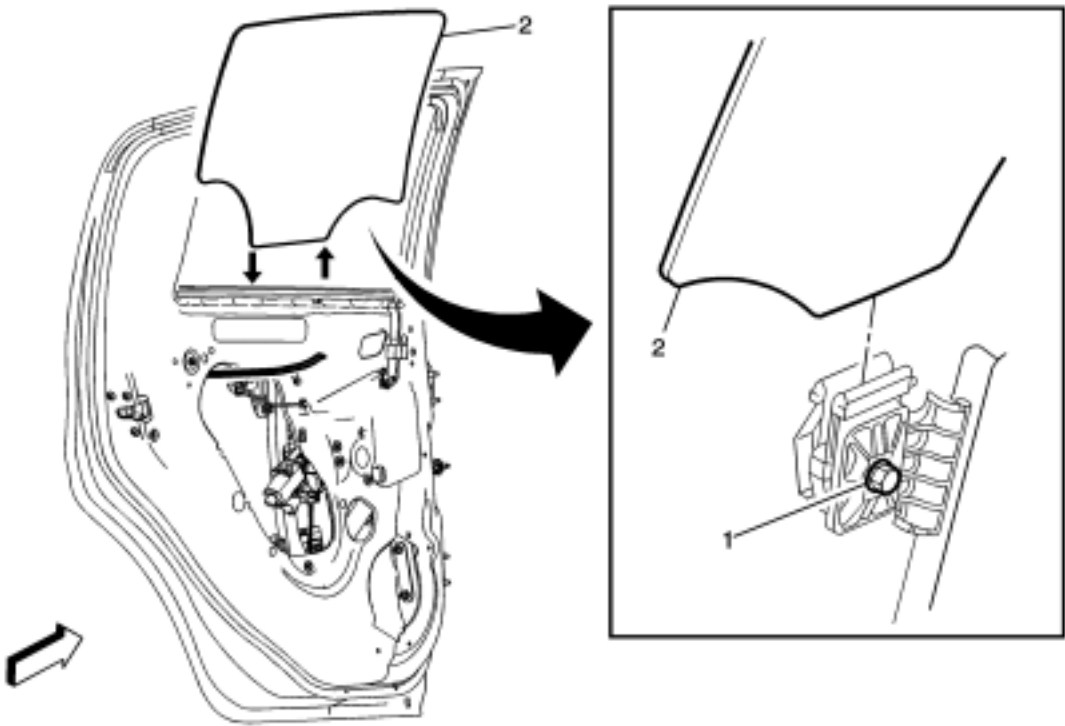
Rear Side Door Window Replacement (Sedan)



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</li><li>2. Remove the rear side door rear guide. Refer to <a href="#">Rear Side Door Window Rear Guide Replacement</a> .</li><li>3. Remove the rear side window outer sealing strip. Refer to <a href="#">Rear Side Door Window Outer Sealing Strip Replacement</a> .</li></ol>	
1	<p>Rear Side Door Window Guide Nut (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Use masking tape, tape off the outer door frame and applique to prevent scratching.</li><li>2. Remove the rear side door water deflector.</li><li>3. Loosen nuts on the guide so that the window can be removed.</li><li>4. In order to remove the window out of the frame, carefully grasp and tilt the window as you guide the window up and forward.</li></ol> <p><b>Tighten</b> 11 N·m (97 lbin)</p>
2	<p>Rear Side Door Window</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Align the window guide with the access holes in the inner door panel.</li><li>2. Install the window to the guide.</li><li>3. Do not operate the regulator motor without supporting the window. Ensure that the window remains in the guide when operating the regulator motor.</li><li>4. Carefully move the regulator upward for short slow intervals, while ensuring that the window remains in the guide. Tighten the nuts to the window guide.</li><li>5. Inspect the window for proper operation before installing the trim panel.</li></ol>

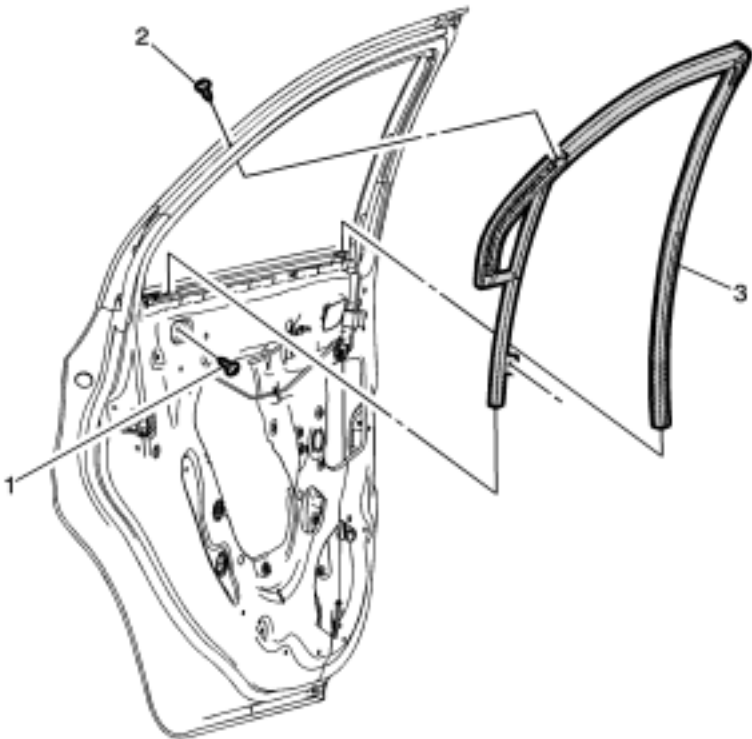


Rear Side Door Window Replacement (Hatchback)



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</li><li>2. Remove the rear side door rear guide. Refer to <a href="#">Rear Side Door Window Rear Guide Replacement</a> .</li><li>3. Remove the rear side window outer sealing strip. Refer to <a href="#">Rear Side Door Window Outer Sealing Strip Replacement</a> .</li></ol>	
1	<p>Rear Side Door Window Guide Nut (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Use masking tape, tape off the outer door frame and applique to prevent scratching.</li><li>2. Remove the rear side door water deflector.</li><li>3. Loosen nuts on the guide so that the window can be removed.</li><li>4. In order to remove the window out of the frame, carefully grasp and tilt the window as you guide the window up and forward.</li></ol> <p><b>Tighten</b> 11 N·m (97 lbin)</p>
2	<p>Rear Side Door Window</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Align the window guide with the access holes in the inner door panel.</li><li>2. Install the window to the guide.</li><li>3. Do not operate the regulator motor without supporting the window. Ensure that the window remains in the guide when operating the regulator motor.</li><li>4. Carefully move the regulator upward for short slow intervals, while ensuring that the window remains in the guide. Tighten the nuts to the window guide.</li><li>5. Inspect the window for proper operation before installing the trim panel.</li></ol>

Rear Side Door Stationary Window Replacement



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Preliminary Procedures</b></p> <p>Remove the rear side door window. Refer to <a href="#">Rear Side Door Window Replacement</a> .</p>	
1	<p>Rear Side Door Window Weatherstrip Lower Bolt</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p> <p><b>Tip</b> The weatherstrip and window is serviced as one assembly.</p>
2	<p>Rear Side Door Window Weatherstrip Upper Screw</p> <p><b>Procedures</b></p> <p>1. Pull the weatherstrip out of the upper retainer to expose the screw. 2. Remove the weatherstrip from the front and rear lower guides. 3. Grasp both upper corners, pull forward releasing assembly from the door frame.</p> <p><b>Tighten</b> 3 N·m (27 lbin)</p>
3	<p>Rear Side Door Window Weatherstrip</p> <p><b>Procedures</b></p> <p>1. Insert the weatherstrip downward in the guide until fully seated. 2. Carefully move the regulator upward for short slow intervals, while ensuring that the window remains in the guides. 3. Inspect the door window for proper operation before installing the door trim panel.</p>

## Rear Window Replacement

### Special Tools

- *BO-24402-A* Glass Sealant Remover (Cold Knife)
- *BO-39032* Stationary Glass Removal Tool
- Use an adhesive that is approved by GM

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

### Removal Procedure

**Warning:** If a window is cracked but still intact, crisscross the window with masking tape in order to reduce the risk of damage or personal injury.

**Note:** Before cutting out a stationary window, apply a double layer of masking tape around the perimeter of the painted surfaces and inner trim.

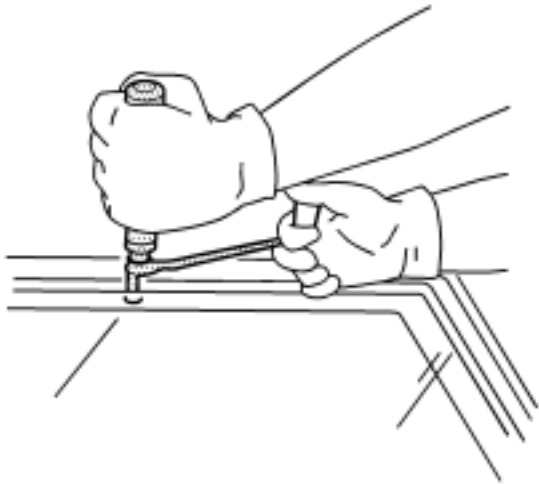
1. Open the rear compartment lid.



2. Disconnect the rear window defogger electrical connectors.
3. Disconnect the OnStar® antenna, if equipped.
4. Disconnect the rear window radio antenna connector.

**Warning:** If broken glass falls into the defroster outlets, it can be blown into the passenger compartment and cause personal injury.

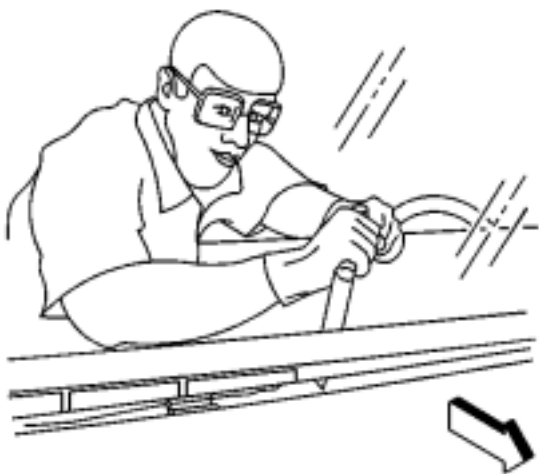
5. Cover to protect the following parts from broken glass:
  - Upper dash pad
  - Defroster outlets and A/C outlets
  - Seats and carpeting



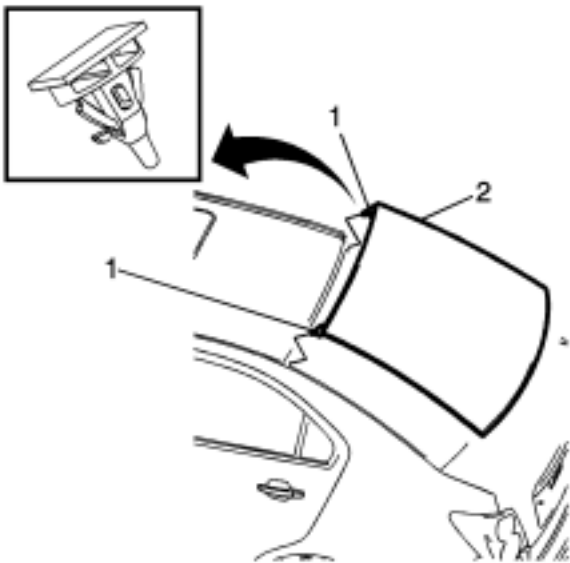
**Note:** Keep the cutting edge of the appropriate tool against the window. There are window locating pins, one in each upper corner of the window. Use care Not to remove or cut them off when removing the window. If the window locator pins are cut, it will be necessary to tape the window in place.

6. This will allow the auto-adhesive to be separated from the window.
7. Remove the rear window reveal molding. Refer to [Rear Window Reveal Molding Replacement](#) .

- Leave a base of urethane on the pinchweld flange.
- The only suitable lubrication is clear water.
- The only suitable lubrication is clear water.
- *BO-24402-A* Glass Sealant Remover (Cold Knife) .
- *BO-39032* Stationary Glass Removal Tool .



8. Use the appropriate tool to remove the bottom of the window from the auto-adhesive. Keep the cutting edge of the tool against the window. Do this from inside the vehicle.

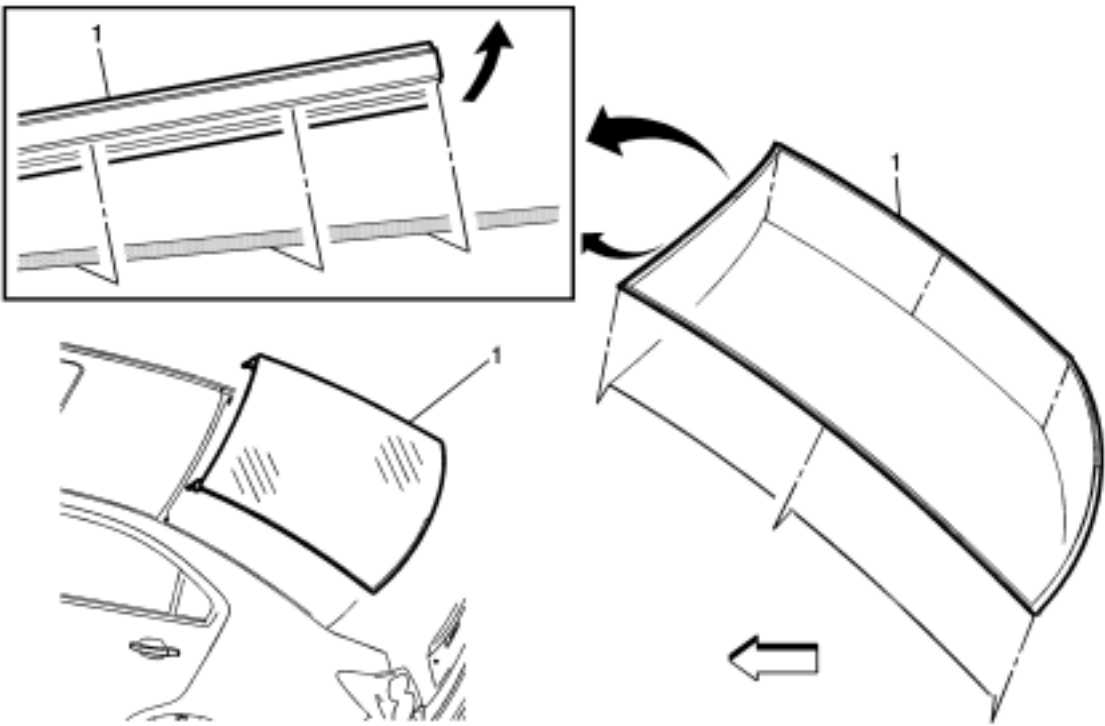


9. With an assistant, remove the window (2) from the vehicle. Check that the retainers (1) are still attached to the window before installing.

**Installation Procedure**

1. Install the rear window into the opening. Refer to [Adhesive Installation of Rear Windows](#) .
2. Connect the rear window defogger electrical connectors.
3. Install the rear window radio antenna connector.
4. Connect the OnStar® antenna, if equipped.  
Check the radio and OnStar® system to verify reception.
5. Close the rear compartment lid.
6. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.

Rear Window Reveal Molding Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the rear window to replace the reveal molding. Refer to <a href="#">Rear Window Replacement</a> .</p>	
1	<p>Rear Window Reveal Molding</p> <p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Mark the window at both ends before remove the reveal molding for installing.</li><li>2. Place the window on a clean and dry surface.</li><li>3. Use a suitable plastic tool, use care when releasing the reveal molding not to pry on the window.</li><li>4. Clean around the edges and surface of the window and molding with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint free cloth.</li></ol>

## Liftgate Window Replacement

### Special Tools

- *BO-24402-A* Glass Sealant Remover (Cold Knife)
- *BO-39032* Stationary Glass Removal Tool
- Use an adhesive that is approved by GM

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

### Removal Procedure

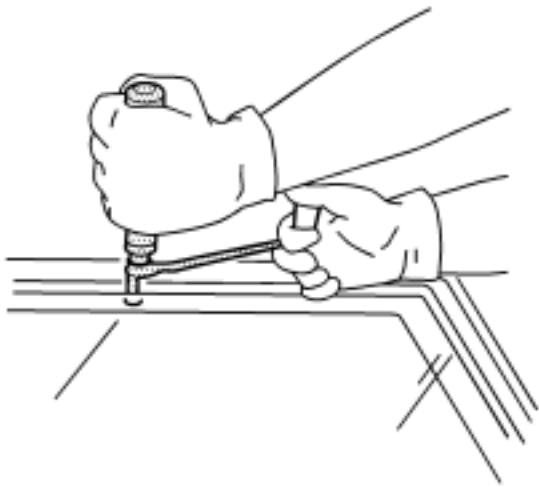
**Warning:** Refer to [Cracked Window Warning](#) .

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

1. Open the liftgate.
2. Remove the liftgate trim. Refer to [Liftgate Trim Finish Panel Replacement](#) .
3. Disconnect the electrical connectors from the liftgate window defogger bus bar.
4. Remove the rear window wiper arm. Refer to [Rear Window Wiper Arm Replacement](#) .
5. Remove the rear spoiler. Refer to [Rear End Spoiler Replacement](#) .

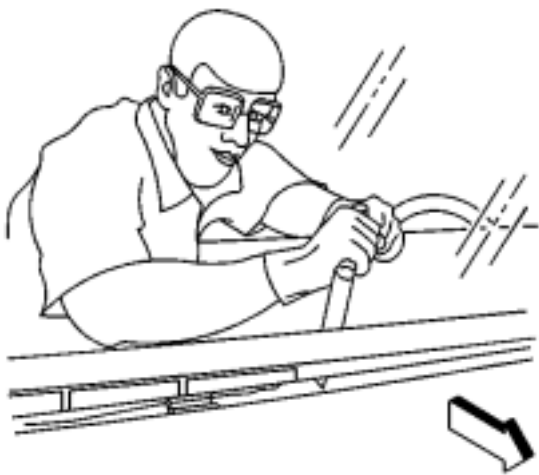
**Warning:** Refer to [Defroster Outlet Warning](#) .

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



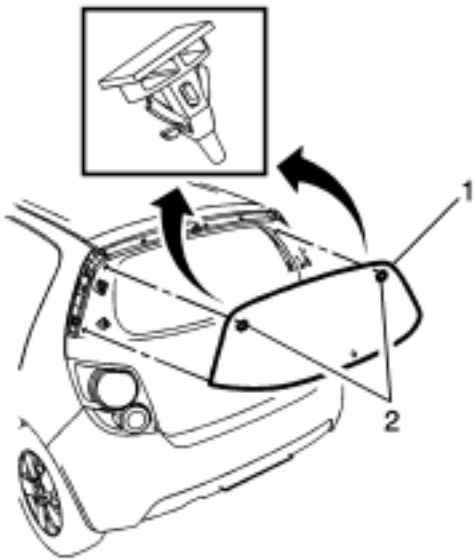
**Note:** Keep the cutting edge of the appropriate tool against the window. There are window locating pins, one in each upper corner of the window. Use care Not to remove or cut them off when removing the window. If the window locator pins are cut, it will be necessary to tape the window in place.

7. This will allow the auto-adhesive to be separated from the window.
  - Leave a base of auto-adhesive on the pinchweld flange.
  - The only suitable lubrication is clean water.
  - Use *BO-24402-A* Glass Sealant Remover (Cold Knife) .
  - *BO-39032* Stationary Glass Removal Tool , or equivalent in order to remove the window.



**Note:** Keep the cutting edge of appropriate tool the against the window. Do this from inside the vehicle.

8. Use the appropraite tool to remove the bottom of the window from the auto-adhesive. Keep the cutting edge of the tool against the window. Do this from inside the vehicle.



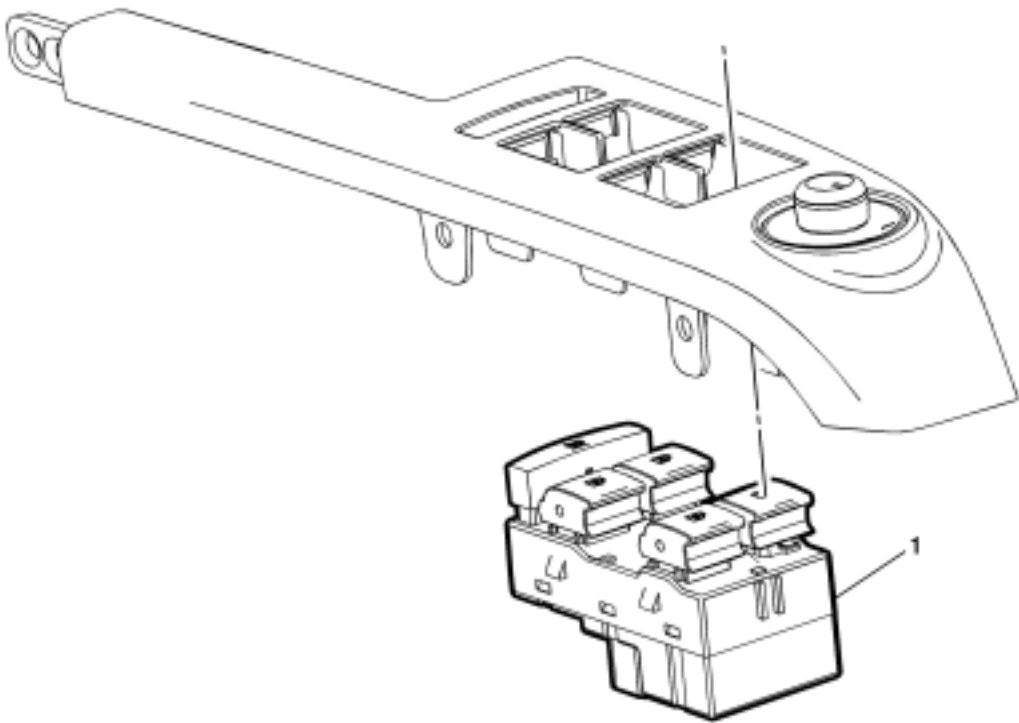
9. With an assistant, remove the window (1) from the vehicle.

**Installation Procedure**

1. Install the liftgate window into the opening. Refer to [Adhesive Installation of Liftgate Windows](#) .
2. Install the rear spoiler. Refer to [Rear End Spoiler Replacement](#) .
3. Install the rear window wiper arm. Refer to [Rear Window Wiper Arm Replacement](#) .
4. Connect the liftgate window defogger electrical connectors to the bus bar.
5. Install the liftgate trim. Refer to [Liftgate Trim Finish Panel Replacement](#) .
6. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.
7. Close the liftgate.



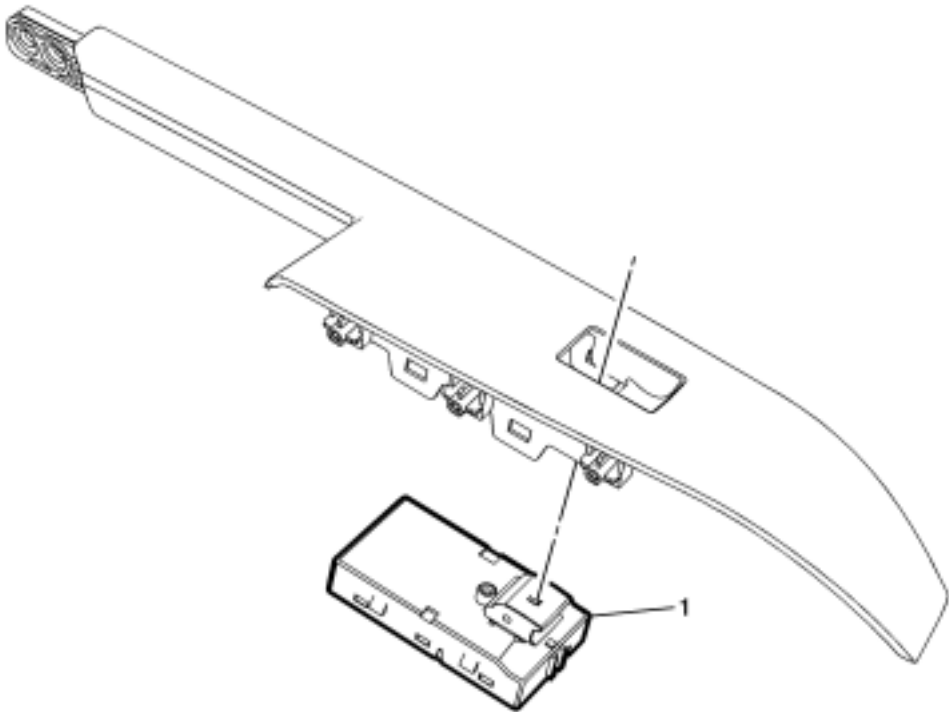
Front Side Door Window Switch Replacement ( Left Side)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door window switch bezel. Refer to <a href="#">Front Side Door Window Switch Bezel Replacement</a> .</p>	
1	<p>Front Side Door Window Switch Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connectors. 2. Refer to <a href="#">Control Module References</a> for programming and set up procedures.</p>

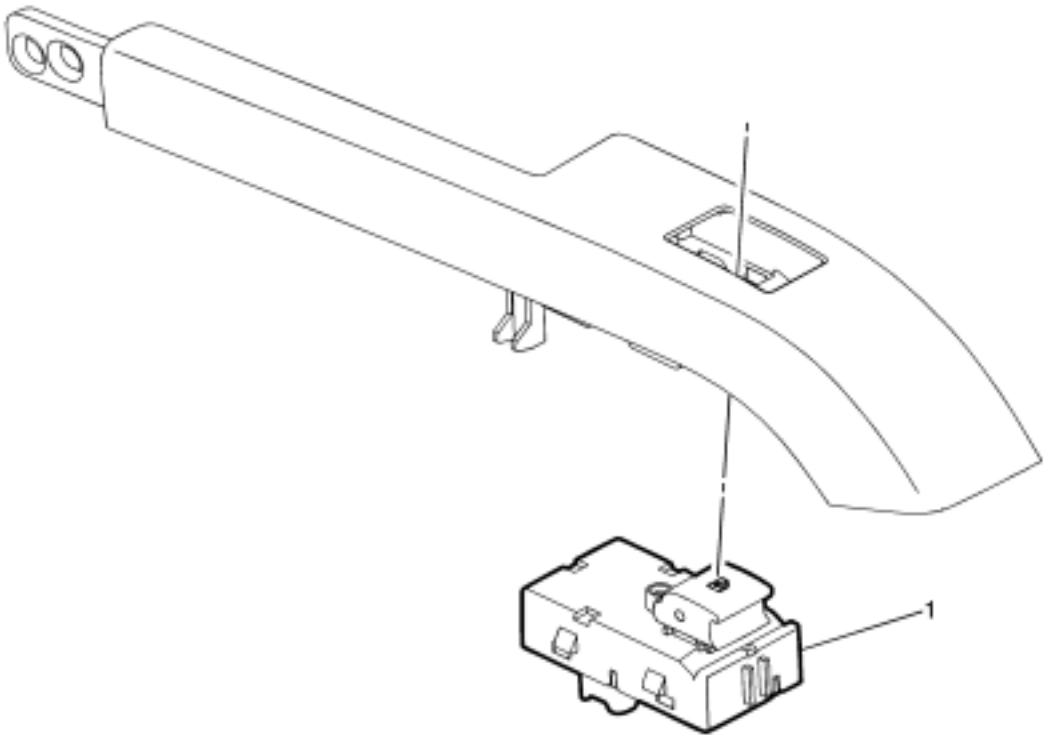


Front Side Door Window Switch Replacement (Right Side)



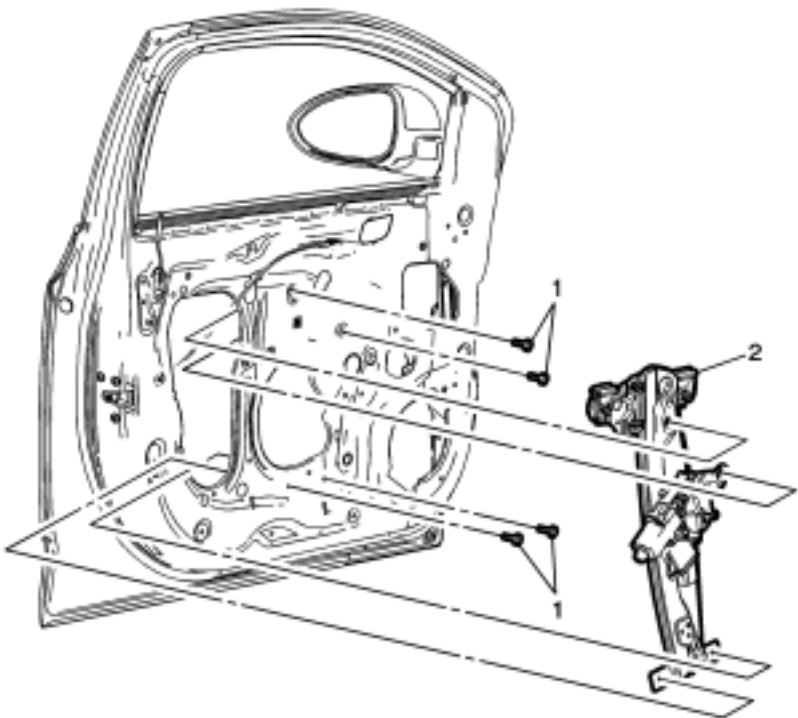
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door widow switch bezel. Refer to <a href="#">Front Side Door Window Switch Bezel Replacement</a> .</p>	
1	<p>Front Side Door Window Switch Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connectors. 2. Refer to <a href="#">Control Module References</a> for programming and set up procedures.</p>

Rear Side Door Window Switch Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear side door window switch bezel. Refer to <a href="#">Rear Side Door Window Switch Bezel Replacement</a> .</p>	
1	<p>Rear Side Door Window Switch Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connectors. 2. Refer to <a href="#">Control Module References</a> for programming and set up procedures.</p>

Front Side Door Window Regulator Replacement



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Remove the front side door window from the guide. Do Not remove the window from the vehicle, raise the window to the fully up position, tape in place. Refer to <a href="#">Front Side Door Window Replacement</a> .</p>	
1	<p>Front Side Door Window Regulator Screw (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the front side door water deflector. 2. Loosen the window guide nuts, Do Not remove the nuts from the guide. 3. Disconnect the electric connector from the regulator motor.</p> <p><b>Tighten</b> 11 N·m (97 lbin)</p>
2	<p>Front Side Door Window Regulator</p> <p><b>Procedure</b></p> <p>1. Transfer the front side door window regulator motor. Refer to <a href="#">Front Side Door Window Regulator Motor Replacement</a> . 2. Inspect the door window for proper operation before installing the door trim panel.</p>

## Window Motor Programming - Express Function

### Window Motor Normalized Procedure

A window motor that has not been normalized will no longer perform the express up and express down functions, this may occur during the following conditions:

- When a window motor has been disconnected
- When a door harness has been disconnected
- When the battery has been disconnected or replaced

**Note:** When DTC B32054B is set, the following warnings will be displayed on the driver information center: Open, then Close Driver Window These warnings will clear once the window has been "Normalized" and the DTC will clear.

To normalize the window motor, follow these steps:

**Note:** The doors must be completely closed prior to normalizing the windows, a door that is open or ajar may cause the power window to function abnormally or to become inoperative while performing the normalizing procedure. If this occurs, verify that the door is completely closed then repeat the normalizing procedure.

1. Ignition ON.
2. Starting with the window completely UP, press and hold the power window switch until the window is fully open and continue holding the switch down for approximately 5seconds after the window is completely open.
3. Pull the power window switch up until the window is fully closed and continue holding the switch up for approximately 5 seconds after the window is completely closed.

The window should now be normalized and the window should perform the express up and express down functions.

### Window Motor Relearn Procedure

A relearn procedure may need to be performed for any Local Interconnect Network (LIN) window motor for the following conditions:

- When the window glass is out of alignment
- When the window glass has been replaced
- When the door has been replaced
- When the window regulator has been replaced

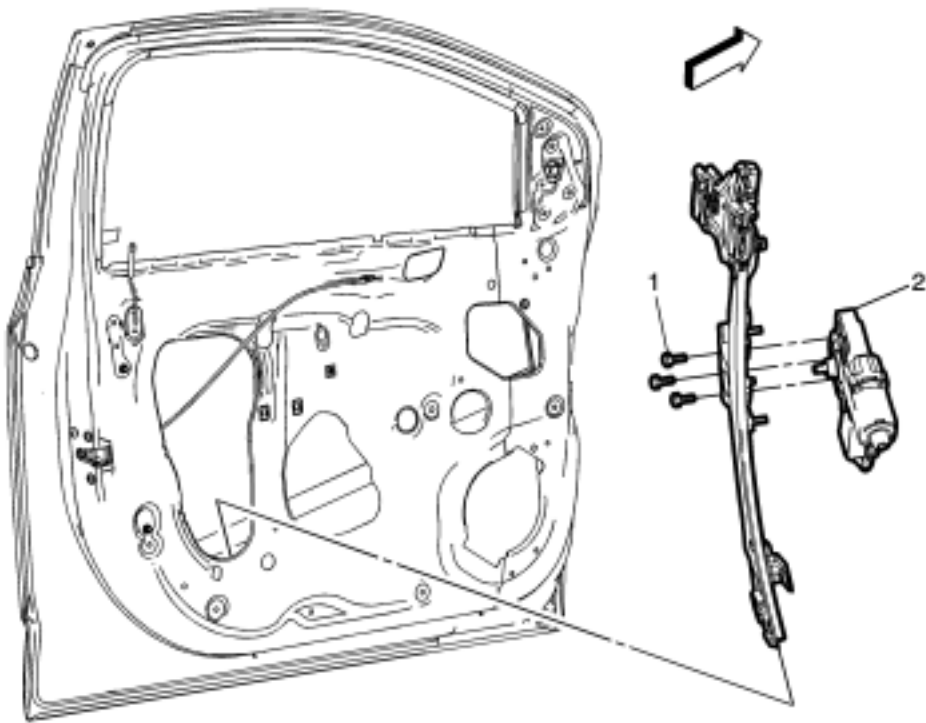
**Note:** Prior to performing the relearn procedure the vehicle must have all 4wheels properly inflated and mounted, the vehicle must be sitting on a level surface and all doors must be completely closed.

To relearn the window motor, follow these steps:

1. Ignition ON.
2. With a scan tool, select Module Diagnosis, Body Control Module, Configuration/Reset Functions and then select the appropriate Clear Window Learn Values for the window motor requiring the relearn procedure.
3. After the learn procedure, exit the scan tool learn procedure completely, the power window cannot be normalized and will not function until you exit the program.
4. Starting with the window completely UP, press and hold the power window switch until the window is fully open and continue holding the switch down for approximately 5seconds after the window is completely open.
5. Pull the power window switch up until the window is fully closed and continue holding the switch up for approximately 5 seconds after the window is completely closed.

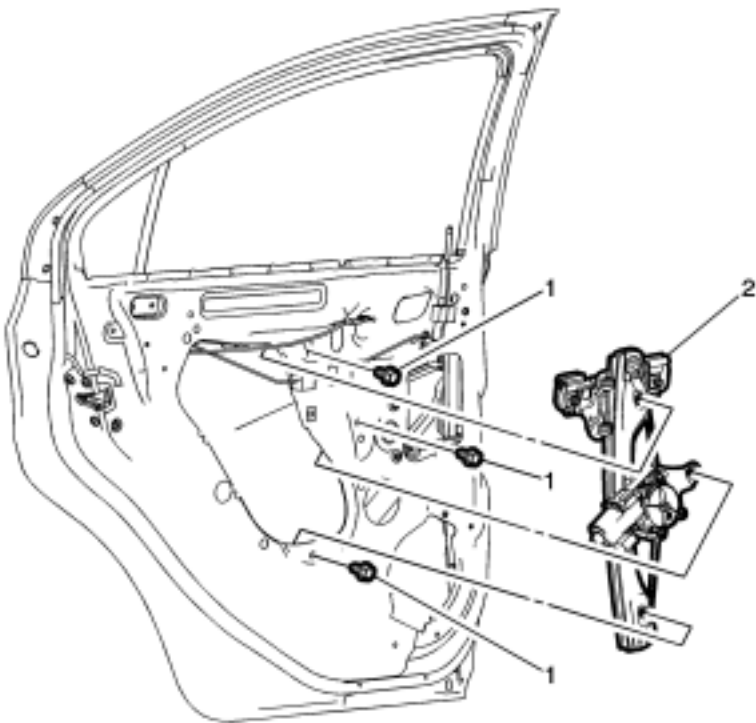
The window is now reprogrammed.

Front Side Door Window Regulator Motor Replacement



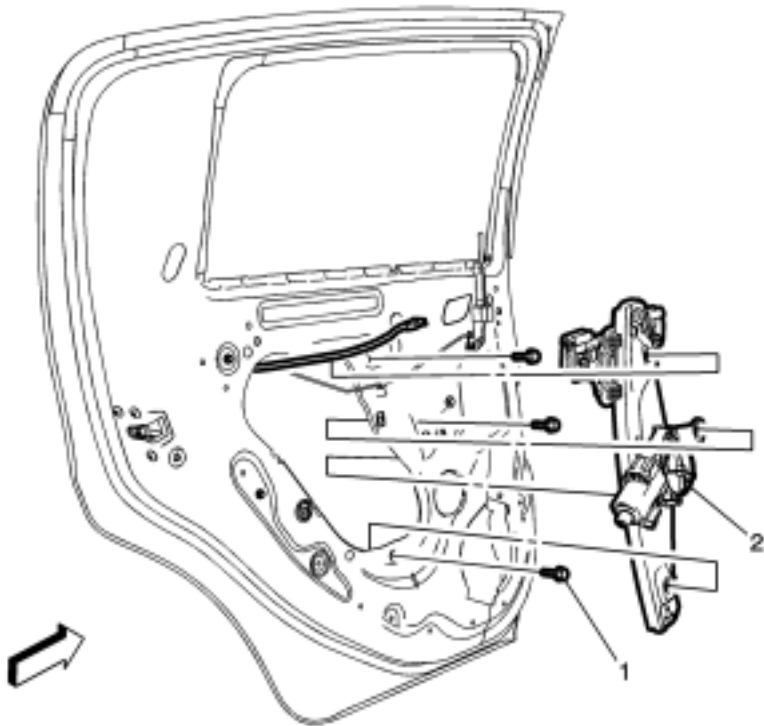
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Remove the front side door window regulator. <a href="#">Front Side Door Window Regulator Replacement</a> .</p>	
1	<p>Front Side Door Window Regulator Motor Screw (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the front side door water deflector. 2. Disconnect the electric connector from the regulator motor.</p> <p><b>Tighten</b> 5 N·m (44 lbin)</p>
2	<p>Front Side Door Window Regulator Motor</p> <p><b>Procedure</b></p> <p>Inspect the door window for proper operation before installing the door trim panel.</p>

Rear Side Door Window Regulator Replacement (Sedan)



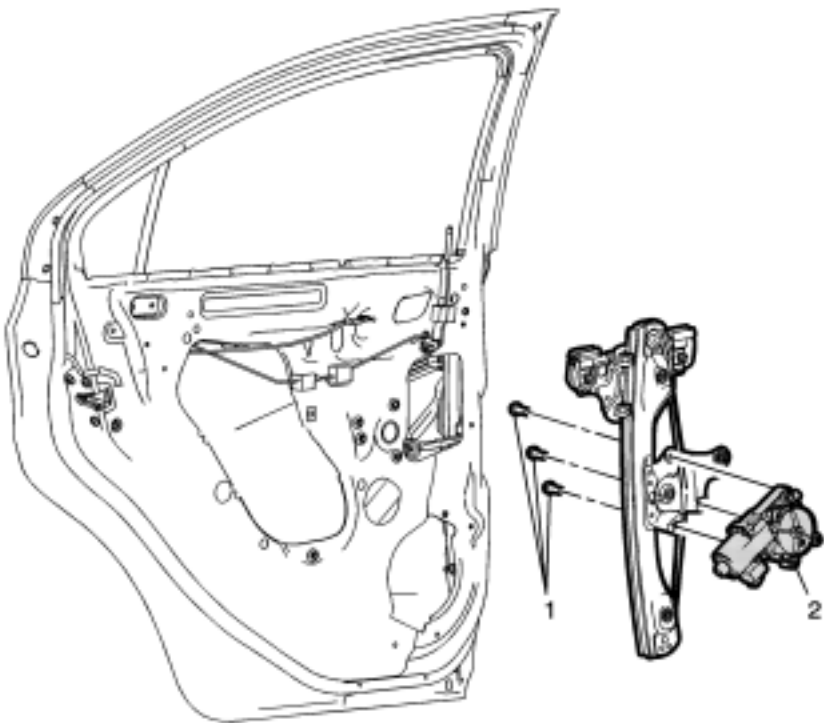
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Remove the front side door window from the guide. Do Not remove the window from the vehicle, raise the window to the fully up position, tape in place. Refer to <a href="#">Rear Side Door Window Replacement</a> .</p>	
1	<p>Rear Side Door Window Regulator Screw (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p>1. Remove the rear side door water deflector. 2. Loosen the window guide nuts, Do Not remove the nuts from the guide. 3. Disconnect the door electrical connector. 4. Remove the rear side door window from the guide. Refer to <a href="#">Rear Side Door Window Rear Guide Replacement</a> . Do Not remove the window from the vehicle, raise the window to the fully up position, tape in place.</p> <p><b>Tighten</b> 11 N·m (97 lbin)</p>
2	<p>Rear Side Door Window Regulator</p> <p><b>Procedure</b></p> <p>1. Transfer the rear side door window regulator motor. Refer to <a href="#">Rear Side Door Window Regulator Motor Replacement</a> . 2. Inspect the door window for proper operation before installing the door trim panel.</p>

Rear Side Door Window Regulator Replacement (Hatchback)



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Remove the front side door window from the guide. Do not remove the window from the vehicle, raise the window to the fully up position, tape in place. Refer to <a href="#">Rear Side Door Window Replacement</a> .</p>	
1	<p>Rear Side Door Window Regulator Screw (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the rear side door water deflector. 2. Loosen the window guide nuts. Do not remove the nuts from the guide. 3. Disconnect the door electrical connector. 4. Remove the rear side door window from the guide. Refer to <a href="#">Rear Side Door Window Rear Guide Replacement</a> . Do not remove the window from the vehicle, raise the window to the fully up position, tape in place.</p> <p><b>Tighten</b> 11 N·m (97 lbin)</p>
2	<p>Rear Side Door Window Regulator</p> <p><b>Procedure</b></p> <p>1. Transfer the rear side door window regulator motor. Refer to <a href="#">Rear Side Door Window Regulator Motor Replacement</a> . 2. Inspect the door window for proper operation before installing the door trim panel.</p>

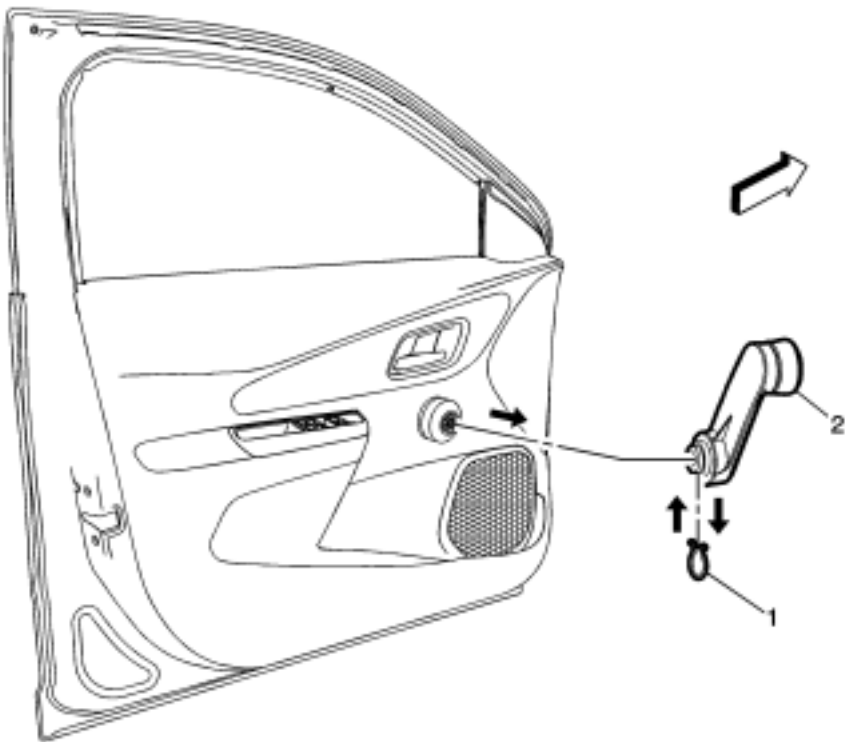
Rear Side Door Window Regulator Motor Replacement



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">Glass and Sheet Metal Handling Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>Remove the rear side door window regulator. Refer to <a href="#">Rear Side Door Window Regulator Replacement</a> .</p>	
1	<p>Rear Side Door Window Regulator Motor Screw (Qty: 3).</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the rear side door water deflector. 2. Remove the rear side door window from the guide. Do Not remove the window from the vehicle, raise the window to the fully up position, tape in place. 3. Disconnect the electrical connector from the window regulator motor.</p> <p><b>Tighten</b> 5 N·m (44 lbin)</p>
2	<p>Rear Side Door Window Regulator Motor</p> <p><b>Procedure</b></p> <p>Inspect the door window for proper operation before installing the door trim panel.</p>

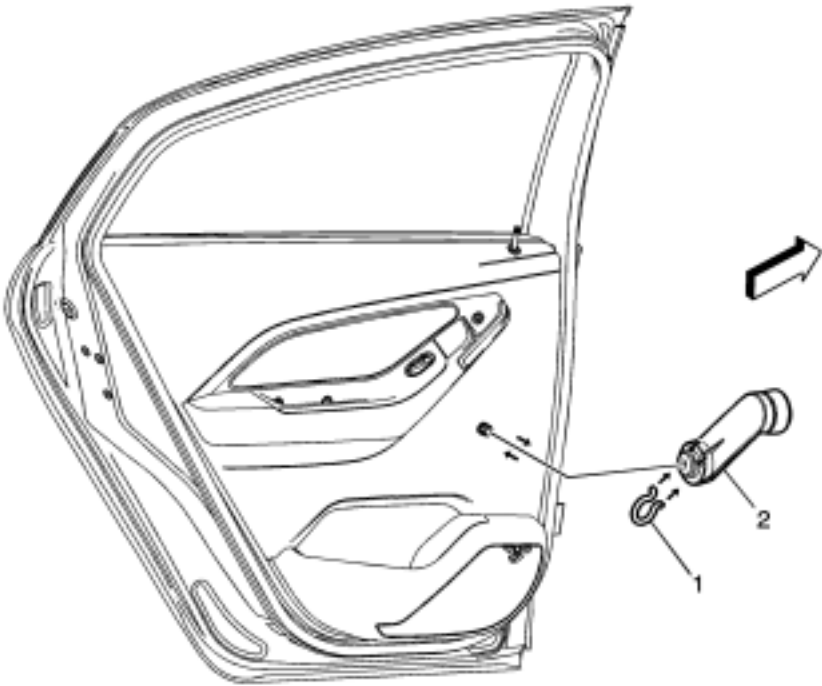


Front Side Door Window Regulator Handle Replacement



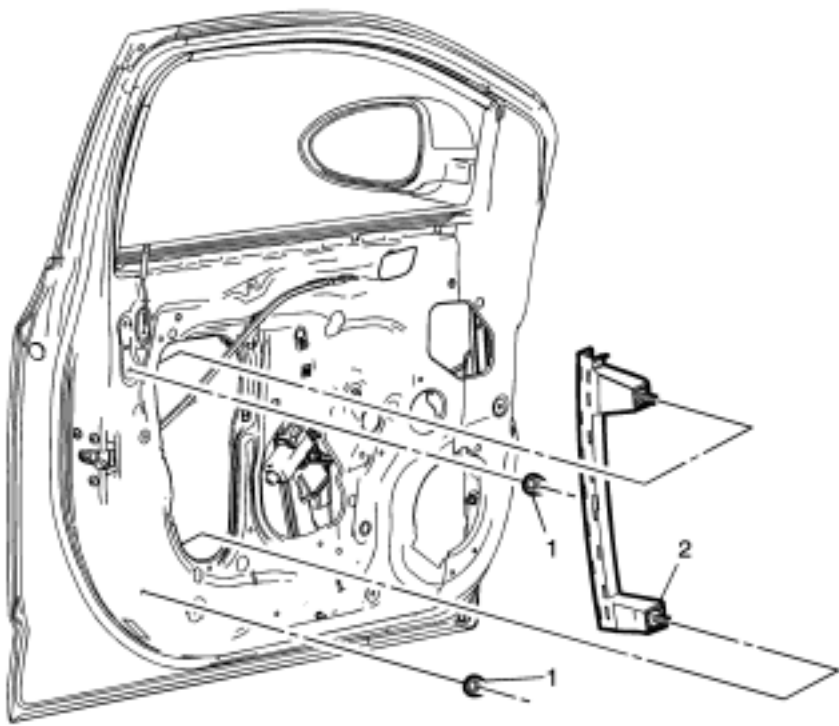
Callout	Component Name
1	Front Side Door Window Regulator Handle Clip  <b>Procedure</b> Use the appropriate tool, remove the clip from handle.
2	Front Side Door Window Regulator Handle

Rear Side Door Window Regulator Handle Replacement



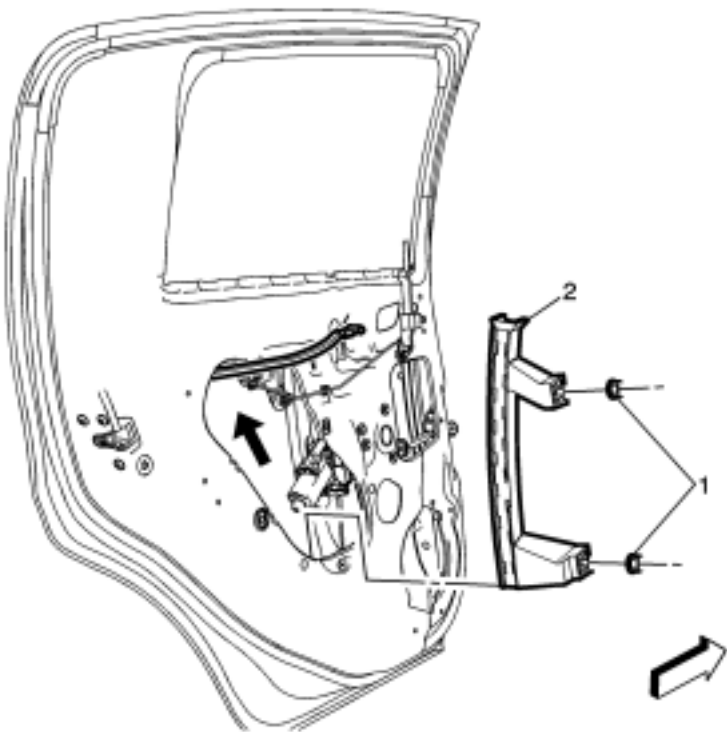
Callout	Component Name
1	Rear Side Door Window Regulator Handle Clip  <b>Procedure</b> Use the appropriate tool, remove the clip from handle.
2	Rear Side Door Window Regulator Handle

Front Side Door Window Rear Guide Replacement



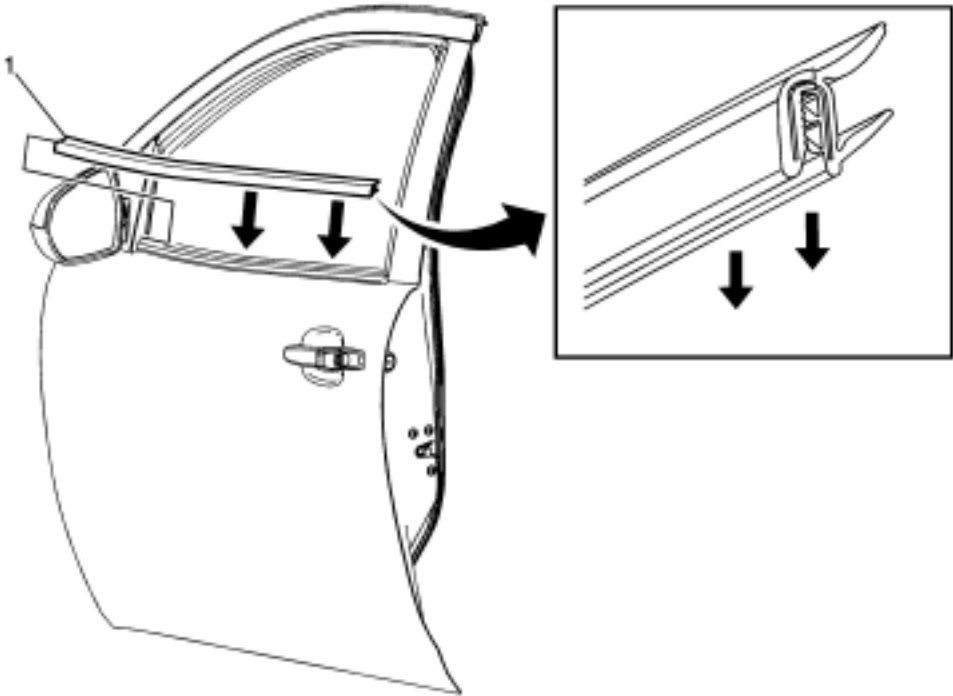
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door trim panel. Refer to <a href="#">Front Side Door Trim Replacement</a> .</p>	
1	<p>Front Side Door Window Rear Guide Nut (Qty:2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the front side door water deflector. 2. Do not remove the window from the vehicle, raise the window to the fully up position. 3. Pull the weatherstrip out from the inner channel of the guide.</p> <p><b>Tighten</b> 11 N·m (97 lbin)</p>
2	<p>Front Side Door Window Rear Guide</p> <p><b>Tip</b> Inspect the window for proper operation before installing the trim panel.</p>

Rear Side Door Window Rear Guide Replacement



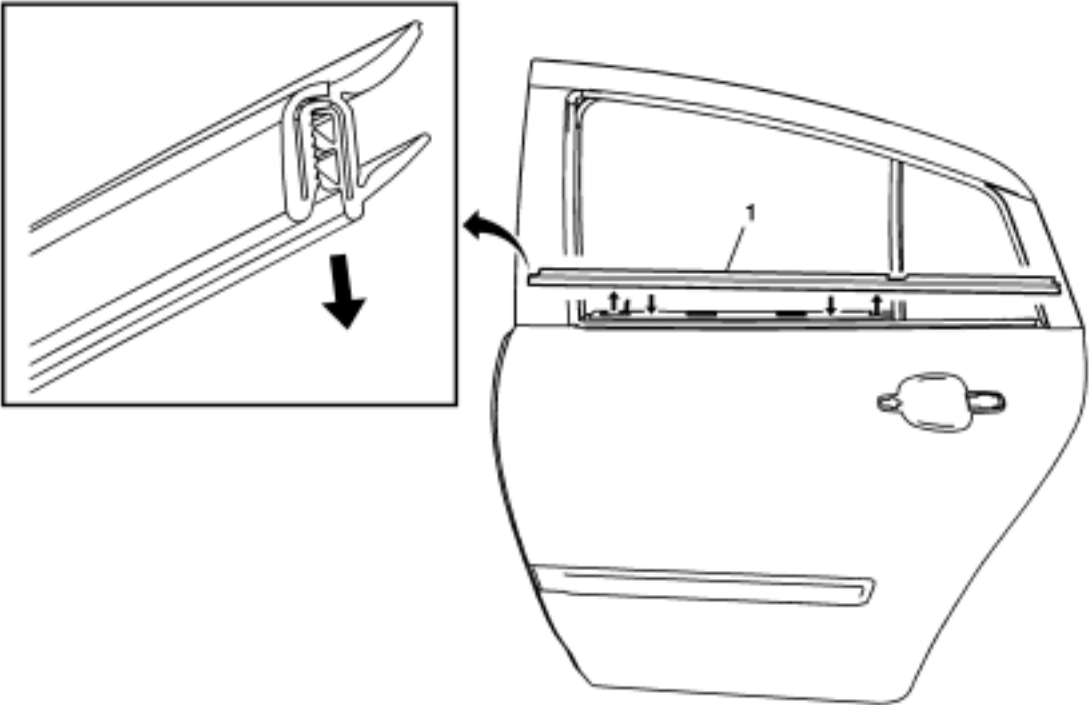
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</p>	
1	<p>Rear Side Door Window Rear Guide Nut (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the rear side door water deflector. 2. Do Not remove the window from the vehicle, raise the window to the fully up position. 3. Pull the weatherstrip out from the inner channel of the guide.</p> <p><b>Tighten</b> 11 N·m (97 lbin)</p>
2	<p>Rear Side Door Window Rear Guide</p> <p><b>Tip</b> Inspect the door window for proper operation before installing the door trim panel.</p>

Front Side Door Window Outer Sealing Strip Replacement



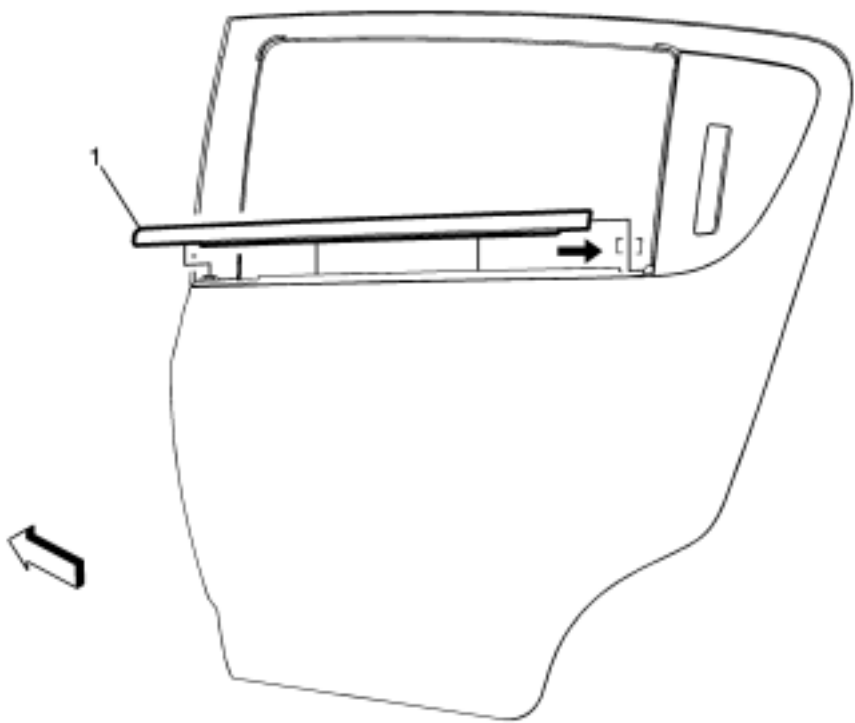
Callout	Component Name
1	<div>Front Side Door Window Outer Sealing Strip</div> <div><b>Procedure</b><div><div>1. Do Not remove the outside rearview mirror.</div><div>2. Use the appropriate tool, lift the rear corner of the sealing strip and pull upward and away from the door flange.</div><div>3. Press firmly to insert the front side door window sealing strip back on the door flange.</div><div>4. Inspect the door window for proper operation.</div></div></div>

Rear Side Door Window Outer Sealing Strip Replacement (Sedan)



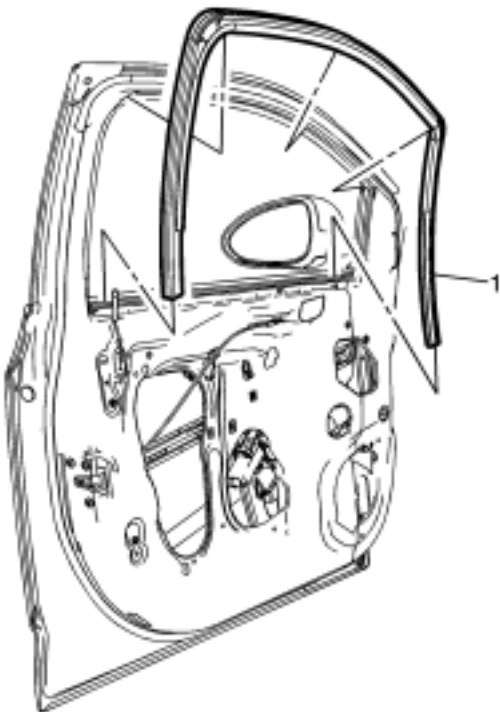
Callout	Component Name
1	<div>Rear Side Door Window Outer Sealing Strip</div> <div><b>Procedure</b></div> <div>Use the appropriate tool, lift one end up and pull away from the door flange to remove.</div>

Rear Side Door Window Outer Sealing Strip Replacement (Hatchback)



Callout	Component Name
1	<div>Rear Side Door Window Outer Sealing Strip</div> <div><b>Procedure</b><div><div>1. Use the appropriate tool, lift the front corner of the sealing strip and pull upward and away from the door flange.</div><div>2. Press firmly to insert the rear side door window sealing strip back on the door flange.</div><div>3. Inspect the door window for proper operation before installing the door trim panel.</div></div></div>

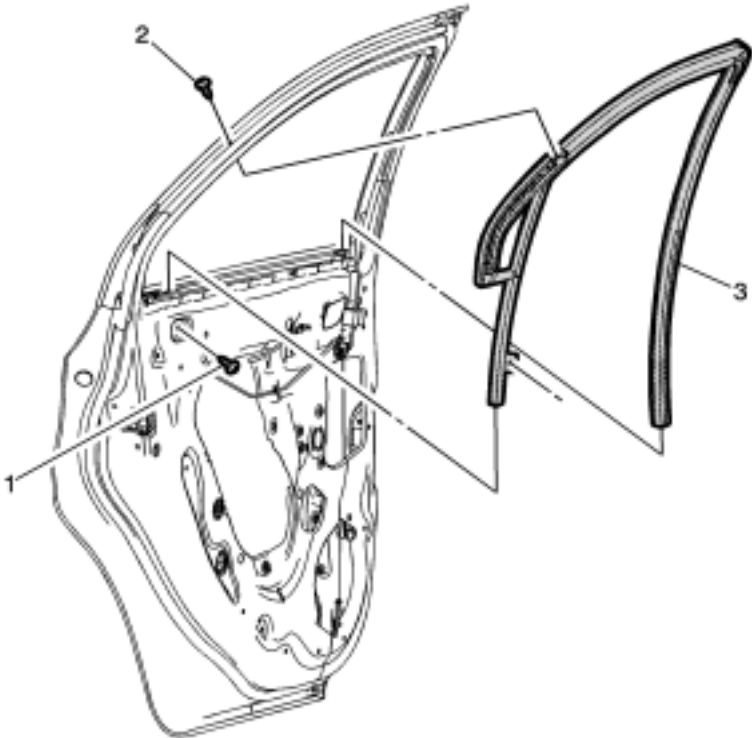
Front Side Door Window Weatherstrip Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove front side door trim panel. Refer to <a href="#">Front Side Door Trim Replacement</a> .</p> <p>2. Remove the outside rearview mirror. Refer to <a href="#">Outside Rearview Mirror Replacement</a> .</p>	
1	<p>Front Side Door Window Weatherstrip</p> <p><b>Procedure</b></p> <p>1. Place the window in the fully down position.</p> <p>2. Remove the water deflector.</p> <p>3. Grasp both upper corners of the window weatherstrip, pull downward releasing the assembly from the door frame.</p> <p>4. Insert the weatherstrip downward in the front and rear channel until fully seated.</p> <p>5. Position the window weatherstrip in the upper rear corner of the frame, work the weatherstrip around the door frame.</p> <p>6. Carefully move the regulator upward for short slow intervals, while ensuring that the window remains in the channels.</p> <p>7. Inspect the door window for proper operation before installing the door trim panel.</p>

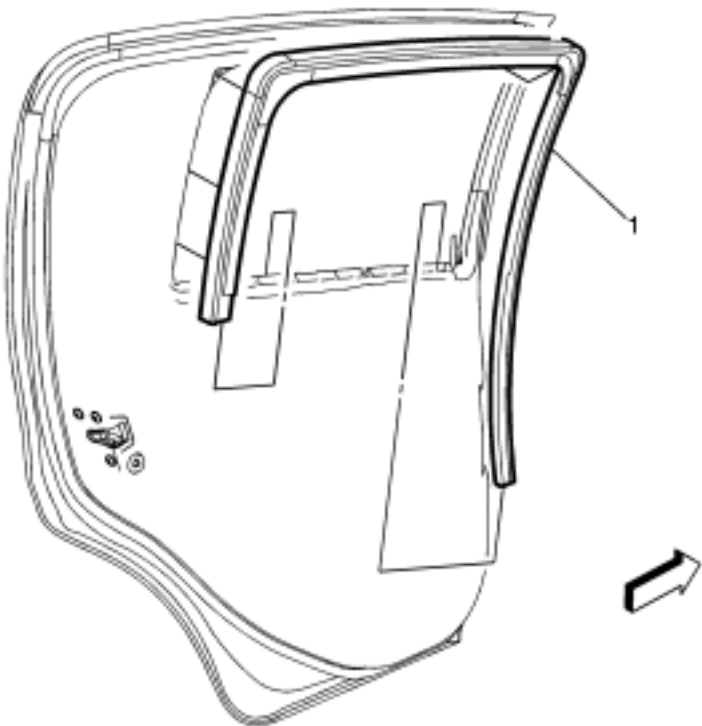


Rear Side Door Window Weatherstrip Replacement (Sedan)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. The rear door side window weatherstrip and window is serviced as one assembly. Refer to <a href="#">Rear Side Door Stationary Window Replacement</a> .</p> <p>2. Remove the rear side door window . Refer to <a href="#">Rear Side Door Window Replacement</a> .</p>	
1	<p>Rear Side Door Window Weatherstrip Lower Bolt</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Remove the rear side door water deflector.</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Rear Side Door Window Weatherstrip Upper Screw</p> <p><b>Procedure</b></p> <p>1. Pull the door weatherstrip out of the upper retainer to expose the screw. 2. Remove the weatherstrip from the front and rear lower guides. 3. Grasp both upper corners, pull downward releasing the weatherstrip from the door frame.</p> <p><b>Tighten</b> 3 N·m (27 lbin)</p>
3	<p>Rear Side Door Window Weatherstrip</p> <p><b>Procedure</b></p> <p>1. Insert the weatherstrip downward in the guide until fully seated. 2. Carefully move the regulator upward for short slow intervals, while ensuring that the window remains in the guides.</p> <p>3. Inspect the door window for proper operation before installing the door trim panel.</p>

Rear Side Door Window Weatherstrip Replacement (Hatchback)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear side door window . Refer to <a href="#">Rear Side Door Window Replacement</a> .</p>	
1	<p>Rear Side Door Window Weatherstrip</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Remove the rear side door water deflector.</li><li>2. Remove the weatherstrip from the front and rear lower window guides.</li><li>3. Grasp both upper corners, pull downward releasing the weatherstrip from the door frame.</li><li>4. Insert the weatherstrip downward in the window guides until fully seated.</li><li>5. Carefully move the regulator upward for short slow intervals, while ensuring that the window remains in the guides.</li><li>6. Inspect the door window for proper operation before installing the door trim panel.</li></ol>

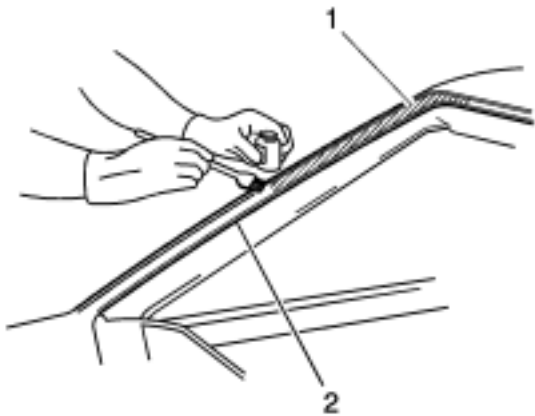
## Adhesive Installation of Windshields

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Use a urethane adhesive systems which meet GM Specification GM3651G.
2. Remove all mounds or loose pieces of urethane adhesive from the pinchweld area.
3. If the original window is being reused, remove all but approximately 2 mm (3/64 in) of the existing bead of urethane adhesive from the pinchweld flange by using a clean utility knife or razor blade scraper.
4. Inspect for any of the following problems in order to help prevent future breakage of the window:
  - The flange of the window opening
  - High weld
  - Solder spots
  - Hardened sealer
  - Any other obstruction or irregularity in the pinchweld flange

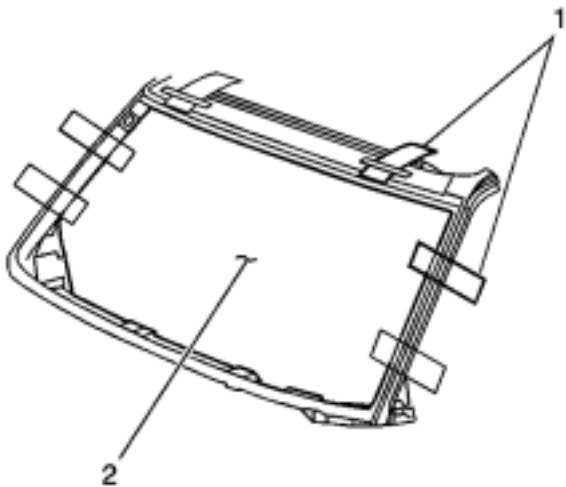
**Note:** If corrosion of the pinch-weld flange is present or if sheet metal repairs or replacements are required, the pinch-weld flange must be refinished in order to restore the bonding area strength. If paint repairs are required, mask the flange bonding area prior to applying the color coat in order to provide a clean primer only surface. Materials such as BASFDE15®, DuPont 2610®, Sherwin-Williams PSE4600 and NP70® and Martin-Semour 5120 and 5130® PPGDP90LF SPIES/ HECKER3688/8590 – 3688/5150 – 4070/5090 STANDOX11158/13320 – 14653/14980 products are approved for this application.

5. After repairing the opening as indicated, perform the following steps:
  - 5.1 Remove all traces of broken glass from the outer cowl panel, seats, floor and defroster ducts.
  - 5.2 Clean around the edge of the inside surface of the window with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint free cloth.
6. Verify all primers and urethane adhesive are within expiration dates.



**Warning:** Failure to prep the area prior to the application of primer may cause insufficient bonding of urethane adhesive. Insufficient bonding of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

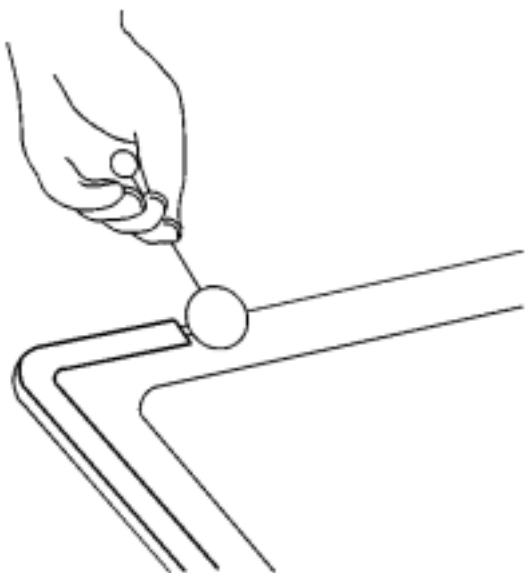
7. Apply the primer to the surface of the pinch-weld flange (1).
8. Allow the pinch-weld primer to dry per auto-adhesive instructions by the manufacturer's.
9. With an assistant, dry fit the window (1) to the opening in order to determine the correct position.



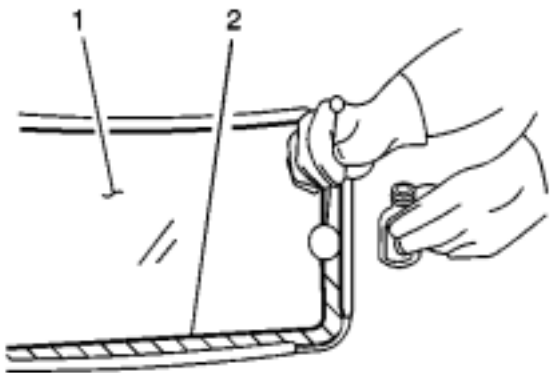
10. Use masking tape in order to mark the locations (1) of the window (2) in the opening.
11. Cut the masking tape in the center and remove the window from the opening.



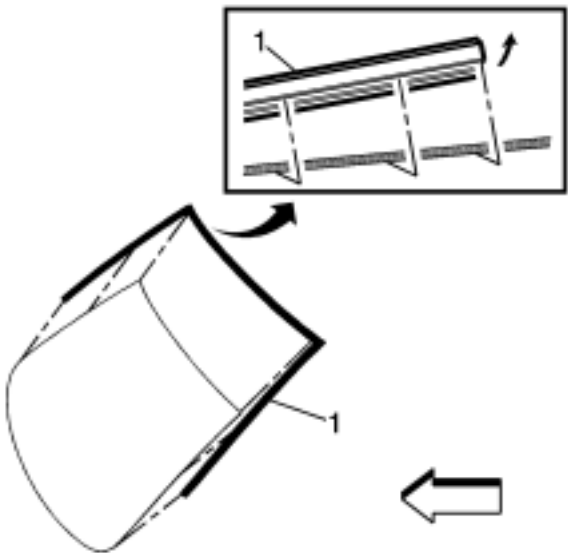
12. Apply glass prep clear to the area approximately 10–16 mm (3/8–5/8 in) around the entire perimeter of the window inner surface.  
Immediately wipe the glass primed area using a clean, lint-free cloth.



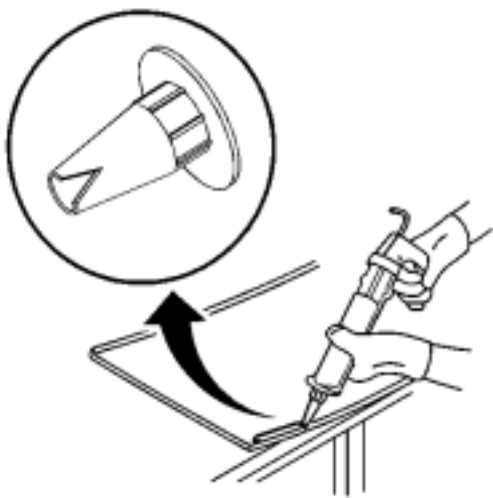
13. Apply bonded-glass primer and let dry per auto-adhesive instructions by the manufacturer's.



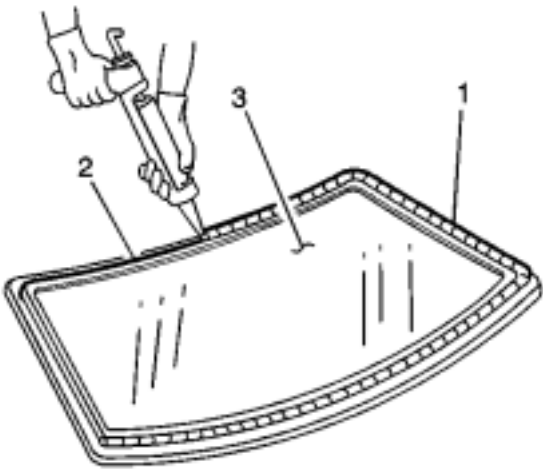
14. Apply the auto-adhesive primer-application (2) around the perimeter of the window (1) per auto-adhesive instructions by the manufacturer's.  
15. Apply the glass primer black to the same areas (2) that glass prep clear was applied.  
16. Allow the glass primer to dry per auto-adhesive instructions by the manufacturer's.



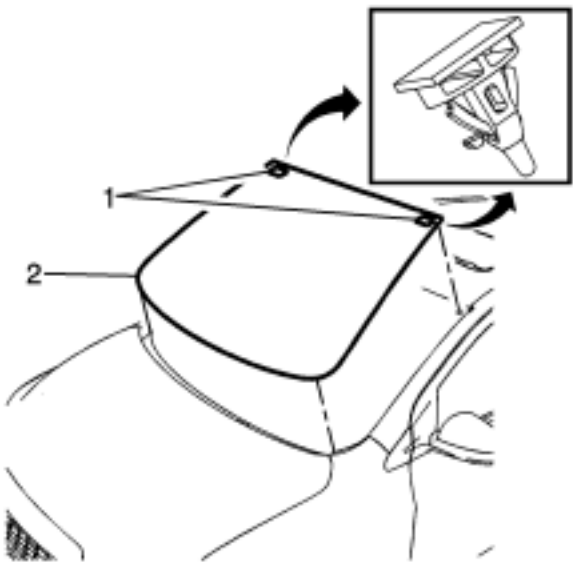
17. Install the window reveal molding (1). Refer to [Windshield Upper Reveal Molding Replacement](#) .



18. Use a cartridge-type caulking gun in order to apply a smooth, continuous bead.  
Cut the applicator nozzle to provided a V cut to apply the auto-adhesive.



19. Use the edge of the window as a guide for the nozzle in order to apply the urethane adhesive(1) to the inner surface of the window (3).



**Note:** If the locating pins were cut off it will be necessary to tape the window in place until the auto-adhesive cures per auto-adhesive instructions by the manufacturer's.

20. With an assistant, align the window locating pins(1) to the slots located in each corner of the pinch-weld flange. Lower the window (2) to touch the auto-adhesive.



21. Gently depress the window on the auto-adhesive bead until the window reveal molding is seated.
22. Tape the window to the body in order to minimize movement and until the auto-adhesive cures per auto-adhesive instructions by the manufacturer's.



23. Ensure all excess urethane adhesive is cleaned from the body before water test.



**Note:** Do not direct a hard stream of high pressure water to the freshly applied urethane adhesive.

- 24. Use a soft spray of warm water in order to immediately water test the window.
- 25. Inspect the window for leaks.
- 26. If any leaks are found, use a plastic paddle in order to apply extra urethane adhesive at the leak point.
- 27. Retest the window for leaks.

**Warning:** Insufficient curing of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

- For the moisture-curing type of urethane adhesive, allow a minimum of 6 hours at 21°C (70°F) or greater and with at least 30 percent relative humidity. Allow at least 24 hours for the complete curing of the urethane adhesive.
- For the chemical-curing type of urethane adhesive, allow a minimum of 1 hour .

Do NOT physically disturb the repair area until after these minimum times have elapsed.

- 28. Maintain the following conditions in order to properly cure the urethane adhesive:
  - Partially lower a door window in order to prevent pressure buildups when closing doors before the urethane adhesive cures.
  - Do not drive the vehicle until the urethane adhesive is cured. Refer to the above curing times.
  - Do not use compressed air in order to dry the urethane adhesive.
- 29. Complete the window installation.



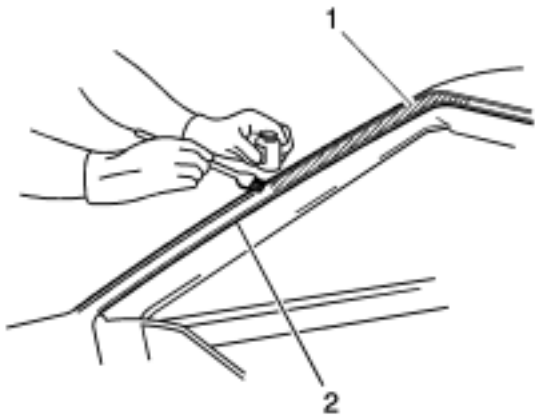
## Adhesive Installation of Rear Window s

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Use a urethane adhesive systems which meet GM Specification GM3651G.
2. Remove all mounds or loose pieces of urethane adhesive from the pinchweld area.
3. If the original window is being reused, remove all but approximately 2 mm (3/64 in) of the existing bead of urethane adhesive from the pinchweld flange by using a clean utility knife or razor blade scraper.
4. Inspect for any of the following problems in order to help prevent future breakage of the window:
  - The flange of the window opening
  - High weld
  - Solder spots
  - Hardened sealer
  - Any other obstruction or irregularity in the pinchweld flange

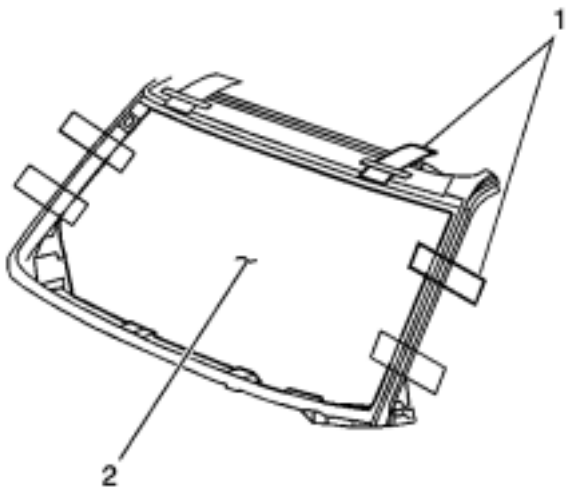
**Note:** If corrosion of the pinch-weld flange is present or if sheet metal repairs or replacements are required, the pinch-weld flange must be refinished in order to restore the bonding area strength. If paint repairs are required, mask the flange bonding area prior to applying the color coat in order to provide a clean primer only surface. Materials such as BASFDE15®, DuPont 2610®, Sherwin-Williams PSE4600 and NP70® and Martin-Semour 5120 and 5130® PPGDP90LF SPIES/ HECKER3688/8590 – 3688/5150 – 4070/5090 STANDOX11158/13320 – 14653/14980 products are approved for this application.

5. After repairing the opening as indicated, perform the following steps:
  - 5.1 Remove all traces of broken glass from the outer cowl panel, seats, floor and defroster ducts.
  - 5.2 Clean around the edge of the inside surface of the window with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint free cloth.
6. Verify all primers and urethane adhesive are within expiration dates.



**Warning:** Failure to prep the area prior to the application of primer may cause insufficient bonding of urethane adhesive. Insufficient bonding of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

7. Apply the primer to the surface of the pinch-weld flange(1).
8. Allow the pinch-weld primer to dry per auto-adhesive instructions by the manufacturer's.

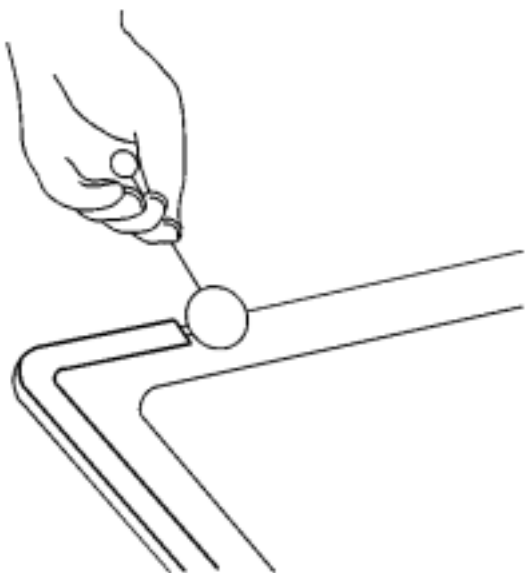


9. Use masking tape in order to mark the locations(1) of the window (2) in the opening.
10. Cut the masking tape in the center and remove the window from the opening.

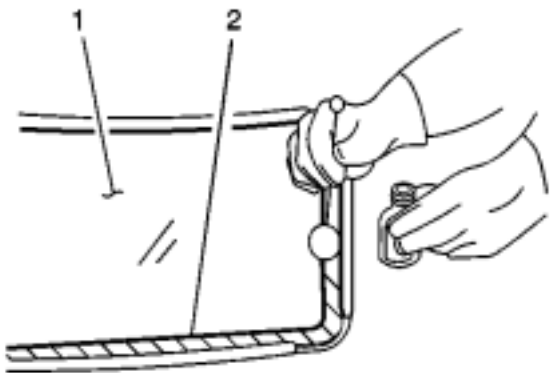




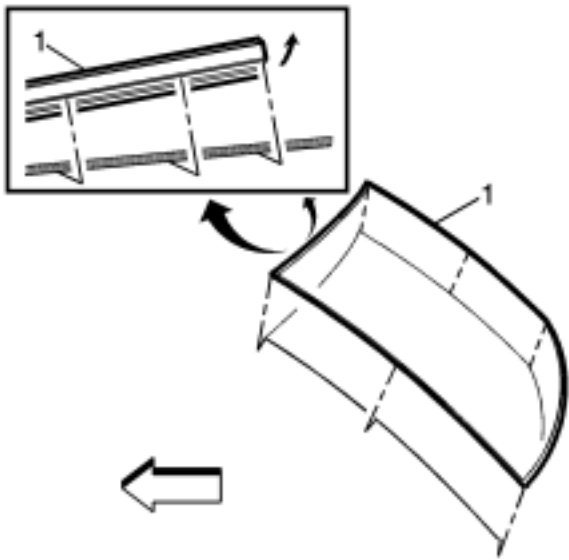
11. Apply glass prep clear to the area approximately 10–16 mm (3/8–5/8 in) around the entire perimeter of the window inner surface.  
Immediately wipe the glass primed area using a clean, lint-free cloth.



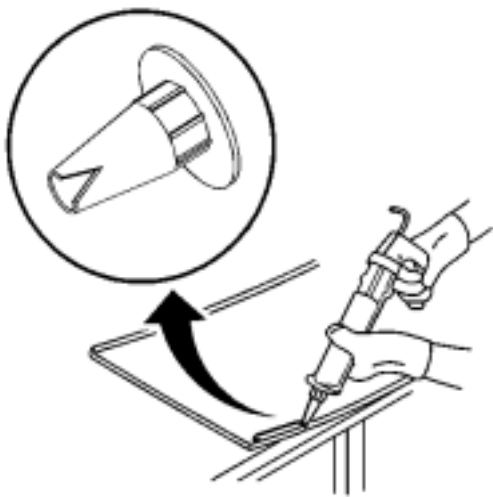
12. Apply bonded-glass primer and let dry per auto-adhesive instructions by the manufacturer's.



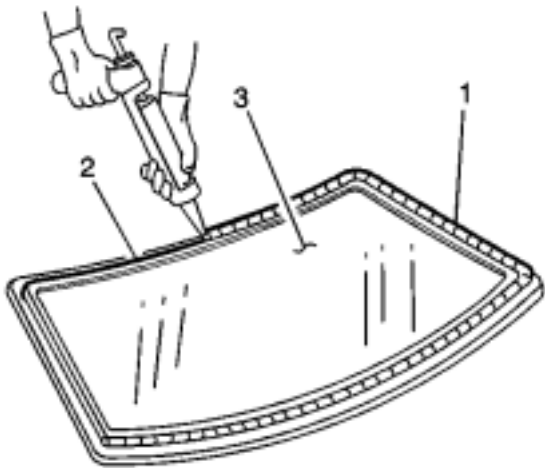
13. Apply the auto-adhesive primer-application (2) around the perimeter of the window (1) per auto-adhesive instructions by the manufacturer's.  
14. Apply the glass primer black to the same areas (2) that glass prep clear was applied.  
15. Allow the glass primer to dry per auto-adhesive instructions by the manufacturer's.



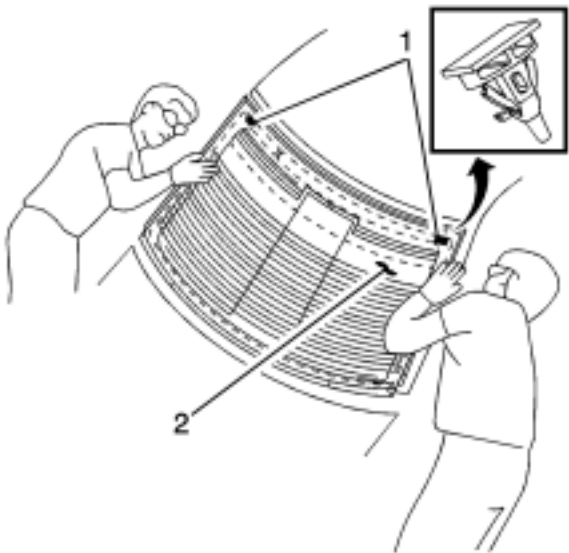
16. Install the window reveal molding (1). Install the window reveal molding. Refer to [Rear Window Reveal Molding Replacement](#) .



17. Use a cartridge-type caulking gun in order to apply a smooth, continuous bead.  
Cut the applicator nozzle to provided a V cut to apply the auto-adhesive.

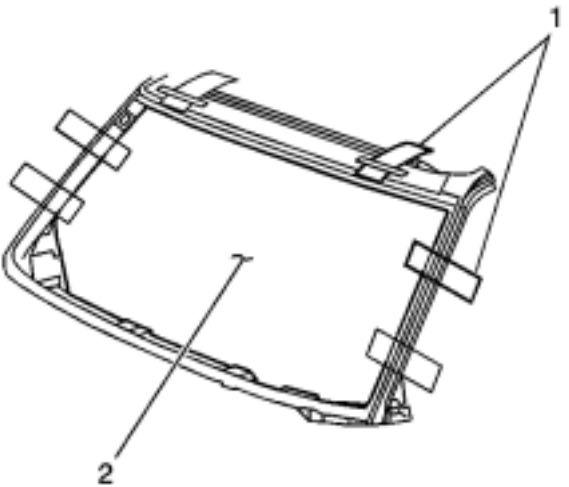


18. Use the edge of the window as a guide for the nozzle in order to apply the urethane adhesive(1) to the inner surface of the window (3).



**Note:** If the locating pins were cut off it will be necessary to tape the window in place until the auto-adhesive cures per auto-adhesive instructions by the manufacturer's.

19. With an assistant, align the window locating pins(1) to the slots located in each corner of the pinch-weld flange. Lower the window (2) to touch the auto-adhesive.



20. If the locating pins were damaged, align the masking tape(1) lines on the window (2) and the body.



21. Gently depress the window on the auto-adhesive bead until the window reveal molding is seated.  
22. Tape the window to the body in order to minimize movement and until the auto-adhesive cures per auto-adhesive instructions by the manufacturer's.



23. Ensure all excess urethane adhesive is cleaned from the body before water test.



**Note:** Do not direct a hard stream of high pressure water to the freshly applied urethane adhesive.

- 24. Use a soft spray of warm water in order to immediately water test the window.
- 25. Inspect the window for leaks.
- 26. If any leaks are found, use a plastic paddle in order to apply extra urethane adhesive at the leak point.
- 27. Retest the window for leaks.

**Warning:** Insufficient curing of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

- For the moisture-curing type of urethane adhesive, allow a minimum of 6 hours at 21°C (70°F) or greater and with at least 30 percent relative humidity. Allow at least 24 hours for the complete curing of the urethane adhesive.
- For the chemical-curing type of urethane adhesive, allow a minimum of 1 hour .

Do NOT physically disturb the repair area until after these minimum times have elapsed.

- 28. Maintain the following conditions in order to properly cure the urethane adhesive:
  - Partially lower a door window in order to prevent pressure buildups when closing doors before the urethane adhesive cures.
  - Do not drive the vehicle until the urethane adhesive is cured. Refer to the above curing times.
  - Do not use compressed air in order to dry the urethane adhesive.
- 29. Complete the window installation.

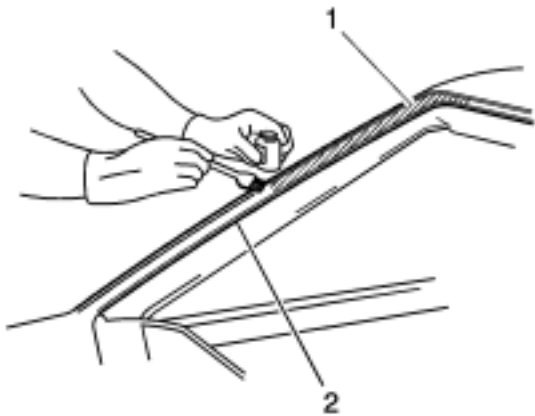
## Adhesive Installation of Liftgate Windows

**Warning:** Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Use a urethane adhesive systems which meet GM Specification GM3651G.
2. Remove all mounds or loose pieces of urethane adhesive from the pinchweld area.
3. If the original window is being reused, remove all but approximately 2 mm (3/64 in) of the existing bead of urethane adhesive from the pinchweld flange by using a clean utility knife or razor blade scraper.
4. Inspect for any of the following problems in order to help prevent future breakage of the window:
  - The flange of the window opening
  - High weld
  - Solder spots
  - Hardened sealer
  - Any other obstruction or irregularity in the pinchweld flange

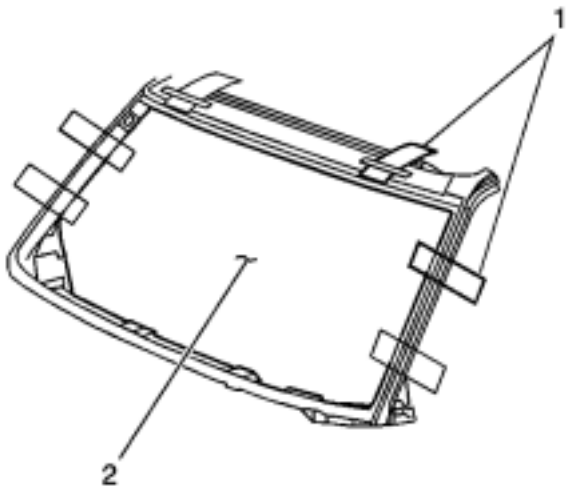
**Note:** If corrosion of the pinch-weld flange is present or if sheet metal repairs or replacements are required, the pinch-weld flange must be refinished in order to restore the bonding area strength. If paint repairs are required, mask the flange bonding area prior to applying the color coat in order to provide a clean primer only surface. Materials such as BASFDE15®, DuPont 2610®, Sherwin-Williams PSE4600 and NP70® and Martin-Semour 5120 and 5130® PPGDP90LF SPIES/ HECKER3688/8590 – 3688/5150 – 4070/5090 STANDOX11158/13320 – 14653/14980 products are approved for this application.

5. After repairing the opening as indicated, perform the following steps:
  - 5.1 Remove all traces of broken glass from the outer cowl panel, seats, floor and defroster ducts.
  - 5.2 Clean around the edge of the inside surface of the window with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint free cloth.
6. Verify all primers and urethane adhesive are within expiration dates.



**Warning:** Failure to prep the area prior to the application of primer may cause insufficient bonding of urethane adhesive. Insufficient bonding of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

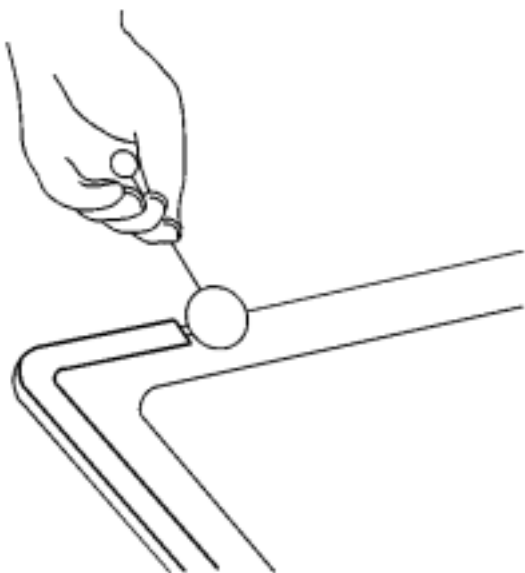
7. Apply the primer to the surface of the pinch-weld flange (1).
8. Allow the pinch-weld primer to dry per auto-adhesive instructions by the manufacturer's.
9. With an assistant, dry fit the window (1) to the opening in order to determine the correct position.



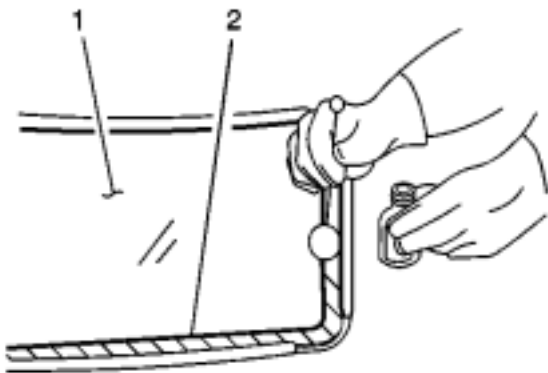
10. Use masking tape in order to mark the locations (1) of the window (2) in the opening.
11. Cut the masking tape in the center and remove the window from the opening.



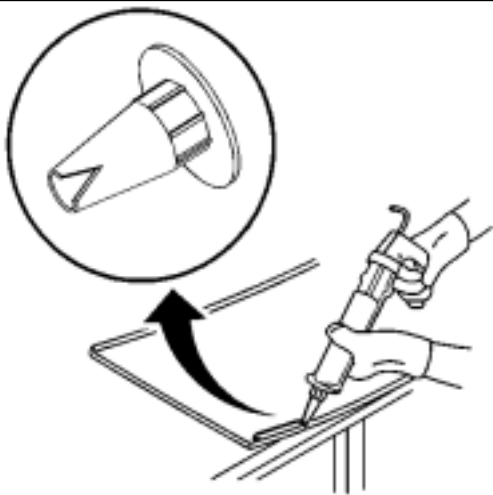
12. Apply glass prep clear to the area approximately 10–16 mm (3/8–5/8 in) around the entire perimeter of the window inner surface.  
Immediately wipe the glass primed area using a clean, lint-free cloth.



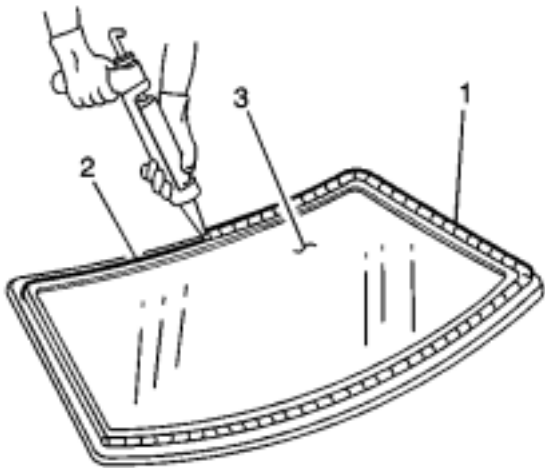
13. Apply bonded-glass primer and let dry per auto-adhesive instructions by the manufacturer's.



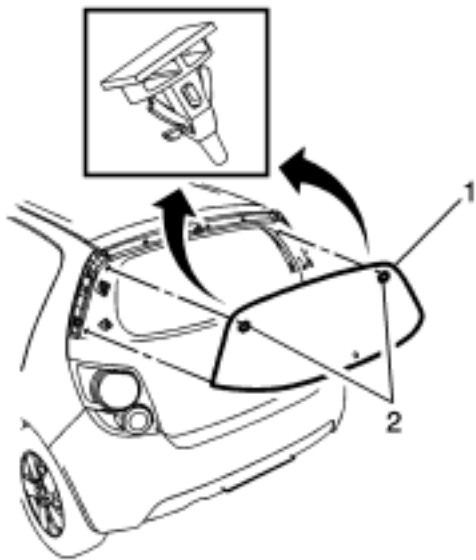
14. Apply the auto-adhesive primer-application (2) around the perimeter of the window (1) per auto-adhesive instructions by the manufacturer's.  
15. Apply the glass primer black to the same areas (2) that glass prep clear was applied.  
16. Allow the glass primer to dry per auto-adhesive instructions by the manufacturer's.



17. Use a cartridge-type caulking gun in order to apply a smooth, continuous bead.  
Cut the applicator nozzle to provided a V cut to apply the auto-adhesive.
18. Install the window reveal molding, if equipped.

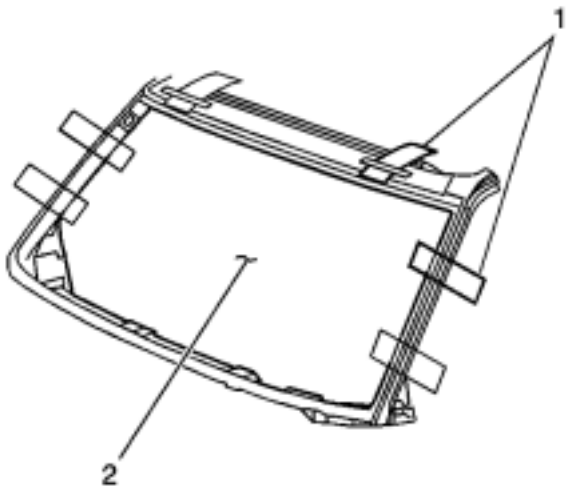


19. Use the edge of the window as a guide for the nozzle in order to apply the urethane adhesive(1) to the inner surface of the window (3).



**Note:** If the locating pins were cut off it will be necessary to tape the window in place until the auto-adhesive cures per auto-adhesive instructions by the manufacturer's.

20. With an assistant, align the window locating pins(2) to the slots located in each corner of the pinch-weld flange. Lower the window (1) to touch the auto-adhesive.



21. If the locating pins were damaged, align the masking tape(1) lines on the window(2) and the body.



22. Gently depress the window on the auto-adhesive bead until the window reveal molding is seated.
23. Tape the window to the body in order to minimize movement and until the auto-adhesive cures per auto-adhesive instructions by the manufacturer's.



24. Ensure all excess urethane adhesive is cleaned from the body before water test.





**Note:** Do not direct a hard stream of high pressure water to the freshly applied urethane adhesive.

- 25. Use a soft spray of warm water in order to immediately water test the window.
- 26. Inspect the window for leaks.
- 27. If any leaks are found, use a plastic paddle in order to apply extra urethane adhesive at the leak point.
- 28. Retest the window for leaks.

**Warning:** Insufficient curing of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

- For the moisture-curing type of urethane adhesive, allow a minimum of 6 hours at 21°C (70°F) or greater and with at least 30 percent relative humidity. Allow at least 24 hours for the complete curing of the urethane adhesive.
- For the chemical-curing type of urethane adhesive, allow a minimum of 1 hour .

Do NOT physically disturb the repair area until after these minimum times have elapsed.

- 29. Maintain the following conditions in order to properly cure the urethane adhesive:
  - Partially lower a door window in order to prevent pressure buildups when closing doors before the urethane adhesive cures.
  - Do not drive the vehicle until the urethane adhesive is cured. Refer to the above curing times.
  - Do not use compressed air in order to dry the urethane adhesive.
- 30. Complete the window installation.



Fixed and Movable Windows

BODY SYSTEMS

0-4

Full-Cut Method Description

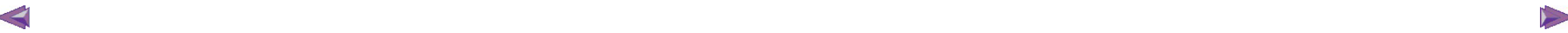
Power Windows Description and Operation

Rear Window Defogger Description and Operation

Stationary Window Description

Urethane Adhesive Description





## Full-Cut Method Description

**Note:**

- If corrosion of the pinch-weld flange is present, or if sheet metal repairs or replacements are required, refinish the pinch-weld flange in order to present a clean, primer-only surface.
- If paint repairs are required, mask the flange bonding area, prior to applying the color coat, in order to provide a clean, primer-only surface.
- Appropriate materials for these primer applications are typically 2 component catalyzed products. Use materials such as BASFDE15®, DuPont 2610®, Sherwin-Williams PSE4600 and NP70® and Martin-Semour 5120 ,5130® , PPGDP90LF SPIES/HECKER3688/8590 – 3688/5150 – 4070/5090 STANDOX11158/13320 – 14653/14980 products are approved for this application. Follow the manufacturer's directions for the mix, the application, and the drying times.
- After repairing the opening as indicated, shake the pinch-weld primer black # 3 well. Using a new dauber, apply the primer to the primed surface of the flange in the bonding area. Allow the primer to dry for 10 minutes.

Use only the full cut method, also known in the field as full strip method, when installing windows.

This method includes the following:

- The replacement of a majority of the urethane adhesive bead. Remove all but approximately 2 mm (3/64 in) of the existing bead of urethane adhesive from the pinch-weld flange.
- Apply pinch-weld primer to any exposed painted areas on the pinch-weld flange.

No mounds or loose pieces of urethane adhesive should remain on the pinch-weld flange. Do not remove all traces of urethane adhesive.



## Power Windows Description and Operation

### Power Window System Components

The power window system consists of the following components:

- Driver window switch
- Front passenger window switch
- Left rear window switch
- Right rear window switch
- Window regulator motors in each of the doors
- 30 amp fuse
- 25 amp fuse

### Power Window System Controls

The power window system can be controlled by a power window up or down switch activation.

### Window Operation and the Driver Window Switch

When the ignition switch is in the RUN or ACCY position, or Retained Accessory Power (RAP) is enabled, battery positive voltage is supplied to the driver window switch. Ground for the switch is provided by a ground circuit connected to a ground stake. When the driver window switch is pressed in the down position, the voltage is applied to the driver window motor down circuit and ground is applied to the driver window motor up circuit causing the window to open. When the driver window switch is pressed in the up position, the polarity is reversed, voltage and ground are applied to the opposite circuits and the window closes. In order to control the passenger windows from the driver door, the driver window switch assembly contains a separate window switch for each passenger door window. These window switches operate in the same way as the driver window switch, except that the applied voltage and ground must also pass through the local passenger, left rear or right rear window switch in order to command the respective window motor.

The driver window switch also provides power and ground for the local rear window switches. Battery positive voltage is supplied, through the power window master switch lockout signal circuit, to each remote rear window switch. The remote front passenger door window switch has a separate battery positive voltage circuit, however, this circuit is spliced into the driver window switch voltage supply circuit within the IP Fuse Block. Ground for all three of the passenger door switches, is also supplied by the driver window switch.

### Driver Express Up and Express Down Power Window Motor (If Equipped)

The driver door may be equipped with a smart window motor that will detect excessive resistance while performing the express up function and automatically reverse direction to prevent injury to any occupants that may become trapped between the closing window and the door frame. The automatic reverse safety feature can be overridden by pulling and holding the window switch.

The logic circuit within the window motor monitors the up, down and express signal circuits which are normally equal to B+ voltage. When a switch is used on the driver window switch, the contacts close causing a voltage drop within the appropriate signal circuit. The driver window motor will detect the voltage drop and will command the window to move in the direction requested.

### Lockout Switch Feature

The driver window switch contains a rear window lockout switch which disconnects the battery positive voltage supply to the remote rear passenger door window switches, disabling them. The remote front passenger door window switch cannot be locked out.

### Window Operation and the Passenger Window Switches

When the ignition switch is in the RUN or ACCY position, or Retained Accessory Power (RAP) is enabled, battery positive voltage is supplied to each of the remote passenger door window switches. When a remote window switch is pressed in the down position, voltage is applied to the window motor down circuit and ground is applied to the window motor up circuit, causing the window to open. When the window switch is pressed in the up position, the polarity is reversed, voltage and ground are applied to the opposite circuits, and the window closes.



# Rear Window Defogger Description and Operation

## Rear Window Defogger System Components

The rear window defogger system consist of the following components:

- The HVAC control module
- The body control module (BCM)
- The rear defogger relay
- The rear window grid

## Rear Window Defogger Operation

The BCM supplies 12 V to the rear window defogger switch signal circuit to the HVAC control module. When you depress the rear window defogger switch, the rear window defogger switch pulls the signal circuit low. The BCM interprets as a request for the rear window defogger system. The BCM enables the rear window defogger system by supplying voltage to the rear defogger relay coil. The relay coil supply voltage is also spliced off internally in the BCM to the supply voltage circuit of the rear window defogger indicator. The rear defogger relay is energized and the rear window defogger indicator is illuminated. With the relay energized, battery positive voltage is allowed from the relay switched input through the switch contacts and out the relay switched output to the rear window defogger grid.

When you start the engine and press the rear window defogger switch for the first time, the defogger cycle lasts for 15 minutes. Further operation results in 7.5 minute defogger cycles. The rear defogger feature will not time out if vehicle speed is above 80km/h (50mph). The defogger cycle resets to 15 minutes when you cycle the ignition to the OFF position and then to the ON position.





## Stationary Window Description

Most stationary windows, specifically windshields, are retained to the body with adhesive which adheres the window to the body, increasing structural integrity. The reinstallation of the windows with adhesive requires complete replacement of the adhesive bead, and is known as the full cut method. All stationary windows must use a adhesive systems which meet GM Specification GM3651G





## Urethane Adhesive Description

For replacement of any adhesive-installed window, use the full cut method only.



Use adhesive systems which meet GM Specification GM3651G.

Use these materials based on specific manufacturer. Do NOT intermix primers or adhesives from one manufacturer to another.

Always follow the system manufacturer's instructions for application, handling, and curing.



Special Tools

Illustration	Tool Number/ Description
	BO-24402-A J-24402-A Glass Sealant Cold Knife Remover
	BO-39032 J-39032 Stationary Glass Removal Tool





Specifications

Horn Replacement

Steering Wheel Horn Contact Replacement

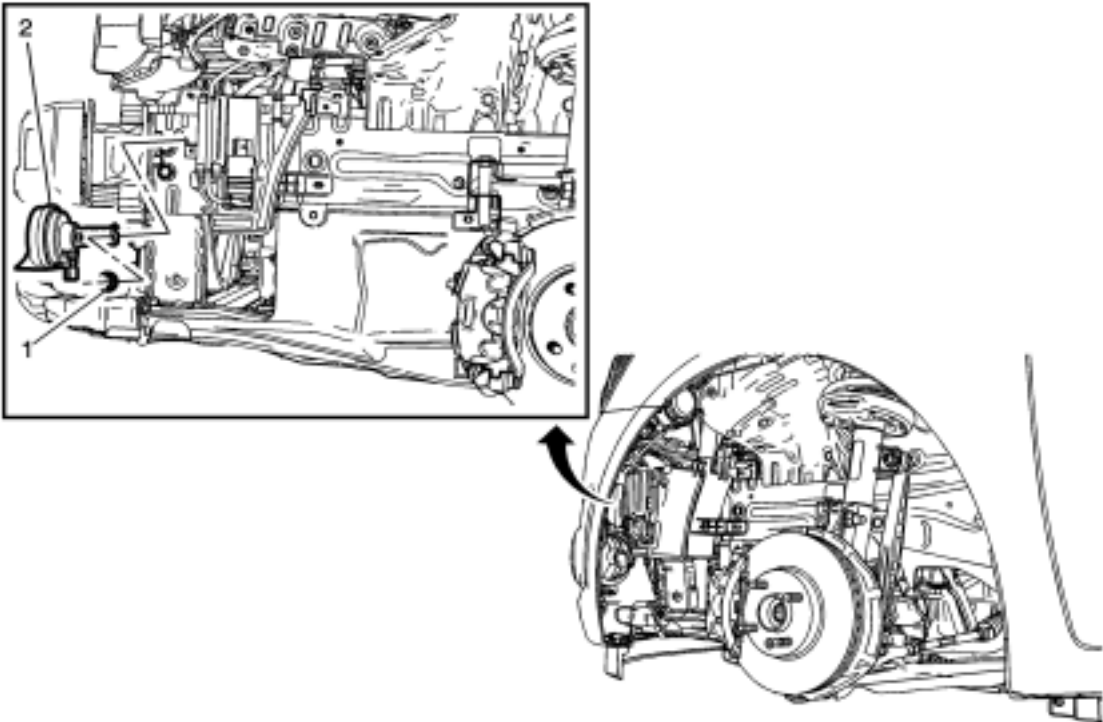
Description and Operation



Fastener Tightening Specifications

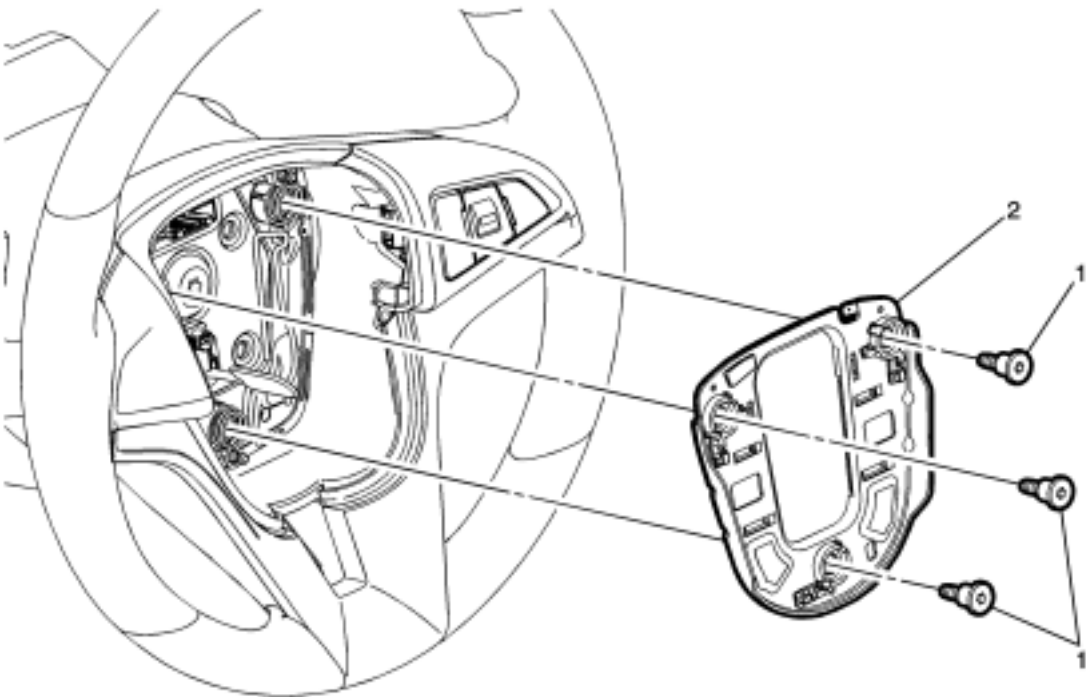
Application	Specification	
	Metric	English
Horn Nut	17 N·m	13 lb ft
Steering Wheel Horn Contact Bolts	5.5 N·m	49 lb in

Horn Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front wheelhouse liner front. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p>	
1	<p>Horn Nut</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 17 N·m (13 lbft)</p>
2	<p>Horn</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connector.</p>

Steering Wheel Horn Contact Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the steering wheel inflatable restraint module. Refer to <a href="#">Steering Wheel Inflatable Restraint Module Replacement</a> .</p>	
1	<p>Steering Wheel Horn Contact Spring Retainer Bolt (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 5.5 N·m (49 lb in)</p>
2	<p>Steering Wheel Horn Contact Assembly</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connectors.</p>



## Horns System Description and Operation

### System Description

The horn system consists of the following components:

- F51UA 15A fuse
- Underhood fuse block (contains a non-serviceable PCB Horn relay)
- Horn switch
- Horn
- Body control module (BCM)

### System Operation

- The vehicle horn is activated whenever the horn switch is depressed.
- The BCM commands the horns ON under any of the following conditions:
  - When the content theft deterrent system detects a vehicle intrusion—For further information refer to [Content Theft Deterrent \(CTD\) Description and Operation](#) .
  - When the keyless entry system is used to lock the vehicle, a horn chirp may sound to notify the driver that the vehicle has been locked. The notification feature may be enabled or disabled through personalization. For further information refer to [Keyless Entry System Description and Operation](#) .

### Circuit Operation

The BCM controls the horn operation, when the horn switch is pressed, it closes a switch pulling the horn signal circuit low. When the BCM detects the drop in voltage in the horn switch signal circuit, it energizes the PCB Horn relay which provides B+ voltage to the horn control circuit, sounding the horn.

When the vehicle is in the Off Power Mode the BCM will attempt to detect a stuck or continuously activated horn switch. When enabled, activation of the horn will be limited to 10 seconds to protect the horn from excessive use.





Specifications	Front Side Turn Signal Lamp Bulb Replacement
Brake Pedal Position Sensor Calibration	Parking and Turn Signal Lamp Bulb Replacement
Brake Pedal Position Sensor Replacement	High Mount Stop Lamp Replacement (Sedan)
Headlamp Switch Replacement	High Mount Stop Lamp Replacement (Hatchback)
Hazard Warning Switch Replacement	Cargo Center Courtesy Lamp Bulb Replacement (Hatchback)
Dome Lamp Bezel Replacement	Cargo Center Courtesy Lamp Bulb Replacement (Sedan)
Windshield Header Courtesy Lamp Replacement	Backup Lamp Bulb Replacement (Sedan)
Dome Lamp Bulb Replacement	Rear License Plate Lamp Replacement (Sedan)
Headlamp Replacement	Rear License Plate Lamp Replacement (Hatchback)
Headlamp Bulb Replacement	Rear License Plate Lamp Bulb Replacement (Sedan)
Headlamp Housing Bracket Replacement	Rear License Plate Lamp Bulb Replacement (Hatchback)
Headlamp Aiming	Tail Lamp Replacement (Sedan)
Front Fog Lamp Replacement	Tail Lamp Replacement (Hatchback)
Front Fog Lamp Bulb Replacement	Stop and Turn Signal Lamp Bulb Replacement (Sedan)
Front Fog Lamp Cover Replacement (Without T3U)	Stop and Turn Signal Lamp Bulb Replacement (Hatchback)
Front Fog Lamp Cover Replacement (With T3U)	Rear Compartment Courtesy Lamp Replacement (Hatchback)
Fog Lamp Aiming	Rear Compartment Courtesy Lamp Replacement (Sedan)
Front Side Turn Signal Lamp Replacement	Description and Operation



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Fog Lamp Bolt	1.5 N·m	13 lb in
Headlamp Bolt	2.5 N·m	22 lb in
High Mount Stop Lamp Bolt	2.5 N·m	22 lb in
Rear License Plate Lamp Bolt	1.0 N·m	9 lb in
Tail Lamp Bolt	2.5 N·m	22 lb in



## Brake Pedal Position Sensor Calibration

### Calibration Criteria

**Note:** Do not apply the brake pedal during the brake pedal position sensor calibration procedure. Any movement of the brake pedal during this procedure will cause the calibration procedure to fail. If this occurs, the brake pedal position sensor calibration must be repeated.

Brake pedal position sensor calibration must be performed after the brake pedal position sensor or body control module (BCM) have been serviced. The calibration procedure will set the brake pedal position sensor home value. This value is used by the BCM to determine the action of the driver applying the brake system and to provide this information to the vehicle subsystems via serial data.

### Calibration Procedure

1. Apply the parking brake.
2. Place the transmission in the PARK position for automatic transmission or NEUTRAL position for manual transmission.
3. Install a scan tool.
4. Clear all BCM DTCs before proceeding.
5. Navigate to the Configuration/Reset Functions menu of the BCM.
6. Select the Brake Pedal Position Sensor Learn procedure and follow the directions displayed on the screen.

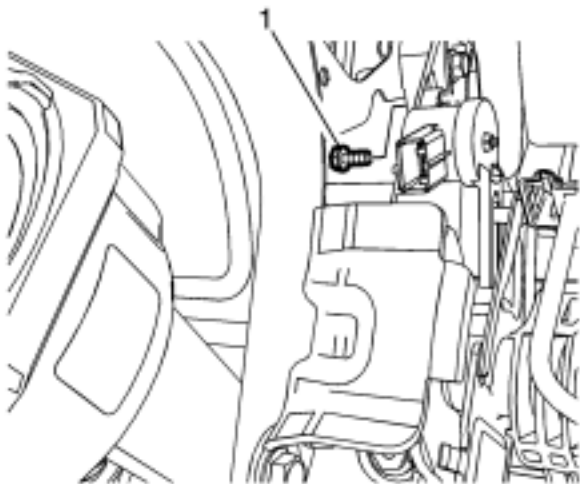




## Brake Pedal Position Sensor Replacement

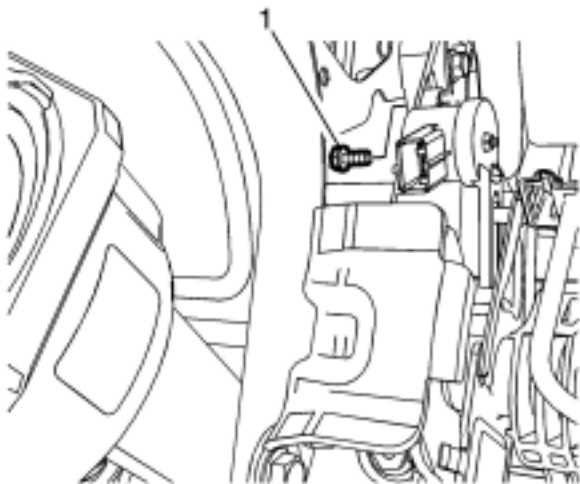
### Removal Procedure

1. Remove the instrument panel lower trim pad cover. Refer to [Instrument Panel Lower Trim Pad Cover Replacement](#) .



2. Disconnect the brake pedal position sensor electrical connector.
3. Remove the brake pedal position sensor bolt (1).
4. Remove the brake pedal position sensor.

### Installation Procedure



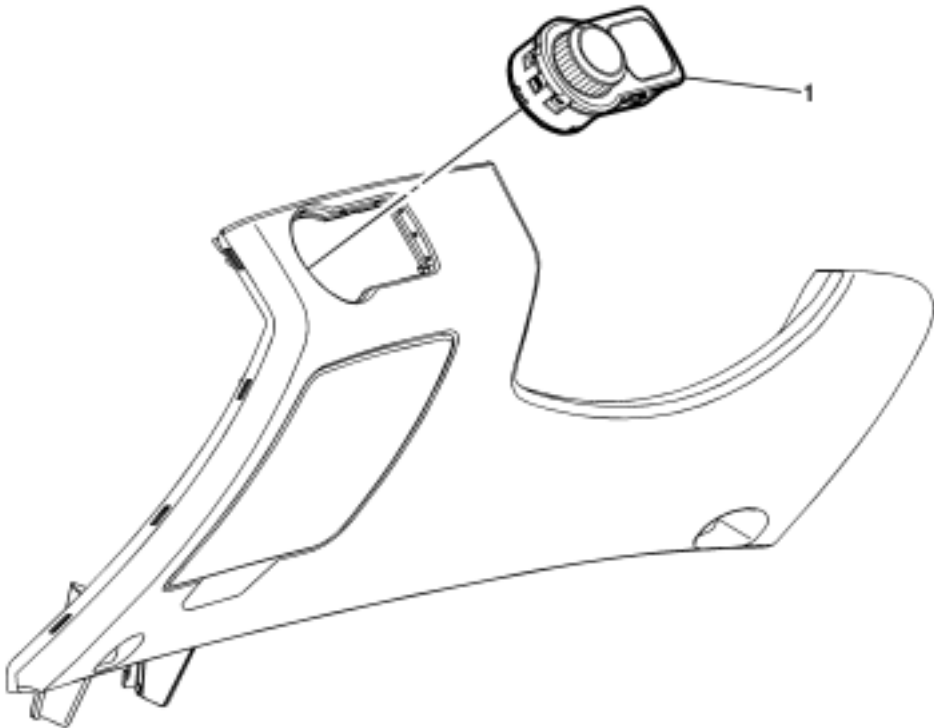
**Note:** Ensure the fork of the brake pedal position sensor is positioned over the brake pedal post.

1. Install the brake pedal position sensor to the brake pedal bracket.

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

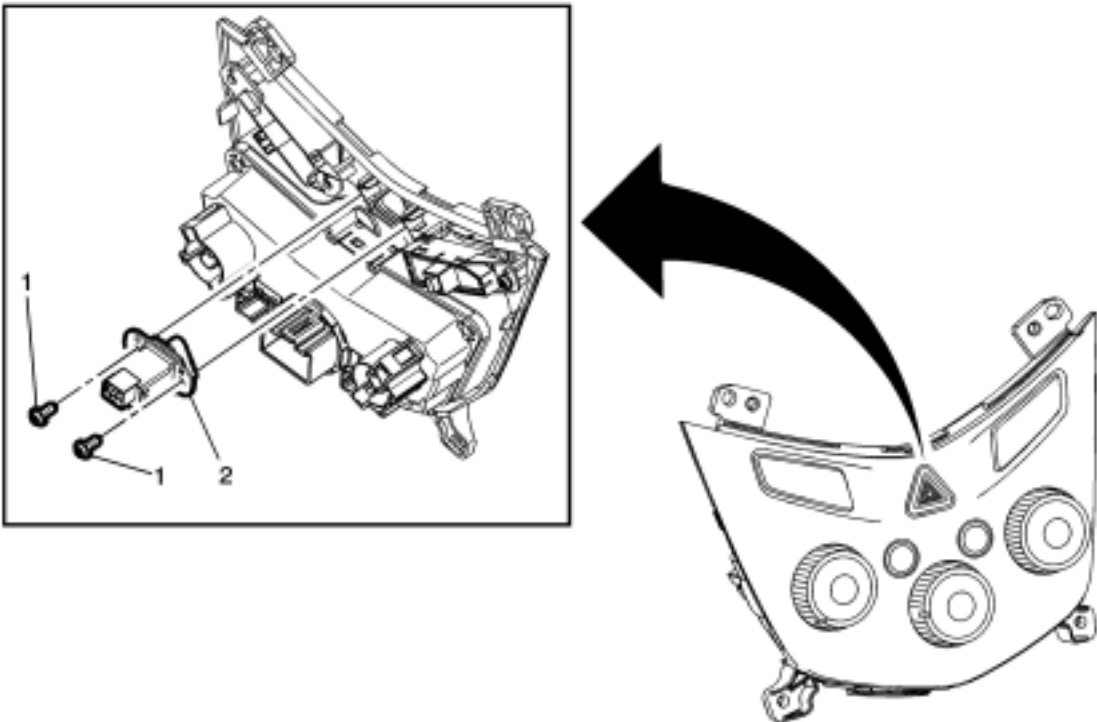
2. Install the brake pedal position sensor bolt (1) and tighten to **3 N·m (27 lbin)** .
3. Connect the brake pedal position sensor electrical connector.
4. Calibrate the brake pedal position sensor. Refer to [Brake Pedal Position Sensor Calibration](#) .
5. Install the instrument panel lower trim pad cover. Refer to [Instrument Panel Lower Trim Pad Cover Replacement](#) .

Headlamp Switch Replacement



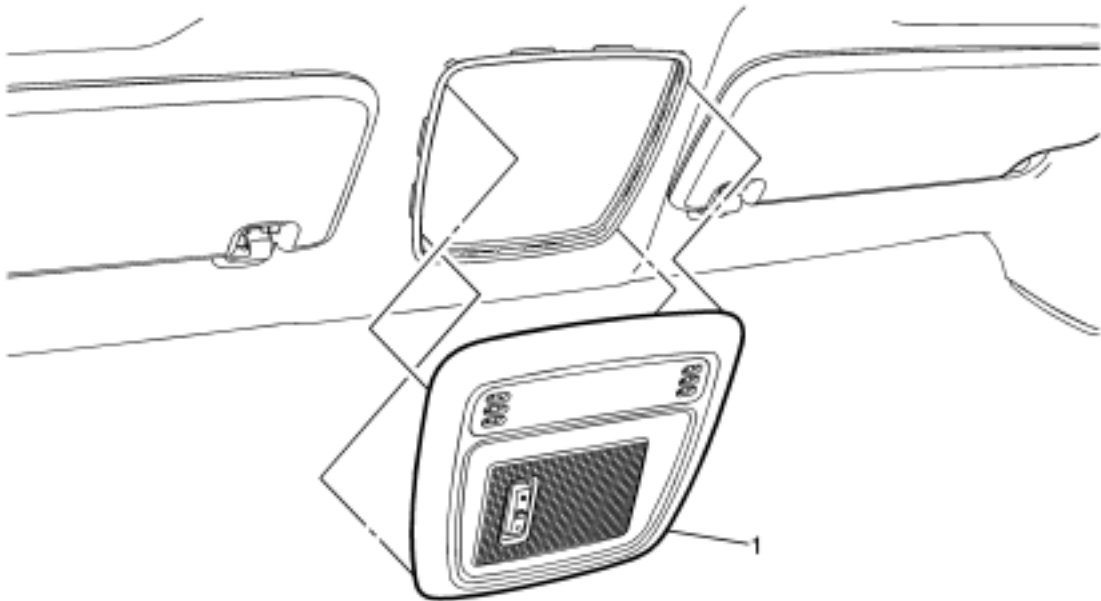
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the instrument panel lower trim pad cover. Refer to <a href="#">Instrument Panel Lower Trim Pad Cover Replacement</a></p>	
1	<p>Headlamp Switch</p> <p><b>Procedure</b></p> <p>1. Gently depress tabs to remove the switch assembly from the instrument panel lower cover.</p> <p>2. Disconnect the electrical connector.</p>

Hazard Warning Switch Replacement



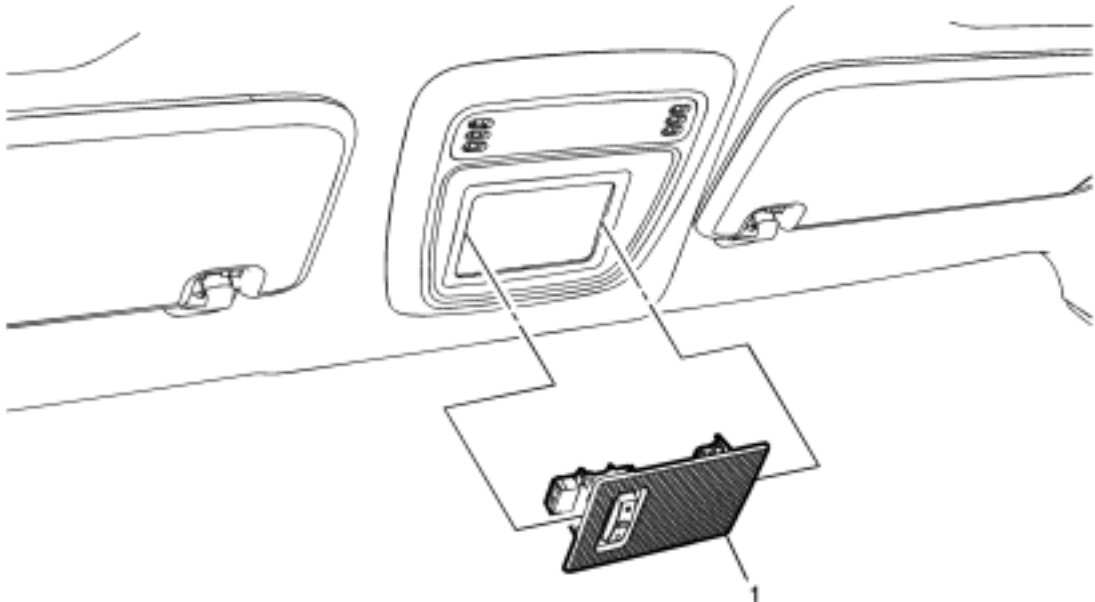
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the heater and air conditioning control. Refer to <a href="#">Heater and Air Conditioning Control Replacement</a> .</p>	
1	<p>Hazard Warning Switch Bolts (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Hazard Warning Switch</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connector.</p>

Dome Lamp Bezel Replacement



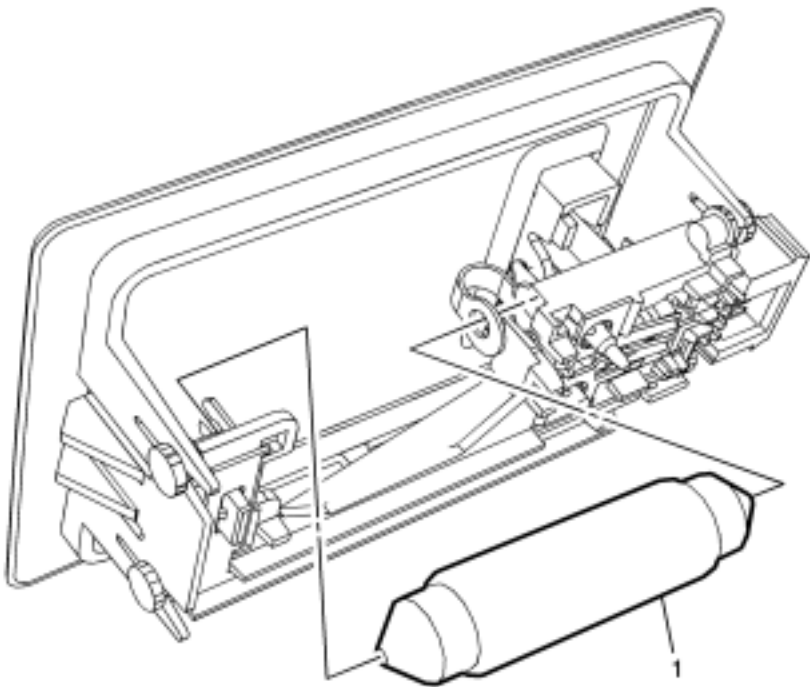
Callout	Component Name
1	<div>Dome Lamp Bezel</div> <div>Procedures</div> <div><div>1. Grasp the bezel assembly and pull downward to release the retainer clips securing the bezel assembly to the headliner.</div><div>2. Disconnect the electrical connections.</div></div>

Windshield Header Courtesy Lamp Replacement



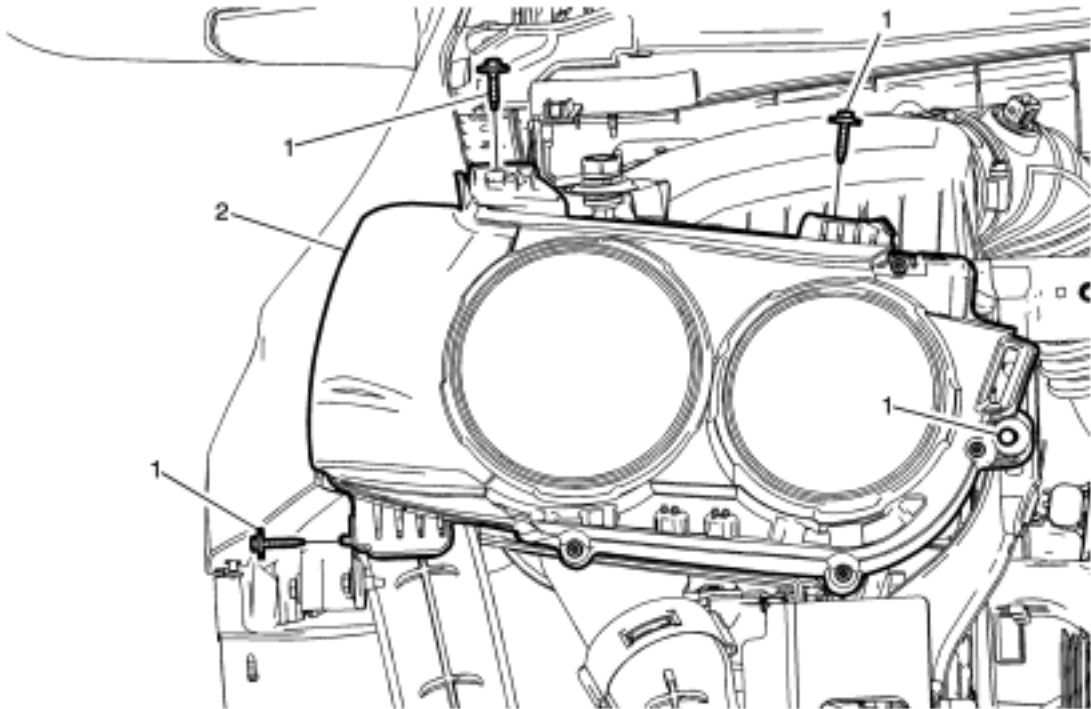
Callout	Component Name
1	<div>Windshield Header Courtesy Lamp</div> <div><b>Procedures</b><div><div>1. Grasp the courtesy lamp assembly and pull downward to release the retainer clips securing the courtesy lamp assembly to the dome lamp bezel.</div><div>2. Disconnect the electrical connections.</div></div></div>

Dome Lamp Bulb Replacement



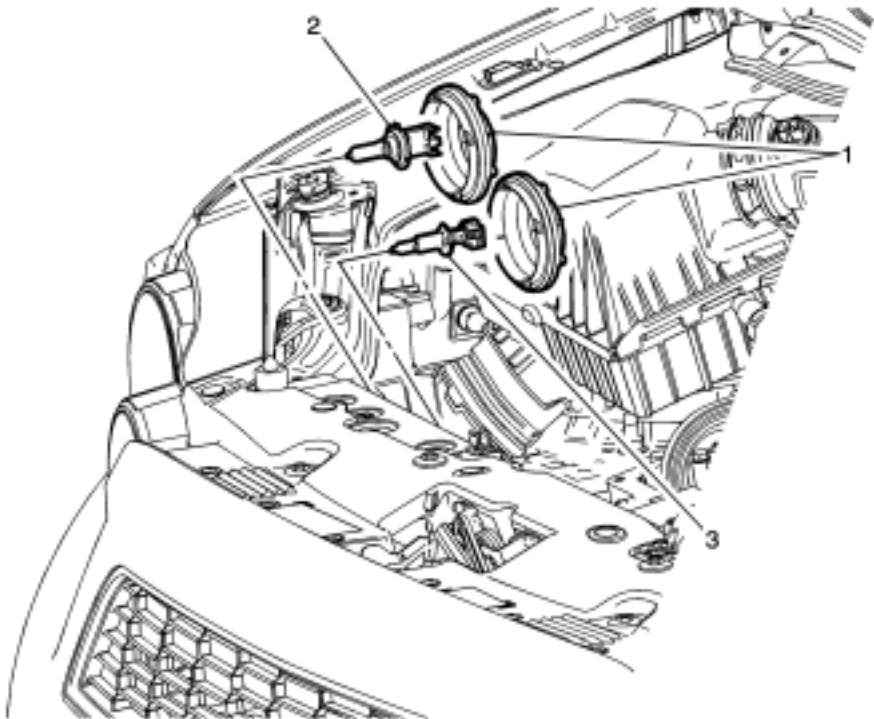
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the windshield header courtesy lamp. Refer to <a href="#">Windshield Header Courtesy Lamp Replacement</a></p>	
1	Dome Lamp Bulb

Headlamp Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	<p>Headlamp Assembly Screw (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 2.5 N·m (22 lb in)</p>
2	<p>Headlamp Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connector bulb harness and remove the headlamp assembly. 2. Aim the headlamps after replacement. Refer to <a href="#">Headlamp Aiming</a> .</p>

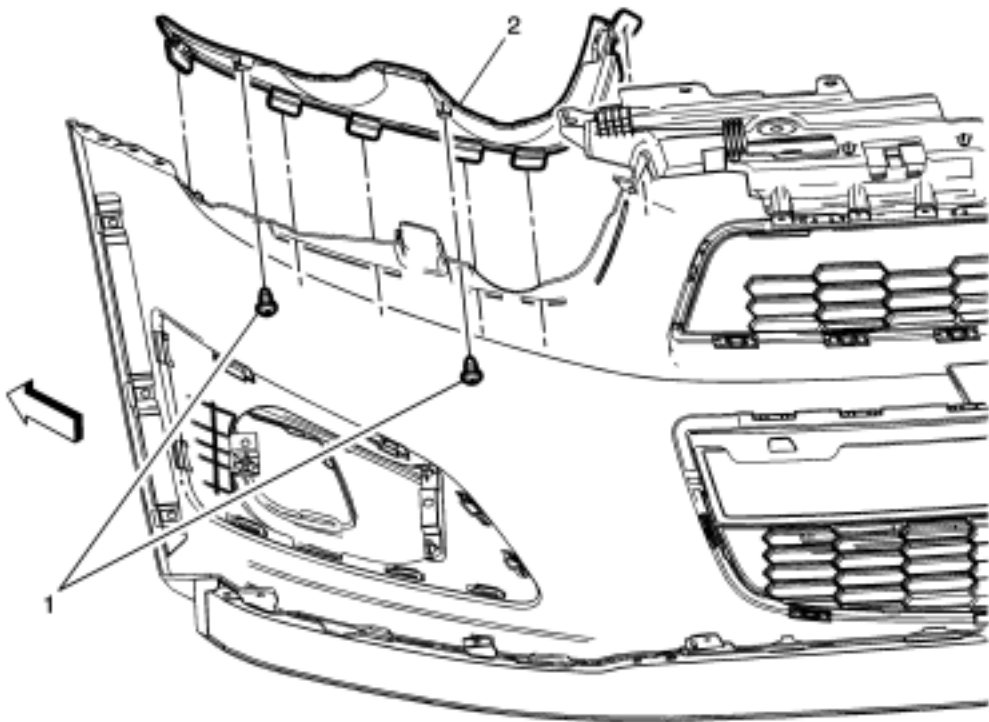
Headlamp Bulb Replacement



Callout	Component Name
<b>Preliminary Procedure</b> Open and support the hood assembly.	
1	Accessory Bulb Cover (Qty: 2)
2	<b>Warning:</b> Refer to <a href="#">Halogen Bulb Warning</a> .  Headlamp Bulb (Low Beam)  <b>Procedure</b>  1. Disconnect the electrical connector from the bulb socket. 2. Rotate the bulb socket and remove from the headlamp housing.
3	Headlamp Bulb (High Beam)  <b>Procedure</b>  1. Disconnect the electrical connector from the bulb socket. 2. Rotate the bulb socket a quarter turn and remove from the headlamp housing.



Headlamp Housing Bracket Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	<p>Headlamp Housing Bracket Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 2.5 N·m (22 lbin)</p>
2	<p>Headlamp Housing Bracket</p> <p><b>Procedure</b></p> <p>Release the tabs on the housing bracket from the front bumper fascia and remove.</p>

## Headlamp Aiming

### Visual Aiming Preparation Procedure

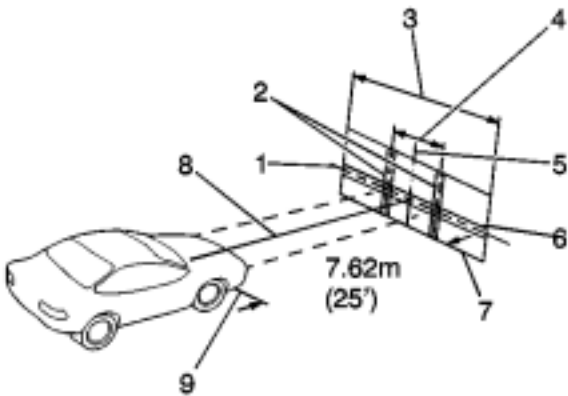
**Note:** Some state and local laws specify requirements for headlamp aim. Comply with all of these laws when performing any headlamp aiming operations.

Headlamp aim should be checked:

- When a new headlamp capsule is installed.
- If service or repairs to the front end area have, or may have, disturbed the headlamps or their mounting.

The aiming screen should meet the following criteria:

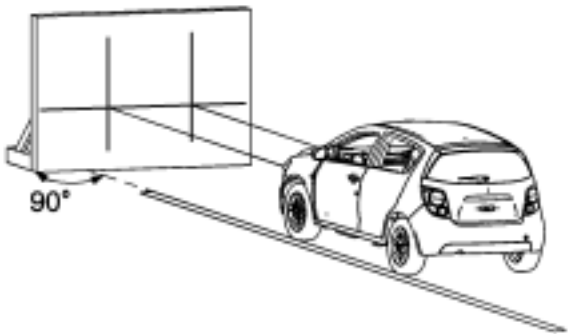
- The area will consist of a level surface large enough to allow for a vehicle and an additional 7.62 m (25 ft) measured from face of lamps to the front of the aiming screen.
- The screen will be 1.52 m (5 ft) high x 3.66 m (12 ft) wide with a matte white surface well shaded from extraneous light, and properly adjusted to the floor on which the vehicle stands. Provisions should be made to align the aiming screen parallel with the vehicle.
- The screen shall be provided with a fixed vertical centerline, two laterally adjustable vertical tapes, and one vertically adjustable horizontal tape.
- If a regular commercial aiming screen is not available, the screen may consist of a vertical wall having a clear uninterrupted area approximately 1.83 m (6 ft) high and 3.66 m (12 ft) wide. The surface should be finished with a washable non-gloss white paint.



- After the aiming screen has been set up in a permanent location, paint a reference line on the floor directly under the lens of the lamps to indicate the proper location of the headlamps when they are being aimed:
  - Distance between headlamps (1)
  - Center line of screen (2)
  - Adjustable vertical pointer (3)
  - Adjustable horizontal tape (4)
  - Diagram of light screen (5)
  - Vertical center line ahead of right headlamp pointer position (6)
  - 7.62 m (25 ft) (7)
  - Car axis (8)
  - Adjustable vertical pointer
  - Horizontal center line of lamps
  - Vertical center line ahead of left headlamp

Prior to aiming the headlamps, the following steps must be taken:

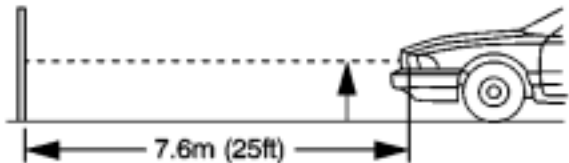
1. Remove any snow, ice or mud from the vehicle.
2. The vehicle must have a full tank of gas.
3. Stop all other work on the vehicle.
4. If any service has been performed on the vehicle, make sure that all of the components are back in their original place.
5. The vehicle must be on a level surface.



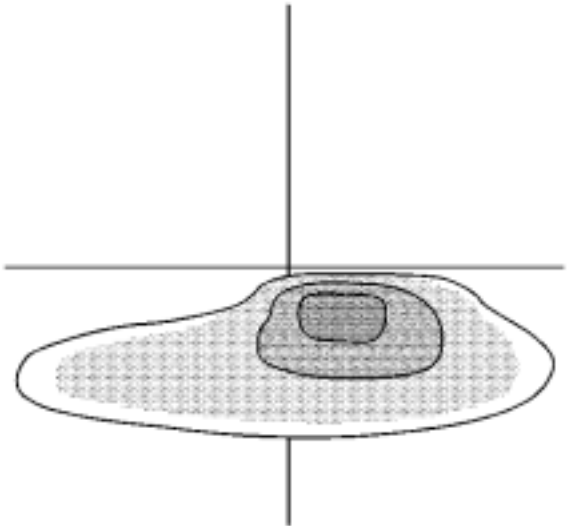
- The vehicle left tires must be aligned with the reference line extending from the screen with the headlamps aligned with the reference line.
- Do not load any cargo in the vehicle.
- The vehicle must contain approximately 75kg (165lb) on the driver seat.
- Inflate the tires to the proper pressure.
- Simulate the vehicle loads if the intended use of the vehicle is for hauling heavy loads or towing a trailer.
- Rock the vehicle in order to stabilize the suspension.
- Turn on the headlamps to low beam and observe the left and the top edges of the high intensity zone on the screen. The edges of the high intensity zone should fall within the specifications.

Headlamp Aiming Procedure

- Open the hood.

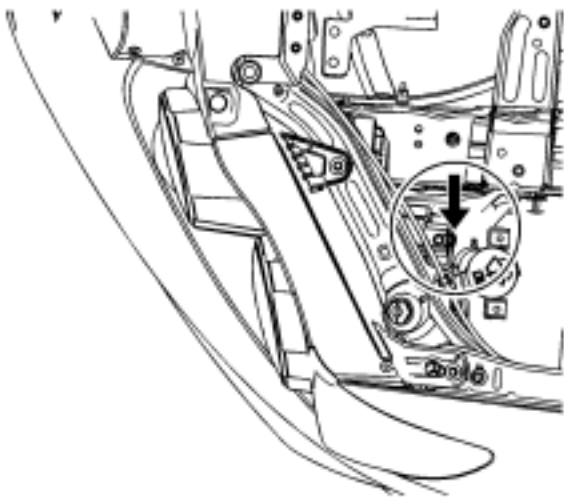


- Measure from the floor to the center of the headlamp bulb. Some headlamps have an aim dot marked on the headlamp lens.
- At the screen, measure from the floor and place the horizontal tape at the measured distance.
- Measure from the reference line on the floor to the left headlamp bulb centerline.
- At the screen, measure from the reference line and place the vertical tape at the measured distance.
- Measure from the reference line on the floor to the right headlamp bulb centerline.
- At the screen, measure from the reference line and place the vertical tape at the measured distance.



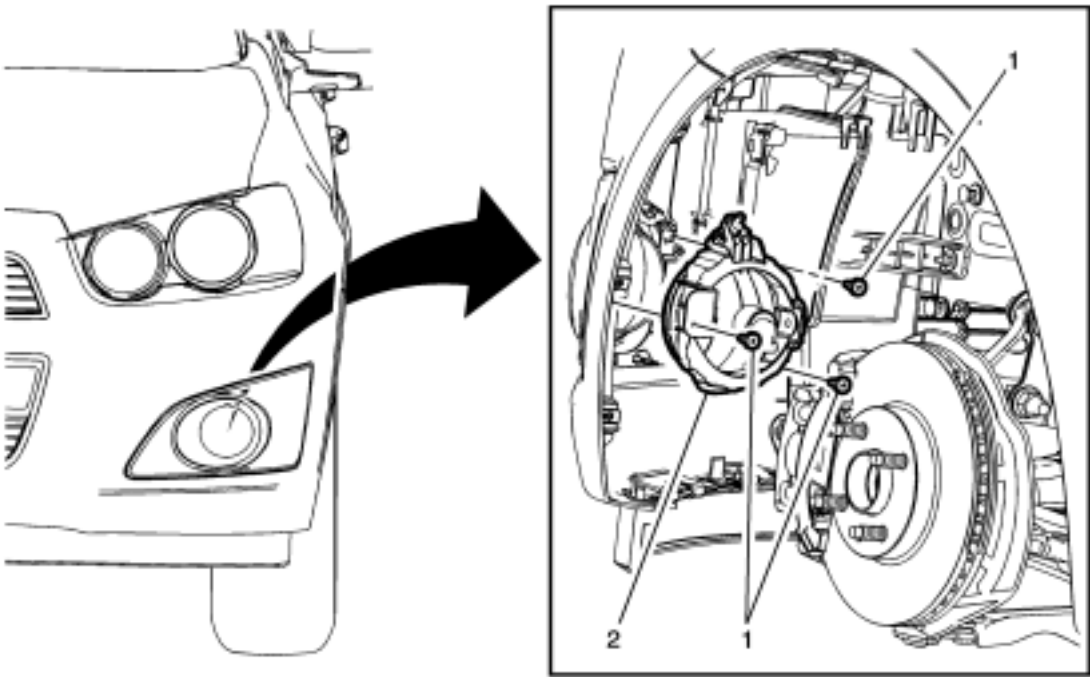
**Note:** DO NOT cover the headlamp. This may cause excessive heat build up.

8. Turn ON the low beam headlamps. Block the light from projecting onto the screen from the passenger side headlamp.



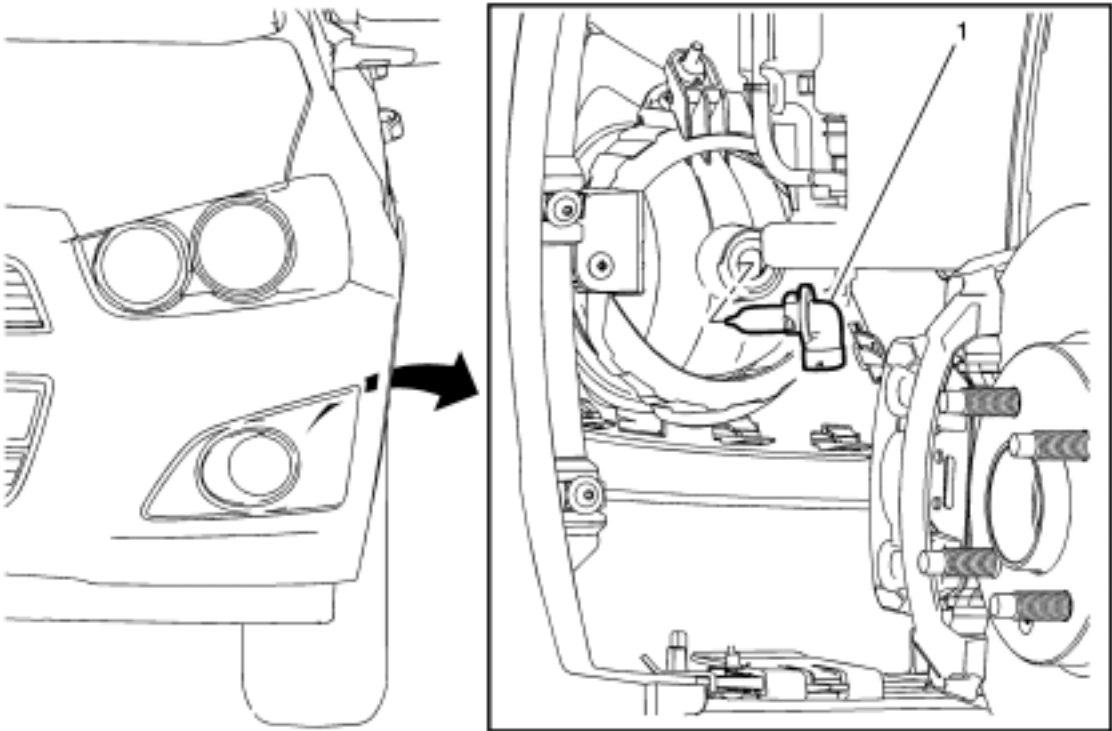
9. Adjust the vertical aim screw ( as shown by the arrow ) of the headlamps to the specifications required by the state and the local authorities, or as shown in step number 8.
10. Repeat the aiming procedure for the passenger side headlamp while blocking the light from projecting onto the screen from the driver side headlamp.
11. Turn the headlamps OFF.
12. Close the hood.

Front Fog Lamp Replacement



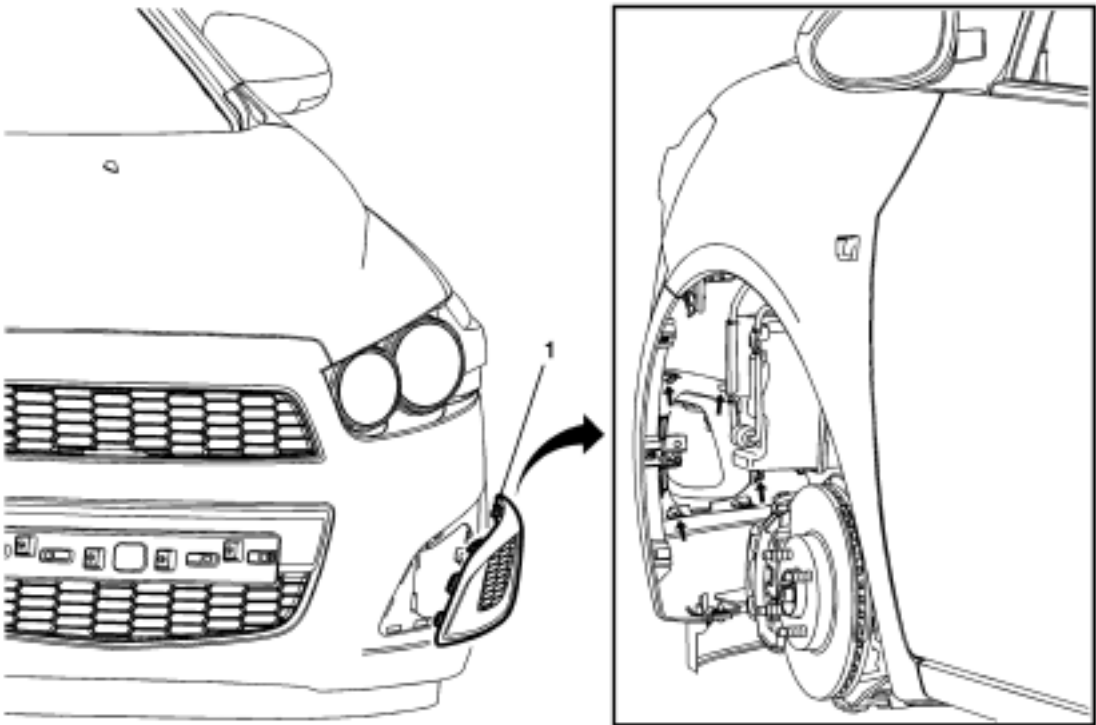
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove either the right front or left front wheelhouse liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p> <p>2. Disconnect the electrical connector from the fog lamp bulb socket.</p>	
1	<p>Front Fog Lamp Screw (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p>Remove the three fog lamp mounting screws from the front bumper fascia.</p>
2	<p>Front Fog Lamp</p> <p><b>Procedure</b></p> <p>Aim the front fog lamps after replacement. Refer to <a href="#">Fog Lamp Aiming</a> .</p>

Front Fog Lamp Bulb Replacement



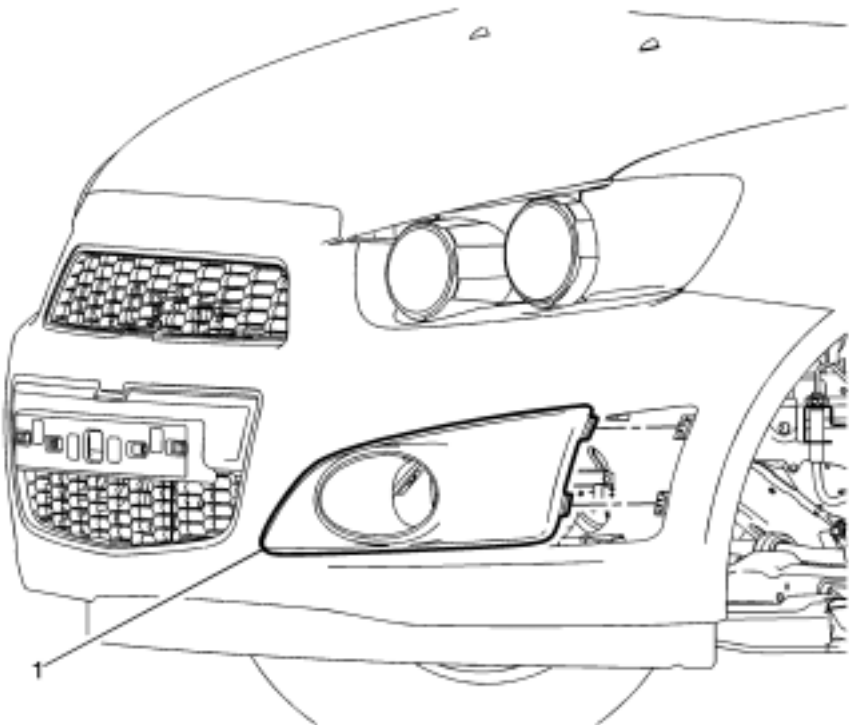
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove either the left front or right front wheelhouse liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p> <p>2. Disconnect the electrical connector to the fog lamp bulb.</p>	
1	<p>Front Fog Lamp Bulb</p> <p><b>Warning:</b> Refer to <a href="#">Halogen Bulb Warning</a> .</p> <p>Turn the fog lamp bulb socket counter-clockwise and remove from the fog lamp housing.</p>

Front Fog Lamp Cover Replacement (Without T3U)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front wheelhouse liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p>	
1	<p>Front Fog Lamp Front Cover</p> <p><b>Procedure</b></p> <p>Release the tabs securing the front fog lamp front cover to the front bumper fascia and remove.</p>

Front Fog Lamp Cover Replacement (With T3U)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front wheelhouse liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p>	
1	<p>Front Fog Lamp Front Cover</p> <p><b>Procedure</b></p> <p>Release the tabs securing the front fog lamp front cover to the front bumper fascia and remove.</p>



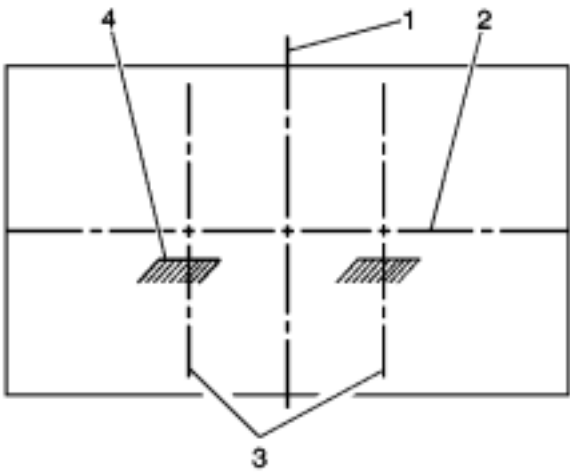
## Fog Lamp Aiming

### Preparation Procedure

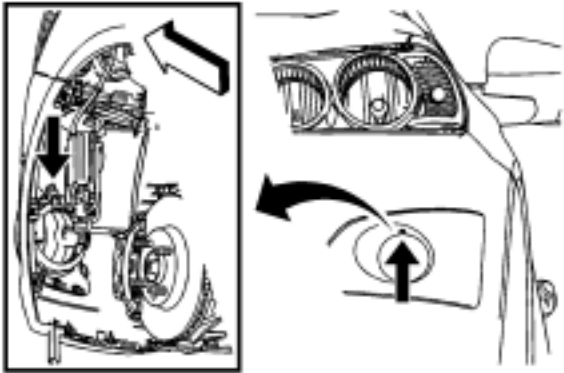
**Note:** Horizontal aim is not adjustable on this vehicle. Vertical aim is done by an adjusting nut located on the rear of the fog lamp. Prior to aiming the fog lamps, perform the following steps:

1. Completely assemble all of the components on the vehicle.
2. Place the vehicle on a level surface.
3. Stop all unnecessary operations or work that could affect the ride height of the vehicle.
4. Close the doors and verify that the luggage compartment is empty.
5. Stabilize the suspension by rocking the vehicle sideways.
6. Ensure that the fuel level is full.
7. Ensure that the tires are inflated to the proper pressure.
8. Ensure that the driver or a similar weight , approximately 75kg (165lb), is in the vehicle driver seat.

### Aiming Procedure

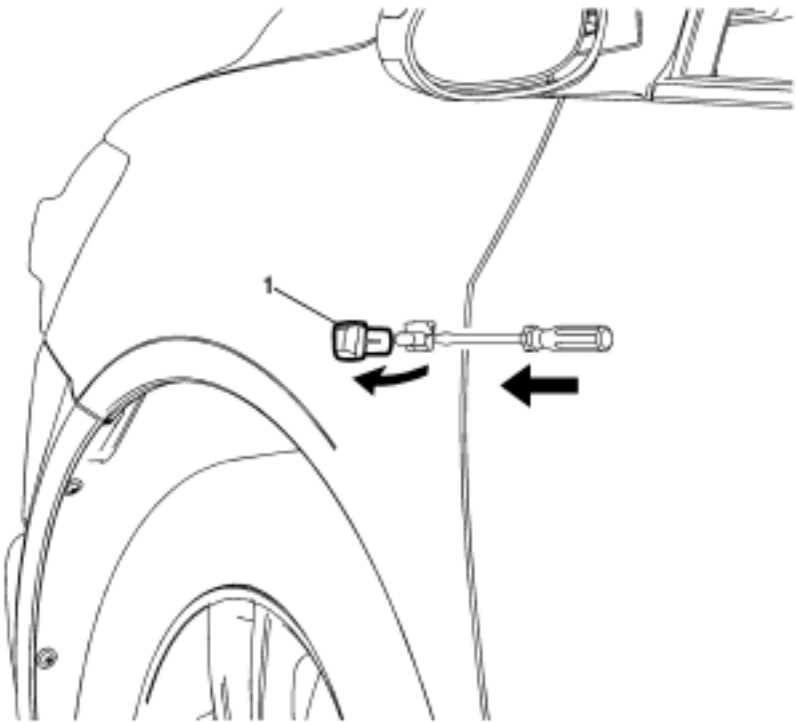


1. Park the vehicle 7.6 m (25ft) away from the target screen.
2. Measure from the center of the fog lamp to the ground line. Using this measurement, mark the horizontal centerline(2) of the fog lamp on the target screen directly in front of the vehicle.
3. Turn ON the fog lamps. The top of the fog lamp beam image(4) on the target screen should be 102mm (4 in) below the center of the fog lamp lens height.



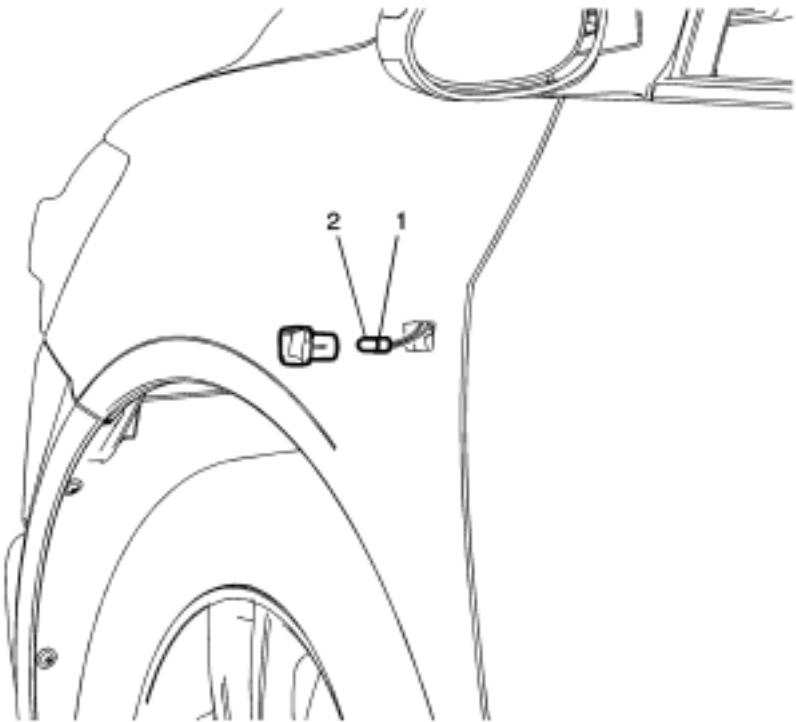
4. Adjust the fog lamp as required using the adjusting screw above the projector lens on the outside of the front bumper fascia.
5. Turn OFF the fog lamps.

Front Side Turn Signal Lamp Replacement



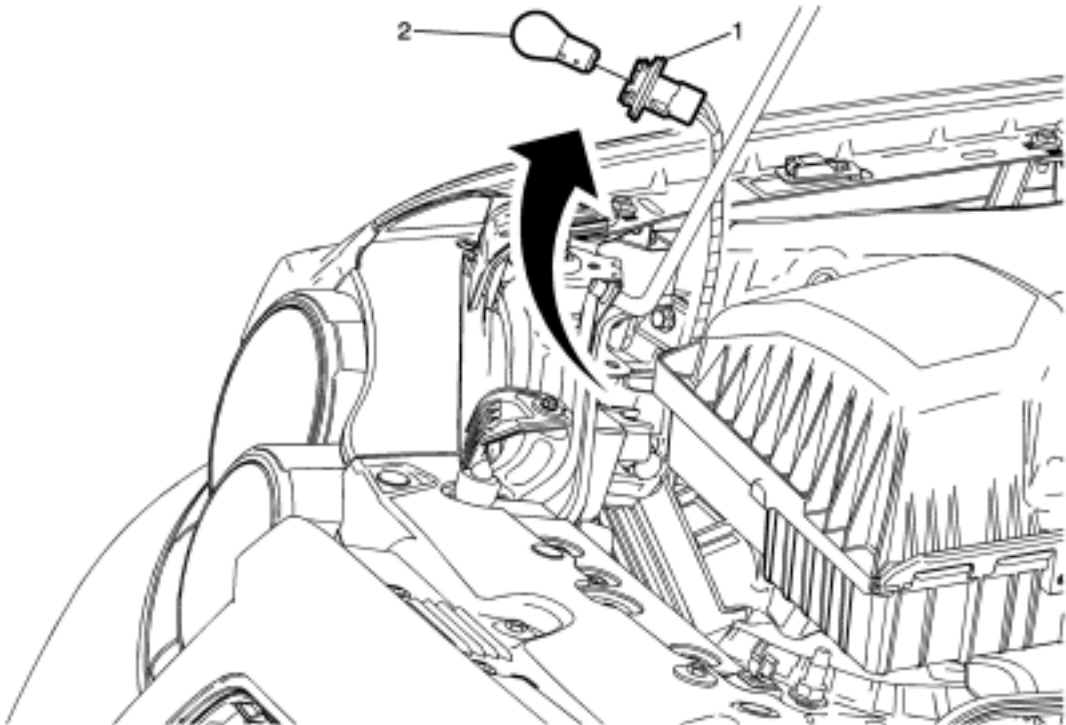
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p><b>Caution:</b> Refer to <a href="#">Exterior Trim Emblem Removal Caution</a> .</p> <ol style="list-style-type: none"><li>1. Apply a layer of masking tape around the turn signal lamp being serviced.</li><li>2. Using a small flat-bladed tool, depress the rear edge of the left hand lamp or the front edge of the right hand lamp in order to rotate the lamp from the opening in the fender.</li><li>3. Rotate forward the lamp housing from the fender opening.</li><li>4. Rotate the electrical bulb socket counter-clockwise and remove from the housing.</li></ol>	
1	<p>Front Side Turn Signal Lamp Assembly</p> <p><b>Tip</b> Remove the masking tape from the fender after the lamp has been removed.</p>

Front Side Turn Signal Lamp Bulb Replacement



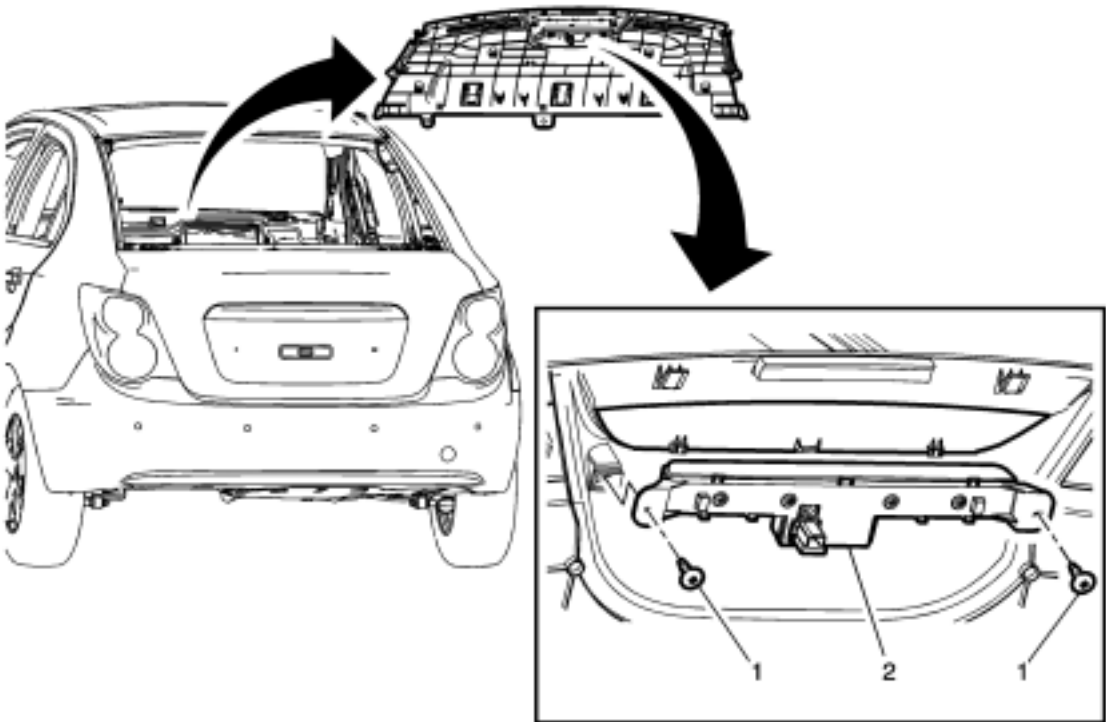
Callout	Component Name
<b>Preliminary Procedure</b> Remove the front side turn signal lamp. Refer to <a href="#">Front Side Turn Signal Lamp Replacement</a> .	
1	Front Side Turn Signal Lamp Socket
2	Front Side Turn Signal Lamp Bulb <b>Procedure</b> Hold the bulb socket and pull the turn signal lamp bulb straight from the bulb socket.

Parking and Turn Signal Lamp Bulb Replacement



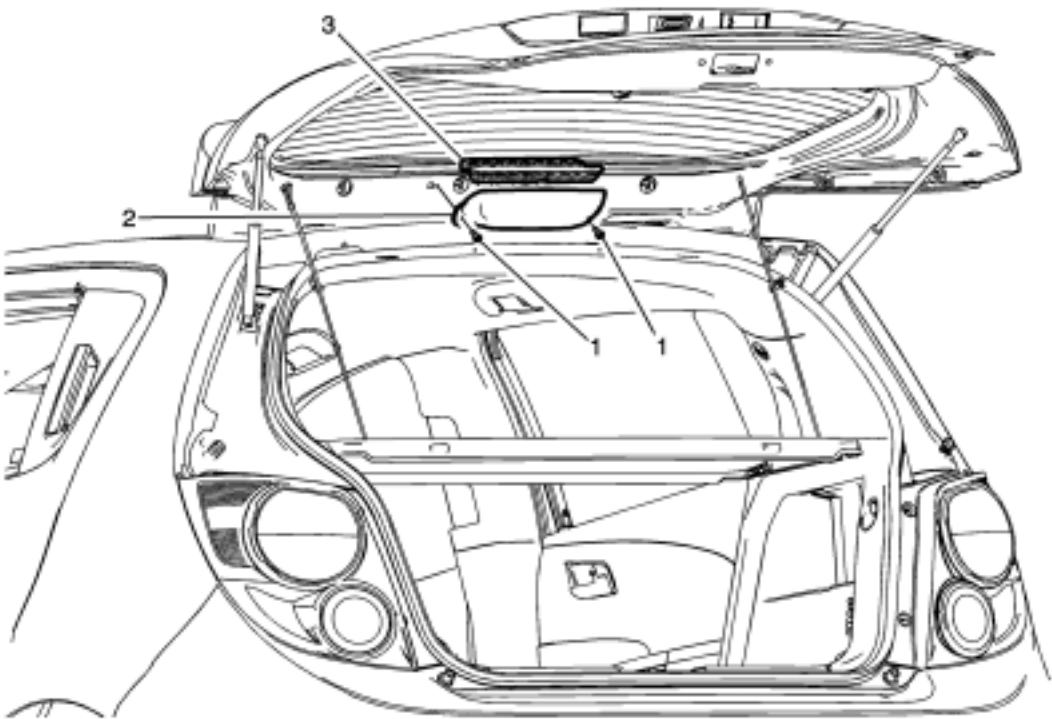
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Open and support the hood assembly.</p> <p>2. Reposition the air cleaner inlet duct on the passenger side of the engine compartment.</p> <p>3. Remove the low beam accessory bulb cover in order to access the front parking and turn signal lamp bulb socket.</p>	
1	<p>Parking and Turn Signal Lamp Bulb Socket</p> <p><b>Procedure</b></p> <p>Rotate the bulb socket counter-clockwise and remove from the headlamp housing.</p>
2	<p>Parking and Turn Signal Lamp Bulb</p> <p><b>Procedure</b></p> <p>Push inward and rotate the parking and turn signal bulb counter-clockwise in order to remove.</p>

High Mount Stop Lamp Replacement (Sedan)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the rear window panel trim. Refer to <a href="#">Rear Window Panel Trim Replacement</a> .</p> <p>2. Place the rear window panel trim face down on a clean protected surface to access and remove the high mount stop lamp screws.</p>	
1	<p>High Mount Stop Lamp Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>High Mount Stop Lamp</p> <p><b>Tip</b> The high mount stop lamp is (LED) Light Emitting Diode and is serviced as an assembly.</p>

High Mount Stop Lamp Replacement (Hatchback)



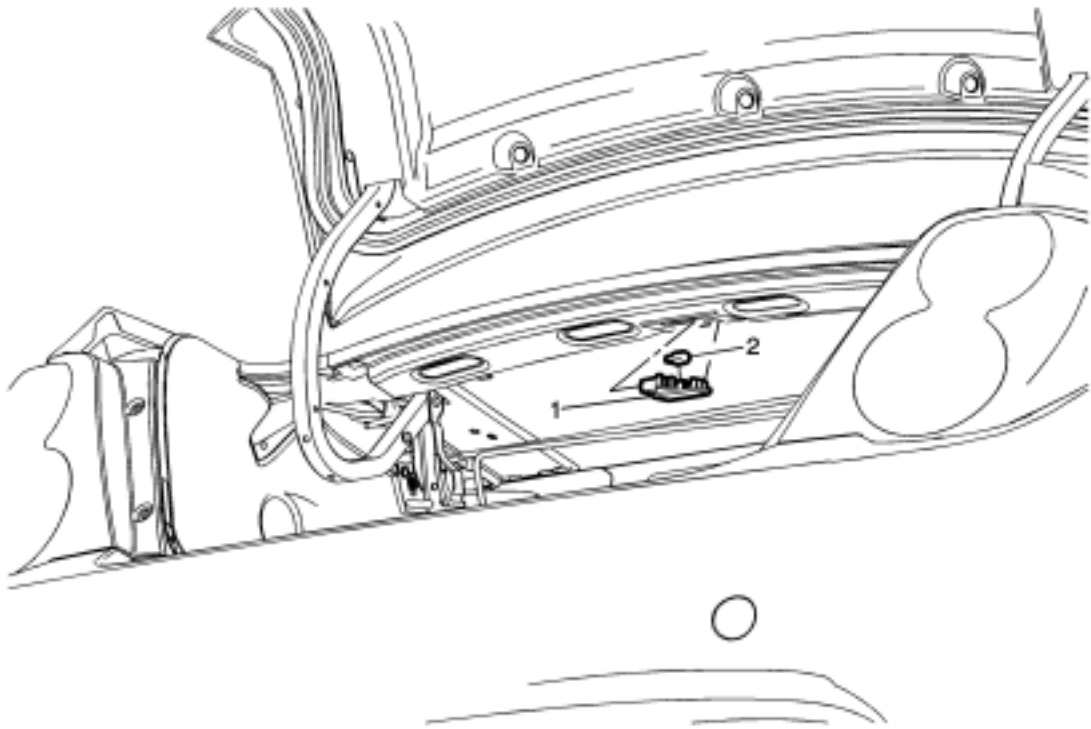
Callout	Component Name
<b>Preliminary Procedure</b> Open and support the liftgate assembly.	
1	High Mount Stop Lamp Bolt (Qty: 2)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 2.5 N·m (22 lb in)
2	High Mount Stop Lamp Cover  <b>Procedure</b> Remove the cover and the four screws from the high mount stop lamp.
3	High Mount Stop Lamp Assembly  <b>Procedure</b> Release the electrical connector and (LED) Light Emitted Diode lamp from the cover.

Cargo Center Courtesy Lamp Bulb Replacement (Hatchback)



Callout	Component Name
1	Rear Compartment Courtesy Lamp Refer to <a href="#">Rear Compartment Courtesy Lamp Replacement</a>
2	Cargo Lamp Bulb

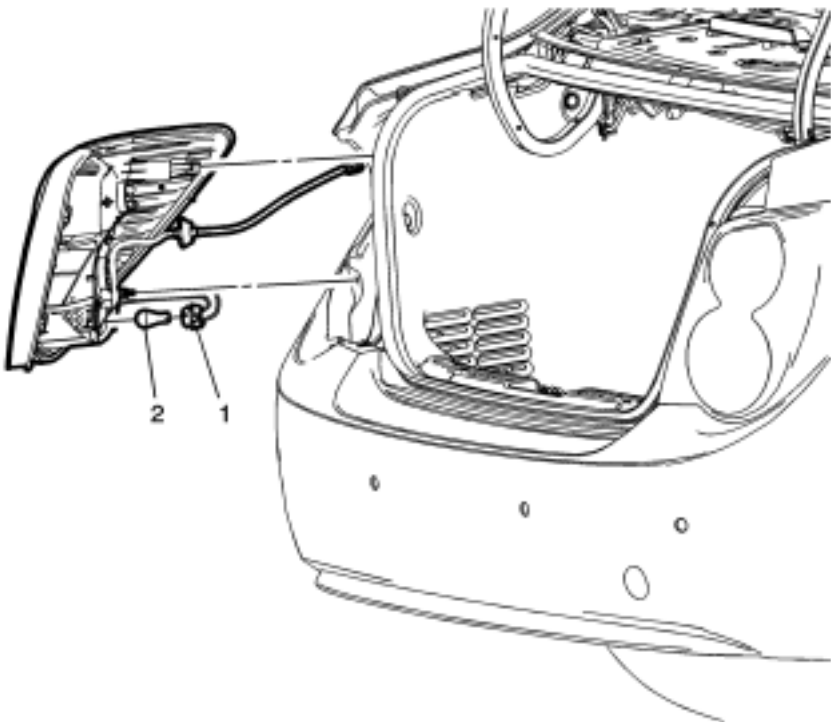
Cargo Center Courtesy Lamp Bulb Replacement (Sedan)



Callout	Component Name
1	Rear Compartment Courtesy Lamp Refer to <a href="#">Rear Compartment Courtesy Lamp Replacement</a>
2	Cargo Lamp Bulb

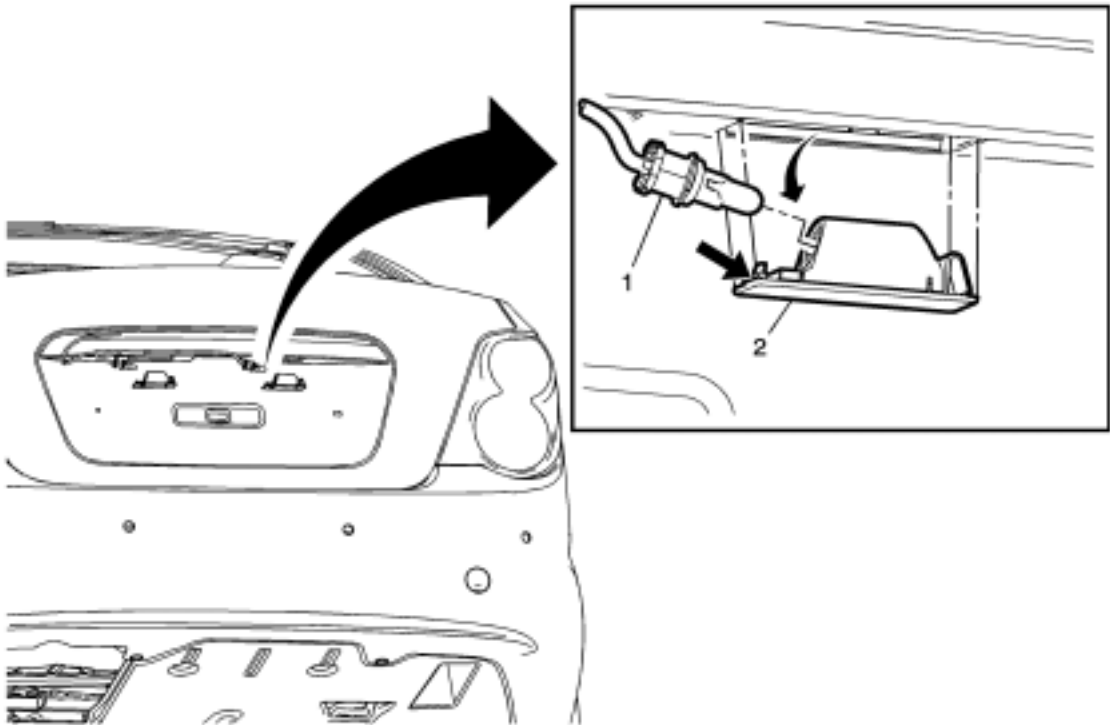


Backup Lamp Bulb Replacement (Sedan)



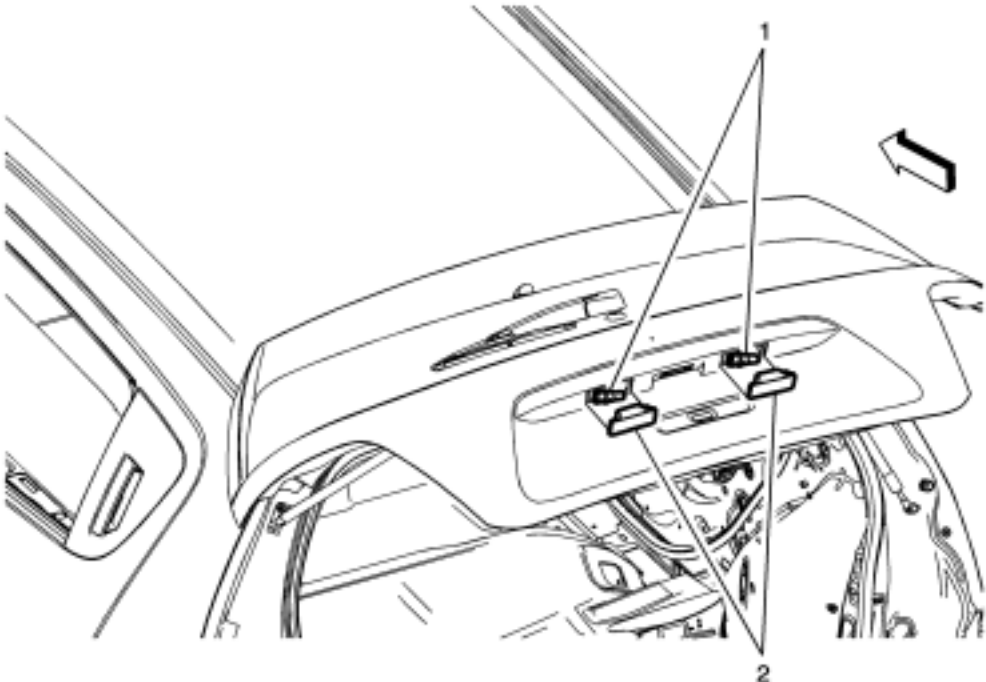
Callout	Component Name
<b>Preliminary Procedure</b> Remove the tail lamp assembly. Refer to <a href="#">Tail Lamp Replacement</a> .	
1	Back Up Lamp Bulb Socket  <b>Procedure</b> Rotate the back up lamp bulb socket counter-clockwise and remove from the tail lamp housing.
2	Back Up Lamp Bulb  <b>Procedure</b> Push inward while rotating counter-clockwise on the bulb and remove from the lamp socket.

Rear License Plate Lamp Replacement (Sedan)



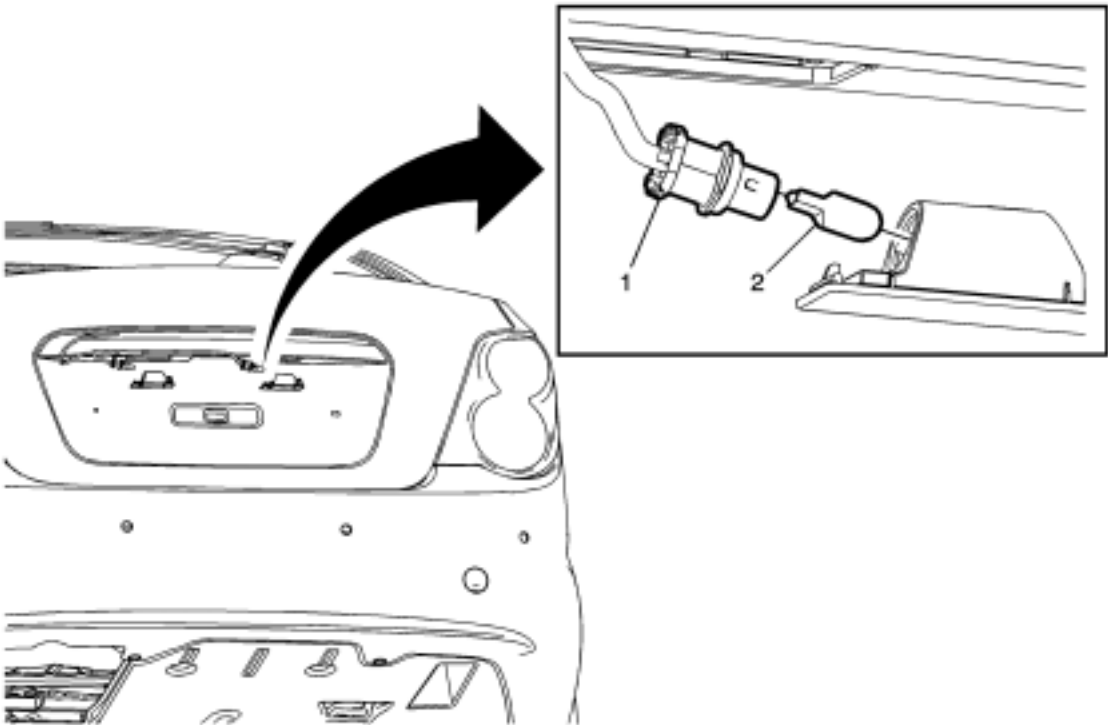
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Insert a small flat-blade at the arrow location at the lamp housing edge.</p> <p>2. Push inward slightly and rotate downward.</p> <p>3. Pull the housing down far enough to access the lamp socket and electrical harness.</p>	
1	<p>Rear License Plate Lamp Socket</p> <p><b>Procedure</b></p> <p>Rotate the lamp socket a quarter turn and remove.</p>
2	<p>Rear License Plate Lamp</p>

Rear License Plate Lamp Replacement (Hatchback)



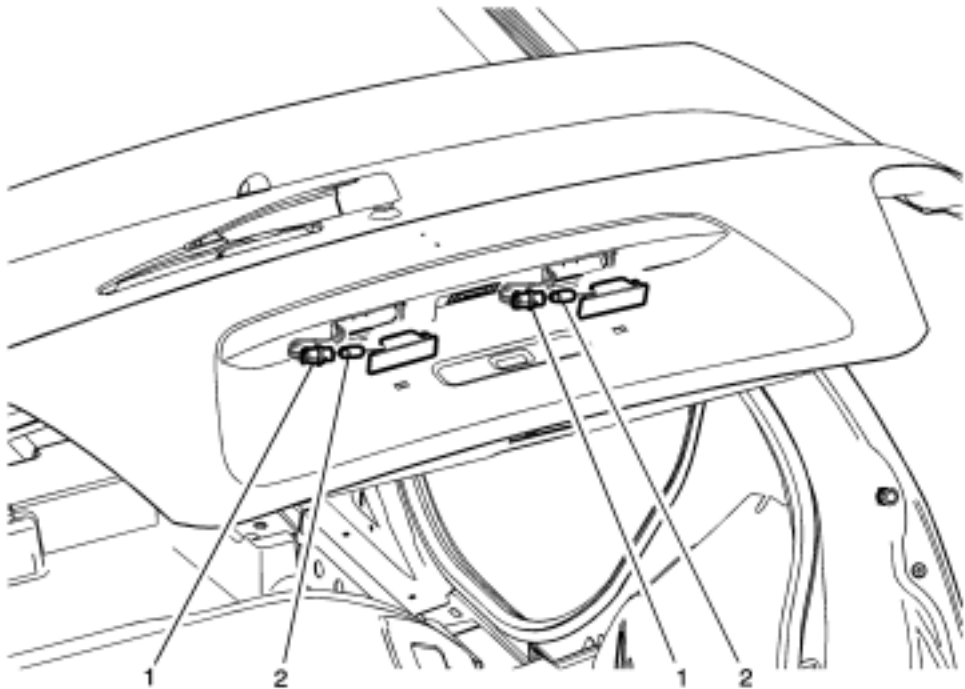
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Open and support the lift gate assembly.</p> <p>2. At the left side of the lamp, insert a small flat-blade into the lamp housing edge and push slightly sideways to disengage the lamp housing from the rear applique.</p> <p>3. Pull and rotate the housing downward far enough to remove and access the lamp socket and electrical harness.</p>	
1	<p>Rear License Plate Lamp Socket</p> <p><b>Procedure</b></p> <p>Rotate the lamp socket counter-clockwise and remove from the lamp housing.</p>
2	<p>Rear License Plate Lamp</p>

Rear License Plate Lamp Bulb Replacement (Sedan)



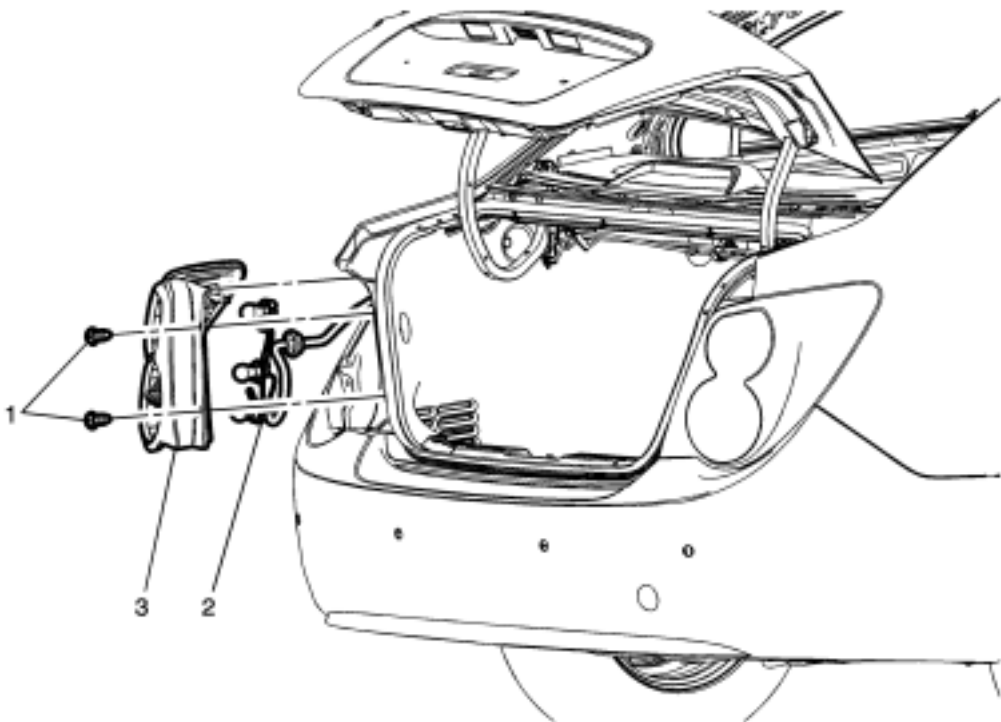
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear license plate lamp housing. Refer to <a href="#">Rear License Plate Lamp Replacement</a> .</p>	
1	License Plate Lamp Socket
2	<p>License Plate Lamp Bulb</p> <p><b>Tip</b> Pull the bulb straight out of the lamp socket.</p>

Rear License Plate Lamp Bulb Replacement (Hatchback)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear license plate lamp housing. Refer to <a href="#">Rear License Plate Lamp Replacement</a> .</p>	
1	<p>License Plate Lamp Socket</p> <p><b>Procedure</b></p> <p>Rotate the electrical lamp socket a quarter turn counter-clockwise and remove from the lamp housing.</p>
2	<p>License Plate Lamp Bulb</p> <p><b>Procedure</b></p> <p>Pull the bulb straight out of the electrical lamp socket.</p>

Tail Lamp Replacement (Sedan)



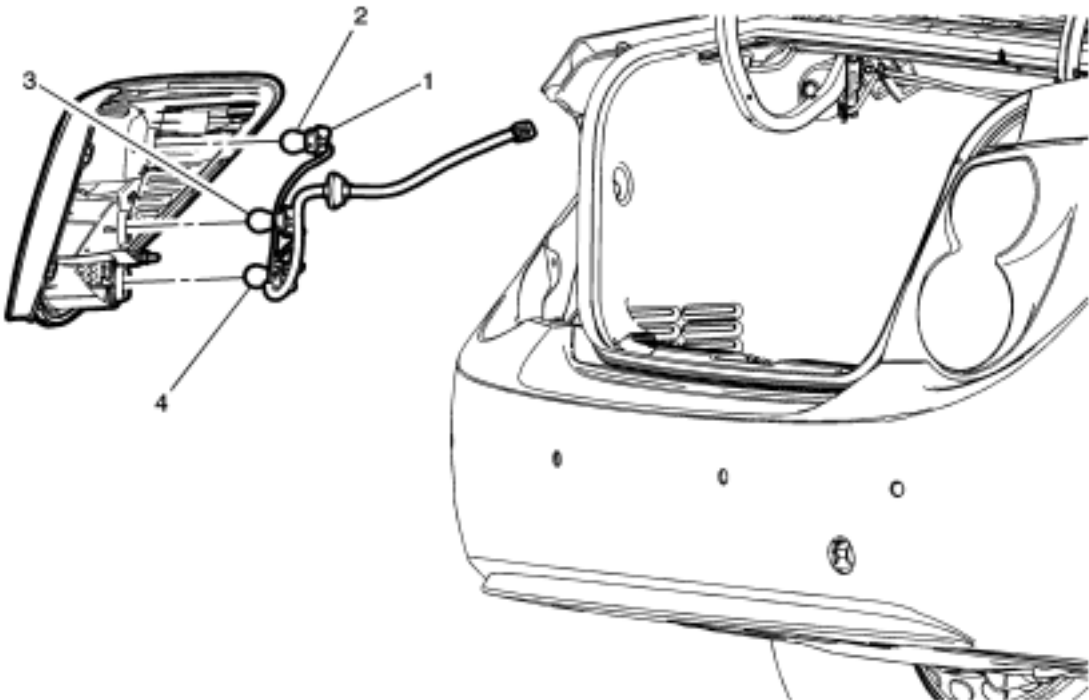
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Open and secure the rear compartment lid.</p>	
1	<p>Tail Lamp Bolt/Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 2.5N·m (22lbin)</p>
2	<p>Tail Lamp Electrical Harness</p> <p><b>Procedure</b></p> <p>Remove all three tail lamp bulb sockets with bulbs.</p>
3	<p>Tail Lamp</p>

Tail Lamp Replacement (Hatchback)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Open and support the liftgate assembly.</p>	
1	<p>Tail Lamp Bolt/Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 2.5N·m (22lbin)</p>
2	<p>Tail Lamp Assembly</p> <p><b>Procedure</b></p> <p>1. Hold both sides of the tail lamp assembly and give a quick pull rearward in order to disengage the two locator pins from the bodyside outer panel.</p> <p>2. Rotate all three bulb sockets and remove from the tail lamp housing, being careful not to damage the exposed bulbs.</p> <p>3. Disengage the tail lamp bulb electrical harness from the retainer clips on the tail lamp housing.</p>

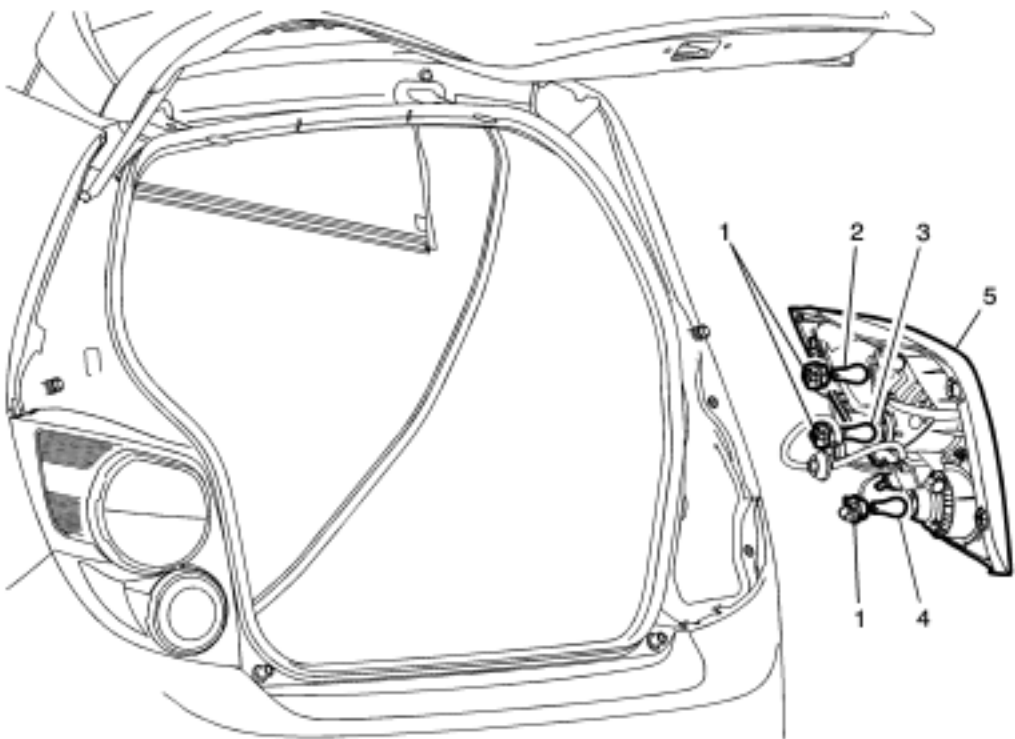
Stop and Turn Signal Lamp Bulb Replacement (Sedan)



Callout	Component Name
<b>Preliminary Procedure</b> Remove the tail lamp assembly. Refer to <a href="#">Tail Lamp Replacement</a> .	
1	<div>Tail Lamp Socket</div> <div><b>Procedure</b> Rotate the lamp socket counter-clockwise and remove the socket from the lamp housing.</div>
2	<div>Park and Stop Lamp Bulb</div> <div><b>Procedure</b> Push the bulb inward while rotating counter-clockwise to remove.</div>
3	Turn Signal Bulb
4	Back Up Bulb



Stop and Turn Signal Lamp Bulb Replacement (Hatchback)



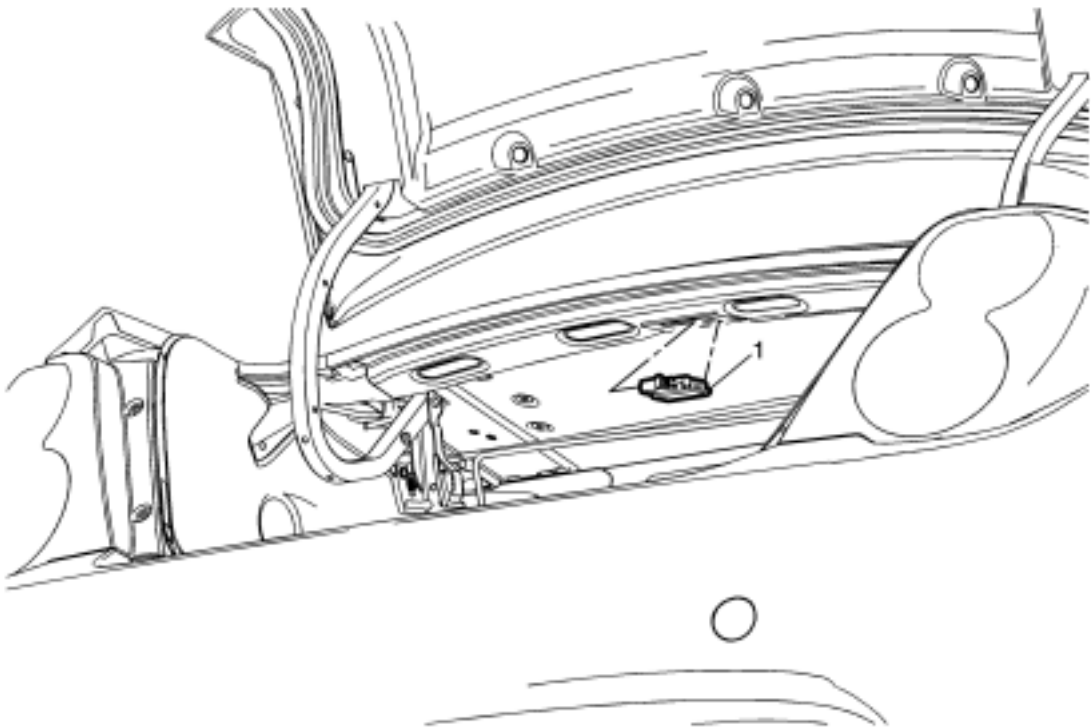
Callout	Component Name
<b>Preliminary Procedure</b> Remove the tail lamp assembly. Refer to <a href="#">Tail Lamp Replacement</a> .	
1	Tail Lamp Socket (Qty: 3)  <b>Procedure</b> Rotate the lamp socket counter-clockwise and remove the socket from the lamp housing.
2	Park and Stop Lamp Bulb  <b>Procedure</b> Pull the bulb straight from the lamp harness socket.
3	Turn Signal Bulb
4	Back Up Bulb
5	Tail Lamp Housing Assembly

Rear Compartment Courtesy Lamp Replacement (Hatchback)



Callout	Component Name
1	<div>Rear Compartment Courtesy Lamp Assembly</div> <div><b>Procedure</b><div><div>1. Use the appropriate trim tool in order to release the lamp assembly from the rear quarter trim panel.</div><div>2. Disconnect the electrical connection.</div></div></div>

Rear Compartment Courtesy Lamp Replacement (Sedan)



Callout	Component Name
1	<div>Rear Compartment Courtesy Lamp Assembly</div> <div><b>Procedure</b><div><div>1. Use the appropriate trim tool in order to release the lamp assembly from the rear quarter trim panel.</div><div>2. Disconnect the electrical connection.</div></div></div>

## Exterior Lighting Systems Description and Operation

### Headlamps

The headlamps are controlled by the multifunction lever located on the left side of the steering column. The headlamps will only come on with the Ignition switch in the RUN position. Turning the headlamp switch to the first position turns ON the parking lamps, the license plate lamps and the instrument panel illumination. Turning the switch to the second position turns ON all of the previous lamps and the headlamps. Turning the switch to the OFF position turns OFF all the lamps.

Headlamp high beams and low beams are also controlled by this lever. When the headlamps are ON, pushing the lever away from the driver until the switch clicks changes the lamp from low beam to high beam. An indicator lamp on the instrument cluster assembly will come on when the high beam headlamps are ON. To return the headlamps to low beam, pull the lever toward the driver.

The headlamps must be aimed for proper illumination of the road. Headlamp aim should be checked whenever a new headlamp assembly is installed, or whenever service repairs to the front end area may have disturbed the headlamp assembly or its mountings.

### Daytime Running Lamps

The daytime running lamps (DRL) will come ON when:

- The ignition is ON.
- The light is OFF.
- The parking brake is released.

When the exterior lights are ON, the DRL will turn OFF. To turn the DRL OFF when idling, apply the parking brake.

### Parking and Turn Signal Lamps

The parking lamps can be turned on by turning the lighting switch to the first position. The parking lamps can be turned off by turning the switch to the OFF position.

When the turn signals are activated, the front and rear turn signal lamps flash to signal a turn. The turn signals work only when the ignition is ON.

The turn signals are controlled by the light switch on the left side of the steering column. Moving the lever all the way up or down, past the detent, will turn ON the front and rear turn signals. When the turn is completed, the lever will return to horizontal and the turn signals will stop flashing.

For changing lanes, or for shallow turns in which the steering wheel does not turn far enough to cancel the signal, move the signal lever only to the first detent and hold it there. When the lever is released, it will return to horizontal and the turn signals will cancel.

### Side Marker Lamps

For the North American application, the side marker lamps are located in the front and rear bumper fascias and work in conjunction with the exterior lighting system. When the parking lamps or headlamps are turned on, the side marker lamps will illuminate to mark the front and the rear end of the vehicle.

### Fog Lamps

The fog lamp switch is on the instrument panel to the right of the steering column. To use the fog lamps, first turn on the headlamps or the parking lamps, then push the fog lamp switch. The indicator light in the switch will illuminate to indicate that the fog lamps are on. Push the switch again to turn OFF the fog lamps. The indicator light will then go OFF.

The fog lamps should not be used as a substitute for the headlamps.

The fog lamps must be aimed for proper illumination of the road. Fog lamp aim should be checked when a new bulb is installed or if service or repairs in the front end area may have disturbed the fog lamp mountings.

### Rear Combination Lamps

The tail lamps, stop lamps, turn signal lamps and backup lamp are one assembly.

Turning on either the headlamps or the parking lamps will also turn ON the tail lamps. When the brake pedal is pushed, the tail lamps will glow brighter to serve as stop lamps.

The center high-mounted stop lamp is located in the rear window and will come on when the brake pedal is pressed.

### Backup Lamps

The backup lamps are located in the rear combination lamps. They will come on when the transaxle is shifted into reverse. On a vehicle with an automatic transaxle, the backup lamps are activated by the neutral safety backup (NSBU) switch. On a vehicle with a manual transaxle, they are activated by a reverse switch which is part of the transaxle.

### License Plate Lamp

The license plate lamps will come ON when the headlamps or the parking lamps are ON. The license plate lamps are mounted above the license plate.

### Lamp Control Module

The automatic lighting Off feature turns off the headlamps, park lamps, tail lamps, license plate lamps and instrument panel illumination within seconds of closing the driver's door. The feature activates if you leave the headlamp switch in the first or second position, remove the key, and get out of the car.



## Interior Lighting Systems Description and Operation

### Interior Courtesy Lamp

The courtesy lamp is located on the headliner just behind the front seats. The lamp switch has 3 positions. If the switch is left in the center position, the lamp will go ON whenever a door is opened and go OFF when it is closed. In the ON position, the lamp will stay ON until it is turned OFF. In the OFF position, the lamp will not come ON, even when a door is opened.

### Luggage Compartment Lamp

The luggage compartment lamp is located under the deck lid sill plate on the notchback. The lamp is located on the left-side wheelhouse trim panel on the hatchback. It will come ON whenever the luggage compartment is opened.





Specifications	Outside Rearview Mirror Motor Replacement
Outside Rearview Mirror Replacement (Power)	Outside Rearview Mirror Glass Replacement
Outside Rearview Mirror Replacement (Manual)	Outside Rearview Mirror Housing Replacement
Outside Rearview Mirror Housing Rear Cover Replacement	Inside Rearview Mirror Replacement
Outside Remote Control Rearview Mirror Switch Replacement	Description and Operation



Fastener Tightening Specifications

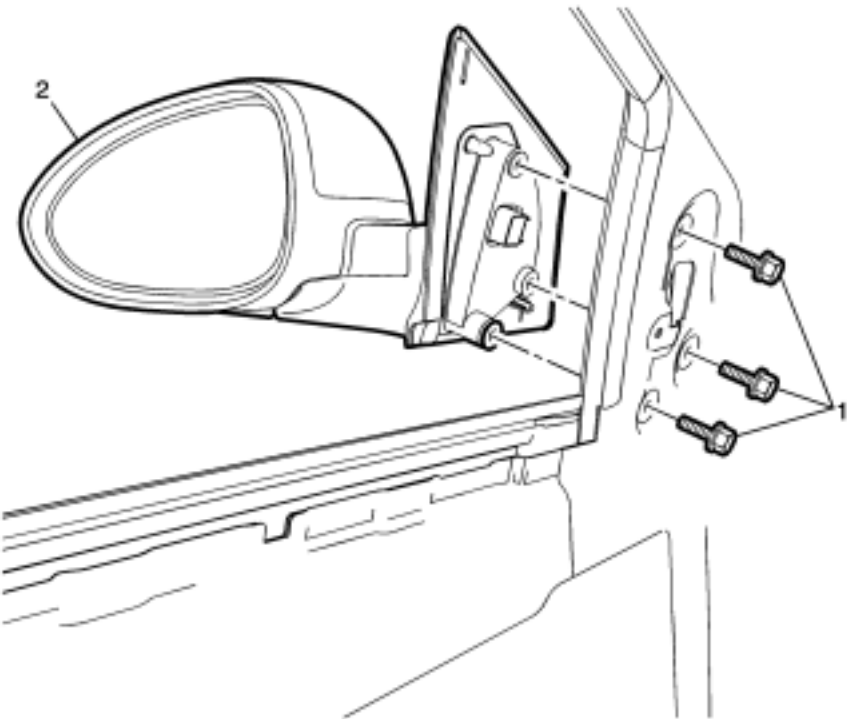
Application	Specification	
	Metric	English
Inside Rearview Mirror Fastener	2 N·m	18 lb in
Outside Rearview Mirror Motor Fastener	5 N·m	44 lb in
Outside Rearview Mirror Fastener	10 N·m	89 lb in

Adhesives, Fluids, Lubricants, and Sealers

Application	Type of Material	GM Part Number
Inside Mirror Adhesive Kit	Adhesive	Refer to Electronic Parts Catalog

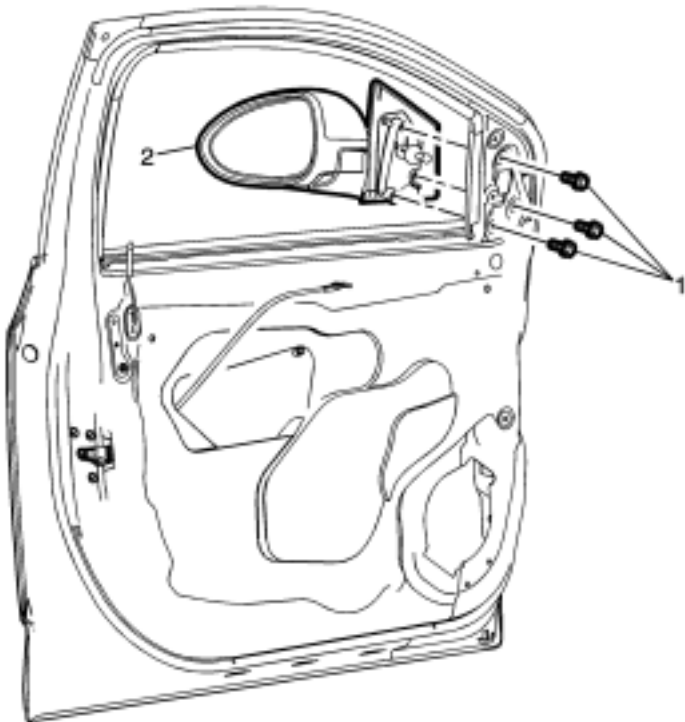


Outside Rearview Mirror Replacement (Power)



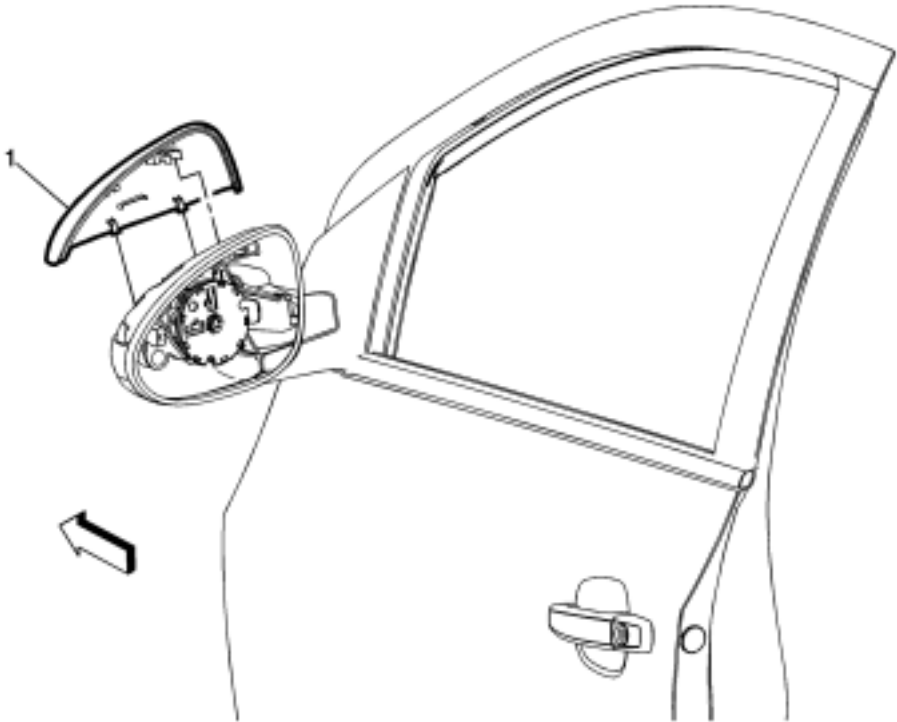
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the front side door upper front trim panel. Refer to <a href="#">Front Side Door Upper Front Trim Panel Replacement</a> .</p> <p>2. Remove the outside rearview mirror bolt access hole on the front side door trim panel.</p>	
1	<p>Outside Rearview Mirror Fastener (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connector.</p> <p><b>Tighten</b> 10 N·m (89 lbin)</p>
2	<p>Outside Rearview Mirror</p> <p><b>Procedure</b></p> <p>Inspect the outside mirror for proper operation before installing the door trim panel.</p>

Outside Rearview Mirror Replacement ( Manual)



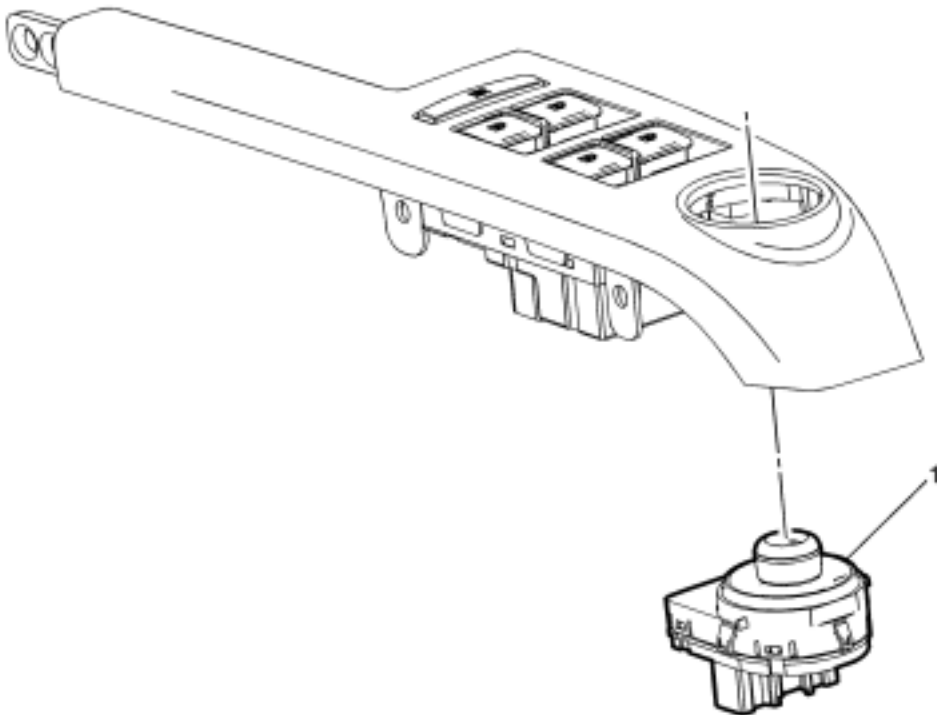
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the front side door upper front trim panel. Refer to <a href="#">Front Side Door Upper Front Trim Panel Replacement</a> .</p> <p>2. Remove the outside rearview mirror bolt access hole on the front side door trim panel.</p>	
1	<p>Outside Rearview Mirror Fastener (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 10 N·m (89 lbin)</p>
2	<p>Outside Rearview Mirror</p> <p><b>Procedure</b></p> <p>1. Transfer the outside rearview mirror knob.</p> <p>2. Inspect the outside mirror for proper operation before installing the door trim panel.</p>

Outside Rearview Mirror Housing Rear Cover Replacement



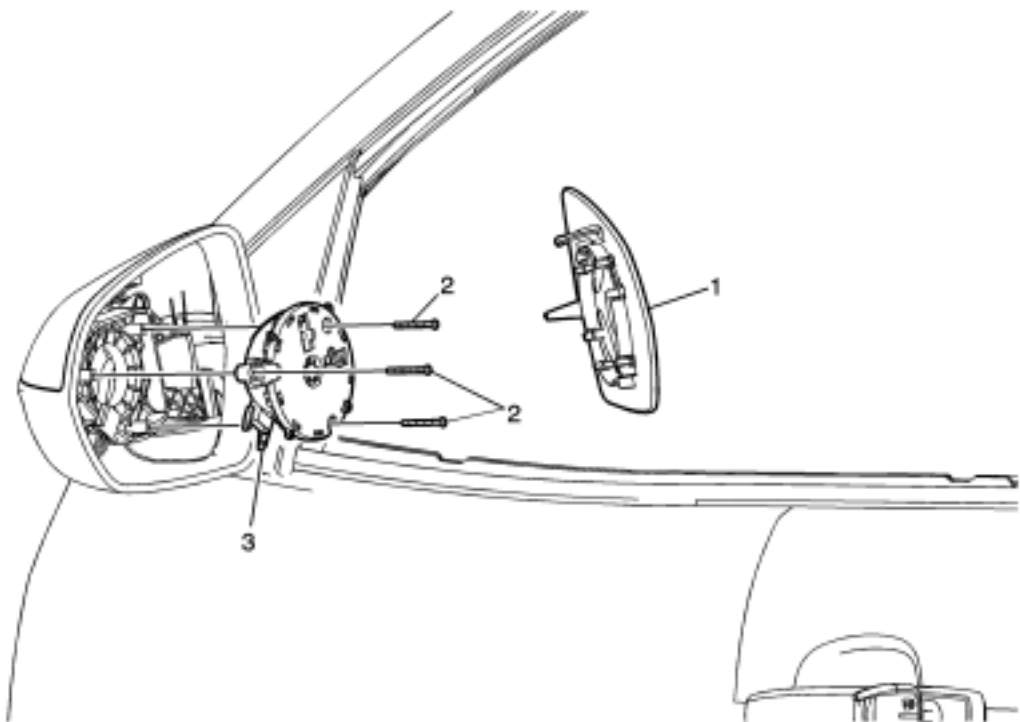
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the outside rearview mirror glass. Refer to <a href="#">Outside Rearview Mirror Glass Replacement</a> .</p>	
1	<p>Outside Rearview Mirror Housing Cover</p> <p><b>Tip</b></p> <p>1. After the mirror glass has been removed the retainers can be accessed to release.</p> <p>2. Align the housing cover with the slots in the mirror housing, push downward locking retainers in place.</p>

Outside Remote Control Rearview Mirror Switch Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door widow switch bezel. Refer to <a href="#">Front Side Door Window Switch Bezel Replacement</a> .</p>	
1	<p>Outside Remote Control Rearview Mirror Switch Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connector.</p> <p>2. Refer to <a href="#">Control Module References</a> for programming and set up procedures.</p>

Outside Rearview Mirror Motor Replacement



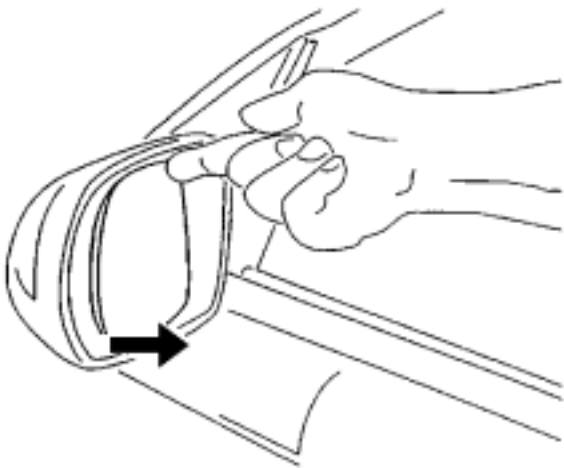
Callout	Component Name
1	<div>Outside Rearview Mirror Glass</div> <div><b>Procedure</b></div> <div>Remove the outside rearview mirror glass. Refer to <a href="#">Outside Rearview Mirror Glass Replacement</a> .</div>
2	<div>Outside Rearview Mirror Motor Fastener (Qty: 3)</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Procedure</b></div> <div>Disconnect the outside mirror motor electrical connector.</div> <div><b>Tighten</b> 5 N·m (44 lbin)</div>
3	<div>Outside Rearview Mirror Motor</div> <div><b>Procedure</b></div> <div>Inspect the outside mirror for proper operation before installing the door trim panel.</div>

## Outside Rearview Mirror Glass Replacement

### Removal Procedure

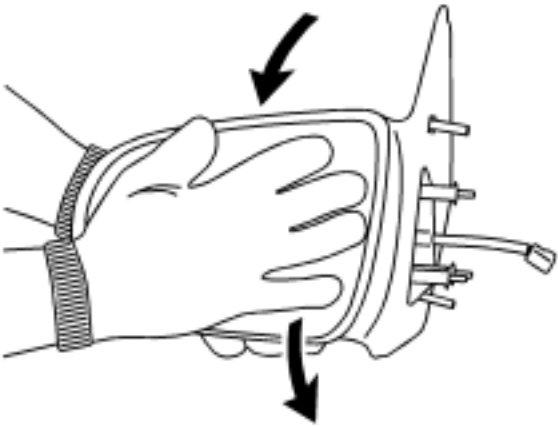
**Warning:** Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

1. Place masking tape over the mirror glass.



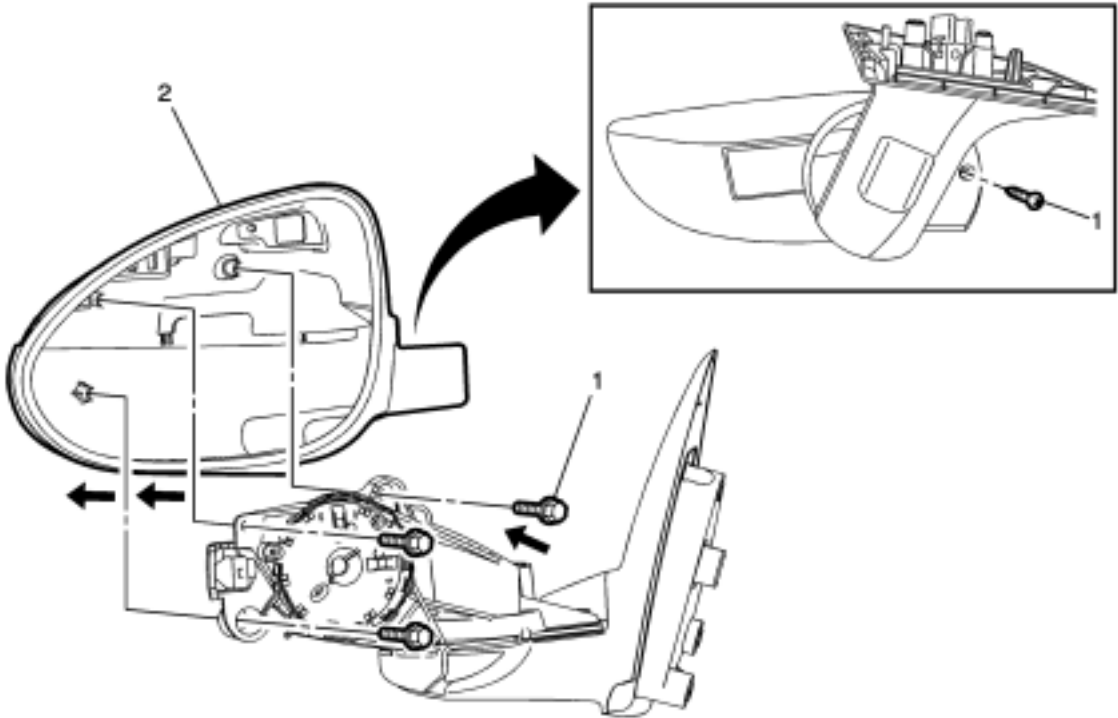
2. Carefully push the outside rearview mirror glass upward and into the right corner of the mirror housing, allowing access to the bottom edge.
3. Grasp the bottom edge of the mirror glass firmly, lift it up and pull rearward until the mirror glass releases the motor ring.

### Installation Procedure



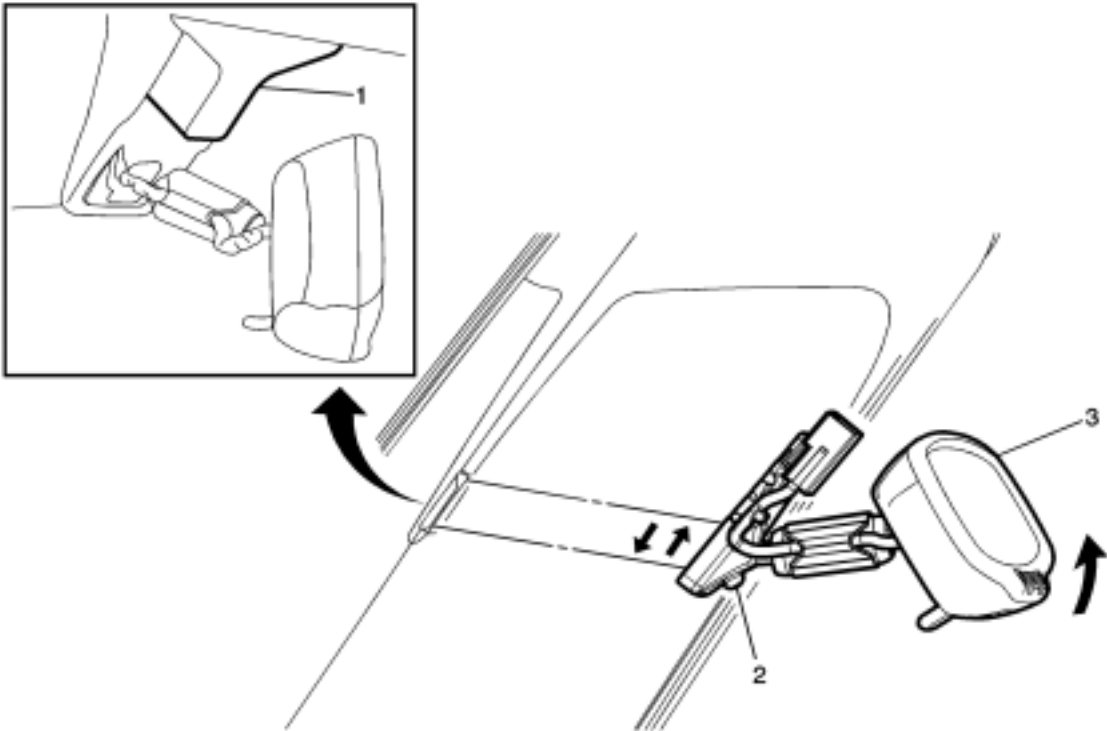
1. Place the mirror glass on the lower motor ring retainers.
2. Place one hand on the back of the mirror housing, using the flat palm of the other hand press inward locking the mirror glass to the motor ring.
3. Remove the masking tape from the mirror glass.
4. Inspect the outside mirror for proper operation before installing the door trim panel.

Outside Rearview Mirror Housing Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the outside rearview housing cover. Refer to <a href="#">Outside Rearview Mirror Housing Rear Cover Replacement</a> .</p> <p>2. Remove the outside rearview mirror motor. Refer to <a href="#">Outside Rearview Mirror Motor Replacement</a> .</p>	
1	<p>Outside Rearview Mirror Housing Fastener (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 5 N·m (44 lb in)</p>
2	<p>Outside Rearview Mirror Housing</p> <p><b>Procedure</b></p> <p>Inspect the outside mirror for proper operation before installing the door trim panel.</p>

Inside Rearview Mirror Replacement



Callout	Component Name
1	<div>Inside Rearview Mirror Cover</div> <div>Procedure</div> <div><div>1. Remove the wire harness cover, sliding the cover upward releasing the cover from the support.</div><div>2. Disconnected the connector from the mirror base.</div></div>
2	<div>Inside Rearview Mirror Screw</div> <div>Caution: Refer to <a href="#">Fastener Caution</a> .</div> <div>Procedure</div> <div><div>1. Adjust the mirror to the full upward position, loosen the screw at the base in order to remove the mirror from the button.</div><div>2. Slide the mirror in an upward motion in order to remove.</div></div> <div>Tighten 2N·m (18lbin)</div>
3	<div>Inside Rearview Mirror</div>





## Outside Mirror Description and Operation

### Power Mirror System Components

The power mirror system consists of the following components:

- Outside rearview mirror switch
- Mirror selector switch
- Driver outside rearview mirror
- Passenger outside rearview mirror

Each of the outside rearview mirror contains two motors. The vertical motor operates the mirror in the up and down directions, and the horizontal motor operates the mirror in the left and right directions.

### Power Mirror System Controls

The outside rearview mirror switch is a four position directional switch: Up, Down, Left and Right.

The mirror select switch is a three position switch: left, neutral/fold, and right.

### Power Mirror System Operation

The outside rearview mirror switch receives battery voltage from the underhood fuse block The power mirror switch also receives a constant ground.

The four positions of the direction switch have dual switch contacts. Each of the contacts are connected to opposing sides of the appropriate power mirror motors through the selector switch. The selector switch completes these circuits depending on the position of the selector switch, L or R.

If the selector switch is placed in the L position and the up switch is pressed, battery voltage will be supplied to the left outside rearview mirror vertical motor through the left mirror motor vertical control circuit and ground through the left mirror motor common control circuit. If the down switch is pressed, battery voltage will be supplied to the left outside rearview mirror vertical motor through the left mirror motor common control circuit and ground through the left mirror motor vertical control circuit.

The remainder of the mirror functions operate in the same manner as described above. Placing the power mirror switch in opposing positions, left/right or up/down, will reverse the polarity to the mirror motor, reversing the direction of movement.

### Folding Mirrors (If Equipped)

The folding mirror system is controlled through an electronic switch that can be activated when the mirror select switch is in the neutral position. When the mirror select switch is in the neutral position, the fold/retract function is activated by pressing the down arrow. The fold/retract switch will fold or retract the mirrors depending on their current state. When a power fold or retract function is activated, battery voltage is supplied to the fold motor by the appropriate fold or retract control circuit and the motor will be grounded by the opposite control circuit.

### Heated Mirrors (If Equipped)

The heated mirrors are controlled through the rear defog relay. Whenever the rear window defogger is turned on battery voltage is supplied to the mirror heater elements through the left and right mirror heater element control circuits.





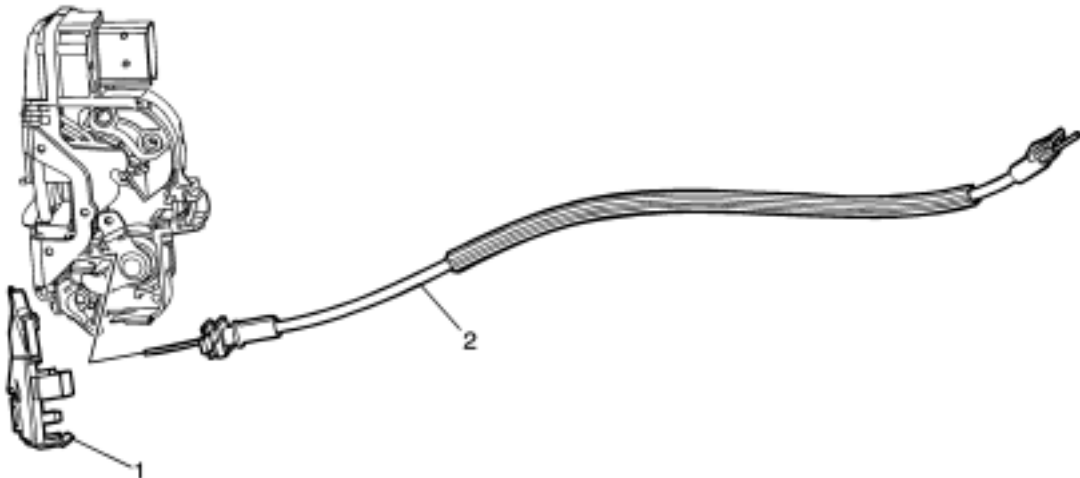
Specifications	Front Side Door Outside Handle Rod Adjustment
Front Side Door Inside Handle Cable Replacement	Front Side Door Outside Handle Rod Replacement
Rear Side Door Inside Handle Cable Replacement	Rear Side Door Locking Rod Replacement (Sedan)
Front Side Door Lock Cylinder Replacement	Rear Side Door Locking Rod Replacement (Hatchback)
Rear Door Lock Cylinder Replacement	Rear Side Door Locking Rod Bellcrank Replacement
Front Side Door Outside Handle Replacement	Rear Side Door Outside Handle Rod Adjustment
Front Side Door Outside Handle Bracket Replacement	Rear Side Door Outside Handle Rod Replacement (Sedan)
Rear Side Door Outside Handle Bracket Replacement	Rear Side Door Outside Handle Rod Replacement (Hatchback)
Liftgate Latch Replacement	Front Side Door Lock Striker Adjustment
Rear Side Door Outside Handle Replacement (Sedan)	Front Side Door Lock Striker Replacement
Rear Side Door Outside Handle Replacement (Hatchback)	Liftgate Latch Striker Replacement
Front Side Door Latch Replacement	Rear Compartment Lid Latch Striker Replacement
Rear Compartment Lid Latch Replacement	Rear Side Door Lock Striker Adjustment
Rear Side Door Latch Replacement	Rear Side Door Lock Striker Replacement
Front Side Door Lock Cylinder Opening Cover Replacement	Liftgate Release Switch Replacement
Rear Side Door Lock Cylinder Opening Cover Replacement	Door Lock Switch Replacement
Front Side Door Locking Rod Replacement	Description and Operation
Front Side Door Lock Cylinder Rod Replacement	



Fastener Tightening Specifications

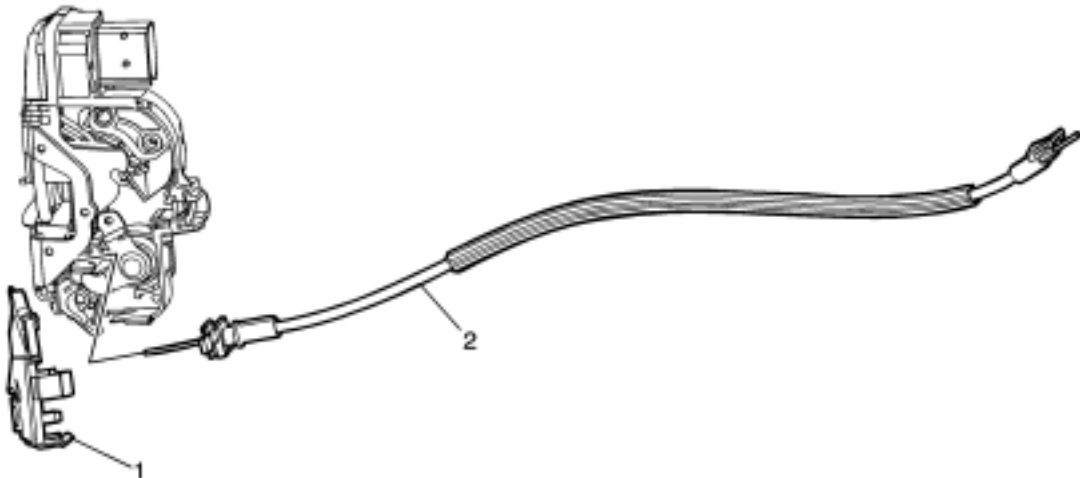
Application	Specification	
	Metric	English
Front Side Door Lock Cylinder Clamp Screw	5 N·m	44 lb in
Front Side Door Lock Screws	10 N·m	89 lb in
Front Side Door Outside Handle Bracket Screw	5 N·m	44 lb in
Front Side Door Striker Screws	22 N·m	16 lb ft
Liftgate Latch Screws	9 N·m	80 lb in
Liftgate Latch Striker Bolts	22 N·m	16 lb ft
Rear Compartment Lid Latch Screw	9 N·m	80 lb in
Rear Compartment Lid Latch Striker Bolts	22 N·m	16 lb ft
Rear Side Door Lock Cylinder Clamp Screw	5 N·m	44 lb in
Rear Side Door Lock Screws	10 N·m	89 lb in
Rear Side Door Outside Handle Bracket Screw	5 N·m	44 lb in
Rear Side Door Striker Screws	22 N·m	16 lb ft

Front Side Door Inside Handle Cable Replacement



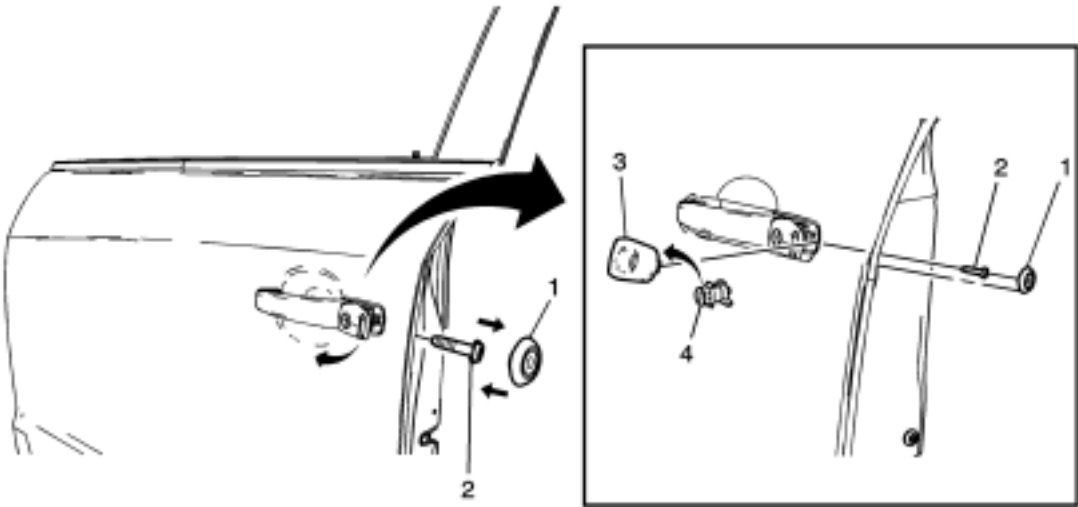
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door latch. Refer to <a href="#">Front Side Door Latch Replacement</a> .</p>	
1	<p>Front Side Door Inside Handle Cable Cover</p> <p><b>Tip</b> Open the inside handle cable cover to access the release.</p>
2	<p>Front Side Door Inside Handle Cable</p>

Rear Side Door Inside Handle Cable Replacement



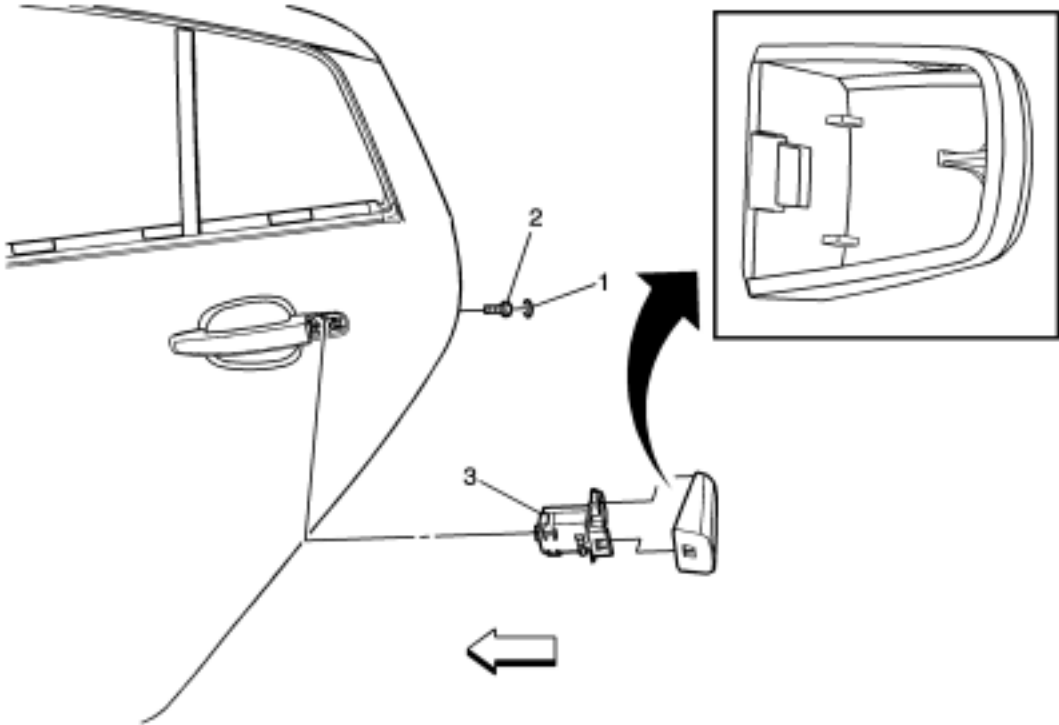
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear side door latch. Refer to <a href="#">Rear Side Door Latch Replacement</a> .</p>	
1	<p>Rear Side Door Inside Handle Cable Cover</p> <p><b>Tip</b> Open the inside handle cable cover to access the release.</p>
2	<p>Rear Side Door Inside Handle Cable</p>

Front Side Door Lock Cylinder Replacement



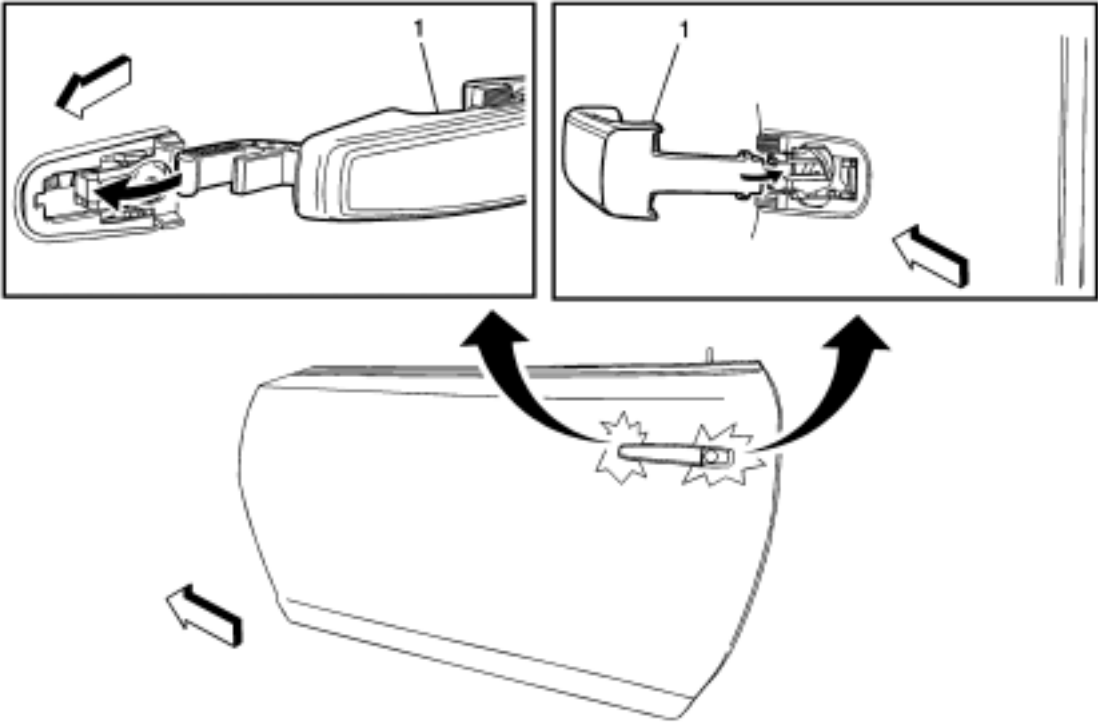
Callout	Component Name
1	<div>Front Side Door Lock Cylinder Screw Access Plug</div> <div><b>Tip</b> Use the appropriate tool, remove the plug.</div>
2	<div>Front Side Door Lock Cylinder Clamp Screw</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Procedure</b>  Do Not remove the cylinder clamp screw completely from the housing, unscrew the screw to a hard stop, releasing the cylinder from the housing.</div> <div><b>Tip</b> It is not necessary to remove the outside door handle or housing to replace the lock cylinder.</div> <div><b>Tighten</b> 5 N·m (44 lbin)</div>
3	<div>Front Side Door Lock Cylinder Cover</div> <div><b>Procedure</b>  Remove the lock cylinder cover. Refer to <a href="#">Front Side Door Lock Cylinder Opening Cover Replacement</a> .</div>
4	<div>Front Side Door Lock Cylinder</div> <div><b>Procedure</b>  1. Ensure that the lock cylinder gasket is in place when installing the lock cylinder to the handle. 2. Inspect the lock cylinder for proper operation.</div>

Rear Door Lock Cylinder Replacement



Callout	Component Name
1	<div>Rear Side Door Lock Cylinder Opening Cover Screw Access Plug</div> <div><b>Tip</b> Use a flat-bladed tool to remove the cover.</div>
2	<div>Rear Side Door Lock Cylinder Clamp Screw</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Procedure</b>  Do Not remove the cylinder screw completely from the housing. unscrew the screw to a hard stop, remove the cylinder.</div> <div><b>Tighten</b> 5 N·m (44 lbin)</div>
3	<div>Rear Side Door Lock Cylinder</div> <div><b>Procedure</b>  Remove the lock cylinder cover. Refer to <a href="#">Rear Side Door Lock Cylinder Opening Cover Replacement</a> .</div>

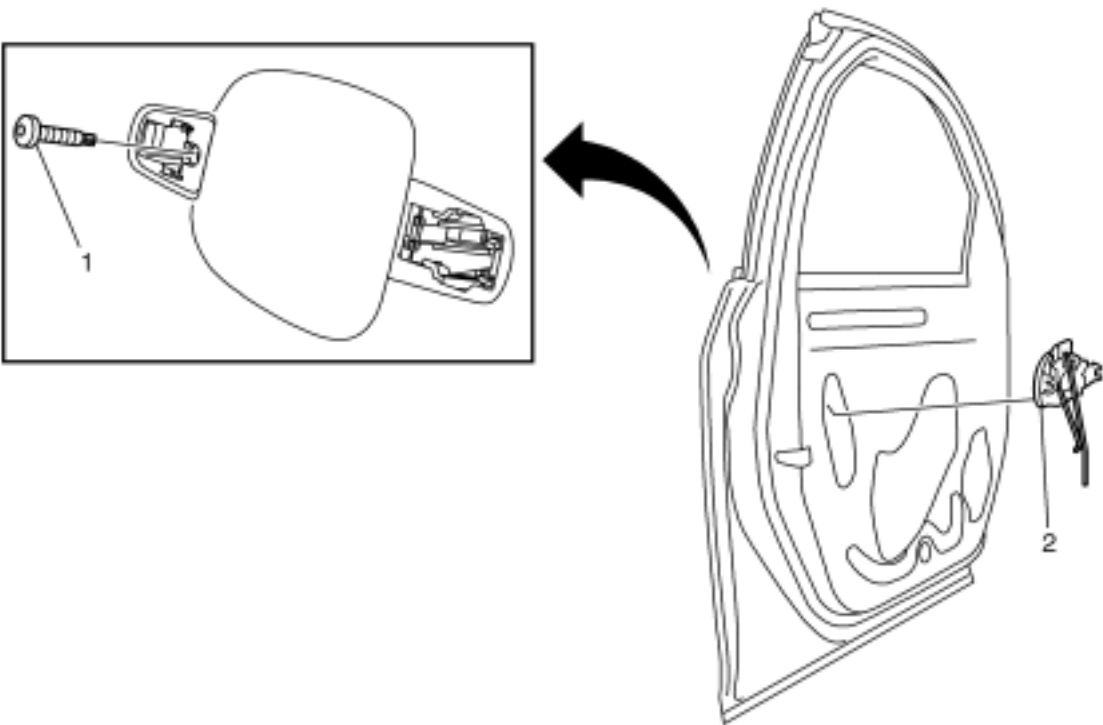
Front Side Door Outside Handle Replacement



Callout	Component Name
1	<div>Front Side Door Outside Handle</div> <div>Procedure</div> <div><div><div>1. Remove the front side door water deflector.</div><div>2. Disconnect the electrical connector.</div><div>3. Remove the access hole plug located on the inside opening of the door that conceals the screw for the latch cylinder clamp.</div><div>4. Pull and hold the door handle in the open position.</div><div>5. While holding the door handle, unscrew the latch cylinder clamp screw until it comes to a hard stop.</div><div>6. Release the handle, by now the handle should stay in the open position.</div><div>7. Remove the lock cylinder, gently pull it straight out.</div><div>8. Remove the outside door handle by sliding rearwards and then out in a swinging motion.</div><div>9. Inspect the door locking system for proper operation before installing the trim panel.</div></div></div> <div>Tip</div> <div>While screwing in the screw for the lock cylinder hold the handle in the open position, this will avoid the door handle from snapping once the spring pressure is relieved and the door handle returns to the close position.</div>

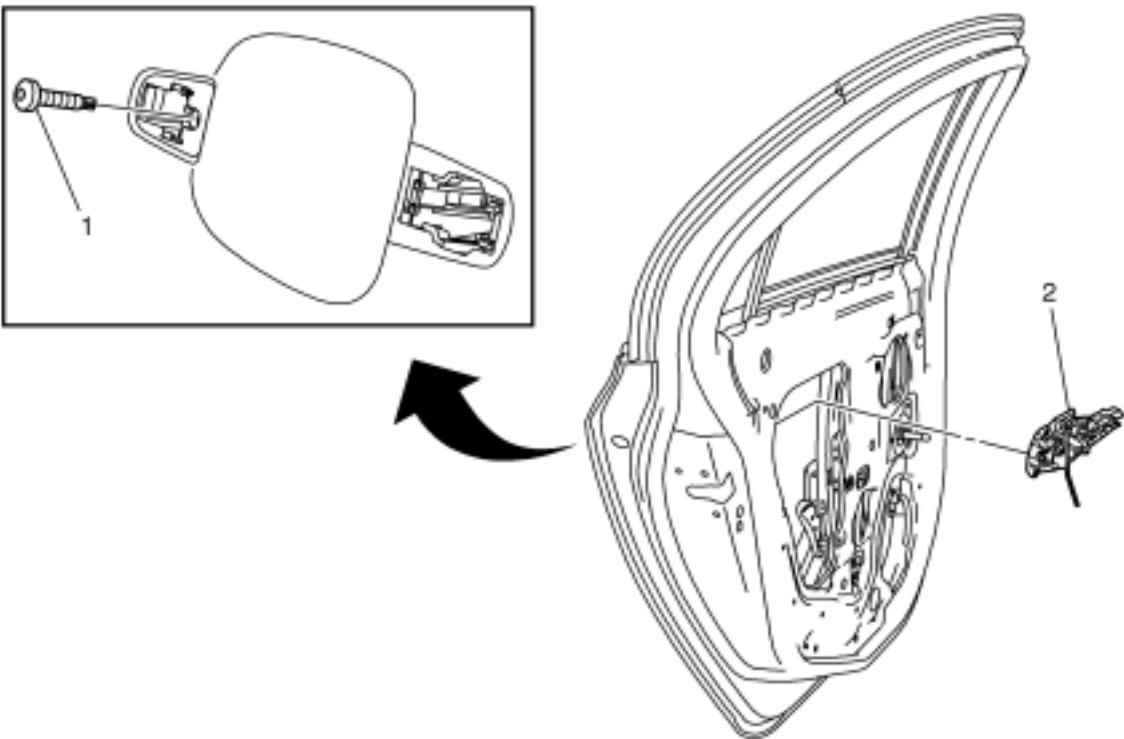


Front Side Door Outside Handle Bracket Replacement



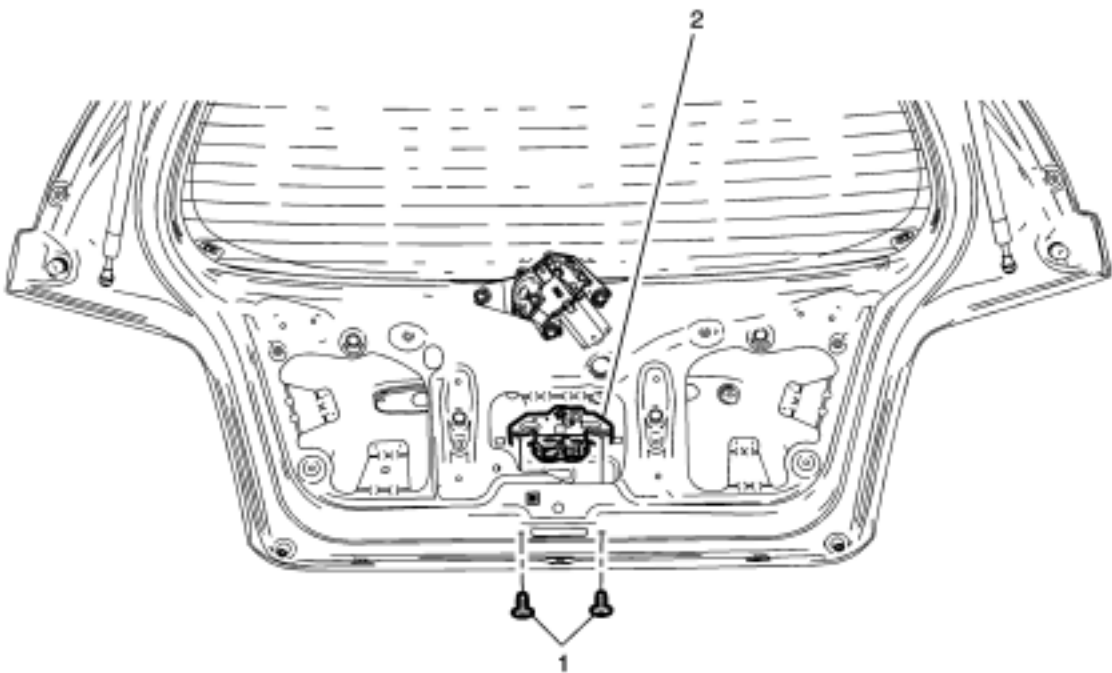
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the front side door trim panel. Refer to <a href="#">Front Side Door Trim Replacement</a> .</p> <p>2. Remove the front side door outside handle. Refer to <a href="#">Front Side Door Outside Handle Replacement</a> .</p>	
1	<p>Front Side Door Outside Handle Bracket Screw</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Remove the front side door water deflector.</p> <p><b>Tighten</b> 5 N·m (44 lbin)</p>
2	<p>Front Side Door Outside Handle Bracket</p> <p><b>Procedure</b></p> <p>1. Release front side door outside handle rod mechanism at shift linkage lever – clip.</p> <p>2. Release the front side door latch cylinder rod from the door latch.</p> <p>3. Transfer components as necessary.</p> <p>4. Inspect the door latch system for proper operation before installing the door trim panel.</p>

Rear Side Door Outside Handle Bracket Replacement



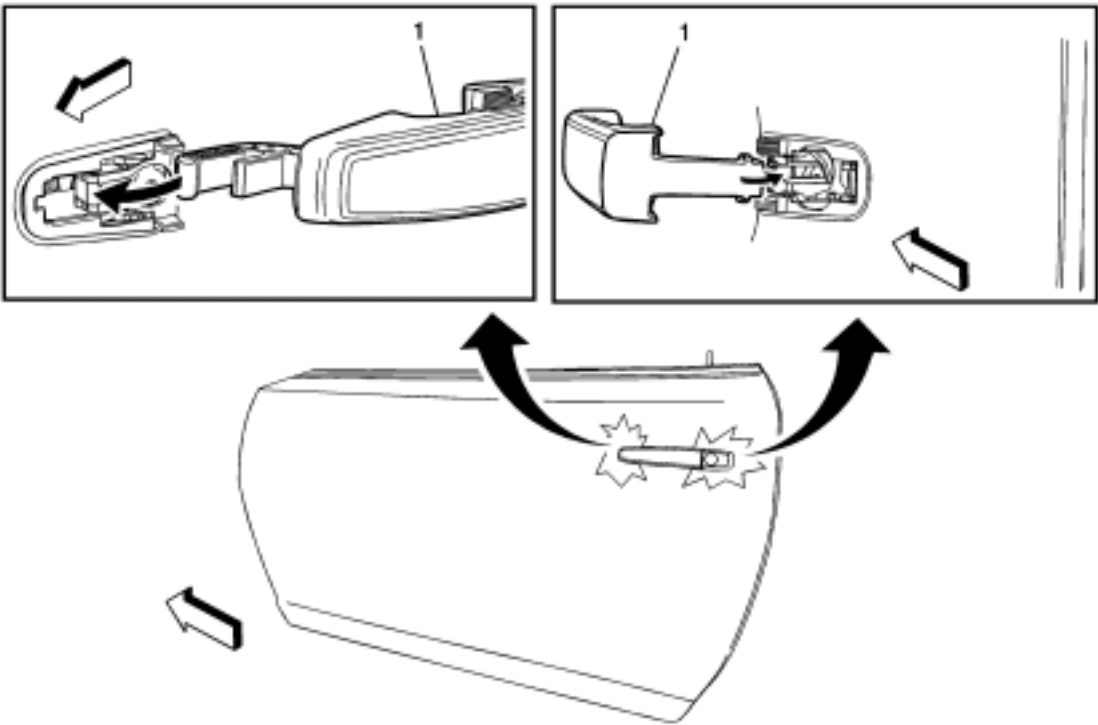
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</p> <p>2. Remove the rear side door outside handle. Refer to <a href="#">Rear Side Door Outside Handle Replacement</a> .</p>	
1	<p>Rear Side Door Outside Handle Bracket Screw</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Remove the rear side door water deflector.</p> <p><b>Tighten</b> 5 N·m (44 lbin)</p>
2	<p>Rear Side Door Outside Handle Bracket</p> <p><b>Procedure</b></p> <p>1. Release rear side door outside handle rod mechanism at shift linkage lever – clip.</p> <p>2. Release the rear side door latch cylinder rod from the door latch.</p> <p>3. Transfer components as necessary.</p> <p>4. Inspect the door latch system for proper operation before installing the door trim panel.</p>

Liftgate Latch Replacement



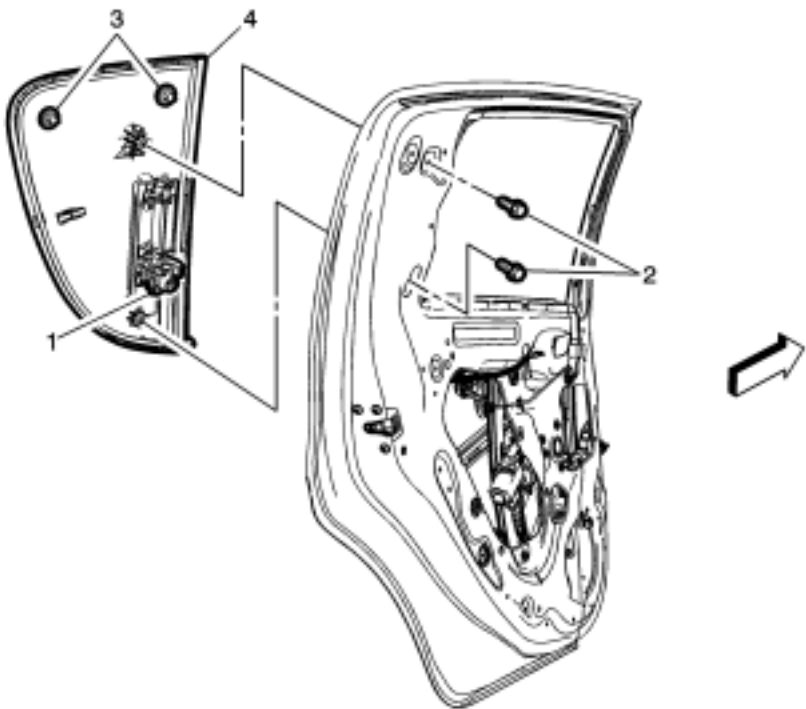
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the liftgate trim finish panel. Refer to <a href="#">Liftgate Trim Finish Panel Replacement</a> .</p> <p>2. Remove the liftgate latch cover.</p>	
1	<p>Liftgate Latch Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Liftgate Latch Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connector. 2. Adjust the liftgate if needed.</p>

Rear Side Door Outside Handle Replacement (Sedan)



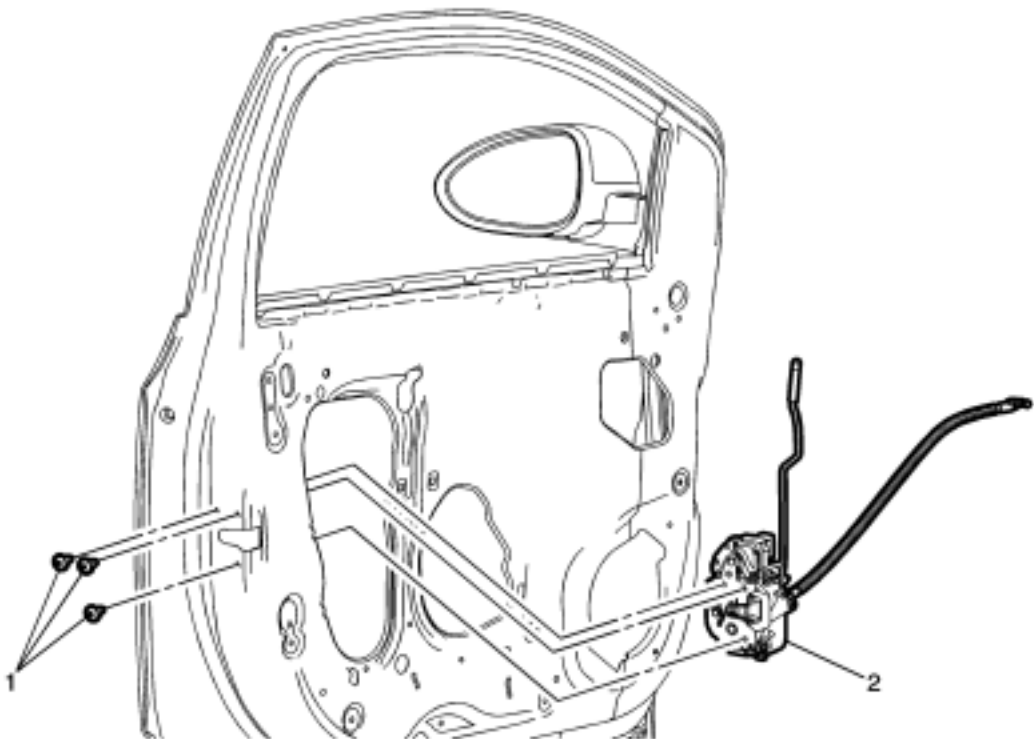
Callout	Component Name
<b>Preliminary Procedures</b> Remove the rear side door lock cylinder opening cover. Refer to <a href="#">Rear Side Door Lock Cylinder Opening Cover Replacement</a> .	
1	<p>Rear Side Door Outside Handle</p> <p><b>Procedures</b></p> <ol style="list-style-type: none"><li>1. Remove the rear side door water deflector.</li><li>2. Remove the access hole plug located on the inside opening of the door that conceals the screw for the lock cylinder clamp.</li><li>3. Pull and hold the door handle in the open position.</li><li>4. While holding the door handle, unscrew the lock cylinder clamp screw until it comes to a hard stop.</li><li>5. Release the handle, by now the handle should stay in the open position.</li><li>6. Remove the lock cylinder, gently pull it straight out.</li><li>7. Remove the outside door handle by sliding rearwards and then out in a swinging motion.</li><li>8. Inspect the door locking system for proper operation before installing the trim panel.</li></ol> <p><b>Tip</b> While screwing in the screw for the lock cylinder hold the handle in the open position, this will avoid the door handle from snapping once the spring pressure is relieved and the door handle returns to the close position.</p>

Rear Side Door Outside Handle Replacement (Hatchback)



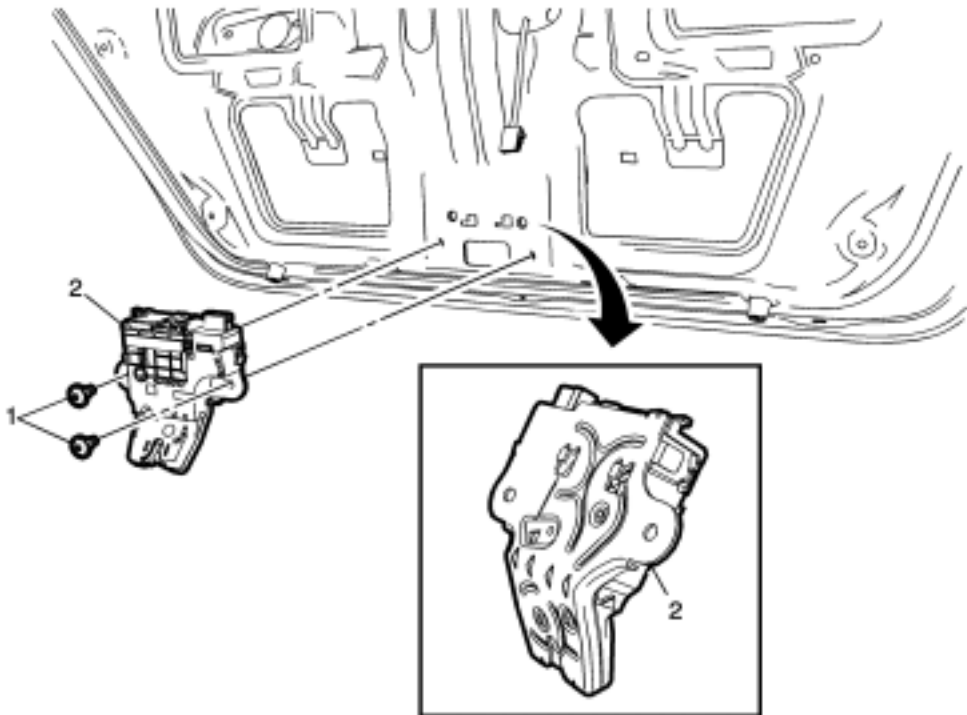
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</p>	
1	<p>Rear Side Door Outside Handle Rod Clip</p> <p><b>Procedure</b></p> <p>1. Place the window in the full up position. 2. Remove the water deflector. 3. Remove the outside door handle rod from the clip, Do not remove the rod from the door lock.</p>
2	<p>Rear Side Door Outside Handle Screws (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
3	<p>Rear Side Door Outside Handle Push-In Retainers (Qty: 2)</p> <p><b>Tip</b> If the retainers are broken when removing they Must be replaced.</p>
4	<p>Rear Side Door Outside Handle</p> <p><b>Procedure</b></p> <p>In order to prevent outside handle lever pre-load, lock, outside handle shall be fully secured to the door prior to securing integral lock clip to outside handle rod. Integral lock clip shall be in the full up position while securing to outside handle rod. Refer to <a href="#">Rear Side Door Outside Handle Rod Adjustment</a> .</p> <p><b>Tip</b> Inspect the door lock system for proper operation before installing the door trim panel.</p>

Front Side Door Latch Replacement



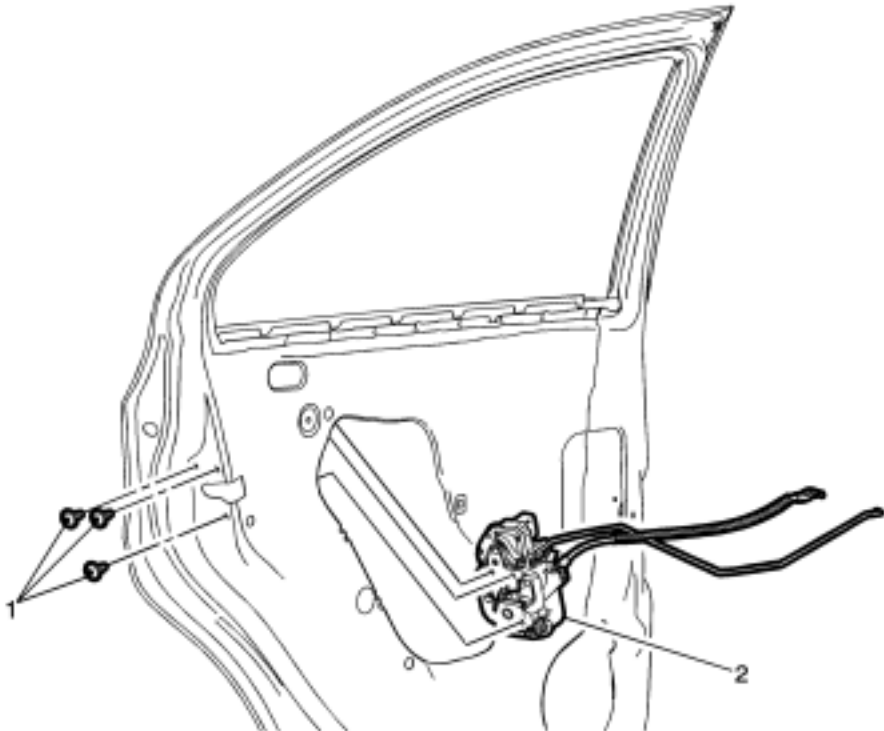
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door trim panel. Refer to <a href="#">Front Side Door Trim Replacement</a> .</p>	
1	<p>Front Side Door Lock Screw (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedures</b></p> <ol style="list-style-type: none"><li>1. Remove the water deflector.</li><li>2. Release the front inside door handle cable retainers from the door.</li><li>3. Remove the front side door window rear guide. Refer to <a href="#">Front Side Door Window Rear Guide Replacement</a> .</li></ol> <p><b>Tighten</b> 10 N·m (89 lbin)</p>
2	<p>Front Side Door Lock Assembly</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Disconnect the front side door lock electrical connector.</li><li>2. Transfer the front side door lock rods.</li><li>3. Front outside door handle rod adjustment. Refer to <a href="#">Front Side Door Outside Handle Rod Adjustment</a> .</li></ol>

Rear Compartment Lid Latch Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear compartment lid inner panel trim. Refer to <a href="#">Rear Compartment Lid Inner Panel Trim Replacement</a> .</p>	
1	<p>Rear Compartment Lid Latch Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Rear Compartment Latch</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connection. 2. Slide the latch to the right and up to remove from the compartment lid.</p>

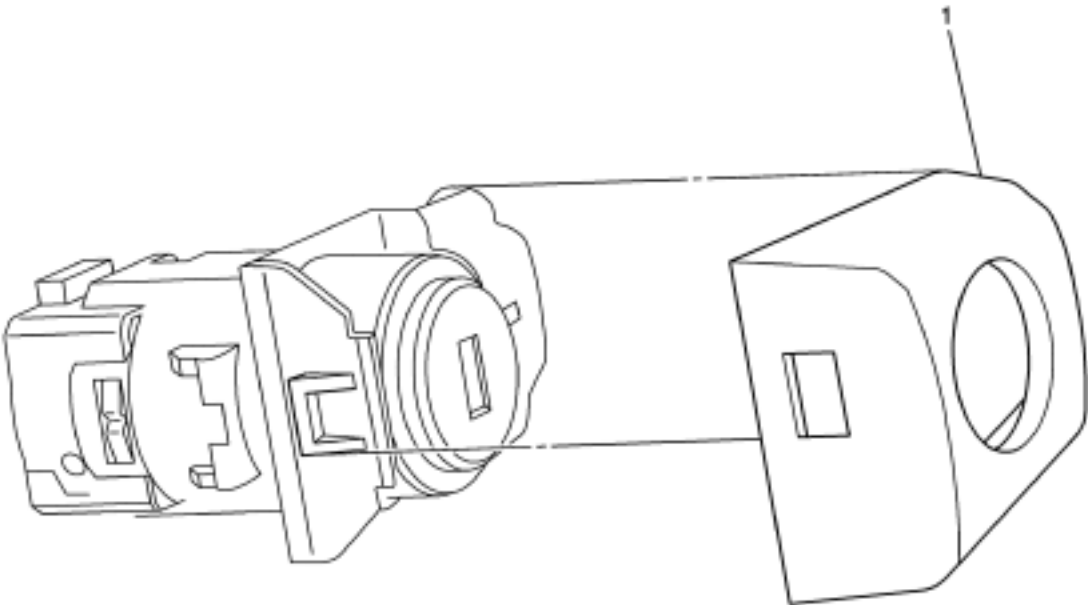
Rear Side Door Latch Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</p>	
1	<p>Rear Side Door Lock Screw (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedures</b></p> <ol style="list-style-type: none"><li>1. Remove the water deflector.</li><li>2. Release the rear inside door handle cable retainers from the door.</li><li>3. Remove the rear side door window rear guide. Refer to <a href="#">Rear Side Door Window Rear Guide Replacement</a> .</li></ol> <p><b>Tighten</b> 10 N·m (89 lbin)</p>
2	<p>Rear Side Door Lock Assembly</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Disconnect the rear side door lock electrical connector.</li><li>2. Transfer the rear side door lock rods.</li><li>3. Rear outside door handle rod adjustment. Refer to <a href="#">Rear Side Door Outside Handle Rod Adjustment</a> .</li></ol>

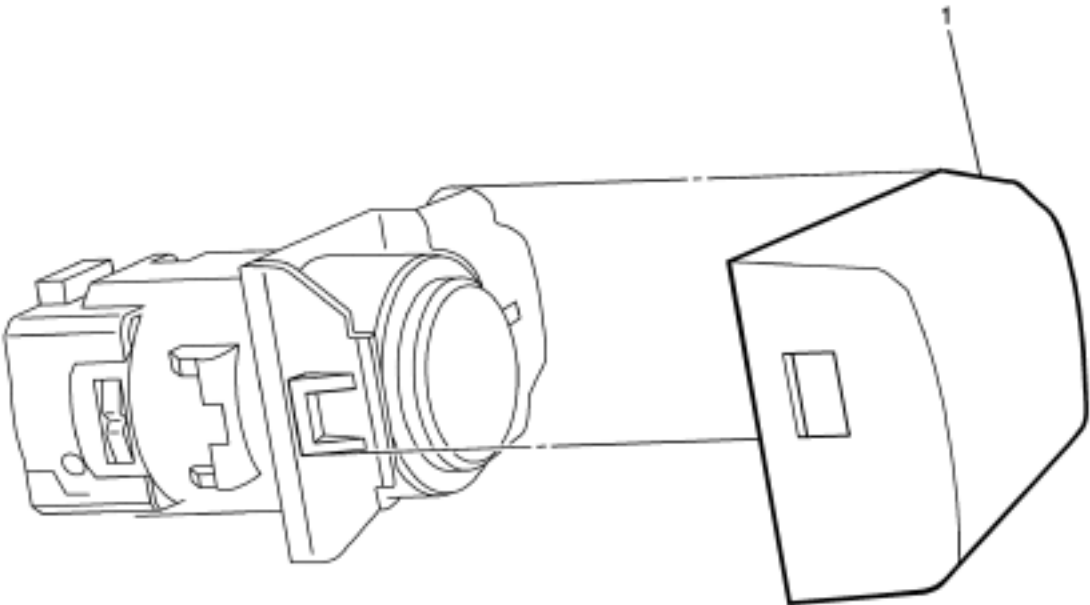


Front Side Door Lock Cylinder Opening Cover Replacement



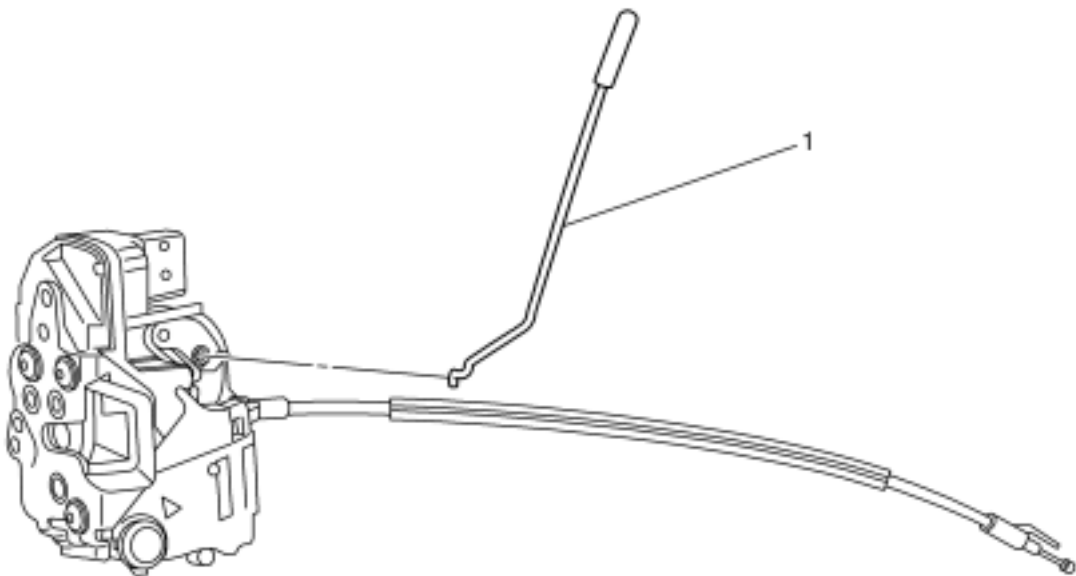
Callout	Component Name
1	<div>Front Side Door Lock Cylinder Opening Cover</div> <div><b>Procedure</b><div><div>1. Remove the front side door lock cylinder, Do Not remove the outside door handle. Refer to <a href="#">Front Side Door Lock Cylinder Replacement</a> .</div><div>2. Do Not remove the lock cylinder screw completely from the housing. Unscrew the screw to a hard stop, remove the cylinder.</div></div><div><b>Tip</b><div>Use a small flat-bladed tool to release the lock cylinder bezel retainers location on both sides.</div></div></div>

Rear Side Door Lock Cylinder Opening Cover Replacement



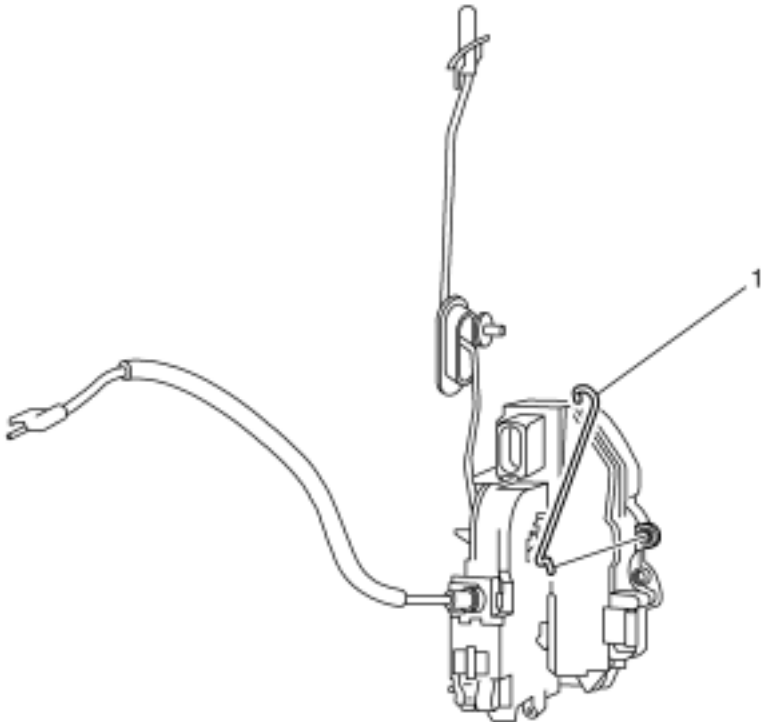
Callout	Component Name
1	<p>Rear Side Door Lock Cylinder Opening Cover</p> <p><b>Procedure</b></p> <p>1. Remove the rear side door lock cylinder, Do Not remove the outside door handle. Refer to <a href="#">Rear Door Lock Cylinder Replacement</a> .</p> <p>2. Do Not remove the lock cylinder screw completely from the housing. Unscrew the screw to a hard stop, remove the cylinder.</p> <p><b>Tip</b></p> <p>Use a small flat-bladed tool to release the lock cylinder bezel retainers location on both sides.</p>

Front Side Door Locking Rod Replacement



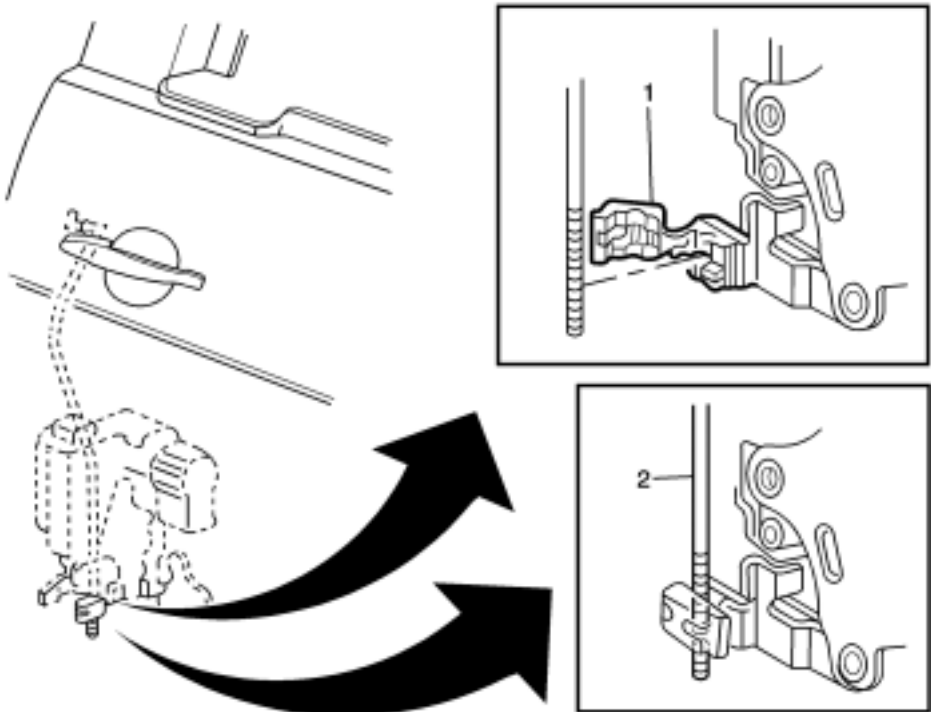
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the front side door window rear guide. Refer to <a href="#">Front Side Door Window Rear Guide Replacement</a> .</p> <p>2. Remove the front side door lock . Refer to <a href="#">Front Side Door Latch Replacement</a> . Do Not remove the lock completely from the door, lower the lock to disconnect the rod.</p>	
1	<p>Front Side Door Lock Rod</p> <p><b>Procedure</b></p> <p>1. Place the window in the full up position.</p> <p>2. Remove the water deflector.</p> <p>3. Transfer components as necessary.</p> <p>4. In order to prevent outside handle lever pre-load, lock, outside handle, handle bracket and cover/cap shall be fully secured to the door prior to securing integral lock clip to outside handle rod. Integral lock clip shall be in the full up position while securing to outside handle rod. Refer to <a href="#">Front Side Door Outside Handle Rod Adjustment</a> .</p> <p><b>Tip</b></p> <p>Inspect the door lock system for proper operation before installing the door trim panel.</p>

Front Side Door Lock Cylinder Rod Replacement



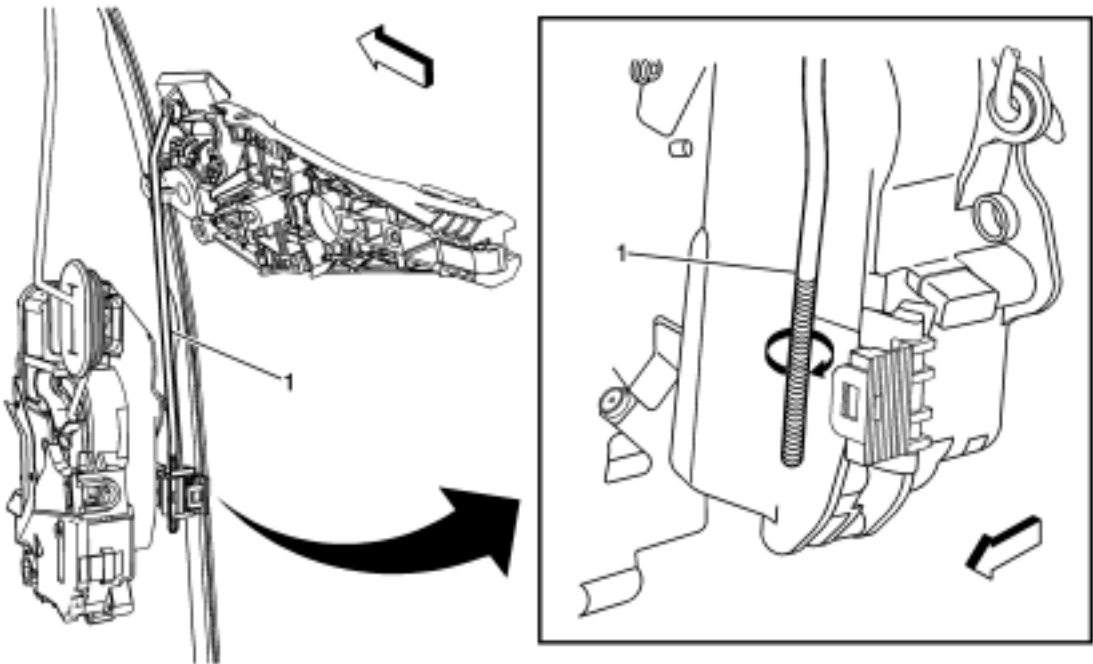
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the rear side door window rear guide. Refer to <a href="#">Rear Side Door Window Rear Guide Replacement</a> .</p> <p>2. Remove the rear side door lock. Refer to <a href="#">Rear Side Door Latch Replacement</a> .</p>	
1	<p>Rear Side Door Lock Cylinder Rod</p> <p><b>Procedure</b></p> <p>1. Place the window in the full up position.</p> <p>2. Remove the water deflector.</p> <p>3. In order to prevent outside handle lever pre-load, lock, outside handle, handle bracket and cover/cap shall be fully secured to the door prior to securing integral lock clip to outside handle rod. Integral lock clip shall be in the full up position while securing to outside handle rod. Refer to <a href="#">Front Side Door Outside Handle Rod Adjustment</a> .</p> <p><b>Tip</b></p> <p>Inspect the door lock system for proper operation before installing the door trim panel.</p>

Front Side Door Outside Handle Rod Adjustment



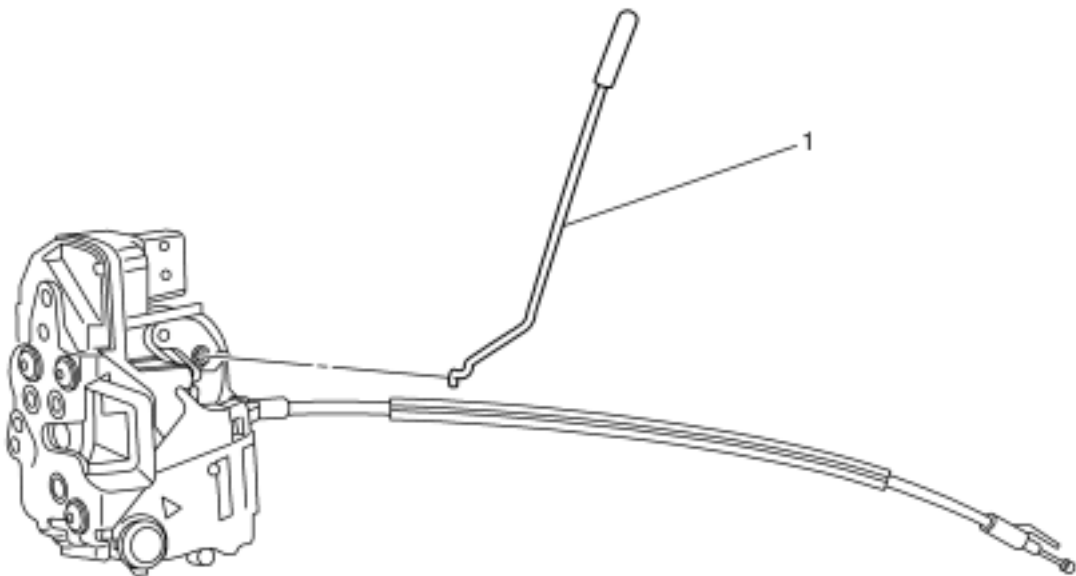
Callout	Component Name
<b>Preliminary Procedures</b> Remove the front side door trim panel. Refer to <a href="#">Front Side Door Trim Replacement</a>	
1	<p>Front Side Door Outside Handle Rod Retainer</p> <p><b>Procedure</b></p> <p>Remove the front side door water deflector.</p>
2	<p>Front Side Door Outside Handle Rod</p> <p><b>Procedure</b></p> <p>1. Position the front side door outside handle rod in the retainer in order to eliminate any free play in the outside door handle.</p> <p>2. Adjust the travel of the handle by removing the threaded rod from the retainer.</p> <p>3. Install the retainer cover closed over the threaded front side door outside handle rod.</p> <p>4. Inspect the door lock system for proper operation before installing the trim panel.</p> <p><b>Tip</b></p> <p>Use a flat-head tool to open the retainer from the threaded rod connecting the lock to the outside handle.</p>

Front Side Door Outside Handle Rod Replacement



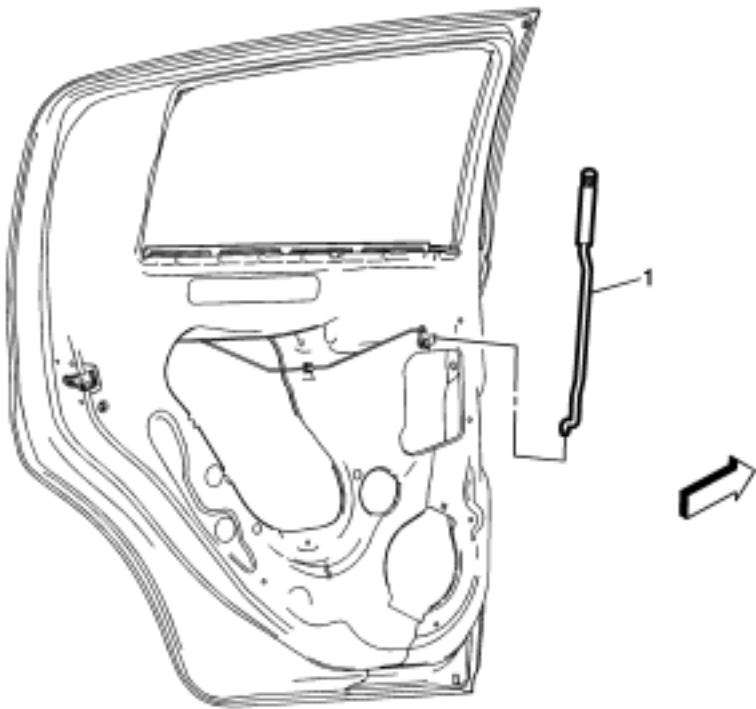
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front side door outside handle bracket. Refer to <a href="#">Front Side Door Outside Handle Bracket Replacement</a> .</p>	
1	<p>Front Side Door Outside Handle Rod</p> <p><b>Procedure</b></p> <p>1. Place the window in the full up position.</p> <p>2. Remove the water deflector.</p> <p>3. Open the handle rod by releasing the clip at the end of the handle rod.</p> <p>4. In order to prevent outside handle lever pre-load, lock, outside handle, handle bracket and cover/cap shall be fully secured to the door prior to securing integral lock clip to outside handle rod. Integral lock clip shall be in the full up position while securing to outside handle rod. Refer to <a href="#">Front Side Door Outside Handle Rod Adjustment</a> .</p> <p><b>Tip</b></p> <p>Inspect the door lock system for proper operation before installing the door trim panel.</p>

Rear Side Door Locking Rod Replacement (Sedan)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear side door lock. Refer to <a href="#">Rear Side Door Latch Replacement</a> . Do Not remove the lock completely from the door, lower the lock to disconnect the rod.</p>	
1	<p>Rear Side Door Lock Rod</p> <p><b>Procedure</b></p> <p>1. Place the window in the full up position. 2. Remove the water deflector. 3. Transfer components as necessary. 4. In order to prevent outside handle lever pre-load, lock, outside handle, handle bracket and cover/cap shall be fully secured to the door prior to securing integral lock clip to outside handle rod. Integral lock clip shall be in the full up position while securing to outside handle rod. Refer to <a href="#">Rear Side Door Outside Handle Rod Adjustment</a> .</p> <p><b>Tip</b> Inspect the door lock system for proper operation before installing the door trim panel.</p>

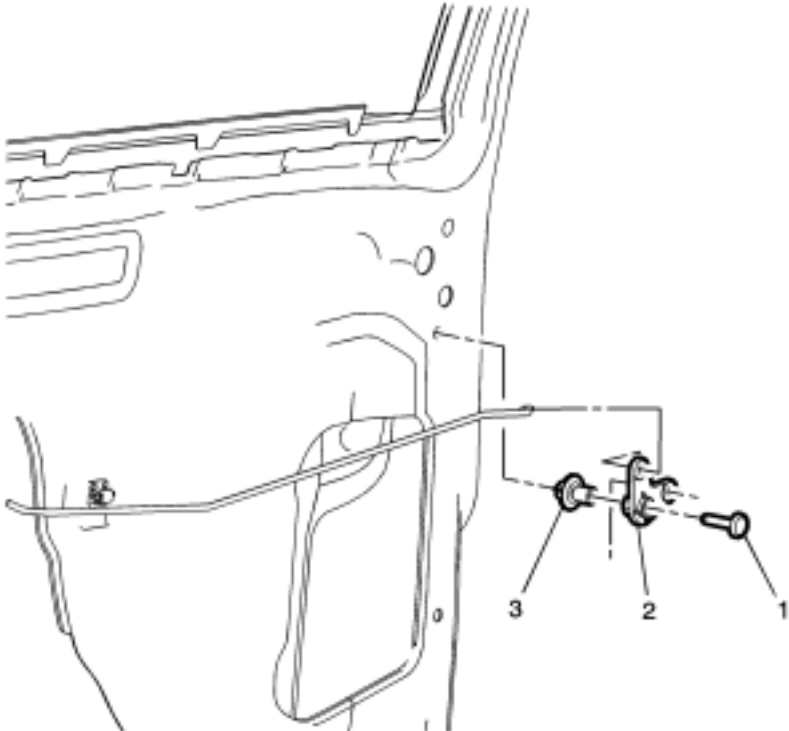
Rear Side Door Locking Rod Replacement (Hatchback)



Callout	Component Name
Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a>	
1	<div>Rear Side Door Lock Rod</div> <div><b>Procedure</b> Remove the water deflector.</div> <div><b>Tip</b> Inspect the door lock system for proper operation before installing the door trim panel.</div>

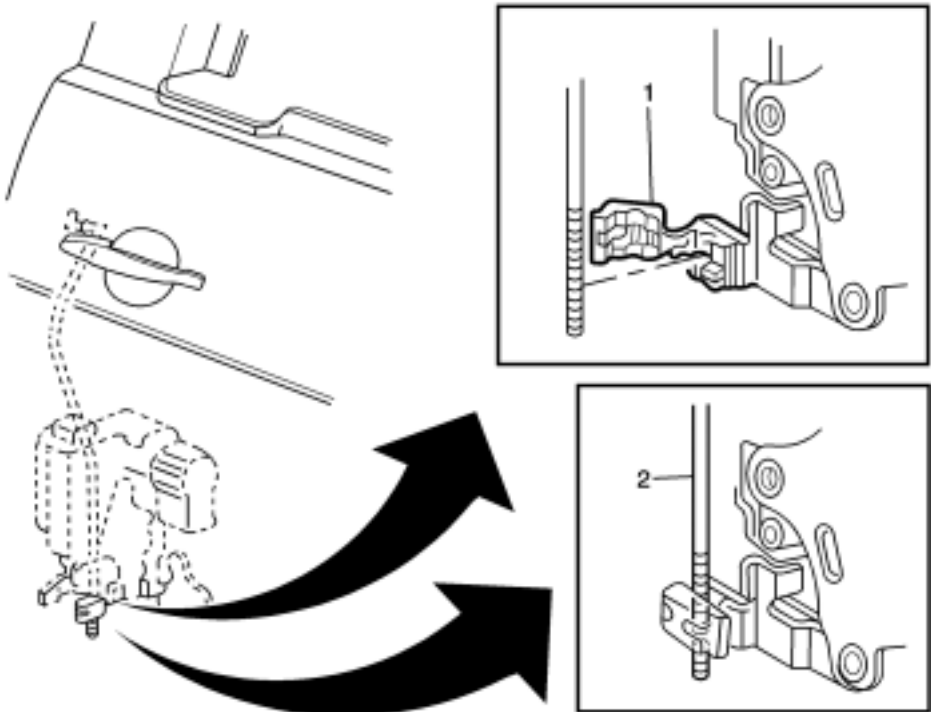


Rear Side Door Locking Rod Bellcrank Replacement



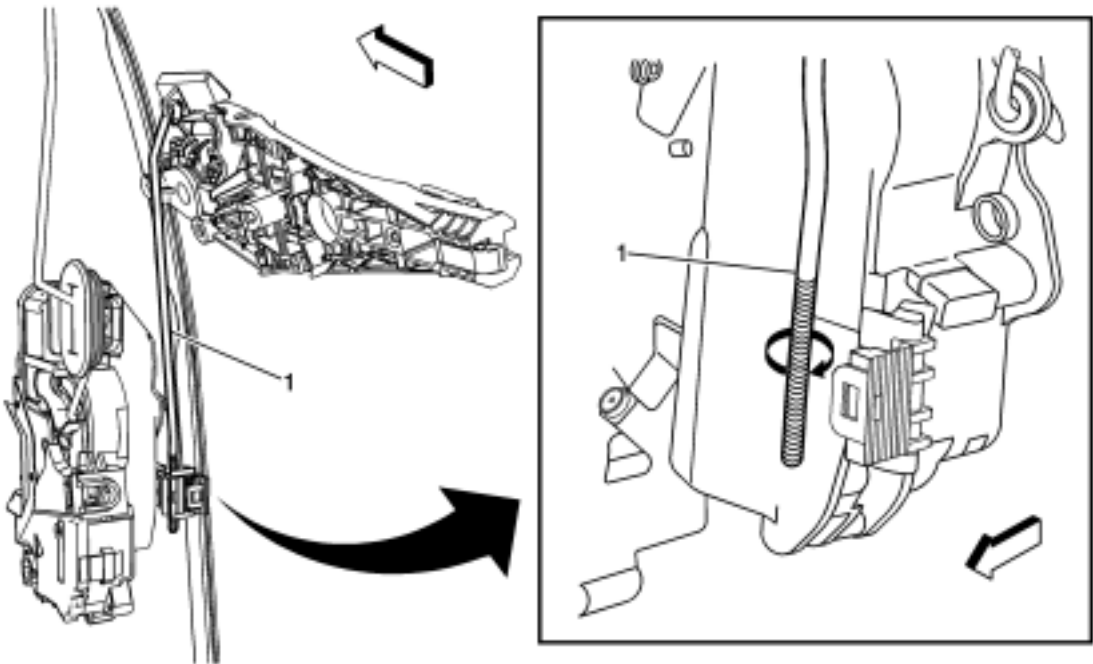
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</p>	
1	<p>Rear Side Door Lock Rod Bellcrank Center Retainer</p> <p><b>Procedure</b></p> <p>1. Place the window in the full up position. 2. Remove the water deflector.</p> <p><b>Note:</b> Use a small flat-bladed tool to release the retainer from the center of the bellcrank.</p>
2	<p>Rear Side Door Lock Rod Bellcrank Center</p>
3	<p>Rear Side Door Lock Rod Bellcrank Retainer to Door</p> <p><b>Note:</b> Inspect the door lock system for proper operation before installing the door trim panel.</p>

Rear Side Door Outside Handle Rod Adjustment



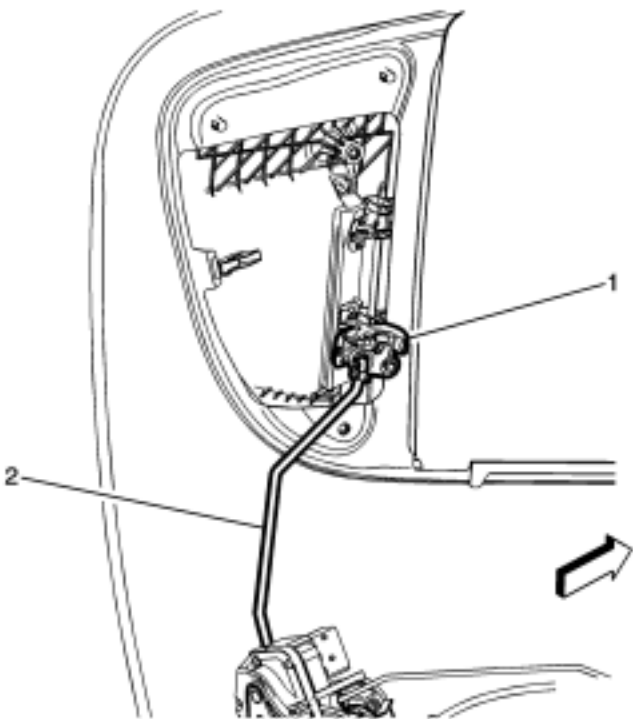
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</p>	
1	<p>Rear Side Door Outside Handle Rod Retainer</p> <p><b>Procedure</b></p> <p>Remove the rear side door water deflector.</p>
2	<p>Rear Side Door Outside Handle Rod</p> <p><b>Procedure</b></p> <p>1. Position the rear side door outside handle rod in the retainer in order to eliminate any free play in the outside door handle.</p> <p>2. Adjust the travel of the handle by removing the threaded rod from the retainer.</p> <p>3. Install the retainer cover closed over the threaded front side door outside handle rod.</p> <p>4. Inspect the door locking system for proper operation before installing the trim panel.</p> <p><b>Tip</b></p> <p>Use a flat-head tool to open the retainer from the threaded rod connecting the lock to the outside handle.</p>

Rear Side Door Outside Handle Rod Replacement (Sedan)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .</p>	
1	<p>Rear Side Door Outside Handle Rod</p> <p><b>Procedures</b></p> <ol style="list-style-type: none"><li>1. Remove the rear side door water deflector.</li><li>2. Open the handle rod clip.</li><li>3. Inspect the door locking system for proper operation before installing the trim panel. Refer to <a href="#">Rear Side Door Outside Handle Rod Adjustment</a> .</li></ol>

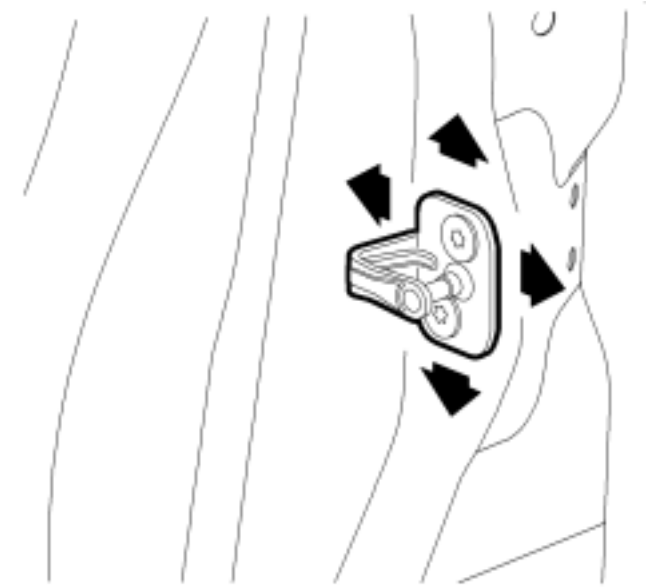
Rear Side Door Outside Handle Rod Replacement (Hatchback)



Callout	Component Name
<b>Preliminary Procedures</b>  Remove the rear side door trim panel. Refer to <a href="#">Rear Side Door Trim Replacement</a> .	
1	<div>Rear Side Door Outside Handle Rod Upper Retainer</div> <b>Procedure</b>  Remove the water deflector
2	<div>Rear Side Door Outside Handle Rod</div> <b>Procedure</b>  1. Use a flat-head tool to open the lower retainer from the threaded rod connecting the lock to the outside handle. 2. Position the rear side door outside handle rod in the retainer in order to eliminate any free play in the outside door handle. 3. Adjust the travel of the handle by removing the threaded rod from the retainer. 4. In order to prevent outside handle lever pre-load, lock the outside handle shall be fully secured to the door prior to securing integral lock clip to outside handle rod. Integral lock clip shall be in the full up position while securing to outside handle rod. Refer to <a href="#">Rear Side Door Outside Handle Rod Adjustment</a> . 5. Inspect the door lock system for proper operation before installing the trim panel.

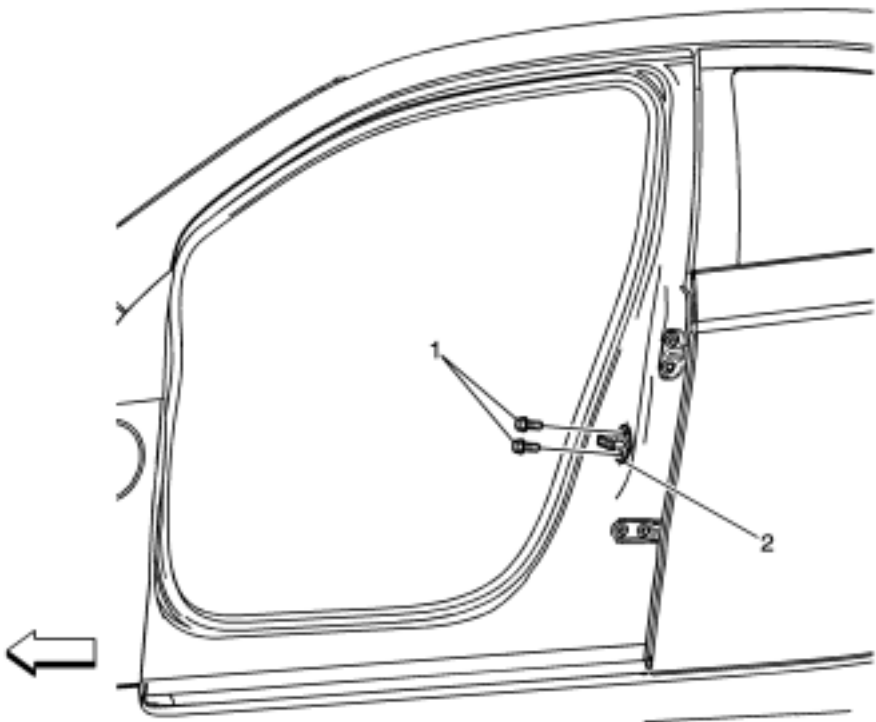
## Front Side Door Lock Striker Adjustment

To determine if striker adjustment is required, proceed as follows:



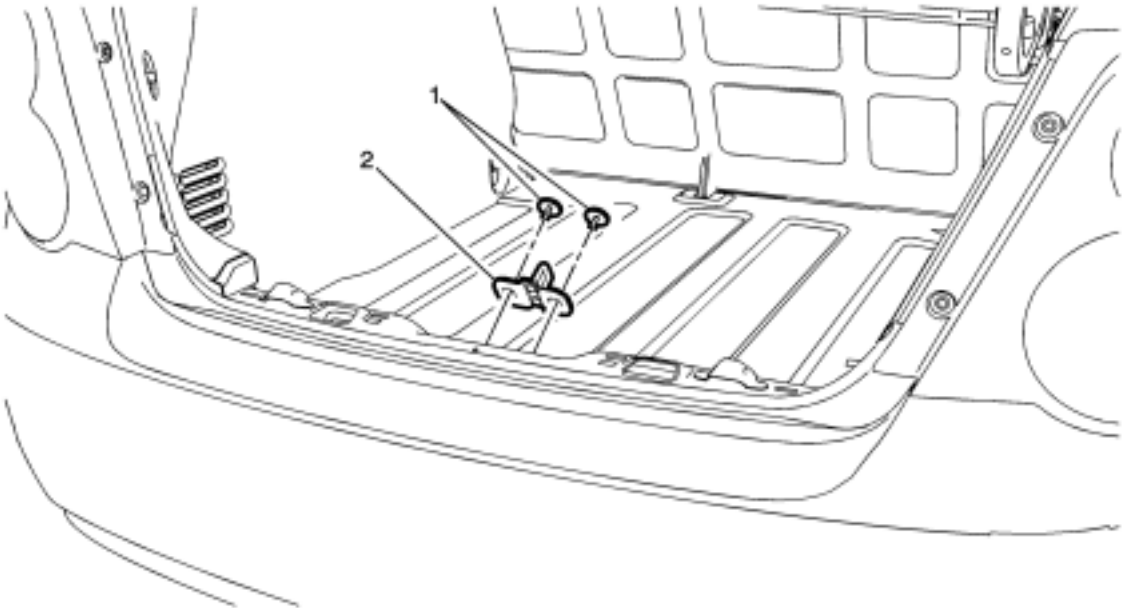
1. Ensure the door is properly aligned within the door opening before proceeding with the striker adjustment.
  2. Close the door onto the striker and note if the door drags on the striker causing the door to move upward or downward upon contact with the striker. Also note the closing effort to fully engage the lock.
  3. Using a grease pencil, mark around the striker for reference of the original position. Loosen the striker.
  4. Move the striker to eliminate drag on the striker and door lock and to achieve the proper door position within the door opening. Start with the up/down position, then position the striker to achieve proper alignment to the door opening. Set the in/out adjustment for the proper door seal engagement making sure the door closing efforts are correct.
- Caution:** Refer to [Fastener Caution](#) .
5. Tighten the striker bolts. Tighten the front side door striker screws to **22 N·m (16 lb ft)**.

Front Side Door Lock Striker Replacement



Callout	Component Name
1	Front Door Lock Striker Screws (Qty: 2)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 22 N·m (16 lbft)
2	Front Door Lock Striker  <b>Procedure</b>  Ensure the alignment of the striker. Refer to <a href="#">Front Side Door Lock Striker Adjustment</a> .

Liftgate Latch Striker Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear compartment sill trim plate. Refer to <a href="#">Rear Compartment Sill Trim Plate Replacement</a> .</p>	
1	<p>Liftgate Latch Striker Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Liftgate Latch Striker</p>

Rear Compartment Lid Latch Striker Replacement

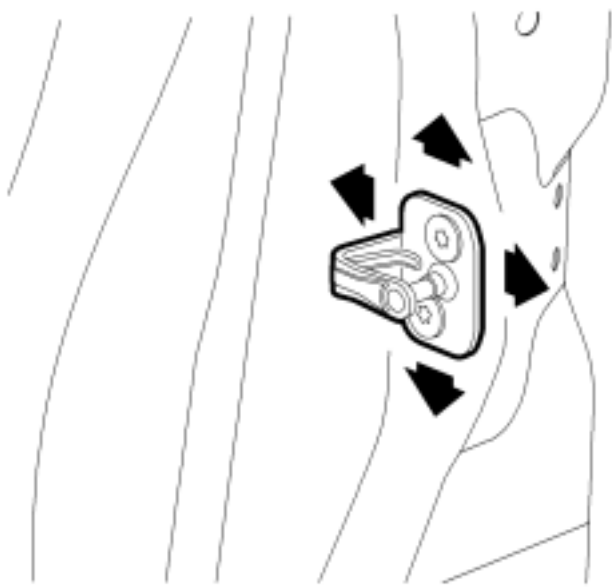


Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear compartment sill trim plate. Refer to <a href="#">Rear Compartment Sill Trim Plate Replacement</a> .</p>	
1	<p>Latch Striker Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Rear Compartment Lid Latch Striker</p>



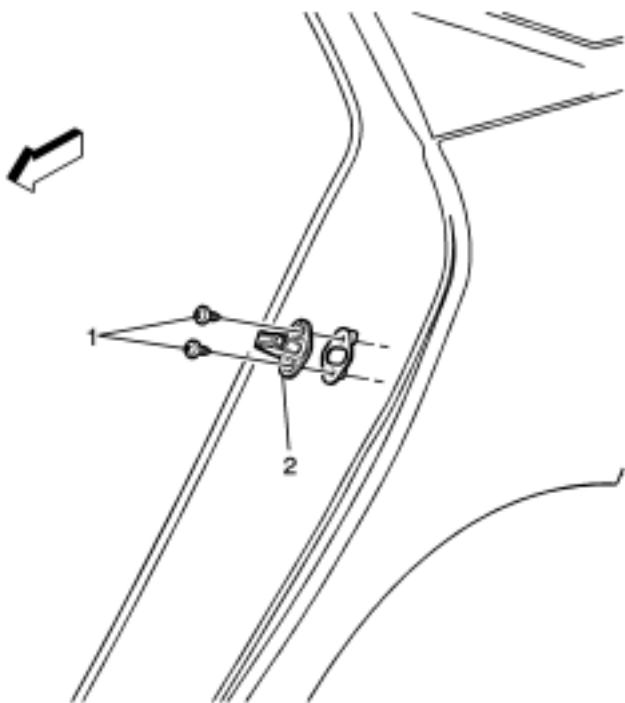
## Rear Side Door Lock Striker Adjustment

To determine if striker adjustment is required, proceed as follows:



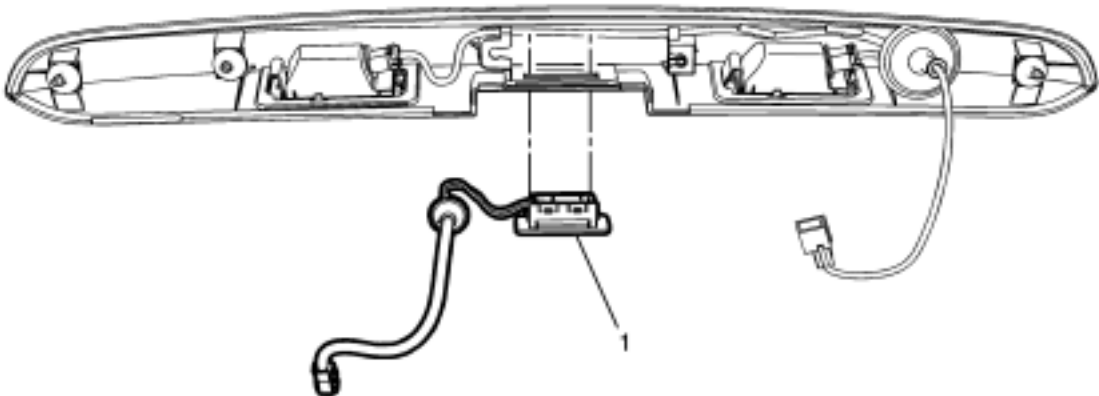
1. Ensure the door is properly aligned within the door opening before proceeding with the striker adjustment.
  2. Close the door onto the striker and note if the door drags on the striker causing the door to move upward or downward upon contact with the striker. Also note the closing effort to fully engage the lock.
  3. Using a grease pencil, mark around the striker for reference of the original position. Loosen the striker.
  4. Move the striker to eliminate drag on the striker and door lock and to achieve the proper door position within the door opening. Start with the up/down position, then position the striker to achieve proper alignment to the door opening. Set the in/out adjustment for the proper door seal engagement making sure the door closing efforts are correct.
- Caution:** Refer to [Fastener Caution](#) .
5. Tighten the striker bolts. Tighten the rear side door striker bolts to **22 N·m (16 lb ft)** .

Rear Side Door Lock Striker Replacement



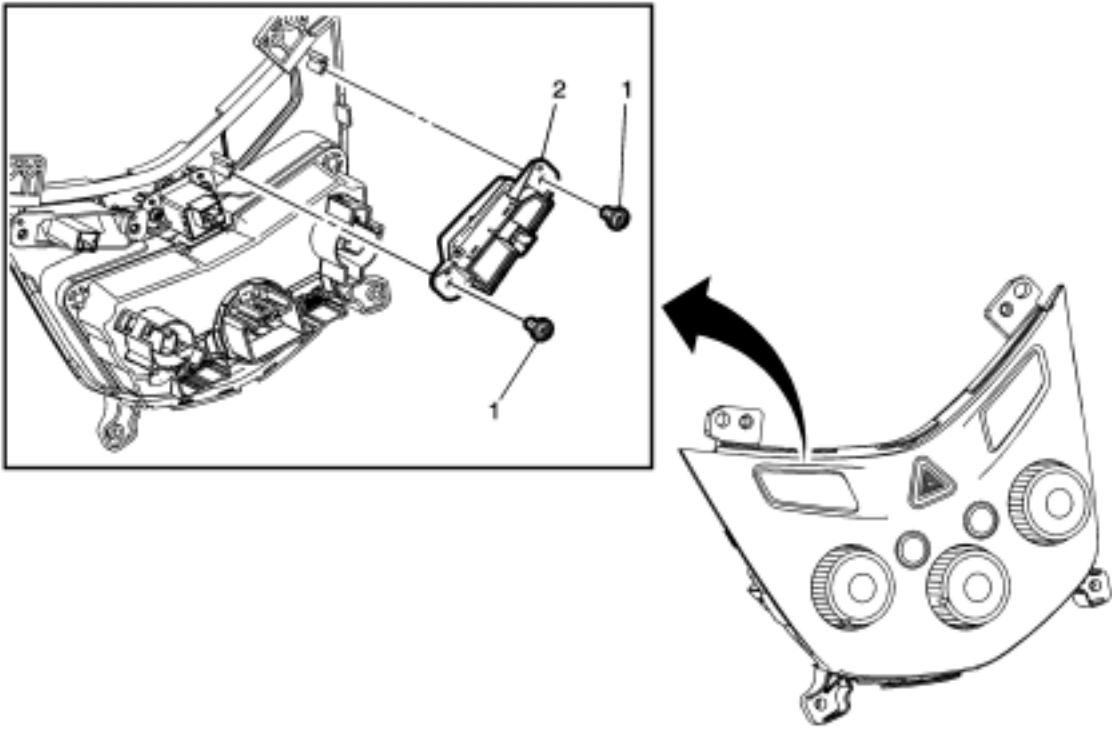
Callout	Component Name
1	<div>Rear Side Door Lock Striker Screw (Qty: 2)</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Tighten</b> 22 N·m (16 lbft)</div>
2	<div>Rear Side Door Lock Striker</div> <div><b>Procedures</b></div> <div><div>1. Ensure the spacer is in place.</div><div>2. Ensure proper alignment after installation. Refer to <a href="#">Rear Side Door Lock Striker Adjustment</a> .</div></div>

Liftgate Release Switch Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the liftgate side applique. Refer to <a href="#">Liftgate Side Applique Replacement</a> .</p>	
1	<p>Liftgate Release Switch</p> <p><b>Procedure</b></p> <p>Depress the retainers on the back side of the switch and push the switch out from the applique.</p>

Door Lock Switch Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the heater and air conditioning control. Refer to <a href="#">Heater and Air Conditioning Control Replacement</a> .</p>	
1	<p>Door Lock Switch Bolts (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Door Lock Switch</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connector.</p>



Vehicle Access

BODY SYSTEMS

0-4

- Door Ajar Indicator Description and Operation
- Fuel Fill Door Description and Operation
- Luggage Compartment Description and Operation

- Power Door Locks Description and Operation
- Trunk/Liftgate Ajar Indicator Description and Operation



## Door Ajar Indicator Description and Operation

### Door Ajar Indicator System Components

The door ajar indicator system consists of the following components:

- Body control module (BCM)
- Instrument panel cluster
- Driver door latch
- Passenger door latch
- Left rear door latch
- Right rear door latch
- Liftgate latch
- Rear compartment lid latch
- Driver window motor

### Driver Door Ajar (AXG)

The driver window motor supplies a 12 V signal to the door ajar switch within the door latch, when the driver door is open the door ajar switch closes pulling the 12 V signal low. When the driver window motor detects the drop in the 12 V signal circuit, it will then communicate this status to the BCM via local interconnect network (LIN) bus. The BCM communicates with the instrument cluster via serial data message. The instrument panel cluster, upon receipt of this serial data message, will illuminate the driver door ajar indicator and also send a serial data message to the radio to activate the door ajar audible warning when the vehicle speed is greater than 8 km/h (5 mph).

### Driver/ Passenger/ Rear Door Ajar (Without AXG)

The body control module (BCM) supplies a 12 V signal to each of the door latches, these latches contain an ajar switch which is normally open when the door is closed. When a door is ajar or open, the contacts of the ajar switch will close causing the voltage in the signal circuit to drop to zero volts. The BCM will detect the voltage drop and will send a message to the instrument panel cluster. The instrument panel cluster, upon receipt of this message, will illuminate the appropriate door ajar message in the driver information center and also send a message to the radio to activate the door ajar audible warning when the vehicle speed is greater than 8 km/h (5 mph).

### Trunk/ Liftgate Ajar

The body control module (BCM) provides a 12♦V signal to the trunk ajar signal circuit. The liftgate latch and the rear compartment lid latch contain an ajar switch which is normally open when the trunk or liftgate is closed. When the liftgate or trunk or is opened, the normally open ajar switch closes. With the ajar switch closed, ground is provided to the ajar switch signal circuit. The BCM detects the voltage drop and sends a serial data message to the instrument panel to display the door ajar indicator



## Fuel Fill Door Description and Operation

### Fuel Door Release System Components

- Body control module (BCM)
- Fuel door release actuator

The locking and unlocking of the fuel door is a function of the power door lock system. The fuel door release actuator is supplied by the door lock control circuit and the driver door unlock control circuit. The BCM, upon receipt of a lock switch lock or unlock signal, will supply battery voltage to the door lock actuator lock or unlock control circuits. Since the opposite side of the lock actuator is connected to ground through the other lock actuator control circuit, the driver door latch assembly and the fuel door release actuator will then lock or unlock as commanded.



## Luggage Compartment Description and Operation

### Luggage Compartment Release System Components

- Body control module (BCM)
- Exterior rear compartment lid release switch (Sedan)
- Liftgate unlatch switch (Hatchback)
- Rear compartment lid latch (Sedan)
- Liftgate latch (Hatchback)
- Rear compartment lid release relay (Sedan)
- Liftgate release relay (Hatchback)

### Luggage Compartment Release Operation

#### Trunk/ Liftgate Release Switch

The BCM monitors supplies a 12 V signal to the release switch so that when the switch is pressed, the voltage within the signal circuit is pulled low and in response, the BCM will detect the voltage drop and check the status of the door lock system. If the driver door is locked, the BCM will ignore the request, if the driver door is unlocked, the BCM will recognize the request and will provide voltage to the release relay.

#### Rear Compartment Lid Latch

When BCM receives a rear compartment release command from the release switch, the BCM applies brief pulse of voltage to the release relay control circuit, which energizes the coil side of the relay. The switch side of the release relay then momentarily closes, supplying a brief pulse of battery positive voltage to the rear compartment latch. The rear compartment latch is continuously grounded and when it receives the voltage pulse, it will become energized and the latch will activate releasing the trunk lid or liftgate so that the trunk lid or liftgate may be manually raised to an open position.

#### Keyless Entry Transmitter

The BCM may also get a rear compartment release command from the remote keyless entry module. When the trunk button is pressed on the keyless entry transmitter, a rear compartment release request is sent to the remote keyless entry module, the remote keyless entry module will then send a serial data message to the BCM to command the release of the trunk/liftgate.





## Power Door Locks Description and Operation

### Door Lock System Components

The power door lock system consists of the following components:

- Door lock switch, located in the instrument panel center stack
- Body control module (BCM)
- Driver door latch
- Passenger door latch
- Left rear door latch
- Right rear door latch

### Door Lock and Unlock Operation

When a door lock switch is activated in the lock or unlock position the BCM will receive a ground signal on either the door lock switch lock or unlock signal circuits.

The BCM, upon receipt of a lock switch lock or unlock signal, will supply battery voltage to the door lock actuator lock or unlock control circuits. Since the opposite side of the lock actuator is connected to ground through the other lock actuator control circuit, the doors will then lock or unlock as commanded.

The following three circuits are used to operate the lock:

- Driver door unlock
- Passenger/rear doors unlock
- All door lock

The driver door lock actuator is isolated so it can be unlocked by itself using the keyless entry transmitter.





## Trunk/ Liftgate Ajar Indicator Description and Operation

### Door Ajar Indicator

The body control module (BCM) monitors the voltage level of the liftgate ajar signal circuit which is normally at the system voltage when the liftgate or trunk lid is closed. When the liftgate or trunk lid is ajar or open, a switch within the latch assembly closes providing a path to ground for the liftgate ajar signal circuit. The voltage within the signal circuit will then drop to 0 volts, the BCM will then detect the voltage drop and will send a serial data message to the instrument panel cluster (IPC). The IPC will then display the door ajar icon.





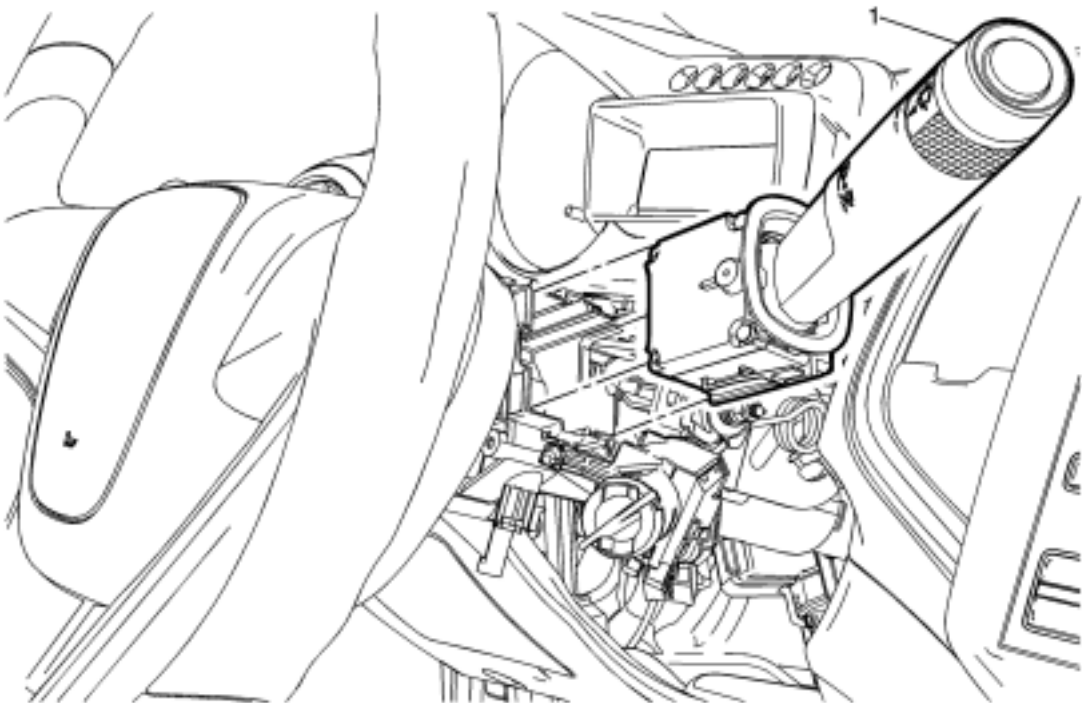
Specifications	Windshield Wiper Blade Replacement
Windshield Wiper and Washer Switch Replacement	Rear Window Wiper Blade Replacement
Windshield Washer Nozzle Hose Replacement	Windshield Wiper Motor Replacement
Windshield Washer Nozzle Replacement	Rear Window Wiper Motor Replacement (Hatchback)
Rear Window Washer Nozzle Replacement	Windshield Wiper System Module Replacement
Windshield Washer Solvent Container Hose Replacement	Rear Window Wiper Motor Grommet Replacement
Windshield Washer Solvent Container Filler Tube Replacement	Windshield Glass Cleaning
Windshield Washer Solvent Container Replacement	Wiper Blade Element Cleaning
Windshield Washer Pump Replacement	Wiper Chatter Repair
Air Inlet Grille Panel Replacement	Description and Operation
Windshield Wiper Arm Replacement	Special Tools
Rear Window Wiper Arm Replacement	



Fastener Tightening Specifications

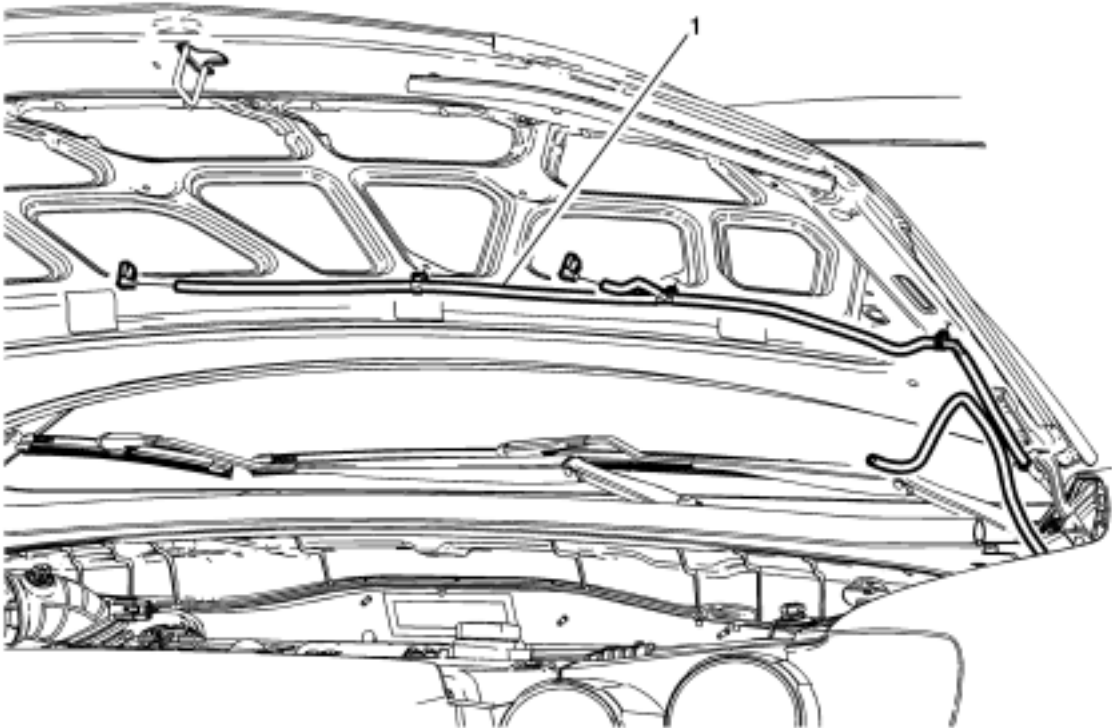
Application	Specification	
	Metric	English
Air Inlet Grille Panel Screw	2.5 N·m	22 lb in
Rear Window Wiper Arm Nut	10 N·m	89 lb in
Rear Window Wiper Motor Bolt	9 N·m	80 lb in
Windshield Washer Solvent Container Nut	5 N·m	44 lb in
Windshield Wiper Arm Nut	25 N·m	18 lb ft
Windshield Wiper Motor Bracket Screw	8.5 N·m	75 lb in
Windshield Wiper System Module Bolt	18 N·m	13 lb ft

Windshield Wiper and Washer Switch Replacement



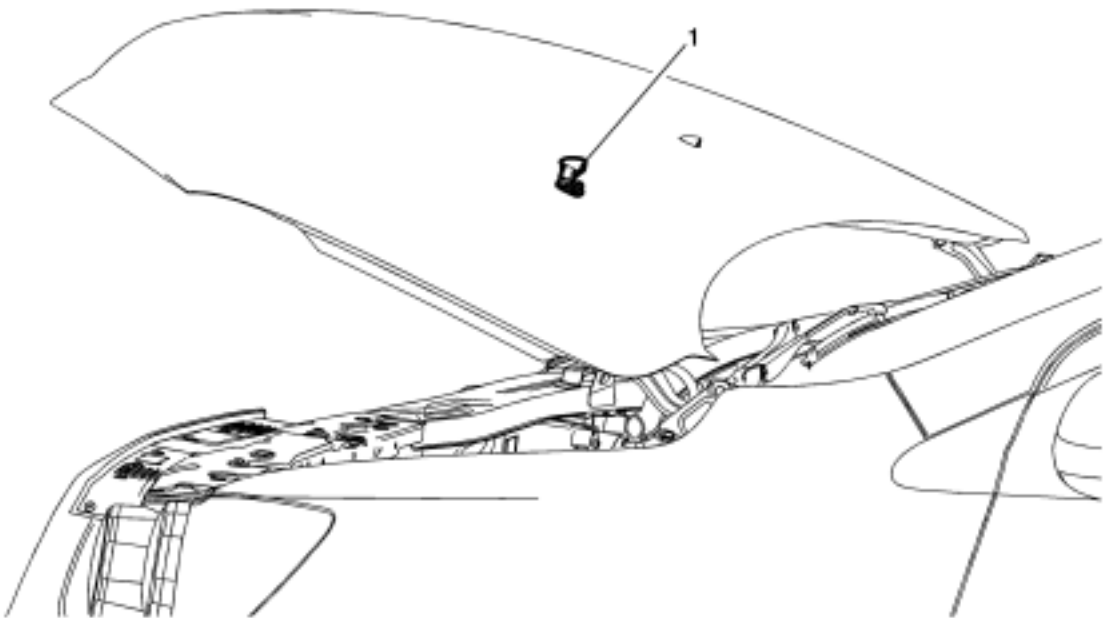
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the upper trim cover and the lower trim cover from the steering column. Refer to <a href="#">Steering Column Lower Trim Cover Replacement</a> .</p>	
1	<p>Windshield Wiper and Washer Switch</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Disconnect any electrical connectors as necessary.</li><li>2. Release the plastic retaining tabs and remove the windshield wiper and washer switch from the turn signal switch bracket.</li></ol>

Windshield Washer Nozzle Hose Replacement



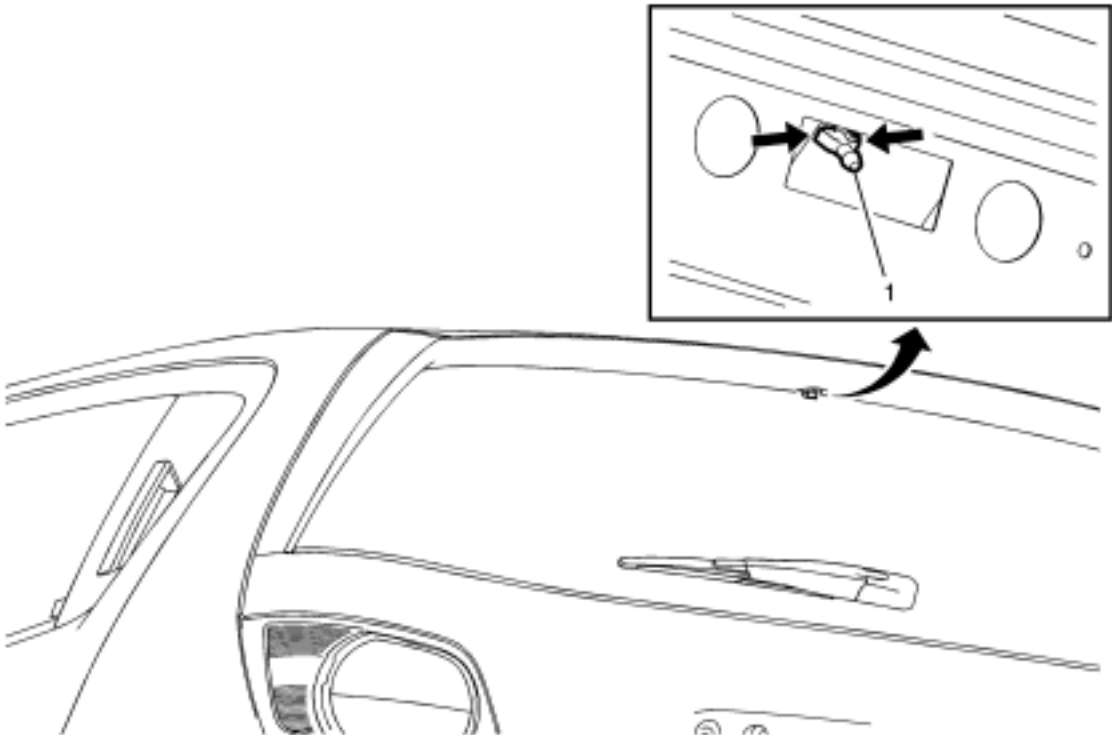
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the hood insulator. Refer to <a href="#">Hood Insulator Replacement</a> .</p>	
1	<p>Windshield Washer Nozzle Hose</p> <p><b>Procedure</b></p> <p>1. Disconnect the windshield washer hose at the front fender upper left hand bracket from the windshield washer solvent container pump hose.</p> <p>2. Disconnect the windshield washer hose retainer at the hood hinge.</p> <p>3. Disconnect all three washer hose retainers from the underside of the hood assembly.</p> <p>4. Disconnect the windshield washer hose at both windshield washer nozzle spouts.</p> <p>5. Remove the windshield washer hose from the vehicle.</p>

Windshield Washer Nozzle Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the hood insulator. Refer to <a href="#">Hood Insulator Replacement</a> .</p>	
1	<p>Windshield Washer Nozzle</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Disconnect the windshield washer hose at the washer nozzle being serviced.</li><li>2. Using two fingers, squeeze the locking tabs on the underside of the hood on the washer nozzle.</li><li>3. Push the washer nozzle outward from the hood while rotating the washer nozzle to the right.</li><li>4. Remove the windshield washer nozzle from the hood assembly.</li></ol>

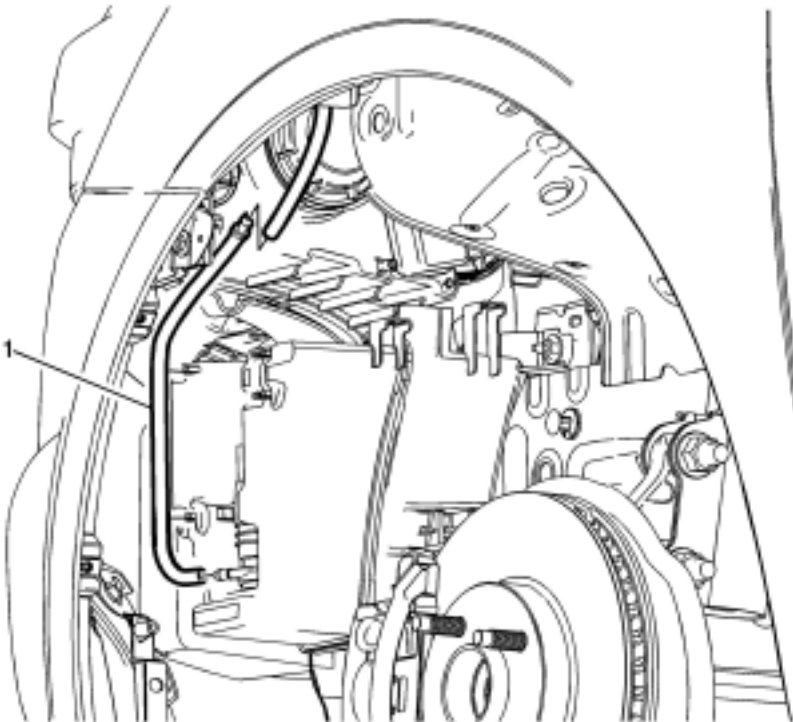
Rear Window Washer Nozzle Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the inside high mount stop lamp. Refer to <a href="#">High Mount Stop Lamp Replacement</a> .</p>	
1	<p>Rear Window Washer Nozzle</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Access the rear window washer nozzle through the hole in behind the high mounted stop lamp.</li><li>2. Disconnect the washer hose from the spout.</li><li>3. Pinch the two tabs on the rear window washer nozzle and push the nozzle up through the liftgate hole.</li><li>4. Remove the rear window washer nozzle from the vehicle.</li></ol>

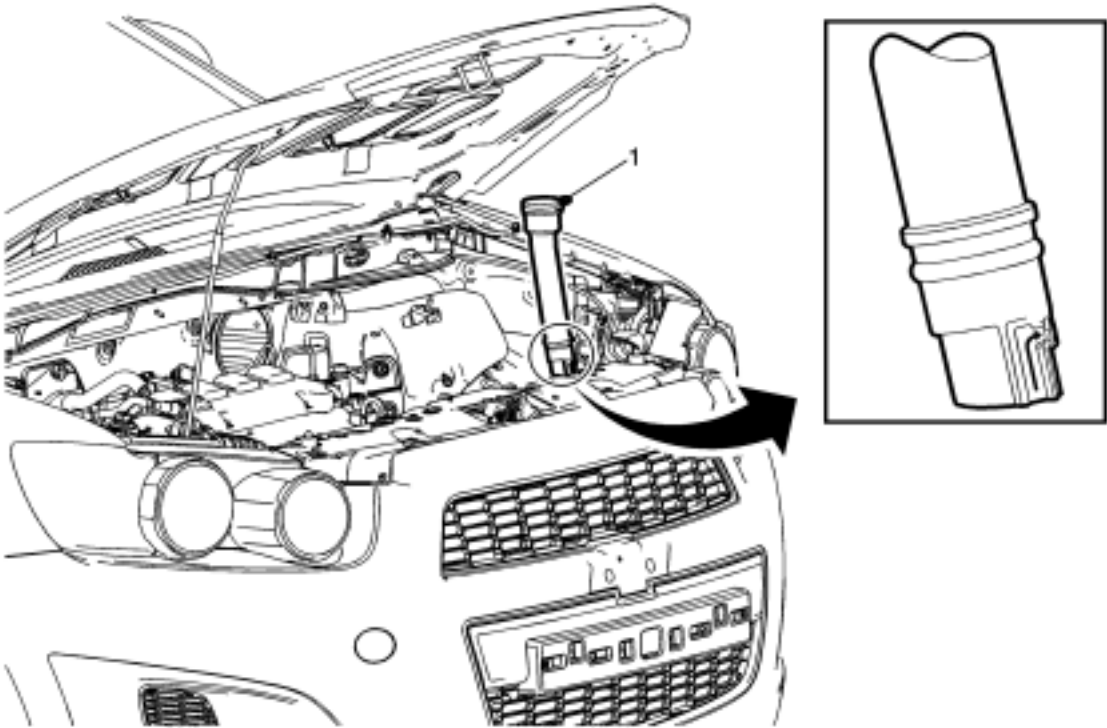


Windshield Washer Solvent Container Hose Replacement



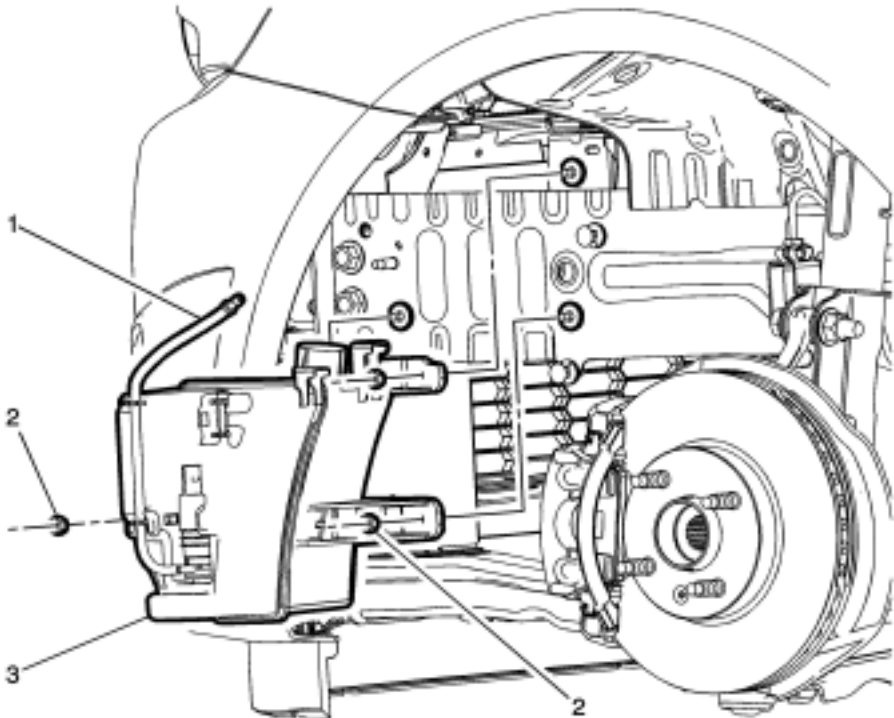
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the left front wheelhouse liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p>	
1	<p>Windshield Washer Pump Hose</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Place a clean suitable drain pan under the washer pump area.</li><li>2. Pull the hose from the windshield washer pump spout first.</li><li>3. Recover the windshield washer solvent from inside the hose.</li><li>4. Disconnect the windshield washer pump hose from the windshield washer nozzle hose near the front fender front bracket.</li><li>5. Disengage the windshield washer pump hose from the two retention clips on the windshield washer container.</li><li>6. Remove the windshield washer pump hose from the vehicle.</li></ol>

Windshield Washer Solvent Container Filler Tube Replacement



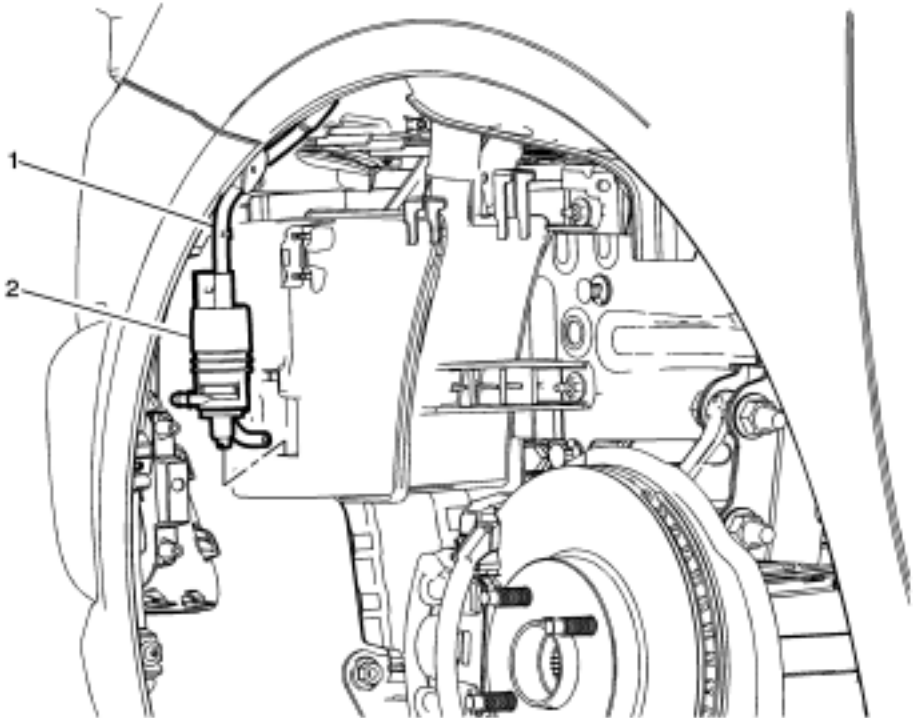
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Open and support the hood assembly.</p> <p>2. Grasp the top portion of the windshield washer container filler tube and rotate the tube 1/8 turn counterclockwise to unlock from the windshield washer solvent container lock tabs.</p> <p>3. Pull the tube straight from the windshield washer solvent container.</p> <p>4. Inspect and/or replace the seal on the windshield washer container filler tube if damaged.</p>	
1	<p>Windshield Washer Solvent Container Filler Tube</p> <p><b>Procedure</b></p> <p>1. Inspect the seal on the filler tube, replace as needed.</p> <p>2. Remove and transfer the windshield washer solvent container cap.</p> <p>3. Upon installation of the windshield washer solvent container filler tube back into the windshield washer solvent container, ensure to twist the filler tube 1/8 turn clockwise and lock the filler tube into the container lock tabs.</p>

Windshield Washer Solvent Container Replacement



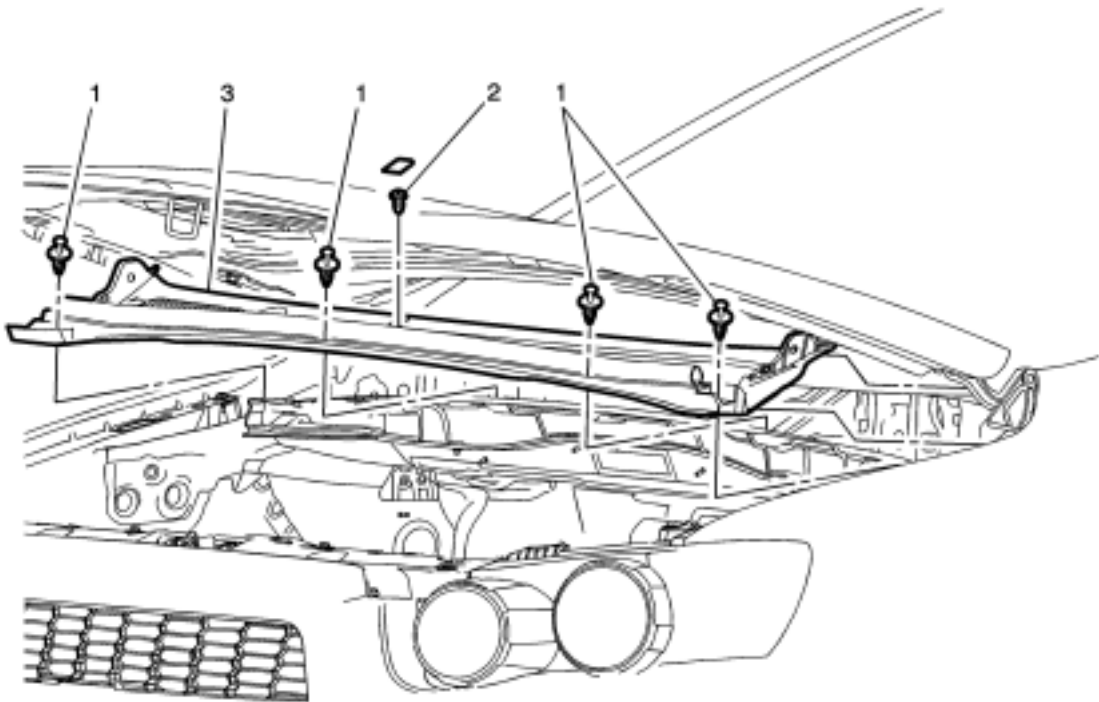
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the windshield washer solvent container filler tube. Refer to <a href="#">Windshield Washer Solvent Container Filler Tube Replacement</a> .</p> <p>2. Remove the left side front portion of the front wheelhouse liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p> <p>3. Disconnect the windshield washer hose from the windshield washer solvent container washer pump hose.</p> <p>4. Disconnect the windshield washer pump electrical connector from the washer pump.</p>	
1	<p>Windshield Washer Solvent Container Washer Pump Hose</p> <p><b>Procedure</b></p> <p>Disengage the washer pump hose from the washer pump spout and the windshield washer container retention tabs.</p>
2	<p>Windshield Washer Solvent Container Nut (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 5.0 N·m (44 lbin)</p>
3	<p>Windshield Washer Solvent Container</p> <p><b>Procedure</b></p> <p>1. Remove the windshield washer solvent container from the three studs on the front compartment front outer side rail and battery tray support.</p> <p>2. Remove the windshield washer pump from the windshield washer solvent container.</p> <p>3. Empty the windshield washer solvent into a suitable approved clean container.</p> <p>4. Transfer parts as needed.</p>

Windshield Washer Pump Replacement



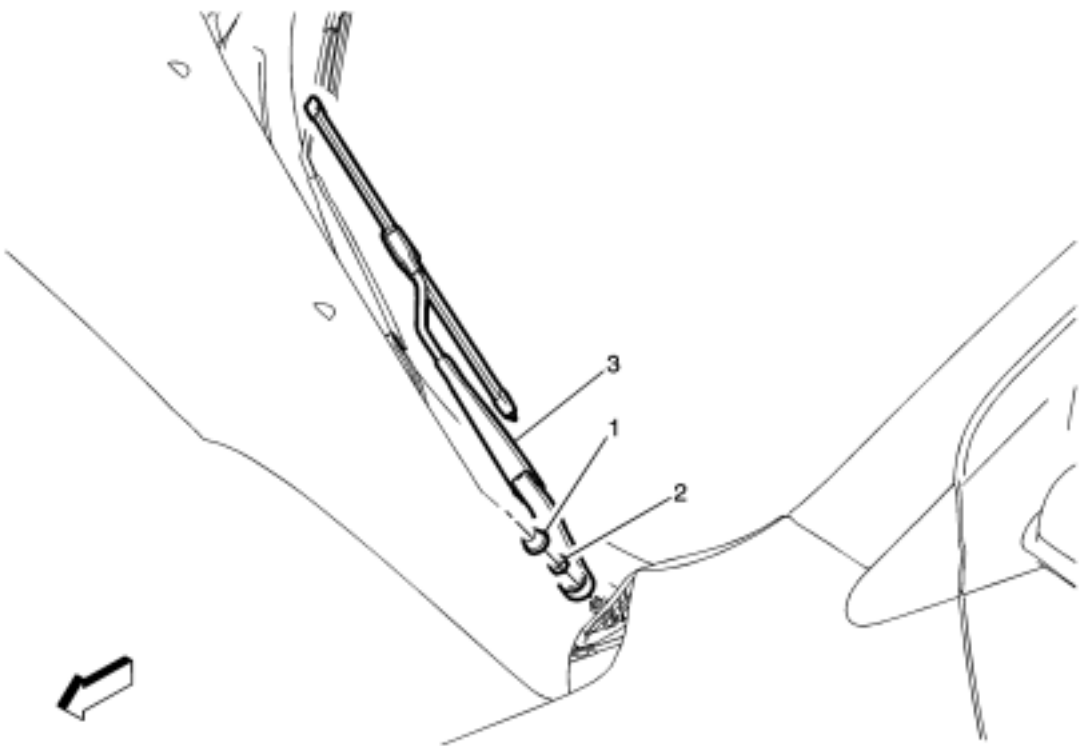
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front left front wheelhouse liner. Refer to <a href="#">Front Wheelhouse Liner Replacement</a> .</p>	
1	<p>Windshield Washer Pump Hose</p> <p><b>Procedure</b></p> <p>Place a clean suitable drain pan under the windshield washer pump area to recover the windshield washer solvent when the windshield washer pump hose is disconnected.</p>
2	<p>Windshield Washer Pump</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Disconnect the electrical connector to the windshield washer pump.</li><li>2. Using two flat-bladed tools, place the blades on each side of the washer pump, under the windshield washer pump grommet.</li><li>3. Twist the two flat-blades in opposite directions to lift the washer pump from the windshield washer solvent container.</li><li>4. Disengage the washer pump from the windshield washer container.</li><li>5. Remove the windshield washer pump and discard the windshield washer pump grommet.</li></ol>

Air Inlet Grille Panel Replacement



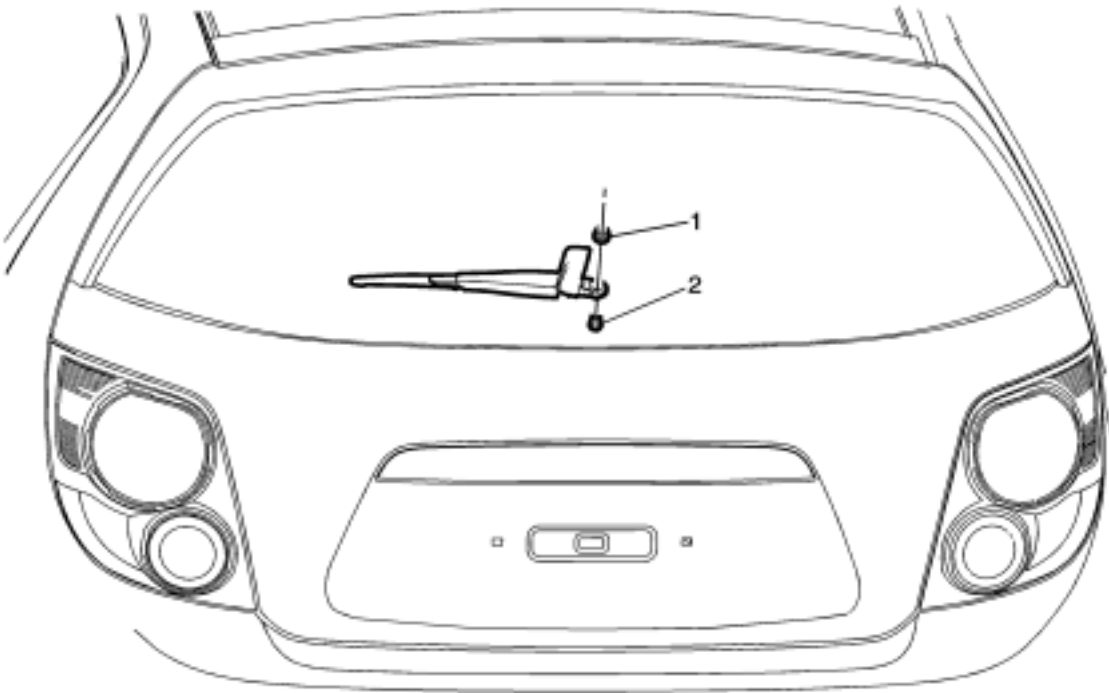
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove both wiper arm assemblies. Refer to <a href="#">Windshield Wiper Arm Replacement</a> .</p> <p>2. Remove both outer hood rear seals. Refer to <a href="#">Hood Rear Seal Replacement</a> .</p>	
1	<p>Air Inlet Grille Panel Retainer (Qty: 4)</p> <p><b>Procedure</b></p> <p>Release and remove the retainers from the air inlet grille panel.</p>
2	<p>Air Inlet Panel Screw</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the screw cover from the air inlet grille panel.</p> <p>2. Remove the air inlet grille panel screw. <b>Tighten</b> 2.5 N·m (22 lbin)</p>
3	<p>Air Inlet Grille Panel</p> <p><b>Procedure</b></p> <p>1. Lift the front edge of the grille panel off the front edge of the dash upper extension panel opening cover.</p> <p>2. Slide the grille panel forward from both hood hinges.</p> <p>3. Remove the grille panel from the vehicle.</p> <p>4. Remove the hood rear weather-strip. Refer to <a href="#">Hood Rear Weatherstrip Replacement</a> .</p>

Windshield Wiper Arm Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Open and support the hood assembly.</p>	
1	<p>Windshield Wiper Arm Nut Cap</p> <p><b>Tip</b> Use a small flat-bladed tool in order to release the finish cap from the wiper arm assembly.</p>
2	<p>Windshield Wiper Arm Nut</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 25 N·m (18 lb ft)</p>
3	<p>Windshield Wiper Arm</p> <p><b>Procedure</b></p> <p>1. Use the <i>BO-49385</i> puller in order to assist in the removal of the wiper arm from the wiper module pivot shaft.</p> <p>2. Remove the wiper arm from the pivot shaft.</p> <p>3. Clean the pivot shaft knurls with a soft wire brush before installing a new wiper arm.</p> <p><b>Special Tools</b></p> <p><i>BO-49385</i> Wiper Arm Puller</p> <p>For equivalent regional tools, refer to <a href="#">Special Tools</a> .</p>

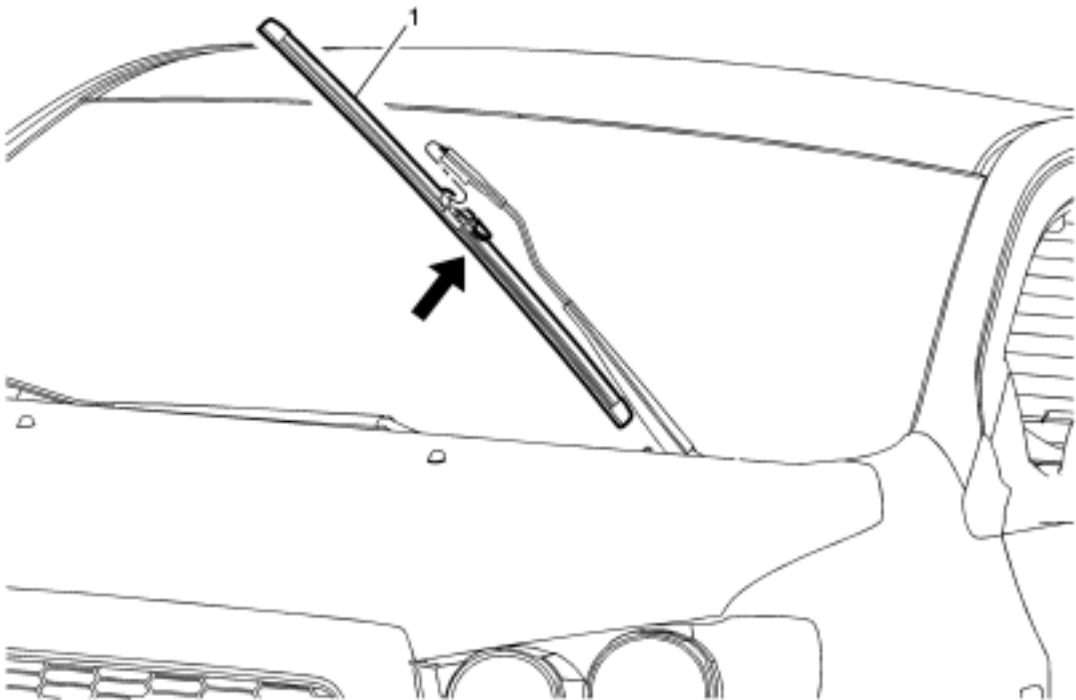
Rear Window Wiper Arm Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Using a small flat-bladed tool, release the locking tabs and lift the end of the wiper arm nut cover in order to access and remove the rear wiper arm nut.</p>	
1	<p>Rear Window Wiper Arm Nut</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 10 N·m (89 lbin)</p>
2	<p>Rear Window Wiper Arm</p> <p><b>Tip</b> Align and hold the rear window wiper arm blade to the edge of the blackout on the rear liftgate window while tightening.</p>



Windshield Wiper Blade Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Service Up and hold the wiper arm off the windshield when performing the wiper blade replacement.</p> <p>2. Pinch the two tabs on top of the wiper blade.</p> <p>3. Rotate the bottom edge of the wiper blade, downward, away from the wiper arm.</p> <p>4. Detach the wiper blade from the hook end of the windshield wiper arm.</p> <p>5. Carefully return the windshield wiper arm back to the glass until the new wiper blade is installed.</p>	
1	Windshield Wiper Blade Assembly

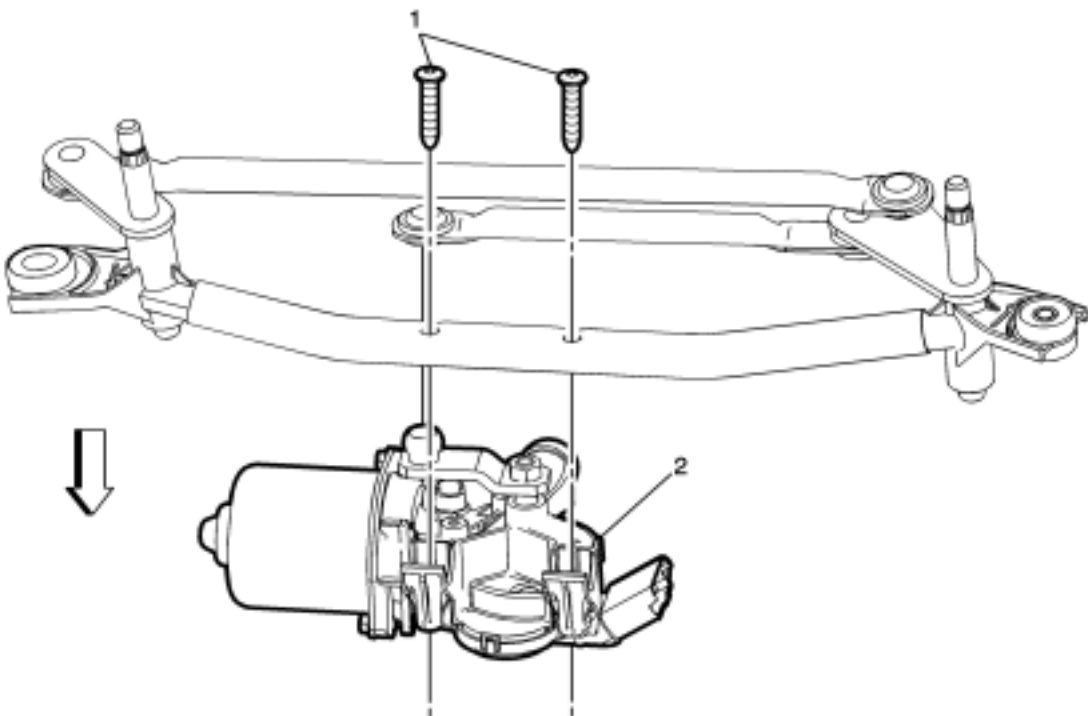


Rear Window Wiper Blade Replacement



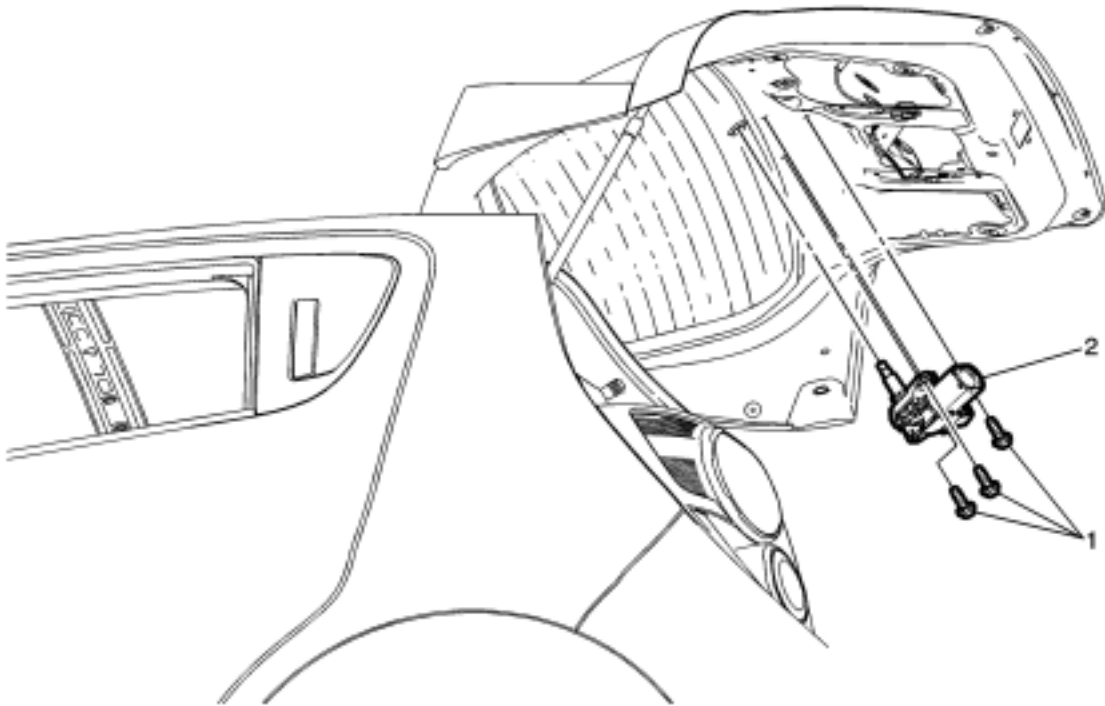
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Lift the rear window wiper arm off the rear window and release the rear window wiper blade from the rear window wiper arm.</p>	
1	Rear Window Wiper Blade

Windshield Wiper Motor Replacement



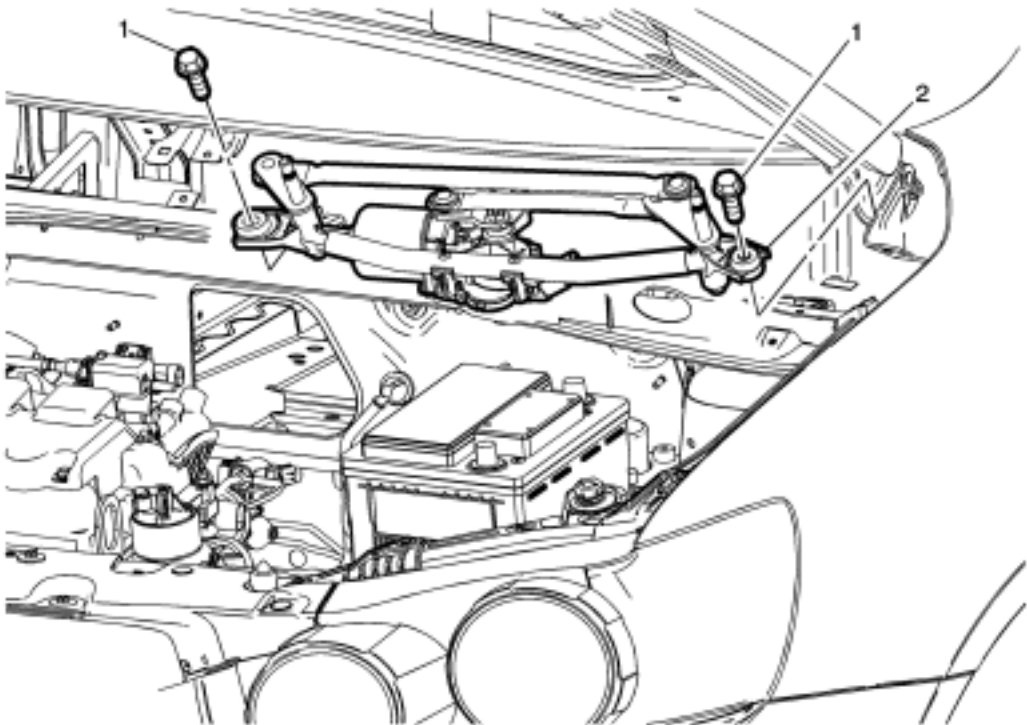
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the wiper system module. Refer to <a href="#">Windshield Wiper System Module Replacement</a></p>	
1	<p>Windshield Wiper Motor Bracket Screw (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 8.5 N·m (75 lbin)</p>
2	<p>Windshield Wiper Motor</p> <p><b>Procedure</b></p> <p>1. Use a wiper linkage separator or similar tool, separate the transmission drive link from the wiper motor crank arm ball stud.</p> <p>2. Use a wiper linkage installer or similar tool, install the transmission drive link onto the wiper motor crank arm ball stud.</p> <p><b>Tip</b> Apply a small amount of grease to the inner cup on the transmission link to aid in installation.</p>

Rear Window Wiper Motor Replacement (Hatchback)



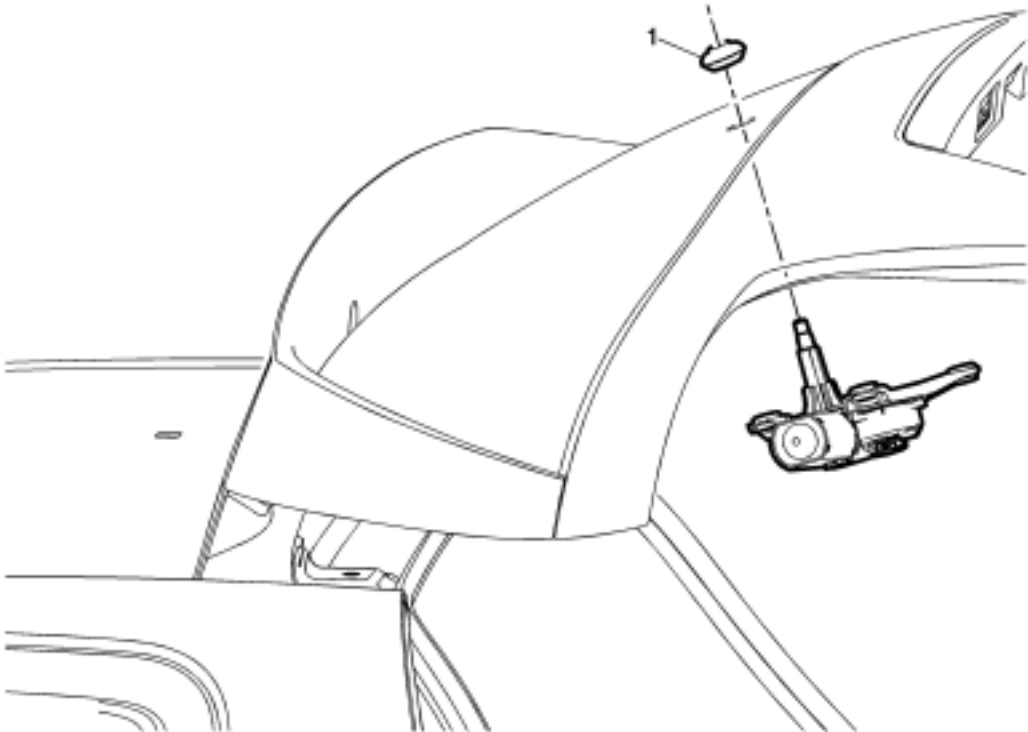
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Open and support the liftgate assembly.</p> <p>2. Remove the rear window wiper arm assembly. Refer to <a href="#">Rear Window Wiper Arm Replacement</a> .</p> <p>3. Remove the rear liftgate trim finish panel. Refer to <a href="#">Liftgate Trim Finish Panel Replacement</a> .</p> <p>4. Disconnect the rear window wiper motor electrical connector.</p>	
1	<p>Rear Window Wiper Motor Bolt (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Rear Window Wiper Motor</p> <p><b>Procedure</b></p> <p>1. Pull the rear window wiper motor inward from the rear liftgate.</p> <p>2. Release the wiper motor pivot shaft from the rear window wiper motor window grommet.</p> <p>3. Carefully remove the rear window wiper motor from the liftgate inner panel assembly.</p>

Windshield Wiper System Module Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Open and support the hood assembly.</p> <p>2. Remove the air inlet grille panel. Refer to <a href="#">Air Inlet Grille Panel Replacement</a> .</p>	
1	<p>Windshield Wiper System Module Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 18 N·m (13 lb ft)</p>
2	<p>Windshield Wiper System Module</p> <p><b>Procedure</b></p> <p>1. Lift the wiper system module from the plenum brackets.</p> <p>2. Disconnect the electrical connector from the windshield wiper motor.</p> <p>3. Remove the windshield wiper system module from the plenum.</p>

Rear Window Wiper Motor Grommet Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear window wiper motor. Refer to <a href="#">Rear Window Wiper Motor Replacement</a> .</p>	
1	<p>Rear Window Wiper Motor Grommet</p> <p><b>Tip</b> Apply some lubricant to the outside of the grommet upon installation to aid in installation through the liftgate glass opening.</p>



## Windshield Glass Cleaning

Clean the windshield with windshield cleaner, or equivalent. The cleaner should not harm the paint finish or scratch the glass. The glass is clean when the water no longer beads, but sheets across the entire glass surface.





## Wiper Blade Element Cleaning

Lift each blade assembly off of the windshield and clean the element with a cloth saturated with full strength washer solvent. Then rinse the blade assemblies with clear water.





## Wiper Chatter Repair

Some vehicles may exhibit a condition where the windshield wipers chatter and/or wipe unevenly. Several items may contribute to this condition. To completely repair this condition, ALL of the items listed should be tested and repaired as necessary.

- Clean the windshield glass. Refer to [Windshield Glass Cleaning](#) .
- Clean the wiper blade elements. Refer to [Wiper Blade Element Cleaning](#) .
- Inspect the wiper blade element set.





## Wiper/ Washer System Description and Operation

### Wiper/ Washer System Components

The wiper/washer system consists of the following electrical components:

- Windshield Wiper Relay
- Windshield Wiper Speed Control Relay
- Windshield Washer Pump Relay
- Windshield Washer Fluid Pump
- Windshield Wiper Motor
- Window Wiper/Washer Switch
- Windshield Wiper Motor Fuse
- Windshield Washer Fluid Pump Fuse
- Body Control Module (BCM)
- Rear Window Wiper Motor
- Rear Window Wiper Motor Fuse
- Rear Window Wiper Relay
- Rear Window Washer Pump Relay
- Rear Window Washer Pump Fuse

### Windshield Wiper System

The body control module (BCM) determines the front wipe/wash system mode of operation by monitoring several signals from the front wipe/wash switch as indicated in the wiper switch.

The front wipe/wash switch receives a reference ground signal from the BCM. Each input of the BCM provides a switched battery pull-up for each front wiper/washer switch output signal it receives. All the BCM inputs are recognized as active when the wiper switch provides a path to the referenced ground signal. The first signal received by the BCM is the result of 6 resistors in the front wiper switch configured as a resistor ladder network. This signal is connected to a BCM analog to digital input. Depending on the function selected (High, Low, Intermittent 1 thru 5, Mist, Off), the front wiper control switch connects a different set of resistors into the circuit resulting in different voltages appearing on the BCM A/D input. By monitoring this voltage, the BCM determines how to control the wiper motor On/Off Relay. It should be noted that High, Low, and Mist all have the same value on this signal circuit. The second signal received from the front wiper switch is active only when the front wiper switch is in the high speed wiper position. When the wiper switch is not in the high speed position, the switch is open and the signal circuit is pulled to battery by the BCM. When the wiper switch is in the high speed position, the switch pulls the circuit low. The BCM determines how to control the Wiper high/low speed relay from this input. The third signal received from the front wiper switch is from the momentary windshield wash control switch. When the washer switch is not active the switch is open and the signal circuit is pulled to battery by the BCM. When the washer switch is active, the switch pulls the circuit low. The BCM controls the windshield wash and windshield wash activated wiper operation based on this input.

The BCM controls front wiper motor operation through two output signals and the monitoring of one input signal. The two outputs (one high side drive, one low side drive) are used to control two external wiper motor relays: front wiper motor on/off relay: which provides the wiper motor with battery power when it is activated by the high side drive signal (switched battery) from the BCM. When left deactivated, the normally closed contacts provide a ground to the wiper motor. Wiper high/low speed relay: when activated by a low side drive signal (ground) from the BCM, it switches the power supplied by the wiper motors on/off relay to the motors high speed input. When left deactivated, the normally closed contacts connect the power supplied by the wiper motors on/off relay to the motors low speed input. The input used by the BCM is from the park switch located in the wiper motor assembly. When the wiper blades are not in the park position, the wiper park switch is open and the circuit is pulled up to battery by the BCM. When the wiper blades are in the park position at the bottom of the glass, the wiper park switch closes to ground pulling the park signal circuit low.

To initiate low speed operation, the BCM only energizes the front wiper motor on/off relay. This allows battery voltage from the wiper fuse to be applied through the switched contacts of the wiper motor on/off relay, through the normally closed contacts of the wiper high/low speed relay, to the low speed control circuit of the windshield wiper motor.

Redundant high speed switch pass through. The BCM provides redundant circuitry which places battery power on its wiper motor on/off relay output with activation of its low assertion high speed wiper switch input. The BCM shall be capable of doing this, even if the module has lost all microprocessor control. This redundant circuit shall supply power while in the RUN and CRANK power modes. however; while in the CRANK power mode, the pass through shall only be active if the BCM is NOT in a computer operating properly state.

To initiate high speed operation, the BCM energizes both the front wiper motor on/off relay and the wiper high/low speed relay . This allows battery voltage from the wiper fuse to be applied through the switched contacts of the wiper motor on/off relay, through the switched contacts of the wiper high/low speed relay, to the high speed control circuit of the windshield wiper motor.

Parking the wiper motor. In order to perform an accurate read of the park switch and to ensure the wipers will come to rest while still in the park position, parking of the wipers only occurs while in a low speed wiper mode. This requires that if the wipers are performing a high speed wiper operation at the time they are required to park, the BCM shall transition the Wipers to low speed by deactivating the wiper high/low relay before attempting to park. In order to park the wipers, the BCM monitors the park circuit until the park switch pulls the park circuit to ground. At this time, the BCM will immediately deactivate the wiper motor on/off relay. The relay contacts will switch back to their normally closed position and will apply ground to the wiper motor power inputs through the normally closed contacts of the wiper high/low relay. This deactivates and dynamically brakes the wiper motor in the park position. When the wiper switch is turned to the OFF position while the wiper motor is somewhere in mid-cycle, the BCM will continue to operate the motor until the wipers reach the park position. If the BCM is running the wiper motor and does not see a state transition of the park switch after 8 s, the wipers will stop immediately when the wiper switch is turned to OFF. If the ignition is turned OFF while the wipers are in mid-cycle, the wipers will stop immediately, regardless of position. The BCM will park the wipers next time the ignition is turned ON.

The windshield wiper system MIST operation is identical to LOW speed operation, except that the MIST switch is a press and release type switch. When the wiper switch is moved to the MIST position and released, low speed wiper motor operation is started and will continue until 1 cycle is complete. If the wiper switch is moved to the MIST position and held, the wiper motor will operate in the LOW speed mode until the switch is released.



Windshield wiper intermittent operation is a low speed wiper motor function with a variable delay interval between the wiper motor cycles. The duration of the delay is controlled by the front wiper control switches intermittent 1 thru intermittent 5 settings. The wiper operation is as follows

1. The BCM will initiate a single wipe by activating its front wiper ON/OFF relay output.
2. At the completion of a single wipe, the BCM will park the wipers as described above.
3. The BCM will then pause the wipers in their park position for the time duration associated with intermittent delay switch setting.
4. When the delay time expires repeat Steps 1 and 3 until the system is turned off or taken out of intermittent mode. If the wiper switch is moved from a longer delay interval to a shorter delay interval, the BCM will command an immediate wipe cycle and reset the delay timer to the shorter delay interval.

Intermittent wiper operation may be vehicle speed sensitive. When enabled, the speed compensated intermittent feature causes the intermittent wiper delay intervals to become shorter as a function of increased speed. As vehicle speed is reduced the intervals will become closer to the predetermined

Windshield Washer System

The BCM controls the windshield wash operation and windshield wash activated wiper operation. When the BCM detects the activation of the momentary windshield wash control switch, it activates its washer pump relay drive output which supplies battery power to the coil of the washer pump relay. This energizes the relay, which switches battery power to the pump motor. The BCM will also activate continuous low speed windshield wipes as described above. Upon deactivation of the windshield wash control switch, the wiper control module (BCM) shall deactivate the wash motor and will also park the wiper motor as described above unless the drip wipe feature is enabled. On some vehicles the drip wipe feature will be enabled and cause the system to provide additional wiping of the windshield after the switch has been released and fluid is no longer being applied. The front wash feature may attempt to detect a stuck switch. When enabled, activation of the wash feature shall be limited to 10 seconds.

On vehicles with the Rear Wash feature a single reversing wash motor may be utilized for both the front and rear wash operation. In this system the wash motor is operated in one direction to spray fluid on the front windshield and then operated in the reverse direction to spray fluid on the rear window. The BCM Controls the reversing wash motor through two High Side Drive outputs. One controls the Front Wiper Motor Relay and one controls the Rear Wiper Relay.

Rear Wiper System


On vehicles equipped with a Rear Wiper, the BCM determines of the Rear Wipe/Wash System Mode of Operation by monitoring the multiplexed output of the Rear Wipe/Wash Switch. The Rear Wipe Wash Switch uses a reference ground signal from the BCM. The BCM provides a switched Battery pull-up for the Rear Wiper/Washer Switch output signal it receives. All the BCM inputs are recognized as active when the Rear Wiper Switch provides a path to the referenced ground signal. The Rear Wiper/Washer signal received by the BCM is the result of 3 resistors in the Rear Wiper Switch configured as a resistor ladder network. This signal is connected to a BCM Analog to Digital Input which also provides a switched Battery pull-up for the circuit. Depending on the function selected (Low, Intermittent, Off, Wash), the Rear Wiper Control Switch connects a different set of resistors into the circuit resulting in different voltages appearing on the BCM A/D input. By monitoring this voltage, the BCM determines how to control the Rear Wiper Motor Relay and the Rear Washer Relay.

The BCM Controls the single speed Rear Wiper Motor by its Active High output to the external Rear Wiper Motor Relay. When the BCM activates its output and applies Battery to the coil of the relay, the relay energizes, allowing Battery voltage from the fuse to be applied through the switched contacts of the Rear Wiper Motor Relay to the Rear Wiper Motors control input. The motor then operates continuously at low speed. The BCM does not control the parking of the Rear Wiper Motor, it is self parking. When the BCM deactivates its output, the contacts of the Rear Wiper Motor Relay switch back to ground which will be used by the wiper for Dynamic Braking. The Rear Wipers internal park switch and circuitry will sustain motor operation until the wiper arm has returned to its Park position.

Rear Wash

When the Body Control Module detects that the Rear wiper/wash switch has activated the momentary Wash switch, it activates a High Side Drive output which supplies Battery to the coil of the Rear Washer Pump Relay. This energizes the Relay, which switches Battery Power to the Washer Pump Motor. The BCM will also activate continuous Low Speed Windshield Wipers as described above. The BCM software will attempt to detect a stuck Rear Wash Switch. A stuck Rear Wash Switch condition is detected if the Rear Wash Motor Relay Output has been continuously active for 10 seconds or more. Upon detecting this the BCM will fail soft the state of the Rear Wash Control to Inactive. This shall cause the System to perform as if the momentary Wash control had been released.

Special Tools

Illustration	Tool Number/ Description
	<div>BO-49385</div> <div>BO-6626</div> <div>KM-6626</div> <div>S0201912</div> <div>Wiper Arm Puller</div>



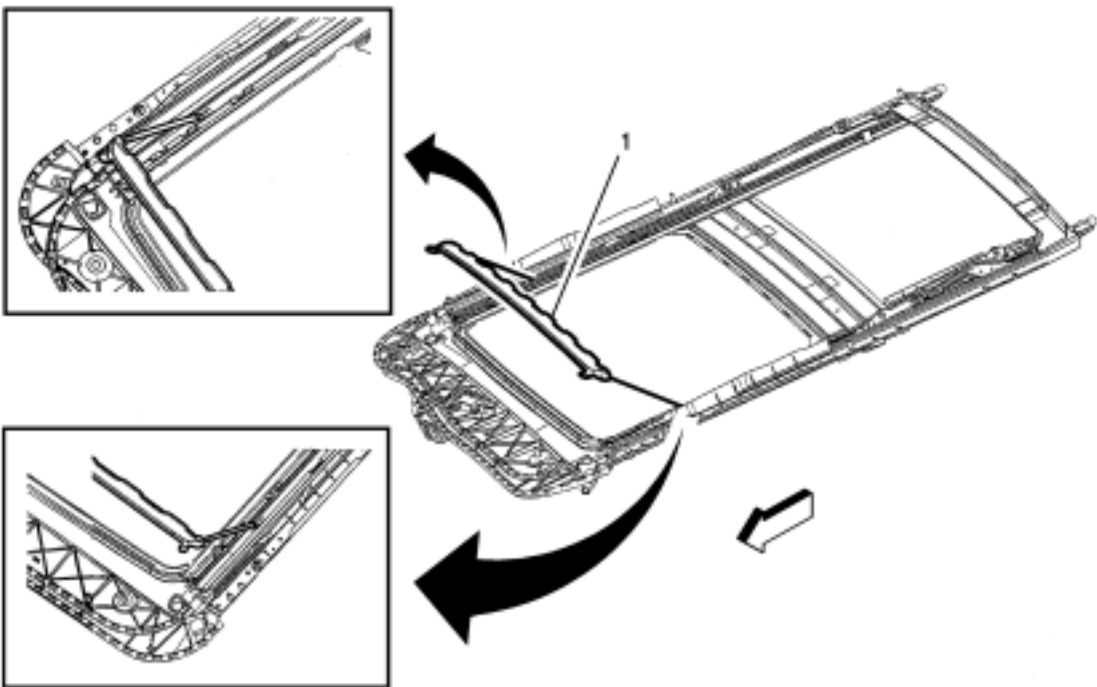
Specifications	Sunroof Sunshade Replacement
Sunroof Air Deflector Replacement	Sunroof Window Seal Replacement
Sunroof Housing Front Drain Hose Replacement	Sunroof Switch Replacement
Sunroof Housing Rear Drain Hose Replacement	Sunroof Window Height and Opening Fit Adjustment
Sunroof Module Assembly Replacement	Sunroof Window Replacement
Sunroof Motor/Actuator Initialization/Teach Process	Description and Operation
Sunroof Actuator Motor Replacement	



Fastener Tightening Specifications

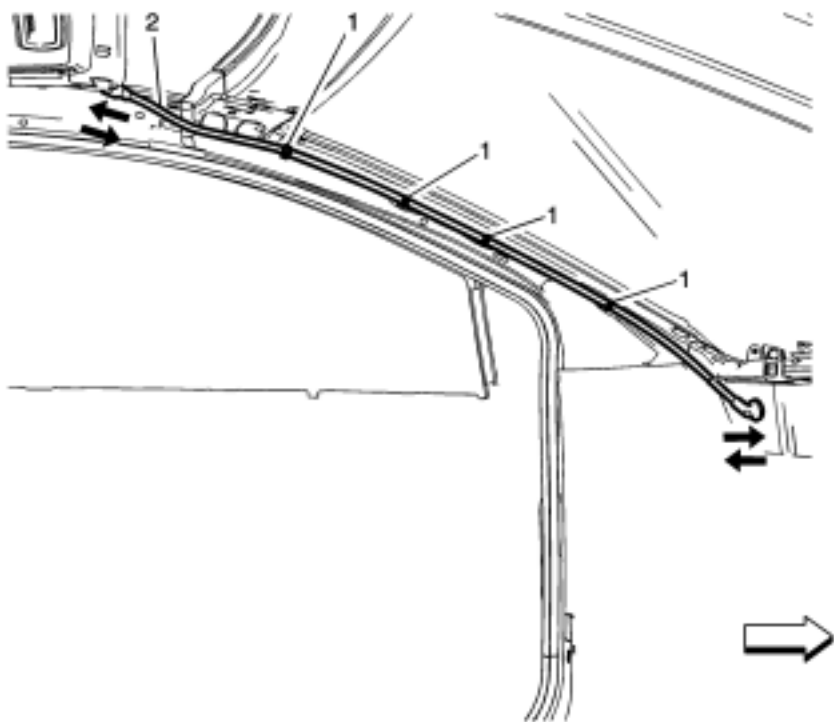
Application	Specification	
	Metric	English
Sunroof Module Bolts	9 N·m	80 lb in
Sunshade Motor/Actuator Screws	6 N·m	53 lb in
Sunroof Window Screws	5 N·m	44 lb in

Sunroof Air Deflector Replacement



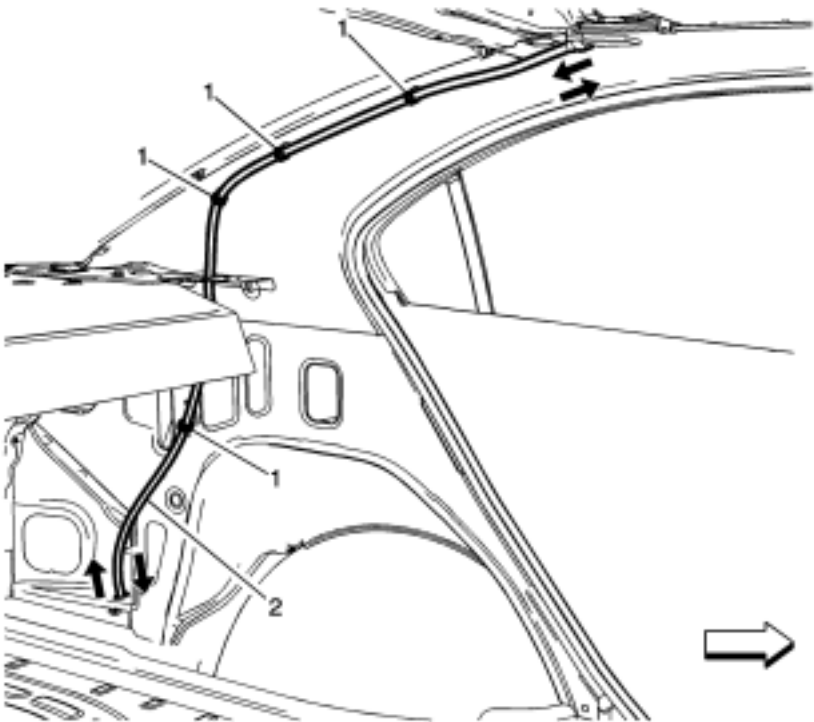
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the sunroof module. Refer to <a href="#">Sunroof Module Assembly Replacement</a> .</p>	
1	<p>Sunroof Air Deflector</p> <p><b>Tip</b> Cycle the sunroof window to the full rearward position.</p>

Sunroof Housing Front Drain Hose Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>It is only necessary to lower the headliner. Only do those steps in the headliner replacement procedure that will lower the headliner enough to gain access to the part. Refer to <a href="#">Headlining Trim Panel Replacement</a> .</p>	
1	Sunroof Housing Front Drain Hose Retainers (Qty: 4)
2	<p>Sunroof Housing Front Drain Hose</p> <p><b>Procedure</b></p> <p>1. Remove the sunroof housing front drain hose and grommet from plenum. 2. Water test the vehicle before installing the headliner to ensure no water leaks.</p>

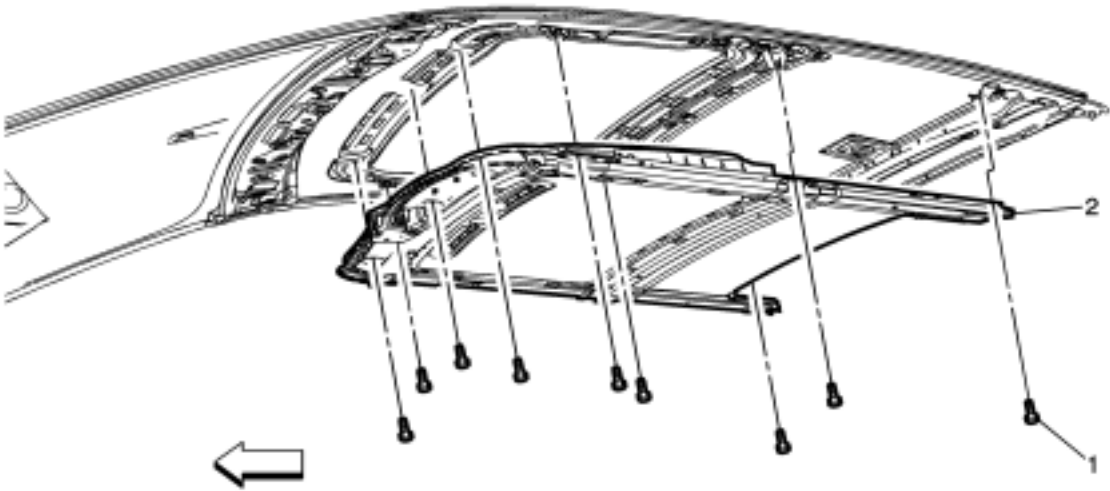
Sunroof Housing Rear Drain Hose Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. It is only necessary to lower the headliner. Only do those steps in the headliner replacement procedure that will lower the headliner enough to gain access to the part. Refer to <a href="#">Headlining Trim Panel Replacement</a> .</p> <p>2. Remove the body side trim panel. Refer to <a href="#">Body Lock Pillar Upper Trim Panel Replacement</a> .</p> <p>3. Remove the rear window panel trim. Refer to <a href="#">Rear Window Panel Trim Replacement</a> .</p> <p>4. Remove the rear compartment trim on the side being repaired. Refer to <a href="#">Rear Compartment Side Trim Replacement - Right Side</a> .</p>	
1	Sunroof Housing Rear Drain Hose Retainers (Qty: 4)
2	<p>Sunroof Housing Rear Drain Hose</p> <p><b>Procedure</b></p> <p>1. Remove the sunroof housing rear drain hose and grommet from the rear compartment quarter panel.</p> <p>2. Water test the vehicle before installing the headliner to ensure no water leaks.</p>



Sunroof Module Assembly Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the sunroof window. Refer to <a href="#">Sunroof Window Replacement</a> .</p> <p>2. Remove the headliner. Refer to <a href="#">Headlining Trim Panel Replacement</a> .</p> <p>3. Disconnect the front and rear sunroof drain hoses. Refer to <a href="#">Sunroof Housing Front Drain Hose Replacement</a> and <a href="#">Sunroof Housing Rear Drain Hose Replacement</a> .</p>	
1	<p>Sunroof Module Bolts (Qty :9)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. With an assistant, lower and remove the sunroof module assembly from the vehicle.</p> <p>2. Place the sunroof assembly on a clean dry surface.</p> <p>3. Transfer all necessary components to the new module assembly.</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Sunroof Module</p> <p><b>Procedure</b></p> <p>1. Secure the harness to the sunroof module.</p> <p>2. Adjust the sunroof window. Refer to <a href="#">Sunroof Window Height and Opening Fit Adjustment</a> .</p> <p>3. Verify the proper operation of the sunroof before securing the headliner.</p> <p>4. Ensure the motor/actuator initialization/teach process has been done. Refer to <a href="#">Sunroof Motor/Actuator Initialization/Teach Process</a> .</p>



## Sunroof Motor/ Actuator Initialization/ Teach Process

**Note:** If the sunroof motor is new, cycle the sunroof seven (7) times to teach the motor/actuator initialization process. Perform the initialization/teach procedure on a reinstall motor or a new motor. Ensure the electrical harness on the headliner is connected to the sunroof motor, battery power is applied, and the ignition switch is ON.

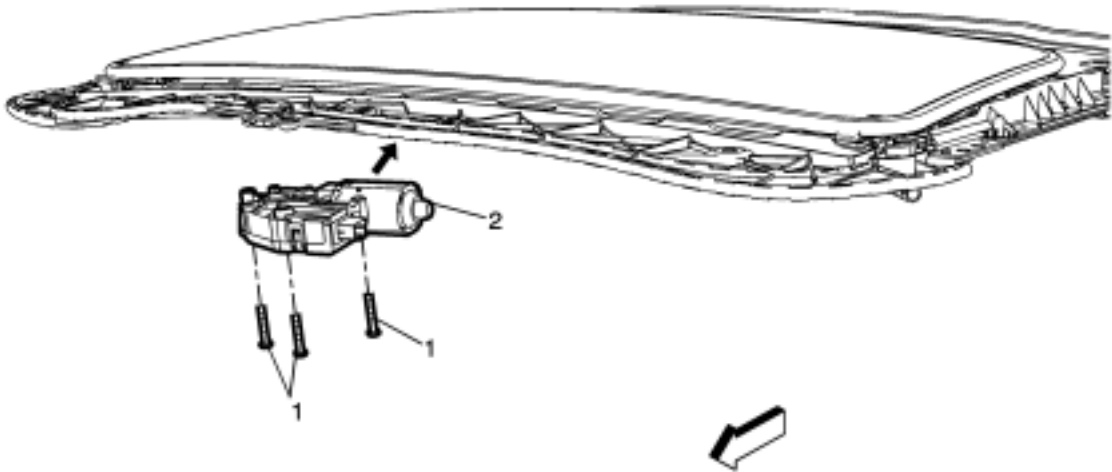
**Note:** If the sunroof window doesn't go to the vent open position first time, release the switch and press the switch again.

1. Press and hold the sunroof switch to the vent open position until the sunroof window stops in the vent open position.
2. Again press and hold the sunroof switch to the vent open position for at least 10 seconds, then the window should move slightly.
3. Verify the sunroof operation.

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

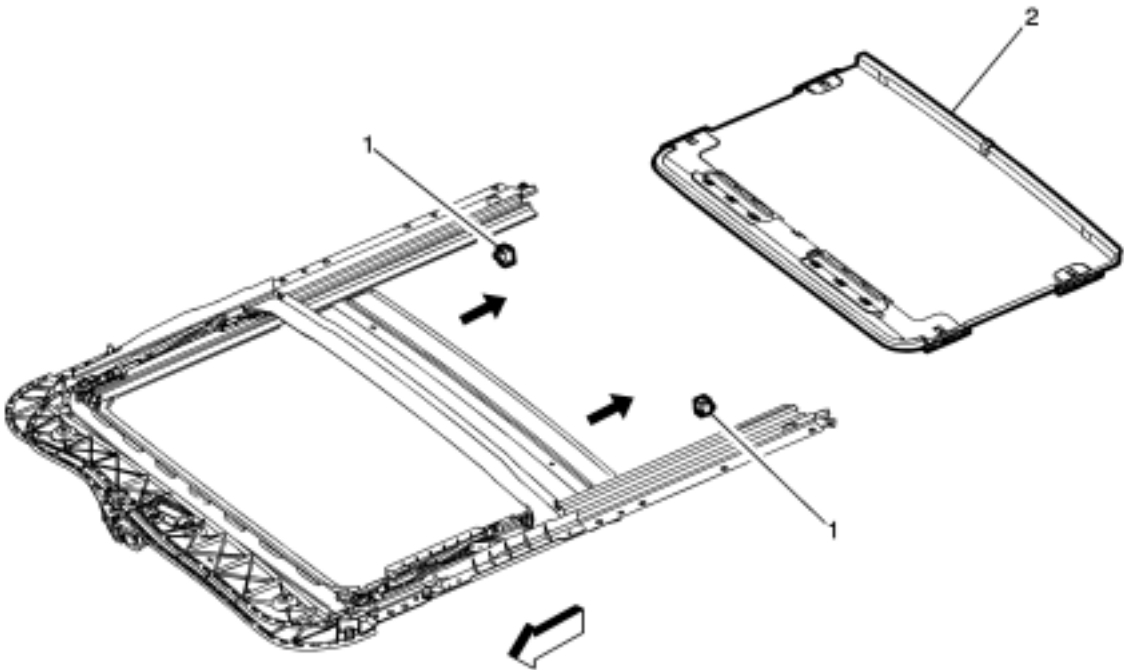


Sunroof Actuator Motor Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the dome lamp bezel. Refer to <a href="#">Dome Lamp Bezel Replacement</a> .</p>	
1	<p>Sunroof Actuator Motor Screw (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. The sunroof window must be in the fully closed position before disconnecting the harness, to ensure synchronization of the sunroof motor to the sunroof module.</p> <p>2. Disconnect the electrical connector from the sunroof motor.</p> <p><b>Tighten</b> 6 N·m (53 lbin)</p>
2	<p>Sunroof Actuator Motor</p> <p><b>Procedure</b></p> <p>1. Pull downward to disengage the actuator motor from the sunroof module.</p> <p>2. Install the motor, verify the sunroof operation.</p> <p>3. Ensure the actuator motor initialization/teach process has been done. Refer to <a href="#">Sunroof Motor/Actuator Initialization/Teach Process</a> .</p> <p>4. Verify the proper operation of the sunroof before installing the dome lamp bezel.</p>

Sunroof Sunshade Replacement

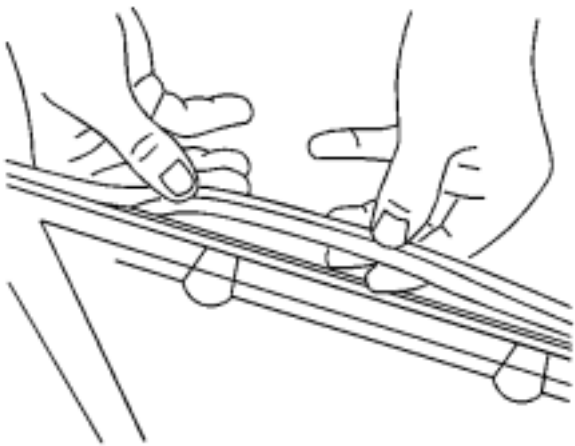


Callout	Component Name
<b>Preliminary Procedures</b> Remove the sunroof module. Refer to <a href="#">Sunroof Module Assembly Replacement</a> .	
1	Sunroof Sunshade Stops (Qty :2)
2	<div>Sunroof Sunshade</div> <div><b>Procedure</b> <div>1. Remove the stops located at the rear of the sunroof module.</div><div>2. Remove the sunshade by sliding it rearward out the ends of the module.</div><div>3. Verify the proper operation of the sunroof sunshade before securing the headliner.</div></div>

## Sunroof Window Seal Replacement

### Removal Procedure

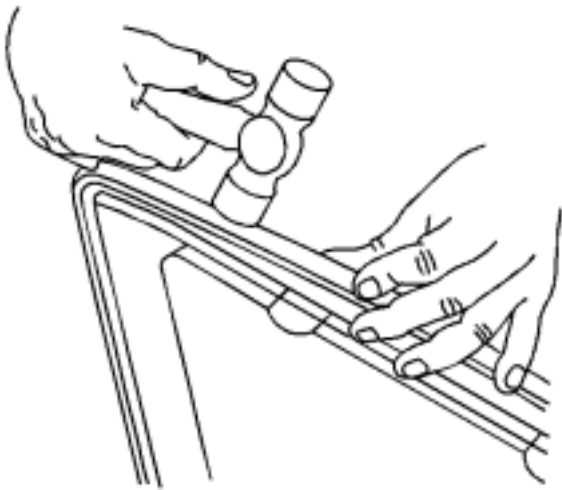
1. Remove the sunroof window panel. Refer to [Sunroof Window Replacement](#) .



2. Remove the seal from the window panel frame by pulling the seal away at one point and continuing around the perimeter of the frame.
3. Clean around the edge of the inside surface of the window with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint free cloth, allow to air dry.

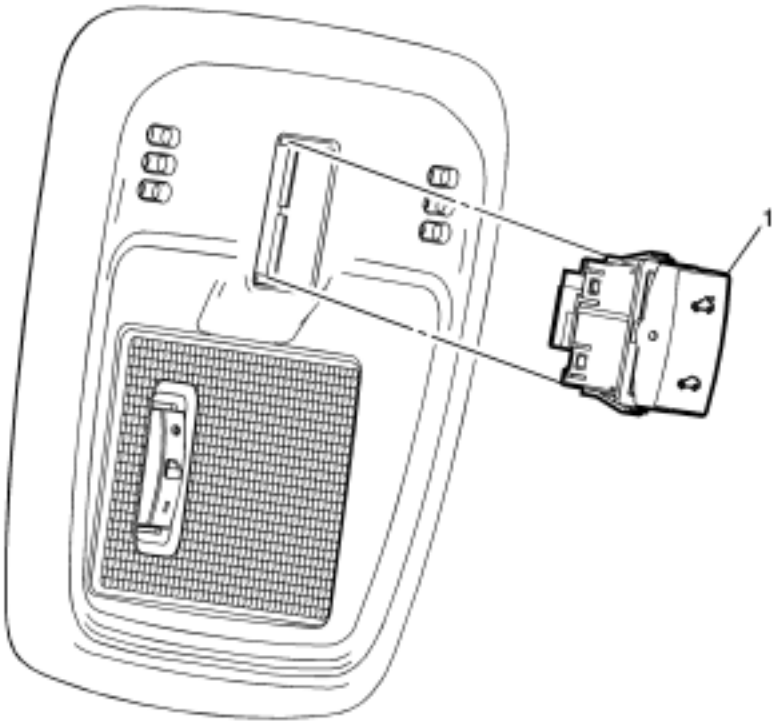
### Installation Procedure

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



2. Position the sunroof window panel seal onto the window frame, locating the starting end of the seal at the relief notch in the center of the passenger side of the frame.  
**Note:** Ensure that the seal is properly seated around the entire perimeter of the window frame.
3. Firmly press the window seal into the retainer edge of the sunroof window, a 50/50 mixture of soap and water by volume will help in the installation.
4. Install the sunroof window panel. Refer to [Sunroof Window Replacement](#) .
5. Adjust the window panel height. Refer to [Sunroof Window Height and Opening Fit Adjustment](#) .
6. Inspect sunroof for proper operation.

Sunroof Switch Replacement

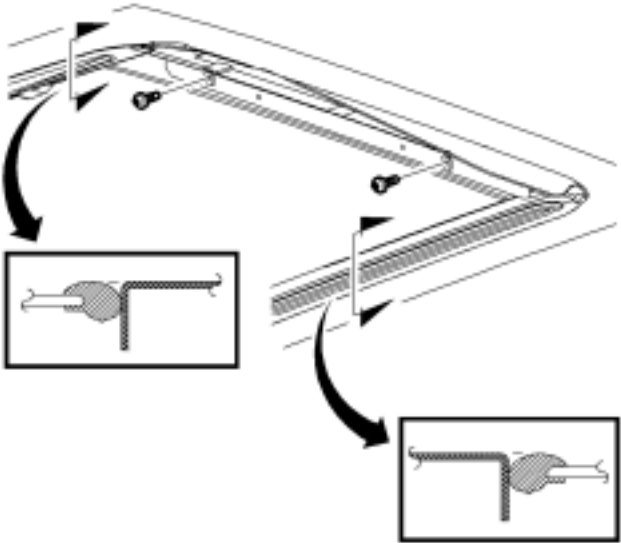


Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the dome lamp bezel. Refer to <a href="#">Dome Lamp Bezel Replacement</a> .</p>	
1	<p>Sunroof Switch</p> <p><b>Procedure</b></p> <p>1. Disconnect electrical connector. 2. Depress tabs to release switch.</p>

## Sunroof Window Height and Opening Fit Adjustment

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

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



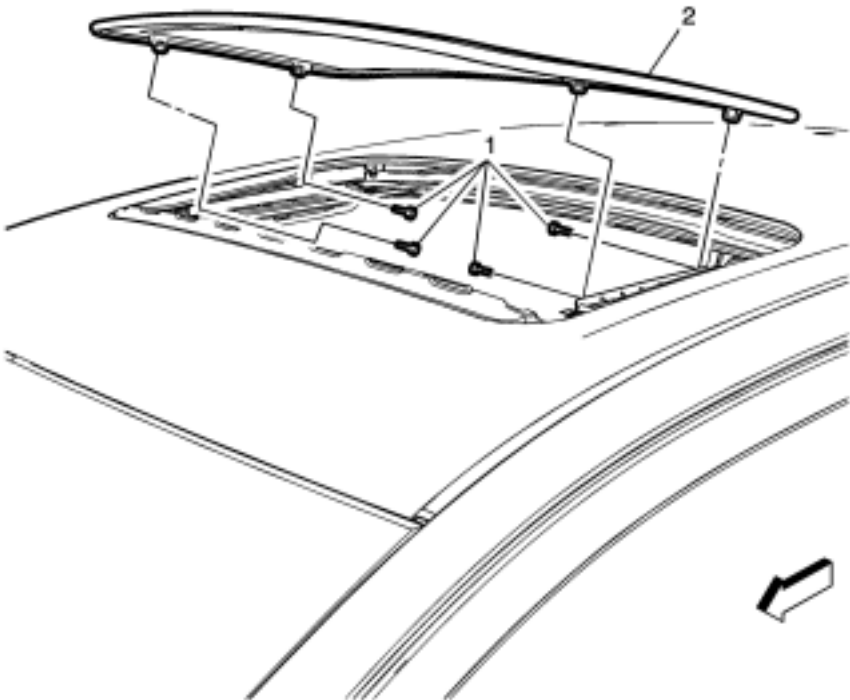
**Note:** Do Not remove or lower headliner to access sunroof window screws.

2. Loosen the adjusting screws on the window.
3. Adjust the corners of the front window panel using the following guidelines:
  - Adjust the front of the sunroof window to0.0 mm – 1.0 mm (0.0 in – 0.04 in) below the top surface of the roof panel.
  - Adjust the rear center line of the sunroof window to2 mm to 3 mm (0 .08 in to0.12 in) below the top surface of the roof panel.

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

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

Sunroof Window Replacement



Callout	Component Name
1	<div>Sunroof Window Bolt (Qty: 4)</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Tighten</b> 5 N·m (44 lbin)</div>
2	<div>Sunroof Window</div> <div><b>Procedure</b><div><div>1. Turn the ignition on.</div><div>2. Slide the sunshade to the full rearward position.</div><div>3. Move the sunroof window to the vent position.</div><div>4. Verify the proper operation of the sunroof. Refer to <a href="#">Sunroof Window Height and Opening Fit Adjustment</a> .</div></div></div>





## Sunroof Description and Operation (Tilt and Slide)

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 above the roof line for venting, and slides between the headliner and the roof panel to open fully.

The sunshade is operated by manually pushing or pulling it. It has a mechanical connection to the glass causing it to open with the glass and keeping it from closing more than the glass. If the glass is fully closed it will move without restriction.

The sunroof glass is controlled by an integrated motor/controller containing the interface to the sunroof switch, internal Hall effect position sensors, a bi-directional motor as well as the necessary control electronics. The Sunroof Motor/Controller is not connected to a serial data communication bus thus the Service scan tool is not capable of communicating with it.

The sunroof switch is connected directly to the Sunroof Motor/Controller and is a momentary rocker type switch with center off. It has two contacts, one for open movement and one for close movement. When activated, each switch contact completes the circuit between the appropriate Sunroof Motor/Controller input and battery voltage provided by the energized Rap/Accessory Relay.

### Sunroof System Thermal Protection

The sunroof controller has a thermal protection algorithm to protect the Sunroof controller and motor from damage due to overheating conditions resulting from excessive switch actuations. The thermal protection algorithm will cause any new sunroof commands to be ignored until the motor is allowed to cool.

### Sunroof Operation

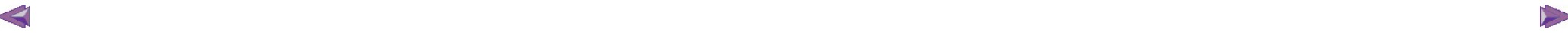
The sunroof will operate when the vehicle is in either the Run or Accessory Mode

#### Open/ Close

To open the sunroof, press and hold the rear of the switch. The sunroof may be expressed to the fully open position by pressing the switch twice within 3 seconds. To close the sunroof, press and hold the front of the switch. There is no express close function.

#### Vent

From the fully closed position, press and hold the front of the switch to vent the sunroof. To close from the tilt position, press the back of the switch.





Specifications	Rear Seat Center Shoulder Belt Replacement (Sedan)
Repairs and Inspections Required After a Collision	Shoulder Belt Replacement - Rear (Sedan)
Seat Belt Latch Stop Installation	Front Seat Belt Guide Adjuster Replacement (with AHU)
Front Seat Belt Buckle Replacement	Description and Operation
Rear Seat Belt Buckle Replacement	



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Driver or Passenger Seat Belt Buckle Fastener	45 N·m	33 lb ft
Driver or Passenger Seat Shoulder Belt Fastener	45 N·m	33 lb ft
Front Seat Shoulder Belt Guide Adjuster Bolt	45 N·m	33 lb ft
Rear Seat Belt Buckle Fastener	45 N·m	33 lb ft
Rear Seat Center Shoulder Belt Buckle Fastener	45 N·m	33 lb ft
Rear Seat Shoulder Belt Anchor Plate Fastener	45 N·m	33 lb ft
Rear Seat Shoulder Belt Retractor Fastener	45 N·m	33 lb ft



## Repairs and Inspections Required After a Collision

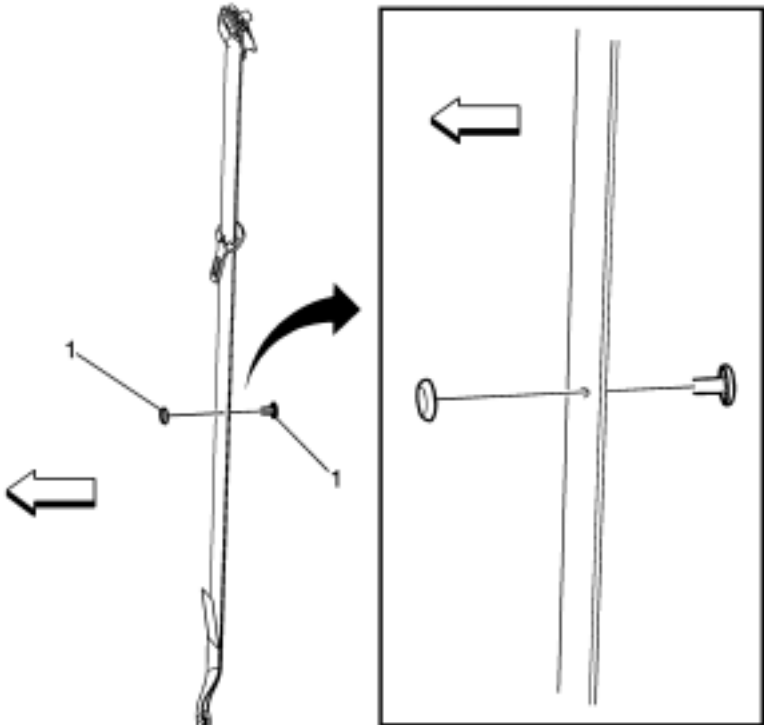
**Warning:** Restraint systems can be damaged in a collision. To help avoid injury and ensure that all parts in need of replacement are replaced:

- Replace any seat belt system that was in use during the collision serious enough to deploy any automatic restraint device such as air bags and seat belt pretensioners. This not only includes seat belt systems in use by people of adult size, but seat belt systems used to secure child restraints, infant carriers and booster seats, including LATCH system and top tether anchorages.
- Replace any seat belt system that has torn, worn, or damaged components. This not only includes adult seat belt systems, but built-in child restraints and LATCH system components, if any.
- Replace any seat belt system if you observe the words “REPLACE” or “CAUTION”, or if a yellow tag is visible. Do not replace a seat belt if only the child seat caution label is visible.
- Replace any seat belt system if you are doubtful about its condition. This not only includes adult seat belt systems, but built-in child restraints, LATCH system components, and any restraint system used to secure infant carriers, child restraints, and booster seats.
- Do NOT replace single seat belt system components in vehicles that have been in a collision as described above. Always replace the entire seat belt system with the buckle, guide and retractor assembly, which includes the latch and webbing material.

After a minor collision where no automatic restraint device was deployed, seat belt system replacement may not be necessary, unless some of the parts are torn, worn, or damaged.

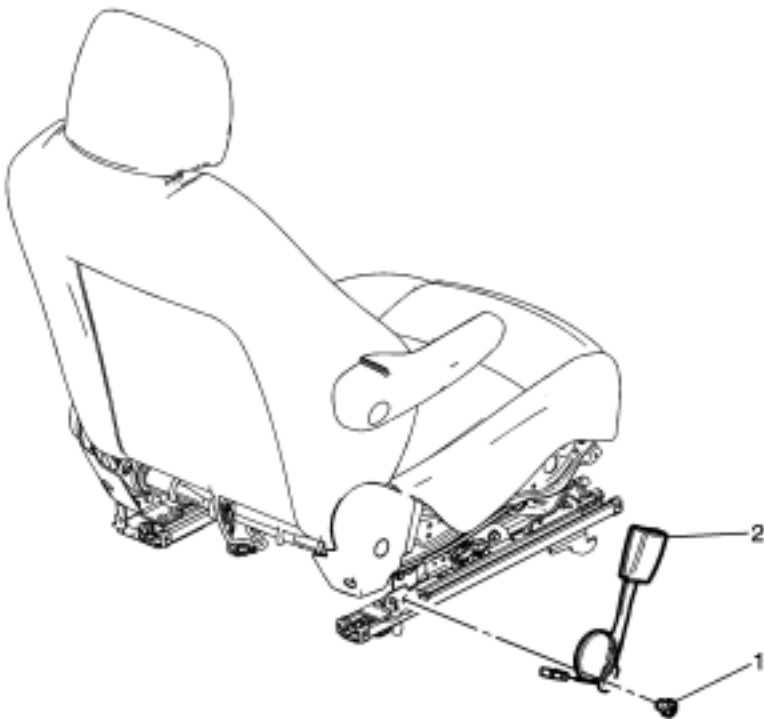


Seat Belt Latch Stop Installation



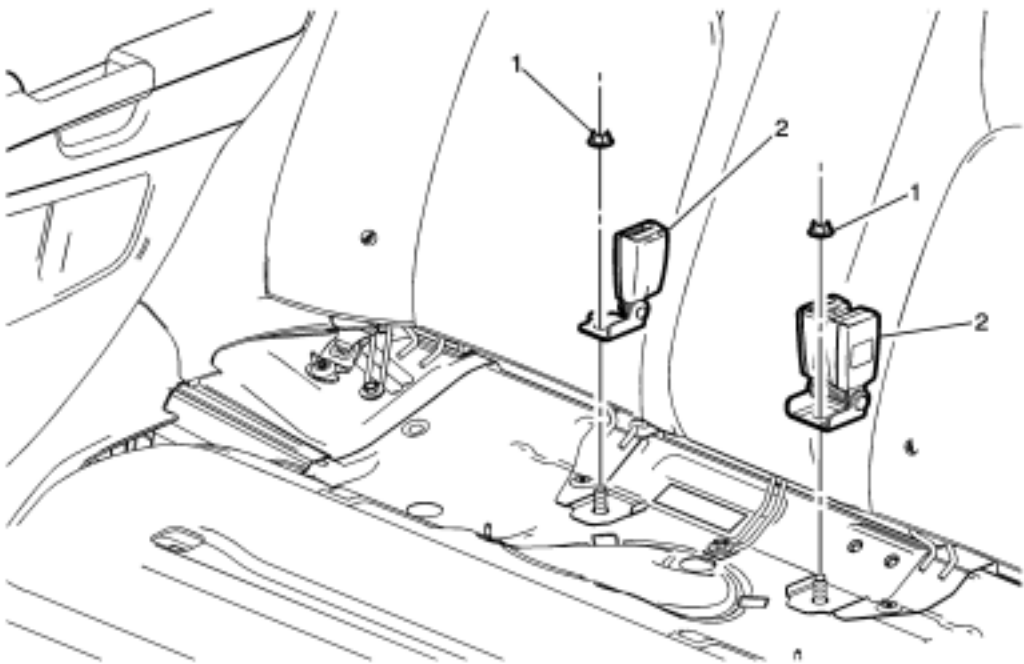
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Locate the hole in the seat belt webbing where the original seat belt stop button was located.</p> <p>2. If the original hole in the seat belt webbing is not visible, perform the following:</p> <p>If either the right or left stop button is missing use the opposing seat belt as a reference. With the opposing seat belt fully stowed, measure the distance between the seat belt lower anchor and the stop button. Using the measurement obtained above, measure and mark the location of the missing stop button on the center of the seat belt webbing.</p> <ul style="list-style-type: none"><li>• If either the right or left stop button is missing use the opposing seat belt as a reference.</li><li>• With the opposing seat belt fully stowed, measure the distance between the seat belt lower anchor and the stop button.</li><li>• Using the measurement obtained above, measure and mark the location of the missing stop button on the center of the seat belt webbing.</li></ul> <p>3. Ensure the seat belt latch plate is located above the mark or original hole.</p>	
1	<p>Seat Belt Stop Button</p> <p><b>Procedure</b></p> <p>1. Work the male half of the stop button through the hole in the webbing or at the marked location.</p> <p>2. Align the female half of the stop button with the male half of the stop button.</p> <p>3. Snap the two halves together.</p> <p>4. Trim off any access of the male half of the stop button flush with the female half of the stop button.</p> <p><b>Tip</b></p> <p>Ensure the male half of the stop button is facing forward in the vehicle in order to ensure the stop button will not snag customers clothing.</p>

Front Seat Belt Buckle Replacement



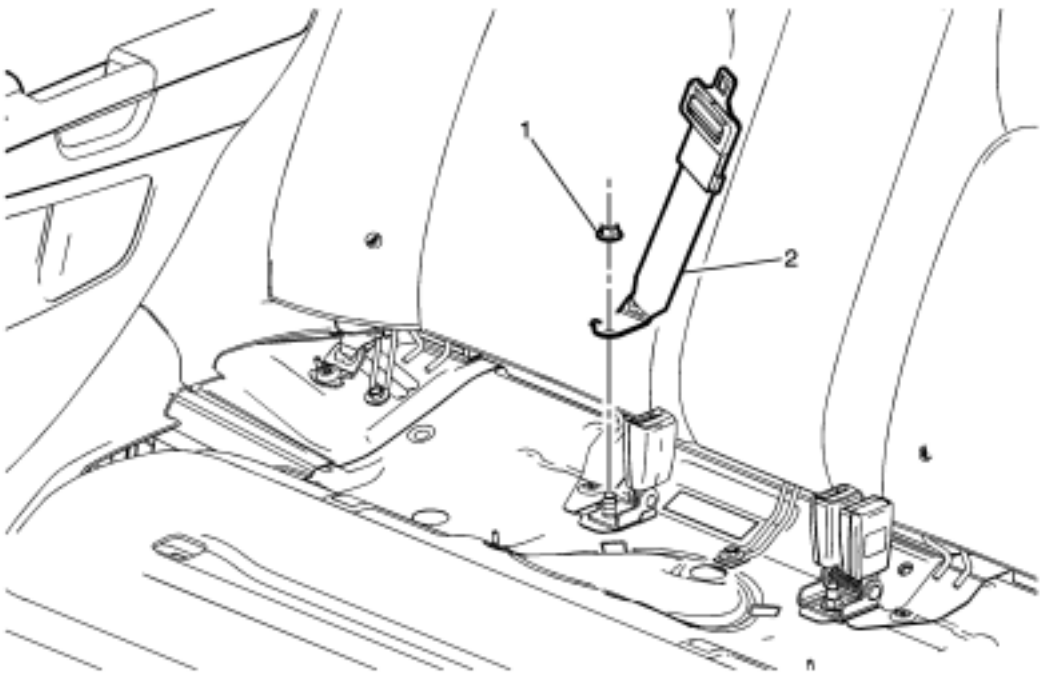
Callout	Component Name
<b>Preliminary Procedures</b> Remove the front seat. Refer to <a href="#">Driver or Passenger Seat Replacement</a> .	
1	Driver or Passenger Seat Belt Buckle Fastener  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 45 N·m (33 lb ft)
2	Driver or Passenger Seat Belt Buckle Assembly  <b>Procedure</b> Disconnect the electrical connector, if equipped.

Rear Seat Belt Buckle Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a> .</p>	
1	<p>Rear Seat Belt Buckle Fastener (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 45 N·m (33 lb ft)</p>
2	<p>Rear Seat Belt Buckle Assembly (Qty: 2)</p>

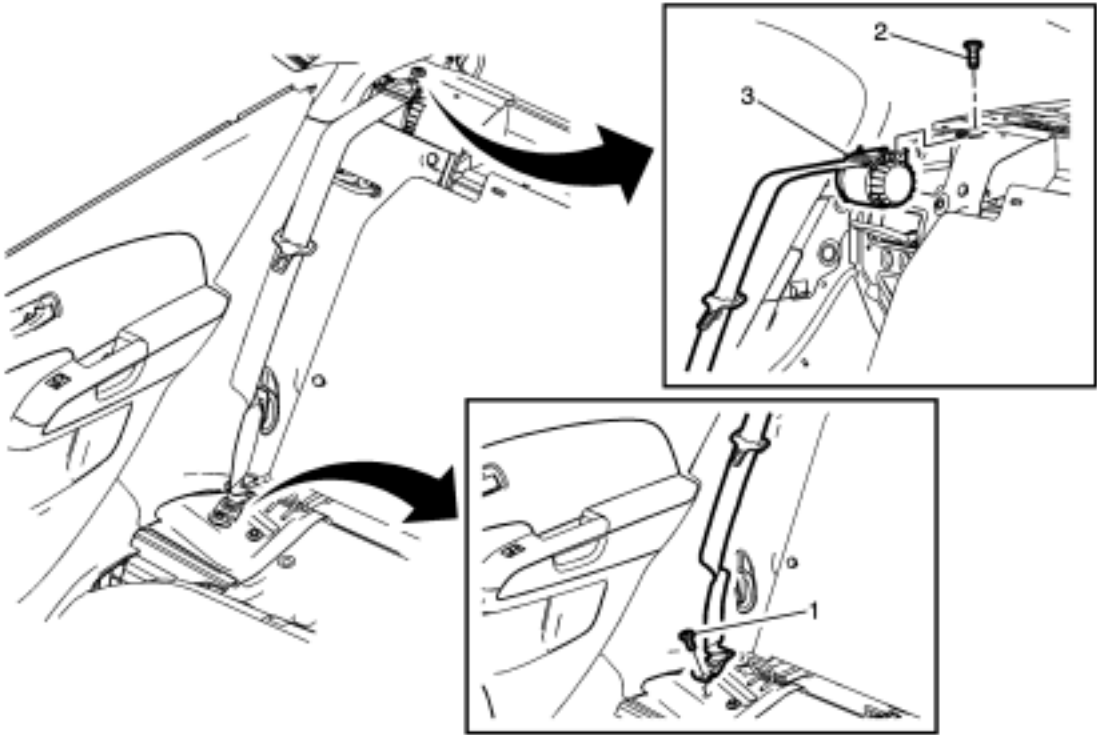
Rear Seat Center Shoulder Belt Replacement (Sedan)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a> .</p>	
1	<p>Rear Seat Center Shoulder Belt Buckle Fastener</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 45 N·m (33 lb ft)</p>
2	<p>Rear Seat Center Shoulder Belt</p>

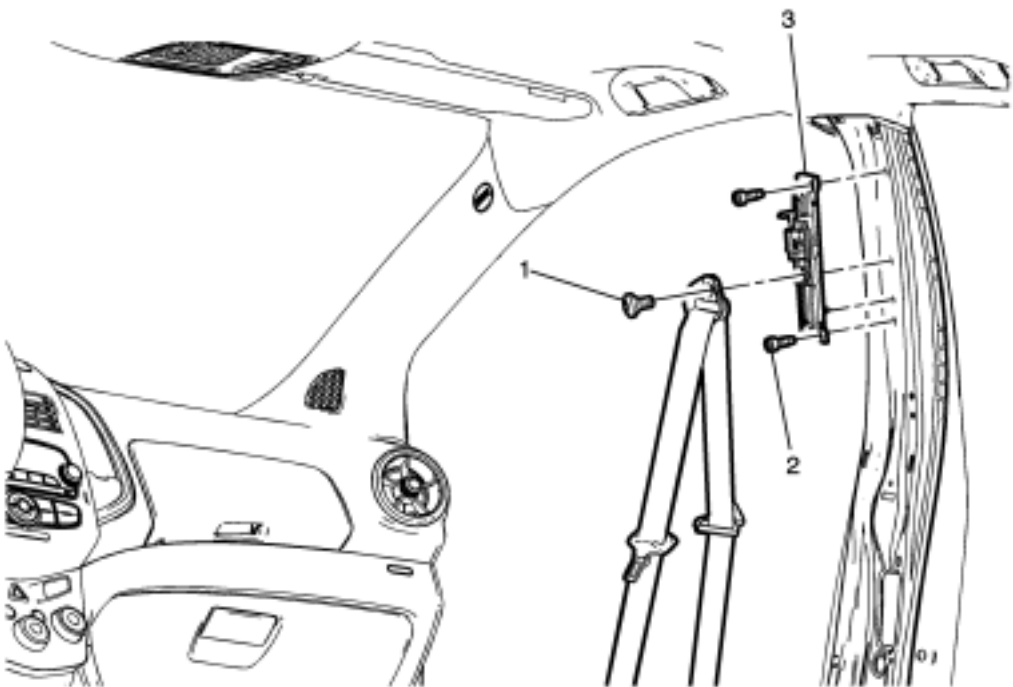


Shoulder Belt Replacement - Rear (Sedan)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear window panel trim. Refer to <a href="#">Rear Window Panel Trim Replacement</a> .</p>	
1	<p>Rear Seat Shoulder Belt Anchor Plate Fastener</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 45 N·m (33 lb ft)</p>
2	<p>Rear Seat Shoulder Belt Retractor Fastener</p> <p><b>Tighten</b> 45 N·m (33 lb ft)</p>
3	<p>Rear Seat Shoulder Belt</p>

Front Seat Belt Guide Adjuster Replacement (with AHU)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove the center pillar upper trim panel. Refer to <a href="#">Center Pillar Upper Trim Panel Replacement</a> .</p>	
1	<p>Driver or Passenger Seat Shoulder Belt Fastener</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 45 N·m (33 lb ft)</p>
2	<p>Front Seat Shoulder Belt Guide Adjuster Bolt (Qty: 2)</p> <p><b>Tighten</b> 45 N·m (33 lb ft)</p>
3	<p>Front Seat Shoulder Belt Guide Adjuster</p>

## Seat Belt System Description and Operation

### Restraint System

**Note:** If the vehicle has been in a collision, refer to [Repairs and Inspections Required After a Collision](#) .

The vehicle has front and rear seat belts that are the primary means of occupant restraint. Seat belts help to keep the occupants inside the passenger compartment and to gradually reduce the impact forces during the following events:

- Frontal impact type crashes
- Rear impact type crashes
- Side impact type crashes
- Roll-over type crashes

All seat belt retractors have emergency locks. The retractors remain unlocked during normal operation and under normal driving conditions. The retractors remain unlocked during normal conditions in order to allow free movement of the upper body of each occupant. A pendulum locks the seat belt webbing into position. The pendulum causes a locking bar to engage a cog on the spool of the retractor mechanism when the following conditions occur:

- A rapid extraction of the seat belt webbing from the retractor
- An abrupt change in vehicle speed
- An abrupt change in vehicle direction
- Operation of the vehicle on a steep upgrade
- Operation of the vehicle on a downgrade

The seat belts have an automatic locking (cinch) feature. The cinch feature is activated when the seat belt webbing is completely extended from the retractor. The cinch feature prevents the webbing from extending beyond the position from which it is allowed to retract. Use of the cinch feature is recommended for securing a child seat. The cinch feature may be cancelled by allowing the webbing to wind back completely into the retractor. After the cinch feature is cancelled, the webbing is unlocked. After the cinch feature is cancelled, the webbing will extend from the retractor. This vehicle is also equipped with a supplemental inflatable restraint (SIR) system. Refer to [SIR System Description and Operation](#) .

### Front Seat Belt System

The front seat belt system includes a driver and passenger seat belt pretensioner retractor and anchor. Both front seat belt pretensioners includes a seat belt switch in the seat buckle which controls a reminder lamp and a tone alarm.

**Note:** The front passenger seat is equipped with a passenger presence detection sensor, which detects an occupant. If the passenger presence detection sensor detects an empty front passenger seat, then the passenger fasten safety belt indicator will be disabled.

- When the driver seat belt is buckled and the ignition switch is turned ON, the following events will occur:
  - The tone alarm will not operate.
  - The reminder lamp will not operate.
- When the passenger seat belt is buckled with an occupant sitting in the passenger front seat, then the ignition switch is turned ON, the following events will occur:
  - The tone alarm will not operate.
  - The reminder lamp, which is located within the hazard warning switch, will not be turned ON.
- When the driver seat belt is not buckled and the ignition switch is in the ON position, the following events will occur:
  - The tone alarm will operate for 4–8seconds and then go OFF.
  - The fasten safety belt indicator will turn ON for 20seconds, until the driver seat belt is buckled.
- When the passenger seat belt is not buckled with an occupant sitting in the passenger front seat, then the ignition switch is turned ON, the following events will occur:
  - The tone alarm will operate for 4–8seconds and then go OFF.
  - The reminder lamp, which is located within the hazard warning switch, will be turned ON.

### Rear Seat Belt System

The Rear Seat Belt System includes the following components:

- The rear seat belt retractor is located at the wheelhouse panel and attached to the floor panel by the rear seat shoulder belt retractor bracket.
- The rear seat belt buckles and the center seat belt buckle are attached to each seat.
- Each of the rear seat belts include a seat belt switch in the seat buckle which controls a reminder lamp and a tone alarm.
- When the ignition switch is turned ON, a rear seat belt is buckled, the rear doors are closed and the speed exceeds 10kph (6.5mph) the following events will occur:
  - The tone alarm will not operate.



- The rear seat belt indicator in the Driver Information Center will illuminate for 35 seconds.
- When the ignition switch is turned ON, a rear seat belt is not buckled for the duration of the ignition cycle, the rear doors are closed and the speed exceeds 10kph (6.5mph) the following events will occur:
  - The tone alarm will not operate.
  - The rear seat belt indicator in the Driver Information Center will not operate.
- When the ignition switch is turned ON, a rear seat belt is buckled and during that ignition cycle is unbuckled with the rear doors closed at all times and the speed exceeding 10kph (6.5mph) the following events will occur:
  - The tone alarm will operate for 3 seconds.
  - The rear seat belt indicator in the Driver Information Center will illuminate and remain on until the seat belt is buckled again or the ignition cycle ends.

Child Seat Restraint System

**Warning:** A child in a rear-facing child restraint can be seriously injured if the right-front passengers air bag inflates. This is because the back of a rear-facing child restraint would be very close to the inflating air bag. NEVER use a rear-facing child restraint in this vehicle. If a forward-facing child restraint is suitable for your child, ALWAYS move the front passenger seat as far back as it will go and then install the child restraint. Be sure the child restraint position does not conflict with any additional requirements provided by the manufacturer. For more information, refer to the vehicle owners manual and the instruction that came with the child restraint.

A child in a rear-facing child restraint can be seriously injured if the right-front passengers air bag inflates. This is because the back of a rear-facing child restraint would be very close to the inflating air bag. NEVER use a rear-facing child restraint in this vehicle. If a forward-facing child restraint is suitable for your child, ALWAYS move the front passenger seat as far back as it will go and then install the child restraint. Be sure the child restraint position does not conflict with any additional requirements provided by the manufacturer. For more information, refer to the vehicle owners manual and the instruction that came with the child restraint.

The child seat may only be used in a forward facing seating location. The child seat should be installed and secured according to the manufacturer's directions. If the child seat has a top strap, the seat will need to be anchored. Passengers should not be allowed to sit at locations where the seat belts are being used to secure the child seat.

All vehicles are equipped with a dual-mode type retractor with emergency and automatic locking features. The automatic locking feature is for restraint of a child seat. The child seat can be secured by pulling the seat belt all the way out to lock it. Then tighten the seat belt around the child seat.

If a child seat is to be used in the second seat position, a special dealer-installed anchor must be used in order to anchor the child seat top strap. This only applies to the seats designed with the top strap provision and for the vehicles sold in Canada. In order to ensure the correct top strap angle, the child seat is only to be used at the seating position for which the top strap anchor is installed.

Fasten Safety Belt Indicators

There are three fasten safety belt indicators for this vehicle. The driver fasten safety belt reminder is displayed in the instrument cluster, the passenger fasten safety belt reminder is displayed in the hazard warning switch, and the rear fasten safety belt reminder is displayed in the driver information center. The fasten safety belt indicator may only be ON during RUN. The fasten safety belt indicator illuminates under the following conditions:

- During the bulb check
- The inflatable restraint sensing and diagnostic module (SDM) sends the status of the driver seat belt to the instrument cluster via serial data. The passenger seat belt status is sent to the hazard warning switch via a hard wire. The rear seat belt status is sent to the driver information center via serial data. If any of the seat belts are unfastened, the instrument cluster will send a message requesting a chime sound to be turned ON after a bulb check.



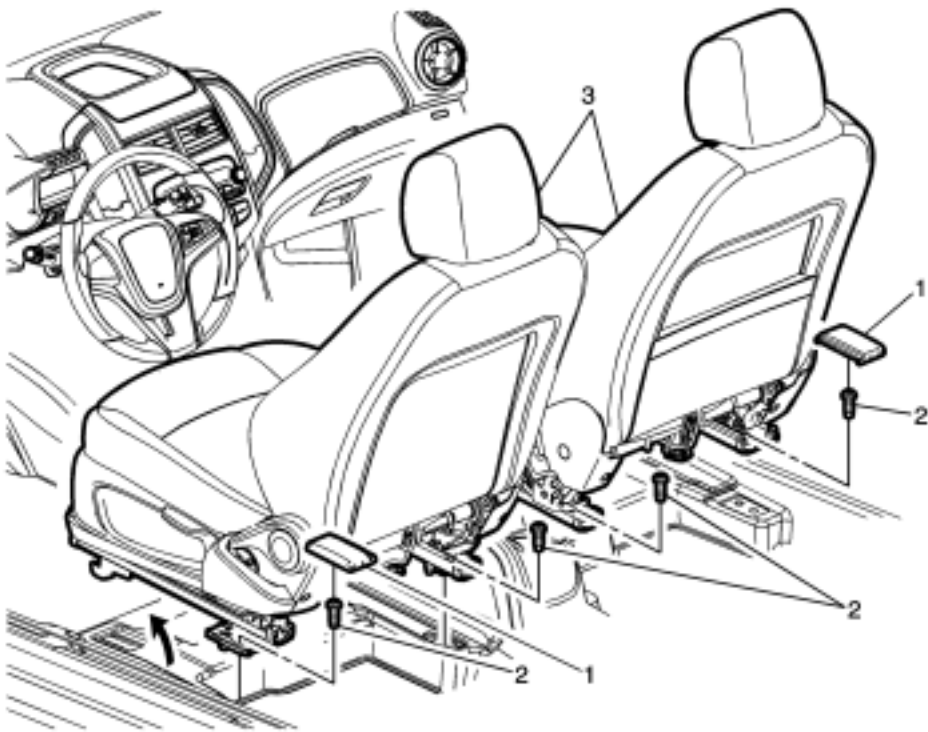
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Front Seat Riser Finish Cover Replacement	Rear Seat Head Restraint Guide Replacement	
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Front Seat Cushion Cover and Pad Replacement	Rear Seat Back Cushion Cover and Pad Replacement (AM7 Non Split Folding)	
Driver or Passenger Seat Back Cushion Cover and Pad Replacement	Rear Seat Back Cushion Hinge Replacement	
Driver or Passenger Seat Back Cushion Frame Replacement	Rear Seat Back Cushion Latch Release Knob Bezel Replacement	
Driver or Passenger Seat Recliner Handle Replacement (4 Way Standard)	Description and Operation	



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Seat Mounting Bolt	40 N·m	30 lb ft
Front Seat Armrest Mounting Bolt	45 N·m	33 lb ft
Front Seat Cushion Frame Bolt	22 N·m	16 lb ft
Front Seat Cushion Outer Trim Panel Fastener	8 N·m	71 lb in
Front Seat Inner Recliner Finish Cover Fastener	8 N·m	71 lb in
Front Seat Back Cushion Frame Bolt	22 N·m	16 lb ft
Rear Seat Back Outer Pivot Bolt	23 N·m	17 lb ft
Rear Seat Latch Bolt	45 N·m	33 lb ft
Rear Seat Back Cushion Bolt (AN1 Fixed Bench)	22 N·m	16 lb ft
Rear Seat Back Cushion Hinge Bolt	43 N·m	32 lb ft
Rear Seat Back Cushion Hinge Nut	43 N·m	32 lb ft

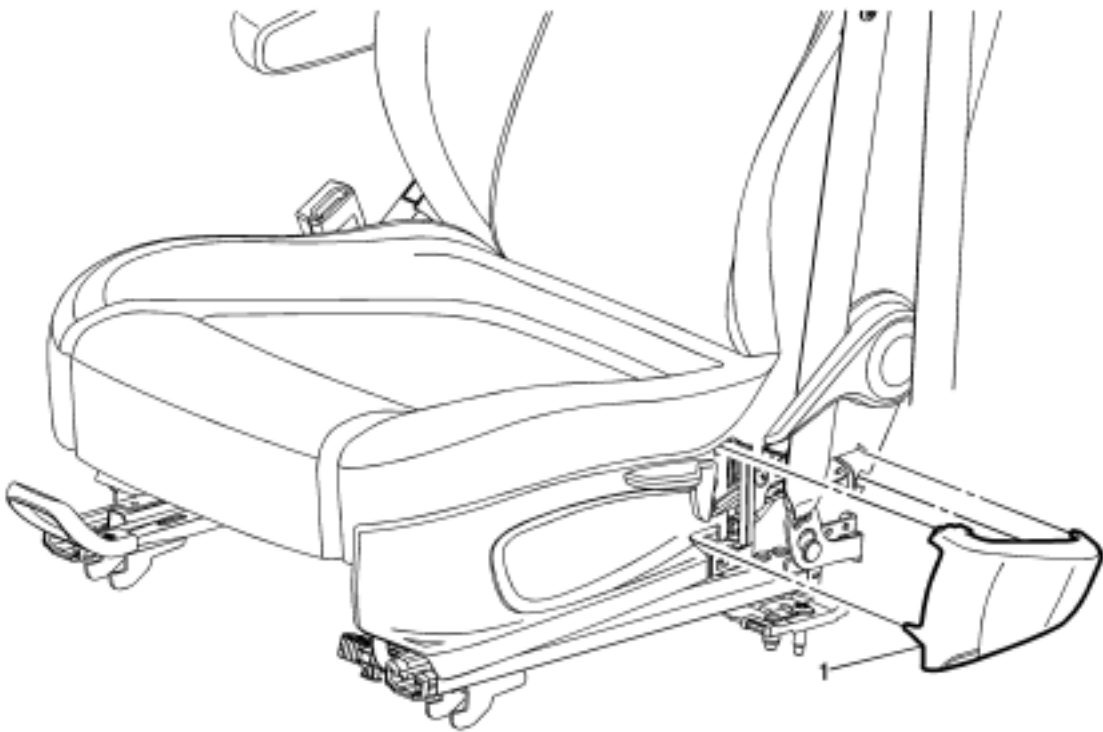
Driver or Passenger Seat Replacement



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Preliminary Procedures</b></p> <p>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</p> <p>2. Disconnect the front seat belt lower fastener. Refer to <a href="#">Driver or Passenger Seat Shoulder Belt Replacement</a> .</p> <p>3. Disable the front seat belt tensioner fastener by removing the cap, and cover, if equipped. Refer to <a href="#">SIR Disabling and Enabling</a> .</p>	
1	<p>Front Seat Riser Finish Cover (Qty: 2)</p> <p><b>Procedure</b></p> <p>Remove the front seat riser cover. Refer to <a href="#">Front Seat Riser Finish Cover Replacement</a> .</p>
2	<p>Front Seat Mounting Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Adjust the seat to the full forward position to gain access to the rear bolts.</p> <p><b>Tighten</b> 40 N·m (30 lbft)</p>
3	<p>Driver or Passenger Seat Assembly (Qty: 2)</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical.</p> <p>2. With the aid of an assistant remove the front seat, by tilting the seat forward and then lifting and pulling the seat rearwards to disengage the front hooks.</p> <p>3. Transfer components as necessary.</p>



Front Seat Outer Recliner Upper Finish Cover Replacement

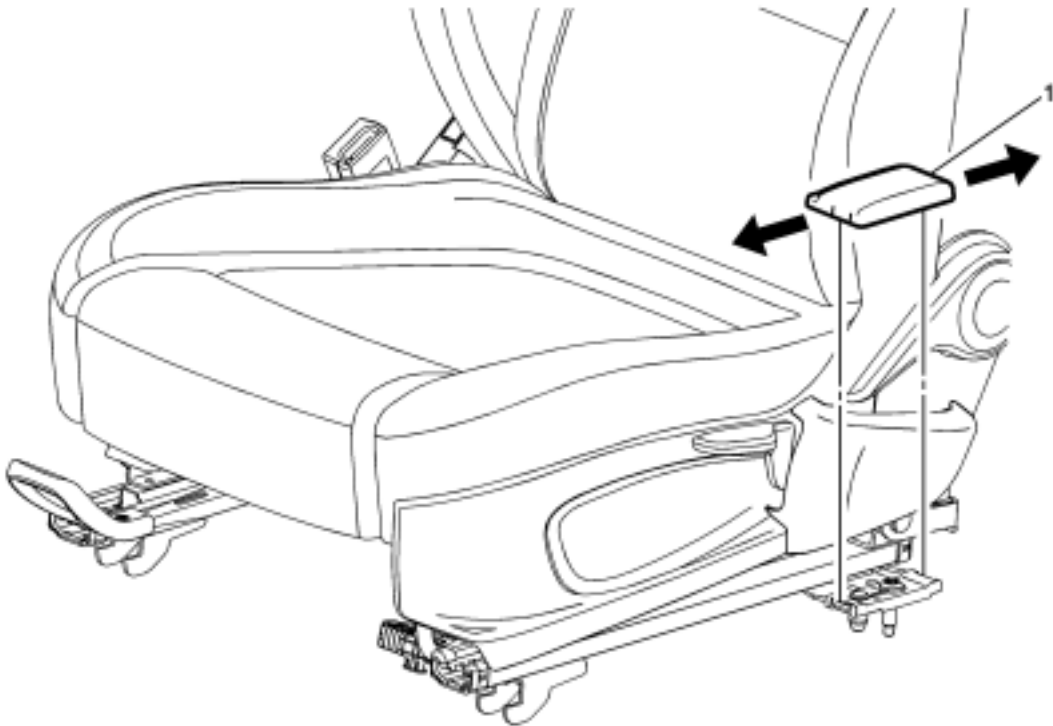


Callout	Component Name
1	<div>Front Seat Outer Recliner Upper Finish Cover</div> <div><b>Caution:</b> Do not twist the cover during removal. Twisting the cover may cause the component to break.</div> <div><b>Procedure</b></div> <div><div>1. Firmly grasp the lower rear area of the finish cover, this area needs to be flexed outward then rearward to disengage it from the outer trim panel.</div><div>2. Remove the finish cover by gently pulling the cover outward to disengage it fully from the outer trim panel.</div></div>





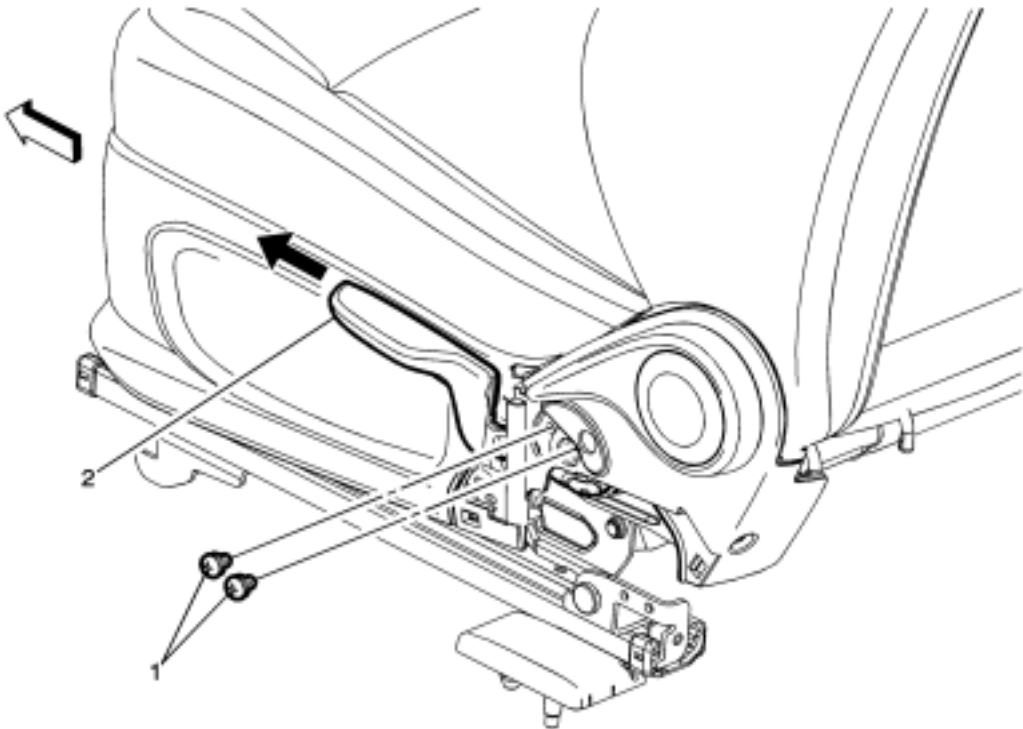
Front Seat Riser Finish Cover Replacement



Callout	Component Name
1	<div>Front Seat Riser Finish Cover</div> <div><b>Caution:</b> Do not twist the cover during removal. Twisting the cover may cause the component to break.</div> <div><b>Procedure</b></div> <div>Remove the finish cover by firmly grasping the front or rear of the cover and pulling the cover outward then upward to disengage it from the track.</div>

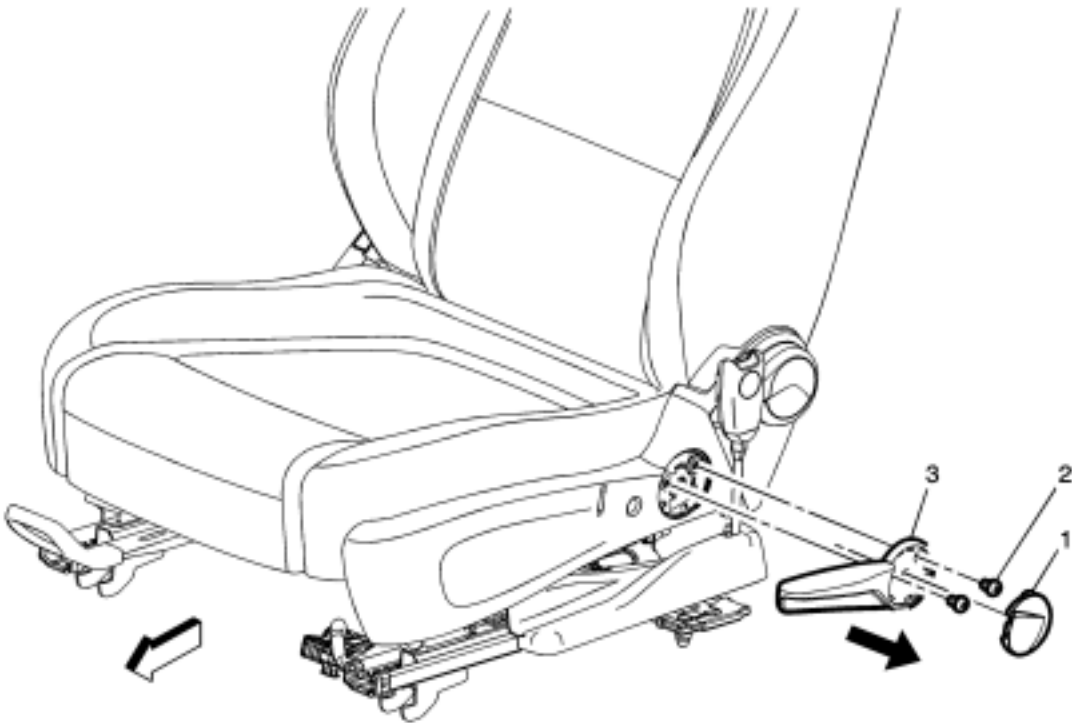


Driver or Passenger Seat Adjuster Handle Replacement (4 Way Standard)



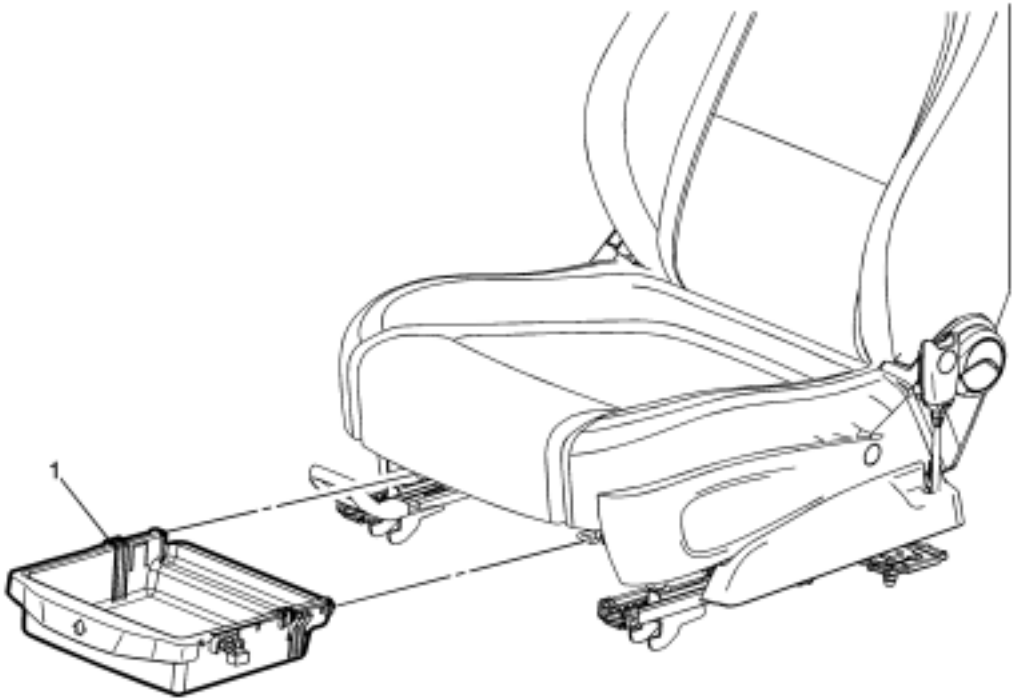
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front seat outer recliner upper finish cover. Refer to <a href="#">Front Seat Outer Recliner Upper Finish Cover Replacement</a></p>	
1	<p>Front Seat Adjuster Fasteners (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Front Seat Adjuster</p>

Driver or Passenger Seat Adjuster Handle Replacement (4 Way Uplevel)



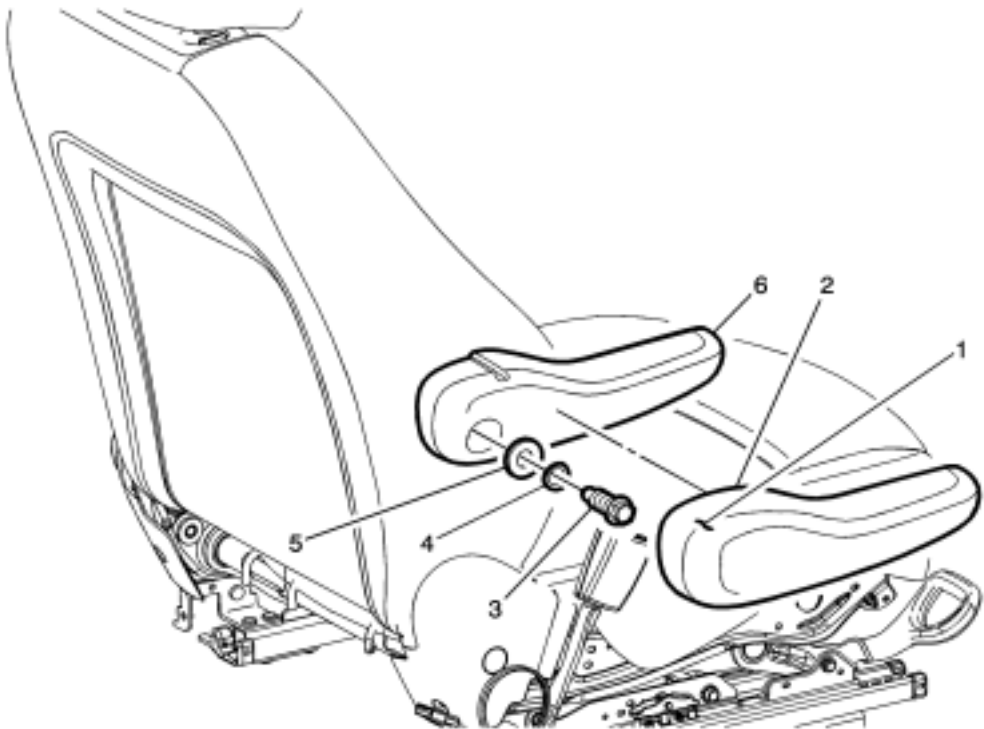
Callout	Component Name
1	<div>Front Seat Adjuster Handle Cover</div> <div><b>Procedure</b></div> <div>Use a flat-bladed tool to push inward on the three tabs to release the handle cover from the handle assembly.</div>
2	<div>Front Seat Adjuster Handle Fastener (Qty: 2)</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div>
3	<div>Front Seat Adjuster Handle</div> <div><b>Procedure</b></div> <div>Use a flat-bladed tool to release the adjuster handle from the seat frame assembly.</div>

Front Seat Storage Tray Replacement



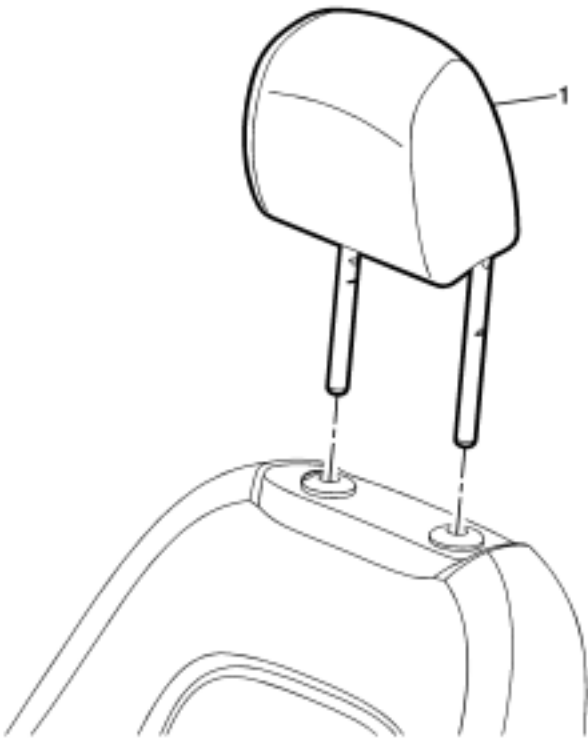
Callout	Component Name
1	<div>Front Seat Storage Tray</div> <div><b>Procedure</b></div> <div>Carefully disengage the tray by pulling forward near the bottom of the tray.</div>

Front Seat Armrest Replacement



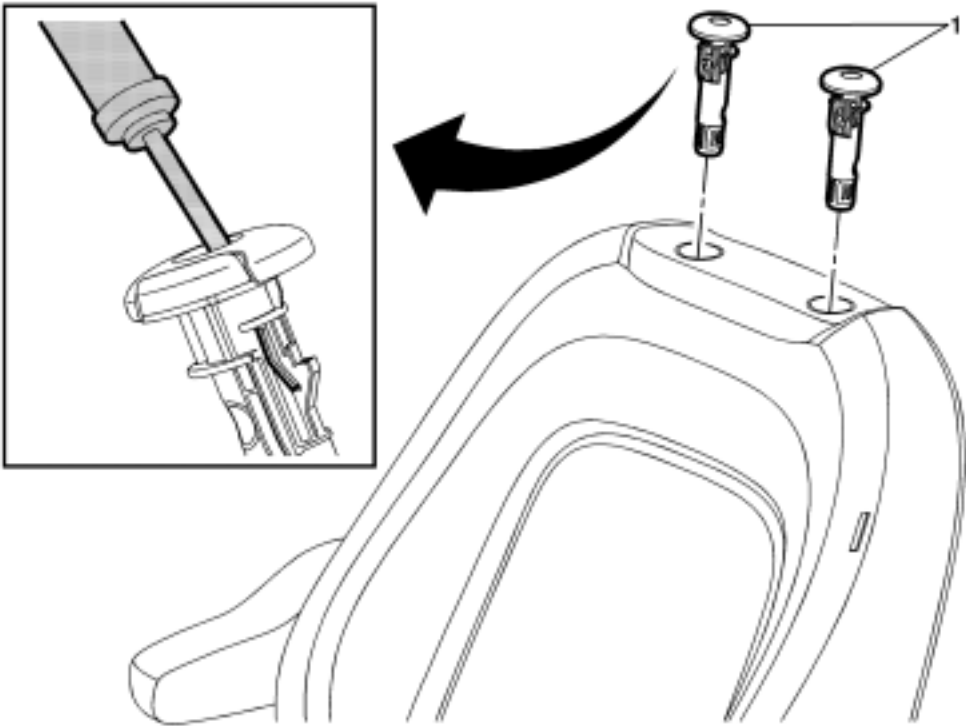
Callout	Component Name
1	<div>Front Seat Armrest Cover Zipper</div> <div><b>Procedure</b></div> <div>Open the zipper to access the front seat armrest mounting bolt and to remove the armrest cover</div>
2	<div>Front Seat Armrest Cover</div> <div><b>Procedure</b></div> <div>Slide the armrest cover off the armrest assembly.</div>
3	<div>Front Seat Armrest Mounting Bolt</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Tighten</b> 45 N·m (33 lb ft)</div>
4	<div>Front Seat Armrest Spring Washer</div>
5	<div>Front Seat Armrest Washer</div>
6	<div>Front Seat Armrest Assembly</div>

Driver or Passenger Seat Head Restraint Replacement



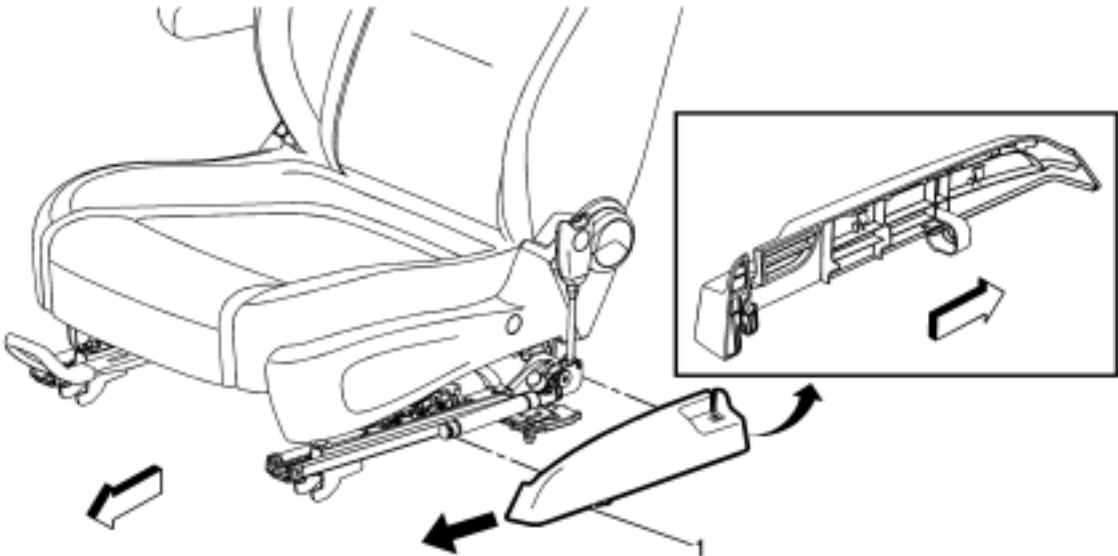
Callout	Component Name
1	<div>Driver or Passenger Seat Head Restraint</div> <div><b>Procedure</b><div><div>1. Raise the headrest to the full upward position.</div><div>2. Depress the flush button on the head restraint guide.</div><div>3. Remove the head restraint by pulling up on the restraint.</div></div></div>

Driver or Passenger Seat Head Restraint Guide Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the seat head restraint. Refer to <a href="#">Driver or Passenger Seat Head Restraint Replacement</a> .</p>	
1	<p>Driver or Passenger Seat Head Restraint Guide (Qty: 2)</p> <p><b>Procedure</b></p> <p>Using a suitable flat-bladed tool, slide the tool on the inside of the guide until it finds the slot. Then push the tool forward pulling the guide tab inward, while pulling upward to remove the guide from the seat back frame.</p>

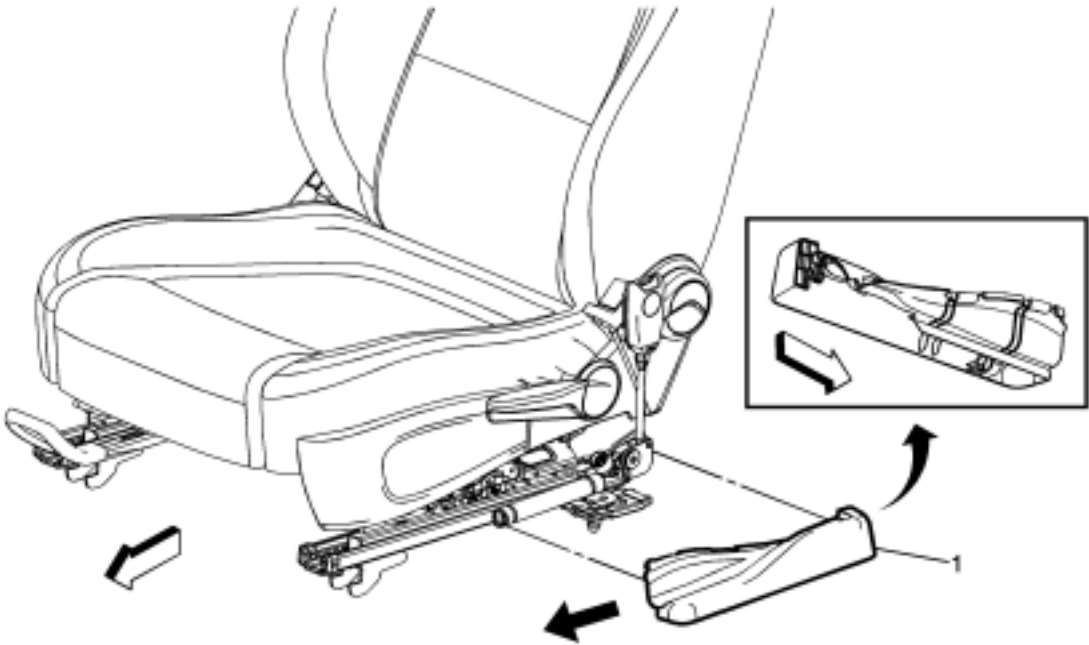
Front Seat Belt Anchor Plate Tensioner Cover Replacement (2 Way)



Callout	Component Name
1	<div>Driver or Passenger Seat Belt Tensioner Cover</div> <div><b>Procedure</b></div> <div>Remove the tensioner cover by pushing downward on the rear of the cover while applying light pressure to the front of the cover. Then push the cover rearward to remove it from the seat frame.</div>



Front Seat Belt Anchor Plate Tensioner Cover Replacement (4 Way)



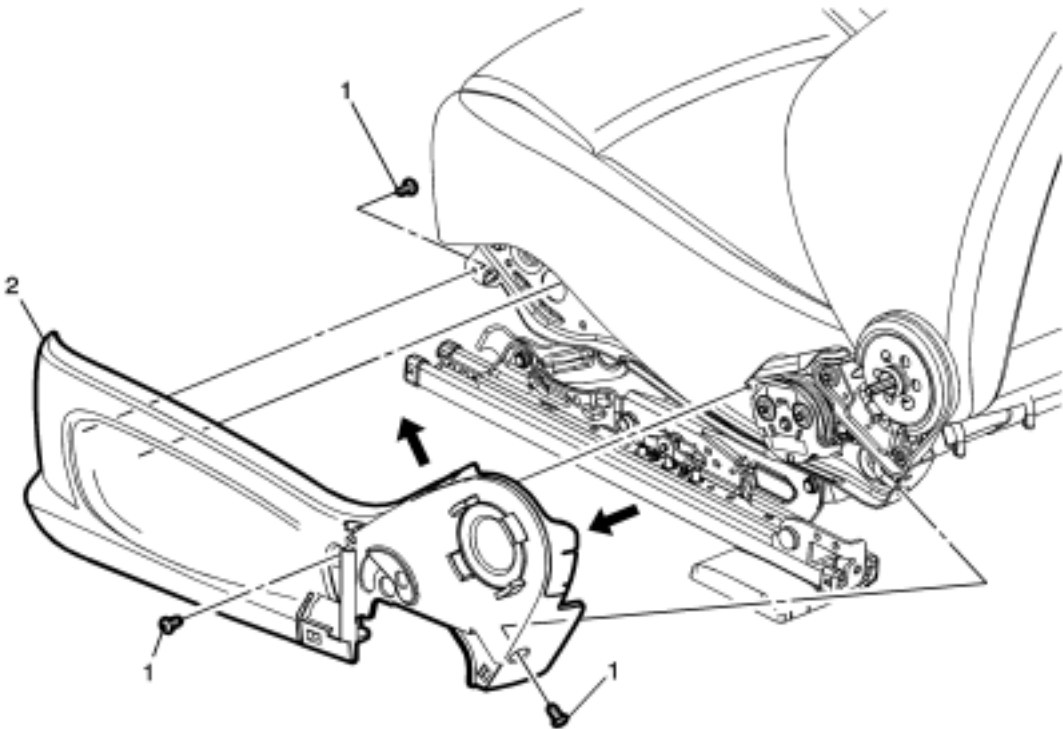
Callout	Component Name
1	<div>Driver or Passenger Seat Belt Tensioner Cover</div> <div><b>Procedure</b></div> <div>Remove the tensioner cover by pushing downward on the rear and center of the cover. Then applying light pressure to the front of the cover, push the cover rearward to remove it from the seat frame.</div>

Driver or Passenger Seat Cushion Frame Replacement



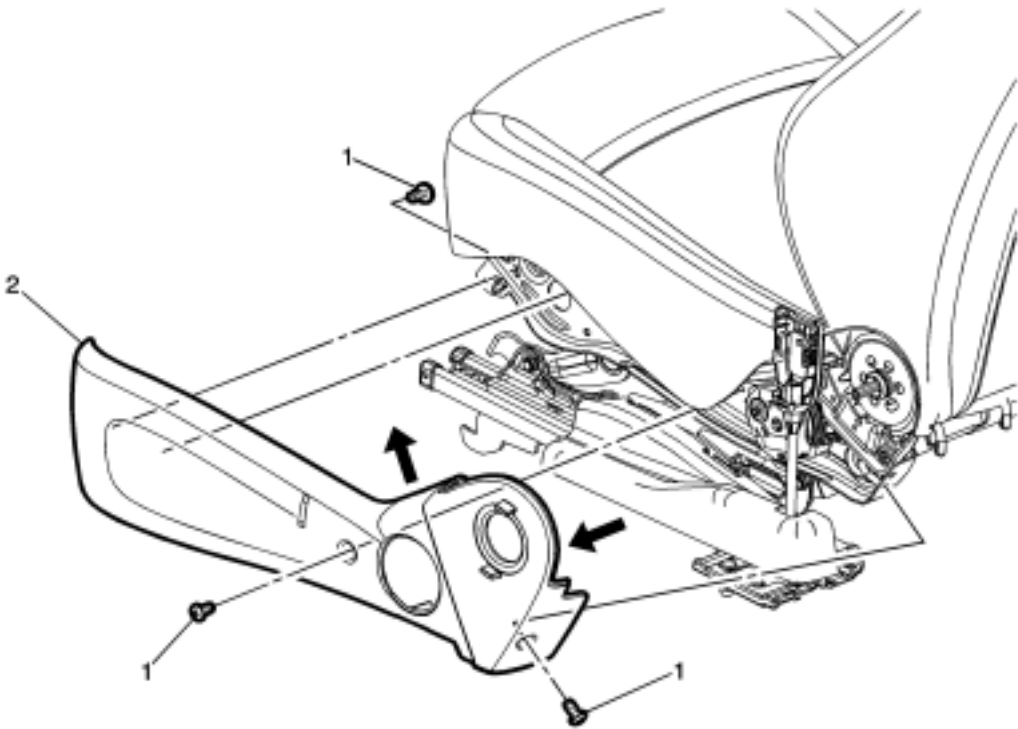
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the driver or passenger seat. Refer to <a href="#">Driver or Passenger Seat Replacement</a></p> <p>2. Remove the front seat cushion outer trim panel. Refer to <a href="#">Front Seat Cushion Outer Trim Panel Replacement</a></p> <p>3. Remove the front seat cushion inner recliner. Refer to <a href="#">Front Seat Cushion Inner Trim Panel Replacement</a></p>	
1	<p>Front Seat Cushion Frame Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Driver or Passenger Seat Cushion Frame</p> <p><b>Procedure</b></p> <p>1. Disconnect electrical connectors as needed.</p> <p>2. If replacing with a new front seat cushion frame, transfer components as necessary.</p>

Front Seat Cushion Outer Trim Panel Replacement (4 Way Standard)



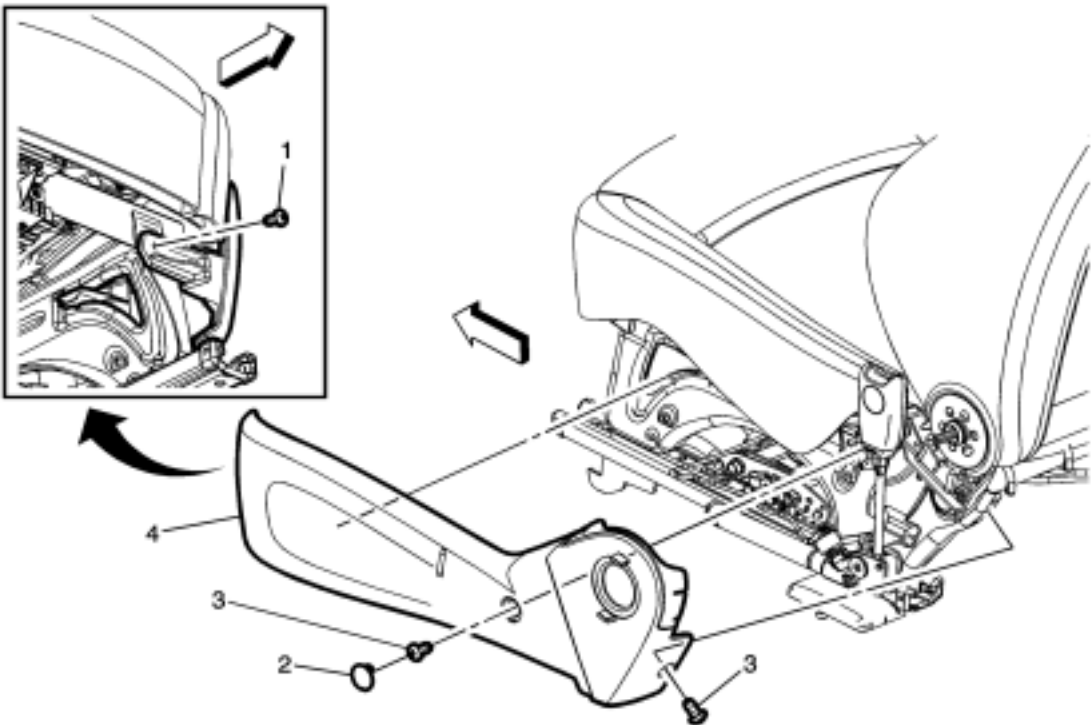
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the front seat outer recliner upper finish cover. Refer to <a href="#">Front Seat Outer Recliner Upper Finish Cover Replacement</a></p> <p>2. Remove the driver or passenger seat recliner handle. Refer to <a href="#">Driver or Passenger Seat Recliner Handle Replacement</a></p> <p>3. Remove the front seat adjuster handle. Refer to <a href="#">Driver or Passenger Seat Adjuster Handle Replacement</a></p>	
1	<p>Front Seat Cushion Outer Trim Panel Fasteners (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 8 N·m (71 lbin)</p>
2	<p>Front Seat Cushion Outer Trim Panel</p> <p><b>Procedure</b></p> <p>1. Make sure the seat is in the full up position.</p> <p>2. Gently pull outboard on the front half of the finish cover to disengage the panel rib from the seat frame.</p> <p>3. Firmly grasp the upper area of the finish cover that folds over the seat cushion frame, this area needs to be flexed outward while sliding the finish cover upward.</p> <p>4. If replacing the cover, transfer components as necessary.</p>

Front Seat Cushion Outer Trim Panel Replacement (4 Way Uplevel)



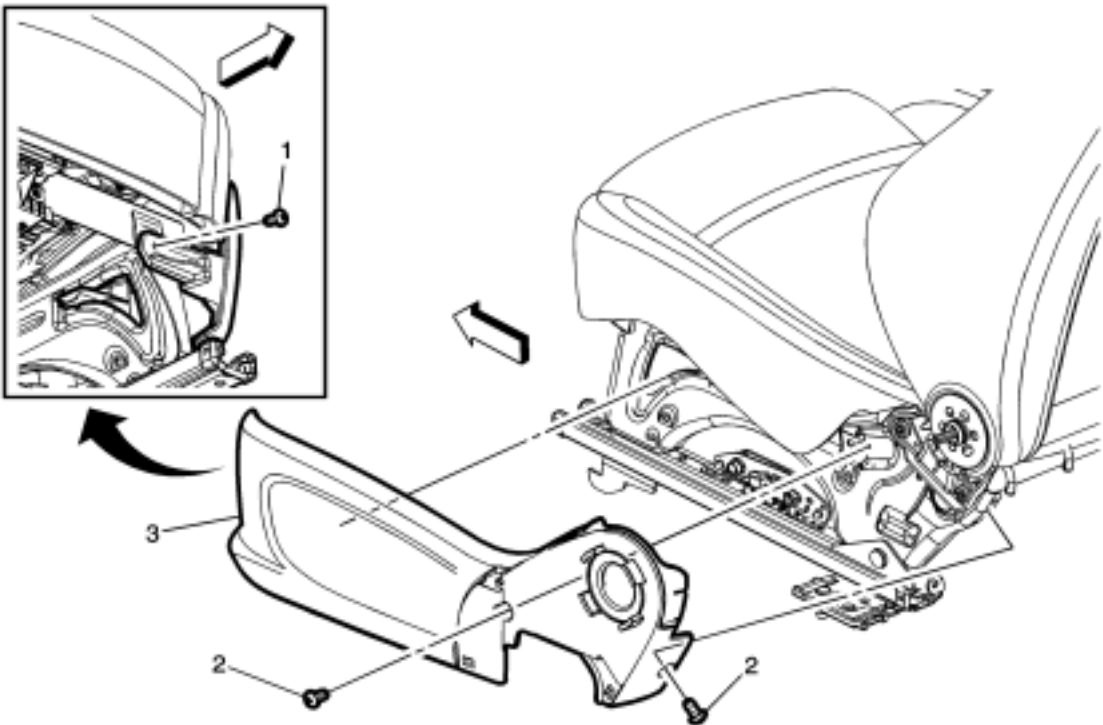
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the front seat outer recliner upper finish cover. Refer to <a href="#">Front Seat Outer Recliner Upper Finish Cover Replacement</a></p> <p>2. Remove the driver or passenger seat recliner handle. Refer to <a href="#">Driver or Passenger Seat Recliner Handle Replacement</a></p> <p>3. Remove the front seat adjuster handle. Refer to <a href="#">Driver or Passenger Seat Adjuster Handle Replacement</a></p>	
1	<p>Front Seat Cushion Outer Trim Panel Fasteners (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 8 N·m (71 lbin)</p>
2	<p>Front Seat Cushion Outer Trim Panel</p> <p><b>Procedure</b></p> <p>1. Make sure the seat is in the full up position.</p> <p>2. Gently pull outboard on the front half of the finish cover to disengage the panel rib from the seat frame.</p> <p>3. Firmly grasp the upper area of the finish cover that folds over the seat cushion frame, this area needs to be flexed outward while sliding the finish cover upward.</p> <p>4. If replacing the cover, transfer components as necessary.</p>

Front Seat Cushion Outer Trim Panel Replacement (2 Way Uplevel)



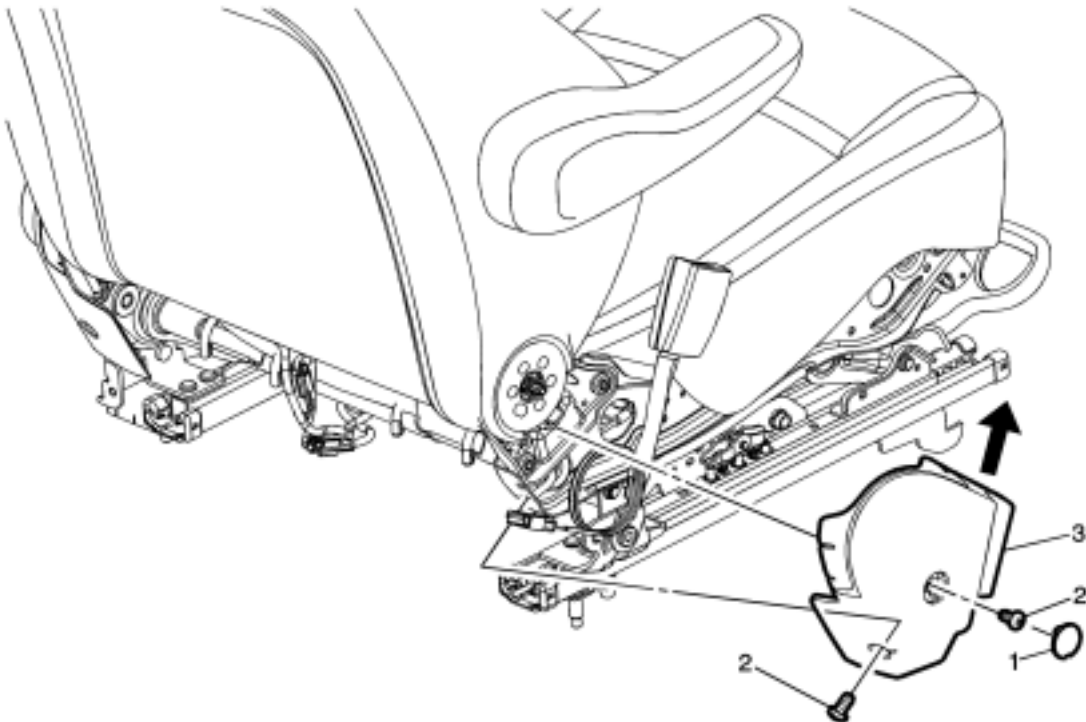
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the driver or passenger seat. Refer to <a href="#">Driver or Passenger Seat Replacement</a></p> <p>2. Remove the front seat outer recliner upper finish cover. Refer to <a href="#">Front Seat Outer Recliner Upper Finish Cover Replacement</a></p> <p>3. Remove the driver or passenger seat recliner handle. Refer to <a href="#">Driver or Passenger Seat Recliner Handle Replacement</a></p> <p>4. Remove the front seat adjuster handle. Refer to <a href="#">Driver or Passenger Seat Adjuster Handle Replacement</a></p>	
1	<p>Front Seat Cushion Outer Trim Panel Front Fastener</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 8 N·m (71 lbin)</p>
2	<p>Front Seat Cushion Outer Trim Panel Cap</p>
3	<p>Front Seat Cushion Outer Trim Panel Fasteners (Qty: 2)</p> <p><b>Tighten</b> 8 N·m (71 lbin)</p>
4	<p>Front Seat Cushion Outer Trim Panel</p> <p><b>Procedure</b></p> <p>1. Make sure the seat is in the full up position.</p> <p>2. Gently pull outboard on the front half of the finish cover to disengage the panel rib from the seat frame.</p> <p>3. Firmly grasp the upper area of the finish cover that folds over the seat cushion frame, this area needs to be flexed outward while sliding the finish cover upward.</p> <p>4. If replacing the cover, transfer components as necessary.</p>

Front Seat Cushion Outer Trim Panel Replacement (2 Way Standard)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the driver or passenger seat. Refer to <a href="#">Driver or Passenger Seat Replacement</a></p> <p>2. Remove the front seat outer recliner upper finish cover. Refer to <a href="#">Front Seat Outer Recliner Upper Finish Cover Replacement</a></p> <p>3. Remove the driver or passenger seat recliner handle. Refer to <a href="#">Driver or Passenger Seat Recliner Handle Replacement</a></p> <p>4. Remove the front seat adjuster handle. Refer to <a href="#">Driver or Passenger Seat Adjuster Handle Replacement</a></p>	
1	<p>Front Seat Cushion Outer Trim Panel Front Fastener</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 8 N·m (71 lbin)</p>
2	<p>Front Seat Cushion Outer Trim Panel Fasteners (Qty: 2)</p> <p><b>Tighten</b> 8 N·m (71 lbin)</p>
3	<p>Front Seat Cushion Outer Trim Panel</p> <p><b>Procedure</b></p> <p>1. Make sure the seat is in the full up position.</p> <p>2. Gently pull outboard on the front half of the finish cover to disengage the panel rib from the seat frame.</p> <p>3. Firmly grasp the upper area of the finish cover that folds over the seat cushion frame, this area needs to be flexed outward while sliding the finish cover upward.</p> <p>4. If replacing the cover, transfer components as necessary.</p>

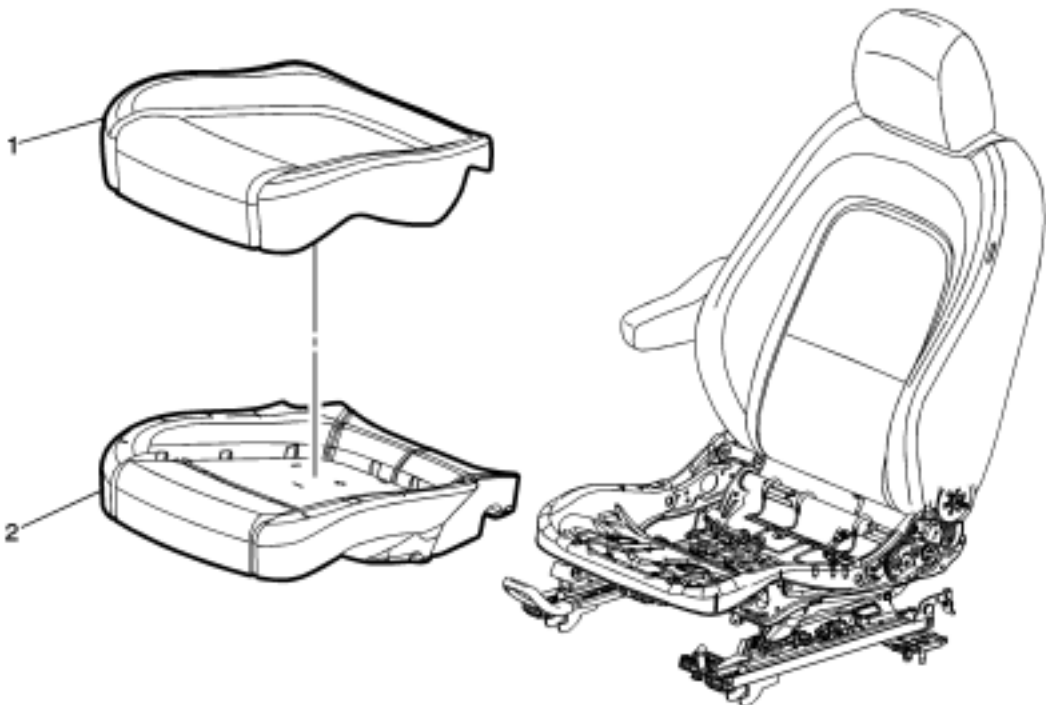
Front Seat Cushion Inner Trim Panel Replacement



Callout	Component Name
1	<div>Driver or Passenger Seat Inner Recliner Finish Cover Cap</div> <div><b>Procedure</b></div> <div>Use a flat-bladed tool to release the cap from the recliner cover.</div>
2	<div>Driver or Passenger Seat Inner Recliner Finish Cover Fastener (Qty: 2)</div> <div><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</div> <div><b>Tighten</b> 8 N·m (71 lbin)</div>
3	<div>Driver or Passenger Seat Inner Recliner Finish Cover</div> <div><b>Procedure</b></div> <div>Firmly grasp the upper area of the finish cover that folds over the seat cushion frame, pull upward and then outboard to disengage the finish cover from the seat cushion frame.</div>



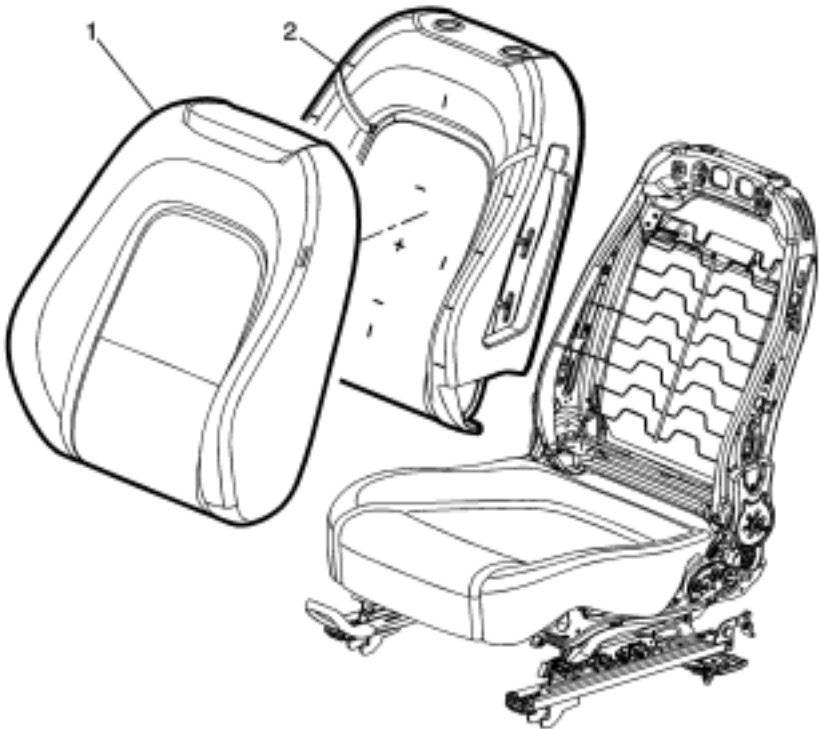
Front Seat Cushion Cover and Pad Replacement



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> SIR Warning .</p> <p><b>Preliminary Procedures</b></p> <p>1. Remove the driver or passenger seat. Refer to <a href="#">Driver or Passenger Seat Replacement</a> .</p> <p>2. Remove the front seat cushion outer trim panel. Refer to <a href="#">Front Seat Cushion Outer Trim Panel Replacement</a> .</p> <p>3. Remove the front seat cushion inner trim panel. Refer to <a href="#">Front Seat Cushion Inner Trim Panel Replacement</a> .</p>	
1	<p>Front Seat Cushion Cover</p> <p><b>Procedure</b></p> <p>1. Disengage the J-channel and hog ring retainers from the seat cushion frame.</p> <p>2. Disconnect the electrical connectors that attach to the seat cushion, if equipped.</p> <p>3. Remove the seat cushion cover and pad from the seat cushion frame as an assembly.</p> <p>4. Separate the seat cushion from the seat cushion pad by pulling the cover away from the pad.</p>
2	<p>Front Seat Cushion Pad</p> <p><b>Note:</b> The seat belt presence sensor and heat mat, if equipped are integral parts of the seat cushion pad.</p>



Driver or Passenger Seat Back Cushion Cover and Pad Replacement



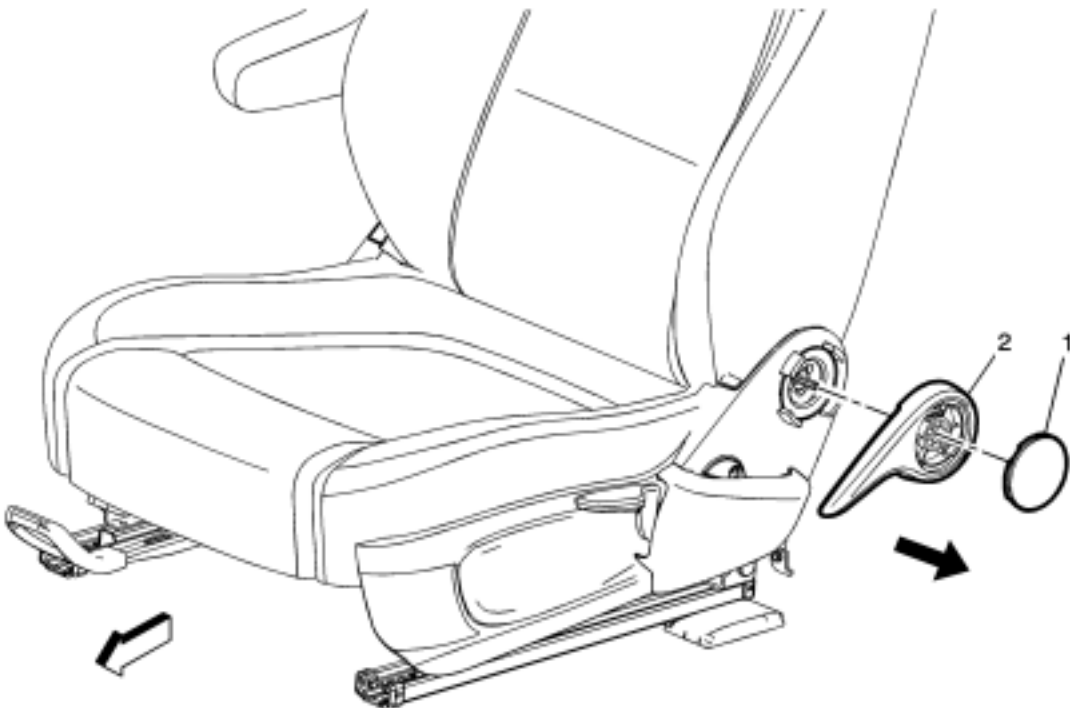
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Warning:</b> Do not repair or replace the seat stitching or seams in the seat back trim cover with an internal mounted seat side airbag module. Replace the complete seat back trim cover from the OEM. Non-OEM seat stitching may cause improper airbag deployment which could result in personal injury.</p> <p><b>Preliminary Procedure</b></p> <p>1. Remove the driver or passenger seat. Refer to <a href="#">Driver or Passenger Seat Replacement</a> .</p> <p>2. Remove the front seat cushion outer trim panel. Refer to <a href="#">Front Seat Cushion Outer Trim Panel Replacement</a> .</p> <p>3. Remove the front seat cushion inner trim panel. Refer to <a href="#">Front Seat Cushion Inner Trim Panel Replacement</a> .</p> <p>4. Remove the front seat armrest. Refer to <a href="#">Front Seat Armrest Replacement</a> .</p> <p>5. Remove the driver or passenger seat head restraint guide. Refer to <a href="#">Driver or Passenger Seat Head Restraint Guide Replacement</a> .</p>	
1	<p>Seat Back Cushion Cover</p> <p><b>Procedure</b></p> <p>1. Disengage the j-channel retainers and tabs at the bottom of the seat back cover from the seat back cushion frame.</p> <p>2. Disconnect the electrical connector that is attached to the seat back cushion, if equipped.</p> <p>3. Remove the seat back cushion cover and pad from the seat cushion frame as an assembly.</p>
2	<p>Front Seat Back Cushion Pad</p> <p><b>Procedure</b></p> <p>Pull the cushion cover assembly off of the pad.</p> <p><b>Tip</b></p> <p>Seat back cover can be damaged upon reinstalling cover to seat back pad. When reinstalling the seat cushion cover to the seat pad, start in upper outboard corner and install outboard side of the cover. Then start at the upper inboard corner and install inboard side of cover.</p>

Driver or Passenger Seat Back Cushion Frame Replacement



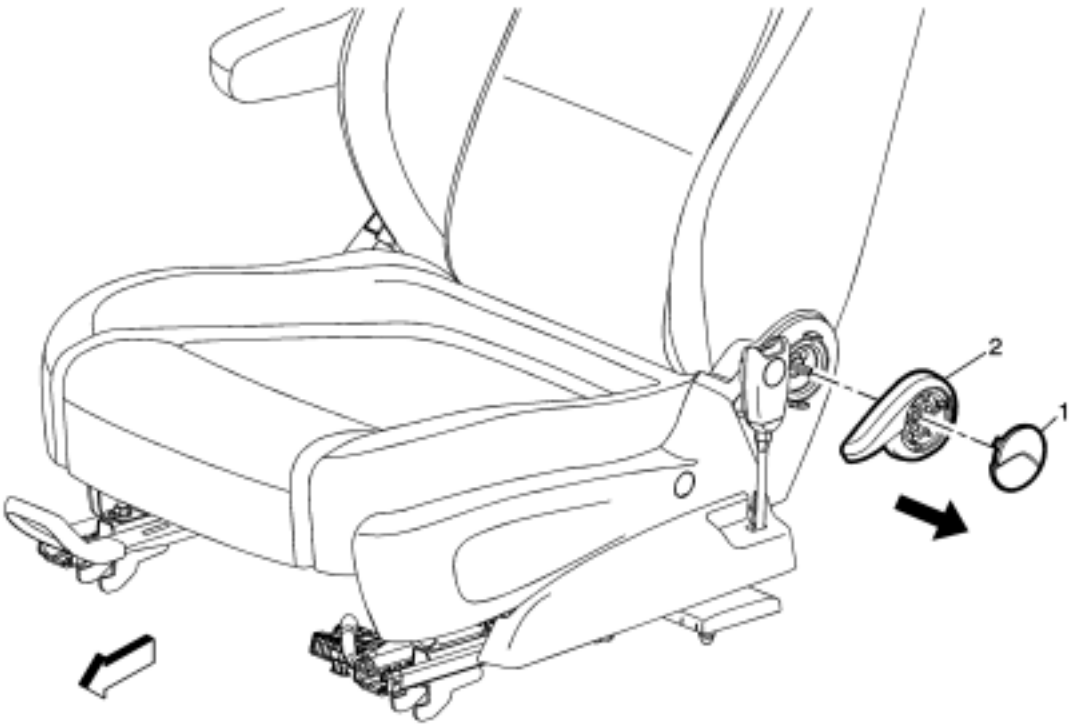
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the driver or passenger seat. Refer to <a href="#">Driver or Passenger Seat Replacement</a></p> <p>2. Remove the front seat cushion outer trim panel. Refer to <a href="#">Front Seat Cushion Outer Trim Panel Replacement</a></p> <p>3. Remove the front seat cushion inner recliner. Refer to <a href="#">Front Seat Cushion Inner Trim Panel Replacement</a></p>	
1	<p>Front Seat Back Cushion Frame Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lb ft)</p>
2	<p>Driver or Passenger Seat Back Cushion Frame</p> <p><b>Procedure</b></p> <p>1. Disconnect electrical connectors as needed.</p> <p>2. If replacing with a new front seat back cushion frame, transfer components as necessary.</p>

Driver or Passenger Seat Recliner Handle Replacement ( 4 Way Standard)



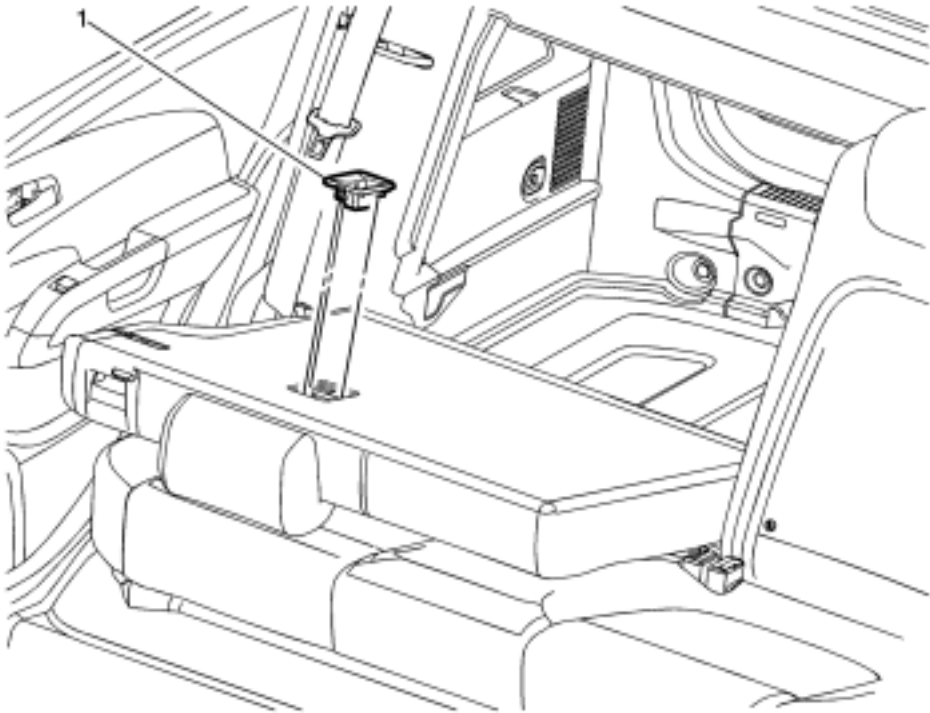
Callout	Component Name
1	<div>Front Seat Recliner Handle Cover Cap</div> <div><b>Procedure</b></div> <div>Use a flat-bladed tool to release the handle cover from the handle assembly.</div>
2	<div>Front Seat Recliner Handle</div> <div><b>Procedure</b></div> <div>Use a flat-bladed tool to release the handle from the seat.</div>

Driver or Passenger Seat Recliner Handle Replacement (2 Way Uplevel)



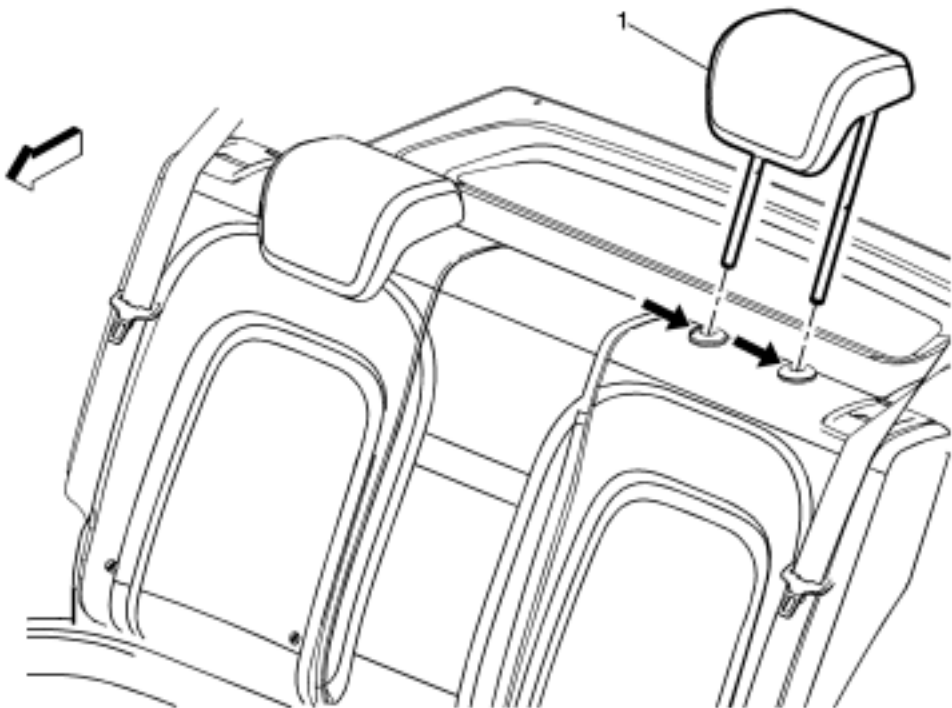
Callout	Component Name
1	<div>Front Seat Recliner Handle Cover Cap</div> <div><b>Procedure</b></div> <div>Use a flat-bladed tool to release the handle cover from the handle assembly.</div>
2	<div>Front Seat Recliner Handle</div> <div><b>Procedure</b></div> <div>Use a flat-bladed tool to release the handle from the seat.</div>

Child Seat Back Cushion Cover Replacement



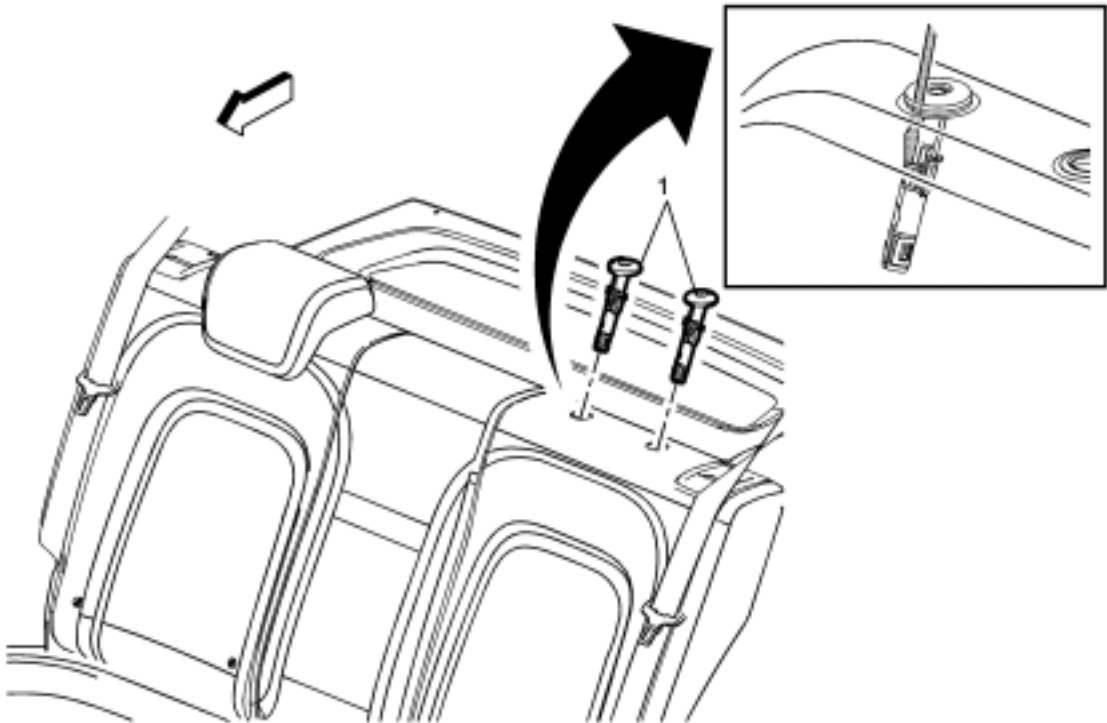
Callout	Component Name
1	<div>Child Seat Back Cushion Cover</div> <div><b>Procedure</b></div> <div>Remove the child seat bracket trim cover using a suitable flat-bladed tool.</div>

Rear Seat Head Restraint Replacement



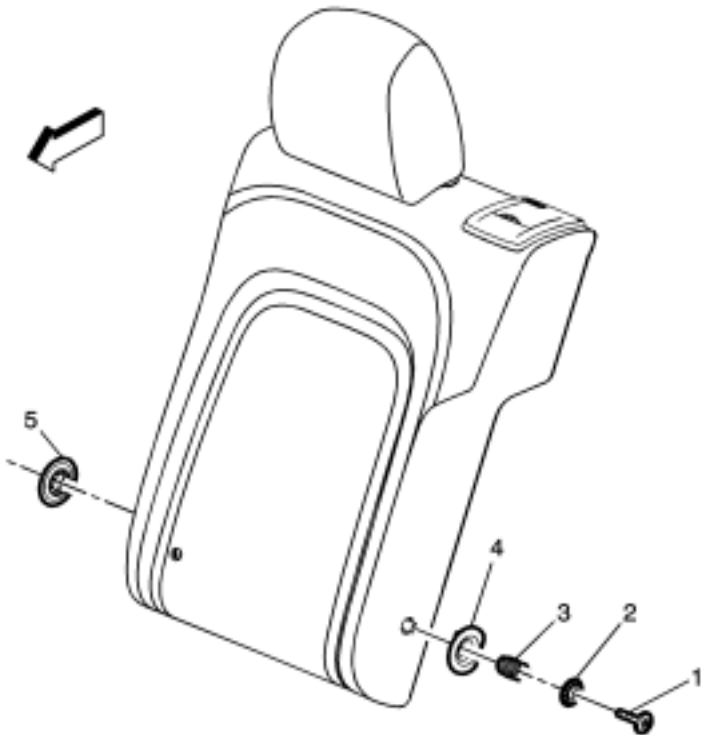
Callout	Component Name
1	<div>Rear Seat Head Restraint</div> <div><b>Preliminary Procedures</b></div> <div><div><div>1. Depress the large button on the head restraint guide and raise the head restraint to the full up position.</div><div>2. Depress the small button on the opposite head restraint guide and pull upward to remove from the seat.</div></div></div>

Rear Seat Head Restraint Guide Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear seat head restraint. Refer to <a href="#">Rear Seat Head Restraint Replacement</a></p>	
1	<p>Rear Seat Head Restraint Guide</p> <p><b>Procedure</b></p> <p>Using a suitable flat-bladed tool, slide the tool between the cushion and the guide until you find the slot on the outboard side of the guide. Push inward on the guide slot tab , while pulling upward to remove the guide from the seat back frame.</p>

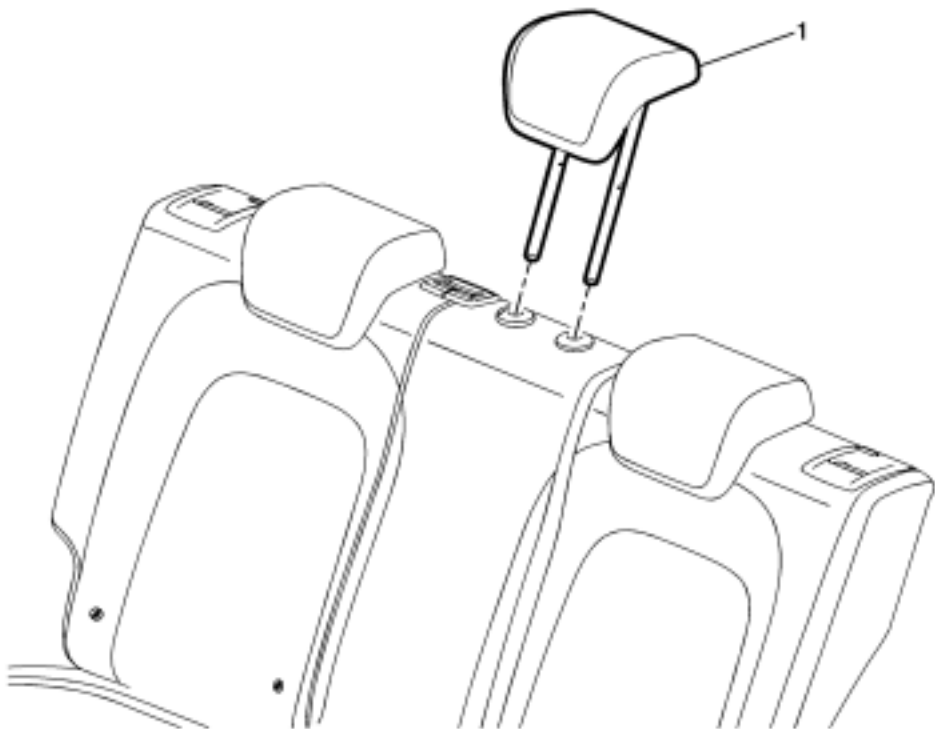
Rear Seat Back Cushion Pivot Support Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear seat back cushion. Refer to <a href="#">Rear Seat Back Cushion Replacement</a></p>	
1	<p>Rear Seat Back Outer Pivot Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 23 N·m (17 lbft)</p>
2	Rear Seat Back Cushion Outer Pivot Bushing
3	Rear Seat Back Cushion Outer Pivot Bolt Spring
4	Rear Seat Back Cushion Pivot Support Housing
5	Rear Seat Back Center Finish Cover

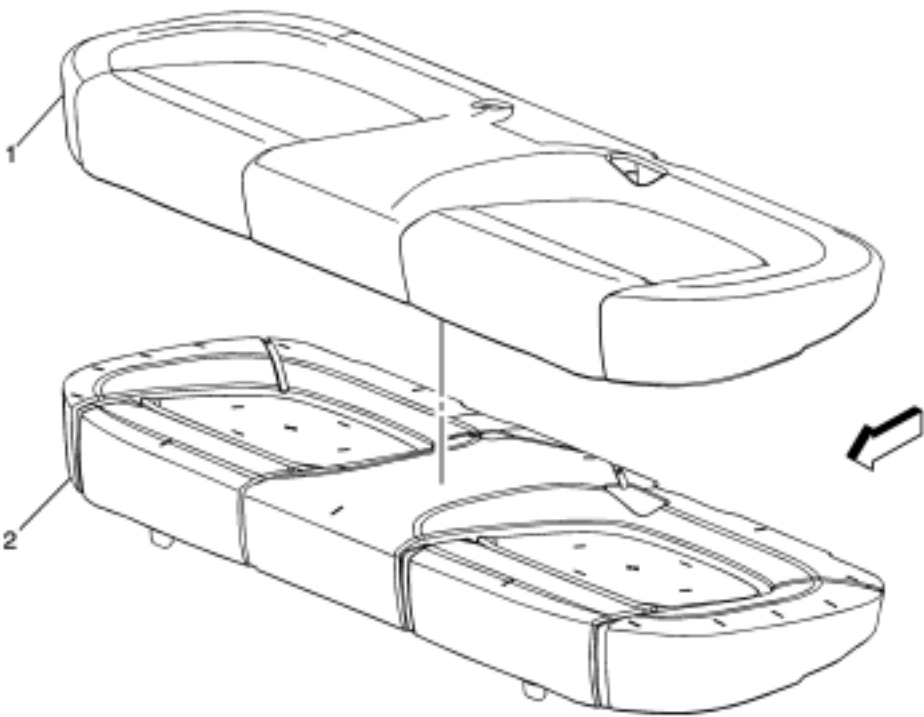


Rear Seat Center Head Restraint Replacement



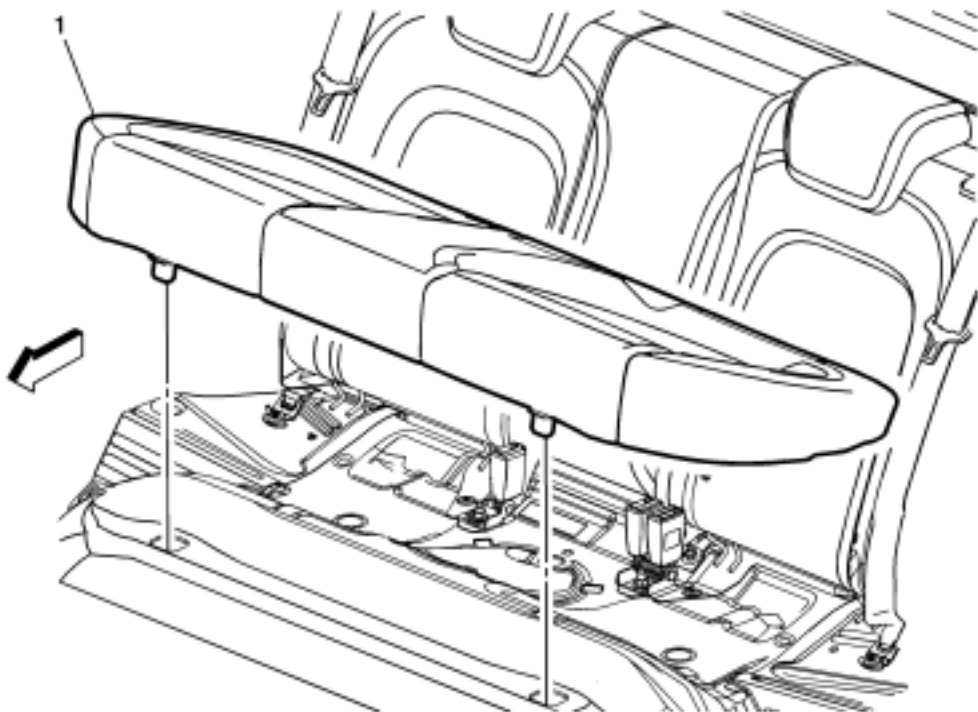
Callout	Component Name
1	<div>Rear Seat Center Head Restraint</div> <div><b>Procedure</b><div><div>1. Depress the large button on the head restraint guide and raise the head restraint to the full up position.</div><div>2. Depress the small button on the opposite head restraint guide and pull upward to remove from the seat.</div></div></div>

Rear Seat Cushion Cover and Pad Replacement



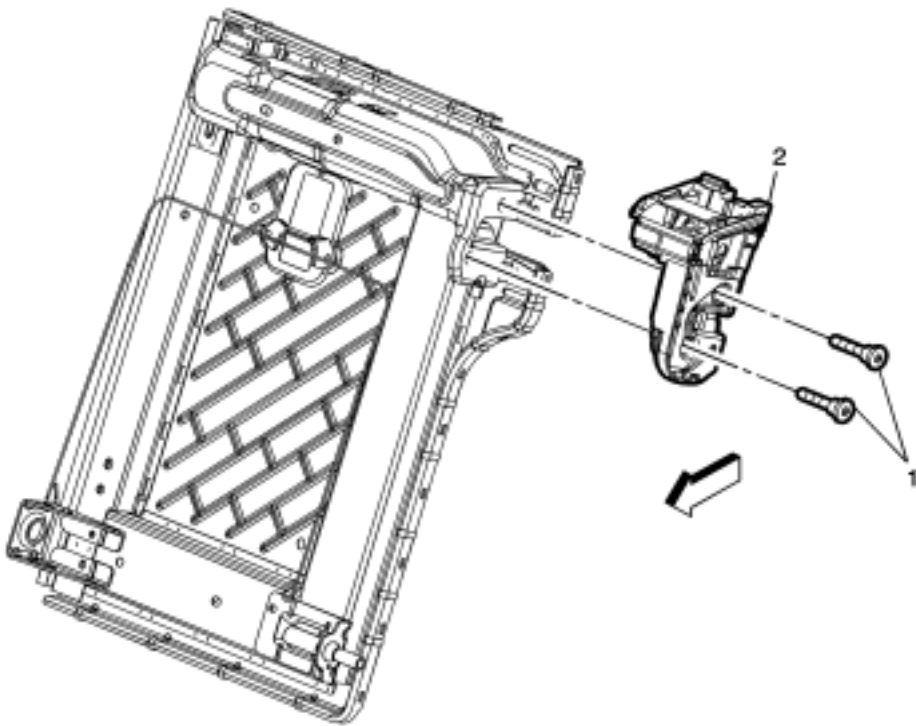
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a></p>	
1	<p>Rear Seat Cushion Cover</p> <p><b>Procedure</b></p> <p>1. Remove the hog rings that secure the rear seat cushion cover to the pad.</p> <p>2. Pull the cover away from the pad to disengage any retainers.</p> <p><b>Note:</b> When installing the rear seat cushion cover, pull the cover tightly in all corners to ensure that no creasing occurs.</p>
2	<p>Rear Seat Cushion Pad</p>

Rear Seat Cushion Replacement



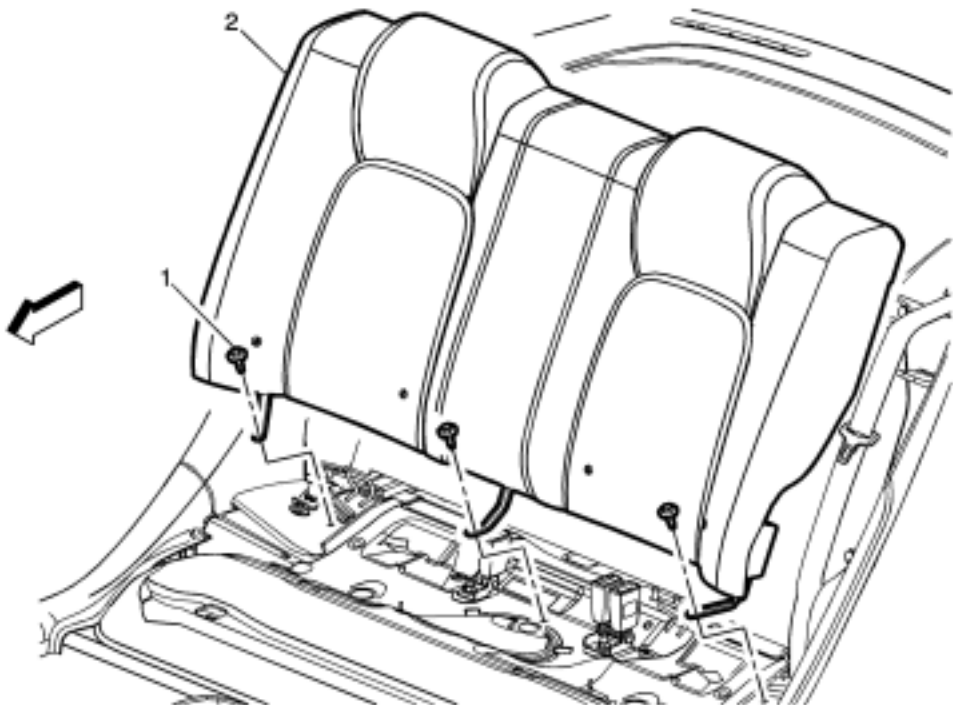
Callout	Component Name
1	<div>Rear Seat Cushion Replacement</div> <div><b>Preliminary Procedures</b><div><div>1. Release the rear seat center seat belts.</div><div>2. Lift up on the front of the seat cushion at the latch locations to disengage the cushion retainers from the floor.</div><div>3. Push down on the rear of the seat cushion to unhook the cushion from the floor wires.</div></div></div>

Rear Seat Latch Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear seat back cushion. Refer to <a href="#">Rear Seat Back Cushion Replacement</a> .</p> <p>2. Remove the rear seat back cushion cover and pad. Refer to <a href="#">Rear Seat Back Cushion Cover and Pad Replacement</a> .</p>	
1	<p>Rear Seat Latch Fasteners (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 45 N·m (33 lb ft)</p>
2	<p>Rear Seat Latch</p>

Rear Seat Back Cushion Replacement ( AN1 Fixed Bench)



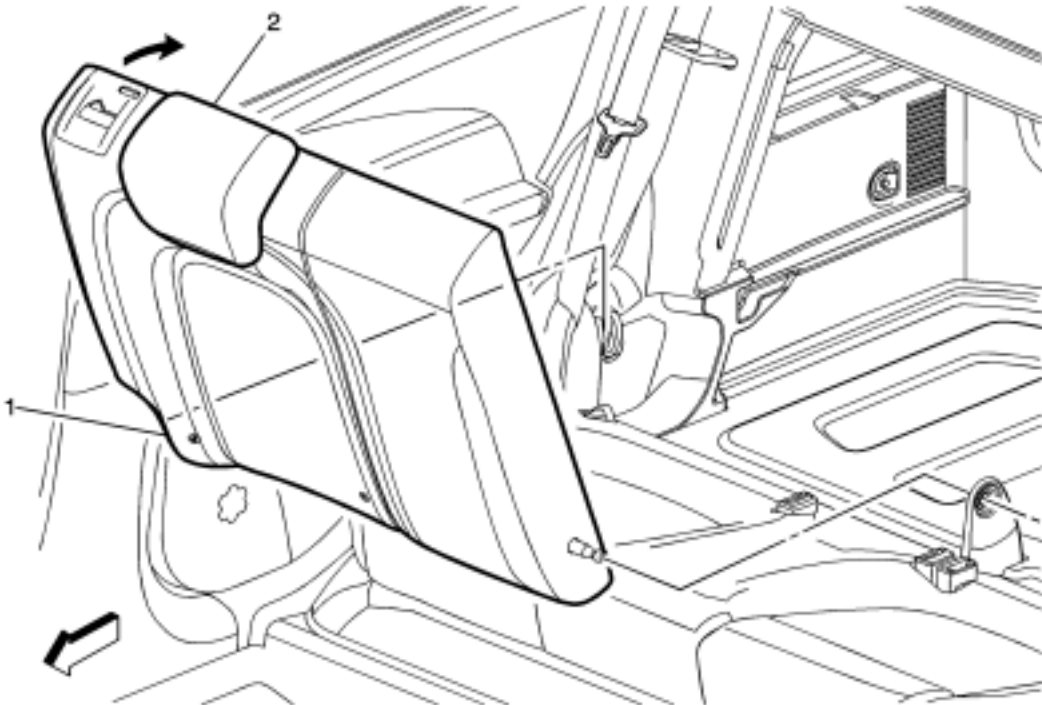
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a></p>	
1	<p>Rear Seat Back Cushion Bolt (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Rear Seat Back Cushion</p> <p><b>Procedure</b></p> <p>1. Remove the rear outboard shoulder belts from the shoulder belt bezel and position it out of the way, if equipped.</p> <p>2. Pull the seat back cushion forward and upward to remove from the vehicle.</p> <p>3. Transfer components as necessary.</p>

Rear Seat Back Cushion Replacement ( AMA 40% w/ Split Back)



Callout	Component Name
<b>Procedure</b> Remove the rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a>	
1	<div>Rear Seat Back Cushion Pivot Support</div> <div><b>Procedure</b> <div>1. Remove the rear outboard shoulder belts from the shoulder belt bezel and position it out of the way.</div><div>2. Pull the rear seat back cushion latch release located on the top of the rear seat back cushion, and fold the rear seat back cushion forward.</div><div>3. Push in on the rear seat back cushion pivot support, and release from bracket.</div></div>
2	<div>Rear Seat Back Cushion</div> <div><b>Procedure</b> <div>1. Pull up on the outer side of the rear seat back cushion and remove the rear seat back cushion from the bracket and hinge.</div><div>2. Transfer components as necessary.</div></div>

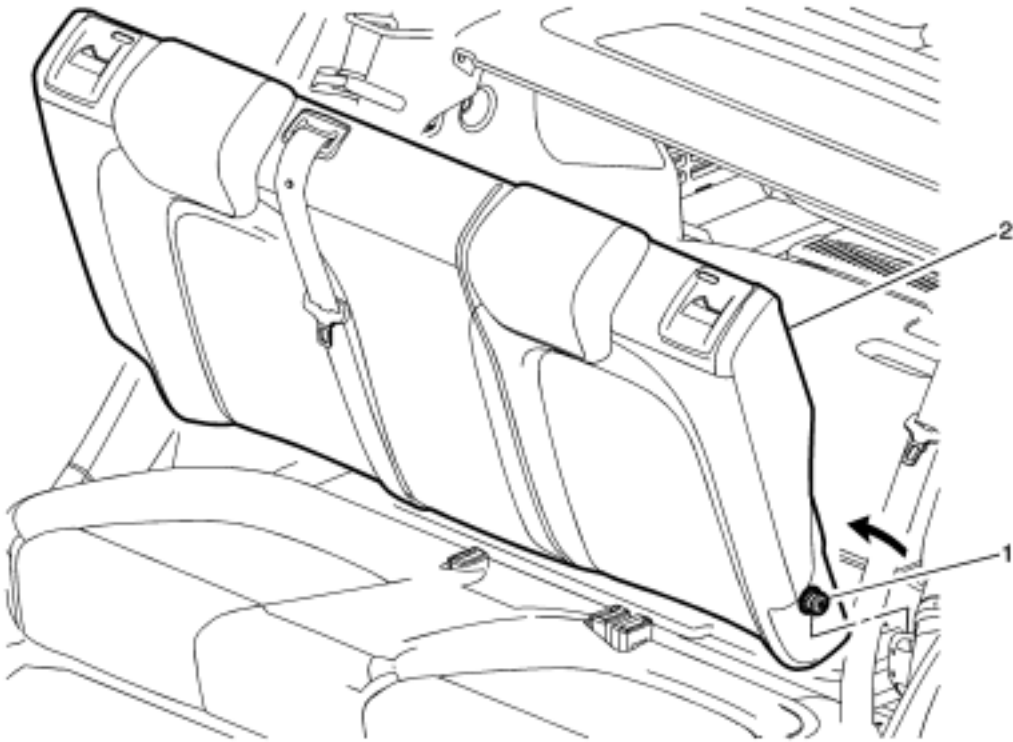
Rear Seat Back Cushion Replacement ( AMA 60% w/ Split Back)



Callout	Component Name
<b>Procedure</b> Remove the rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a>	
1	<div>Rear Seat Back Cushion Pivot Support</div> <div><b>Procedure</b><ol style="list-style-type: none"><li>1. Remove the rear seat back cushion 40% side.</li><li>2. Remove the rear outboard shoulder belts from the shoulder belt bezel and position it out of the way.</li><li>3. Remove the rear seat center seat belt nut from the rear floor. Refer to <a href="#">Rear Seat Center Shoulder Belt Replacement</a></li><li>4. Pull the rear seat back cushion latch release located on the top of the rear seat back cushion, and fold the rear seat back cushion forward.</li><li>5. Push in on the rear seat back cushion pivot support, and release from bracket.</li></ol></div>
2	<div>Rear Seat Back Cushion</div> <div><b>Procedure</b><ol style="list-style-type: none"><li>1. Pull up on the outer side of the rear seat back cushion and remove the rear seat back cushion from the bracket and hinge.</li><li>2. Transfer components as necessary.</li></ol></div>



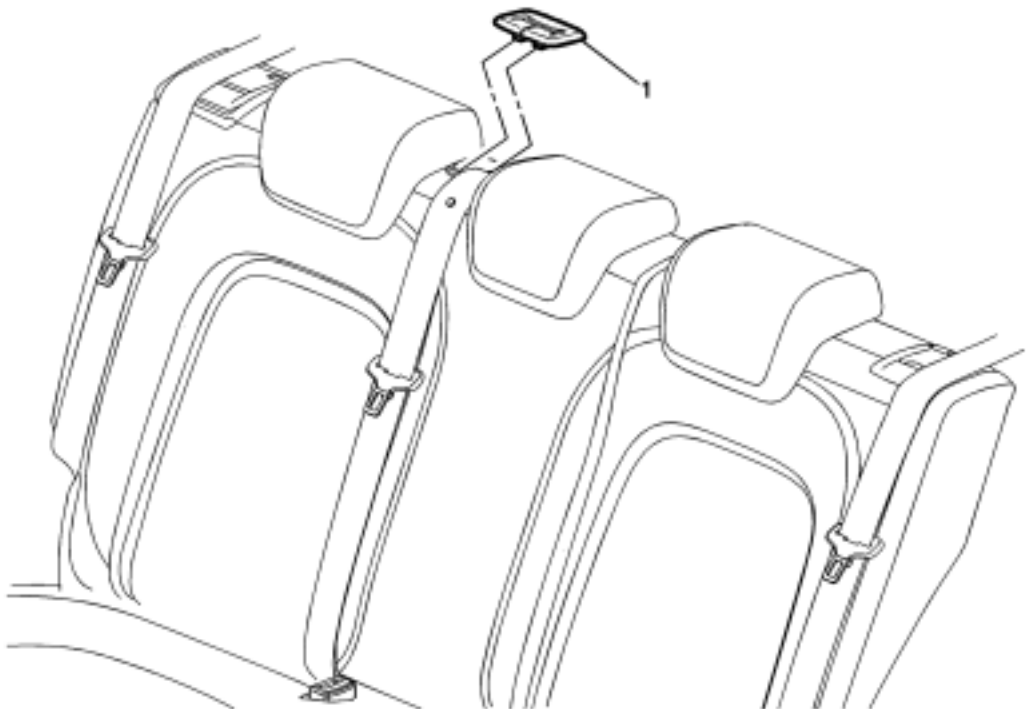
Rear Seat Back Cushion Replacement ( AM7 Non Split Folding)



Callout	Component Name
1	<div>Rear Seat Back Cushion Pivot Support</div> <div>Procedure</div> <div><div>1. Remove the rear outboard shoulder belts from the shoulder belt bezel and position it out of the way, if equipped.</div><div>2. Remove the rear seat center seat belt nut from the rear floor, if equipped. Refer to <a href="#">Rear Seat Center Shoulder Belt Replacement</a></div><div>3. Pull the rear seat back cushion latch release located on the top of the rear seat back cushion, and fold the rear seat back cushion forward.</div><div>4. Push in on the rear seat back cushion pivot support, and release from bracket.</div></div>
2	<div>Rear Seat Back Cushion</div> <div>Procedure</div> <div><div>1. Pull up on the outer side of the rear seat back cushion and remove the rear seat back cushion from the bracket and hinge.</div><div>2. Transfer components as necessary.</div></div>

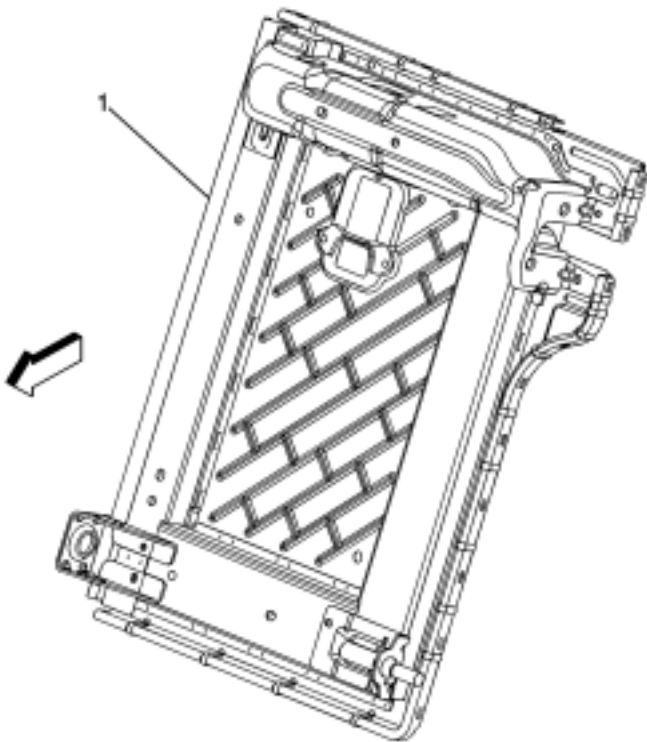


Rear Seat Shoulder Belt Guide Opening Bezel Replacement



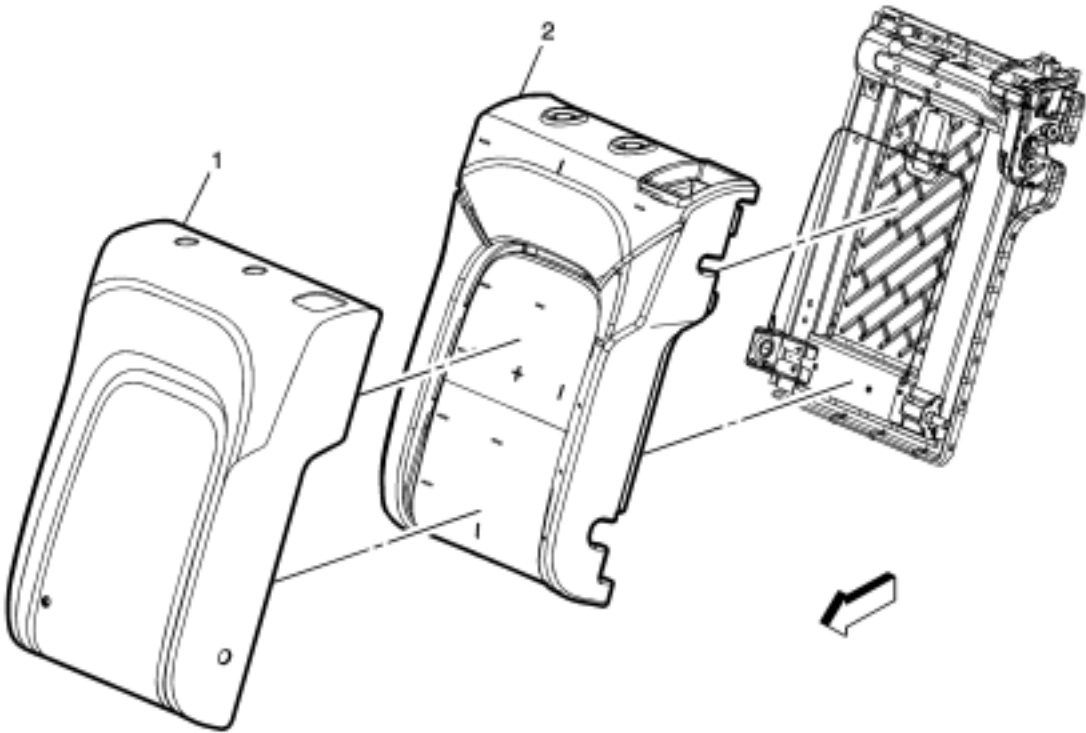
Callout	Component Name
1	<div>Rear Seat Shoulder Belt Opening Bezel</div> <div><b>Procedure</b></div> <div>Push inward and upward from the front of the bezel to release from the seat back.</div> <div><b>Note:</b> The rear seat shoulder belt opening bezel is part of the rear seat center belt assembly and is replaced as an assembly.</div>

Rear Seat Back Cushion Panel Replacement



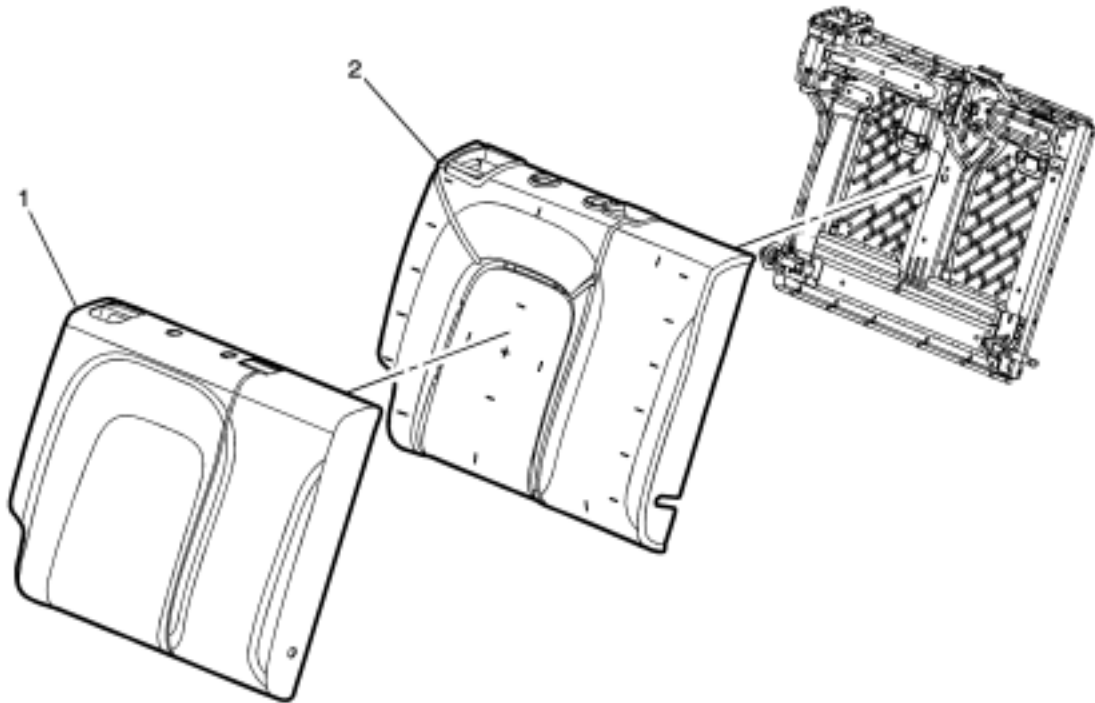
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the rear seat back cushion. Refer to <a href="#">Rear Seat Back Cushion Replacement</a></p> <p>2. Remove the rear seat head restraint guide. Refer to <a href="#">Rear Seat Head Restraint Guide Replacement</a></p> <p>3. Remove the rear seat back cushion latch release knob bezel. Refer to <a href="#">Rear Seat Back Cushion Latch Release Knob Bezel Replacement</a></p> <p>4. Remove the child seat back cushion cover. Refer to <a href="#">Child Seat Back Cushion Cover Replacement</a></p> <p>5. Remove the rear seat back cushion pivot support. Refer to <a href="#">Rear Seat Back Cushion Pivot Support Replacement</a></p> <p>6. Remove the rear seat latch. Refer to <a href="#">Rear Seat Latch Replacement</a></p>	
1	<p>Rear Seat Back Cushion Panel</p> <p><b>Procedure</b></p> <p>1. Remove the seat back carpet.</p> <p>2. If replacing the seat back panel, transfer components as necessary.</p>

Rear Seat Back Cushion Cover and Pad Replacement (AMA 40% w/ Split Back)



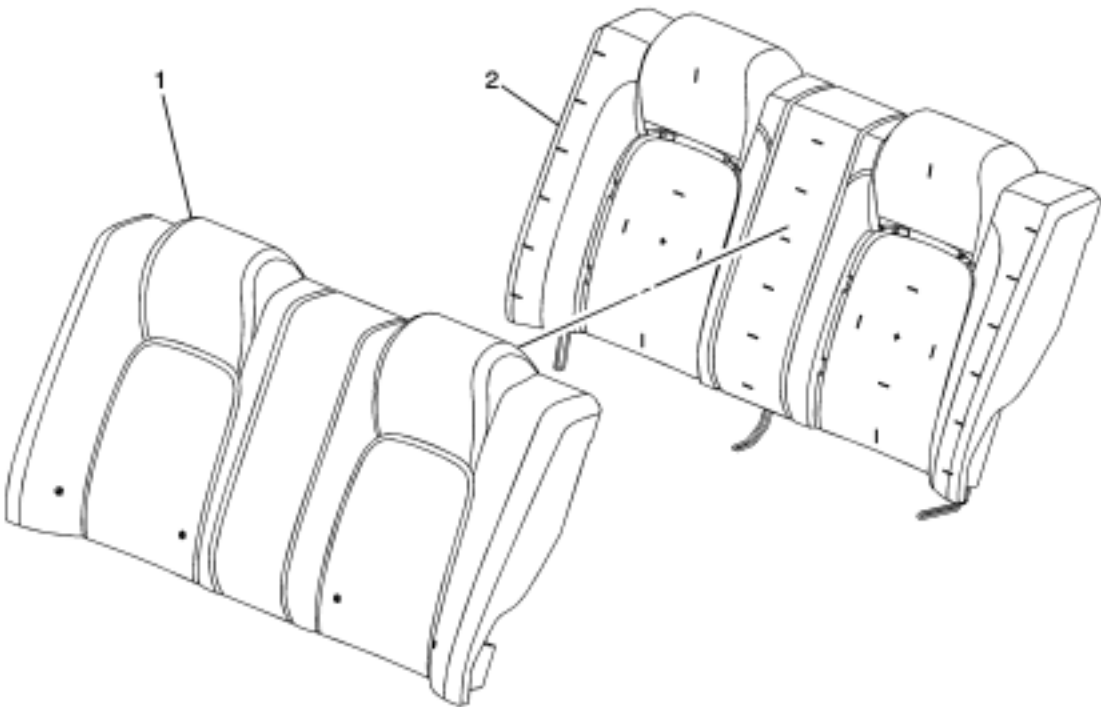
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear seat back cushion. Refer to <a href="#">Rear Seat Back Cushion Replacement</a> .</p> <p>2. Remove the rear seat head restraint guide. Refer to <a href="#">Rear Seat Head Restraint Guide Replacement</a> .</p> <p>3. Remove the rear seat back cushion latch release handle bezel. Refer to <a href="#">Rear Seat Back Cushion Latch Release Knob Bezel Replacement</a></p> <p>4. Remove the child seat back cushion cover. Refer to <a href="#">Child Seat Back Cushion Cover Replacement</a></p> <p>5. Remove the rear seat back cushion pivot support. Refer to <a href="#">Rear Seat Back Cushion Pivot Support Replacement</a> .</p>	
1	<p>Rear Seat Back Cushion Cover</p> <p><b>Procedure</b></p> <p>1. Remove the seat back carpet.</p> <p>2. Disengage the J-channel retainers from the seat back cushion frame.</p> <p>3. Remove the hog rings from the under side of the rear seat back cushion cover.</p> <p>4. Pull the cover away from the pad to disengage the hook and loop retainers.</p> <p>5. If replacing the seat back panel, transfer components as necessary.</p> <p><b>Note:</b> When installing the rear seat back cushion cover, pull the cover tightly in all corners to ensure that no creasing occurs.</p>
2	<p>Rear Seat Back Cushion Pad</p>

Rear Seat Back Cushion Cover and Pad Replacement (AMA 60% w/ Split Back)



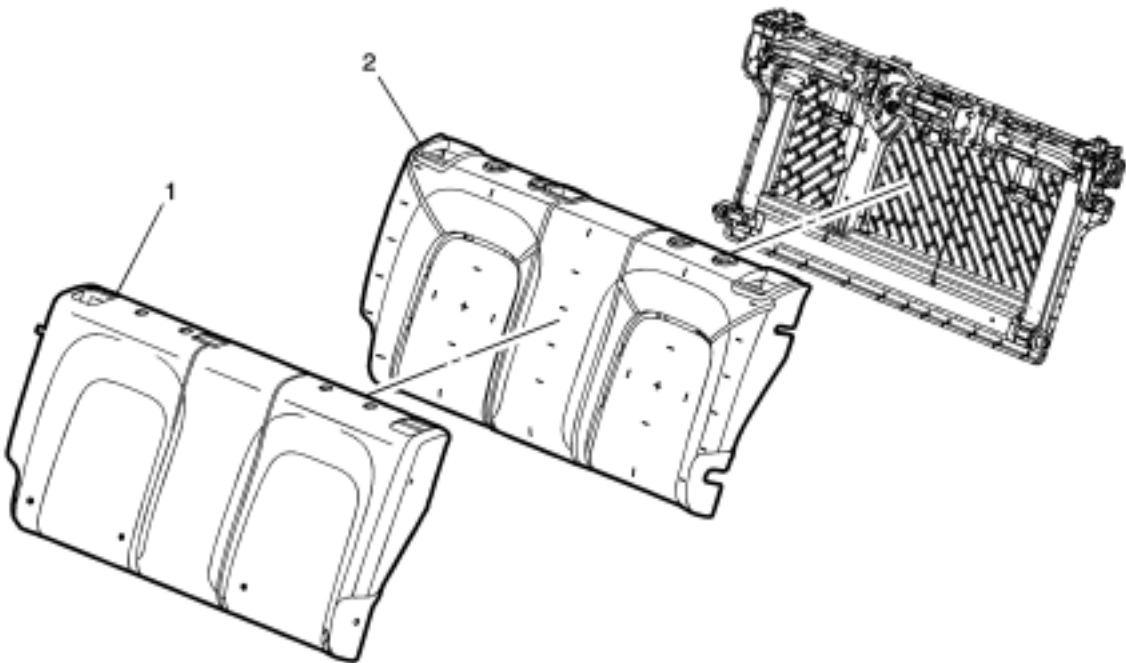
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the rear seat back cushion. Refer to <a href="#">Rear Seat Back Cushion Replacement</a></p> <p>2. Remove the rear seat head restraint guide. Refer to <a href="#">Rear Seat Head Restraint Guide Replacement</a></p> <p>3. Remove the rear seat back cushion latch release knob bezel. Refer to <a href="#">Rear Seat Back Cushion Latch Release Knob Bezel Replacement</a></p> <p>4. Remove the child seat back cushion cover. Refer to <a href="#">Child Seat Back Cushion Cover Replacement</a></p> <p>5. Remove the rear seat back cushion pivot support. Refer to <a href="#">Rear Seat Back Cushion Pivot Support Replacement</a></p> <p>6. Remove the rear seat shoulder belt guide opening bezel, if equipped. Refer to <a href="#">Rear Seat Shoulder Belt Guide Opening Bezel Replacement</a></p>	
1	<p>Rear Seat Back Cushion Cover</p> <p><b>Procedure</b></p> <p>1. Remove the seat back carpet.</p> <p>2. Remove the rear seat center head restraint, if equipped.</p> <p>3. Disengage the J-channel retainers from the seat back cushion frame.</p> <p>4. Remove the hog rings from the under side of the rear seat back cushion cover.</p> <p>5. Pull the cover away from the pad to disengage the hook and loop retainers.</p> <p>6. If replacing the seat back panel, transfer components as necessary.</p> <p><b>Note:</b> When installing the rear seat back cushion cover, pull the cover tightly in all corners to ensure that no creasing occurs.</p>
2	<p>Rear Seat Back Cushion Pad</p>

Rear Seat Back Cushion Cover and Pad Replacement ( AN1 Fixed Bench)



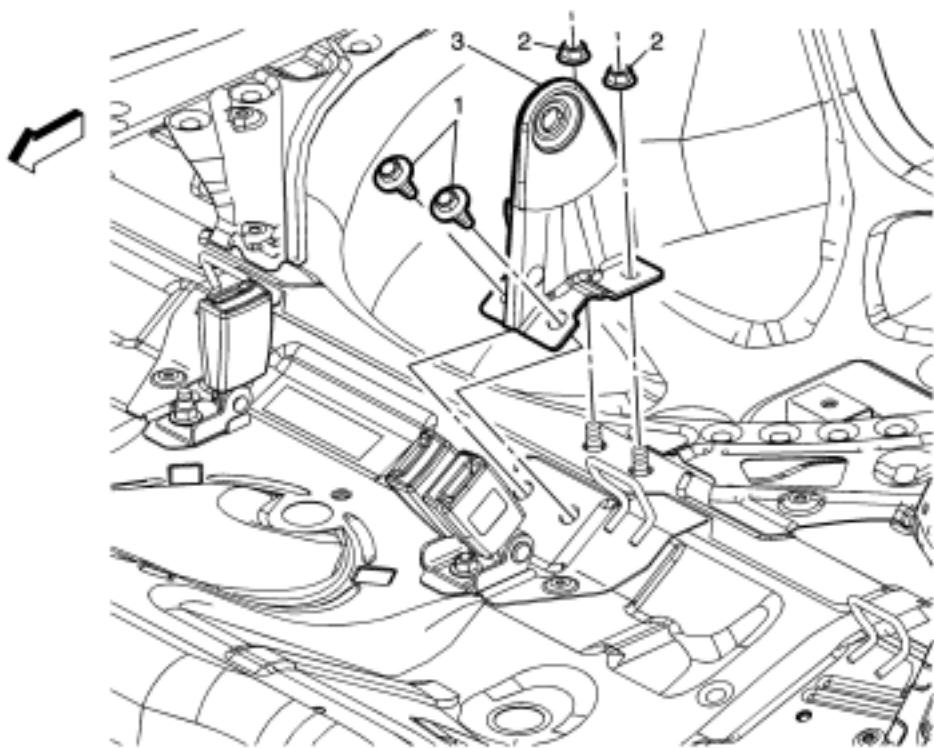
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the rear seat back cushion. Refer to <a href="#">Rear Seat Back Cushion Replacement</a></p>	
1	<p>Rear Seat Back Cushion Cover</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Remove the seat back carpet.</li><li>2. Disengage the J-channel retainers from the seat back cushion frame.</li><li>3. Remove the hog rings from the under side of the rear seat back cushion cover.</li><li>4. Pull the cover away from the pad to disengage the hook and loop retainers.</li><li>5. If replacing the seat back panel, transfer components as necessary.</li></ol> <p><b>Note:</b> When installing the rear seat back cushion cover, pull the cover tightly in all corners to ensure that no creasing occurs.</p>
2	<p>Rear Seat Back Cushion Pad</p>

Rear Seat Back Cushion Cover and Pad Replacement (AM7 Non Split Folding)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the rear seat back cushion. Refer to <a href="#">Rear Seat Back Cushion Replacement</a></p> <p>2. Remove the rear seat head restraint guide. Refer to <a href="#">Rear Seat Head Restraint Guide Replacement</a></p> <p>3. Remove the rear seat back cushion latch release knob bezel. Refer to <a href="#">Rear Seat Back Cushion Latch Release Knob Bezel Replacement</a></p> <p>4. Remove the child seat back cushion cover. Refer to <a href="#">Child Seat Back Cushion Cover Replacement</a></p> <p>5. Remove the rear seat back cushion pivot support. Refer to <a href="#">Rear Seat Back Cushion Pivot Support Replacement</a></p>	
1	<p>Rear Seat Back Cushion Cover</p> <p><b>Procedure</b></p> <p>1. Disengage the J-channel retainers from the seat back cushion frame.</p> <p>2. Remove the seat back carpet.</p> <p>3. Remove the hog rings from the under side of the rear seat back cushion cover.</p> <p>4. Pull the cover away from the pad to disengage the hook and loop retainers.</p> <p><b>Note:</b> When installing the rear seat back cushion cover, pull the cover tightly in all corners to ensure that no creasing occurs.</p>
2	<p>Rear Seat Back Cushion Pad</p>

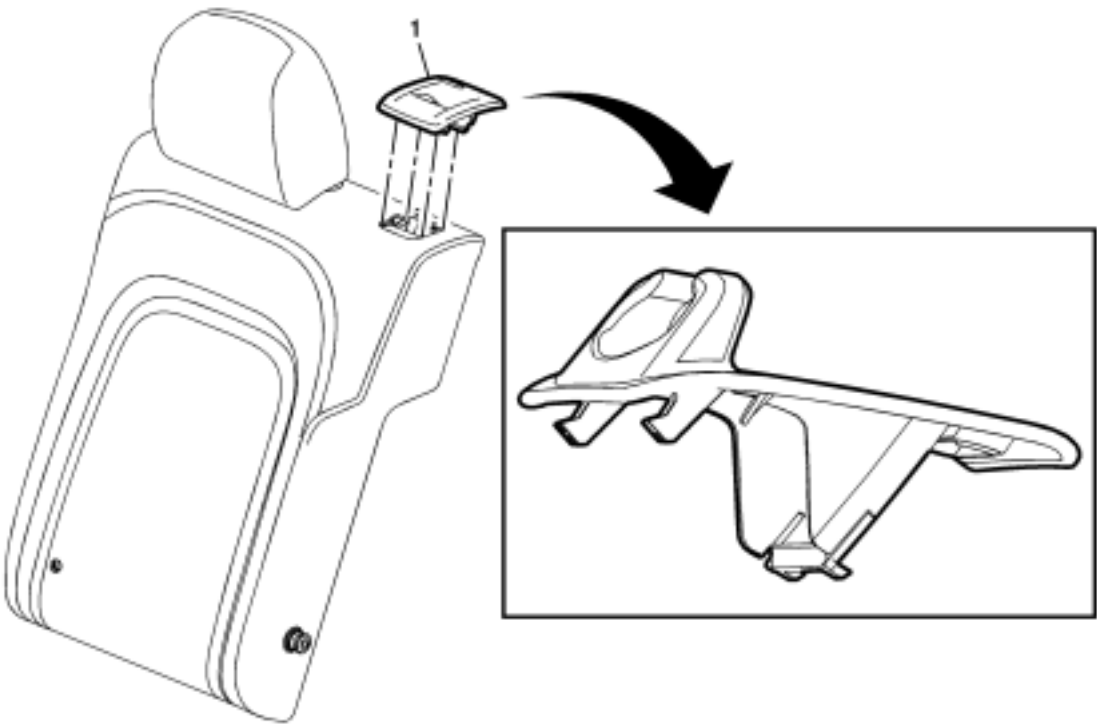
Rear Seat Back Cushion Hinge Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the rear seat cushion. Refer to <a href="#">Rear Seat Cushion Replacement</a></p> <p>2. Remove the rear seat back cushion. Refer to <a href="#">Rear Seat Back Cushion Replacement</a></p> <p>3. Remove the rear compartment floor panel carpet. Refer to <a href="#">Rear Compartment Floor Panel Carpet Replacement</a></p>	
1	<p>Rear Seat Back Cushion Hinge Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 43 N·m (32 lb ft)</p>
2	<p>Rear Seat Back Cushion Hinge Nut (Qty: 2)</p> <p><b>Tighten</b> 43 N·m (32 lb ft)</p>
3	<p>Rear Seat Back Cushion Hinge</p>



Rear Seat Back Cushion Latch Release Knob Bezel Replacement



Callout	Component Name
1	<div>Rear Seat Back Cushion Latch Release Handle Bezel</div> <div><b>Procedure</b></div> <div>Use a flat-bladed tool to tilt the rear of the handle upward, then lifting and pulling the bezel rearward to disengage the front hooks.</div>





## Manual Seats Description

**Note:** Do not attempt to change the designed seat position by altering the designed seat adjuster-to-floor pan anchor provisions or the seat adjuster-to-seat frame anchor provisions. Changing the seat position could affect the performance of the seat system.

This vehicle is equipped with low-backed front seats with separate head restraints and a three-passenger folding rear seat. Split folding rear seat is optional. Seat cushions and seatbacks have formed foam pads, which fit the contours of the full-panel seatback frame assembly and the designed contour of the seat cushion frame. There are no front seat forward or rearward relocation provisions provided at either the seat adjuster-to-seat frame or the seat adjuster-to-floor pan anchor attachments.





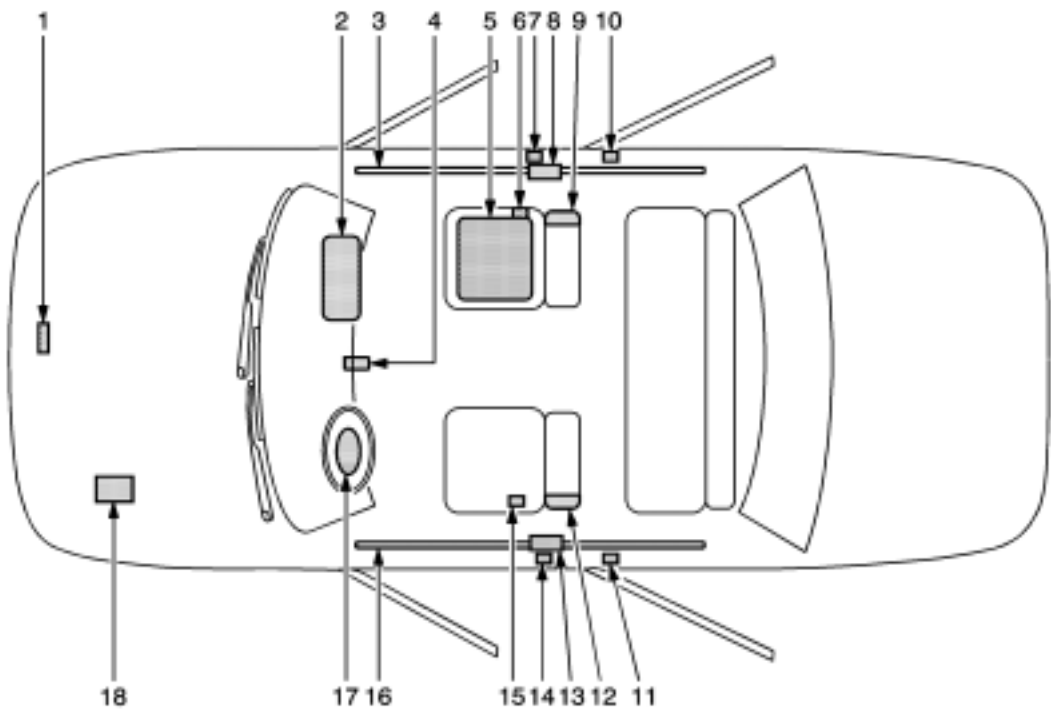
Index	RESTRAINTS	0-8
Specifications	Driver or Passenger Seat Side Inflatable Restraint Module Replacement	
Component Locator	Inflatable Restraint Instrument Panel Compartment Module Disable Switch Replacement	
SIR Disabling and Enabling	Roof Side Rail Inflatable Restraint Module Replacement (AYC)	
SIR Service Precautions	Front Seat Belt Anchor Plate Tensioner Replacement	
Front End Inflatable Restraint Discriminating Sensor Replacement	Driver or Passenger Seat Shoulder Belt Replacement (with A69)	
Inflatable Restraint Side Impact Sensor Replacement	Driver or Passenger Seat Shoulder Belt Replacement (without A69)	
Inflatable Restraint Sensing and Diagnostic Module Replacement	Repairs and Inspections Required After a Collision	
Steering Wheel Inflatable Restraint Module Replacement	Inflatable Restraint Module Handling and Scrapping	
Steering Wheel Airbag Coil Replacement	Pretensioner Handling and Scrapping	
Inflatable Restraint Steering Wheel Module Coil Centering	Description and Operation	
Instrument Panel Inflatable Restraint Module Replacement	Special Tools	



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Driver or Passenger Seat Belt Tensioner Cover Fastener	7.5 N·m	66 lb in
Driver or Passenger Seat Belt Tensioner Fastener	45 N·m	33 lb ft
Driver or Passenger Seat Shoulder Belt Fastener	45 N·m	33 lb ft
Driver or Passenger Seat Side Inflatable Restraint Module Fastener	4 N·m	35 lb in
Driver or Passenger Shoulder Belt Retractor Fastener	45 N·m	33 lb ft
Inflatable Restraint Front End Discriminating Sensor	7.5 N·m	66 lb in
Front Seat Belt Anchor Plate Fastener	8 N·m	70 lb in
Front Seat Belt Retractor D Ring Fastener	45 N·m	33 lb ft
Front Seat Shoulder Belt Retractor Fastener	45 N·m	33 lb ft
Inflatable Restraint Roof Side Rail Fastener	9.5 N·m	84 lb in
Inflatable Restraint Sensing and Diagnostic Module Fastener	10 N·m	89 lb in
Inflatable Restraint Side Impact Sensor	7.5 N·m	66 lb in

Component Locator



- (1) Center Front Impact Sensor—Located under the hood at the center of the vehicle
- (2) Passenger Instrument Panel Air Bag—Located at the top right under the instrument panel
- Right Roof Rail Air Bag—Located under the headliner, extending from the passenger front windshield pillar to the passenger rear windshield pillar
- (3)
- Inflatable Restraint Sensing and Diagnostic Module (SDM)—Located underneath the center stack
- (4)
- Passenger Presence System (PPS)—Located on the passenger front seat underneath the seat bottom trim
- (5)
- Passenger Seat Belt Anchor Pretensioner—
- (6) Located on the outboard side of the passengers seat
- (7) Right Front Side Impact Sensor—Located at the B-pillar underneath the door sill
- (8) Inflator Module for Right Roof Rail Air Bag— Located behind headliner at the upper B-pillar
- (9) Passenger Seat Side Air Bag—Located on the seat back of passenger seat
- Passenger Seat Belt Retractor Pretensioner—
- (10) Located under the trim near the bottom of the center pillar on the passenger side of vehicle
- Driver Seat Belt Retractor Pretensioner—
- (11) Located under the trim near the bottom of the center pillar on the driver side of vehicle
- (12) Driver Seat Side Air Bag—Located on the seat back of driver seat
- (13) Inflator Module for Left Roof Rail Air Bag— Located behind headliner at the upper B-pillar
- (14) Left Front Side Impact Sensor—Located at the B-pillar underneath the door sill
- (15) Driver Seat Belt Anchor Pretensioner—Located on the outboard side of the drivers seat
- Left Roof Rail Air Bag—Located under the headliner, extending from the driver front windshield pillar to the driver rear windshield pillar
- (16)
- (17) Driver Steering Wheel Air Bag—Located on the steering wheel
- (18) Vehicle Battery—Located under the hood on the left side

## SI R Disabling and Enabling

SI R component location affects how a vehicle should be serviced. There are parts of the SI R system installed in various locations around a vehicle. To find the location of the SI R components refer to [SI R Identification Views](#) .

There are several reasons for disabling the SI R system, such as repairs to the SI R system or servicing a component near or attached to an SI R component. There are several ways to disable the SI R system depending on what type of service is being performed. The following information covers the proper procedures for disabling/enabling the SI R system.

Condition	Action
If the vehicle was involved in an accident with an air bag deployment.	Disconnect the negative battery cable(s) *. Refer to <a href="#">Repairs and Inspections Required After a Collision</a> .
When performing SI R diagnostics.	Follow the appropriate SI R service manual diagnostic procedure(s) *
When moving, removing or replacing an SI R component or a component attached to an SI R component. (Anytime you remove fasteners.)	Disconnect the negative battery cable(s) *
If the vehicle is suspected of having shorted electrical wires.	Disconnect the negative battery cable(s) *
When performing electrical diagnosis on components other than the SI R system.	Remove the SI R/Airbag fuse(s) when indicated by the diagnostic procedure to disable the SI R system
* DTCs will be lost when the negative battery cable is disconnected.	

### SI R Service Precautions

**Warning:** When performing service on or near the SI R components or the SI R wiring, the SI R system must be disabled. Failure to observe the correct procedure could cause deployment of the SI R components. Serious injury can occur. Failure to observe the correct procedure could also result in unnecessary SI R system repairs.

The inflatable restraint sensing and diagnostic module (SDM) maintains a reserved energy supply. The reserved energy supply provides deployment power for the air bags if the SDM loses battery power during a collision. Deployment power is available for as much as 1 minute after disconnecting the vehicle power. Waiting 1 minute before working on the system after disabling the SI R system prevents deployment of the air bags from the reserved energy supply.

### General Service Instructions

The following are general service instructions which must be followed in order to properly repair the vehicle and return it to its original integrity:

- Do not expose air bags to temperatures above 65°C (149°F).
- Verify the correct replacement part number. Do not substitute a component from a different vehicle.
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the SI R system.

Discard any of the following components if it has been dropped from a height of 92 cm (3 feet) or greater:

- Inflatable restraint sensing and diagnostic module (SDM)
- Any air bag
- Driver steering wheel air bag coil
- Any impact sensor
- Seat belt anchor and/or retractor pretensioners



- Passenger presence module and/or occupant sensor

**Disabling Procedure – Air Bag Fuse**

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Place the ignition in the OFF position.

**Warning:** The SDM may have more than one fused power input. To ensure there is no unwanted SIR deployment, personal injury, or unnecessary SIR system repairs, remove all fuses supplying power to the SDM. With all SDM fuses removed and the ignition switch in the ON position, the AIR BAG warning indicator illuminates. This is normal operation, and does not indicate a SIR system malfunction.

3. Locate and remove the fuse(s) supplying power to the SDM. Refer to [SIR Schematics](#) or [Electrical Center Identification Views](#) .
4. Wait 1 minute before working on the system.

**Enabling Procedure – Air Bag Fuse**

1. Place the ignition in the OFF position.
2. Install the fuse(s) supplying power to the SDM. Refer to [SIR Schematics](#) or [Electrical Center Identification Views](#) .
3. Turn the ignition switch to the ON position. The AIR BAG indicator will flash then turn OFF.
4. Perform the Diagnostic System Check – Vehicle if the AIR BAG warning indicator does not operate as described. Refer to [Diagnostic System Check - Vehicle](#) .

**Disabling Procedure – Negative Battery Cable**

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Place the ignition in the OFF position.
3. Disconnect the negative battery cable from the battery. Refer to [Battery Negative Cable Disconnection and Connection](#) .
4. Wait 1 minute before working on system.

**Enabling Procedure – Negative Battery Cable**

1. Place the ignition in the OFF position.
2. Connect the negative battery cable to the battery. Refer to [Battery Negative Cable Disconnection and Connection](#) .
3. Turn the ignition switch to the ON position. The AIR BAG indicator will flash then turn OFF.
4. Perform the Diagnostic System Check – Vehicle if the AIR BAG warning indicator does not operate as described. Refer to [Diagnostic System Check - Vehicle](#) .





## SI R Service Precautions

### General Service Instructions

**Warning:** When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR Disabling and Enabling . Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.

**Note:** The inflatable restraint sensing and diagnostic module (SDM) maintains a reserved energy supply. The reserved energy supply provides deployment power for the SIR air bags. Deployment power may be available for up to 60 seconds after disconnecting the vehicle power. Disabling the SIR system prevents deployment of the SIR air bags from the reserved energy supply.

**Note:** The following are general service instructions which must be followed in order to properly repair the vehicle and return it to its original integrity:

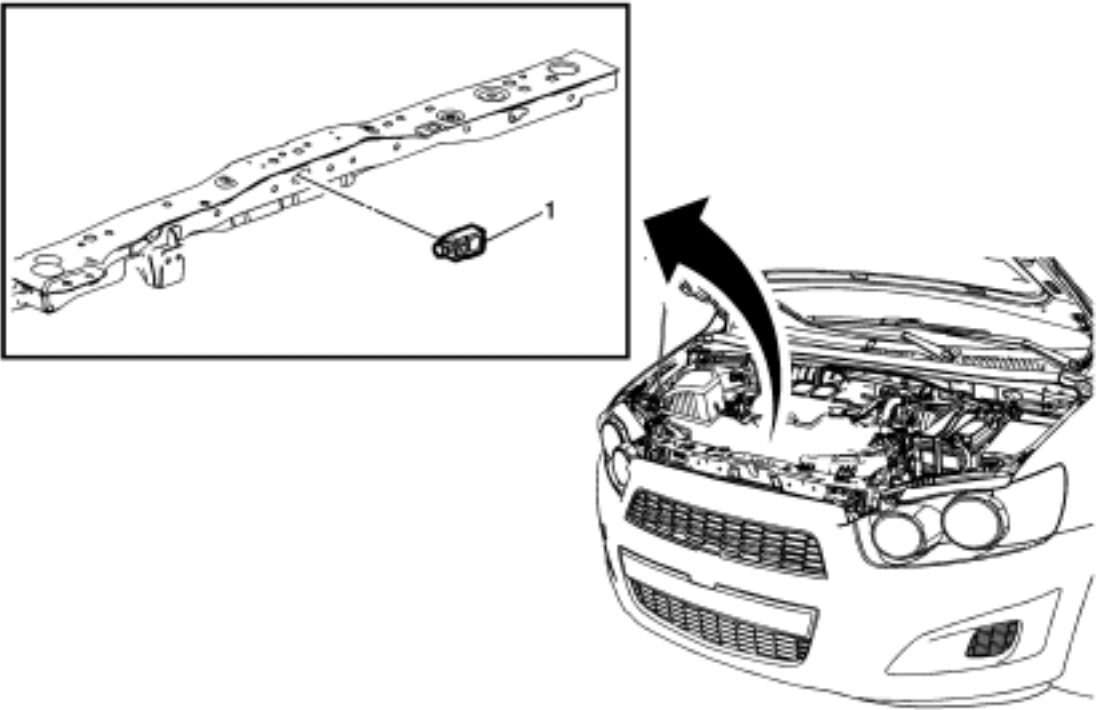
- Do not expose air bags to temperatures above 65°C (149°F)
- Verify the correct replacement part number. Do not substitute a component from a different vehicle
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the SIR system

**Note:** Discard any of the following components if it has been dropped from a height of 92 cm (3 ft) or greater:

- SDM
- Passenger instrument panel air bag
- Driver steering wheel air bag
- Driver steering wheel air bag coil
- Roof rail air bags
- Front and /or side impact sensors
- Seat belt achor and/or retractor pretensioners
- Front seat side air bag



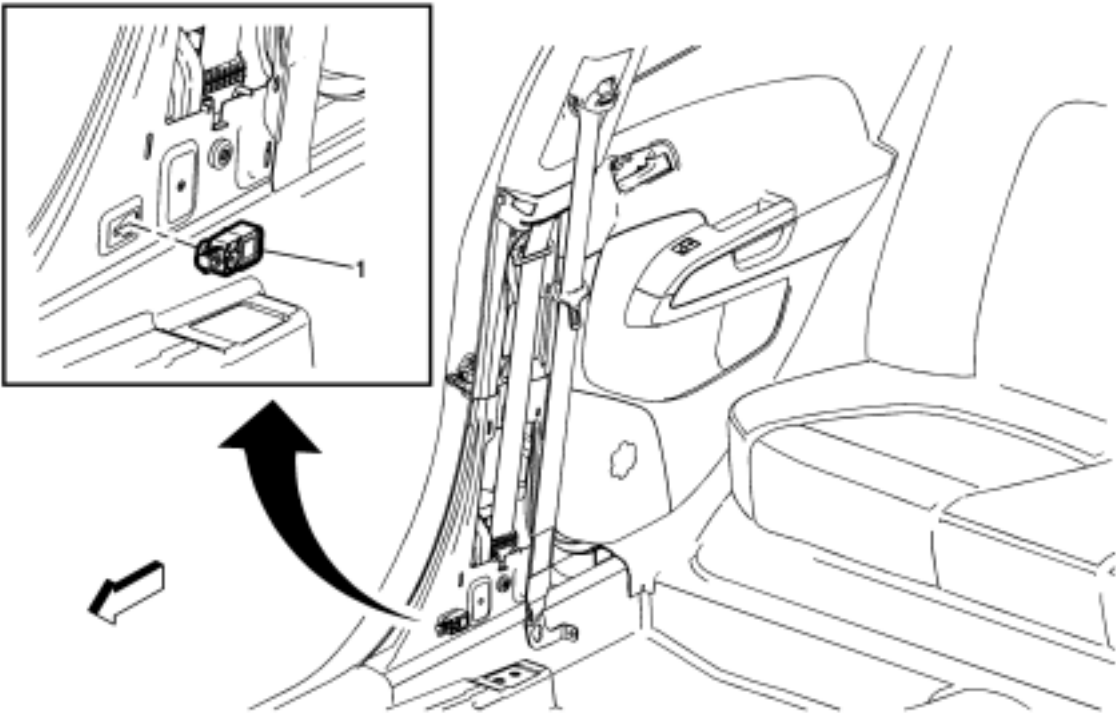
Front End Inflatable Restraint Discriminating Sensor Replacement



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Warning:</b> Refer to <a href="#">SIR Inflator Module Handling and Storage Warning</a> .</p> <p><b>Warning:</b> Following the deployment of a side impact air bag, inspect the following parts for damage. Replace these parts if necessary:</p> <ul style="list-style-type: none"><li>• The seat cushion frame</li><li>• The seat recliner, if equipped</li><li>• The seat adjuster</li><li>• The seat back frame</li></ul> <p>Failure to do so may cause future personal injury.</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Disable the supplemental inflatable restraint (SIR) system. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>2. Remove the radiator opening upper cover. Refer to <a href="#">Radiator Opening Upper Cover Replacement</a> .</li></ol>	
1	<p>Inflatable Restraint Front End Discriminating Sensor Assembly</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Disconnect electrical connector.</li><li>2. Loosen the bolts and slide the sensor out of the keyhole slots.</li><li>3. The bolts are integral to the sensor assembly and DO NOT remove separately.</li></ol> <p><b>Tighten</b> 7.5 N·m (66 lb in)</p>

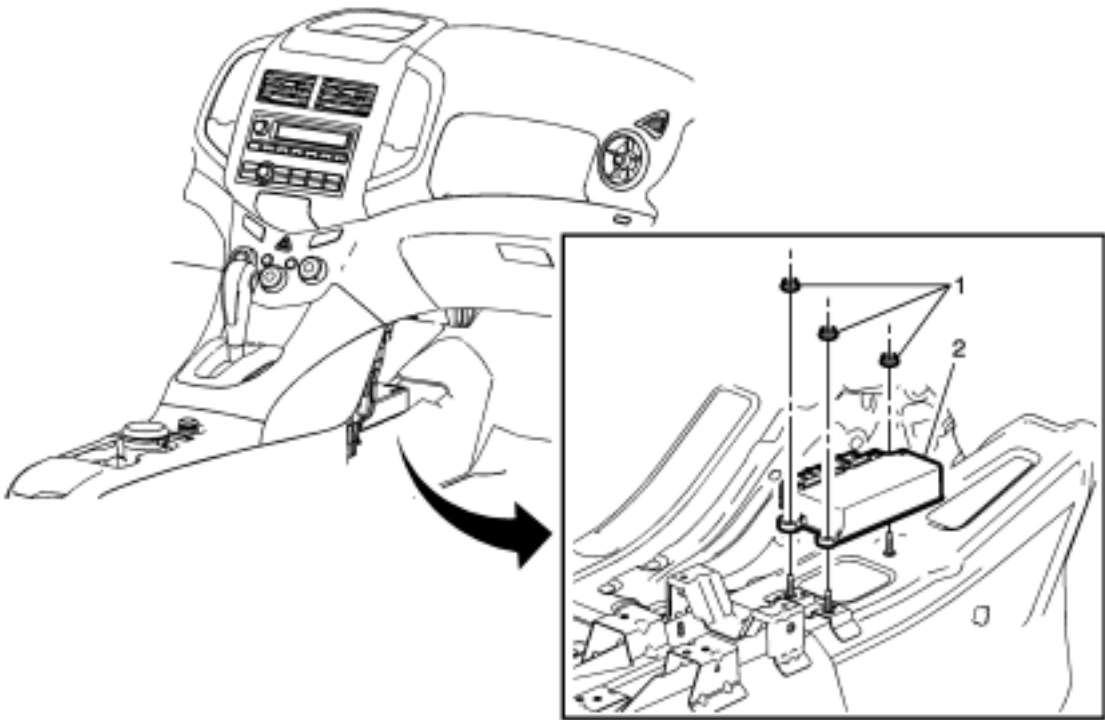


Inflatable Restraint Side Impact Sensor Replacement



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Warning:</b> Refer to <a href="#">SIR Inflator Module Handling and Storage Warning</a> .</p> <p><b>Warning:</b> Following the deployment of a side impact air bag, inspect the following parts for damage. Replace these parts if necessary:</p> <ul style="list-style-type: none"><li>• The seat cushion frame</li><li>• The seat recliner, if equipped</li><li>• The seat adjuster</li><li>• The seat back frame</li></ul> <p>Failure to do so may cause future personal injury.</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>2. Remove the center pillar lower trim panel. Refer to <a href="#">Center Pillar Lower Trim Panel Replacement</a> .</li></ol>	
1	<p>Inflatable Restraint Side Impact Sensor Assembly</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Disconnect electrical connector.</li><li>2. Loosen the fasteners and slide the sensor out of the keyhole slots.</li><li>3. The bolts are integral to the sensor assembly, DO NOT remove separately.</li></ol> <p><b>Tighten</b> 7.5 N·m (66 lbin)</p>

Inflatable Restraint Sensing and Diagnostic Module Replacement



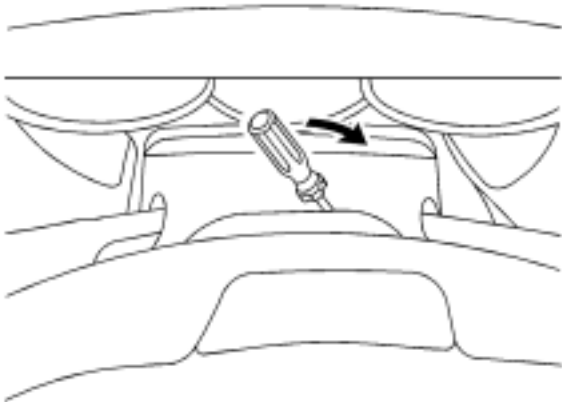
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Warning:</b> Do not strike or jolt the inflatable restraint sensing and diagnostic module (SDM). Before applying power to the SDM, make sure that it is securely fastened with the arrow facing toward the front of the vehicle. Failure to observe the correct installation procedure could cause SIR deployment, personal injury, or unnecessary SIR system repairs.</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Disable the supplemental inflatable restraint (SIR) system. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>2. Remove the front floor console extension. Refer to <a href="#">Front Floor Console Extension Replacement - Left Side</a> or <a href="#">Front Floor Console Extension Replacement - Right Side</a> .</li><li>3. Disconnect the electrical connector.</li></ol>	
1	<p>Inflatable Restraint Sensing and Diagnostic Module Fastener (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 10 N·m (89 lbin)</p>
2	<p>Inflatable Restraint Sensing and Diagnostic Module Assembly</p> <p><b>Tip</b></p> <ul style="list-style-type: none"><li>• When installing, ensure the arrow on the module is pointed towards the front of the vehicle.</li><li>• If installing a replacement module, program the module. Refer to <a href="#">Control Module References</a> .</li></ul>

## Steering Wheel Inflatable Restraint Module Replacement

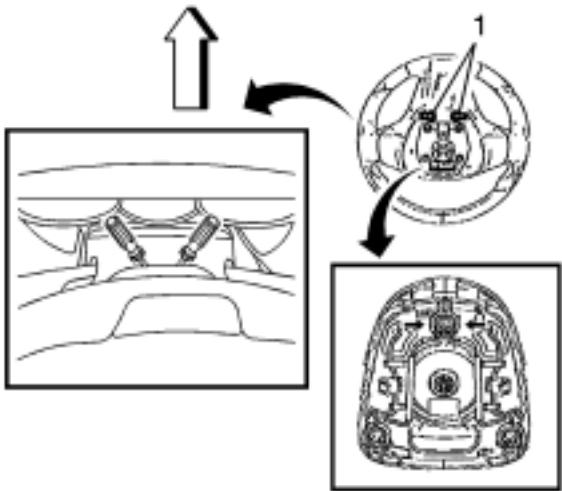
### Removal Procedure

**Warning:** Refer to [SIR Inflator Module Handling and Storage Warning](#) .

**Warning:** Refer to [SIR Warning](#) .



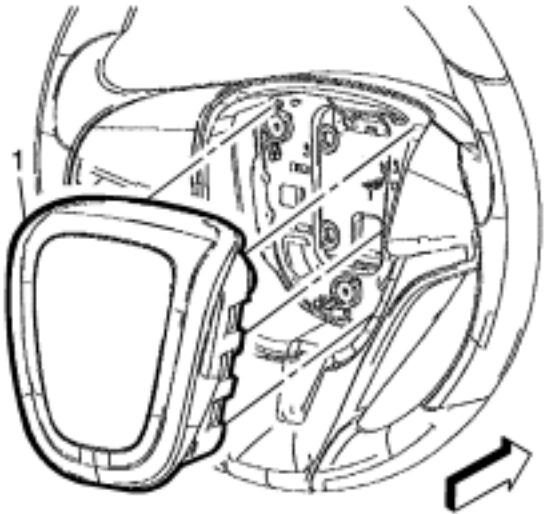
1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Rotate the steering wheel 180 degrees.



3. Using a blunt-ended tool, push the spring fastener inward through the access hole(1) located on the rear of the steering wheel by pulling the tool outwards.
4. Keeping the tool inserted, repeat the step for other opening.
5. Keeping the upper step pull the steering wheel inflatable restraint module out of the steering wheel.
6. Disconnect the electrical connectors.
7. Remove the steering wheel inflatable restraint module.

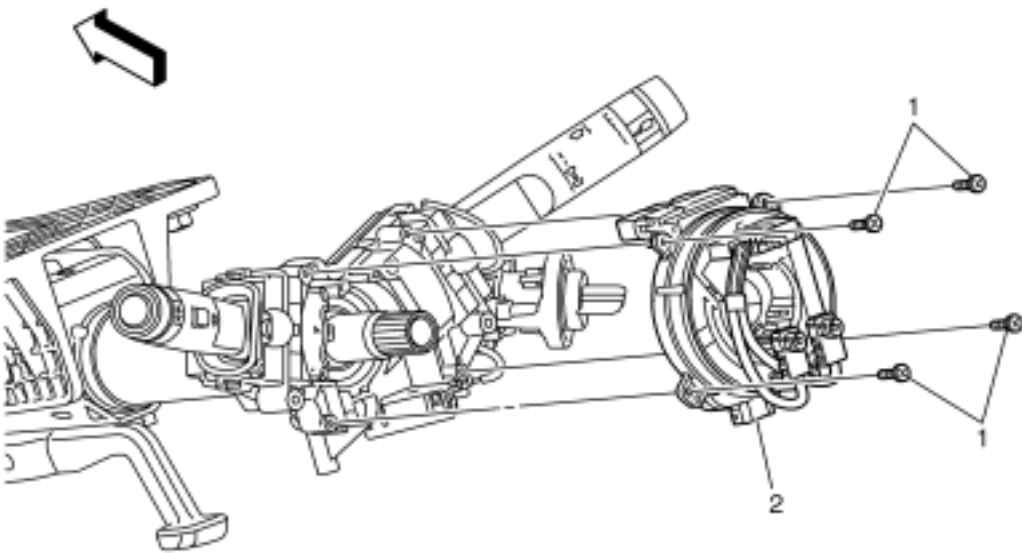
### Installation Procedure

1. Connect the electrical connectors.



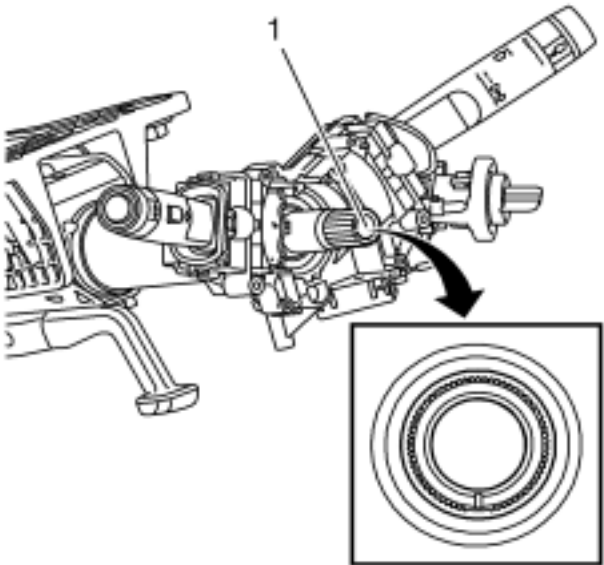
- 2. Align the steering wheel module fasteners to the steering column fastener holes.
- 3. Push the steering wheel module(1) firmly into the steering column in order to engage the fasteners.
- 4. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .
- 5. After replacing the module, fully deploy the module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to [Inflatable Restraint Module Handling and Scrapping](#) .

Steering Wheel Airbag Coil Replacement



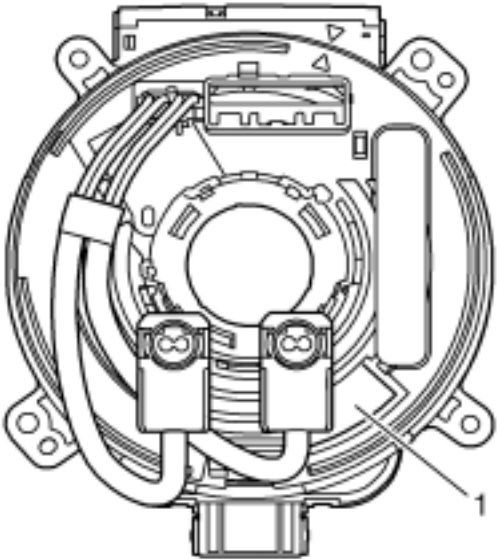
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the steering wheel. Refer to <a href="#">Steering Wheel Replacement</a> .</p> <p>2. Remove the steering column upper trim cover. Refer to <a href="#">Steering Column Upper Trim Cover Replacement</a> .</p> <p>3. Remove the steering column lower trim cover. Refer to <a href="#">Steering Column Lower Trim Cover Replacement</a> .</p>	
1	<p>Steering Wheel Inflatable Restraint Module Coil Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Steering Wheel Inflatable Restraint Module Coil</p> <p><b>Procedure</b></p> <p>1. Disconnect any electrical connectors as necessary.</p> <p>2. Use tape in order to secure the old coil in the center position.</p> <p>3. Remove the old coil from the steering column.</p> <p>4. Transfer the steering angle sensor. Refer to <a href="#">Steering Angle Sensor Replacement</a> .</p> <p>5. Ensure the coil is centered during installation. If you are installing a NEW coil, ensure the centering tab is on the coil. If the coil is not centered, refer to <a href="#">Inflatable Restraint Steering Wheel Module Coil Centering</a> .</p>

## Inflatable Restraint Steering Wheel Module Coil Centering



**Caution:** The new SIR coil assembly will be centered. Improper alignment of the SIR coil assembly may damage the unit, causing an inflatable restraint malfunction.

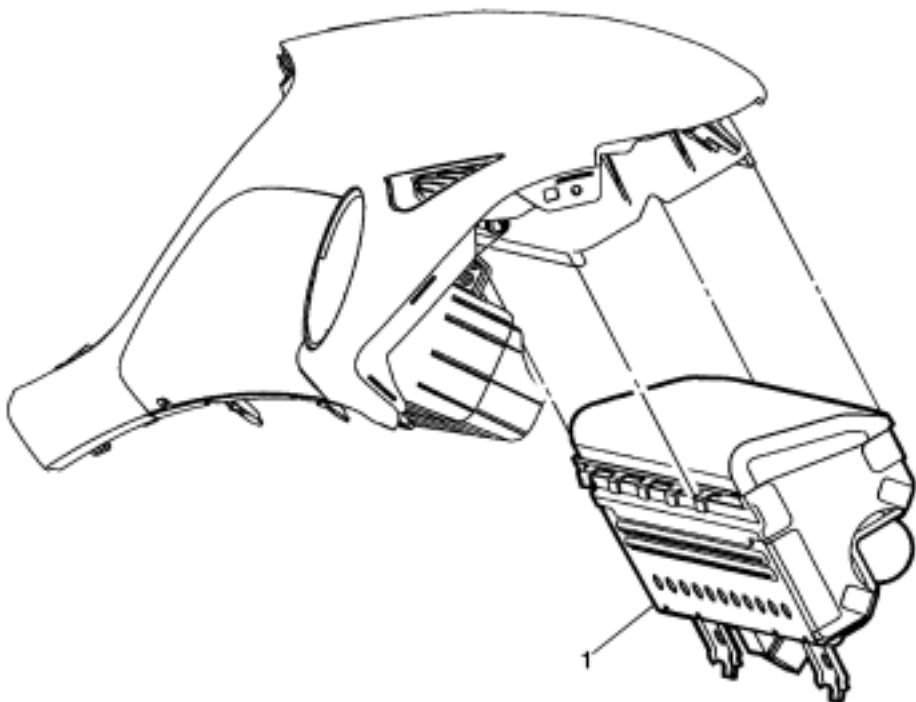
1. Verify the following conditions before centering the supplemental inflatable restraint (SIR) steering wheel module coil:
  - The wheels on the vehicle are straight ahead.
  - The centering mark (1) of the steering shaft is in the 6 o'clock position.
2. Turn the lobe of the coil clockwise until the coil ribbon stops. Do not force.
3. Turn the lobe of the coil counterclockwise approximately 3 turns to the neutral position.



**Note:** The quantity of electrical connectors may vary depending upon the content of the vehicle.

4. Properly align the coil until the centering window turns yellow (1). This indicates the CENTER position of the coil.

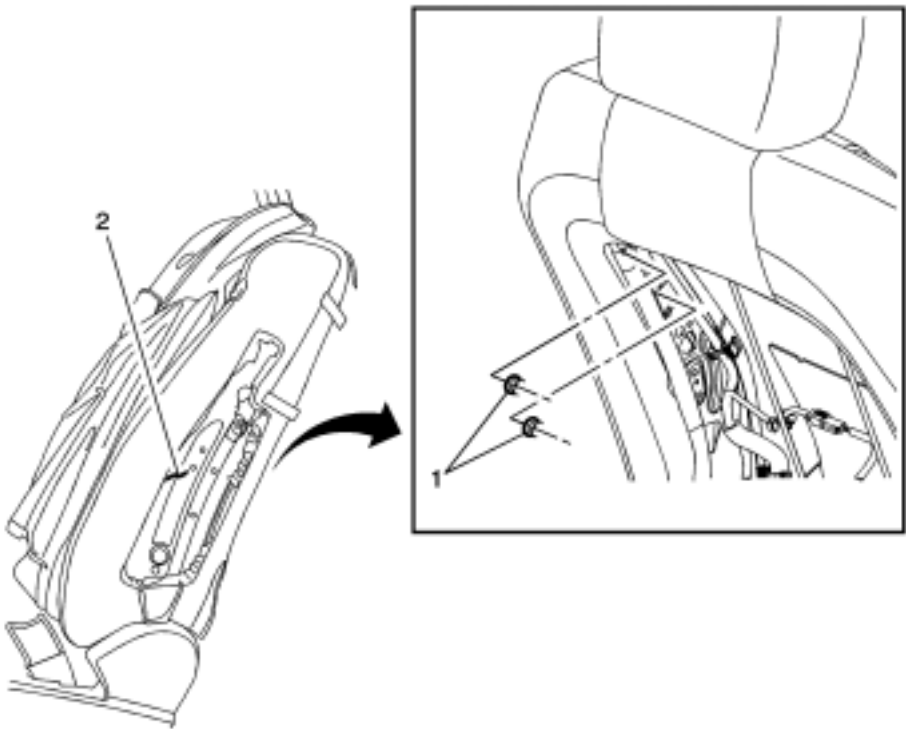
Instrument Panel Inflatable Restraint Module Replacement



Callout	Component Name
	<p><b>Warning:</b> Refer to <a href="#">SIR Inflator Module Handling and Storage Warning</a> .</p> <p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <p>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</p> <p>2. Remove the instrument panel upper trim panel assembly – right side. Refer to <a href="#">Instrument Panel Upper Trim Panel Replacement - Right Side</a> .</p>
1	<p>Instrument Panel Inflatable Restraint Module Assembly</p> <p><b>Procedure</b></p> <p>1. Ensure that the instrument panel inflatable restraint module is fully deployed before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to <a href="#">Inflatable Restraint Module Handling and Scrapping</a> .</p> <p>2. Enable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</p>



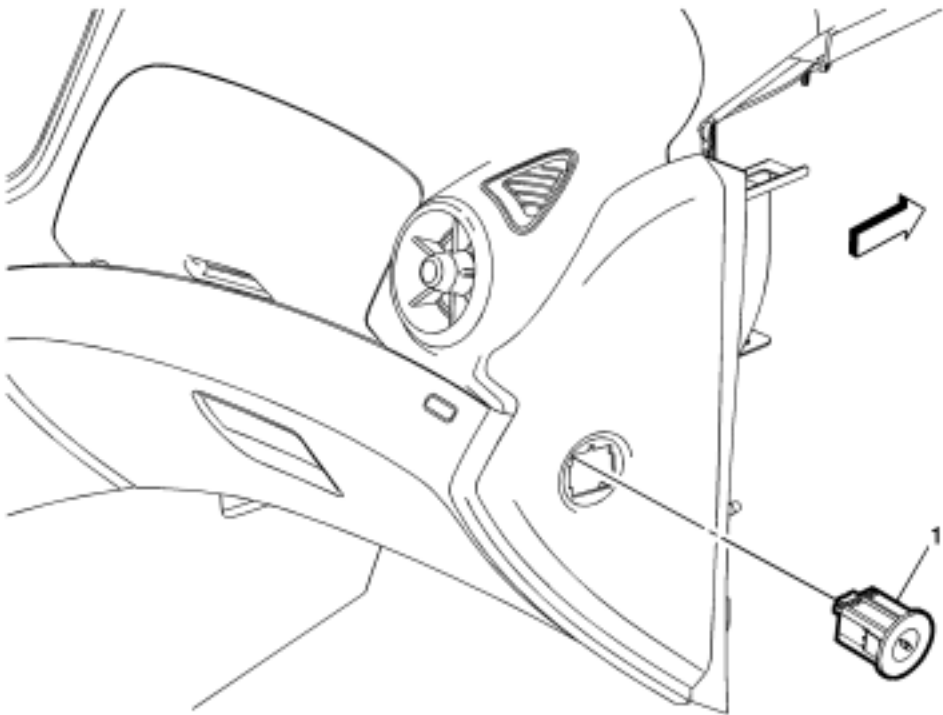
Driver or Passenger Seat Side Inflatable Restraint Module Replacement



Callout	Component Name
	<p><b>Warning:</b> Following the deployment of a side impact air bag, inspect the following parts for damage. Replace these parts if necessary:</p> <ul style="list-style-type: none"><li>• The seat cushion frame</li><li>• The seat recliner, if equipped</li><li>• The seat adjuster</li><li>• The seat back frame</li></ul> <p>Failure to do so may cause future personal injury.</p> <p><b>Warning:</b> Do not repair or replace the seat stitching or seams in the seat back trim cover with an internal mounted seat side airbag module. Replace the complete seat back trim cover from the OEM. Non-OEM seat stitching may cause improper airbag deployment which could result in personal injury.</p> <p><b>Preliminary Procedure</b></p> <ol style="list-style-type: none"><li>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>2. Remove the driver or passenger seat. Refer to <a href="#">Driver or Passenger Seat Replacement</a> .</li><li>3. Remove the driver or passenger seat back cushion cover and pad. Refer to <a href="#">Driver or Passenger Seat Back Cushion Cover and Pad Replacement</a> .</li></ol>
1	<p>Seat Side Inflatable Restraint Module Nut (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a></p> <p><b>Tighten</b> 4 N·m (35 lbin)</p>
2	<p>Driver or Passenger Seat Side Inflatable Restraint Module</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Disconnect the electrical connector.</li><li>2. Remove the seat side inflatable restraint module.</li><li>3. Fully deploy the module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to <a href="#">Inflatable Restraint Module Handling and Scrapping</a> .</li></ol>

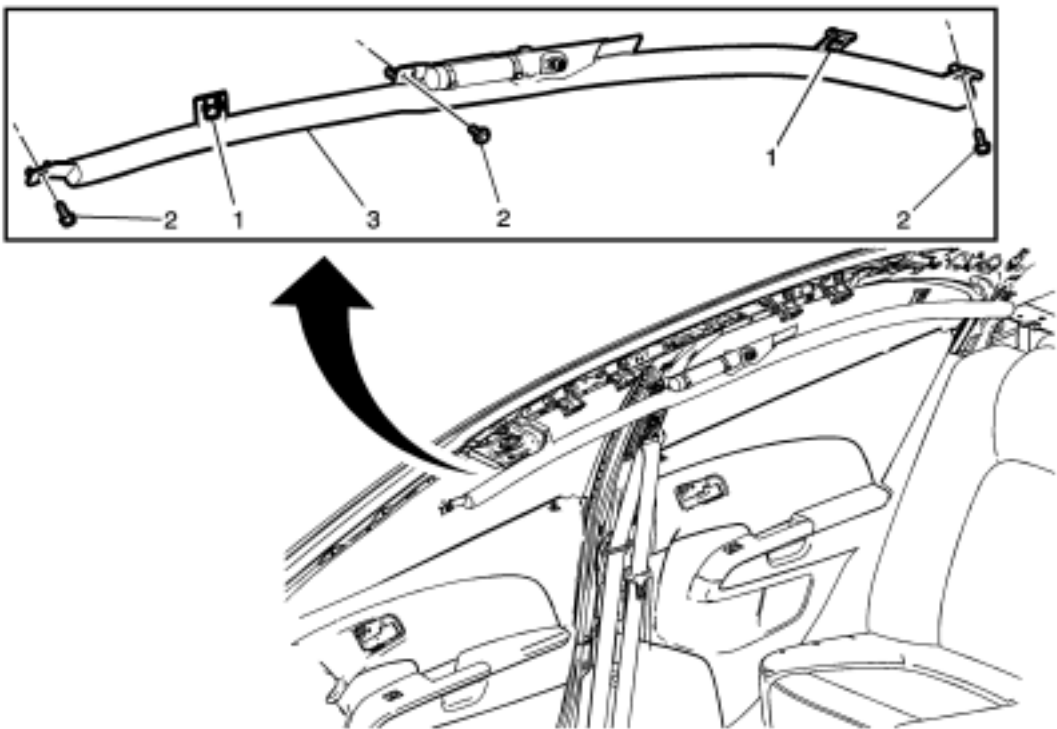


## Inflatable Restraint Instrument Panel Compartment Module Disable Switch Replacement



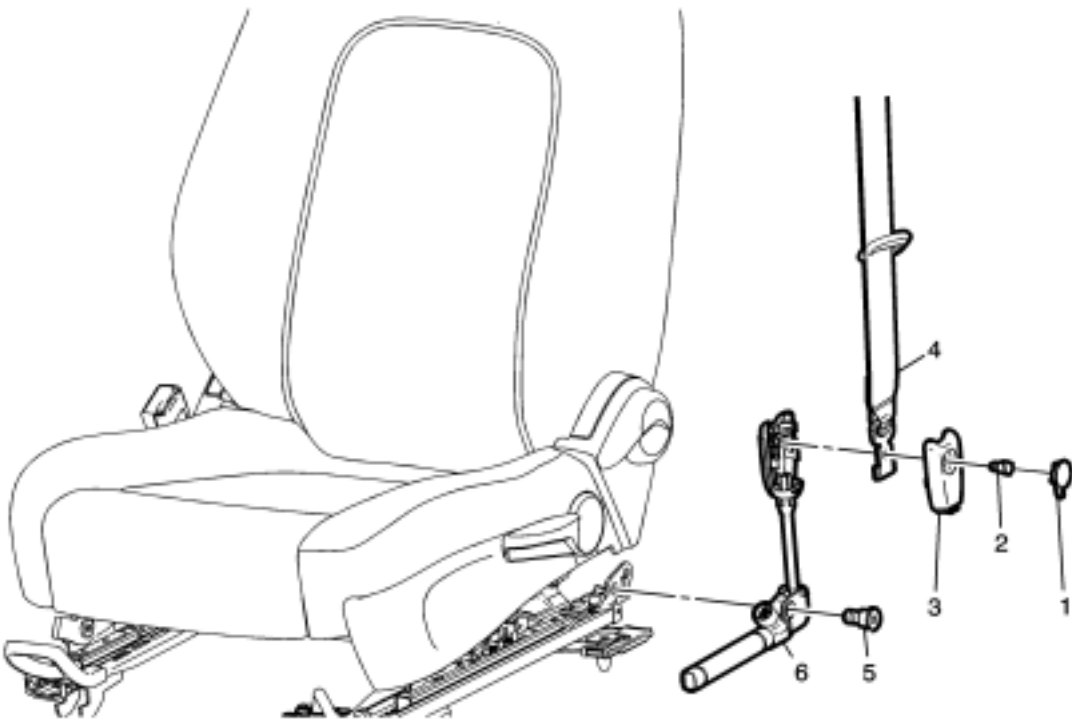
Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Preliminary Procedure</b></p> <ol style="list-style-type: none"><li>1. Disable the supplemental inflatable restraint (SIR) system. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>2. Remove the instrument panel outer trim cover. Refer to <a href="#">Instrument Panel Outer Trim Cover Replacement</a> .</li></ol>	
1	<p>Inflatable Restraint Instrument Panel Module Disable Switch Assembly</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Use a small flat bladed tool to aid in the removal of the switch from the instrument panel side trim panel.</li><li>2. Disconnect the electrical connector.</li></ol>

Roof Side Rail Inflatable Restraint Module Replacement (AYC)



Callout	Component Name
<p><b>Warning:</b> In order to prevent SIR deployment, personal injury, or unnecessary SIR system repairs, do not strike the door or the door pillar in the area of the side impact sensor (SIS). Turn OFF the ignition and remove the key when performing service in the area of the SIS.</p> <p><b>Warning:</b> When installing the roof rail airbag, do not twist or turn the airbag 360 degrees. Securing the roof rail airbag with an airbag twisted or turned 360 degrees may cause the airbag not to deploy correctly and could cause personal injury.</p> <p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Warning:</b> Refer to <a href="#">SIR Inflator Module Handling and Storage Warning</a> .</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Disable the SIR system. Refer to <a href="#">SIR Disabling and Enabling</a></li><li>2. 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 <a href="#">Headlining Trim Panel Replacement</a></li></ol>	
1	Roof Side Rail Inflatable Restraint Module Retainer (Qty: 2)
2	Roof Side Rail Inflatable Restraint Module Fastener (Qty: 3)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 9.5 N·m (84 lbin)
3	Roof Side Rail Inflatable Restraint Module Assembly  <b>Procedure</b>  <ol style="list-style-type: none"><li>1. Disconnect the electrical connector.</li><li>2. Remove the roof side rail inflatable restraint module from the vehicle.</li><li>3. Fully deploy the module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to <a href="#">Inflatable Restraint Module Handling and Scrapping</a> .</li></ol>

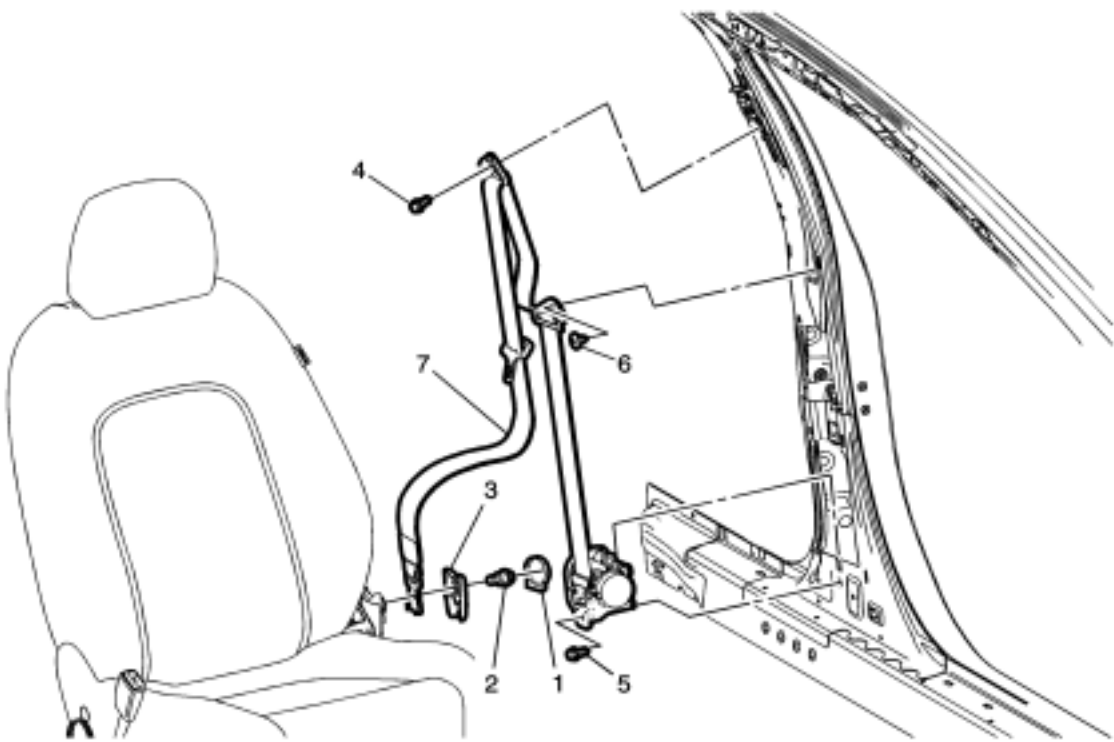
Front Seat Belt Anchor Plate Tensioner Replacement



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Warning:</b> In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflatable restraint seat belt pretensioner as normal shop waste. Undeployed seat belt pretensioners contain substances that could cause severe illness or personal injury if their sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed seat belt pretensioner. Failure to observe the following disposal methods may be a violation of federal, state, or local laws.</p> <p><b>Preliminary Procedures</b></p> <p>1. Move the front seat to the full forward and full up position.</p> <p>2. Disable the SIR. Refer to <a href="#">SIR Disabling and Enabling</a> .</p> <p>3. Remove the driver or passenger seat belt tensioner cover. Refer to <a href="#">Front Seat Belt Anchor Plate Tensioner Cover Replacement</a> .</p> <p>4. For pretensioner handling and scrapping. Refer to <a href="#">Pretensioner Handling and Scrapping</a> .</p>	
1	Driver or Passenger Seat Belt Tensioner Cover
2	Driver or Passenger Seat Belt Tensioner Cover Fastener  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a>  <b>Tighten</b> 7.5 N·m (66 lb in)
3	Driver or Passenger Seat Belt Tensioner Cover
4	Driver or Passenger Seat Belt Tensioner Seat Belt Latch

	<p><b>Procedure</b></p> <p>Remove the seat belt with latch from front seat belt tensioner.</p>
5	<p>Driver or Passenger Seat Belt Tensioner Fastener</p> <p><b>Tighten</b> 45 N·m (33 lb ft)</p>
6	<p>Driver or Passenger Seat Belt Tensioner Assembly</p> <p><b>Procedure</b></p> <p>Disconnect the electrical connector.</p>

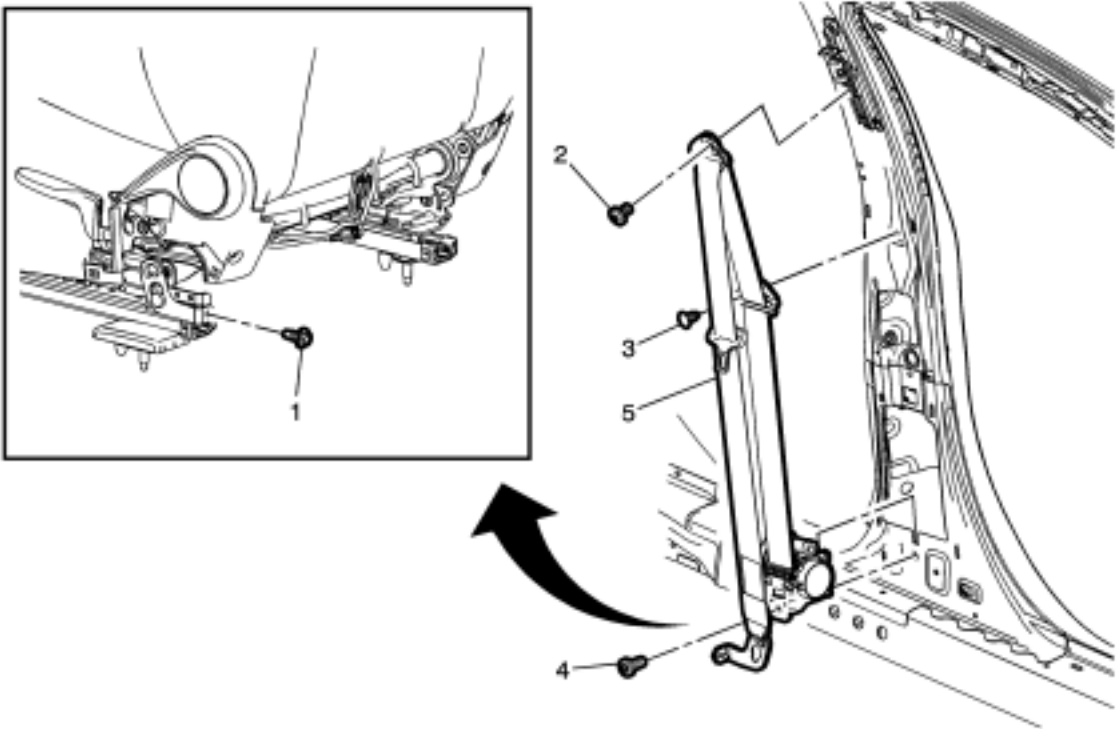
Driver or Passenger Seat Shoulder Belt Replacement (with A69)



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Warning:</b> Refer to <a href="#">SIR Inflator Module Handling and Storage Warning</a> .</p> <p><b>Warning:</b> Refer to <a href="#">SIR Seatbelt Pretensioner Handling Warning</a> .</p> <p><b>Warning:</b> In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflatable restraint seat belt pretensioner as normal shop waste. Undeployed seat belt pretensioners contain substances that could cause severe illness or personal injury if their sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed seat belt pretensioner. Failure to observe the following disposal methods may be a violation of federal, state, or local laws.</p> <p><b>Preliminary Procedures</b></p> <ol style="list-style-type: none"><li>1. Move the front seat to a full forward and full up position.</li><li>2. Disable the SIR. Refer to <a href="#">SIR Disabling and Enabling</a> .</li><li>3. Remove the center pillar upper trim panel. Refer to <a href="#">Center Pillar Upper Trim Panel Replacement</a> .</li></ol>	
1	Driver or Passenger Seat Belt Tensioner Cover
2	Driver or Passenger Seat Belt Tensioner Cover Fastener  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 7.5 N·m (66 lbin)
3	Driver or Passenger Seat Belt Tensioner Cover
4	Driver or Passenger Seat Shoulder Belt Fastener  <b>Tighten</b> 45 N·m (33 lbft)

5	<p>Driver or Passenger Shoulder Belt Retractor Fastener</p> <p><b>Tighten</b> 45 N·m (33 lbft)</p>
6	<p>Driver or Passenger Seat Belt Push On Retainer</p> <p><b>Procedure</b></p> <p>Use a flat-bladed tool to remove locking pin in retainer.</p>
7	<p>Driver or Passenger Seat Shoulder Belt Retractor Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connector. 2. Full deploy the module before disposal. If the module was replaced under warranty, full deploy and dispose of the module after the required retention period. Refer to <a href="#">Pretensioner Handling and Scrapping</a> .</p>

Driver or Passenger Seat Shoulder Belt Replacement (without A69)



Callout	Component Name
<p><b>Warning:</b> Refer to <a href="#">SIR Warning</a> .</p> <p><b>Warning:</b> Refer to <a href="#">SIR Seatbelt Pretensioner Handling Warning</a> .</p> <p><b>Warning:</b> In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflatable restraint seat belt pretensioner as normal shop waste. Undeployed seat belt pretensioners contain substances that could cause severe illness or personal injury if their sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed seat belt pretensioner. Failure to observe the following disposal methods may be a violation of federal, state, or local laws.</p> <p><b>Preliminary Procedures</b></p> <p>1. Remove the center pillar upper trim panel. Refer to <a href="#">Center Pillar Upper Trim Panel Replacement</a> .</p> <p>2. Remove the front seat lower finish cover. Refer to <a href="#">Front Seat Belt Anchor Plate Tensioner Cover Replacement</a> .</p>	
1	Front Seat Belt Anchor Plate Fastener  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .  <b>Tighten</b> 8 N·m (70 lbin)
2	Front Seat Belt Retractor D Ring Fastener  <b>Tighten</b> 45 N·m (33 lbft)
3	Front Seat Shoulder Belt Guide Retainer
4	Front Seat Shoulder Belt Retractor Fastener  <b>Tighten</b> 45 N·m (33 lbft)
5	Front Seat Shoulder Belt Assembly



## Repairs and Inspections Required After a Collision

### Accident With or Without Air Bag Deployment – Component Inspections

**Warning:** Proper operation of the Supplemental Inflatable Restraint (SIR) sensing system requires that any repairs to the vehicle structure return the vehicle structure to the original production configuration. Not properly repairing the vehicle structure could cause non-deployment of the air bag(s) in a frontal collision or deployment of the air bag(s) for conditions less severe than intended.

After any collision, inspect the following components as indicated. If you detect any damage, replace the component. If you detect any damage to the mounting points or mounting hardware, repair the component or replace the hardware as needed.

- The steering column—Inspect the steering column for bending, twisting, buckling or any type of damage.
- The instrument panel knee bolsters and mounting points—Inspect the knee bolsters for bending, twisting, buckling, or any other type of damage.
- The instrument panel brackets, braces, etc.—Inspect for bending, twisting, buckling, or any other type of damage.
- The seat belts—Perform the seat belt operational and functional checks. Refer to Repairs and Inspections Required After a Collision .
- The instrument panel cross car beam—Inspect for bending, twisting, buckling, or any other type of damage.
- The instrument panel mounting points and brackets—Inspect for bending, twisting, buckling, or any other type of damage.
- The seats and seat mounting points—Inspect for bending, twisting, buckling, or any other type of damage.
- The roof and headliner mounting points.
- The brake pedal --Inspect the brake pedal for bending, twisting, buckling or any type of damage.

### Accident With Frontal Air Bag Deployment – Component Replacement and Inspections

After a collision involving air bag deployment, replace the following components.

- Driver steering wheel air bag
- Passenger instrument panel air bag, if deployed
- Inflatable restraint sensing and diagnostic module (SDM), if SDM has DTCB0052 56
- Front and/or side impact sensors
- Driver/Passenger seat side air bag, if deployed
- Seat back cover if side seat air bag is deployed
- Driver/Passenger seat belt anchor and/or retractor pretensioners

Perform additional inspections on the following components.

- Steering wheel air bag coil and the coil wiring pigtail—Inspect for melting, scorching, or other damage due to excessive heat.
- Mounting points or mounting hardware for the passenger instrument panel air bag, steering wheel air bag, SDM, seat side air bag (if deployed) and seat belt anchor and/or retractor pretensioners—Inspect for any damage and repair or replace each component as needed.

### Accident With Side Seat Air Bag Deployment – Component Replacement and Inspections

After a collision involving driver/passenger side seat air bag deployment, replace the following components.

- Left/right side impact sensors on the side of the impact.
- Left/right roof rail air bag on the side of the impact.
- Inflatable restraint sensing and diagnostic module (SDM), if SDM has DTC B0052 56.
- Inflatable restraint seat belt anchor and/or retractor pretensioner.
- Driver or passenger seat back cushion cover replacement.

**Warning:** Do not repair or replace the seat stitching or seams in the seat back trim cover with an internal mounted seat side airbag module. Replace the complete seat back trim cover from the OEM. Non-OEM seat stitching may cause improper airbag deployment which could result in personal injury.

Perform additional inspections on the following components.

- Mounting points or mounting hardware for the side impact sensors, and driver/passenger side seat air bags on the side of impact—Inspect for any damage and repair or replace each component as needed.
- Mounting points, mounting hardware, headliner and trim pieces for the left/right roof rail air bag on the side of impact—Inspect for any damage and repair or replace each component as needed.
- Mounting points or mounting hardware for the SDM and seat belt anchor and/or retractor pretensioners—Inspect for any damage and repair or replace each component as needed.
- The seat cushion frame
- The seat recliner and cover, if equipped
- The seat adjuster
- The seat back frame
- Door trim assembly
- Impacted seat cushion side covers and switches







Impact Sensor Replacement Guidelines

The impact sensor replacement policy requires replacing sensors in the area of the accident damage. The area of accident damage is defined as the portion of the vehicle which is crushed, bent, or damaged due to a collision. An example of this would be a moderate collision where the front of the vehicle impacts a object. If the vehicle has an impact sensor mounted forward of the radiator, it must be replaced.

- Replace the impact sensor whether or not the air bags have deployed.
- Replace the impact sensor even if it appears to be undamaged.

Impact sensor damage which is not visible, such as slight bending of the mounting bracket or cuts in the wire insulation, can cause improper operation of the SIR system. Do not try to determine whether the impact sensor is undamaged, replace the impact sensor. Also, if you follow a diagnostic trouble code (DTC) procedure and a malfunctioning impact sensor is indicated, replace the impact sensor.



## Inflatable Restraint Module Handling and Scrapping

### Air Bag Module Deployment – Inside of Vehicle

**Warning:** When deploying an airbag inside the vehicle, make sure the vehicle doors are closed and the side windows are fully open. Wear safety glasses throughout the entire procedure. Make sure the deployment area in the vehicle is clear of people, or loose objects. Failure to follow these guidelines could result in personal injury or vehicle damage.

Deploy the air bags before disposing them. If a vehicle is to be scrapped, the air bag may be deployed inside the vehicle.

**Warning:** When you are deploying an inflator module for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

- Before deploying the air bags, remove all loose objects from the air bags expansion area.
- Deploy the air bags with the vehicles doors closed and the side windows open.
- Deploy the air bags only in an evacuated area. Service personnel who must be present during the deployment should be at least 10 m (33 ft) in front of the vehicle.
- Do not connect the voltage source until after having completed all other preparations for the deployment of air bags.
- Allow a deployed air bag module or pretensioner cool for 30 minutes before handling.
- Wear gloves and eye protection during the disposal procedure.
- If the deployment fails, disconnect the voltage source and wait 5 minutes before approaching the vehicle.

### Deployment Procedure

**Warning:** Refer to [Sensing and Diagnostic Module Voltage after Ignition is Turned Off Warning](#) .

**Warning:** Refer to [Battery Disconnect Warning](#) .

1. Disconnect both battery cables and place the battery at least 10 m (33 ft) from the vehicle.
2. Remove the driver side knee bolster or instrument panel lower cover from the steering column.
3. At the lower steering column, cut the 2 wires leading from the supplemental inflatable restraints (SIR) harness to the steering wheel module coil.
4. Strip 13 mm (0.5 in) of the insulation from the end of the wires leading to the steering wheel module coil.
5. Use 2 additional wires, each at least 10 m (33 ft) long, to reach from the deployment battery to the inflator module.
6. Strip 13 mm (0.5 in) of the insulation from the end of these 2 additional wires.
7. Twist the 2 wires together at one end.
8. Place the twisted ends of the 2 wires near the deployment battery. Do not connect the wires to the battery at this time.
9. Using the free ends of the 10 m (33 ft) wires leading to the steering wheel module coil, make 2 splices, one at each wire from the air bag modules.
10. Wrap the wires with insulation tape.
11. Now that the free ends of the 10 m (33 ft) wires are spliced to the air bag module wires, and the ends that are twisted together are near the deployment battery, clear the area.
12. Untwist the wires that near the deployment battery.
13. Touch one wire to the positive battery terminal and touch the other wire to the negative battery terminal. The air bag will deploy.
14. Repeat this procedure for the passenger air bag, side air bags, and pretensioners.
15. Using proper precautions, dispose of the deployed air bags/pretensioners. Refer to Deployed Air Bag Module Disposal Procedure.

### Air Bag Module Deployment – Outside of Vehicle

If the vehicle is within the warranty period, contact the General Motors regional service manager for approval or special instructions before deploying the air bag modules.

Deploy air bag modules in following situations:

- The vehicle is to be scrapped—Refer to [Inflatable Restraint Module Handling and Scrapping](#) .
- If an air bag module is damaged during transit, storage, or service

**Warning:** When you are deploying an inflator module for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

- Deploy the air bags only in an evacuated area. Service personnel who must be present during the deployment should be at least 10 m (33 ft) in front of the vehicle.
  - Do not connect the voltage source until after having completed all other preparations for the deployment of air bags.
  - Allow a deployed air bag module or pretensioner cool for 30 minutes before handling.
  - Wear gloves and eye protection during the disposal procedure.
  - If the deployment fails, disconnect the voltage source and wait 5 minutes before approaching the vehicle.
1. Position the air bag module face up, on flat ground outdoors, at least 10 m (33 ft) from any obstacles or people.
  2. Place a vehicle battery at least 10 m (33 ft) away from the air bag module.



3. Deploy the air bag module.
4. Perform the Air Bag Module Deployment procedure as follows.
5. Cut the yellow wires to the air bag module/pretensioner.
6. Strip 13mm (0.5in) of the insulation from the end of the wires leading to the air bag module/pretensioner.
7. Use 2additional wires, each at least 10m (33ft) long, to reach from the deployment battery to the air bag module/pretensioner.
8. Strip 13mm (0.5in) of the insulation from the ends of these 2additional wires.
9. Twist the 2wires together at oneend.
10. Place the twisted ends of the 2wires near the deployment battery. Do not connect the wires to the battery at this time.
11. Using the free ends of the 10m (33ft) wires leading to the air bag module/pretensioner, make 2splices, oneat each wires from the air bag module/pretensioner.
12. Wrap the splices with insulating tape.
13. Now that the free ends of the 10m (33ft) wires are spliced to the air bag module/pretensioner wires, and the ends that are twisted together are near the deployment battery, clear the area.
14. Untwist the wires that are near the deployment battery.
15. Touch onewire to the positive battery terminal and touch the other wire to the negative battery terminal. The air bag will deploy.
16. Using proper precautions, dispose of the deployed air bags/pretensioners. Refer to the Deployed Air Bag Module Disposal Procedure.

Deployed Air Bag Module Disposal Procedure

**Warning:** Safety precautions must be followed when handling a deployed inflator module (air bag). After deployment, the inflator module (air bag) surface may contain a small amount of sodium hydroxide, a by-product of the deployment reaction, that is irritating to the skin and eyes. Most of the powder on the inflator module (air bag) is harmless. as a precaution, wear gloves and safety glasses when handling a deployed inflator module (air bag), and wash your hands with mild soap and water afterwards.

**Warning:** Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

**Warning:** Immediately following the deployment of an air bag, the metal surfaces of the inflator module are very hot. Do not place the deployed inflator module near any flammable objects. Wait for about ten minutes before touching any metal surface of the inflator module. Disregarding these precautions may cause fire or personal injury.

Deploy an air bag or pretensioner before disposing of it.

This includes those in a whole vehicle being scrapped. If the vehicle is still within the warranty period contact the General Motors regional service manager for approval or special instructions before deploying an air bag module or a pretensioner. Deployed air bag module or pretensioner should be disposed of in the same manner as other scrap parts, with the addition of the following steps:

1. Place the deployed air bag or pretensioner in a sturdy plastic bag.
2. Seal the plastic bag securely.
3. Wash your hands and rinse them with water after handling a deployed air bag.



## Pretensioner Handling and Scrapping

### Scrapping Procedure

During the course of a vehicles useful life, certain situations may arise which will necessitate the disposal of a live (undeployed) pretensioner. The following information covers the proper procedures for the disposing of a live (undeployed) pretensioner. Deploy the pretensioner before disposal. Do not dispose of a live (undeployed) pretensioner through normal disposal channels until the pretensioner has been deployed. The following information covers the proper procedures for the disposing of a live (undeployed) pretensioner.

- After replacement of a pretensioner under warranty. The pretensioner may need to be returned undeployed to the original manufacturer of pretensioner.
- If the vehicle is the subject of a Product Liability report related to the SIR system and is subject to a Preliminary Investigation (GM-1241). Do not alter the SIR system in any manner.
- If the vehicle is involved in a campaign affecting the pretensioners. Follow the instructions in the Campaign Service Bulletin for proper SIR handling procedures.

### Deployment Procedures

**Note:** Some countries, states or localities may not allow service deployment of air bags without special permission or training. Local laws regarding deploying and scrapping of air bags/devices with pyrotechnics must be followed.

The pretensioner can be deployed inside or outside of the vehicle. The method used depends upon the final disposition of the vehicle. Review the following procedures in order to determine which will work best in a given situation.

#### Deployment Inside the Vehicle

Refer to [Inflatable Restraint Module Handling and Scrapping](#) for deploying the pretensioner inside vehicle under Vehicle Scrapping Procedure.

#### Deployment Outside Vehicle for Seat Belt Pretensioners

Deploy the seat belt pretensioners outside of the vehicle when the vehicle will be returned to service. Situations that require deployment outside of the vehicle include the following:

- Using the SIR diagnostics, you determine that the seat belt pretensioner is malfunctioning.
- The pretensioner pigtail (if equipped) is damaged.
- The pretensioner connector is damaged.
- The pretensioner connector terminal is damaged.

Deployment and disposal of a malfunctioning seat belt pretensioner is subject to any required retention period.

**Warning:** In order to prevent accidental deployment of the pretensioner which could cause personal injury, do not dispose of an undeployed pretensioner as normal shop waste. The undeployed pretensioner contains substances that could cause severe illness or personal injury if the sealed container is damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed pretensioner. Failure to dispose of a pretensioner as instructed may be a violation of federal, state, or local laws.

**Warning:** When you are deploying a pretensioner for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

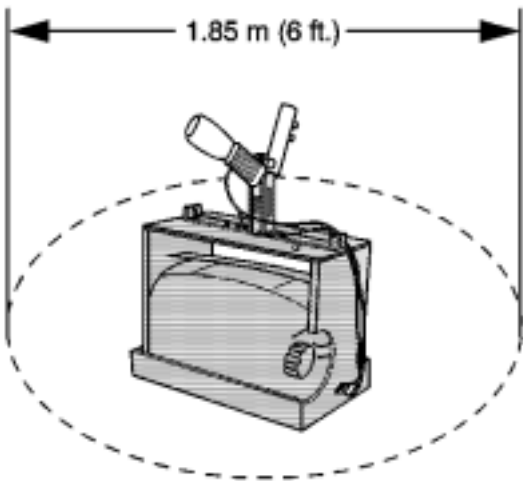
### Special Tools

- *EL-39401-B* SIR Deployment Fixture
- *EL-38826* SIR Deployment Harness

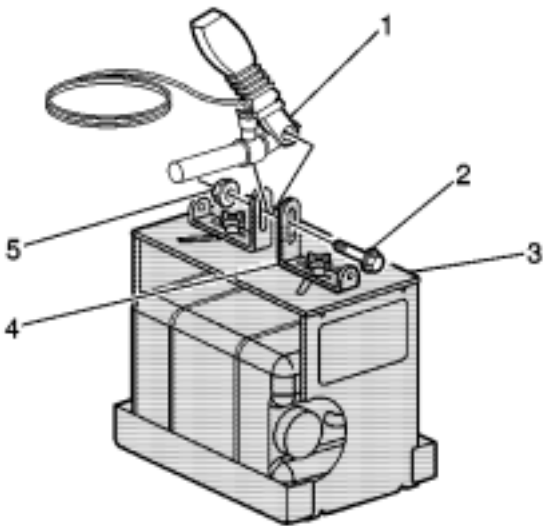


1. Turn the ignition switch to the OFF position.

- 2. Remove the ignition key.
- 3. Put on safety glasses.
- 4. Remove the seat belt pretensioner from the vehicle.
- 5. When carrying a pretensioner to the deployment area keep the open end of pretensioner pointed away from the body.



- 6. Clear a space on the ground about 1.85 M (6ft) in diameter for deployment of the pretensioner. If possible, use a paved, outdoor location free of activity. Otherwise, use a space free of activity on the shop floor. Make sure you have sufficient ventilation.
- 7. Make sure no loose or flammable objects are in the area.
- 8. Place the *EL-39401-B* SIR deployment fixture in the center of the cleared area.
- 9. Fill the fixture plastic reservoir with water or sand.



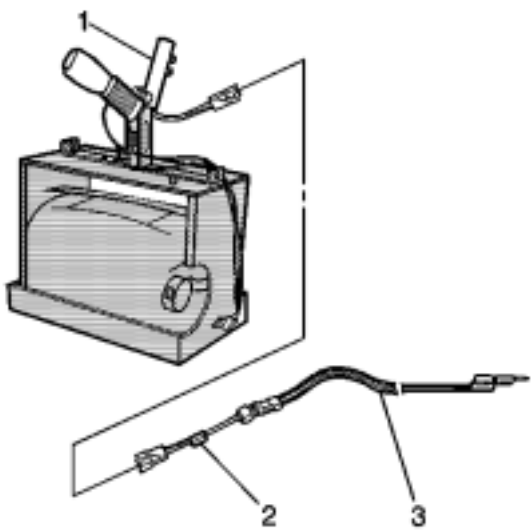
- 10. Mount the pretensioner (1) in the SIR deployment fixture(3) with the open end facing up using the following mounting method.
  - 10.1 Adjust and secure the EL-39401-B arms(4) to the deployment fixture(3).
  - 10.2 To mount, use the proper size bolt (2) and nut (5) with washers in order to secure the pretensioner (1) to the deployment fixture brackets(4).
  - 10.3 Securely tighten all fasteners prior to deployment.

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- 11. Inspect the *EL-38826* SIR deployment harness and the appropriate pigtail adapter for damage. Replace as needed.
- 12. Short the 2 SIR deployment harness(1) leads together using one banana plug seated into the other.
- 13. Connect the appropriate pigtail adapter (2) to the SIR deployment harness(1).



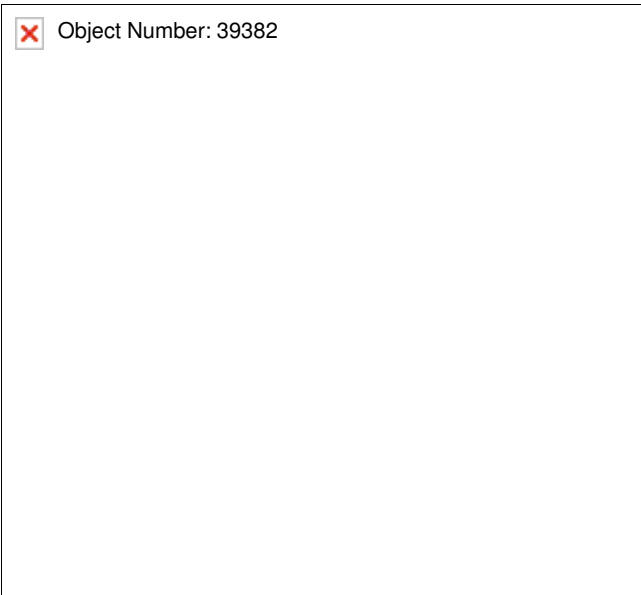
14. Extend the SIR deployment harness and adapter to full length from the deployment fixture.



15. Connect the pretensioner (1) to the adapter (2) on the deployment harness (3).

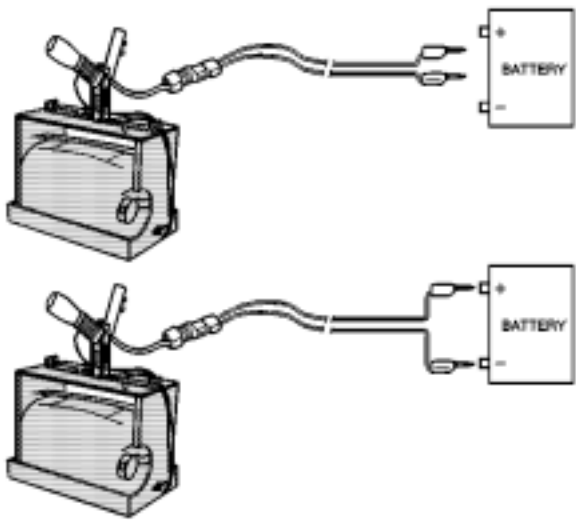
**Note:** The rapid gas expansion involved with deploying a pretensioner is very loud. Notify all the people in the immediate area that you intend to deploy the seat belt pretensioner.

16. Clear the area of people.



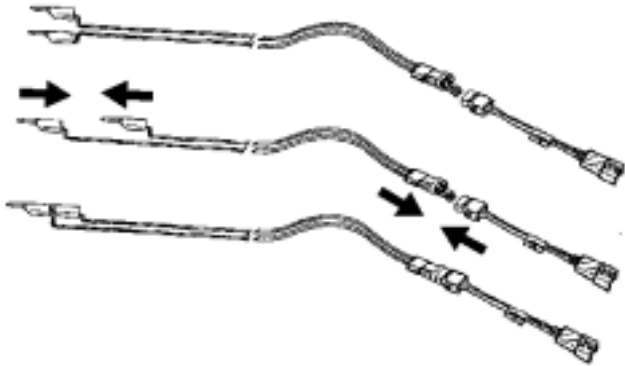
**Warning:** When you are deploying a pretensioner for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

17. Separate the 2 banana plugs on the SIR deployment harness.



**Note:** When the seat belt pretensioner deploys, the deployment fixture may jump about 30 cm (1 ft) vertically. This is a normal reaction of the seat belt pretensioner due to the force of the rapid expansion of gas inside the pretensioner.

- 18. Place a 12V minimum/2A minimum power source (i.e., vehicle battery) near the shorted end of the harness.
- 19. Connect the SIR deployment harness wires to the power source. Pretensioner deployment will occur when contact is made.
- 20. Disconnect the SIR deployment harness from the power source after the pretensioner deploys.



- 21. Seat one banana plug into the other in order to short the deployment harness leads.
- 22. If the pretensioner did not deploy, disconnect the adapter and discontinue the procedure. Contact the Technical Assistance Group. Otherwise, proceed to the following steps.
- 23. Put on a pair of shop gloves.
- 24. Disconnect the pigtail adapter from the pretensioner as soon as possible.
- 25. Inspect the pigtail adapter and the SIR deployment harness. Replace as needed.
- 26. Dispose of the deployed pretensioner through normal refuse channels.
- 27. Wash hands with a mild soap.





## SI R System Description and Operation

### SI R System Overview

The supplemental inflatable restraint (SIR) system supplements the protection offered by the seat belts. The SIR system contains an inflatable restraint sensing and diagnostic module (SDM), air bags, seat belt pretensioners (anchor and retractor), and impact sensors. The SDM determines the severity of a collision with the assistance of side impact sensors located at strategic points on the vehicle. When the SDM detects a collision, the SDM will process the information provided by the sensors to further support air bag or pretensioner deployment. The SDM will deploy the air bags and pretensioners if it detects a collision of sufficient force. If the force of the impact is not sufficient to warrant air bag deployment, the SDM may still deploy the seat belt pretensioners. The SDM contains a sensing device that converts vehicle velocity changes to an electrical signal. The SDM compares these signals to values stored in memory. If the signals exceed a stored value, the SDM will determine the severity of the impact and either cause current to flow through the frontal deployment loops deploying the frontal air bags and pretensioners, or it will deploy the pretensioners only. The SDM continuously monitors the deployment loops for malfunctions and illuminates the AIR BAG indicator if a fault is detected. The SDM performs continuous diagnostic monitoring of the SIR system electrical components. Upon detection of a circuit malfunction, the SDM will set a DTC and inform the driver by illuminating the AIR BAG indicator. The steering column and knee bolsters are designed to absorb energy and compress during frontal collisions in order to limit leg movement and decrease the chance of injury to the driver and passenger.

### AIR BAG Indicator (Driver)

The AIR BAG indicator, located in the instrument cluster, is used to notify the driver of SIR system malfunctions and to verify that the inflatable restraint sensing and diagnostic module (SDM) is communicating with the instrument cluster. When the ignition is turned ON, the SDM is supplied with ignition positive voltage. The instrument cluster will momentarily turn on the AIR BAG indicator. While the indicator is on, the SDM conducts tests on all SIR system components and circuits. If no malfunctions are detected the SDM will communicate with the instrument cluster through the serial data circuit and command the AIR BAG indicator OFF. The SDM provides continuous monitoring of the air bag circuits by conducting a sequence of checks. If a malfunction is detected the SDM will store a diagnostic trouble code (DTC) and command the instrument cluster to illuminate the AIR BAG indicator via serial data. The presence of a SIR system malfunction could result in non-deployment of the air bags or deployment in conditions less severe than intended. The AIR BAG indicator will remain ON until the malfunction has been repaired.

### Inflatable Restraint Sensing and Diagnostic Module (SDM)

The inflatable restraint sensing and diagnostic module (SDM) is a microprocessor and the control center for the supplemental inflatable restraint (SIR) system. The SDM contains internal sensors along with external impact sensors, mounted at strategic locations on the vehicle. In the event of a collision, the SDM compares the signals from the internal and external impact sensors to a value stored in memory. When the generated signals exceed the stored value, the SDM will cause current to flow through the appropriate deployment loops to deploy the air bags. The SDM records the SIR system status when a deployment occurs and illuminates the AIR BAG indicator located in the instrument cluster. The SDM performs continuous diagnostic monitoring of the SIR system electrical components and circuitry when the ignition is turned ON. If the SDM detects a malfunction, a DTC will be stored and the SDM will request the instrument cluster to illuminate the AIR BAG indicator, notifying the driver that a malfunction exists. In the event that ignition positive voltage is lost during a collision, the SDM maintains a 23 V loop reserve for deployment of the air bags. It is important when disabling the SIR system for servicing or rescue operations to allow the 23 V loop reserve to dissipate, which could take up to 1 minute.

### Air Bags

This vehicle contains 6 air bags. The 6 air bags are located in the steering wheel, instrument panel (passenger side), driver side (B-pillar), passenger side (B-pillar), left roof rail, and right roof rail. To view the locations of the air bags refer to [SIR Identification Views](#) . Air bags contain a housing, inflatable air bag, two initiating devices (if dual inflator), canister of gas generating material and, in some cases, stored compressed gas. The deployment loops supply current through the inflator modules to deploy the air bags. The steering wheel and instrument panel passenger side air bags have two stages of deployment, which varies the amount of restraint to the occupant according to the collision severity. The current passing through the air bag, ignites the material in the canister producing a rapid generation of gas and is some cases, the release of compressed gas. The gas produced from this reaction rapidly inflates the air bag. Once the air bag is inflated it quickly deflates through the air bag vent holes and/or the bag fabric. Each air bag is equipped with a shorting bar located in the connectors of the module. The shorting bar shorts the air bag deployment loop circuitry to prevent unwanted deployment of the air bag when it is disconnected.

### Seat Belt Pretensioners (Anchor and Retractor)

The seat belt pretensioners (driver and passenger) consist of a housing, seat belt retractor (located in the B-pillar), seat belt anchor (located on the floor), seat belt webbing, an initiator, and a canister of gas generating materials. To view the locations of the seat belt pretentioners refer to [SIR Identification Views](#) . The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, the SDM causes current to flow through the seat belt deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas. The gas produced from this reaction deploys the seat belt pretensioners which removes all of the slack in the seat belts. Depending on the severity of the collision, the seat belt pretensioners may deploy without the frontal air bags deploying, or they will deploy immediately before the frontal air bags deploy. Each seat belt pretensioner is equipped with a shorting bar that is located in the connector of the seat belt pretensioner. The shorting bar shorts the seat belt pretensioner circuitry to prevent unwanted deployment of the seat belt pretensioner when the connector is disconnected.

### Impact Sensors

This vehicle contains 3 impact sensors. The 3 impact sensors are located in the front of the vehicle 1 and 2 in the B-pillars (left and right). To view the locations of the impact sensors refer to [SIR Identification Views](#) . The impact sensors contain a sensing device which monitors vehicle acceleration and velocity changes to detect side collisions that are severe enough to warrant air bag deployment. The impact sensors are not part of the deployment loop, but instead provide input to the SDM. The SDM contains a microprocessor that performs calculations using the measured accelerations and compares these calculations to a value stored in memory. When the generated calculations exceed the stored value, the SDM will cause current to flow through the deployment loops deploying the appropriate impact module air bags.

### Passenger Air Bag Disable Switch

The passenger air bag disable switch is used to turn the passenger frontal air bag on or off. The customer can decide to disable the passenger air bag by turning this switch on. When the SDM sees a ground circuit from this switch the passenger air bag is turned








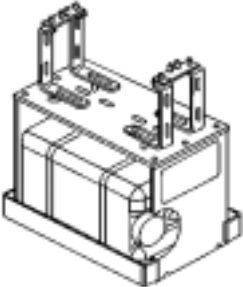
off. The vehicle has a PASSENGER AIR BAG ON/OFF indicator to tell the customer when the passenger air bag is on or off based on the disable switch position.

Seat Belt Indicators

The seat belt indicators are controlled through the inflatable restraint sensing and diagnostic module (SDM). For further information on seat belt indicators refer to [Seat Belt System Description and Operation](#) .



Special Tools

Illustration	Tool Number/ Description
	EL38826 J38826 KM799-3 SIR Deployment Harness
	EL39401-B J39401-B SIR Deployment Fixture



Specifications	Steering Wheel Horn Cap Replacement
Intermediate Steering Shaft Replacement (NJ1)	Steering Wheel Replacement
Intermediate Steering Shaft Replacement (N40)	Steering Column Replacement (NJ1)
Steering Column Upper Trim Cover Replacement	Steering Column Replacement (N40)
Steering Column Lower Trim Cover Replacement	Steering Angle Sensor Replacement
Turn Signal Switch Bracket Replacement	Description and Operation
Turn Signal Multifunction Switch Replacement	



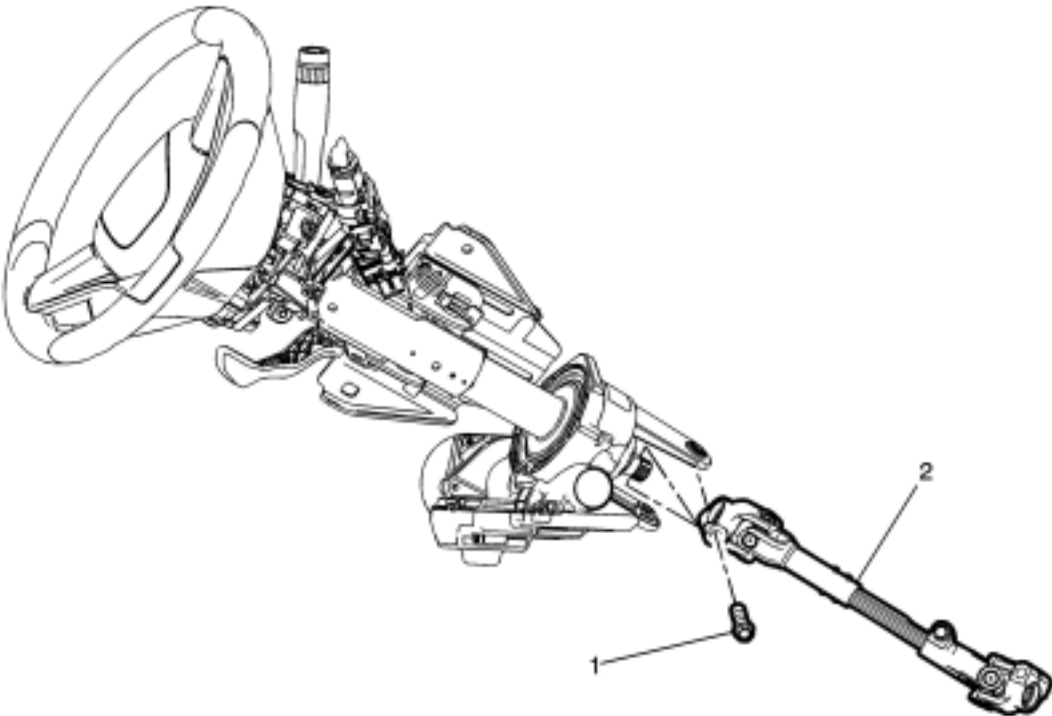


### Fastener Tightening Specifications

Application	Specification	
	Metric	English
Intermediate Steering Shaft Lower Bolt	49 N·m	36 lb ft
Intermediate Steering Shaft Upper Bolt	49 N·m	36 lb ft
Steering Column Lower Support Bracket Bolts	22 N·m	16 lb ft
Steering Column Upper Support Bracket Nuts	22 N·m	16 lb ft
Steering Wheel Bolt	30 N·m	22 lb ft



Intermediate Steering Shaft Replacement (NJ1)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the steering column and the intermediate steering shaft as an assembly. Refer to <a href="#">Steering Column Replacement</a> .</p>	
1	<p>Intermediate Steering Shaft Upper Bolt</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 49 N·m (36 lbft)</p>
2	<p>Intermediate Steering Shaft</p> <p><b>Procedure</b></p> <p>1. Use paint in order to place match marks on the intermediate steering shaft and on the steering column shaft.</p> <p>2. If you are replacing the intermediate steering shaft or the steering column, copy the match marks from the old parts to the new parts.</p> <p>3. Align the match marks as you install the intermediate steering shaft to the steering column shaft.</p> <p>4. After the installation is complete, perform the following tasks:</p> <p>Setup the power steering control module. Refer to . Center the steering angle sensor. Refer to .</p> <p>2.1. Setup the power steering control module. Refer to <a href="#">Power Steering Control Module Programming and Setup</a> .</p> <p>2.2. Center the steering angle sensor. Refer to <a href="#">Steering Angle Sensor Centering</a> .</p>

## Intermediate Steering Shaft Replacement (N40)

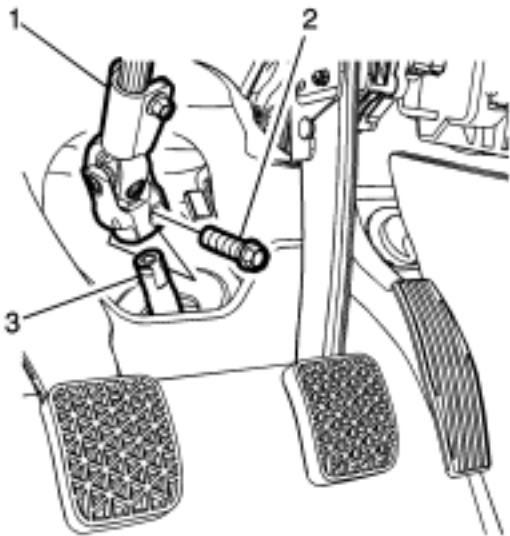
### Removal Procedure

**Caution:** With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

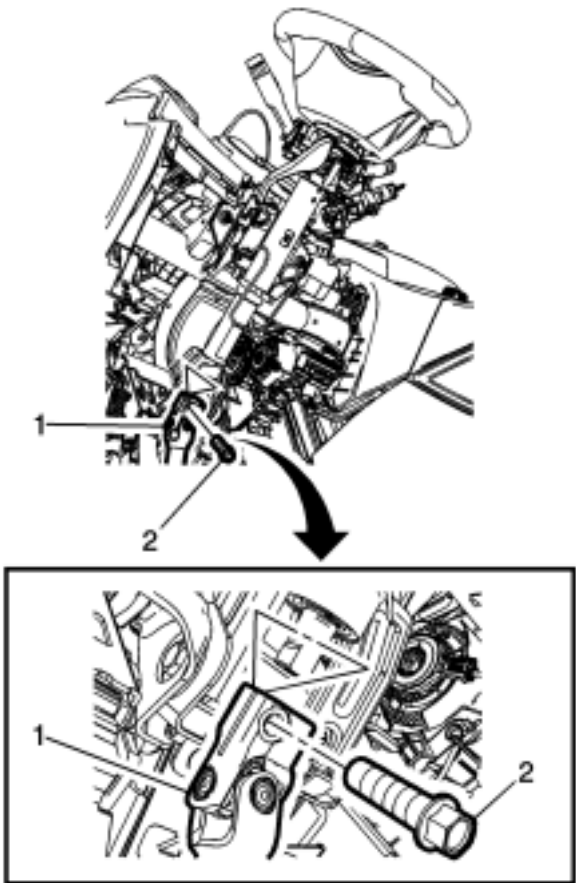
- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

1. With the steering wheel in the straight ahead position, LOCK the steering column.
2. Remove the upper trim cover and the lower trim cover from the steering column. Refer to [Steering Column Lower Trim Cover Replacement](#) .
3. Remove the instrument panel lower trim pad cover. Refer to [Instrument Panel Lower Trim Pad Cover Replacement](#) .
4. Remove the left side floor air outlet duct. Refer to [Floor Air Outlet Duct Replacement - Left Side](#) .
5. Disconnect any electrical connectors as necessary.



6. Use paint in order to place match marks on the intermediate steering shaft (1) and on the steering gear pinion shaft (3).
7. Remove the intermediate steering shaft lower bolt (2).
8. Disconnect the intermediate steering shaft from the steering gear pinion shaft.

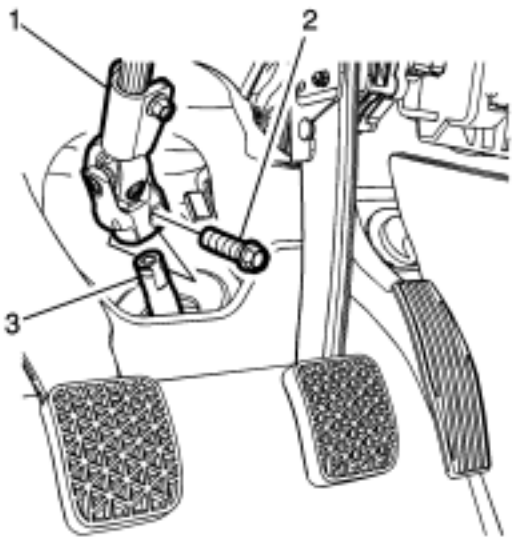


9. Use paint in order to place match marks on the steering column shaft and on the intermediate steering shaft (1).
10. Remove the intermediate shaft upper bolt (2).

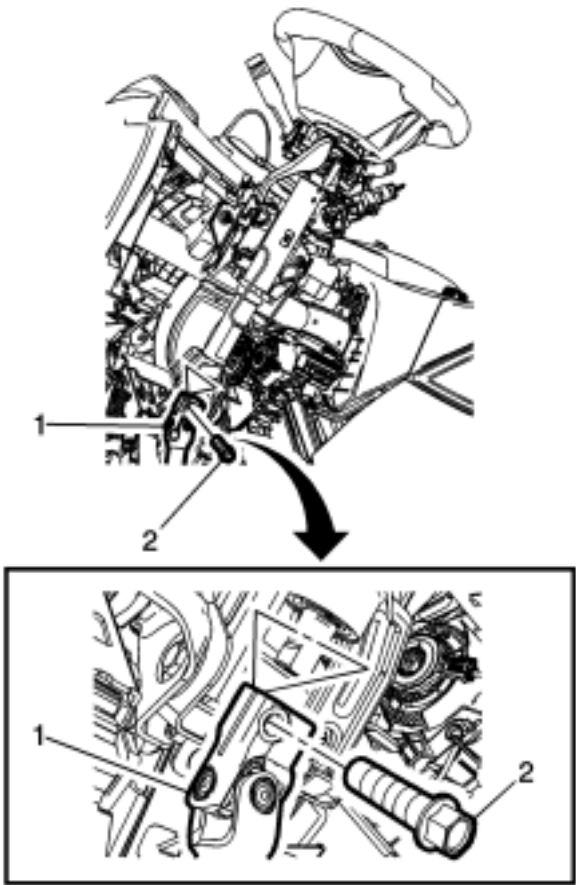
- 11. Disconnect the intermediate steering shaft from the steering column shaft.
- 12. Remove the intermediate steering shaft from the vehicle.

Installation Procedure

- 1. If you are replacing the intermediate steering shaft, copy the match marks from the old shaft to the new shaft.
- 2. Position the intermediate steering shaft in the vehicle.



- 3. Align the match marks and connect the intermediate steering shaft (1) to the steering gear pinion shaft (3).

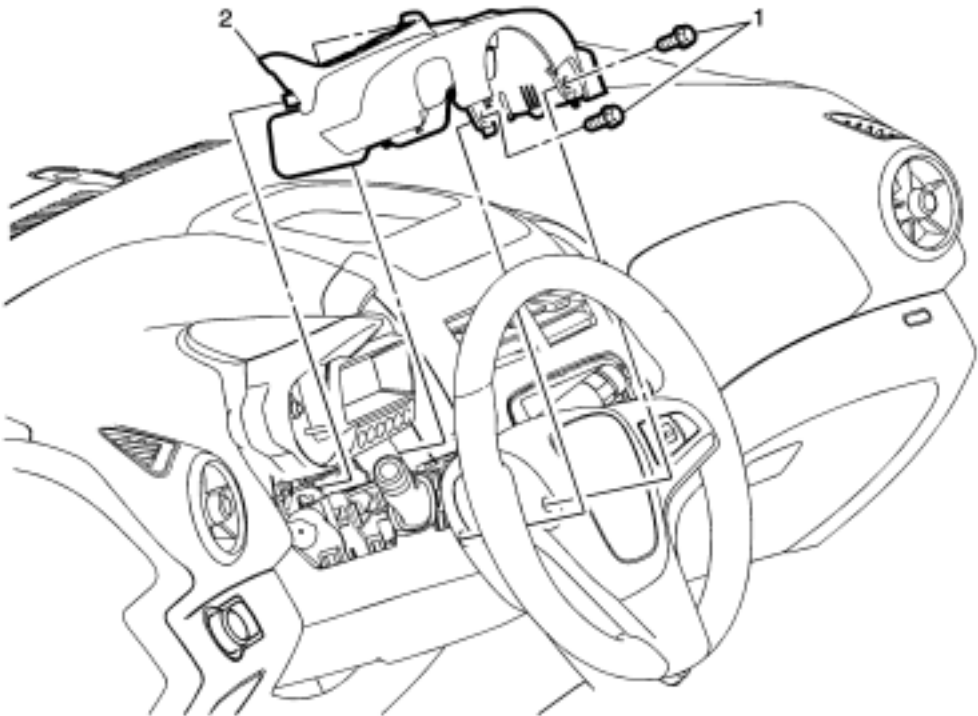


- 4. Align the match marks and connect the intermediate steering shaft (1) to the steering column shaft.

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

- 5. Install the intermediate steering shaft upper bolt (2) and tighten to **49 N·m (36 lb ft)** .
- 6. Install the intermediate steering shaft lower bolt (2) and tighten to **49 N·m (36 lb ft)** .
- 7. Connect any electrical connectors as necessary.
- 8. Install the left side floor air outlet duct. Refer to [Floor Air Outlet Duct Replacement - Left Side](#) .
- 9. Install the instrument panel lower trim pad cover. Refer to [Instrument Panel Lower Trim Pad Cover Replacement](#) .
- 10. Install the upper trim cover and the lower trim cover to the steering column. Refer to [Steering Column Lower Trim Cover Replacement](#) .
- 11. Center the steering angle sensor. Refer to [Steering Angle Sensor Centering](#) .

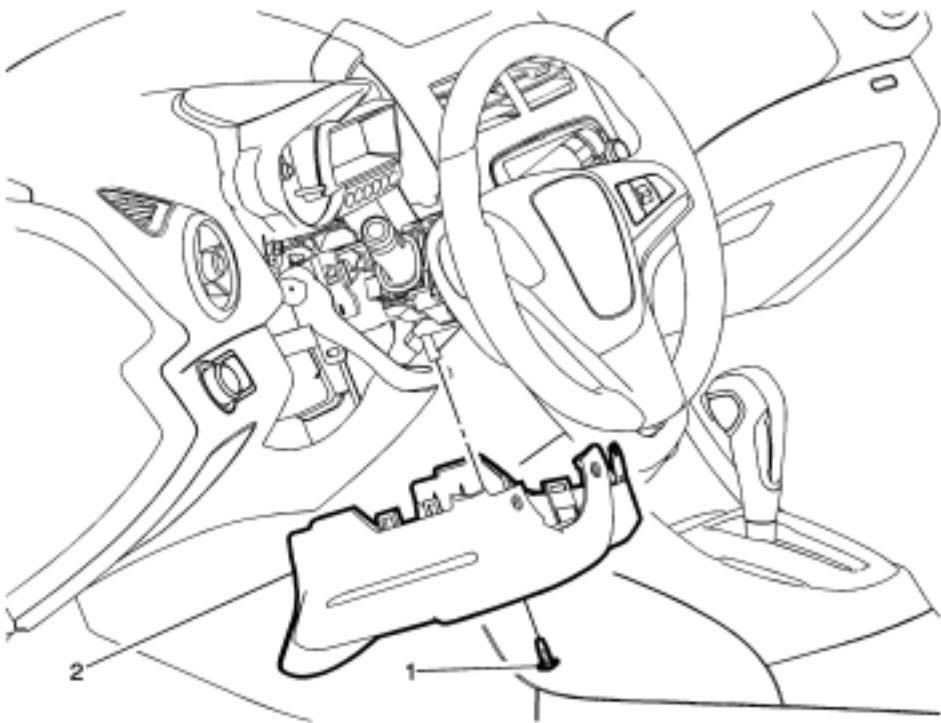
Steering Column Upper Trim Cover Replacement



Callout	Component Name
1	<p>Instrument Panel Steering Column Upper Trim Cover Fasteners (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Turn the steering wheel to the right and to the left in order to gain access to the fasteners.</p>
2	<p>Instrument Panel Steering Column Upper Trim Cover Assembly</p> <p><b>Procedures</b></p> <p>1. Use a flat bladed plastic trim tool along the right and left sides of the trim panel in order to release the retainers securing the upper trim cover to the lower trim cover.</p> <p>2. Lift the upper trim cover upward and rearward in order to release the retainers along the front forward edge of the upper trim cover.</p>

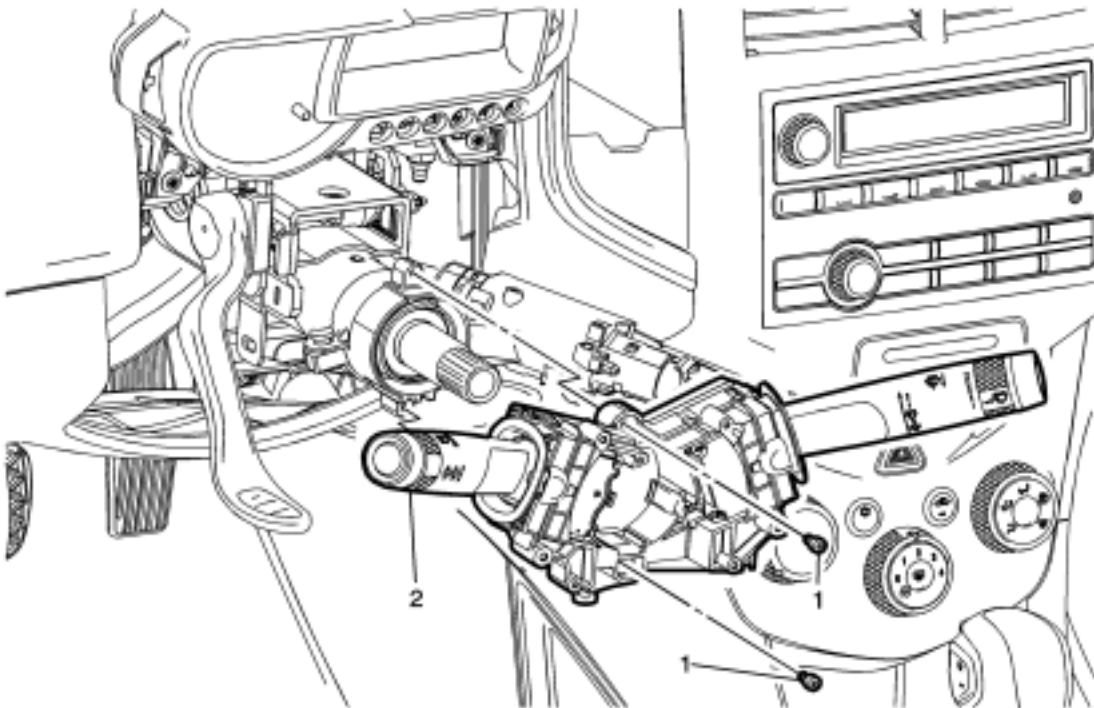


Steering Column Lower Trim Cover Replacement



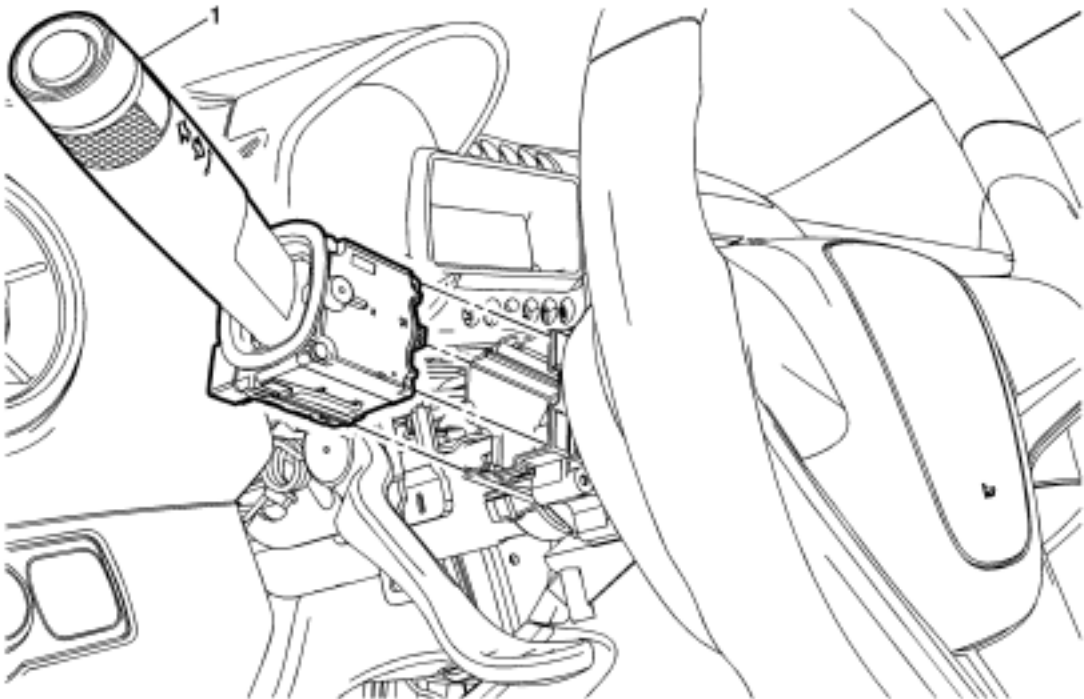
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the instrument panel steering column upper trim cover. Refer to <a href="#">Steering Column Upper Trim Cover Replacement</a> .</p>	
1	<p>Instrument Panel Steering Column Lower Trim Cover Fastener</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Instrument Panel Steering Column Lower Trim Cover Assembly</p>

Turn Signal Switch Bracket Replacement



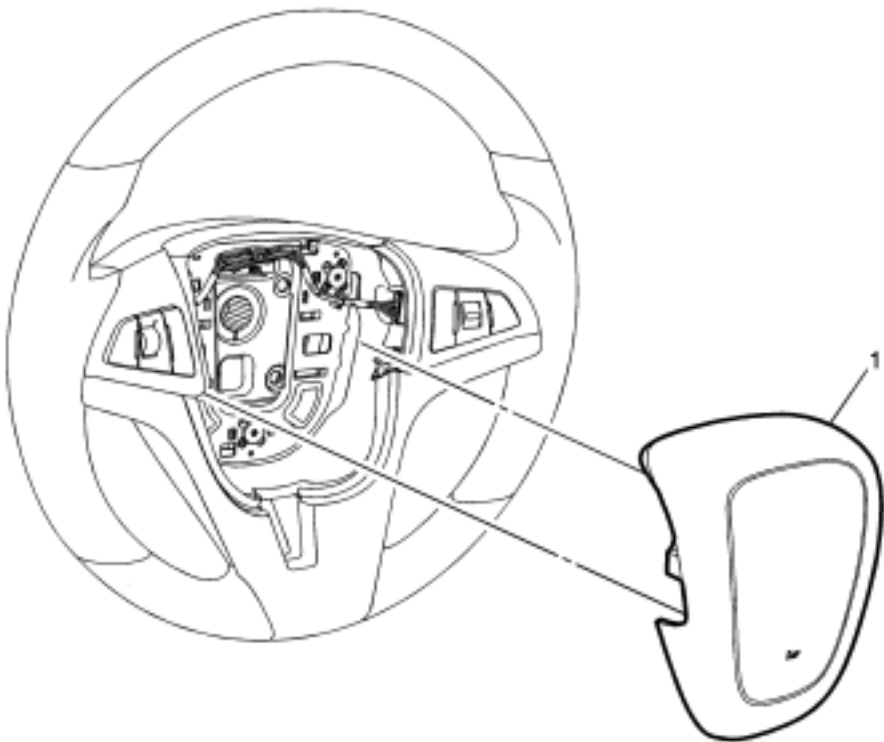
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the inflatable restraint steering wheel module coil. Refer to <a href="#">Steering Wheel Airbag Coil Replacement</a> .</p>	
1	<p>Turn Signal Switch Bracket Fastener (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Turn Signal Switch Bracket</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Disconnect any electrical connectors as necessary.</li><li>2. Release the locking tab in order to disconnect the turn signal switch bracket from the steering column.</li><li>3. Transfer components as necessary.</li></ol>

Turn Signal Multifunction Switch Replacement



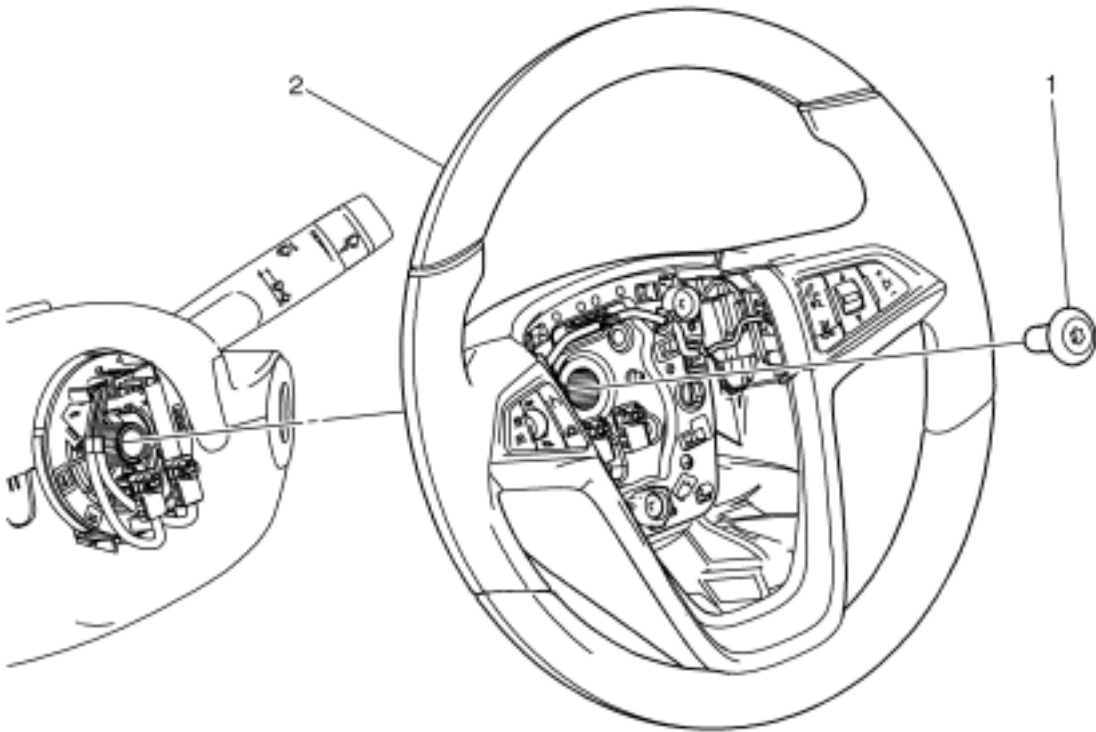
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the upper trim cover and the lower trim cover from the steering column. Refer to <a href="#">Steering Column Lower Trim Cover Replacement</a> .</p>	
1	<p>Turn Signal Switch</p> <p><b>Procedure</b></p> <p>1. Disconnect any electrical connectors as necessary.</p> <p>2. Release the plastic retaining tabs and remove the turn signal multifunction switch from the turn signal switch bracket.</p>

Steering Wheel Horn Cap Replacement



Callout	Component Name
1	<div>Steering Wheel Horn Cap</div> <div><b>Procedure</b></div> <div>Use flat bladed plastic tool to gently pry horn cap from steering wheel.</div>

Steering Wheel Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. If equipped with the supplemental inflatable restraint system, remove the steering wheel module. Refer to <a href="#">Steering Wheel Inflatable Restraint Module Replacement</a> . If equipped with a steering wheel horn cap, remove the horn cap. Refer to <a href="#">Steering Wheel Horn Cap Replacement</a> .</p> <p>2. Use paint in order to place match marks on the steering wheel and on the steering column shaft.</p>	
1	<p>Steering Wheel Bolt</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 30 N·m (22 lb ft)</p>
2	<p>Steering Wheel</p> <p><b>Procedure</b></p> <p>1. Disconnect all electrical connectors as necessary.</p> <p>2. Loosen the steering wheel until 2 to 3 threads are left engaged.</p> <p>3. Wiggle the steering wheel until the steering wheel disengages completely.</p> <p>4. Remove the steering wheel bolt.</p> <p>5. Remove the steering wheel.</p> <p>6. Copy the match marks from the old steering wheel to the new steering wheel.</p> <p>7. Transfer any parts as necessary.</p>

## Steering Column Replacement (NJ1)

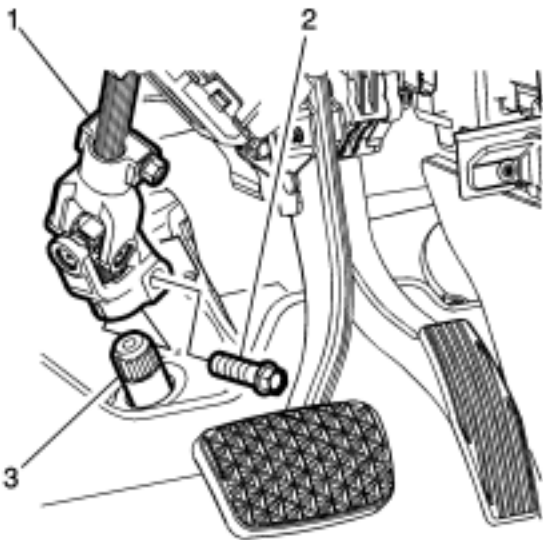
### Removal Procedure

**Caution:** With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

1. With the steering wheel in the straight ahead position, LOCK the steering column.
2. Remove the upper trim cover and the lower trim cover from the steering column. Refer to [Steering Column Lower Trim Cover Replacement](#) .
3. Remove the instrument panel lower trim pad cover. Refer to [Instrument Panel Lower Trim Pad Cover Replacement](#) .
4. Remove the left side floor air outlet duct. Refer to [Floor Air Outlet Duct Replacement - Left Side](#) .
5. Disconnect any electrical connectors as necessary.

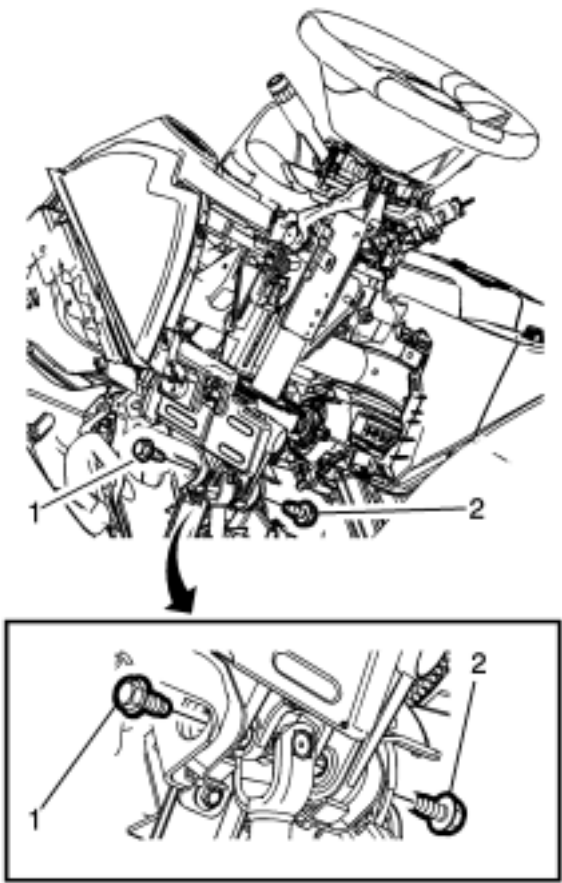


6. Use paint in order to place match marks on the intermediate steering shaft (1) and on the steering gear pinion shaft (3).
7. Remove the intermediate steering shaft lower bolt (2).
8. Disconnect the intermediate steering shaft from the steering gear pinion shaft.

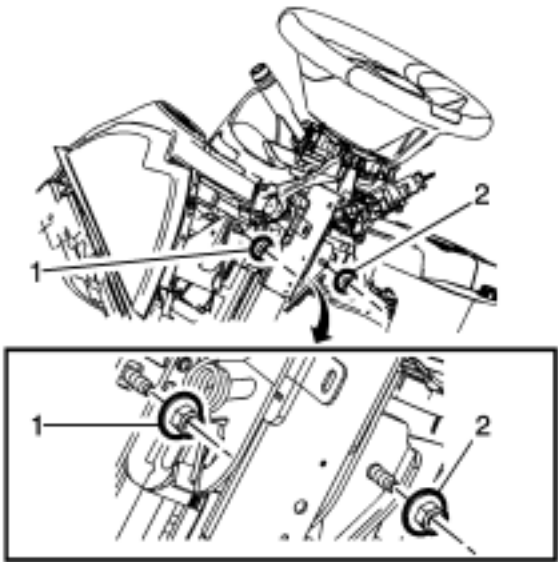
**Caution:** Do not support the steering column by only the lower or upper support bracket. Damage to the column lower bearing adapter could result.

9. Support the steering column.

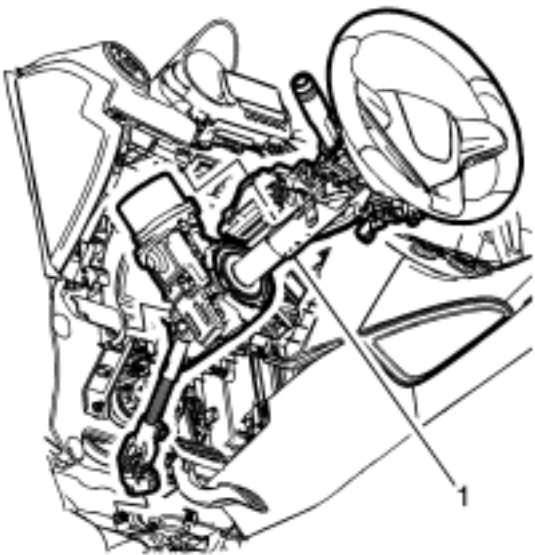




10. Remove the 2 steering column lower support bracket bolts(1,2).



11. Remove the 2 steering column upper support bracket nuts(1,2).

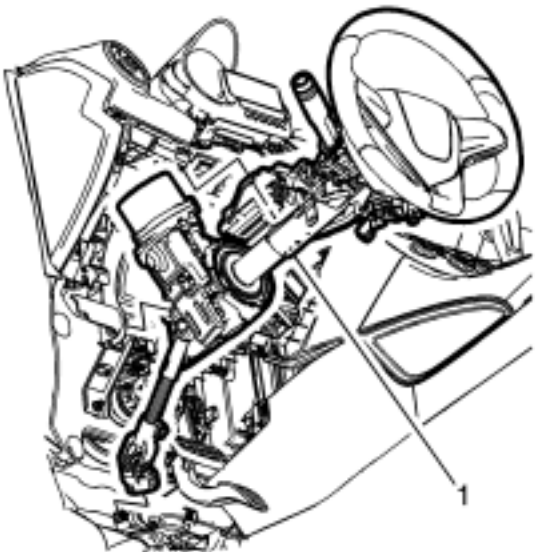


**Caution:** Once the steering column is removed from the vehicle, the column is extremely susceptible to damage. Dropping the column assembly on the end could collapse the steering shaft or loosen the plastic injections, which maintain column rigidity. Leaning on the column assembly could cause the jacket to bend or deform. Any of the above damage could impair the columns collapsible design. Do NOT hammer on the end of the shaft, because hammering could loosen the plastic injections, which maintain column rigidity. If you need to remove the steering wheel, refer to the Steering Wheel Replacement procedure in this section.

12. Remove the steering column assembly(1) from the vehicle.
13. Transfer components as necessary.

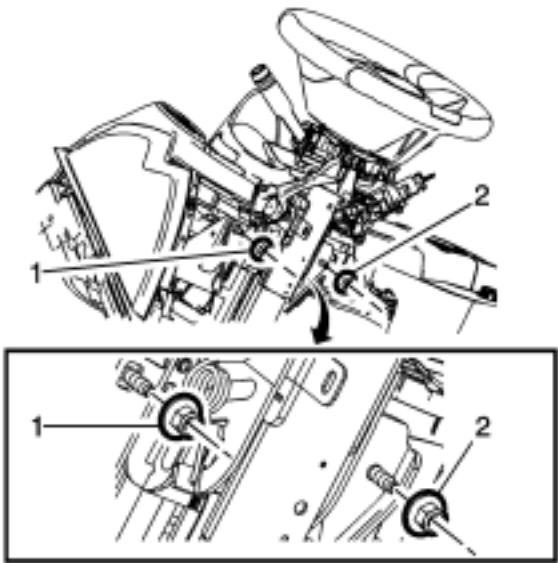
Installation Procedure

1. If you are replacing the steering column or the intermediate steering shaft, copy the match marks from the old parts to the new parts.



**Caution:** Do NOT allow the wiring harness to be pinched between the motor/module assembly and the steering column during installation. A pinched harness will cause diagnostic trouble codes to be set and may require replacement of the steering column.

2. Position the steering column assembly (1) in the vehicle.
3. Align the match marks and connect the intermediate steering shaft to the steering gear pinion shaft.



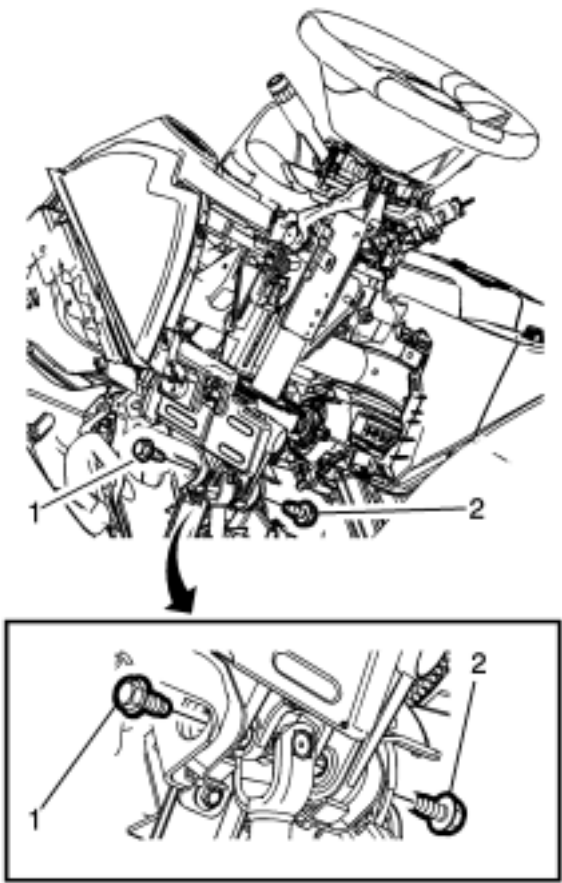
**Warning:** In order to ensure the intended function of the steering column in a vehicle during a crash and in order to avoid personal injury to the driver, perform the following:

- Tighten the steering column lower fasteners before you tighten the steering column upper fasteners. Failure to do this can damage the steering column.
- Tighten the steering column fasteners to the specified torque. Overtightening the upper steering column fasteners could affect the steering column collapse.

**Caution:** Ensure all fasteners are securely seated before applying needed torque. Failure to do so may result in component damage or malfunctioning of steering column.

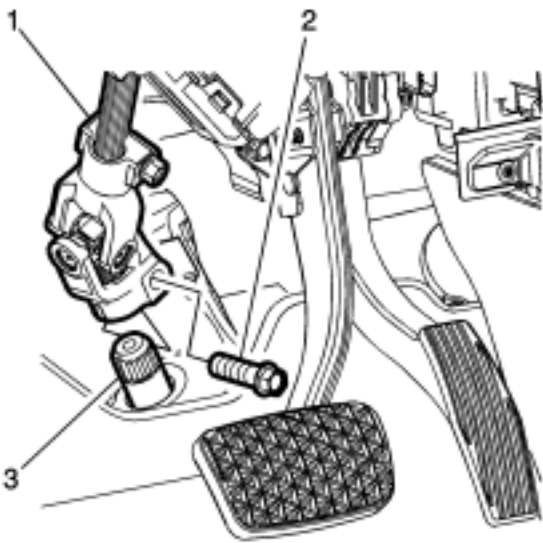
4. Install, but do not tighten, the 2 steering column upper support bracket nuts(1,2).





5. Install, but do not tighten, the 2 steering column lower support bracket bolts(1,2).

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



- 6. Install the intermediate steering shaft lower bolt (2) and tighten to **49 N·m (36 lb ft)**.
- 7. Tighten the 2 steering column lower support bracket bolts to **22 N·m (16 lb ft)**.
- 8. Tighten the 2 steering column upper support bracket nuts to **22 N·m (16 lb ft)**.
- 9. Connect any electrical connectors as necessary.
- 10. Install the left side floor air outlet duct. Refer to [Floor Air Outlet Duct Replacement - Left Side](#) .
- 11. Install the instrument panel lower trim pad cover. Refer to [Instrument Panel Lower Trim Pad Cover Replacement](#) .
- 12. Install the upper trim cover and the lower trim cover to the steering column. Refer to [Steering Column Lower Trim Cover Replacement](#) .
- 13. Setup the power steering control module. Refer to [Power Steering Control Module Programming and Setup](#) .
- 14. Center the steering angle sensor. Refer to [Steering Angle Sensor Centering](#) .

## Steering Column Replacement (N40)

### Removal Procedure

**Caution:** With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

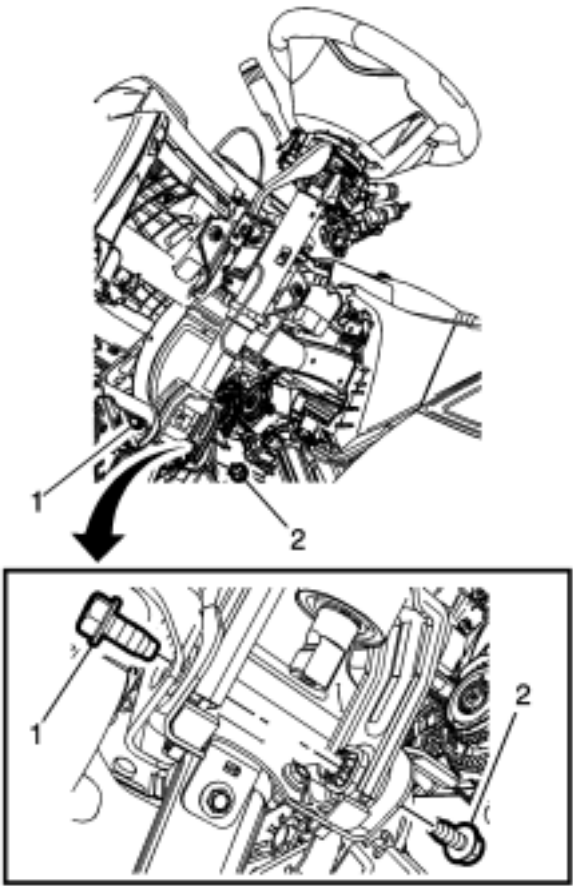
- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

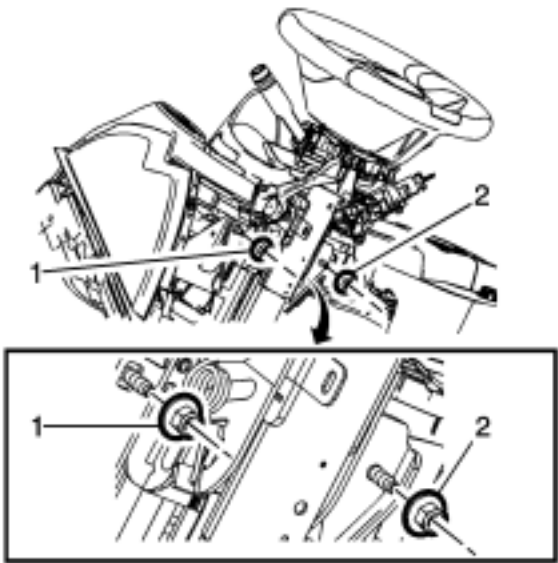
1. With the steering wheel in the straight ahead position, LOCK the steering column.
2. Remove the upper trim cover and the lower trim cover from the steering column. Refer to [Steering Column Lower Trim Cover Replacement](#) .
3. Remove the instrument panel lower trim pad cover. Refer to [Instrument Panel Lower Trim Pad Cover Replacement](#) .
4. Remove the left side floor air outlet duct. Refer to [Floor Air Outlet Duct Replacement - Left Side](#) .
5. Disconnect any electrical connectors as necessary.
6. Use paint in order to place match marks on the intermediate steering shaft and on the steering column shaft.
7. Disconnect the intermediate steering shaft from the steering column shaft. Refer to [Intermediate Steering Shaft Replacement](#) .

**Caution:** Do not support the steering column by only the lower or upper support bracket. Damage to the column lower bearing adapter could result.

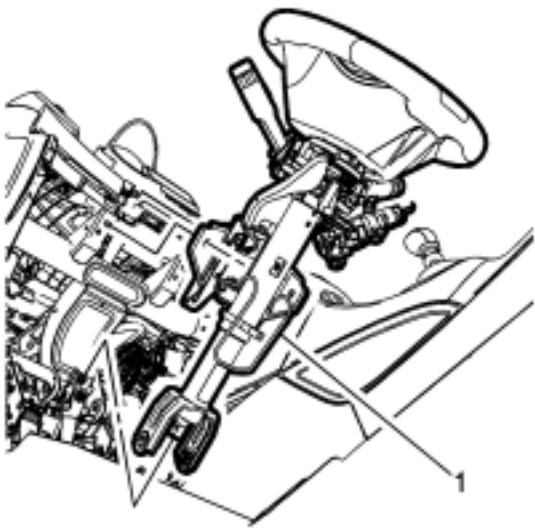
8. Support the steering column.



9. Remove the 2 steering column lower support bracket bolts (1,2).



10. Remove the 2 steering column upper support bracket nuts(1,2).

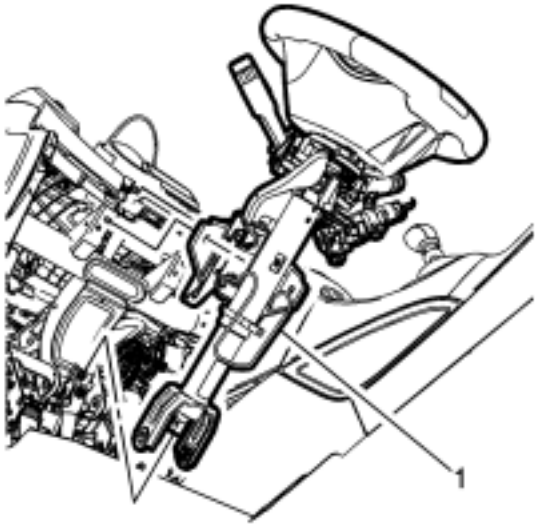


**Caution:** Once the steering column is removed from the vehicle, the column is extremely susceptible to damage. Dropping the column assembly on the end could collapse the steering shaft or loosen the plastic injections, which maintain column rigidity. Leaning on the column assembly could cause the jacket to bend or deform. Any of the above damage could impair the columns collapsible design. Do NOT hammer on the end of the shaft, because hammering could loosen the plastic injections, which maintain column rigidity. If you need to remove the steering wheel, refer to the Steering Wheel Replacement procedure in this section.

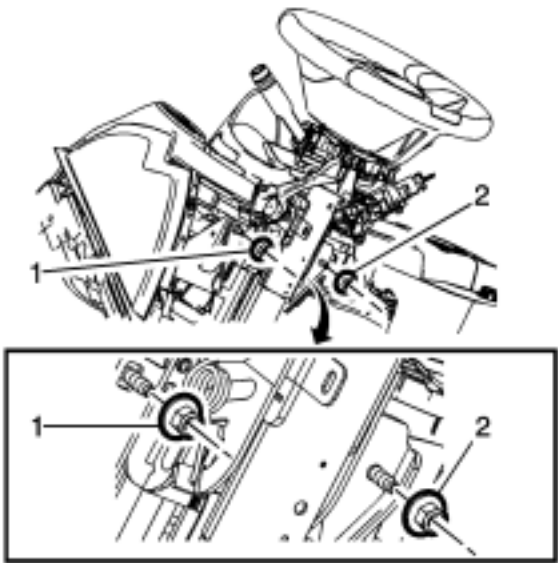
- 11. Remove the steering column assembly (1) from the vehicle.
- 12. Transfer components as necessary.

Installation Procedure

- 1. If you are replacing the steering column or the intermediate steering shaft, copy the match marks from the old parts to the new parts.



- 2. Position the steering column assembly (1) in the vehicle.
- 3. Align the match marks and connect the intermediate steering shaft to the steering column shaft. Refer to [Intermediate Steering Shaft Replacement](#) .



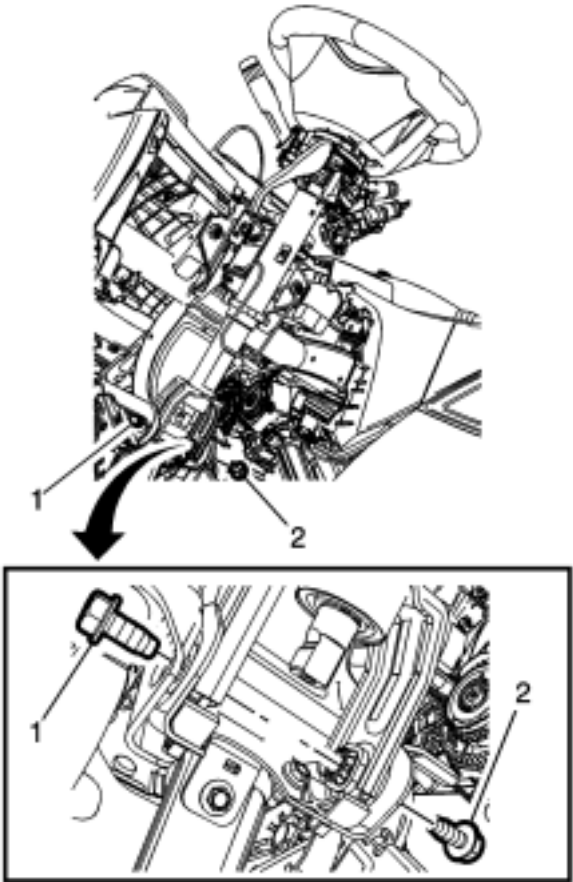
**Warning:** In order to ensure the intended function of the steering column in a vehicle during a crash and in order to avoid personal injury to the driver, perform the following:

- Tighten the steering column lower fasteners before you tighten the steering column upper fasteners. Failure to do this can damage the steering column.
- Tighten the steering column fasteners to the specified torque. Overtightening the upper steering column fasteners could affect the steering column collapse.

**Caution:** Ensure all fasteners are securely seated before applying needed torque. Failure to do so may result in component damage or malfunctioning of steering column.

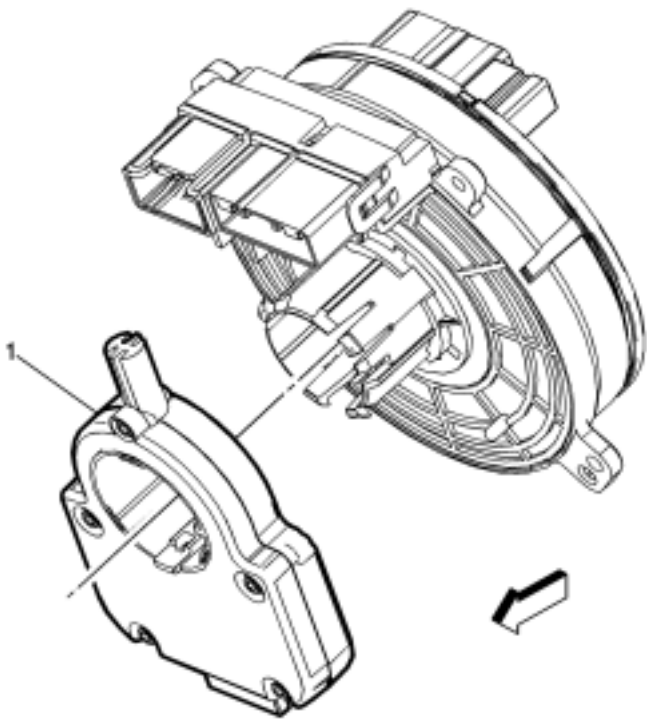
4. Install, but do not tighten, the 2 steering column upper support bracket nuts(1,2).

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



5. Install the 2 steering column lower support bracket bolts(1,2) and tighten to **22 N·m (16 lb ft)**.
6. Tighten the 2 steering column upper support bracket nuts to **22 N·m (16 lb ft)**.
7. Connect any electrical connectors as necessary.
8. Install the left side floor air outlet duct. Refer to [Floor Air Outlet Duct Replacement - Left Side](#) .
9. Install the instrument panel lower trim pad cover. Refer to [Instrument Panel Lower Trim Pad Cover Replacement](#) .
10. Install the upper trim cover and the lower trim cover to the steering column. Refer to [Steering Column Lower Trim Cover Replacement](#) .
11. Center the steering angle sensor. Refer to [Steering Angle Sensor Centering](#) .

Steering Angle Sensor Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the steering wheel airbag coil. Refer to <a href="#">Steering Wheel Airbag Coil Replacement</a> .</p>	
1	<p>Steering Angle Sensor</p> <p><b>Procedure</b></p> <p>1. Press in the clip on the steering wheel airbag coil in order to remove the steering angle sensor.</p> <p>2. After the installation is complete, center the steering angle sensor. Refer to <a href="#">Steering Angle Sensor Centering</a> .</p>



## Steering Wheel and Column Description and Operation

**Warning:** Refer to [Safety Glasses Warning](#) .

**Warning:** In order to ensure the intended function of the steering column in a vehicle during a crash and in order to avoid personal injury to the driver, perform the following:

- Tighten the steering column lower fasteners before you tighten the steering column upper fasteners. Failure to do this can damage the steering column.
- Tighten the steering column fasteners to the specified torque. Overtightening the upper steering column fasteners could affect the steering column collapse.

**Caution:** Refer to [Steering Wheel Straight and Column Locked Caution](#) .

**Caution:** Refer to [Steering Column in Lock Position Caution](#) .

In addition to the steering function, the steering column provides safety and security.

The energy-absorbing column is designed to compress in a front-end collision to lessen the chance of driver injury.

The ignition switch and the lock are mounted on the column, allowing the ignition and steering operations to be locked to prevent theft of the car.

The column levers trigger the turn signals, the headlight beams, and the windshield washer and wipers.

**Note:** Apply a thin coat of lithium grease to all friction points when reassembling to ensure proper operation.

A tilt steering column uses a spherical joint to allow the steering wheel to tilt up and down. This enables the driver to adjust the steering wheel to a comfortable driving position.

The column may be easily disassembled and assembled.



Front Suspension

Rear Suspension

Tires and Wheels





Front Suspension

SUSPENSION

Specifications	Strut and Shock Absorber Inspection (Strut)
Stabilizer Shaft Replacement	Strut Assembly Removal and Installation
Stabilizer Shaft Link Replacement	Shock Absorber Disposal
Front Wheel Bearing and Hub Replacement	Strut, Strut Component, or Spring Replacement
Steering Knuckle Replacement	Description and Operation
Lower Control Arm Replacement	Special Tools
Steering Linkage Outer Tie Rod Replacement	





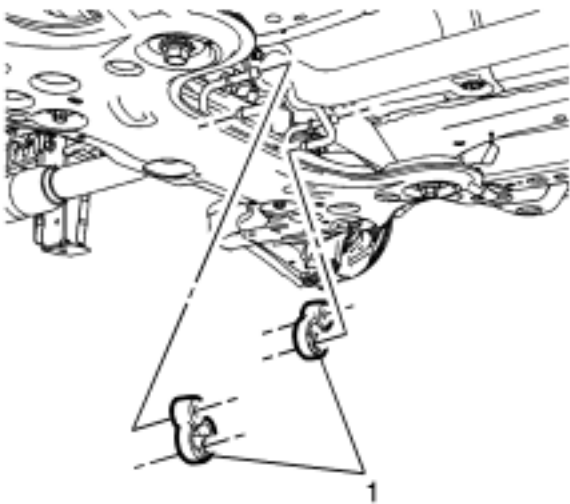
Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Brake Dust Shield	9 N·m	80 lb in
Front Lower Control Arm Ball Joint Nut		
• First Pass	30 N·m	22 lb ft
• Second Pass	plus 120 degrees	
• Third Pass	30 N·m	22 lb ft
• Final Pass	plus 35 degrees	
Front Lower Control Arm Front Bolt		
• First Pass	115 N·m	85 lb ft
• Final Pass	plus 65 degrees	
Front Lower Control Arm Rear Nut		
• First Pass	160 N·m	118 lb ft
• Final Pass	plus 35 degrees	
Front Suspension Stabilizer Shaft Clamp Bolts	22 N·m	16 lb ft
Front Suspension Stabilizer Shaft Link Nuts	65 N·m	48 lb ft
Front Suspension Strut to Steering Knuckle Nuts	110 N·m	82 lb ft
Front Suspension Strut Upper Mount Nut	65 N·m	48 lb ft
Front Suspension Strut Lower Mount Nut	65 N·m	48 lb ft

## Stabilizer Shaft Replacement

### Removal Procedure

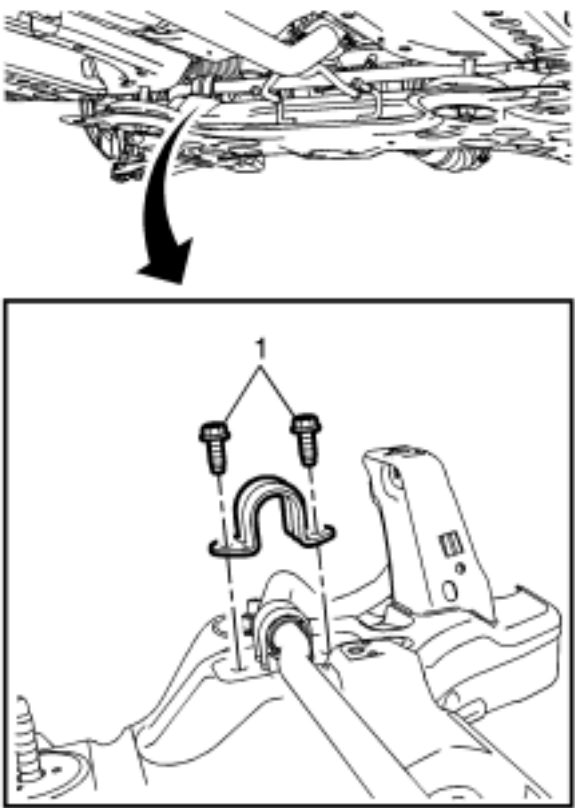
1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
3. Remove the stabilizer shaft links from the stabilizer shaft. Refer to [Stabilizer Shaft Link Replacement](#) .
4. Remove the lower control arm ball joint bolt and nut from the steering knuckle. Refer to [Lower Control Arm Replacement](#) .



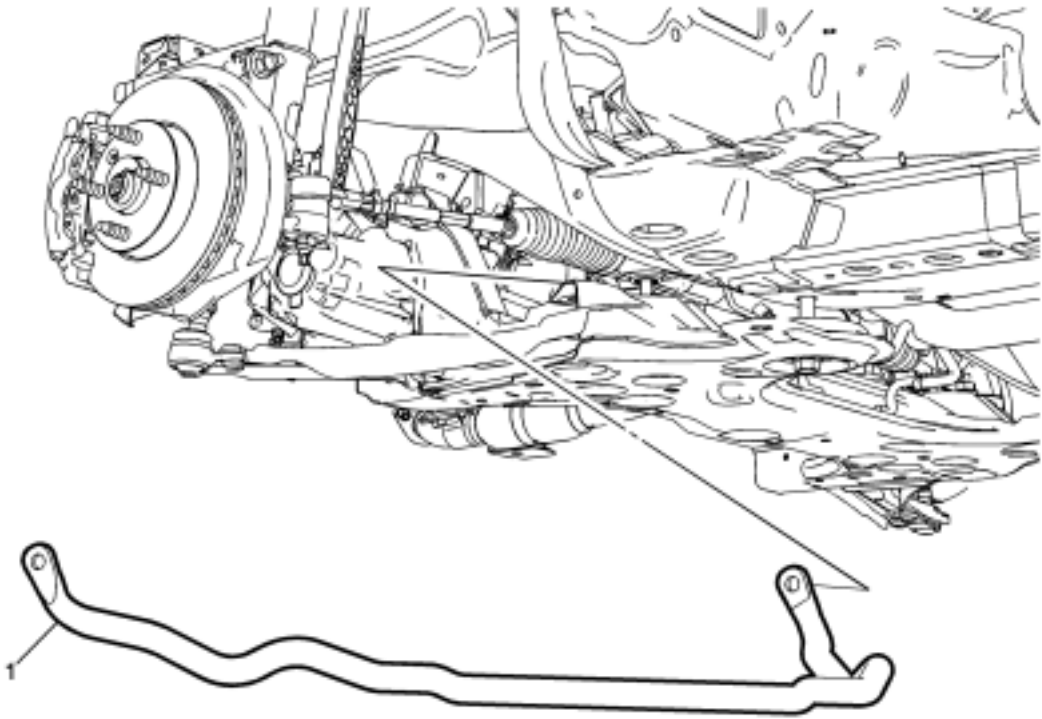
5. Remove the exhaust pipe insulators(1).



6. Using a suitable support, lower the front suspension frame(1) enough to gain access to the stabilizer shaft insulator bolts. Refer to [Drivetrain and Front Suspension Frame Replacement](#) .



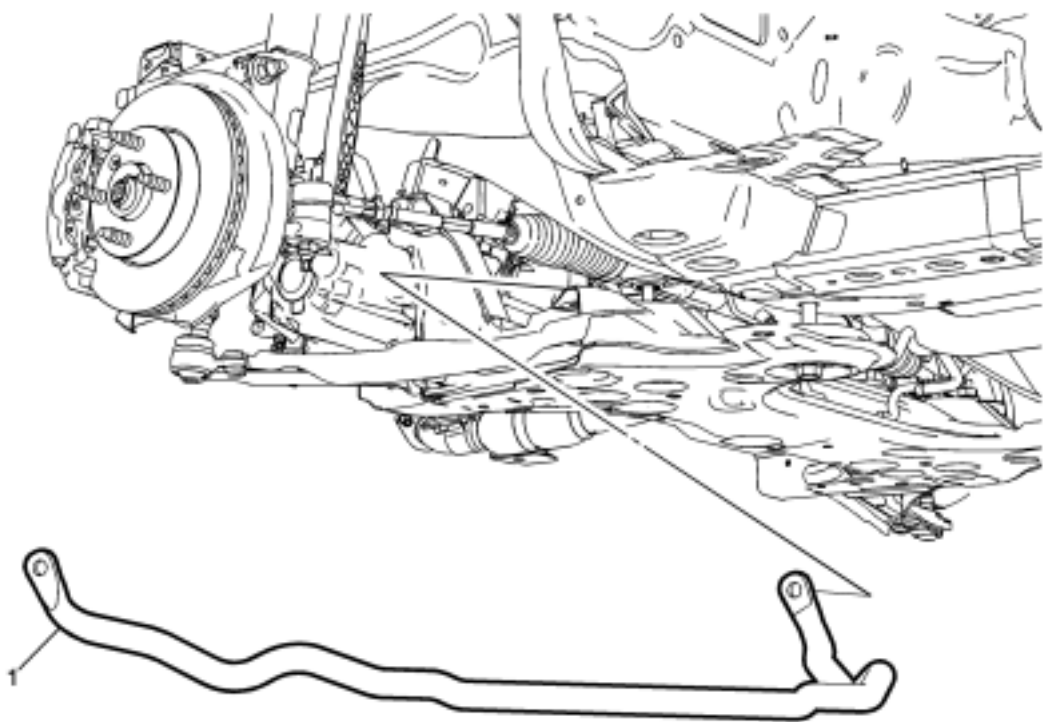
7. Remove the stabilizer shaft insulator bolts(1).



**Note:** It maybe necessary to maneuver the front stabilizer shaft in such away as to remove it from the front suspension frame.

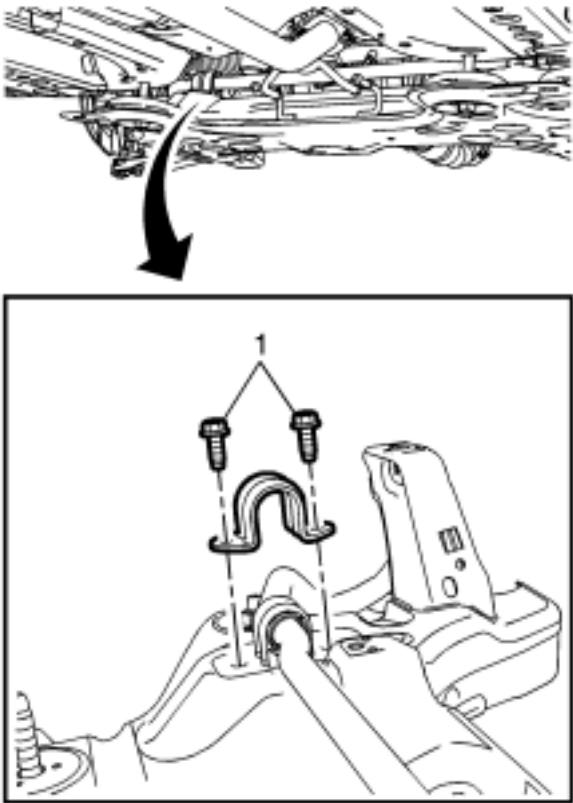
8. Remove the front stabilizer shaft(1) from the front suspension frame.

Installation Procedure

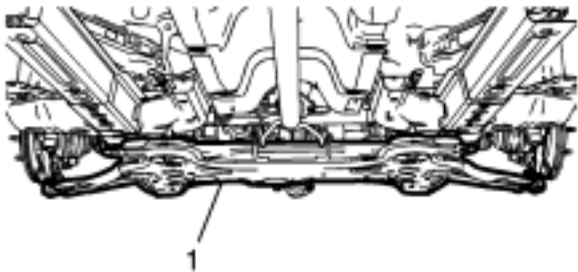


1. Position the front stabilizer shaft (1) in the front suspension frame.

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

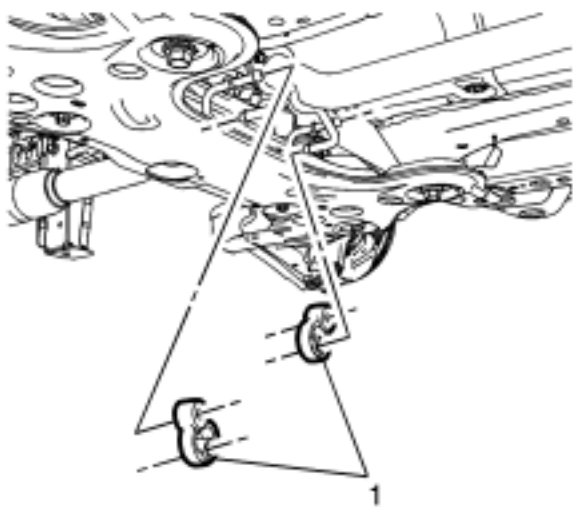


2. Install the front stabilizer shaft insulator bolts and tighten to **22 N·m (16 lb ft)** .



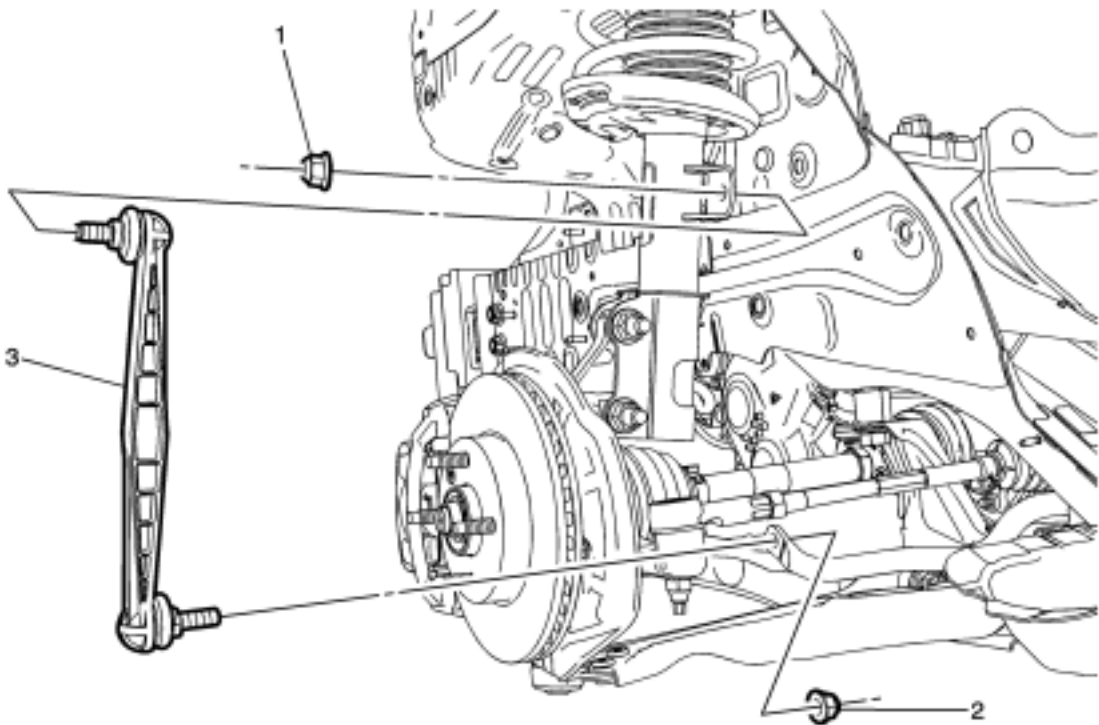
3. Lift the front suspension frame (1) into the proper position. Refer to [Drivetrain and Front Suspension Frame Replacement](#) .  
4. Install the lower control arm ball joint to steering knuckle bolts. Refer to [Lower Control Arm Replacement](#) .

5. Install the stabilizer shaft link to the stabilizer shaft. Refer to [Stabilizer Shaft Link Replacement](#) .



6. Install the exhaust pipe insulators(1).
7. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
8. Remove the support and lower the vehicle.

Stabilizer Shaft Link Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Raise and Support the vehicle. Refer to <a href="#">Lifting and Jacking the Vehicle</a> .</p> <p>2. Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Front Stabilizer Shaft Link Upper Nut</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Use the proper size Allen wrench to hold the stabilizer shaft link stud when loosening or tightening the stabilizer shaft link nut.</p> <p>2. Remove and discard the stabilizer shaft link nut. Replace with NEW only.</p> <p><b>Tighten</b> 65 N·m (48 lbft)</p>
2	<p>Front Stabilizer Shaft Link Lower Nut</p> <p><b>Procedure</b></p> <p>1. Use the proper size Allen wrench to hold the stabilizer shaft link stud when loosening or tightening the stabilizer shaft link nut.</p> <p>2. Remove and discard the nut. Replace with NEW only.</p> <p><b>Tighten</b> 65 N·m (48 lbft)</p>
3	<p>Front Stabilizer Shaft Link</p>

## Front Wheel Bearing and Hub Replacement

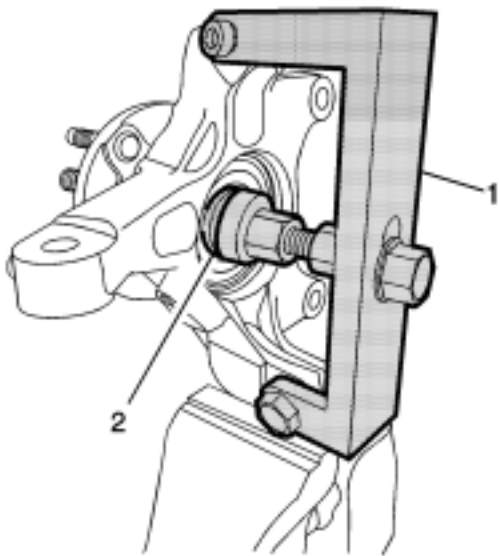
### Special Tools

CH-50559 Wheel Hub/Bearing Remover Kit

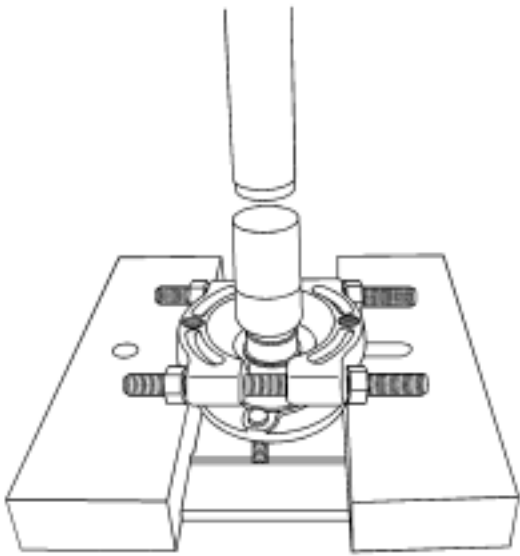
For equivalent regional tools, refer to [Special Tools](#) .

### Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the steering knuckle assembly from the vehicle. Refer to [Steering Knuckle Replacement](#) .

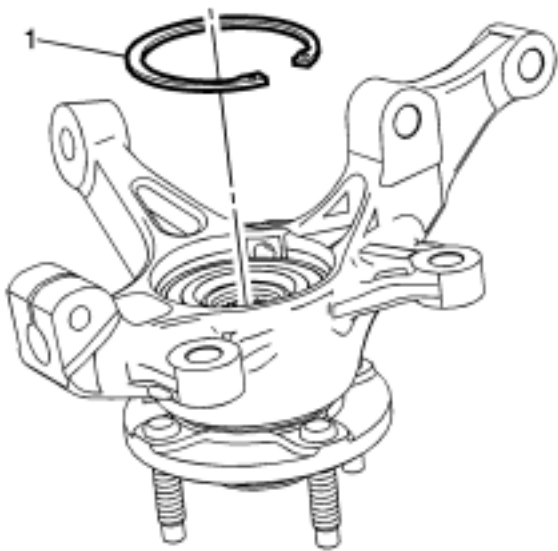


3. Position the steering knuckle assembly (1) in a suitable vise.
4. Position the CH-50059–1 wheel hub/bearing removal/installation bridge assembly (1) and the CH-50559–2 wheel hub/bearing removal/installation adapter (2) on the wheel bearing inner hub.
5. Using the CH-50059–1 and the CH-50559–2 , remove the wheel hub from the wheel bearing.

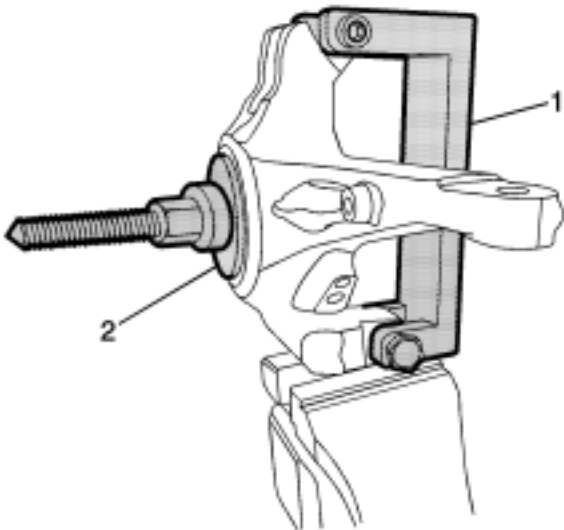


6. If the inner race of the bearing is pulled out with the hub, remove the inner race from the using the appropriate tools.



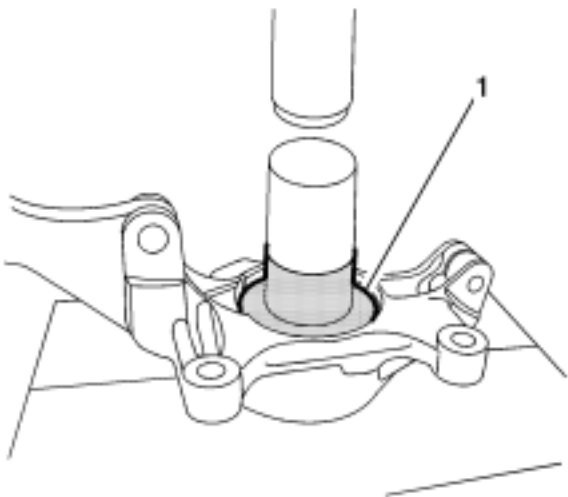


7. Using the appropriate tool, remove the retaining ring (1) from the steering knuckle.



8. Position the CH-50559-1 wheel hub/bearing removal/installation bridge assembly (1) and the CH-50559-3 wheel bearing removal adapter (2) on the steering knuckle.
9. Remove the wheel bearing from the steering knuckle and discard it. Inspect the bore of the of the steering knuckle for pitting, scoring wear, or corrosion. If damage cannot be easily cleaned up with light sanding, replace the steering knuckle.

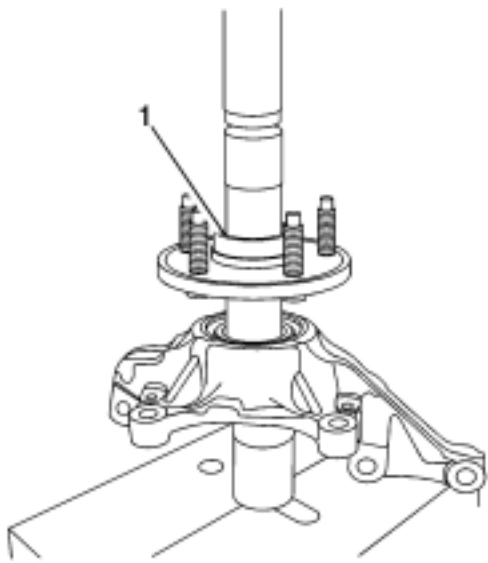
Installation Procedure



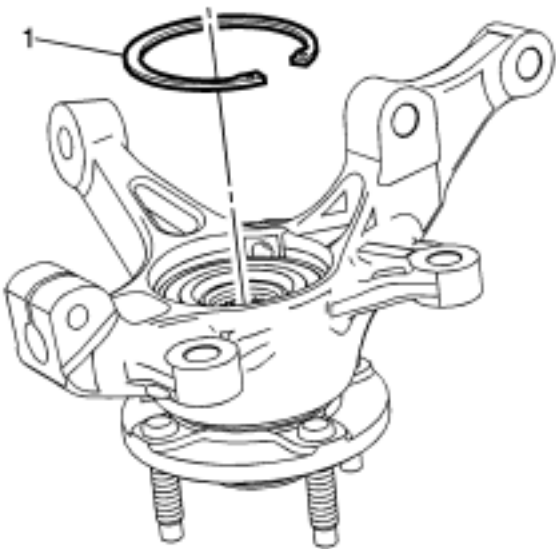
**Note:** Ensure that the wheel bearing is evenly seated in the steering knuckle.

1. Using the CH-50559-4 wheel hub/bearing installation adapter (1) and the appropriate extension and press, install the new bearing into the steering knuckle until it is correctly seated.





- 2. Position the CH-50559-4 (1) wheel hub/bearing installation adapter and the appropriate extension to the inside of the bearing and position the CH-50559-2 wheel hub removal/installation adapter and the appropriate extension on the wheel hub.
- 3. Press in the hub until it is correctly seated.

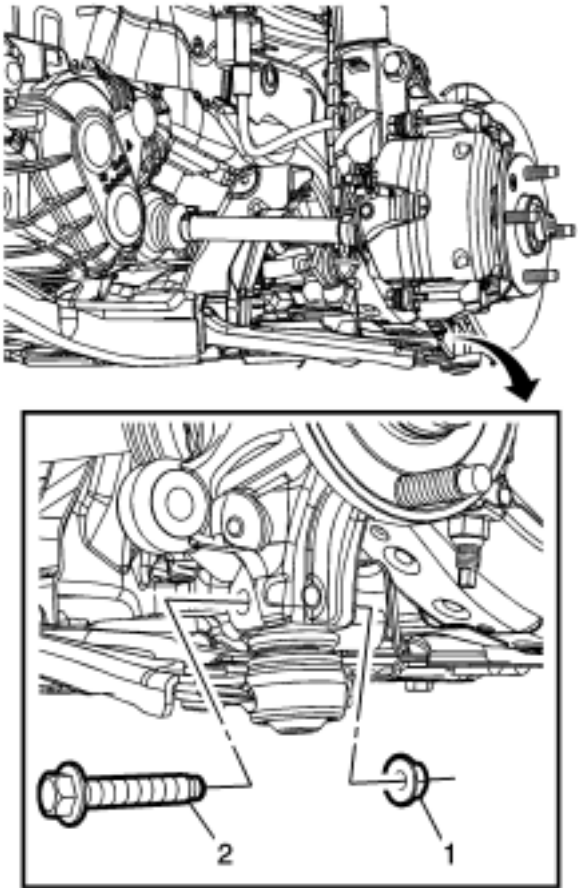


- 4. Using the appropriate tool, install the retaining ring (1).
- 7. Lower the vehicle.
- 5. Verify the hub rotates smoothly.
- 6. Install the steering knuckle assembly in the vehicle. Refer to [Steering Knuckle Replacement](#) .

## Lower Control Arm Replacement

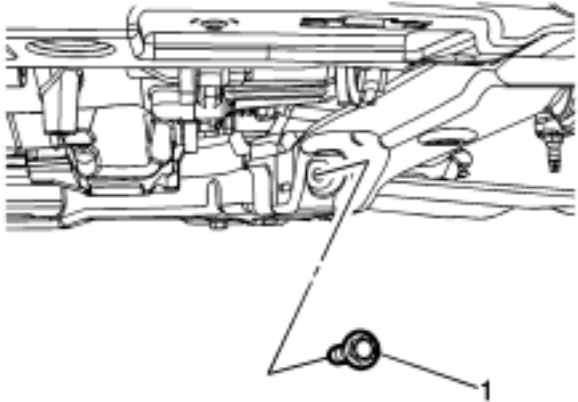
### Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .

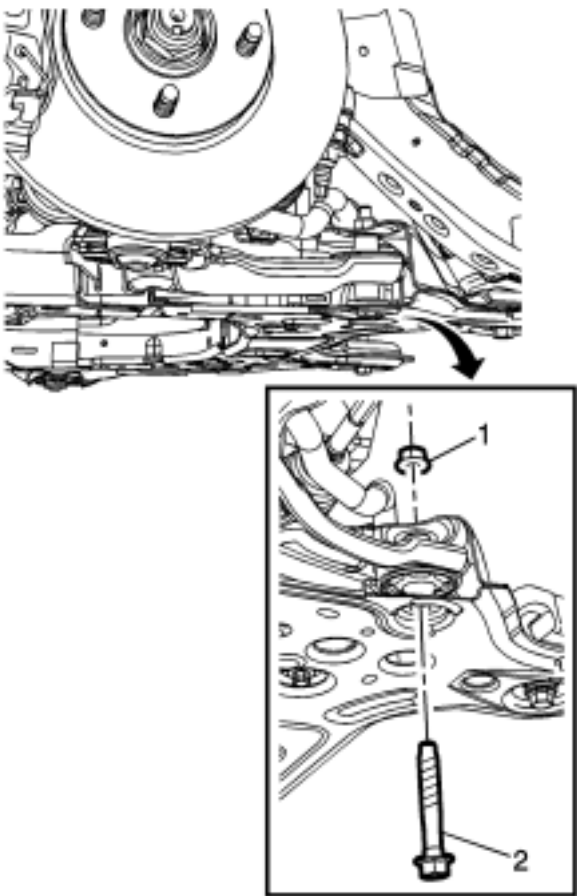


**Note:** DO NOT reuse the ball joint nut. The nut is NOT reusable.

3. Remove the lower ball joint nut (1) and bolt (2).

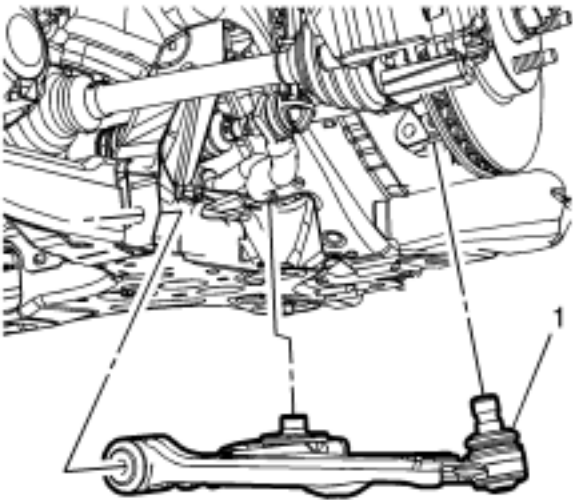


4. Remove and discard the front lower control bolt (1). Replace with NEW only.



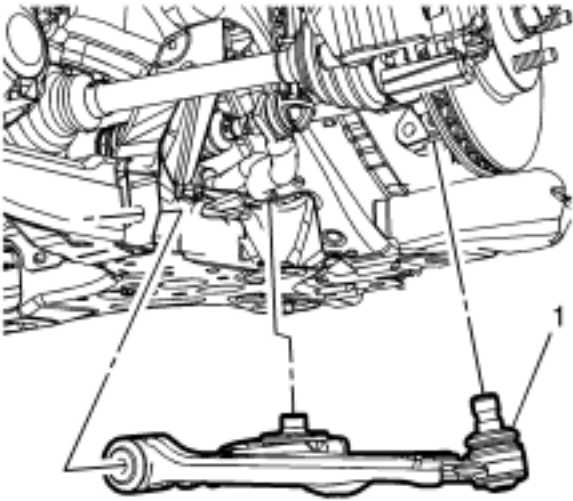
**Note:** DO NOT reuse the rear lower control arm nut. The nut is NOT reusable.

- 5. Remove the front lower control arm rear nut (1) and bolt (2).

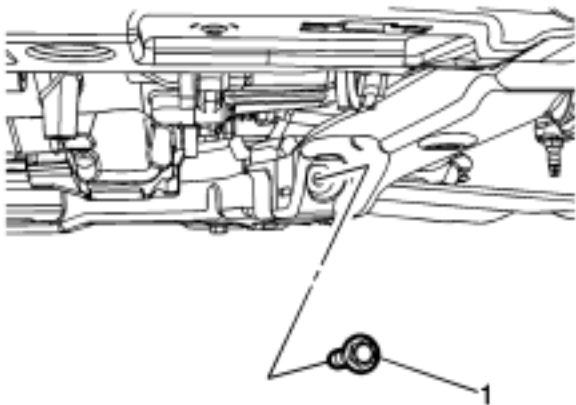


- 6. Remove the front lower control arm (1).

Installation Procedure

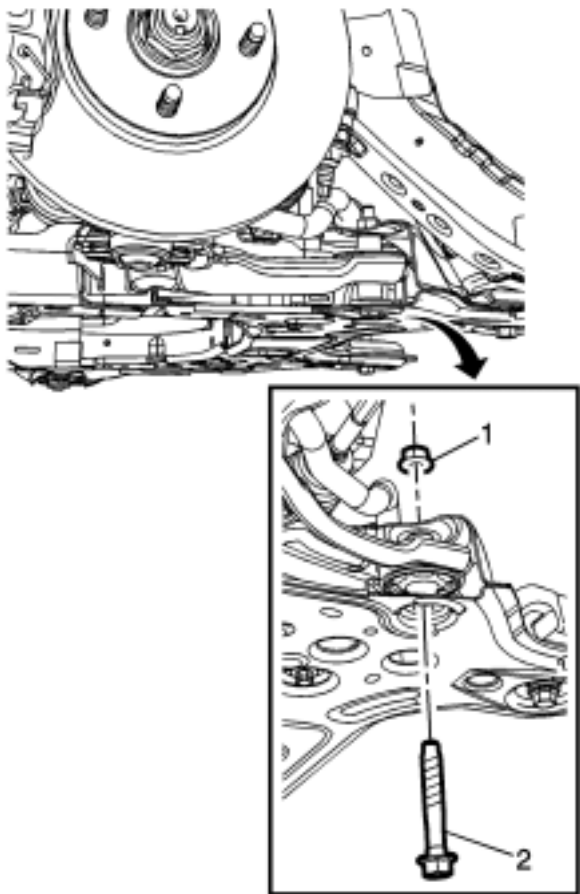


- 1. Position the lower control arm (1) in the vehicle.

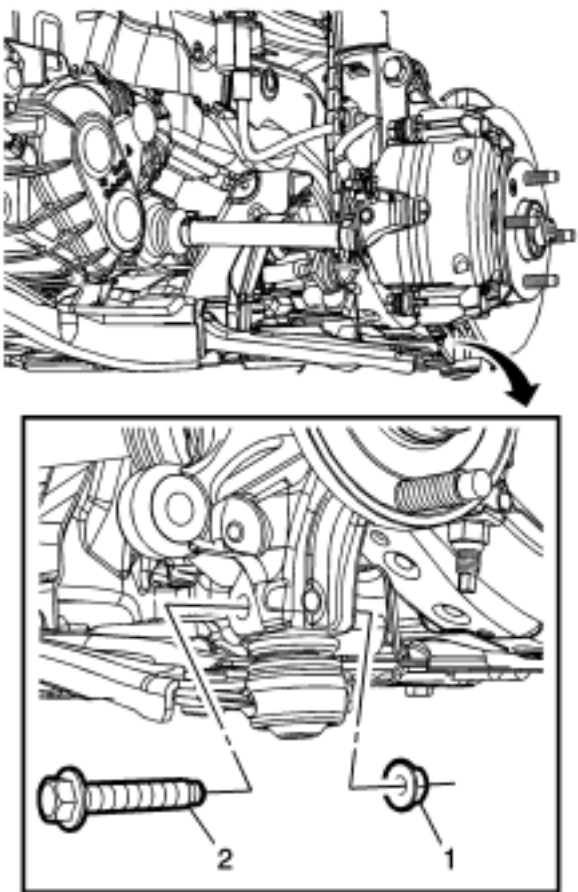


**Note:** Install the front lower control arm rear bolt and nut hand tight to hold the lower control arm in place while tightening the front lower control arm bolt.

2. Install the NEW front lower control arm front bolt (1) and tighten to.
- First Pass: **115 N·m (85 lb ft)**
  - Final Pass: **plus an additional 65 degrees**

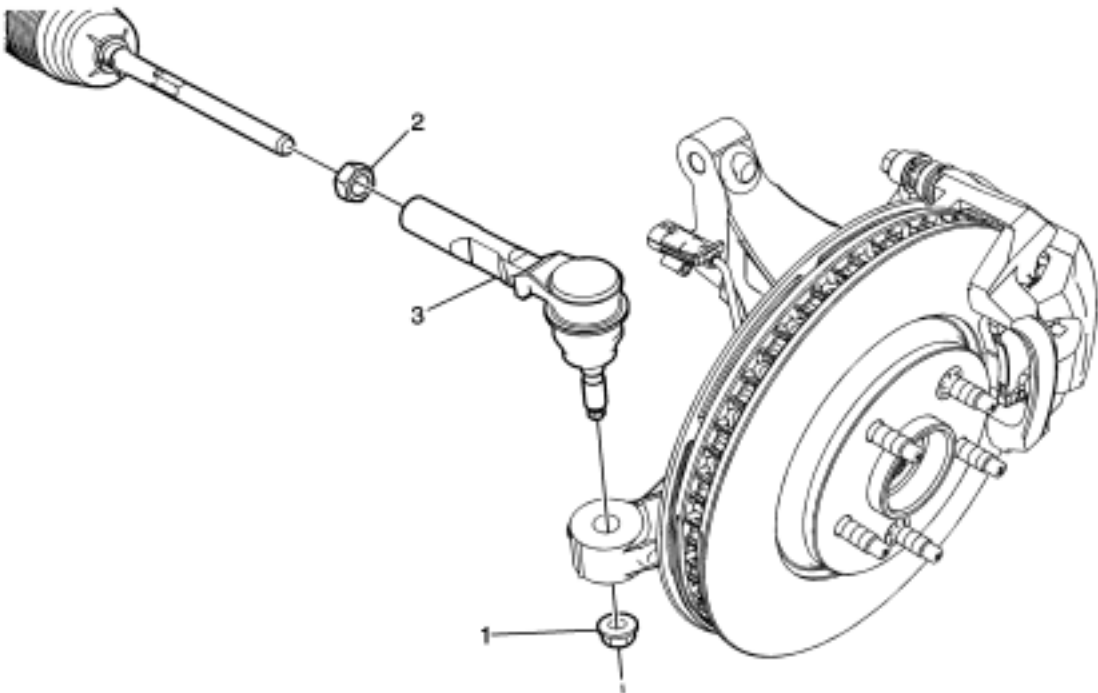


3. Tighten the NEW front lower control arm rear nut (1) to:
- First Pass: **160 N·m (118 lb ft)**
  - Final Pass: **plus an additional 35 degrees**



4. Install the NEW lower ball joint bolt (2) and nut (1) and tighten the to nut (1):
- First Pass: **30 N·m (22 lb ft)**
  - Final Pass: **plus an additional 35 degrees**
5. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
6. Remove the support and lower the vehicle.

Steering Linkage Outer Tie Rod Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Raise and support the vehicle. Refer to <a href="#">Lifting and Jacking the Vehicle</a> .</p> <p>2. Remove the front tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Steering Linkage Outer Tie Rod Nut</p> <p><b>Warning:</b> This component is equipped with torque-to-yield fasteners. Install a NEW torque-to-yield fastener when installing this component. Failure to replace the torque-to-yield fastener could cause bodily injury and damage to the vehicle or component.</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>1. Remove the steering linkage outer tie rod nut. DISCARD the nut.</p> <p>2. Install a NEW outer tie rod nut.</p> <p>3. Use the <i>EN-45059</i> meter in order to tighten the outer tie rod nut to the specification.</p> <p><b>Tighten</b></p> <p>1. 30 N·m (22 lbft)</p> <p>2. 128 degrees</p> <p><b>Special Tools</b></p> <p><i>EN-45059</i> Angle Meter</p> <p>For equivalent regional tools, refer to <a href="#">Special Tools</a> .</p>
2	<p>Steering Linkage Inner Tie Rod Nut</p>

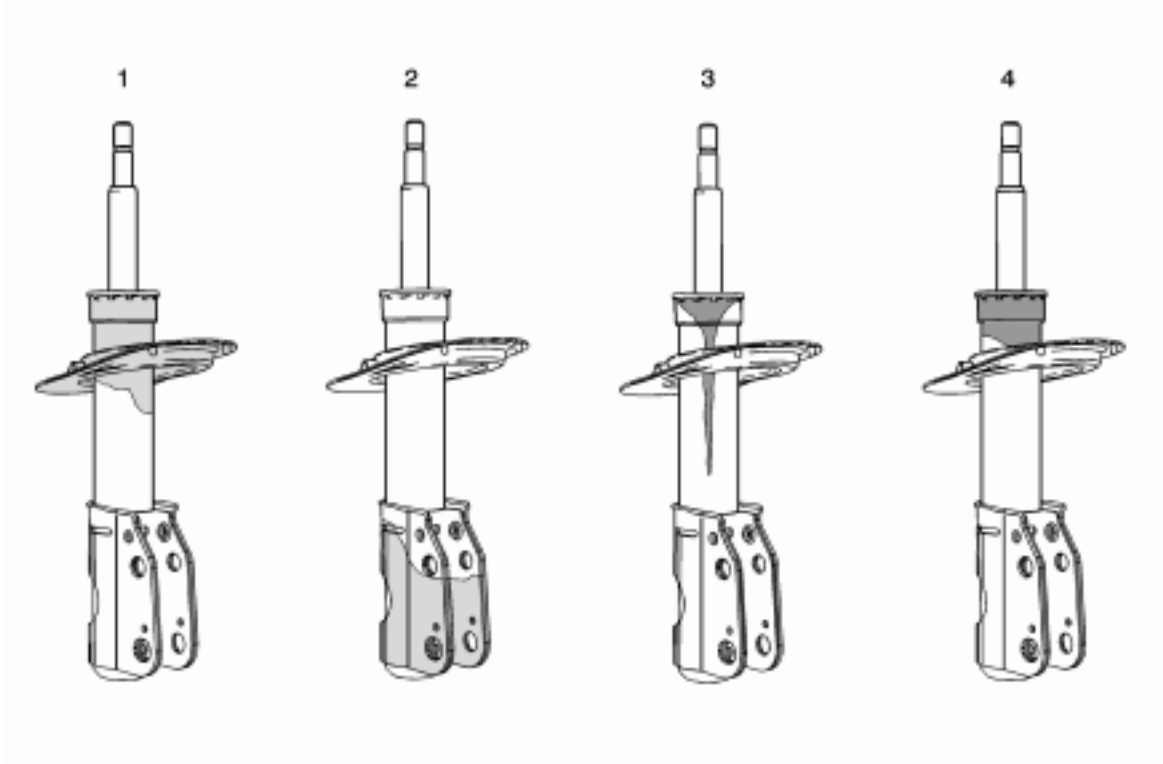
	<p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Use paint in order to place match marks on the steering linkage inner tie rod nut and on the steering linkage inner tie rod.</li><li>2. During installation, align the match marks.</li><li>3. Do not tighten the nut during installation. Tighten the nut after adjusting the front toe. Refer to <a href="#">Wheel Alignment - Steering Wheel Angle and/or Front Toe Adjustment</a> .</li></ol>
3	<p>Steering Linkage Outer Tie Rod</p> <p><b>Caution:</b> Do not free the ball stud by using a pickle fork or a wedge-type tool. Damage to the seal or bushing may result.</p> <p><b>Procedure</b></p> <ol style="list-style-type: none"><li>1. Use the <i>CH-161-B</i> puller in order to separate the steering linkage outer tie rod from the steering knuckle.</li><li>2. Inspect the steering linkage inner tie rod for bent or damaged threads.</li><li>3. Clean the tapered surface of the steering knuckle.</li><li>4. After the installation is complete, measure and adjust the front toe. Refer to <a href="#">Wheel Alignment - Steering Wheel Angle and/or Front Toe Adjustment</a> .</li></ol> <p><b>Special Tools</b></p> <p><i>CH-161-B</i> Bearing Puller</p> <p>For equivalent regional tools, refer to <a href="#">Special Tools</a> .</p>



## Strut and Shock Absorber Inspection (Strut)

**Note:** The strut assembly DOES NOT have to be removed from the vehicle to perform the following inspection procedure.

**Note:** A light film of oil on the top portion of the strut is normal. DO NOT replace the strut for this condition.



### Condition 1

Oil or fluid residue only on the bottom of the strut tube or on other strut components and not originating from the shaft seal, is not a strut related problem. DO NOT replace the strut, look for other external leaks.

### Condition 2

Light film/residue on the strut tube, but not on the spring seat and originating from the shaft seal, is a NORMAL condition. DO NOT replace the strut.

### Condition 3

Oil drip or trail down the strut tube and originating from the shaft seal, is an ABNORMAL condition. Replace the strut.

### Condition 4

Extreme wet film of oil covering the strut tube and pooling in the spring seat and originating from the shaft seal, is an ABNORMAL condition. Replace the strut.

### Inspection

1. Verify the customer's concern is present. If the concern is present, continue to the next step. If the concern is not present, then the vehicle is operating normally.  
**Note:** The strut assembly DOES NOT have to be removed from the vehicle to perform the following inspection procedure.
2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
3. Visually inspect each of the shock absorbers or struts for external fluid leaks. Refer to the following conditions 1, 2, 3, and 4 for visual inspection.
  - If conditions 1 or 2 are found, continue to step 4.
  - If conditions 3 or 4 are found, replace strut. Refer to Strut Replacement.
4. If equipped with electronic suspension control system, ensure that the system is working properly. Refer to Diagnostic Starting Point-Electronic Suspension Control.
5. Use your hands in order to lift up and push down on each corner of the vehicle 3 times. Remove your hands from the vehicle. If the corner motion exceeds 2 cycles, replace the strut. If the strut does not exceed 2 cycles, NO repair is necessary.



## Strut Assembly Removal and Installation

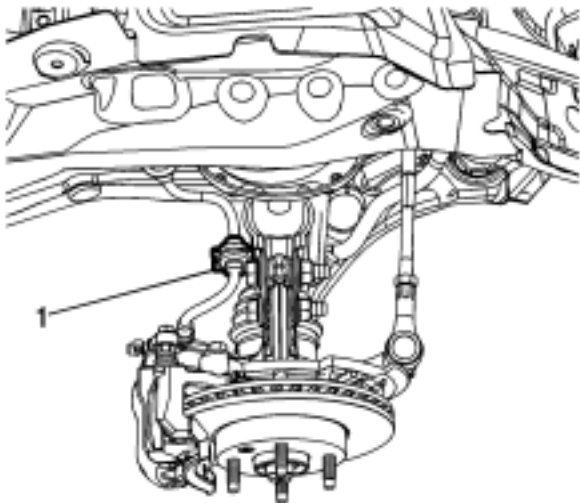
### Special Tools

CH35669 Strut Rod Nut Socket

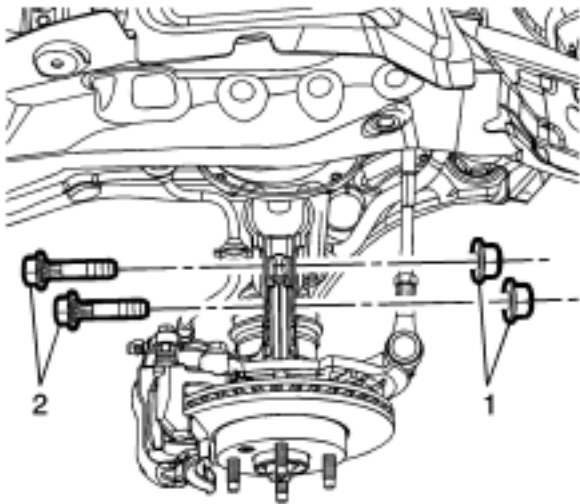
For equivalent regional tools, refer to [Special Tools](#)

### Removal Procedure

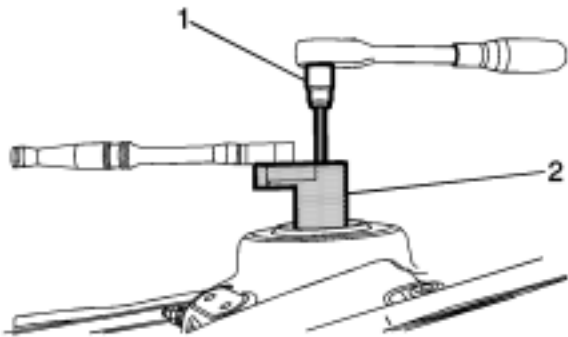
1. Remove the air inlet grille panel. Refer to [Air Inlet Grille Panel Replacement](#) .
2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
3. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
4. Remove the stabilizer shaft link from the front strut assembly. Refer to [Stabilizer Shaft Link Replacement](#) .



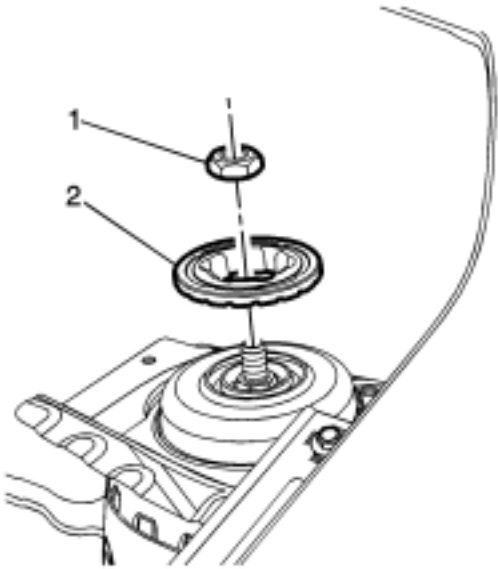
5. Remove the front brake hose(1) from the front strut assembly.
6. Remove the speed sensor wiring harness from the front strut assembly, if needed.
7. Remove the outer tie rod end from the steering knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#) .
8. Support the lower control arm with a jack stand.



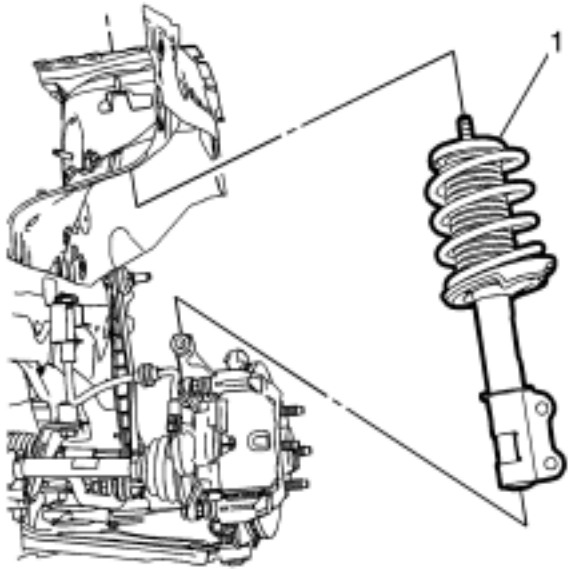
9. Remove the front strut nut (1) and the bolt (2) from the front strut. Discard the nut and replace with NEW only.



10. Using the *CH35669* socket (2) and the proper size allen wrench, loosen the front strut nut.

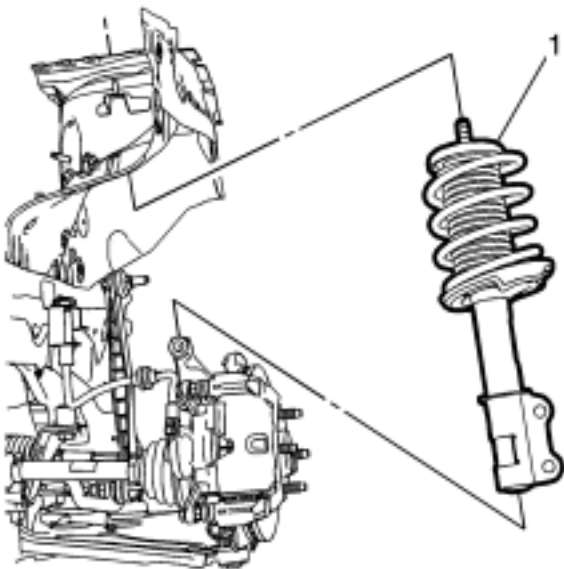


11. Remove the front strut nut (1) and the retaining plate (2). Discard the nut and replace with NEW only.

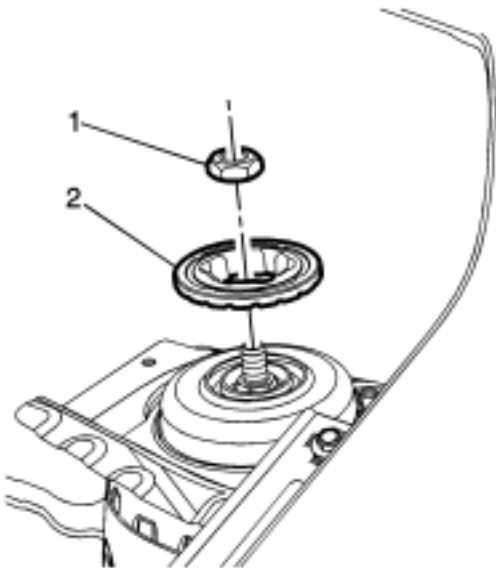


12. Remove the front strut assembly from the vehicle (1).
13. If removing the front strut assembly to service any of the front strut components, refer to [Strut, Strut Component, or Spring Replacement](#) .

Installation Procedure

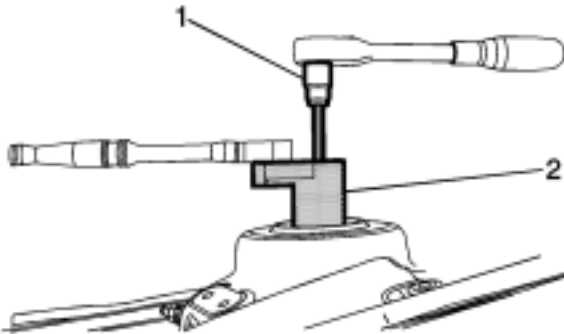


1. Position the front strut assembly (1) in the vehicle.

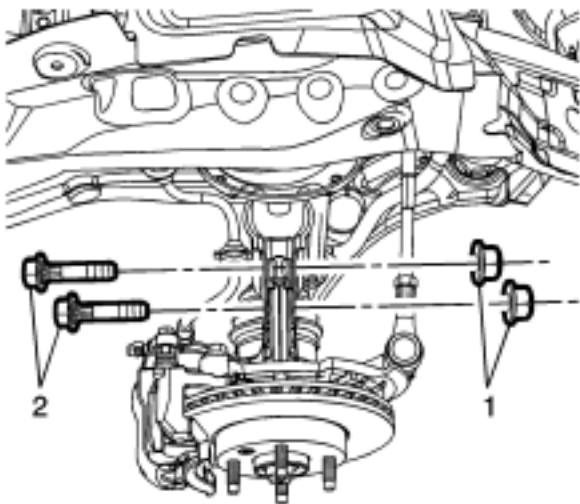


2. Install the NEW front strut nut (1) and the retaining plate (2).

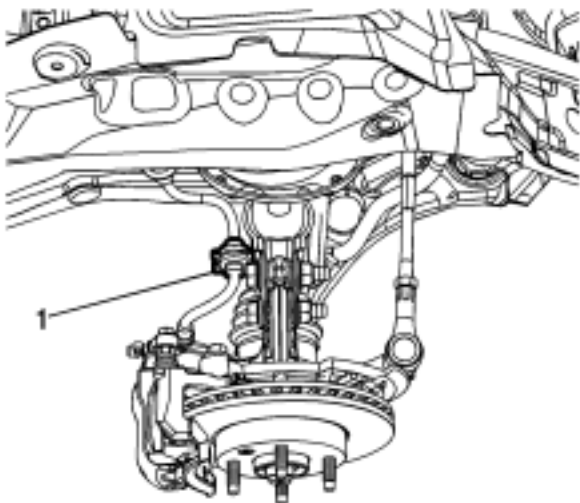
**Caution:** Refer to [Fastener Caution](#) .



3. Using the CH35669 socket (2) and the proper size allen wrench, tighten the nut to **35 N·m (26 lb ft)**.

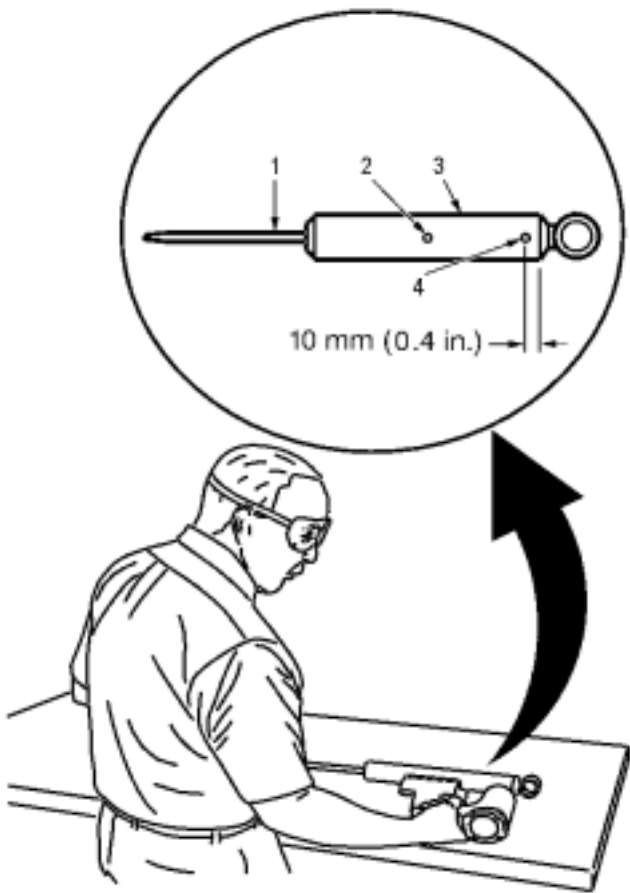


- 4. Install the NEW front strut nut(1) and the bolt (2) from the front strut and tighten the nut to **110 N·m (82 lb ft)**.
- 5. Install the stabilizer shaft link in the front strut assembly. Refer to [Stabilizer Shaft Link Replacement](#) .
- 6. Remove the jack stand from the lower control arm.
- 7. Install the outer tie rod end in the steering knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#) .
- 8. Install the speed sensor wiring harness on the front strut assembly, if needed.



- 9. Install the front brake hose(1) on the front strut assembly.
- 10. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
- 11. Remove the support and lower the vehicle.
- 12. Install the air inlet grille panel. Refer to [Air Inlet Grille Panel Replacement](#) .

## Shock Absorber Disposal



**Warning:** Gas charged shock absorbers contain high pressure gas. Do not remove the snap ring from inside the top of the tube. If the snap ring is removed, the contents of the shock absorber will come out with extreme force which may result in personal injury.

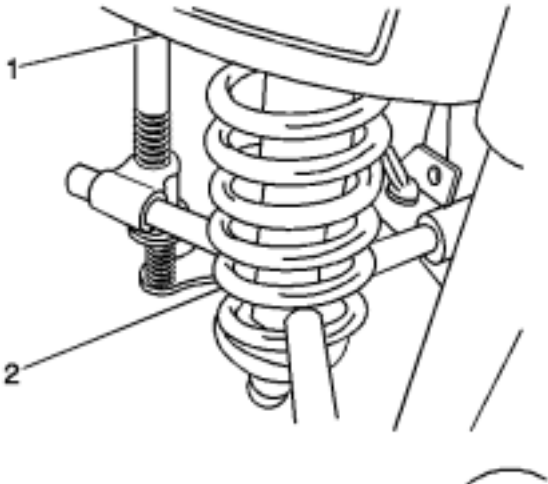
**Warning:** To prevent personal injury, wear safety glasses when centerpunching and drilling the shock absorber. Use care not to puncture the shock absorber tube with the centerpunch.

1. Make an indentation 10 mm (0.4 in) from the bottom (4) of the tube (3) using a centerpunch.
2. Clamp the shock absorber in a vise horizontally with the shock absorber rod (1) completely extended.
3. Drill a hole in the shock absorber at the centerpunch (4) using a 5 mm (3/16 in) drill bit. Gas or a gas/oil mixture will exhaust when the drill bit penetrates the shock absorber. Use shop towels in order to contain the escaping oil.
4. Make an indentation in the middle (2) of the tube (3) with a centerpunch.
5. Drill a second hole in the shock absorber at the centerpunch (2) using a 5 mm (3/16 in) drill bit. Oil will exhaust when the drill bit penetrates the shock absorber. Use shop towels in order to contain the escaping oil.
6. Remove the shock absorber from the vise. Hold the shock absorber over a drain pan horizontally with the holes down. Move the rod (1) in and out of the tube (3) to completely drain the oil from the shock absorber.

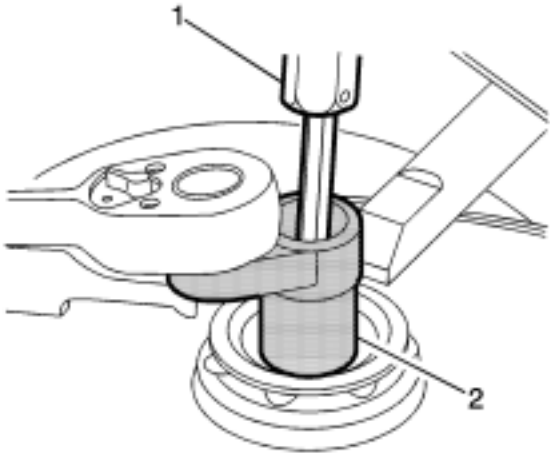
## Strut, Strut Component, or Spring Replacement

### Disassembly Procedure

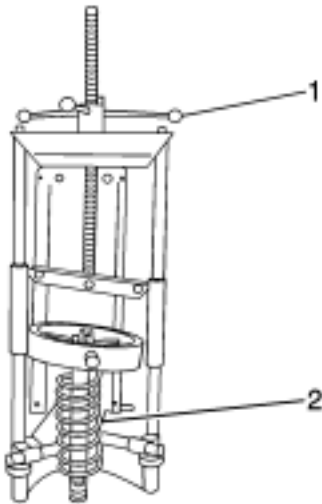
1. Remove the front suspension strut from the vehicle. Refer to [Strut Assembly Removal and Installation](#) .



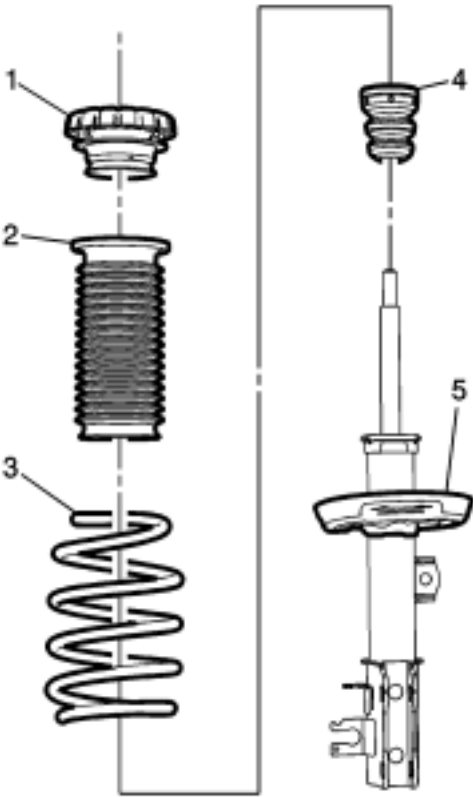
2. Install the front suspension strut (2) in the spring compressor (1).  
**Note:** The spring is compressed when the strut moves freely.
3. Using the spring compressor (1), compress the front spring.



4. Using a TORX® bit (1) and the appropriate socket (2), loosen the front suspension strut nut.

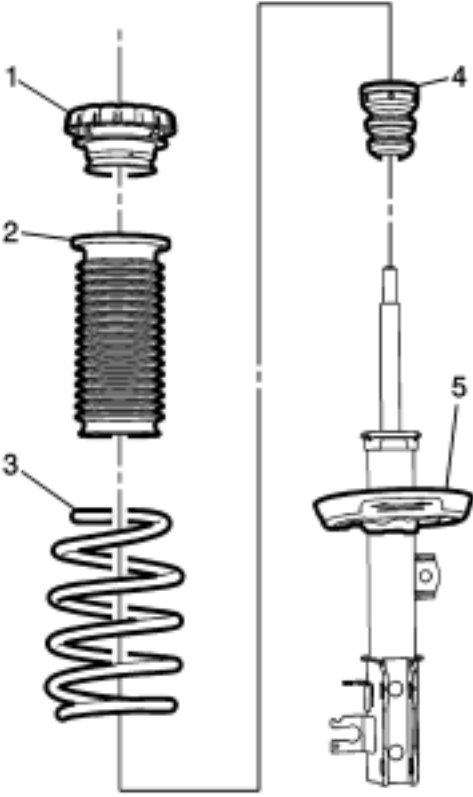


5. Slowly loosen the spring compressor (2) to remove the front suspension strut components to be serviced.

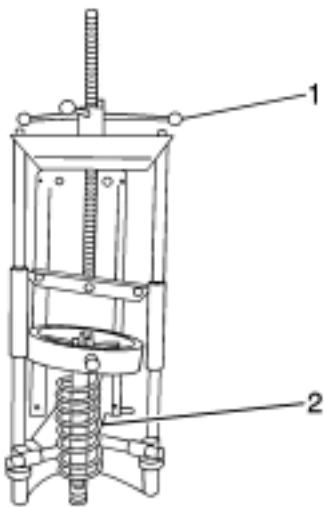


6. Remove the front suspension strut mount (1), front spring insulator (2), front spring (3), front suspension strut bumper (4), and the front strut (5) from the spring compressor.

Assembly Procedure

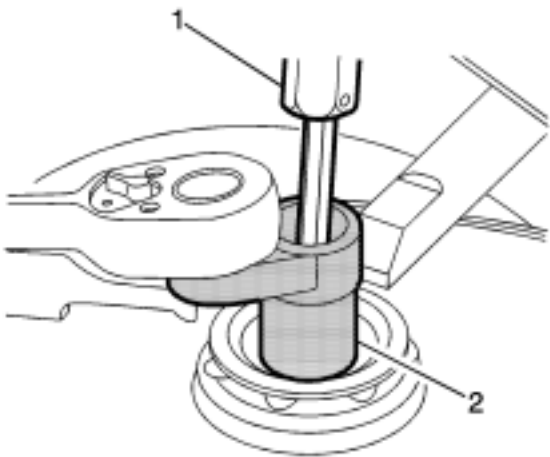


1. Install the front suspension strut (5), front suspension strut bumper (4), front spring (3), front spring insulator (2), and the front suspension strut mount (1) in the spring compressor.



- 2. Using the spring compressor (1), compress the front spring assembly (2) install the front strut spring mount nut.
- 3. Hand tighten the front suspension strut nut.

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



**Note:** Use the proper size TORX® bit, hold the strut shaft.

- 4. Using the appropriate size socket (2) and the TORX® bit (1), tighten the front suspension strut nut to **65 N·m (48 lb ft)**.
- 5. Remove the front suspension strut from the spring compressor.
- 6. Install the front suspension strut to the vehicle. Refer to [Strut Assembly Removal and Installation](#) .



## Front Suspension Description and Operation

The front suspension has 2 primary purposes:

- Isolate the driver from irregularities in the road surface.
- Define the ride and handling characteristics of the vehicle.

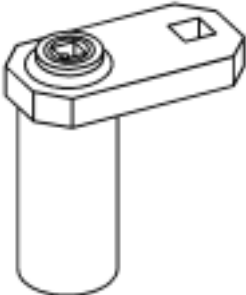

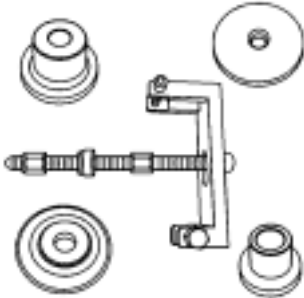
The front suspension absorbs the impact of the tires travelling over irregular road surfaces and dissipates this energy throughout the suspension system. This process isolates the vehicle occupants from the road surface. The rate at which the suspension dissipates the energy and the amount of energy that is absorbed is how the suspension defines the vehicles ride characteristics. Ride characteristics are designed into the suspension system and are not adjustable. The ride characteristics are mentioned in this description in order to aid in the understanding of the functions of the suspension system. The suspension system must allow for the vertical movement of the tire and wheel assembly as the vehicle travels over irregular road surfaces while maintaining the tire's horizontal relationship to the road.

This requires that the steering knuckle be suspended between a lower control arm and a strut assembly. The lower control arm attaches from the steering knuckle at the outermost point of the control arm. The attachment is through a ball and socket type joint. The innermost end of the control arm attached at 2 points to the vehicle frame through semi-rigid bushings. The upper portion of the steering knuckle is attached to a strut assembly. The strut assembly then connects to the vehicle body by way of an upper bearing. The steering knuckle is allowed to travel up and down independent of the vehicle body structure and frame.

This up and down motion of the steering knuckle as the vehicle travels over bumps is absorbed predominantly by the coil spring. This spring is retained under tension over the strut assembly. A strut is used in conjunction with this system in order to dampen out the oscillations of the coil spring. A strut is a basic hydraulic cylinder. The strut is filled with oil and has a moveable shaft that connects to a piston inside the strut. Valves inside the shock absorber offer resistance to oil flow and consequently inhibit rapid movement of the piston and shaft. Each end of the shock absorber is connected in such a fashion to utilize this recoil action of a spring alone. Each end of the strut is designed as the connection point of the suspension system to the vehicle and acts as the coil spring seat. This allows the strut to utilize the dampening action to reduce the recoil of a spring alone. The lower control arm is allowed to pivot at the vehicle frame in a vertical fashion. The ball joint allows the steering knuckle to maintain the perpendicular relationship to the road surface.

Front suspensions systems utilize a stabilizer shaft. The stabilizer bar connects between the left and right lower control arm assemblies through the stabilizer link and stabilizer shaft insulators. This bar controls the amount of independent movement of the suspension when the vehicle turns. Limiting the independent movement defines the vehicles handling characteristics on turns.

Special Tools

Illustration	Tool Number/ Description
	CH49375 Strut Rod Nut Socket
	CH43631 Ball Joint Remover
	CH50559 Wheel Hub/Bearing Remover/Installer Kit



Rear Suspension

SUSPENSION

Specifications	Rear Spring Insulator and Jounce Bumper Replacement
Strut and Shock Absorber Inspection	Description and Operation
Shock Absorber Replacement	Special Tools



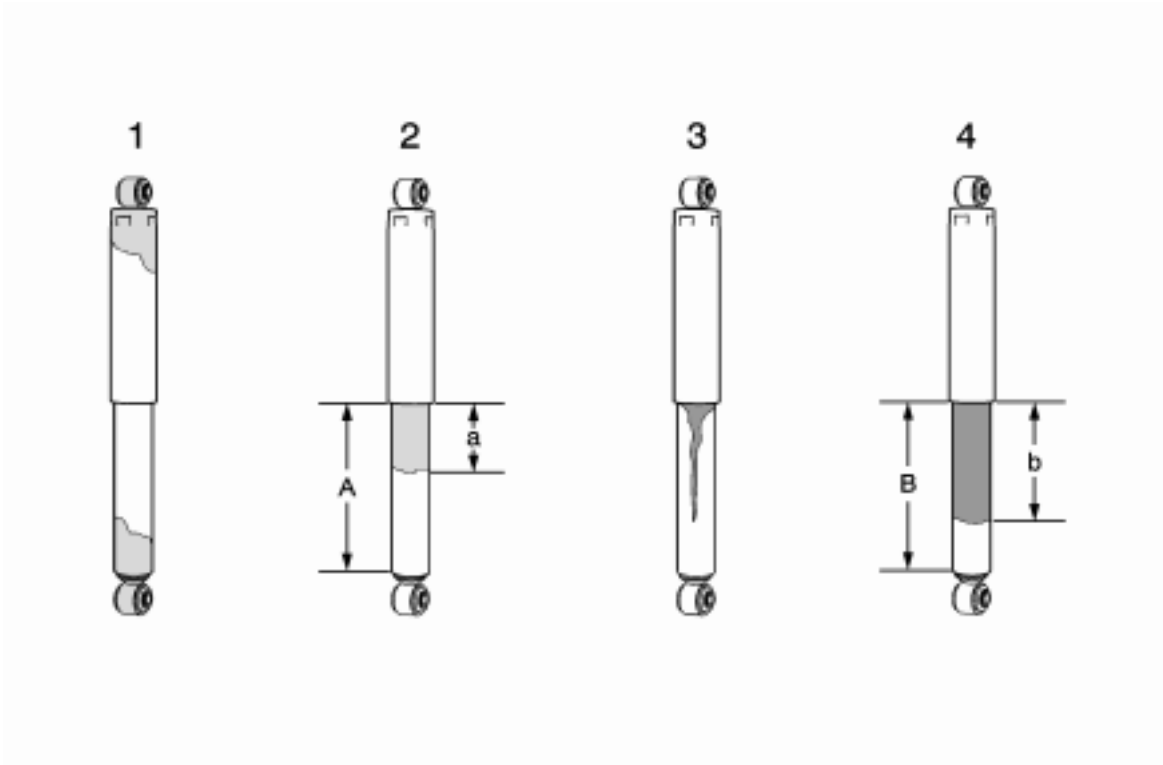
Fastener Tightening Specifications

Application	Specification	
	Metric	English
Rear Axle to Body Bolts	175 N·m	129 lb ft
Rear Wheel Bearing and Hub Bolts	58 N·m	43 lb ft
Shock Absorber-to-Axle Bolt– Lower	120 N·m	89 lb ft
Shock Absorber Nut	25 N·m	18 lb ft
Shock Absorber-to-Upper Mount Bolts	58 N·m	43 lb ft

Strut and Shock Absorber Inspection (Shock Absorber)

**Note:** The shock absorber assembly DOES NOT have to be removed from the vehicle to perform the following inspection procedure.

**Note:** A light film of oil on the top portion of the lower shock absorber tube is normal. DO NOT replace the shock absorber for this condition.



Condition 1

Oil or fluid residue only on the bottom or top of the shock absorber and not originating from the shaft seal, is not a shock absorber related problem. DO NOT replace the shock absorber, look for other external leaks.

Condition 2

Light film/residue on approximately 1/3 (a) or less of the lower shock tube (A) and originating from the shaft seal, is a NORMAL condition. DO NOT replace the shock absorber.

Condition 3

Oil drip or trail down the lower shock tube and originating from the shaft seal, is an ABNORMAL condition. Replace the shock absorber.

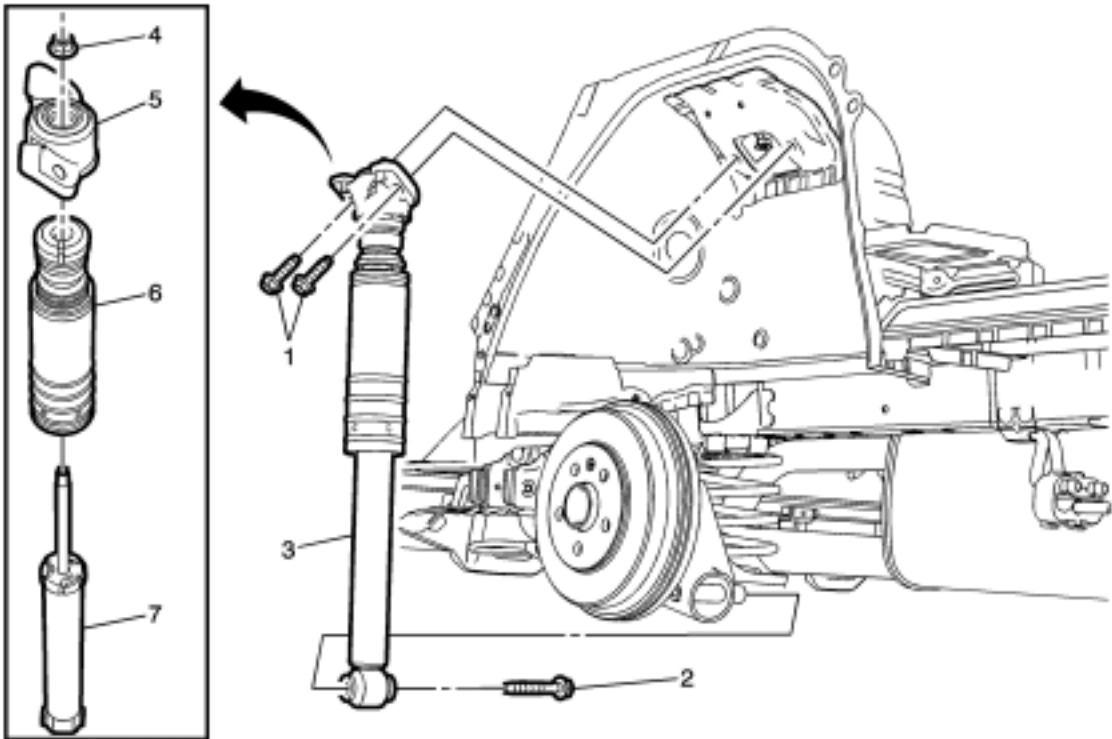
Condition 4

An extreme wet film of oil covering more than 1/3 (b) of the lower shock tube and originating from the shaft seal (B), is an ABNORMAL condition. Replace the shock absorber. Refer to [Shock Absorber Replacement](#) .

Inspection

1. Verify the customer's concern is present. If the concern is present, continue to the next step. If the concern is not present, then the vehicle is operating normally.  
**Note:** The shock absorber assembly DOES NOT have to be removed from the vehicle to perform the following inspection procedure.
2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
3. Visually inspect each of the shock absorbers for external fluid leaks. Refer to the following conditions 1, 2, 3, and 4 for visual inspection.
  - If conditions 1 or 2 are found, continue to step 4.
  - If conditions 3 or 4 are found, replace shock absorber. Refer to [Shock Absorber Replacement](#) .
4. If equipped with electronic suspension control system, ensure that the system is working properly. Refer to Diagnostic Starting Point – Electronic Suspension Control.
5. Use your hands in order to lift up and push down on each corner of the vehicle 3 times. Remove your hands from the vehicle. If the corner motion exceeds 2 cycles, replace the shock absorber. If the shock absorber does not exceed 2 cycles, NO repair is necessary.

Shock Absorber Replacement



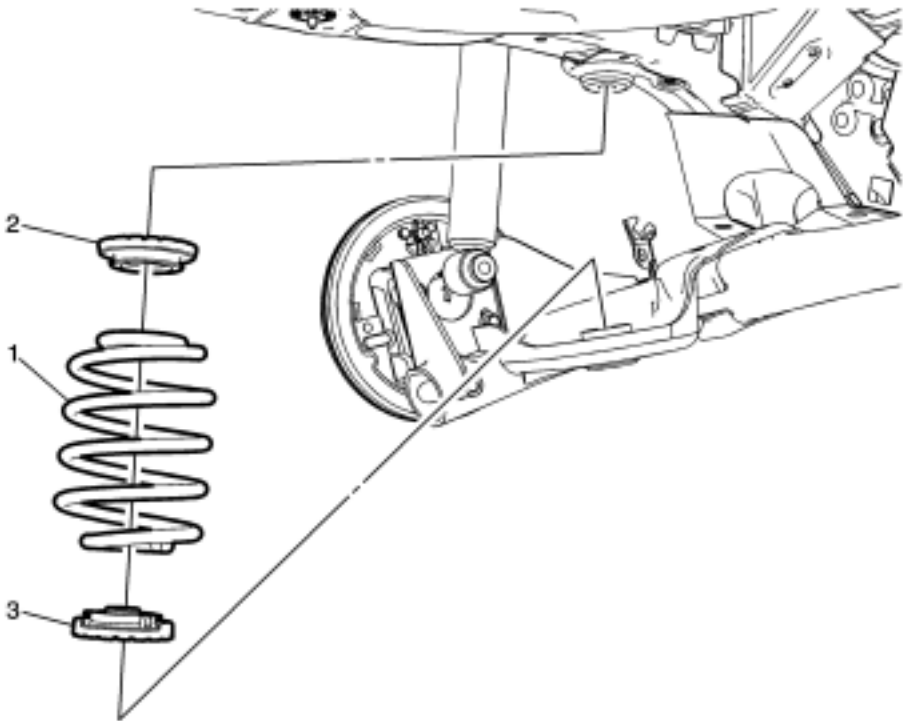
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Raise and support the vehicle. Refer to <a href="#">Lifting and Jacking the Vehicle</a> .</p> <p>2. Remove the tire and wheel assembly. Refer to <a href="#">Tire and Wheel Removal and Installation</a> .</p>	
1	<p>Rear Shock Absorber Upper Bolt (Qty: 2)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Procedure</b></p> <p>Support the rear axle with a hydraulic jack.</p> <p><b>Tighten</b> 58 N·m (43 lb ft)</p>
2	<p>Rear Shock Absorber Lower Bolt</p> <p><b>Tighten</b> 120 N·m (89 lb ft)</p>
3	<p>Rear Shock Absorber Assembly</p>
4	<p>Shock Absorber Nut</p> <p><b>Tighten</b> 25 N·m (18 lb ft)</p>
5	<p>Shock Absorber Mount</p>



6	Shock Absorber Bumper
7	Rear Shock Absorber



Rear Spring, Insulator, and Jounce Bumper Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Raise and support the vehicle. Refer to <a href="#">Lifting and Jacking the Vehicle</a> .</p>	
1	<p>Rear Spring</p> <p><b>Procedure</b></p> <p>1. If removing the rear spring to service other suspension components, note the position of the rear spring in relationship to the insulators.</p> <p>2. Support the rear axle with a hydraulic jack.</p> <p>3. Remove the lower rear shock absorber bolt. Refer to <a href="#">Shock Absorber Replacement</a> .</p>
2	<p>Upper Rear Spring Insulator</p> <p><b>Tip</b> Ensure that the rear spring insulator is properly seated in the rear frame rail.</p>
3	<p>Lower Rear Spring Insulator</p> <p><b>Tip</b> Ensure that the rear spring insulator is properly seated in the rear axle.</p>





## Rear Suspension Description and Operation

This vehicle has a beam rear suspension system consisting of the following components:

- An axle with integral trailing arms
- A cross beam
- Two coil springs
- Two standard shock absorbers

### Axle Assembly

The axle assembly attaches to the underbody through a rubber bushing and bracket located at the front of each integral trailing arm. The brackets are bolted to the underbody side rails. The axle structure itself maintains the geometrical relationship of the wheels relative to the centerline of the body.

Rear camber and tow are not adjustable. Replace any damaged suspension components as necessary.

### Coil Spring

The coil springs support the weight of the vehicle in the rear. Rubber insulators isolate the coil spring at the upper and lower spring seat.

### Shock Absorber

The shock absorbers are connected to the rear axle and the vehicle underbody. The shock absorbers are non-adjustable and non-refillable. Service of the shocks requires replacement of the shock assembly.


### Wheel Bearing/ Hub Assembly

A single hub and bearing assembly is bolted to both ends of the rear axle assembly. The hub and bearing assembly is a sealed unit that eliminates the need for wheel bearing adjustment or periodic maintenance.

Although the rear suspension components are lubricated for life and require no routine lubrication, they should be inspected periodically for damage and wear.



Special Tools

Illustration	Tool Number/ Description
	CH43631 Ball Joint Remover



Tyres and Wheels

SUSPENSION

Specifications

Aluminum Wheel Porosity Repair

Aluminum Wheel Refinishing

Tire and Wheel Removal and Installation





## Fastener Tightening Specifications

Application	Specification	
	Metric	English
Wheel Nuts	140 N·m	103 lb ft





## Aluminum Wheel Porosity Repair

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the tire and wheel. Refer to [Tire and Wheel Removal and Installation](#) .
3. Inflate the tire to the manufacturer specified pressure as stated on the tire.
4. Submerge the tire/wheel into a water bath in order to locate the leak.
5. Inscribe a mark on the wheel in order to indicate the leak areas.
6. Inscribe a mark on the tire at the valve stem in order to indicate the orientation of the tire to the wheel.
7. Remove the tire from the wheel. Refer to [Tire Dismounting and Mounting](#) .  
**Important:** Do not damage the exterior surface of the wheel.
8. Use number 80grit sandpaper to scuff the inside of the rim surface at the leak area.
9. Use general purpose cleaner such as 3M®, P/N08984 or equivalent, to clean the leak area.
10. Apply 3 mm (0.12in) thick layer of adhesive/sealant, GM P/N1052366 or equivalent, to the leak area.
11. Allow for the adhesive/sealant to dry.
12. Align the inscribed mark on the tire with the valve stem on the wheel.
13. Install the tire to the wheel. Refer to [Tire Dismounting and Mounting](#) .
14. Inflate the tire to the manufacturer specified pressure as stated on the tire.
15. Submerge the tire/wheel into a water bath in order ensure the leak is sealed.
16. Balance the tire and wheel. Refer to [Tire and Wheel Assembly Balancing - Off Vehicle](#) .
17. Install the tire and wheel. Refer to [Tire and Wheel Removal and Installation](#) .
18. Lower the vehicle.



# Aluminum Wheel Refinishing

## Finish Damage Evaluation Procedure

**Note:**

- If the wheels are chrome-plated, do not re-plate or refinish the wheels.
- If the wheels are polished aluminum, do not refinish the wheels in the dealer environment. Utilize a refinisher that meets manufacturer guidelines.

1. Inspect the wheels for damage from uncoated wheel balance weights or from automatic car wash facilities.
2. Inspect the wheels for the following conditions:
  - Corrosion
  - Scrapes
  - Gouges
3. Verify the damage is not deeper than what sanding can remove.
4. Inspect the wheels for cracks. If a wheel has cracks, discard the wheel.
5. Inspect the wheels for bent rim flanges. If a rim flange is bent, discard the wheel.

## Refinishing Procedure

**Warning:** To avoid serious personal injury when applying any two part component paint system, follow the specific precautions provided by the paint manufacturer. Failure to follow these precautions may cause lung irritation and allergic respiratory reaction.

1. Remove the tire and wheel assembly from the vehicle. Refer to [Tire and Wheel Removal and Installation](#) .
2. Remove the balance weights from the wheel.
3. Remove the tire from the wheel. Refer to [Tire Dismounting and Mounting](#) .
4. Use a suitable cleaner in order to remove the following contaminants from the wheel:
  - Lubricants
  - Wax
  - Dirt

**Note:**

- Do not re-machine the wheel.
- Do not use chemicals in order to strip the paint from the wheel.

5. Use plastic media blasting in order to remove the paint from the wheel.
6. If the wheel had a machined aluminum finish, spin the wheel and use sand paper in order to restore the circular machined appearance.

**Note:** The wheel mounting surface and the wheel nut contact surface must remain free of paint.
7. Mask the wheel mounting surface and the wheel nut contact surface.
8. Follow the paint manufacturer's instructions for painting the wheel.
9. Unmask the wheel.
10. Install a new valve stem.

**Note:** Use new coated balance weights in order to balance the wheel.

11. Install the tire to the wheel. Refer to [Tire Dismounting and Mounting](#) .
12. Use a suitable cleaner in order to remove the following contaminants from the wheel mounting surface:
  - Corrosion
  - Overspray
  - Dirt
13. Install the tire and wheel assembly to the vehicle. Refer to [Tire and Wheel Removal and Installation](#) .

## Tire and Wheel Removal and Installation

### Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. If rotating the tires, refer to [Tire Rotation](#) .
3. Remove the wheel center cap, if equipped.
4. Remove the wheel center cap nuts, if equipped.
5. Remove the wheel nuts.
6. Remove the tire and wheel assembly.

**Caution:** Never use heat to loosen a tight wheel bolt or nut. This can shorten the life of wheel and damage wheel bearings.

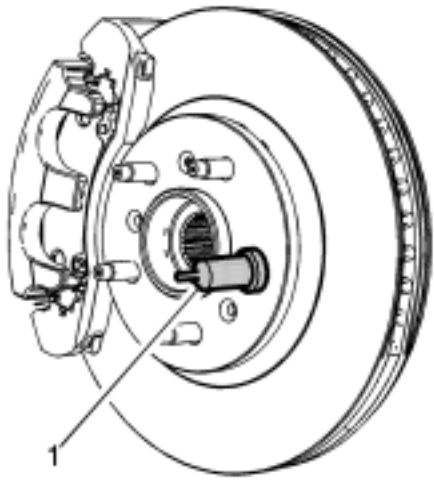
7. If the tire and wheel assembly is difficult to remove or cannot be removed, perform the following steps:
  - 7.1 Apply a small amount of penetrating oil to the wheel nuts, and the center hub. Allow a few moments for the penetrating oil to work.
  - 7.2 Loosen each wheel nut 2 complete turns.
  - 7.3 Lower the vehicle.
  - 7.4 Rock the vehicle from side to side.
  - 7.5 Repeat the procedure if necessary.
8. If the tire and wheel assembly still does not loosen, perform the following:
  - 8.1 Start the engine.
  - 8.2 Allow the vehicle to move forward, and quickly apply the brakes. Repeat this procedure in reverse.
  - 8.3 Repeat this procedure if necessary.
9. With the tire and wheel assembly loose, raise and support the vehicle.
10. Remove the tire and wheel assembly.

**Caution:** Before installing wheels, remove any build-up of corrosion on the wheel mounting surface by scraping and wire brushing. Installing wheels without good metal-to-metal contact at the mounting surfaces can cause wheel bolts or nuts to loosen, which can later allow a wheel bolt or nut to come off while the vehicle is moving. Wheel bolts or nuts must be tightened in sequence and to proper torque to avoid bending the wheel, brake drum or rotor.

### Note:

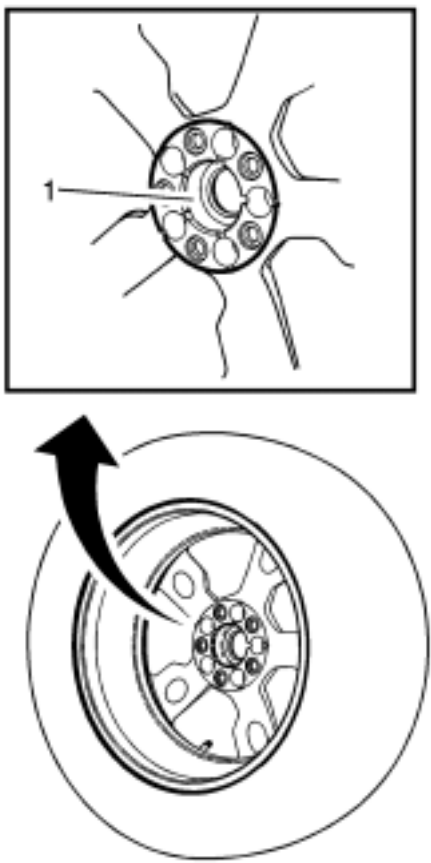
- Wear approved safety glasses when performing the following service procedures.
- DO NOT use power grinders to clean any of the brake rotor or brake drum to wheel contact areas.

11. Using a wire brush or wire wheel, clean the rotor to the wheel or brake drum to wheel hub contact area.
12. Using the appropriate special tool, clean the contact areas of the wheel to brake rotor or brake drum.



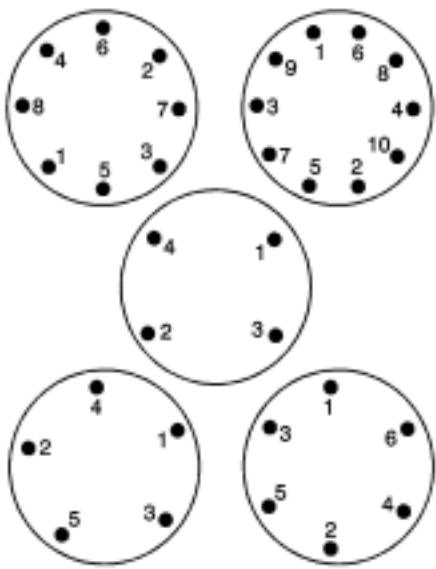
13. Using the appropriate special tool (1), clean the surface around the wheel studs.
14. Clean the threads of the wheel studs. If the threads are damaged, replace the wheel stud.
  - For the front wheel stud replacement, refer to [Wheel Stud Replacement](#) .
  - For the rear wheel stud replacement, refer to [Wheel Stud Replacement](#) .
15. After cleaning all the contact areas, use brake clean or denatured alcohol to remove all the penetrating oil, dirt and debris from the wheel nuts, brake rotor or brake drum.
16. Inspect and clean the contact area of the wheel. Refer to [Wheel Mounting Surface Check](#) .

Installation Procedure



**Note:** Only apply a small amount the lubricant to the pilot hole of the wheel and NOT the wheel bearing flange. DO NOT apply it to the entire pilot hole of the wheel.

- 1. Apply a small amount of lubricant to the inner diameter of the wheel hub pilot hole (1) where it contacts the with the wheel bearing/hub flange.
- 2. Install the tire and wheel assembly.
- 3. Hand start the wheel nuts.



**Caution:** Improperly tightened wheel bolts or nuts can lead to brake pulsation and rotor damage. In order to avoid expensive brake repairs, evenly tighten the wheel bolts or nuts to the proper torque specification.

- 4. Using the proper size socket and the torque wrench, tighten the wheel nuts in the proper sequence to **140 N·m (100 lb ft)**.
- 5. Install the wheel center cap, if required.
- 6. Install the wheel cap nuts, if required.
- 7. Remove the support and lower the vehicle.





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Refrigerant Recovery and Recharging	Heater Inlet Hose Replacement (Diesel)	
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Air Conditioning Compressor Replacement (1.6L or 1.8L)	Instrument Panel Outer Air Outlet Replacement - Left Side	
Air Conditioning Compressor Replacement (1.2L or 1.4L)	Instrument Panel Center Air Outlet Replacement	
Air Conditioning Compressor Replacement (Diesel)	Instrument Panel Outer Air Outlet Replacement - Right Side	
Air Conditioning Compressor Bracket Replacement (Diesel)	Instrument Panel Outer Air Outlet Duct Replacement	
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Heater Outlet Hose Replacement (1.6L or 1.8L)		
Heater Outlet Hose Replacement (1.2L or 1.8L)		



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Air Conditioning Compressor Clutch Bolt	14 N·m	16 lb ft
Air Conditioning Compressor Coil Bolt	4 N·m	35 lb in
Air Conditioning Compressor Mounting Bolts	22 N·m	16 lb ft
Air Conditioning Compressor And Condenser Hose Nut	22 N·m	16 lb ft
Air Conditioning Compressor And Condenser Hose Bolt	22 N·m	16 lb ft
Air Conditioning Evaporator Hose Assembly Nut	22 N·m	16 lb ft
Air Conditioning Refrigerant Pressure Sensor	6 N·m	54 lb in
Air Inlet Housing Fastener	1.2 N·m	11 lb in
Air Inlet Valve Actuator Screw	1.2 N·m	11 lb in
Blower Motor Resistor Screw	1.2 N·m	11 lb in
Blower Motor Screws	1.2 N·m	11 lb in
Blower Motor Service Ring Screws	1.2 N·m	11 lb in
Center Air Distributor Duct Screw	2.5 N·m	22 lb in
Cover Assembly Screw - Heater	1.2 N·m	11 lb in
HVAC Module Assembly Fastener	22 N·m	16 lb ft
Thermal Expansion Valve Bolt	7 N·m	62 lb in

Thermal Expansion Valve Bolt	7 N·m	62 lbin

Refrigerant System Specifications

Application	Specification	
	Metric	English
PAG Oil ISU 105		
Compressor Replacement The service compressor for all Engines for T300 is precharged with 70 ml (2.5 oz) of PAG oil.		
Condenser Replacement	30-40 ml	1.0-1.4 oz
Evaporator Replacement	30-40 ml	1.0-1.4 oz
Total System PAG Oil Capacity	110 ml	3.7 oz
R-134a		
Refrigerant Charge	500 g	17.6 oz

## Refrigerant Recovery and Recharging

### Special Tools

GE-45037 A/C Oil Injector

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

**Warning:** To prevent personal injury, avoid breathing A/C Refrigerant and lubricant vapor or mist. Work in a well ventilated area. To remove refrigerant from the A/C System, use service equipment designed for recovery that is certified to meet the requirements of the appropriate SAE Standards. If an accidental system discharge occurs, ventilate the work area before continuing service. Additional health and safety information may be obtained from the refrigerant, refrigerant recovery, and lubricant manufacturers.

**Warning:** For personal protection, goggles and lint-free gloves should be worn and a clean cloth wrapped around fittings, valves, and connections when doing work that includes opening the refrigerant system. If refrigerant comes in contact with any part of the body severe frostbite and personal injury can result. The exposed area should be flushed immediately with cold water and prompt medical help should be obtained.

**Caution:** R-134a is the only approved refrigerant for use in this vehicle. The use of any other refrigerant may result in poor system performance or component failure.

**Caution:** To avoid system damage use only R-134a dedicated tools when servicing the A/C system.

**Caution:** Use only Polyalkylene Glycol Synthetic Refrigerant Oil (PAG) for internal circulation through the R-134a A/C system and only 525 viscosity mineral oil on fitting threads and O-rings. If lubricants other than those specified are used, compressor failure and/or fitting seizure may result.

**Caution:** R-12 refrigerant and R-134a refrigerant must never be mixed, even in the smallest of amounts, as they are incompatible with each other. If the refrigerants are mixed, compressor failure is likely to occur. Refer to the manufacturer instructions included with the service equipment before servicing.

The air conditioning filling device service center is a complete air conditioning service center for R-134a. The ACR2000 recovers, recycles, evacuates and recharges A/C refrigerant quickly, accurately and automatically. The unit has a display screen that contains the function controls and displays prompts that will lead the technician through the recover, recycle, evacuate and recharge operations. R-134a is recovered into and charged out of an internal storage vessel. The ACR2000 automatically replenishes this vessel from an external source tank in order to maintain a constant 5.45–6.82kg (12–15lb) of A/C refrigerant.

The ACR2000 has a built in A/C refrigerant identifier that will test for contamination, prior to recovery and will notify the technician if there are foreign gases present in the A/C system. If foreign gases are present, the ACR2000 will not recover the refrigerant from the A/C system.

The ACR2000 also features automatic air purge, single pass recycling and an automatic oil drain.

Refer to the air conditioning filling device service center manual for operation and setup instruction. Always recharge the A/C system with the proper amount of R-134a. Refer to [Refrigerant System Specifications](#) for the correct amount.

### A/ C Refrigerant System Oil Charge Replenishing

If oil was removed from the A/C system during the recovery process or due to component replacement, the oil must be replenished. Oil can be injected into a charged system using

GE-45037 injector

. For the proper quantities of oil to add to the A/C refrigerant system, refer to [Refrigerant System Specifications](#) .

## Flushing

### Special Tools

- *BO42220* Universal 12V Leak Detection Lamp
- *GE41447* R-134A A/C Tracer Dye Box of 24
- *GE45268* A/C Flush Adapter Kit

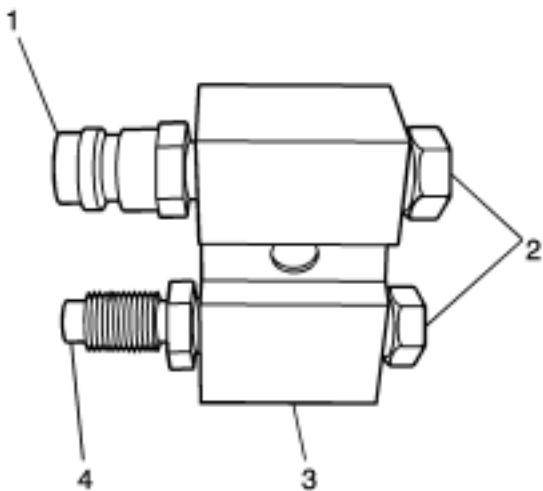
For equivalent regional tools, refer to [Special Tools](#) .

**Note:** Flushing with the ACR 2000 is not intended to remove metal from the A/C system.

Flushing is intended to remove the following:

- Contaminated polyalkylene glycol (PAG) oil
- Desiccant, following a desiccant bag failure
- Overcharge of PAG oil
- Refrigerant contamination

### Forward Flushing Setup



**Note:** Forward flow refrigerant flushing is recommended for contaminated refrigerant or PAG oil.

**Note:** Inspect and lubricate *GE 45268* adapter kit fitting O-rings. Refer to [Air Conditioning O-Ring Seal Replacement](#)

1. Install both *GE 45268-9* fitting O-ring onto *GE 45268-10* adapter .
2. Install *GE 45268-8* fitting O-ring onto suction side of *GE 45268-10* adapter .
3. Install *GE 45268-7* fitting O-ring onto discharge side of *GE 45268-10* adapter .

### Reverse Flushing Setup

**Note:**

- Reverse flow refrigerant flush is recommended for desiccant bag failure. Replace condenser/receiver dehydrator assembly when A/C flush is complete and perform the following procedure:
- Inspect and lubricate *GE 45268* adapter kit fitting O-rings. Refer to [Air Conditioning O-Ring Seal Replacement](#)

1. Install both *GE 45268-9* fitting O-ring onto *GE 45268-10* adapter .
2. Install *GE 45268-8* fitting O-ring onto suction side of *GE 45268-10* adapter .
3. Install *GE 45268-7* fitting O-ring onto discharge side of *GE 45268-10* adapter .

### Flush Procedure

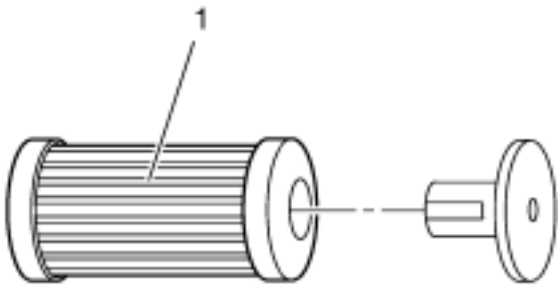
**Note:** Warmer engine or ambient temperatures decreases refrigerant recovery time during the A/C flush procedure.

1. Recover the refrigerant. Refer to [Refrigerant Recovery and Recharging](#) .
2. Remove the thermal expansion valve (TXV). Refer to [Air Conditioning Evaporator Thermal Expansion Valve Replacement](#) .
3. Install the TXV stud onto *GE 45268-115* adapter .
4. Install new sealing washers onto evaporator core. Refer to [Air Conditioning O-Ring Seal Replacement](#) .
5. Install *GE 45268-115* adapter in place of the TXV.

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

6. Install the TXV mounting bolts and tighten to **7 N·m (62 lb in)** .
7. Install new washers onto liquid line and suction hose. Refer to [Air Conditioning O-Ring Seal Replacement](#) .
8. Connect liquid line and suction hose to *GE 45268-115* adapter .

9. Install the TXV block fitting nut and tighten to **22 N·m (16 lb ft)**.
10. Remove the A/C compressor. Refer to [Air Conditioning Compressor Replacement](#) .



11. Remove the A/C refrigerant filter(1). Refer to [Air Conditioning \(AC\) Refrigerant Filter Replacement](#) .

**Note:** The filter inside *GE 45628-1* adapter is serviceable. Remove and discard check valve from the filter.

12. Service the filter before each flush.

**Note:** Assure that suction and discharge ports on *J45268-10* correspond to suction and discharge ports on compressor hose assembly.

13. Install new sealing washers onto A/C compressor and condenser hose. Refer to [Air Conditioning O-Ring Seal Replacement](#) . Assure that suction and discharge ports on *GE 45268-10* adapter correspond to suction and discharge ports on A/C compressor to condenser hose.

14. Install *GE 45268-10* filter adapter to the A/C compressor to condenser hose.

15. Connect *GE 45268-1* filter to *J 45268-7* adapter .

16. Connect blue hose from A/C filling device to *GE 45268* adapter .

17. Connect red hose from A/C filling device to *GE 45268* adapter .

18. Disconnect blue hose from A/C filling device to *GE 45268-1* adapter .

19. Disconnect *GE 45268-1* adapter from *GE 45268-10* adapter .

20. Remove *GE 45268-10* adapter from the A/C compressor to condenser hose.

**Note:** Flushing will remove all PAG oil from the A/C system. The A/C system must be replenished with the correct amount of PAG oil.

21. If you will reinstall the removed A/C compressor, perform the following procedure:

- Drain PAG oil from the A/C compressor. Rotate compressor input shaft to assist in draining the PAG oil from compressor.
- Add the total system capacity of PAG oil to A/C compressor. Refer to [Refrigerant System Specifications](#) .
- Add one bottle of *GE41447* tracer dye .

**Note:** Flushing will remove fluorescent leak detection dye from A/C system.

22. Install the A/C compressor. Refer to [Air Conditioning Compressor Replacement](#) .

23. Install new A/C refrigerant filter. Refer to [Air Conditioning \(AC\) Refrigerant Filter Replacement](#) .

24. Remove the TXV block fitting nut.

25. Disconnect liquid line and suction line from *GE 45268-115* adapter .

26. Remove the TXV bolts retaining *GE 45268-115* adapter .

27. Remove *GE 45268-115* adapter .

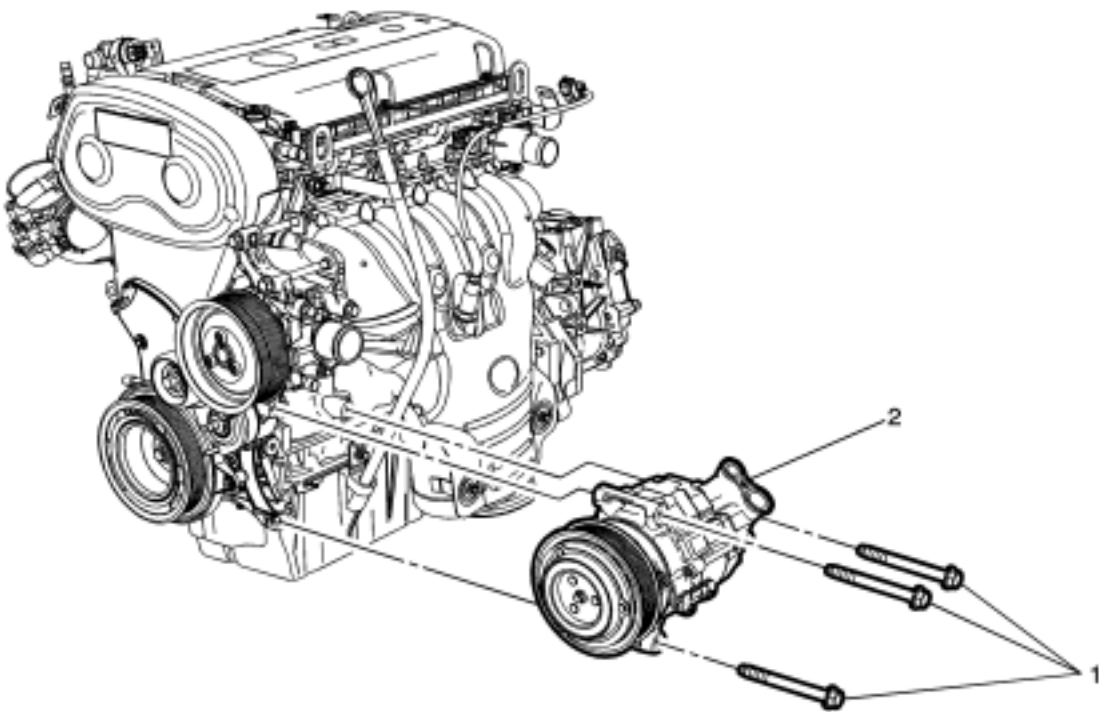
28. Inspect the TXV for debris. Clean or replace as needed.

29. Install the TXV. Refer to [Air Conditioning Evaporator Thermal Expansion Valve Replacement](#) .

30. Evacuate and recharge the A/C system. Refer to [Refrigerant Recovery and Recharging](#) .

31. Leak test fittings using *BO 42220* lamp .

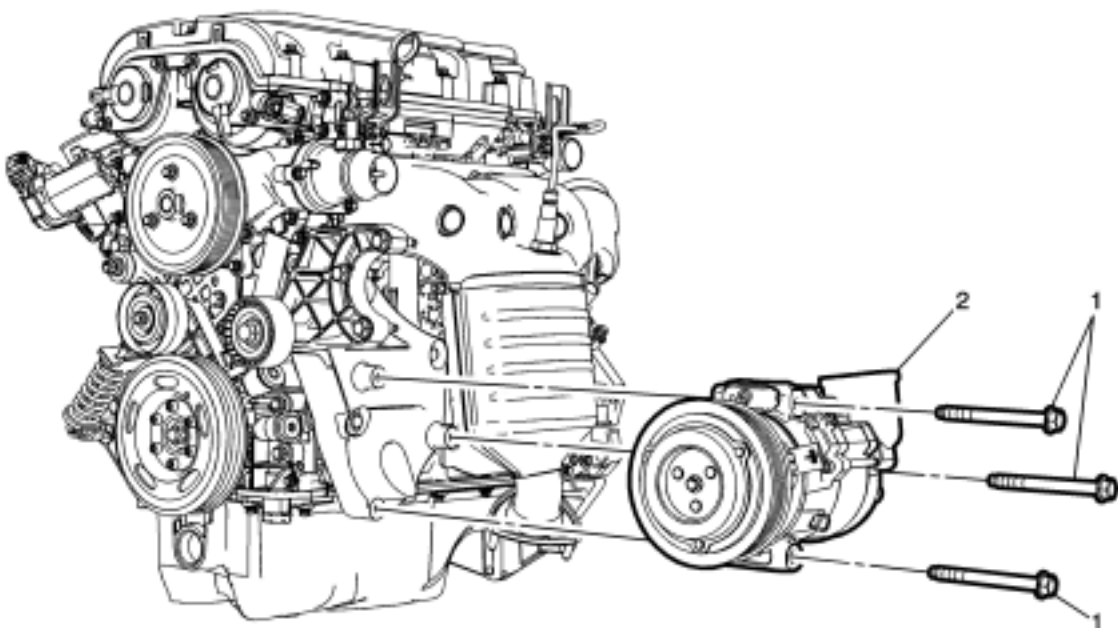
Air Conditioning Compressor Replacement ( 1.6L or 1.8L)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Recover the refrigerant. Refer to <a href="#">Refrigerant Recovery and Recharging</a> .</p> <p>2. Raise and support the vehicle. Refer to <a href="#">Lifting and Jacking the Vehicle</a> .</p> <p>3. Remove the drive belt. Refer to <a href="#">Drive Belt Replacement</a> .</p> <p>4. Remove the air conditioning compressor and condenser hose. Refer to <a href="#">Air Conditioning Compressor and Condenser Hose Replacement</a> .</p> <p>5. Disconnect the electrical connector.</p>	
1	<p>Air Conditioning Compressor Bolts (Qty :3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Air Conditioning Compressor</p> <p><b>Procedure</b></p> <p>When replacing the A/C compressor, balance the compressor oil. Refer to <a href="#">Air Conditioning Compressor Oil Balancing</a> .</p>

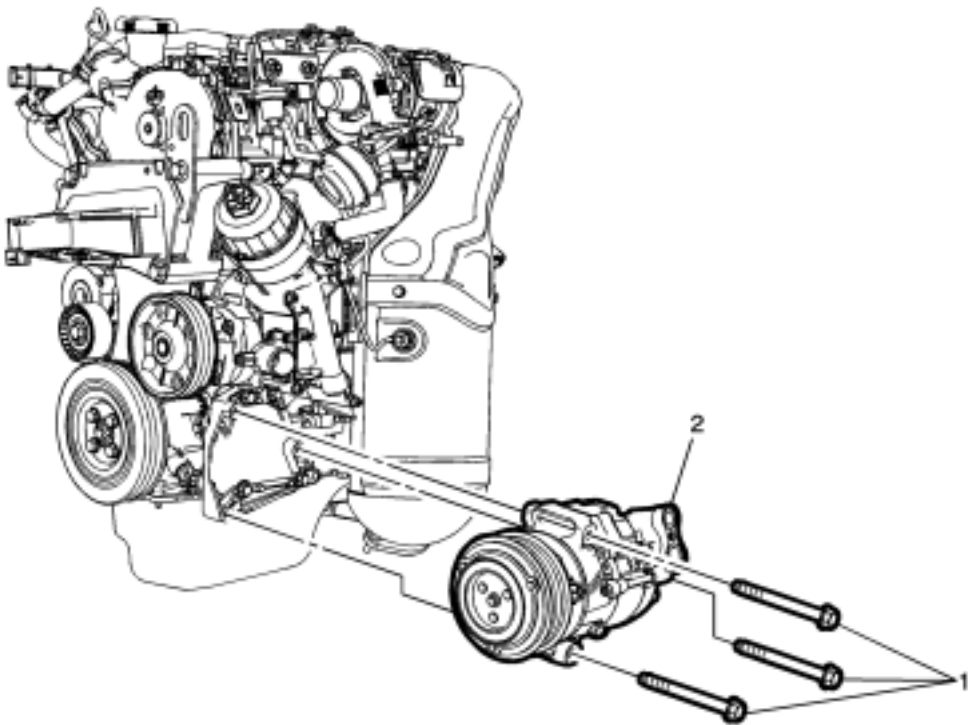


Air Conditioning Compressor Replacement ( 1.2L or 1.4L)



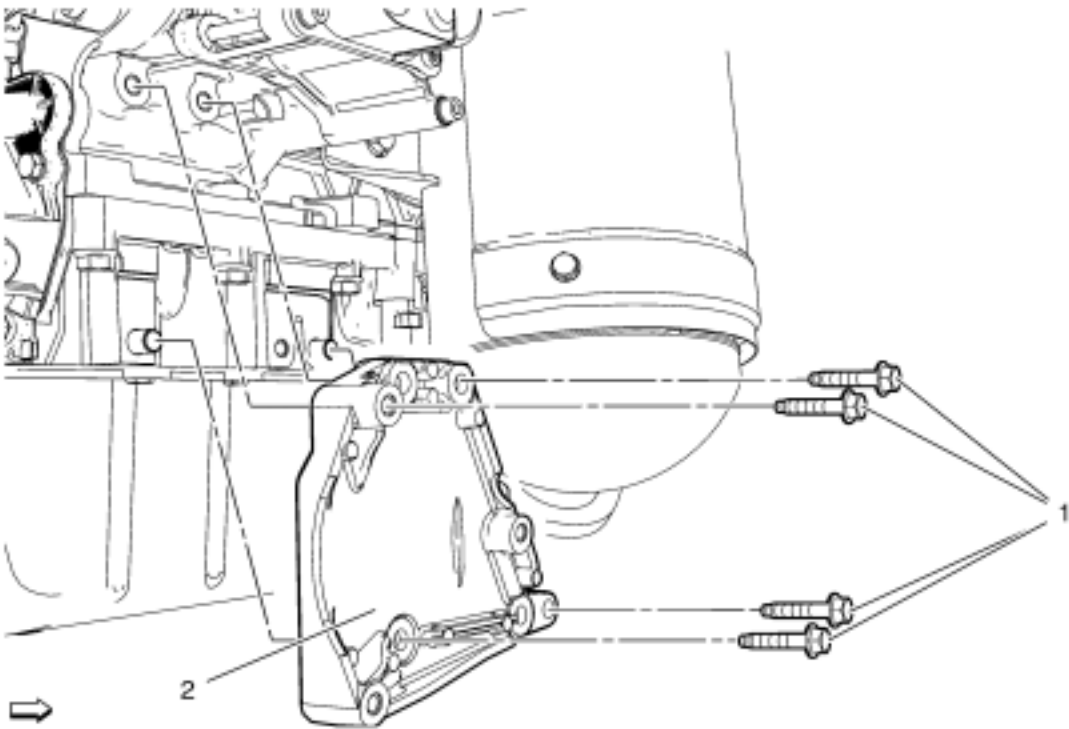
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Recover the refrigerant. Refer to <a href="#">Refrigerant Recovery and Recharging</a></p> <p>2. Raise and support the vehicle. Refer to <a href="#">Lifting and Jacking the Vehicle</a></p> <p>3. Remove the drive belt. Refer to <a href="#">Drive Belt Replacement</a></p> <p>4. Remove the air conditioning compressor and condenser hose. Refer to <a href="#">Air Conditioning Compressor and Condenser Hose Replacement</a></p> <p>5. Disconnect the electrical connector.</p>	
1	<p>Air Conditioning Compressor Bolts (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lbft)</p>
2	<p>Air Conditioning Compressor</p> <p><b>Procedure</b></p> <p>When replacing the A/C compressor, balance the compressor oil. Refer to <a href="#">Air Conditioning Compressor Oil Balancing</a></p>

Air Conditioning Compressor Replacement ( Diesel)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Disconnect the battery negative cable. Refer to <a href="#">Battery Negative Cable Disconnection and Connection</a> .</p> <p>2. Recover the refrigerant. Refer to <a href="#">Refrigerant Recovery and Recharging</a> .</p> <p>3. Remove the air conditioning compressor belt. Refer to <a href="#">Air Conditioning Compressor Belt Replacement</a> .</p> <p>4. Raise and support the vehicle. Refer to <a href="#">Lifting and Jacking the Vehicle</a> .</p> <p>5. Loosen the air conditioning compressor and the condenser hose from the air conditioning compressor. Refer to <a href="#">Air Conditioning Compressor and Condenser Hose Replacement</a> .</p>	
1	<p>A/C Compressor Bolt (Qty: 3)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lb ft)</p>
2	<p>A/C Compressor Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connector.</p> <p>2. Use a low viscosity, poly-alkylene glycol (PAG) oil. Use of the incorrect oil can result in compressor failure.</p> <p>3. When replacing the A/C compressor, balance the compressor oil. Refer to <a href="#">Air Conditioning Compressor Oil Balancing</a> .</p> <p>4. Using <i>GE-39400-A</i> detector leak test A/C compressor fittings.</p> <p><b>Special Tools</b></p> <p><i>GE-39400-A</i> Electronic Halogen Leak Detector</p> <p>For equivalent regional tools, refer to <a href="#">Special Tools</a> .</p>

Air Conditioning Compressor Bracket Replacement ( Diesel)

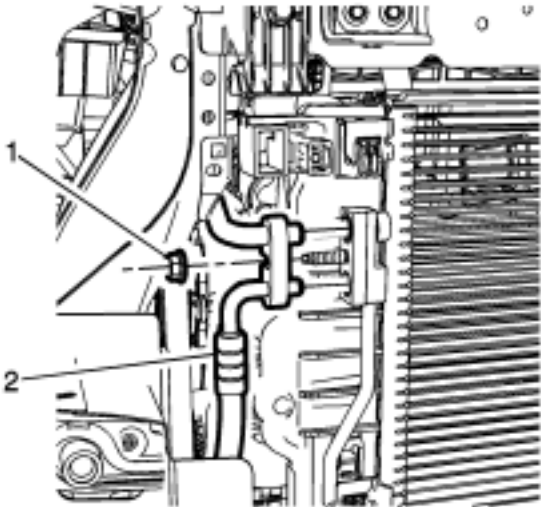


Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>Remove air conditioning compressor. Refer to <a href="#">Air Conditioning Compressor Replacement</a> .</p>	
1	<p>Air Conditioning Compressor Bracket Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (17 lb ft)</p>
2	<p>Air Conditioning Compressor Bracket</p>

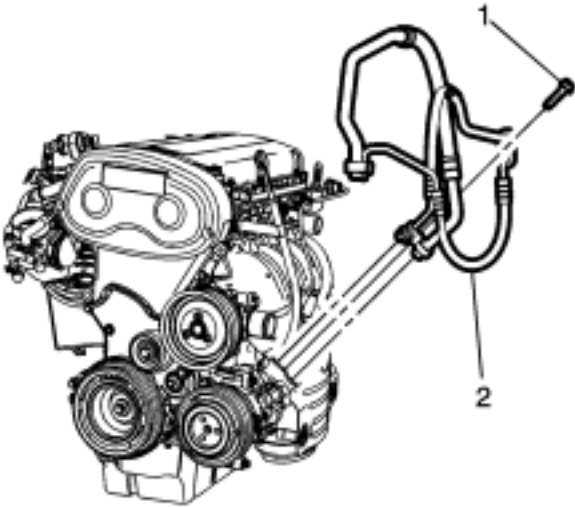
## Air Conditioning Compressor and Condenser Hose Replacement (1.6L or 1.8L)

### Removal Procedure

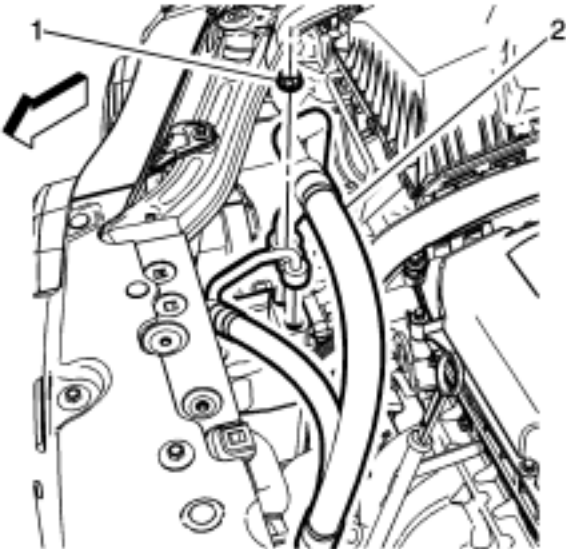
1. Recover the refrigerant. Refer to [Refrigerant Recovery and Recharging](#) .
2. Disconnect the A/C refrigerant pressure sensor electrical connector.



3. Remove air conditioning compressor and condenser hose nut (1).
4. Remove air conditioning compressor and condenser hose (2) from A/C condenser.



5. Remove A/C compressor and condenser hose bolt (1).
6. Remove A/C compressor and condenser hose (2) from A/C compressor.



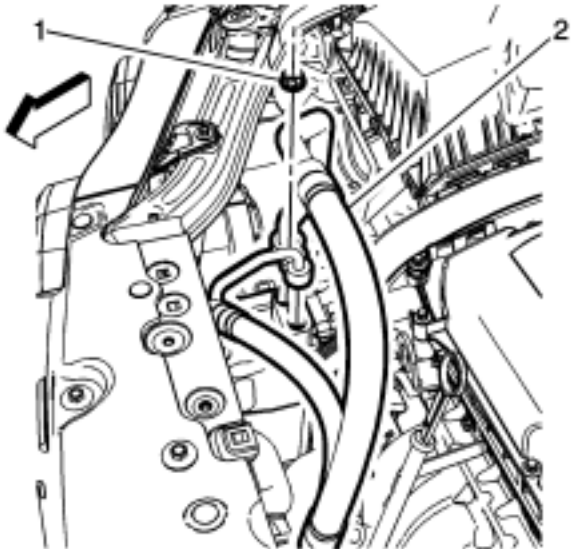
7. Remove air conditioning compressor and condenser hose nut (1).
8. Remove air conditioning compressor and condenser hose (2) from refrigerant hose.
9. Remove air conditioning compressor and condenser hose from the vehicle.

Installation Procedure

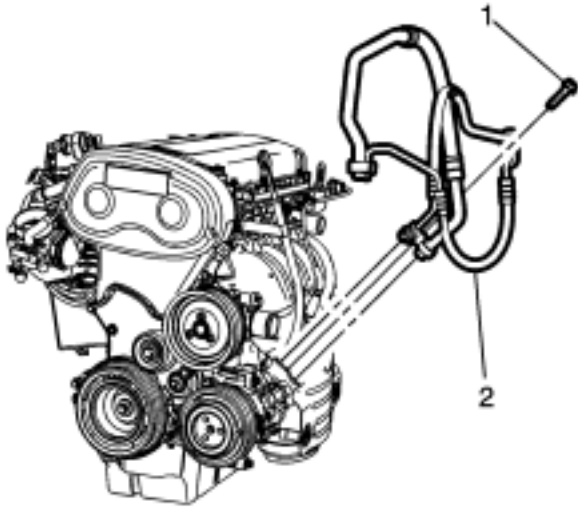
**Note:** Use NEW system seals. Refer to [Air Conditioning System Seal Replacement](#) .

1. Install air conditioning compressor and condenser hose.

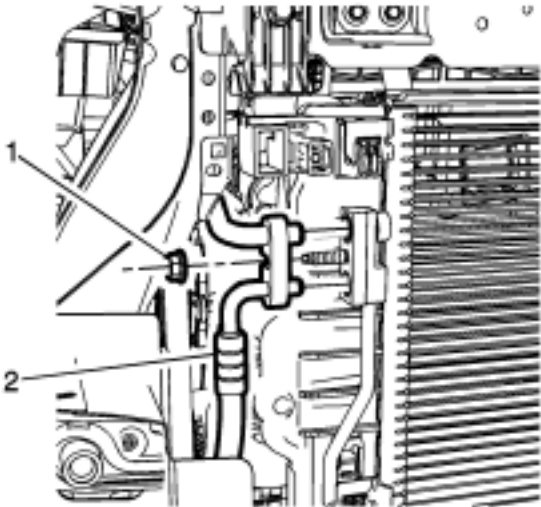
**Caution:** Refer to [Fastener Caution](#) .



2. Install air conditioning compressor and condenser hose(2) to the refrigerant hose.
3. Install air conditioning compressor and condenser hose nut (1). Tighten nut to **22 N·m (16 lb ft)**.



4. Install air conditioning compressor and condenser hose(2) to the A/C compressor.
5. Install air conditioning compressor and condenser hose bolt (1). Tighten bolt to **22 N·m (16 lb ft)**.



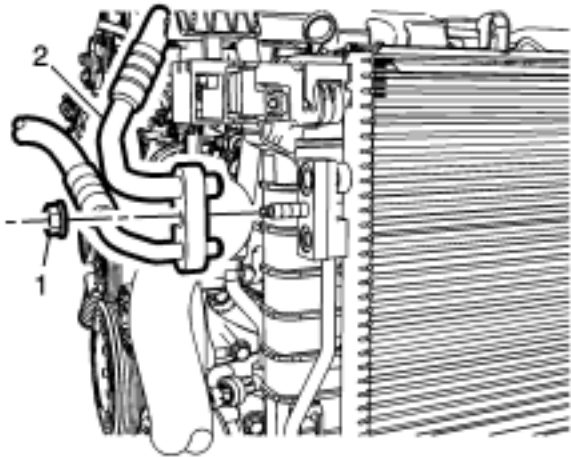
6. Install air conditioning compressor and condenser hose(2) to the A/C condenser.
7. Install air conditioning compressor and condenser hose nut (1). Tighten nut to **22 N·m (16 lb ft)**.
8. Connect the A/C refrigerant pressure sensor electrical connector.
9. Evacuate and charge the refrigerant system. Refer to [Refrigerant Recovery and Recharging](#) .



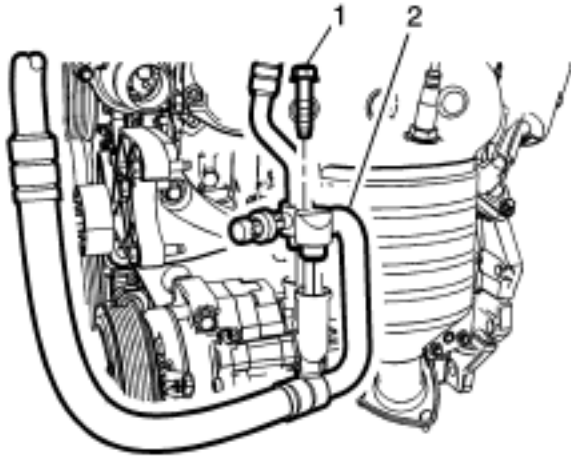
# Air Conditioning Compressor and Condenser Hose Replacement (1.2L or 1.4L)

## Removal Procedure

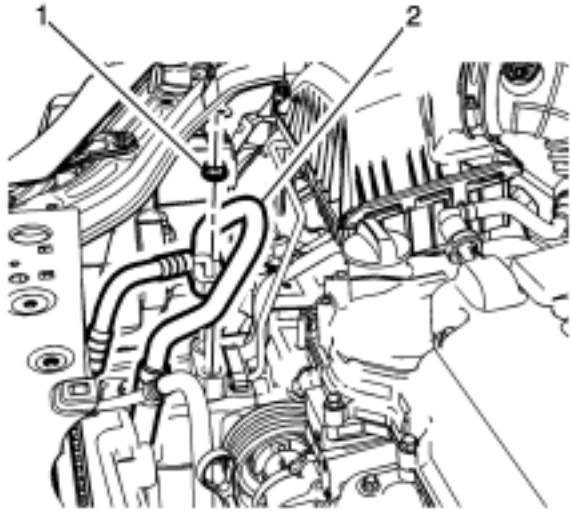
- 1. Recover the refrigerant. Refer to [Refrigerant Recovery and Recharging](#) .
- 2. Disconnect the A/C refrigerant pressure sensor electrical connector.



- 3. Remove air conditioning compressor and condenser hose nut (1).
- 4. Remove air conditioning compressor and condenser hose (2) from A/C condenser.



- 5. Remove A/C compressor and condenser hose bolt (1).
- 6. Remove A/C compressor and condenser hose (2) from A/C compressor.



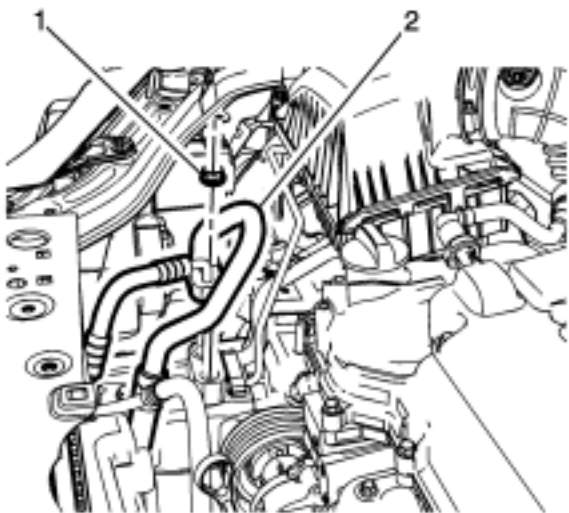
- 7. Remove air conditioning compressor and condenser hose nut (1).
- 8. Remove air conditioning compressor and condenser hose (2) from refrigerant hose.
- 9. Remove air conditioning compressor and condenser hose from the vehicle.

Installation Procedure

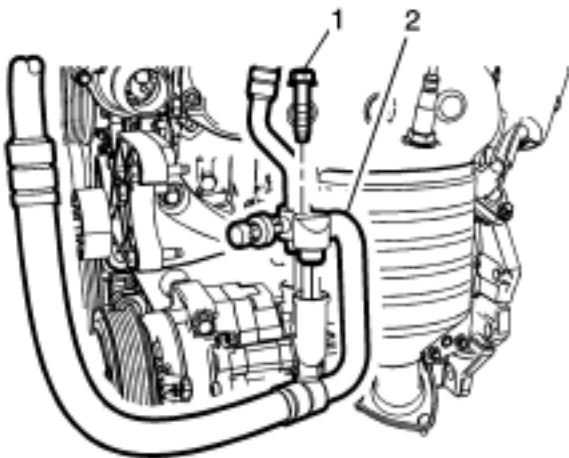
**Note:** Use NEW system seals. Refer to [Air Conditioning System Seal Replacement](#) .

1. Install air conditioning compressor and condenser hose.

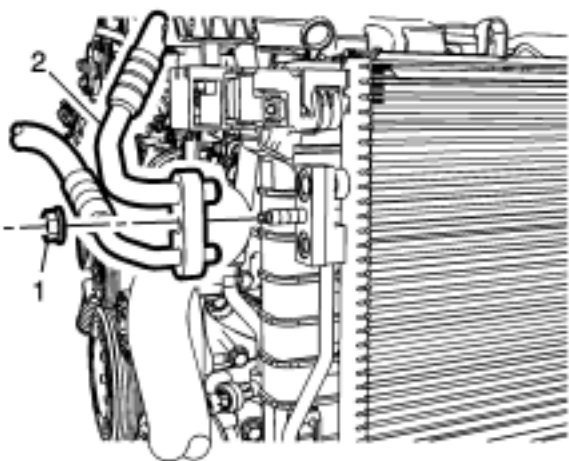
**Caution:** Refer to [Fastener Caution](#) .



2. Install air conditioning compressor and condenser hose(2) to the refrigerant hose.
3. Install air conditioning compressor and condenser hose nut (1). Tighten nut to **22 N·m (16 lb ft)**.



4. Install air conditioning compressor and condenser hose(2) to the A/C compressor.
5. Install air conditioning compressor and condenser hose bolt (1). Tighten bolt to **22 N·m (16 lb ft)**.

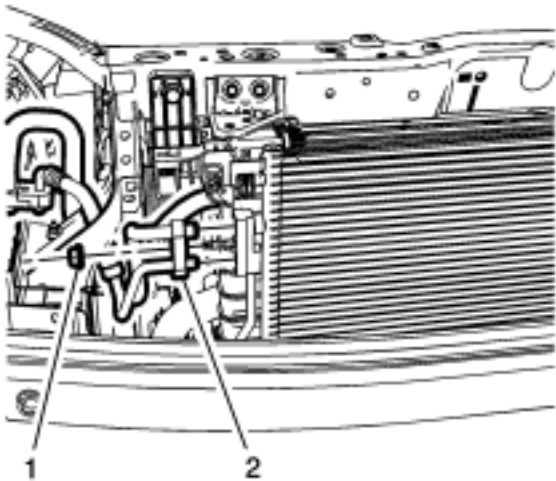


6. Install air conditioning compressor and condenser hose(2) to the A/C condenser.
7. Install air conditioning compressor and condenser hose nut (1). Tighten nut to **22 N·m (16 lb ft)**.
8. Connect the A/C refrigerant pressure sensor electrical connector.
9. Evacuate and charge the refrigerant system. Refer to [Refrigerant Recovery and Recharging](#) .

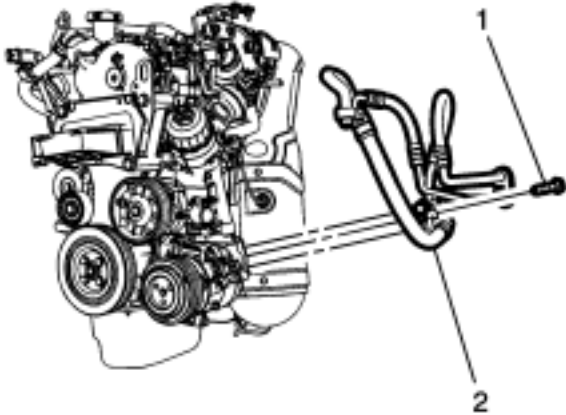
## Air Conditioning Compressor and Condenser Hose Replacement ( Diesel)

### Removal Procedure

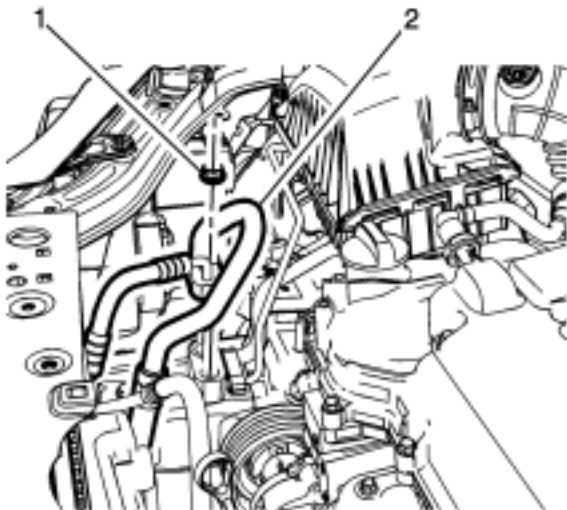
1. Recover the refrigerant. Refer to [Refrigerant Recovery and Recharging](#) .
2. Remove front bumper fascia. Refer to [Front Bumper Fascia Replacement](#) .



3. Remove air conditioning compressor and condenser hose nut (1).
4. Remove air conditioning compressor and condenser hose (2) from A/C condenser.



5. Remove A/C compressor and condenser hose bolt (1).
6. Remove A/C compressor and condenser hose (2) from A/C compressor.



7. Remove air conditioning compressor and condenser hose nut (1).
8. Remove air conditioning compressor and condenser hose (2) from refrigerant hose.
9. Remove air conditioning compressor and condenser hose from the vehicle.

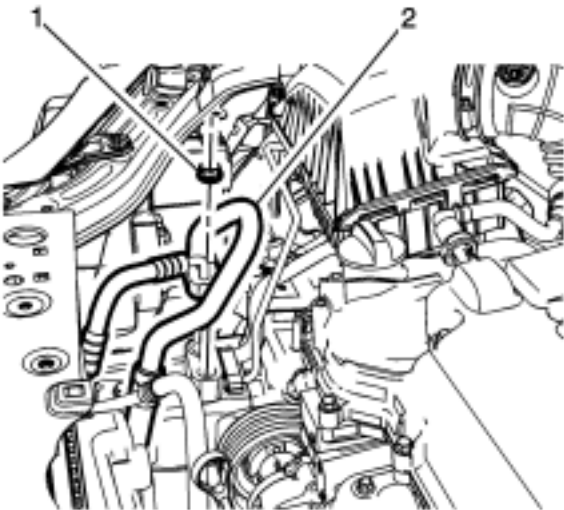


Installation Procedure

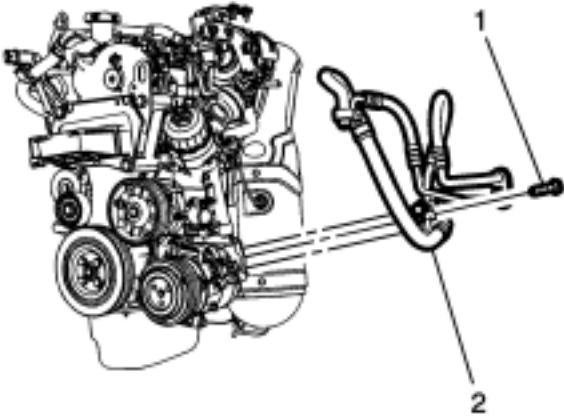
**Note:** Use NEW O-ring seals. Refer to [Air Conditioning O-Ring Seal Replacement](#) .

1. Install air conditioning compressor and condenser hose.

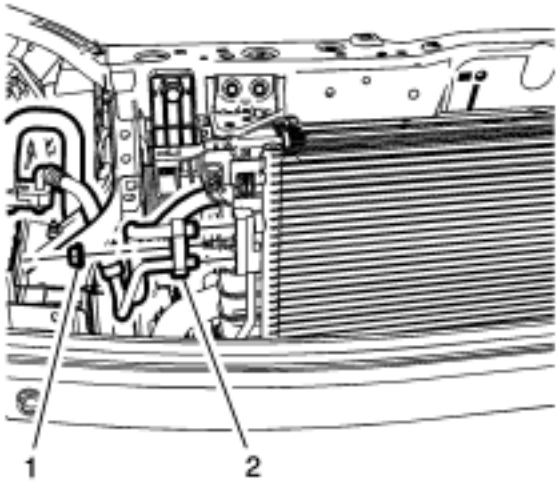
**Caution:** Refer to [Fastener Caution](#) .



2. Install air conditioning compressor and condenser hose(2) to the refrigerant hose.  
3. Install air conditioning compressor and condenser hose nut (1). Tighten nut to **22 N·m (16 lb ft)**.

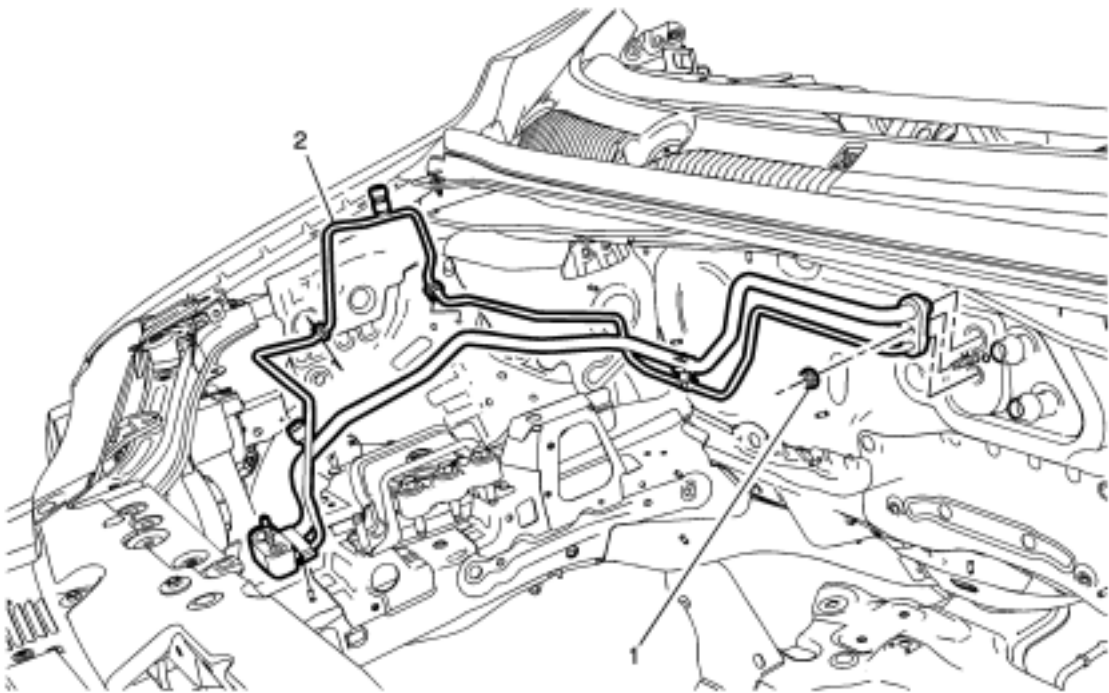


4. Install air conditioning compressor and condenser hose(2) to the A/C compressor.  
5. Install air conditioning compressor and condenser hose bolt (1). Tighten bolt to **22 N·m (16 lb ft)**.



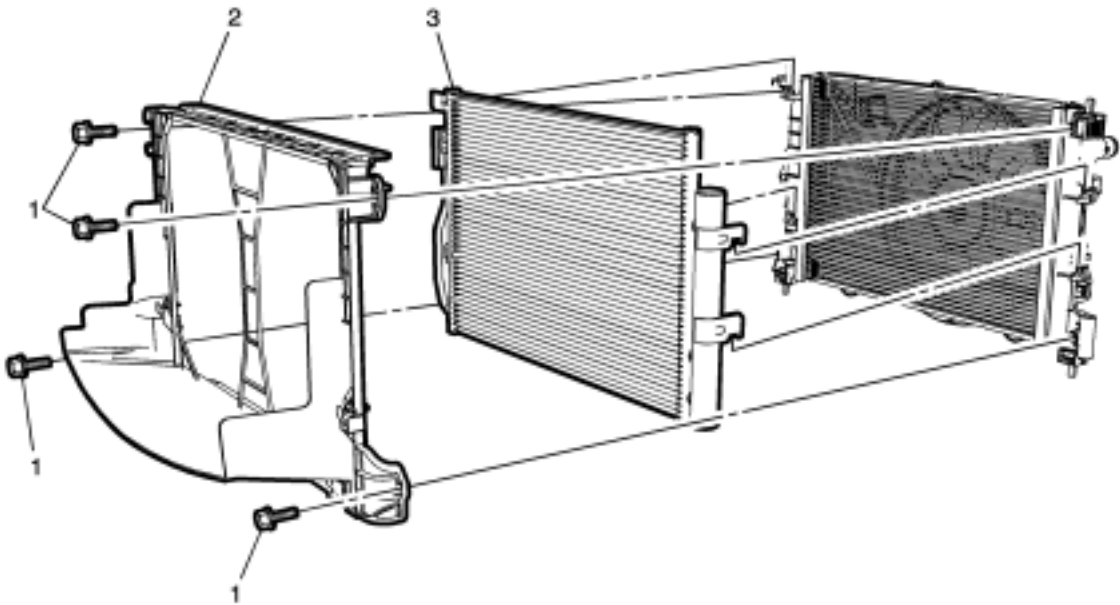
6. Install air conditioning compressor and condenser hose(2) to the A/C condenser .  
7. Install air conditioning compressor and condenser hose nut (1). Tighten nut to **22 N·m (16 lb ft)**.  
8. Install front bumper fascia. Refer to [Front Bumper Fascia Replacement](#) .  
9. Evacuate and charge the refrigerant system. Refer to [Refrigerant Recovery and Recharging](#) .

Air Conditioning Evaporator Hose Assembly Replacement



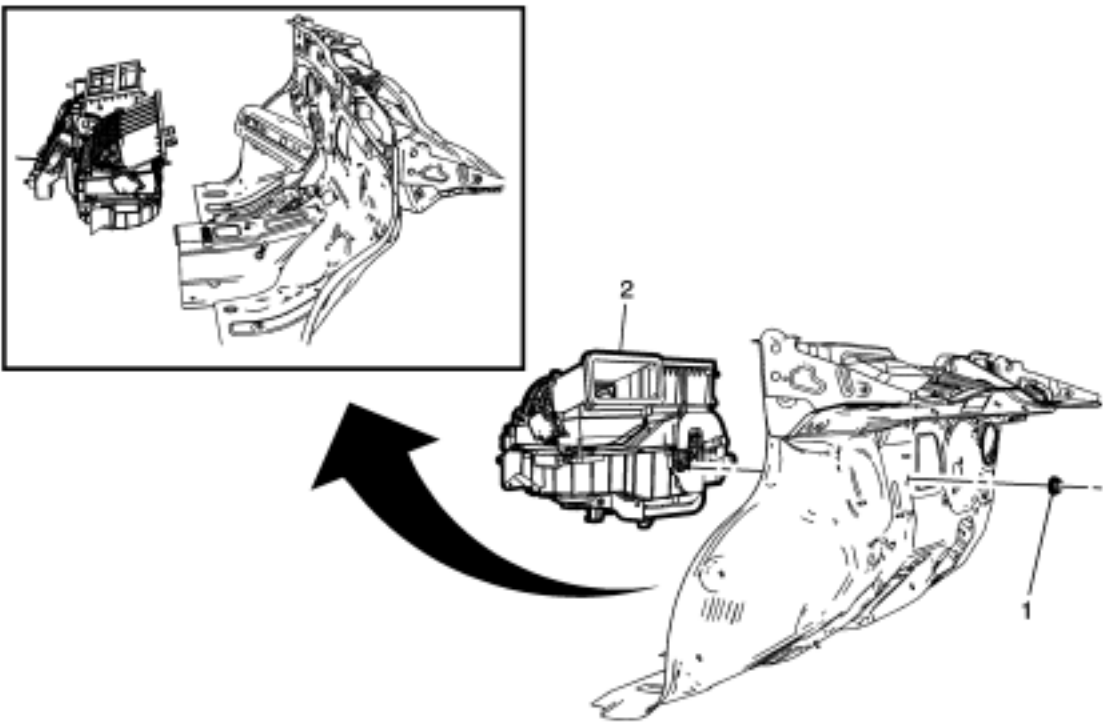
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Recover the refrigerant. Refer to <a href="#">Refrigerant Recovery and Recharging</a></p> <p>2. Remove the air conditioning compressor and condenser hose. Refer to <a href="#">Air Conditioning Compressor and Condenser Hose Replacement</a></p> <p>3. Remove the air cleaner assembly. Refer to <a href="#">Air Cleaner Assembly Replacement</a> or <a href="#">Air Cleaner Assembly Replacement</a> .</p>	
1	<p>Air Conditioning Evaporator Hose Assembly Nut.</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lb ft)</p>
2	<p>Air Conditioning Evaporator Hose Assembly</p> <p><b>Procedure</b></p> <p>Discard and replace all sealing washers. Refer to <a href="#">Air Conditioning System Seal Replacement</a> .</p>

Air Conditioning Condenser Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Recover the refrigerant. Refer to <a href="#">Refrigerant Recovery and Recharging</a> .</p> <p>2. Remove front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p> <p>3. Remove the air conditioning compressor and condenser hose from the condenser. Refer to <a href="#">Air Conditioning Compressor and Condenser Hose Replacement</a> .</p>	
1	<p>Air Conditioning Condenser Baffel Bolt (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a></p> <p><b>Tighten</b> 10 N·m (89 lbin)</p>
2	<p>Air Conditioning Condenser Baffel</p>
3	<p>Air Conditioning Condenser</p> <p><b>Tip</b> Unclip condenser from radiator.</p>

Heater and Air Conditioning Evaporator and Blower Module Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Recover the refrigerant. Refer to <a href="#">Refrigerant Recovery and Recharging</a> .</p> <p>2. Drain the cooling system. Refer to <a href="#">Cooling System Draining and Filling</a> .</p> <p>3. Remove the instrument panel tie bar. Refer to <a href="#">Instrument Panel Tie Bar Replacement</a> .</p> <p>4. Disconnect the HVAC module electrical connectors.</p> <p>5. Remove the air conditioning evaporator hose assembly from the thermal expansion valve. Refer to <a href="#">Air Conditioning Evaporator Hose Assembly Replacement</a> .</p> <p>6. Remove the heater outlet hose. Refer to <a href="#">Heater Outlet Hose Replacement</a> .</p> <p>7. Remove the heater inlet hose. Refer to <a href="#">Heater Inlet Hose Replacement</a> .</p>	
1	<p>Heater and Air Conditioning Evaporator and Blower Module Fastener</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 22 N·m (16 lb ft)</p>
2	<p>Heater and Air Conditioning Evaporator and Blower Module Assembly</p>

## Heater Inlet Hose Replacement (1.6L or 1.8L)

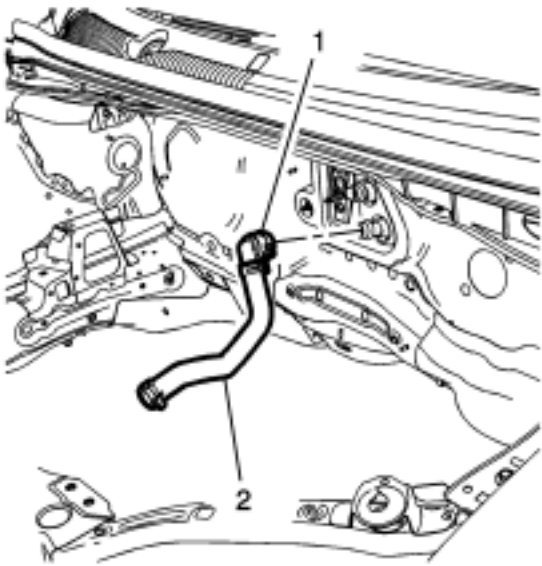
### Special Tools

*BO-38185* Hose Clamp Pliers

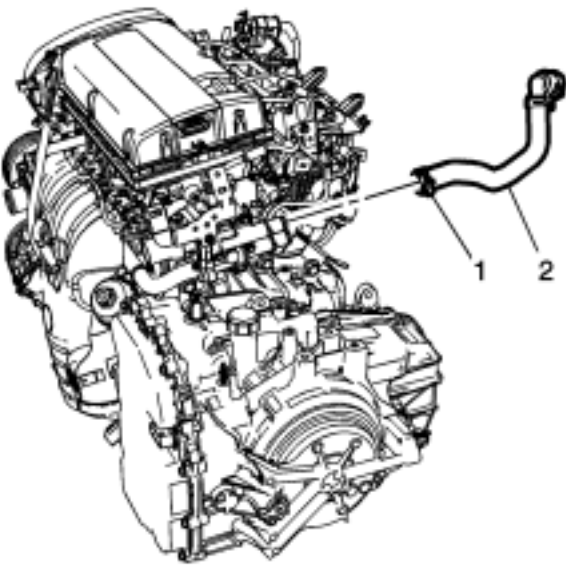
For equivalent regional tools, refer to [Special Tools](#) .

### Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#) .



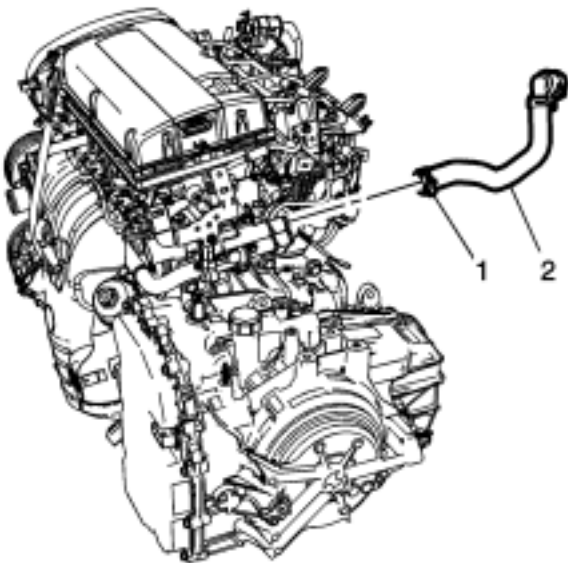
2. Disengage the heater inlet hose quick connect clip(1) at the heater core.
3. Remove the heater inlet hose(2) from the heater core.



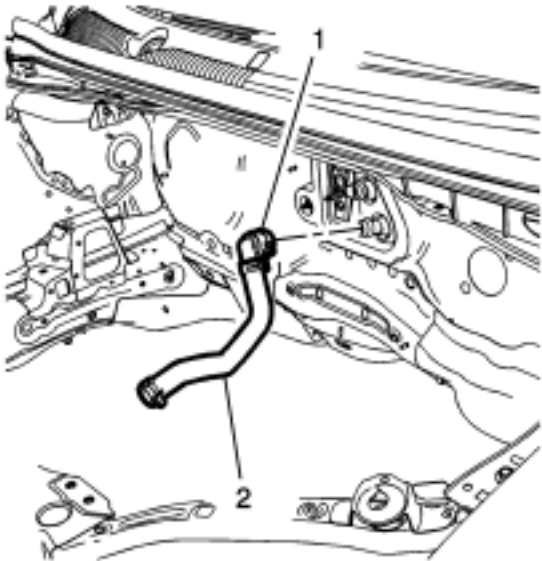
4. Remove the heater inlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .
5. Remove the heater inlet hose(2) from the engine.
6. Remove the heater inlet hose from the vehicle.



Installation Procedure



- 1. Install the heater inlet hose to the vehicle.
- 2. Install the heater inlet hose (2) to the engine.
- 3. Install the heater inlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .



**Note:** The quick connector has an internal anti-rotation feature. The ensure the quick connector is properly aligned to the heater core pipe, position the white mark to the 12:00 O'clock position during installation.

- 4. Install the heater inlet hose (2) to the heater core.
- 5. Engage the heater inlet hose quick connect clip (1) at the heater core.
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#) .

## Heater Outlet Hose Replacement (1.6L or 1.8L)

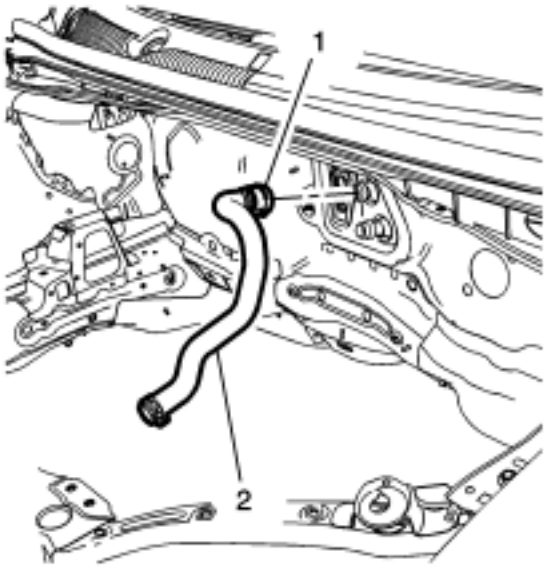
### Special Tools

*BO-38185* Hose Clamp Pliers

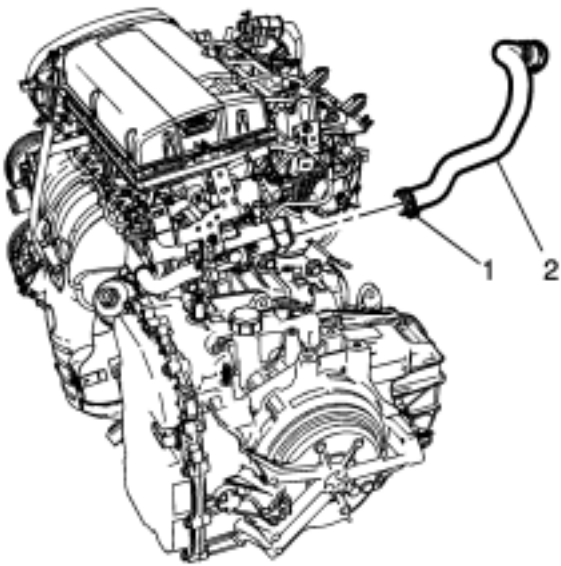
For equivalent regional tools, refer to [Special Tools](#) .

### Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#) .

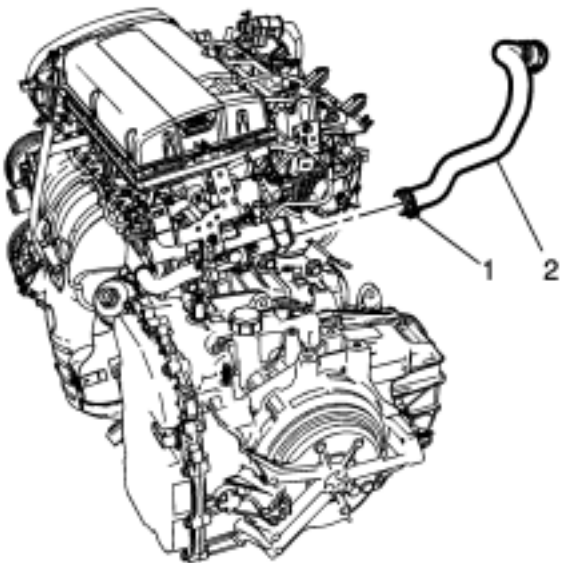


2. Disengage the heater outlet hose quick connect clip (1) at the heater core.
3. Remove the heater outlet hose (2) from the heater core.

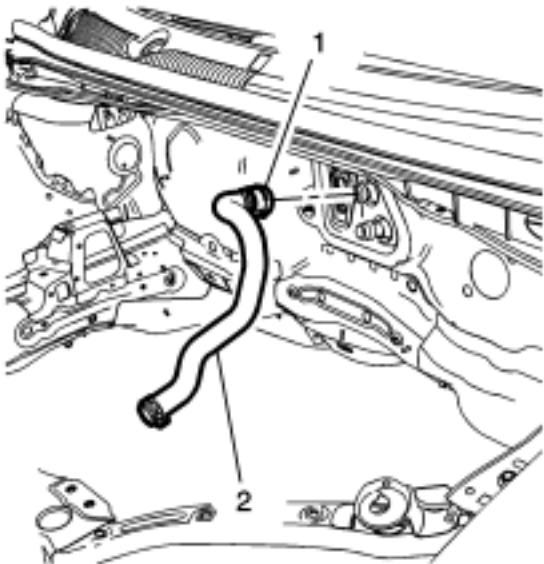


4. Remove the heater outlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .
5. Remove the heater outlet hose (2) from the engine.
6. Remove the heater outlet hose from the vehicle.

Installation Procedure



- 1. Install the heater outlet hose to the vehicle.
- 2. Install the heater outlet hose (2) to the engine.
- 3. Install the heater outlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .



**Note:** The quick connector has an internal anti-rotation feature. The ensure the quick connector is properly aligned to the heater core pipe, position the white mark to the 12:00 O'clock position during installation.

- 4. Install the heater outlet hose (2) to the heater core.
- 5. Engage the heater outlet hose quick connect clip (1) at the heater core.
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#) .



## Heater Outlet Hose Replacement (1.2L or 1.4L)

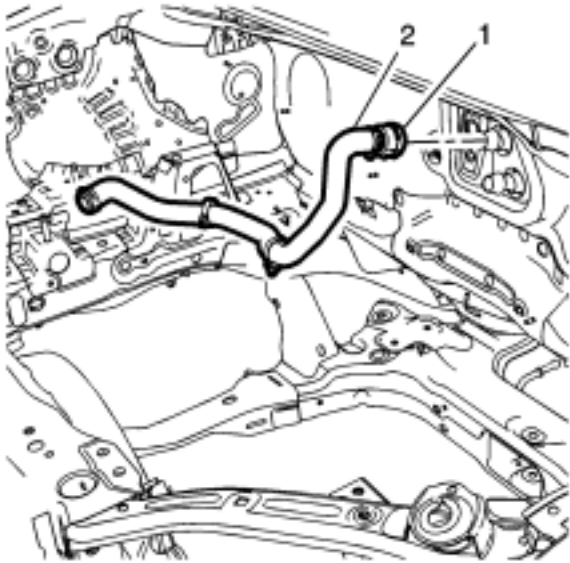
### Special Tools

*BO-38185* Hose Clamp Pliers

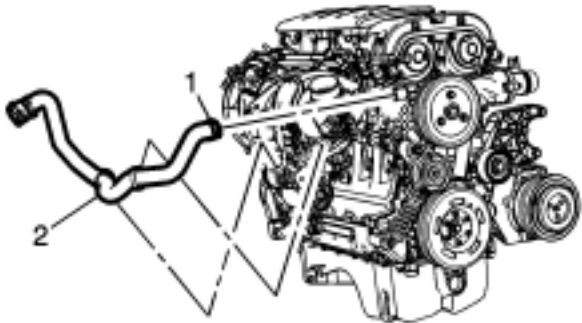
For equivalent regional tools, Refer to [Special Tools](#)

### Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#)

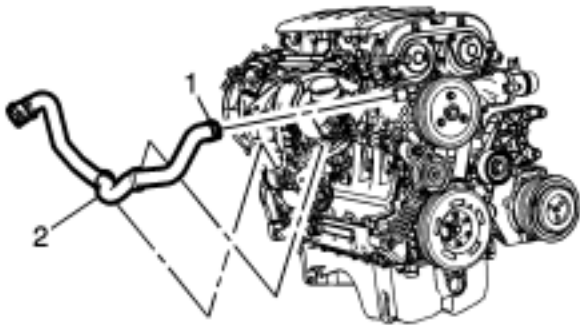


2. Disconnect the heater outlet hose quick connect fitting (1) at the heater core.
3. Remove the heater outlet hose (2) from the heater core.

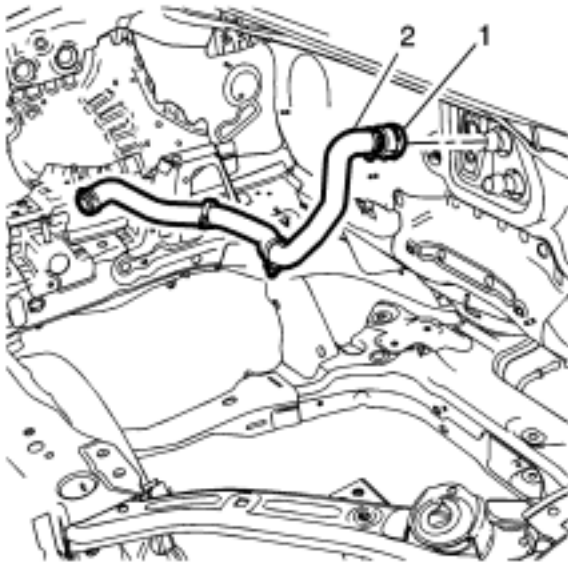


4. Remove the heater outlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .
5. Remove the heater outlet hose (2) from the engine.
6. Remove the heater outlet hose from the vehicle.

Installation Procedure



- 1. Install the heater outlet hose to the vehicle.
- 2. Install the heater outlet hose (2) to the engine.
- 3. Install the heater outlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .



- 4. Install the heater outlet hose (2) to the heater core.
- 5. Connect the heater outlet hose quick connect fitting (1) at the heater core.
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#)

## Heater Inlet Hose Replacement (1.2L or 1.4L)

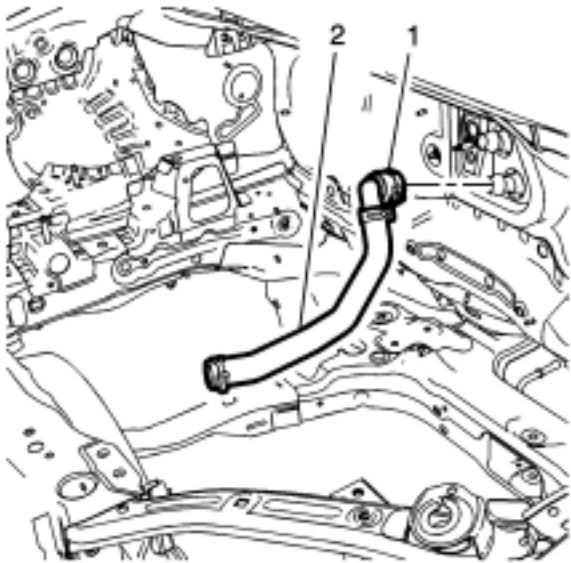
### Special Tools

*BO-38185* Hose Clamp Pliers

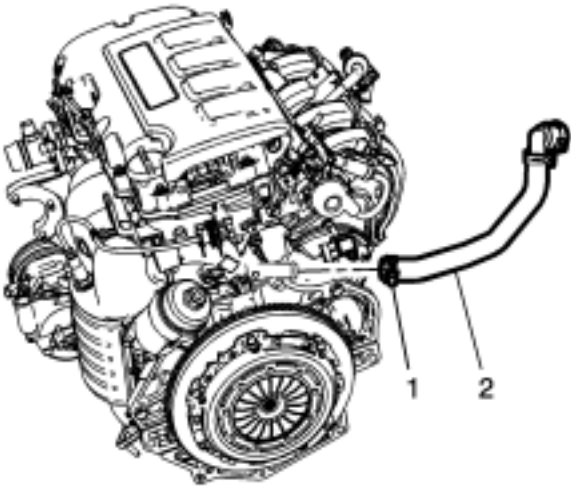
For equivalent regional tools, Refer to [Special Tools](#)

### Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#)

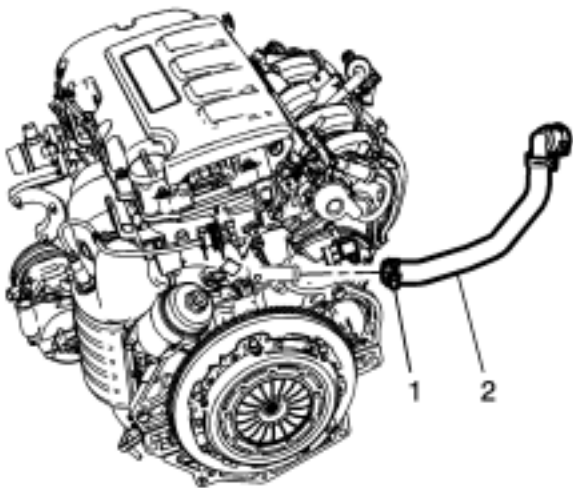


2. Disconnect the heater inlet hose quick connect fitting (1) at the heater core.
3. Remove the heater inlet hose (2) from the heater core.

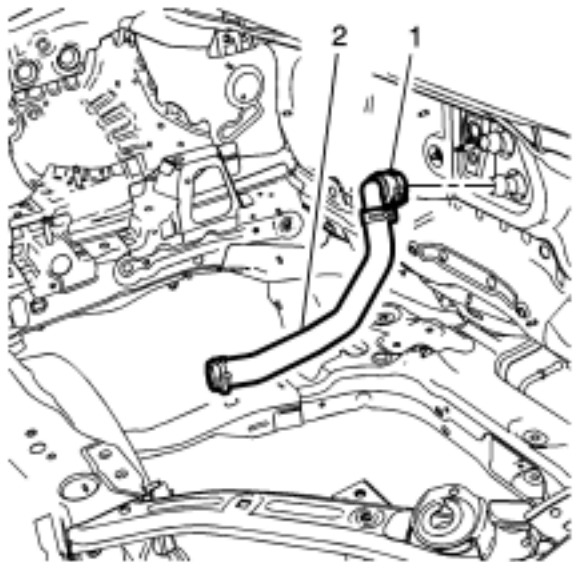


4. Remove the heater inlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .
5. Remove the heater inlet hose (2) from the engine.
6. Remove the heater inlet hose from the vehicle.

Installation Procedure



- 1. Install the heater inlet hose to the vehicle.
- 2. Install the heater inlet hose (2) to the engine.
- 3. Install the heater inlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .



- 4. Install the heater inlet hose (2) to the heater core.
- 5. Connect the heater inlet hose quick connect fitting (1) at the heater core.
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#)

## Heater Inlet Hose Replacement (Deisel)

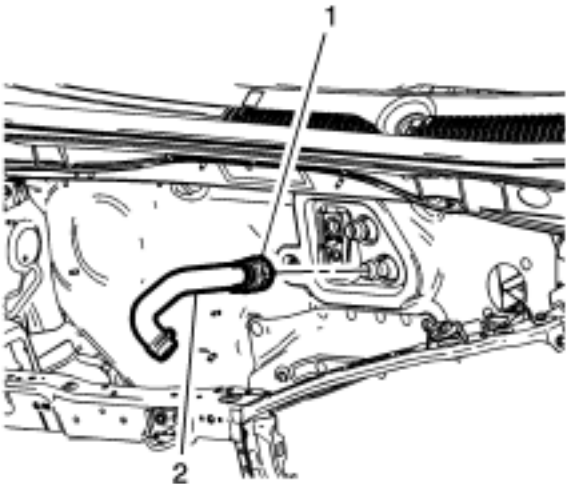
### Special Tools

*BO-38185* Hose Clamp Pliers

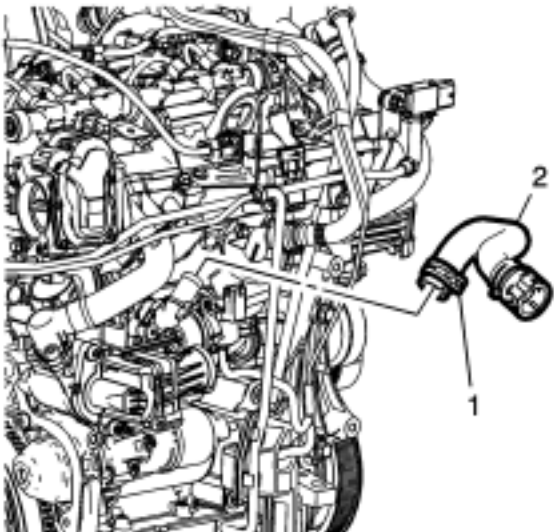
For equivalent regional tools, Refer to [Special Tools](#)

### Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#)

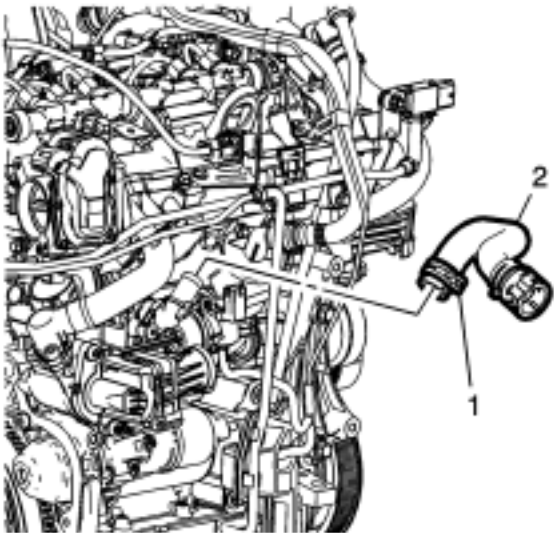


2. Disconnect the heater inlet hose quick connect fitting (1) at the heater core.
3. Remove the heater inlet hose (2) from the heater core.

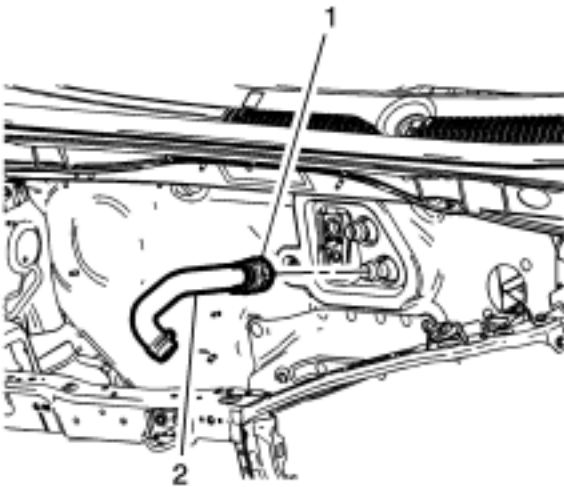


4. Remove the heater inlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .
5. Remove the heater inlet hose (2) from the engine.
6. Remove the heater inlet hose from the vehicle.

Installation Procedure



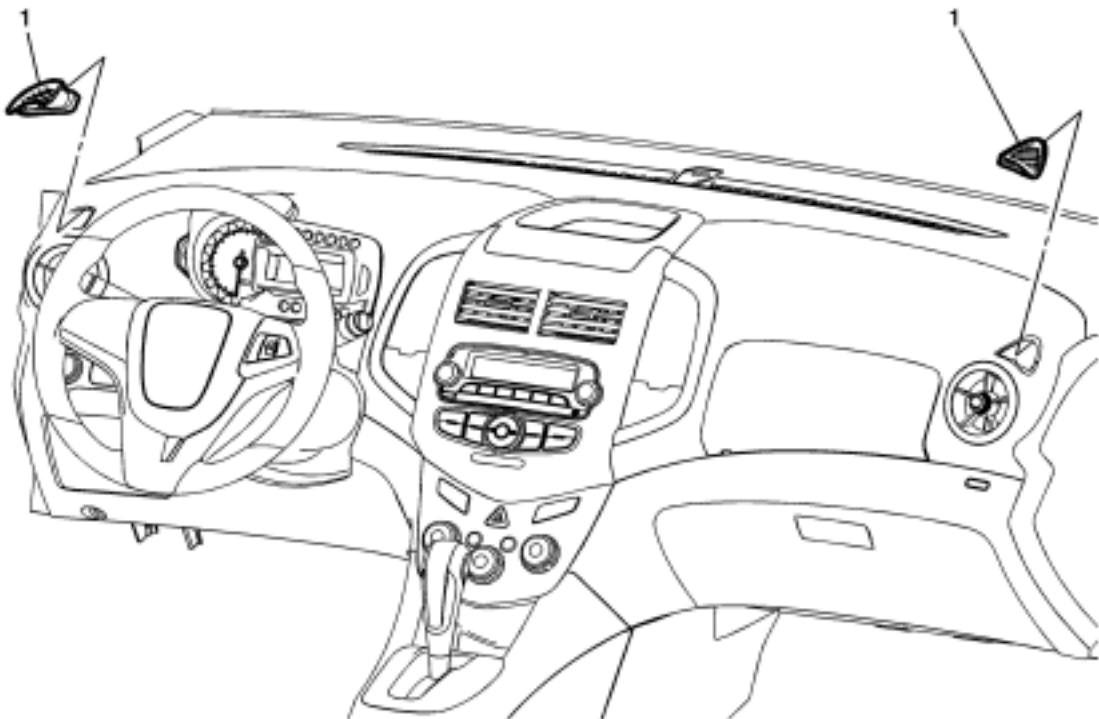
- 1. Install the heater inlet hose to the vehicle.
- 2. Install the heater inlet hose (2) to the engine.
- 3. Install the heater inlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .



- 4. Install the heater inlet hose (2) from the heater core.
- 5. Connect the heater inlet hose quick connect fitting (1) at the heater core.
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#)

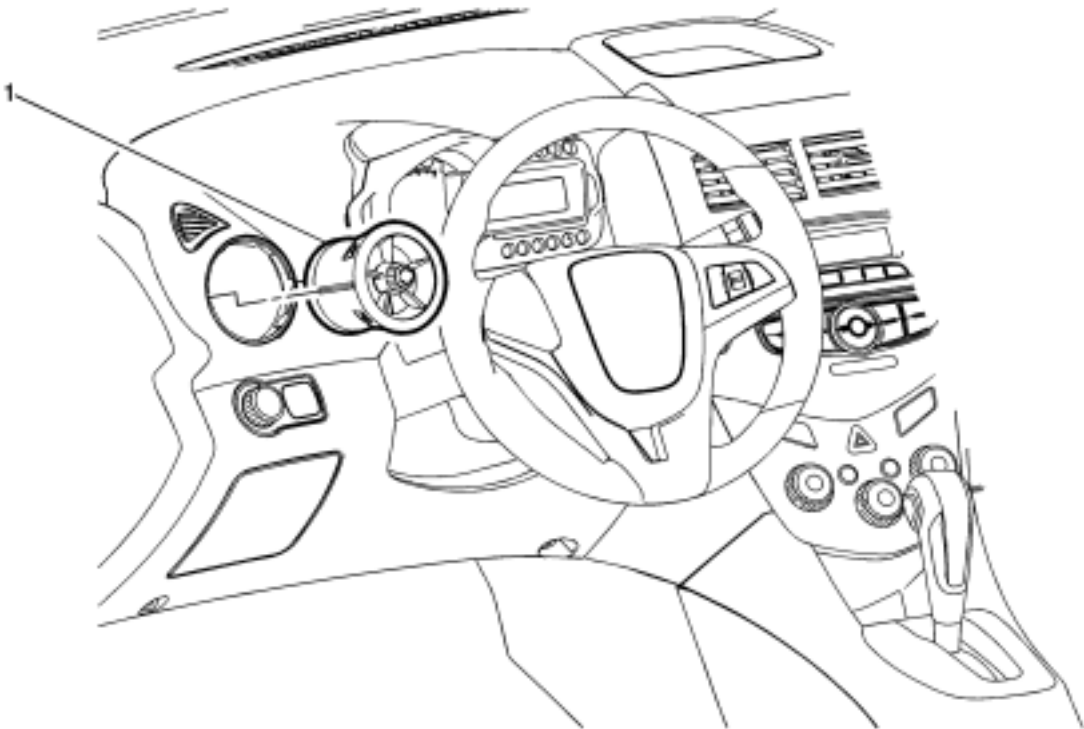


Side Window Defogger Outlet Grille Replacement



Callout	Component Name
1	<div>Side Window Defroster Outlet Grille (Qty: 2)</div> <div><b>Procedure</b></div> <div>Use a flat bladed plastic trim tool to aid in the removal of the grille assemblies from the instrument panel.</div>

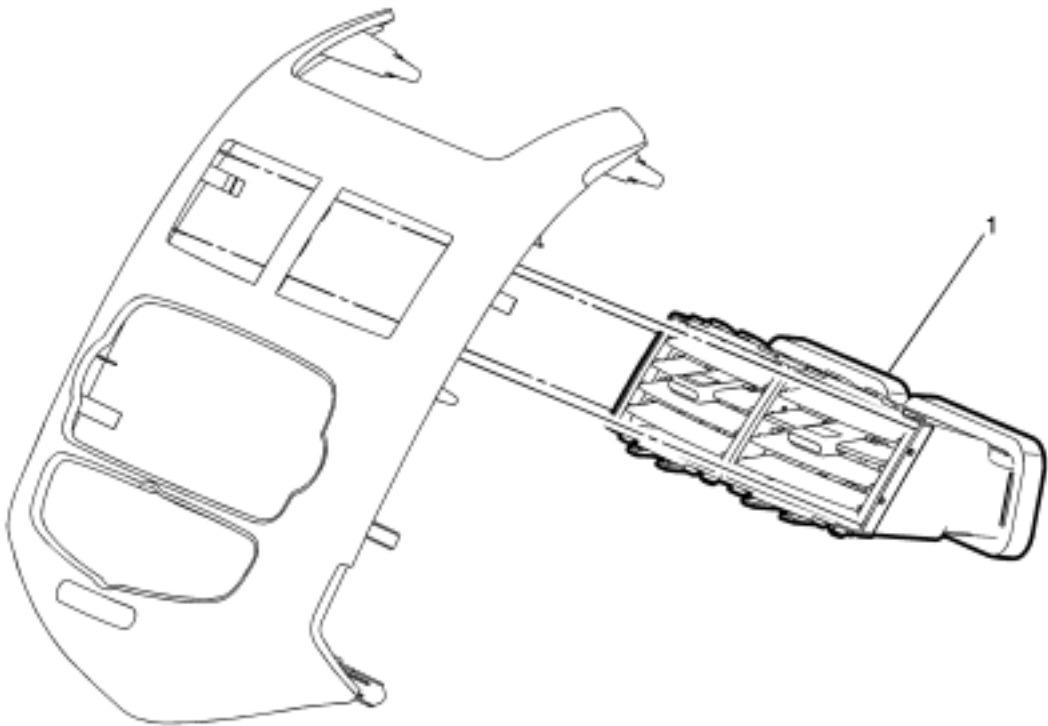
Instrument Panel Outer Air Outlet Replacement - Left Side



Callout	Component Name
1	<div>Instrument Panel Outer Air Outlet Assembly</div> <div><b>Procedure</b></div> <div>Use a flat bladed plastic trim tool to aid in the removal of the air outlet assembly from the instrument panel.</div>

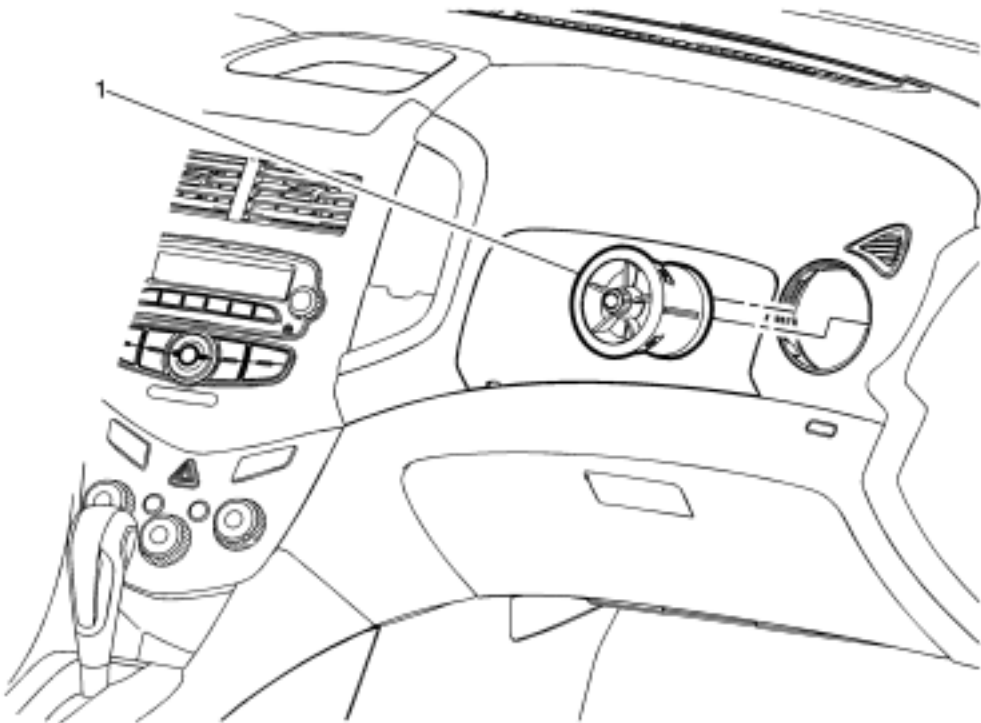


Instrument Panel Center Air Outlet Replacement



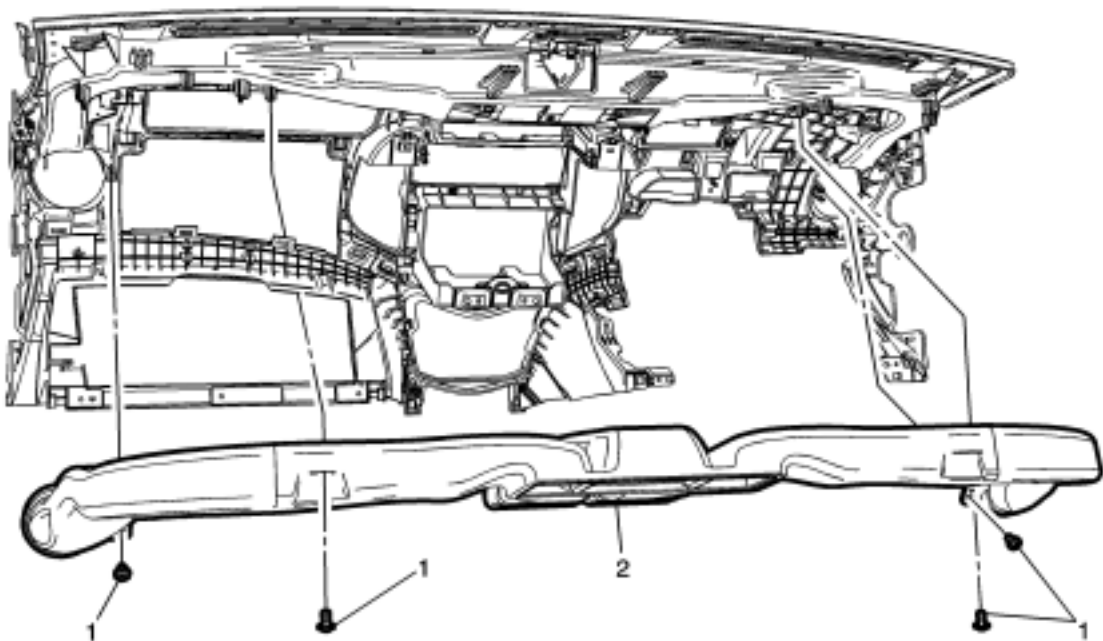
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the instrument panel center molding. Refer to <a href="#">Instrument Panel Center Molding Replacement</a> .</p>	
1	<p>Instrument Panel Center Air Outlet Assembly</p> <p><b>Procedure</b></p> <p>Unsnap the instrument panel center air outlet from the center molding assembly.</p>

Instrument Panel Outer Air Outlet Replacement - Right Side



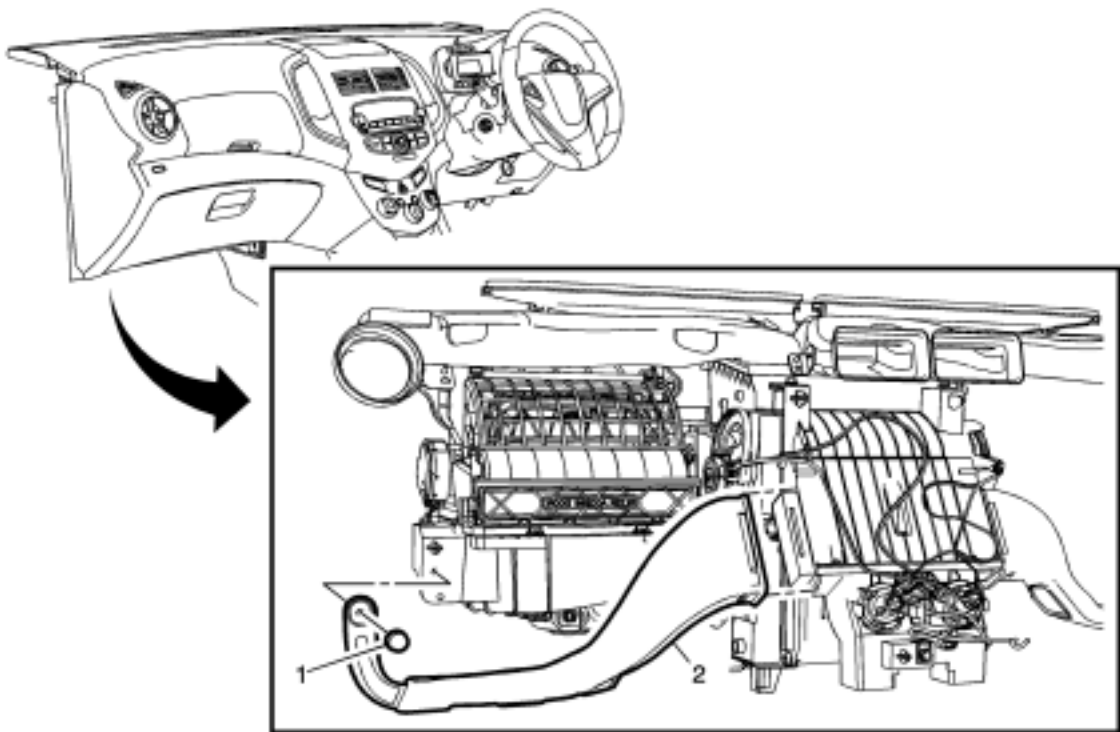
Callout	Component Name
1	<div>Instrument Panel Outer Air Outlet Assembly</div> <div><b>Procedure</b></div> <div>Use a flat bladed plastic trim tool to aid in the removal of the air outlet assembly from the instrument panel.</div>

Instrument Panel Outer Air Outlet Duct Replacement



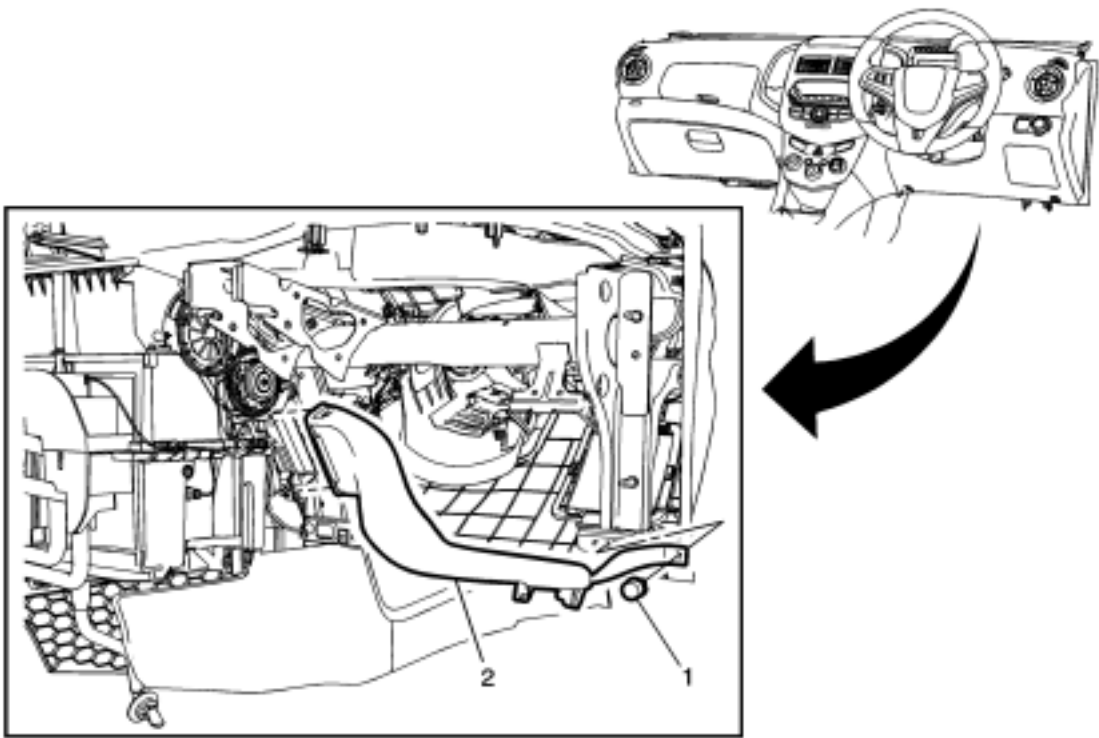
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove the instrument panel assembly. Refer to <a href="#">Instrument Panel Assembly Replacement</a> .</p> <p>2. Reposition any wiring or hoses to gain access to air duct.</p>	
1	Center Air Distributor Duct Screw (Qty: 4)  <b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .
2	Center Air Distributor Duct

Floor Air Outlet Duct Replacement - Left Side (RHD)



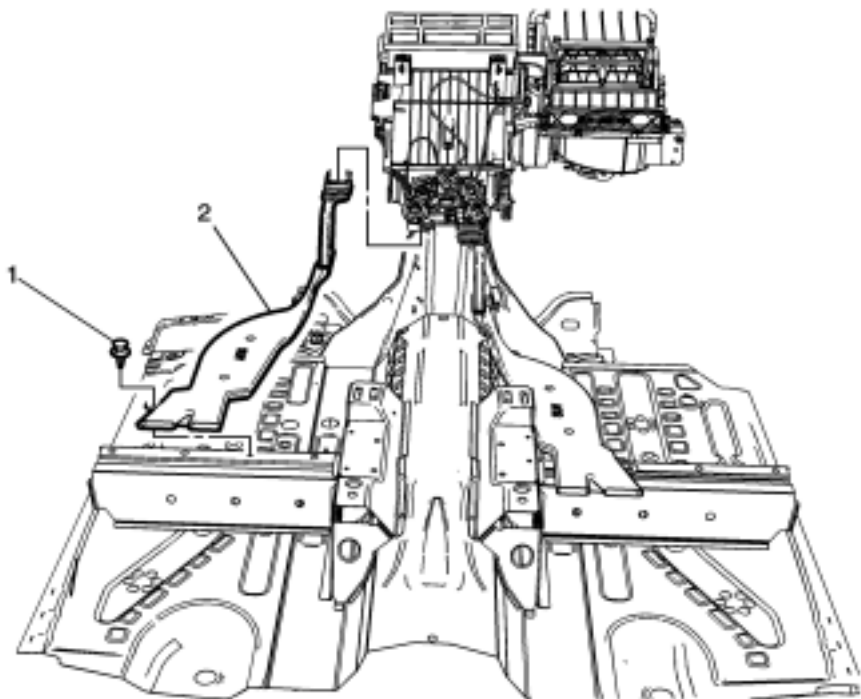
Callout	Component Name
<b>Preliminary Procedure</b> Remove the instrument panel compartment housing. Refer to <a href="#">Instrument Panel Compartment Housing Replacement</a> .	
1	Floor Air Outlet Duct Fastener
2	Floor Air Outlet Duct

Floor Air Outlet Duct Replacement - Right Side (RHD)



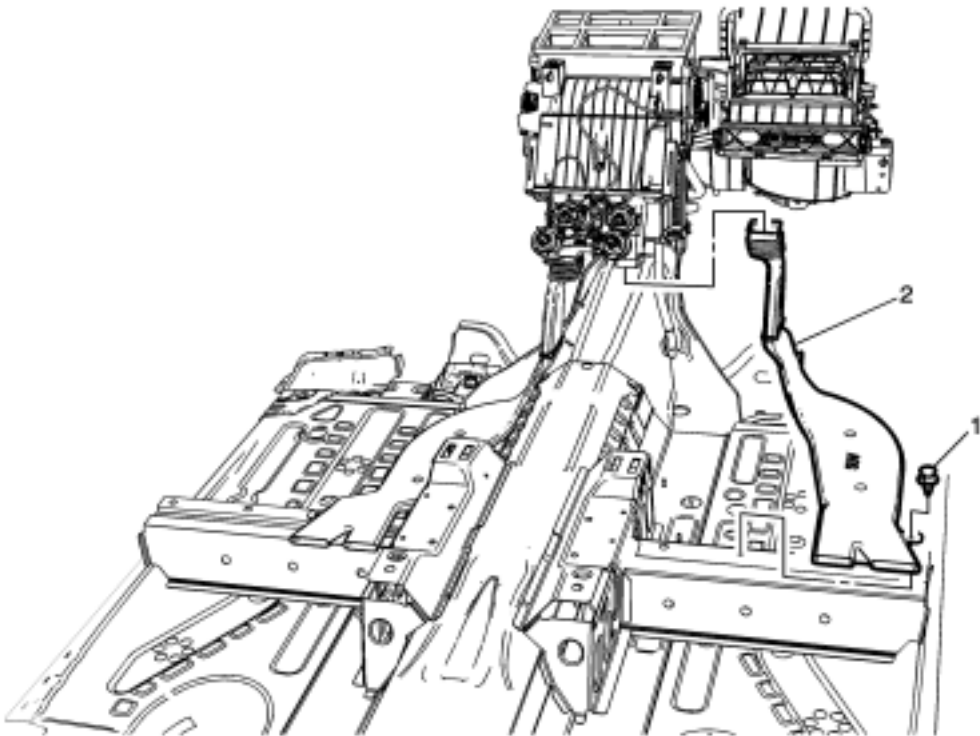
Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the instrument panel insulator, if equipped.</p> <p>2. Remove the instrument panel lower trim pad cover. Refer to <a href="#">Instrument Panel Lower Trim Pad Cover Replacement</a> .</p>	
1	Floor Air Outlet Duct Fastener
2	Floor Air Outlet Duct

Floor Rear Air Outlet Duct Replacement - Left Side



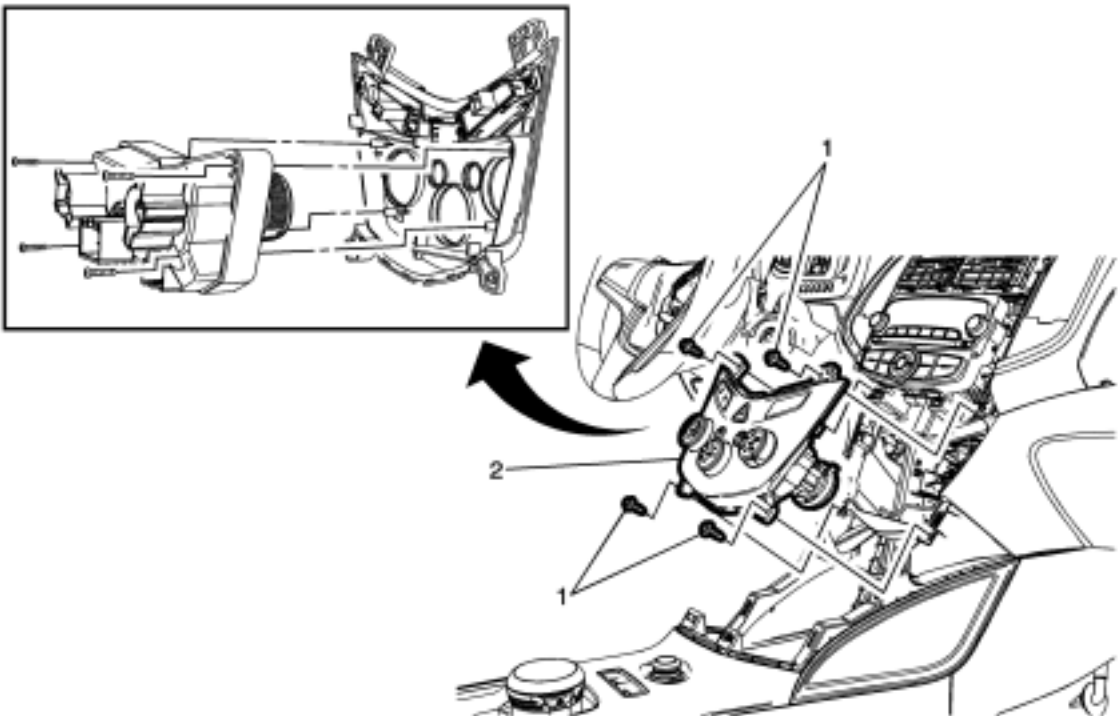
Callout	Component Name
<b>Preliminary Procedure</b> Remove the floor panel carpet . Refer to <a href="#">Floor Panel Carpet Replacement</a> .	
1	Floor Rear Air Outlet Duct Push-In Fastener
2	Floor Rear Air Outlet Duct

Floor Rear Air Outlet Duct Replacement - Right Side



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front floor I carpet. Refer to <a href="#">Floor Panel Carpet Replacement</a> .</p>	
1	<p>Floor Rear Air Outlet Duct</p> <p><b>Procedure</b></p> <p>1. Remove the floor rear air outlet duct fastener. 2. If replacing the floor rear air outlet duct, transfer all necessary components.</p>
2	<p>Floor Rear Air Outlet Duct</p>

Heater and Air Conditioning Control Replacement



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Remove I/P center bezel. Refer to <a href="#">Instrument Panel Center Molding Replacement</a> .</p> <p>2. Remove front floor shifter bezel. Refer to <a href="#">Front Floor Console Cover Replacement</a> .</p>	
1	<p>Heater and Air Conditioning Control Retainer (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 2.5 N·m (22 lbin)</p>
2	<p>Heater and Air Conditioning Control</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connectors</p> <p>2. Disconnect the heater and air conditioning temperature control cable. Refer to <a href="#">Temperature Control Cable Replacement</a> .</p> <p>3. Disconnect the mode control cable. Refer to <a href="#">Mode Control Cable Replacement</a> .</p>



## Heating and Air Conditioning System Description and Operation

### Engine Coolant

Engine coolant is the key element of the heating system. The engine thermostat controls the normal engine operating coolant temperature. Coolant pumped out of the engine enters the heater core through the inlet heater hose. The air flowing through the HVAC module absorbs the heat of the coolant flowing through the heater core. The coolant then exits the heater core through the heater outlet hose and returns back to the engine block.

### A/ C Cycle

Refrigerant is the key element in an air conditioning system. R-134a is presently the only EPA approved refrigerant for automotive use. R-134a is a very low temperature gas that can transfer the undesirable heat from the passenger compartment to the outside air.

A Delphi model CSP-17 compressor is used on this model year vehicle. The A/C compressor is belt driven and operates when the magnetic clutch is engaged. The compressor builds pressure in the A/C system. Compressing the refrigerant also adds heat to the refrigerant. The refrigerant is discharged from the compressor through the discharge hose, and forced to flow to the condenser and then through the balance of the A/C system. The A/C system is mechanically protected with the use of a high pressure relief valve. If the high pressure A/C switch were to fail or if the refrigerant system becomes restricted and refrigerant pressure continued to rise, the high pressure relief will pop open and release refrigerant from the system.

Compressed refrigerant enters the condenser in a high temperature, high pressure vapor state. As the refrigerant flows through the condenser, the heat of the refrigerant is transferred to the ambient air passing through the condenser. Cooling the refrigerant causes the refrigerant to condense and change from a vapor to a liquid state.

The condenser is located in front of the radiator for maximum heat transfer. The condenser is made of aluminum tubing and aluminum cooling fins, which allows rapid heat transfer for the refrigerant. The semi-cooled liquid refrigerant exits the condenser and flows through the liquid line, to the TXV.




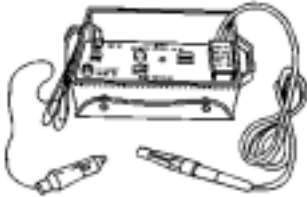

The TXV is located at the evaporator inlet. The TXV is the dividing point for the high and the low pressure sides of the A/C system. As the refrigerant passes through the TXV, the refrigerant is lowered. Due to the pressure differential on the liquid refrigerant, the refrigerant will begin to boil at the TXV. The TXV also meters the amount of liquid refrigerant that can flow into the evaporator.

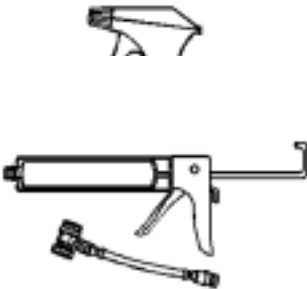
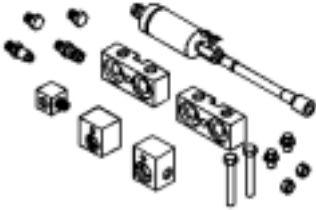

Refrigerant exiting the TXV flows into the evaporator core in a low pressure, liquid state. Ambient air is drawn through the HVAC module and passes through the evaporator core. Warm and moist air will cause the liquid refrigerant to boil inside the evaporator core.

The boiling refrigerant absorbs heat from the ambient air and draws moisture onto the evaporator. The refrigerant exits the evaporator through the suction line and back to the compressor, in a vapor state. This completes the A/C cycle of heat removal. At the compressor, the refrigerant is compressed again and the cycle of heat removal is repeated.




The conditioned air is distributed through the HVAC module for passenger comfort. The moisture removed from the passenger compartment will also change form, or condense, and is discharged from the HVAC module as water.

Special Tools

Illustration	Tool Number/ Description
	A/C Filling Device
	BO-38185 J-38185 Hose Clamp Pliers
	GE-39400 J-39400 GE-50078 Electric Halogen Leak Detector
	GE-39400-A J-39400-A GE-50078 Halogen Leak Detector
	GE-41447 J-41447 R-134A A/C Tracer Dye - Box of 24

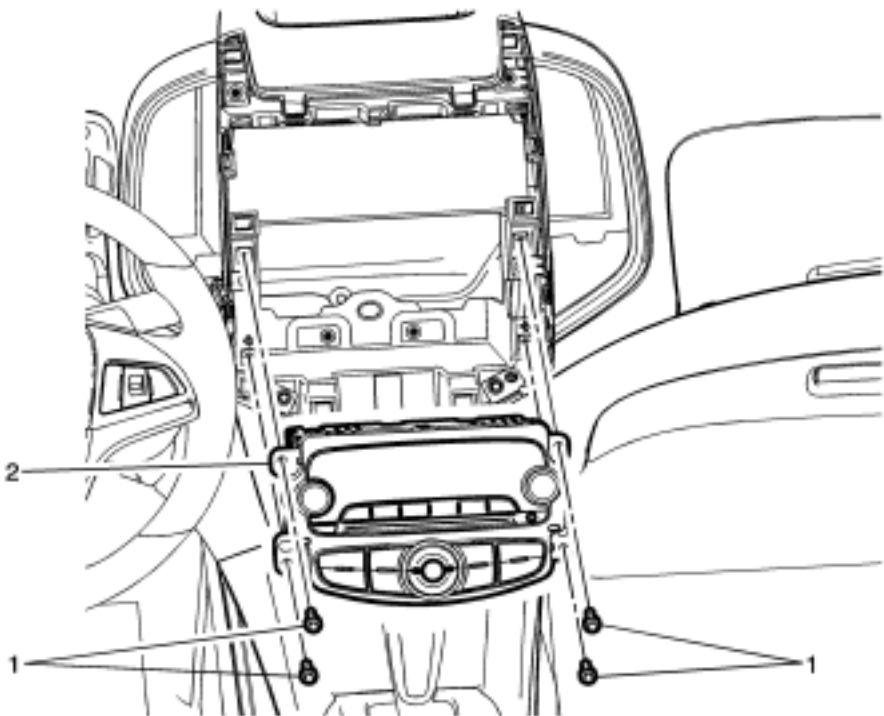
	<div>BO-42220</div> <div>J-42220</div> <div>Universal 12V Leak Detection Lamp</div>
	<div>GE-43872</div> <div>J-43872</div> <div>Florescent Dye Cleaner</div>
	<div>GE-45037</div> <div>J-45037</div> <div>A/C Oil Injector</div>
	<div>GE-45268</div> <div>J-45268</div> <div>A/C Flushing Adapter Kit</div>
	<div>GE-46246</div> <div>J-46246</div> <div>Valve Core Tool</div>



	<div>GE-46297</div> <div>J-46297</div> <div>A/C Dye Injector Kit</div>
	<div>GE-46297-12</div> <div>J-46297-12</div> <div>Replacement Dye Cartridges</div>
	<div>DT-48280</div> <div>Clutch Plate Holder</div>



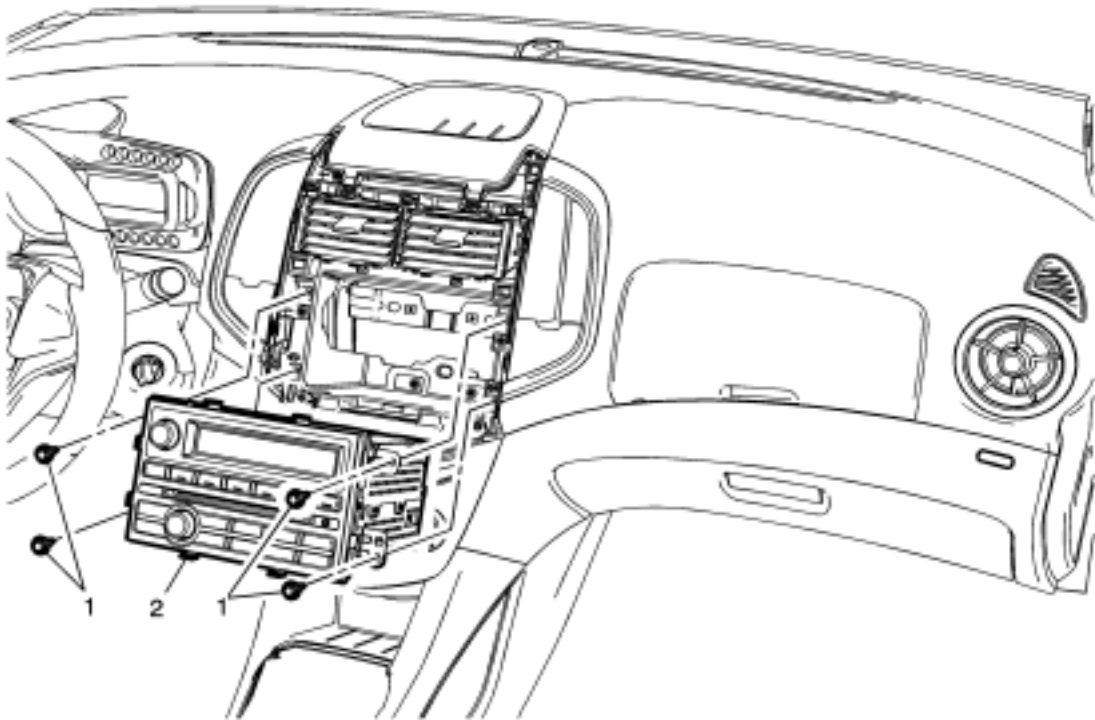
Radio Replacement (With US8)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the instrument panel center molding. Refer to <a href="#">Instrument Panel Center Molding Replacement</a> .</p>	
1	<p>Radio Bolts (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Radio Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connections. 2. Refer to <a href="#">Control Module References</a> for programming and setup information.</p>

SONIC

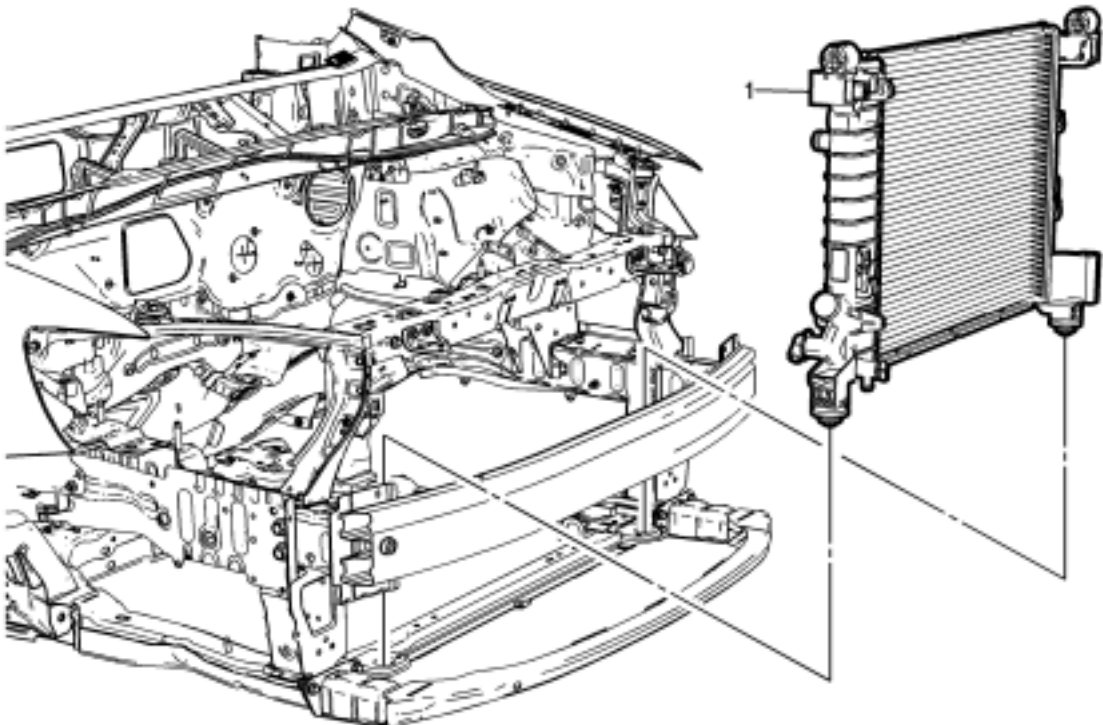
Radio Replacement (Without US8)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the instrument panel center molding. Refer to <a href="#">Instrument Panel Center Molding Replacement</a> .</p>	
1	<p>Radio Bolts (Qty: 4)</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p>
2	<p>Radio Assembly</p> <p><b>Procedure</b></p> <p>1. Disconnect the electrical connections. 2. Refer to <a href="#">Control Module References</a> for programming and setup information.</p>

SONIC

Radiator Replacement ( Gasoline)



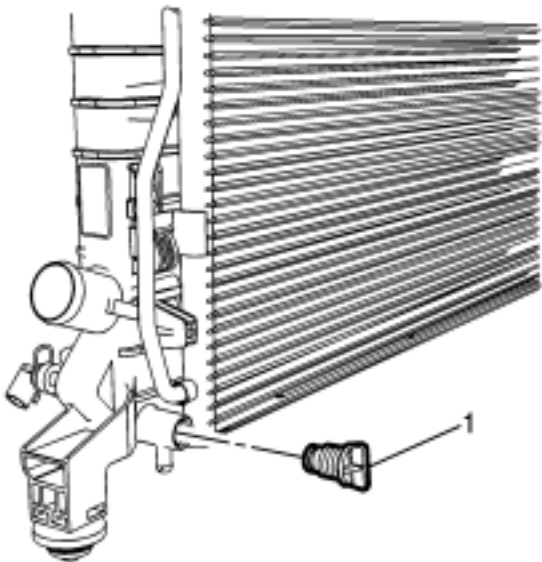
Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Drain the coolant. Refer to <a href="#">Cooling System Draining and Filling</a> .</p> <p>2. Remove the engine coolant temperature sensor.</p> <p>3. Remove the air conditioning condenser. Refer to <a href="#">Air Conditioning Condenser Replacement</a> .</p> <p>4. Remove the engine coolant fan shroud. Refer to <a href="#">Engine Coolant Fan Shroud Replacement</a> .</p> <p>5. Remove the radiator hoses. Refer to <a href="#">Radiator Inlet Hose Replacement</a> and <a href="#">Radiator Outlet Hose Replacement</a> .</p> <p>6. Remove the radiator upper bracket. Refer to <a href="#">Radiator Upper Bracket Replacement</a> .</p>	
1	<p>Radiator</p> <p><b>Tip</b> Tilt radiator forward to remove.</p>

## Cooling System Draining and Filling

### Draining Procedure

**Warning:** To avoid being burned, do not remove the radiator cap or surge tank cap while the engine is hot. The cooling system will release scalding fluid and steam under pressure if radiator cap or surge tank cap is removed while the engine and radiator are still hot.

1. Remove the coolant pressure cap from the radiator surge tank.
2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
3. Remove the front bumper opening lower cover. Refer to [Front Bumper Fascia Opening Lower Cover Replacement](#) .
4. Place a drain pan under the drain cock.



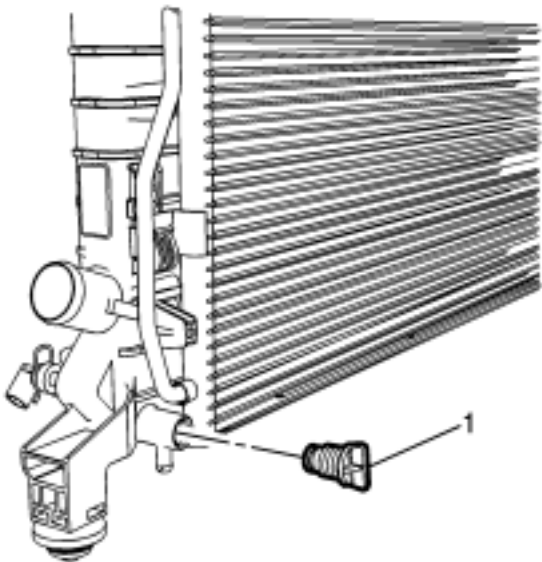
5. Loosen the radiator drain cock (1).
6. Drain the cooling system.
7. Lower the vehicle.
8. Inspect the coolant.
9. Follow the appropriate procedure based on the condition of the coolant.
  - Normal in appearance—Follow the filling procedure.
  - Discolored—Follow the flush procedure. Refer to [Coolant System Flushing](#) .

### Filling Procedure

**Caution:** The procedure below must be followed. Improper coolant level could result in a low or high coolant level condition, causing engine damage.

1. Raise and support the vehicle.

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



2. Tighten the radiator drain cock (1) to **2 N·m (18 lb in)**.
3. Install the front bumper opening lower cover. Refer to [Front Bumper Fascia Opening Lower Cover Replacement](#) .
4. Lower the vehicle.

**Note:** Use a 50/50 mixture of DEX-COOL antifreeze and clean drinkable water.

5. Slowly fill the radiator with a 50/50 coolant mixture until the coolant level reaches the base of the radiator surge tank. Refer to [Approximate Fluid Capacities](#) .





## SONIC

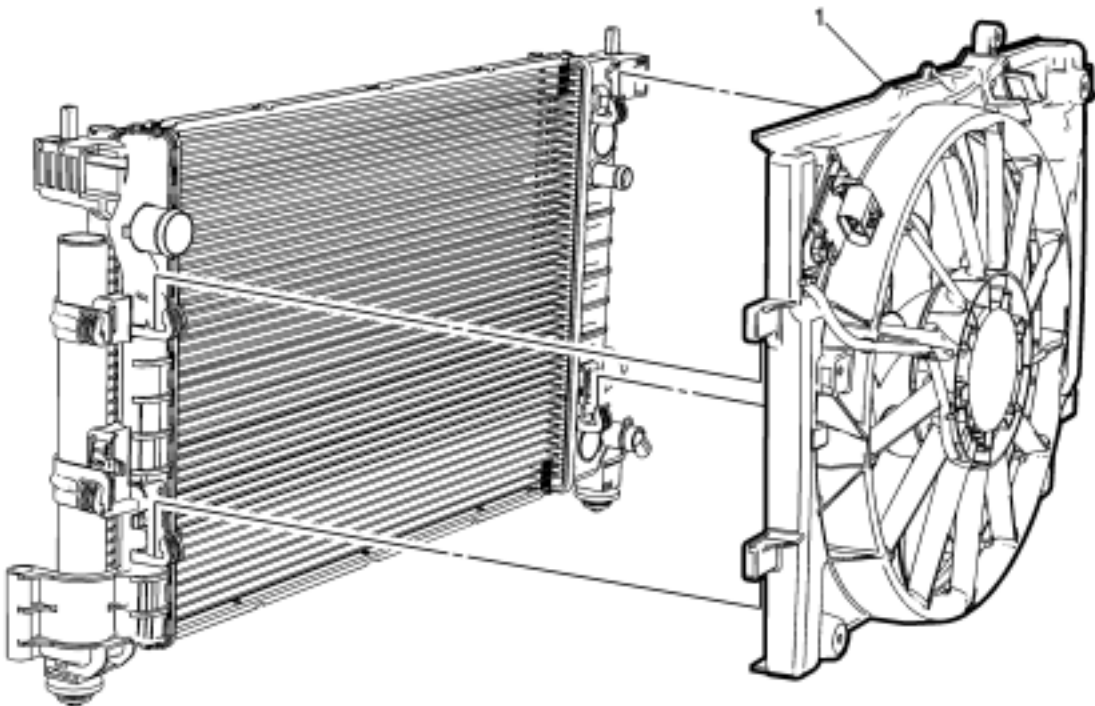
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6. Allow 30 seconds for the coolant level to stabilize and continue to fill the coolant filler neck until the level stabilizes for at least 2 minutes.
7. Start the engine and allow to the engine to idle in PARK or NEUTRAL with the parking brake engaged.
8. Slowly fill the coolant mixture until the level stabilizes at the base of the radiator surge tank.
9. Install the coolant pressure cap.
10. Raise the engine RPM to 2500rpm for 30–40 seconds.
11. Shut the engine OFF.
12. Allow the engine to cool, remove coolant fill cap and repeat steps 4–10 until the coolant level has completely stabilized within the radiator surge tank.
13. Inspect and if necessary, fill the coolant reservoir bottle as necessary.
14. Rinse away any excess coolant from the engine and the engine compartment.
15. Inspect the cooling system for leaks.
16. Top off the radiator surge tank if necessary.



SONIC

Engine Coolant Fan Shroud Replacement (Gasoline)



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>1. Remove the radiator surge tank. Refer to <a href="#">Radiator Surge Tank Replacement</a> .</p> <p>2. Unclip transmission cooler lines from shroud if equipped.</p> <p>3. Unclip radiator surge tank outlet hose from fan shroud.</p> <p>4. Disconnect any electrical connectors from the fan shroud.</p>	
1	<p>Engine Coolant Fan Shroud</p> <p><b>Tip</b> Unclip engine coolant fan shroud from radiator.</p>

SONIC

Radiator Inlet Hose Replacement (1.6L or 1.8L)

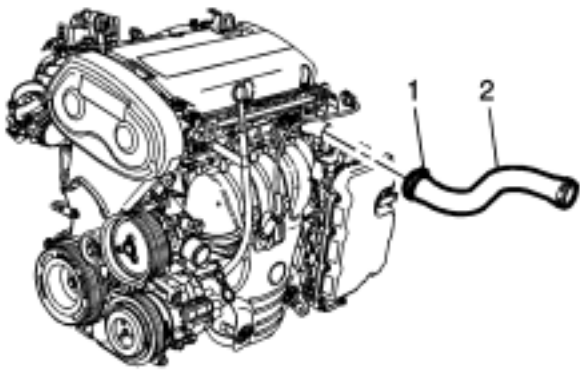
Special Tools

BO-38185 Hose Clamp Pliers

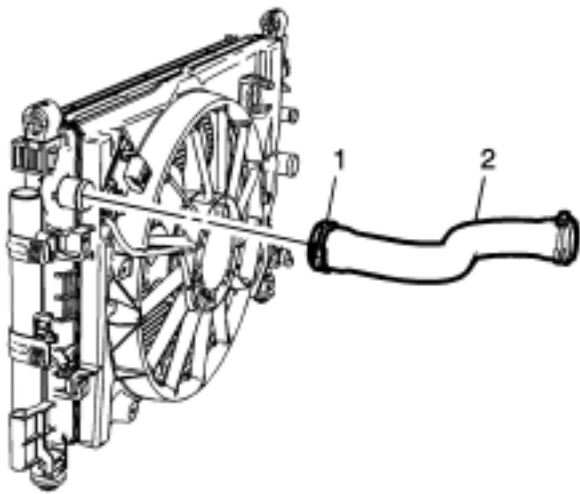
For equivalent regional tools, Refer to [Special Tools](#) .

Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#) .



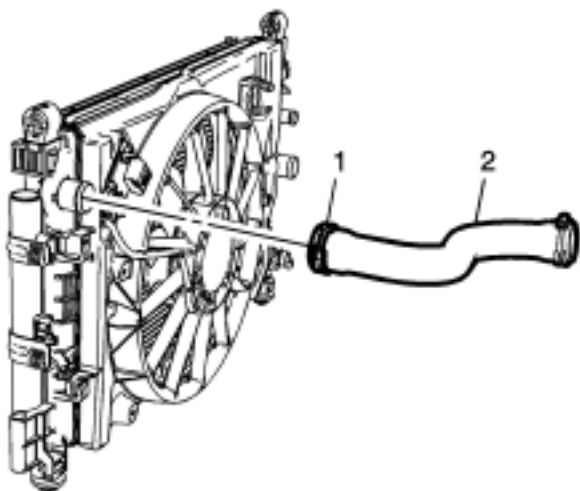
2. Remove the radiator inlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .
3. Remove the radiator inlet hose(2) from the engine.



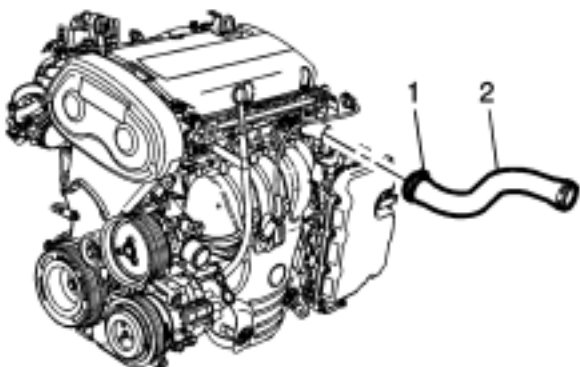
4. Remove the radiator inlet hose clamp(1) at the radiator using *BO-38185* Hose Clamp Pliers .
5. Remove the radiator inlet hose(2) from the radiator.
6. Remove the radiator inlet hose from the vehicle.

SONIC

Installation Procedure



- 1. Install the radiator inlet hose to the vehicle.
- 2. Install the radiator inlet hose(2) to the radiator.
- 3. Install the radiator inlet hose clamp(1) at the radiator using *BO-38185* Hose Clamp Pliers .



- 4. Install the radiator inlet hose(2) to the engine.
- 5. Install the radiator inlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#) .

SONIC

Radiator Inlet Hose Replacement (1.2L or 1.4L)

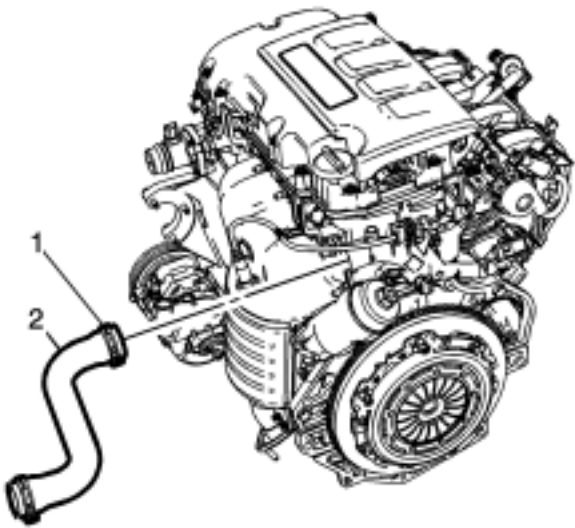
Special Tools

BO-38185 Hose Clamp Pliers

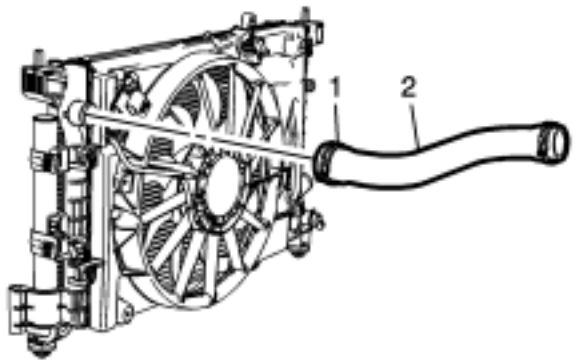
For equivalent regional tools, Refer to [Special Tools](#)

Removal Procedure

- 1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#)



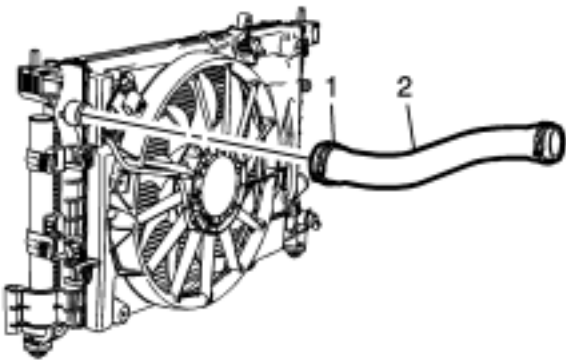
- 2. Remove the radiator inlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .
- 3. Remove the radiator inlet hose(2) from the engine.



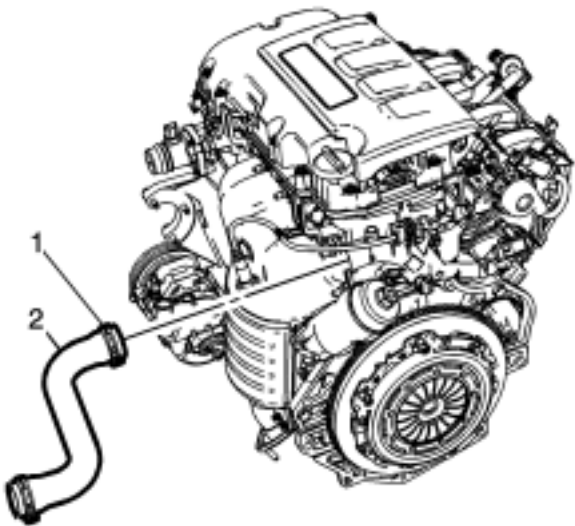
- 4. Remove the radiator inlet hose clamp(1) at the radiator using *BO-38185* Hose Clamp Pliers .
- 5. Remove the radiator inlet hose(2) from the radiator.
- 6. Remove the radiator inlet hose from the vehicle.

SONIC

Installation Procedure



- 1. Install the radiator inlet hose to the vehicle.
- 2. Install the radiator inlet hose(2) to the radiator.
- 3. Install the radiator inlet hose clamp(1) at the radiator using *BO-38185* Hose Clamp Pliers .



- 4. Install the radiator inlet hose(2) to the engine.
- 5. Install the radiator inlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#)

SONIC

# Radiator Inlet Hose Replacement ( Diesel)

## Special Tools

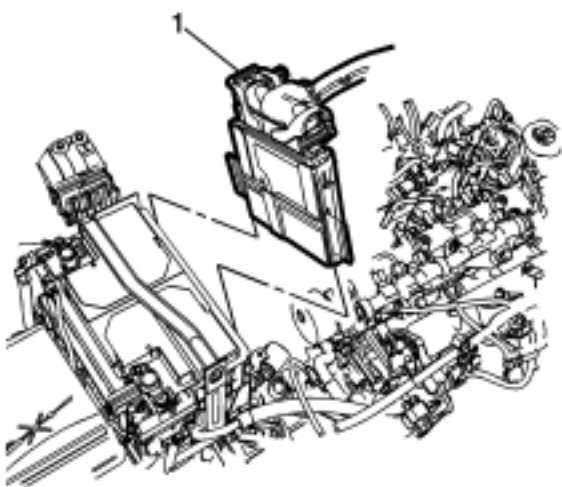
BO-38185 Hose Clamp Pliers

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

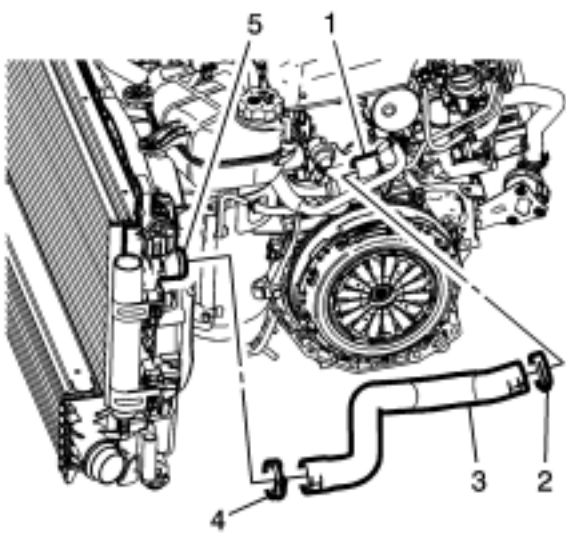
## Removal Procedure

**Warning:** With a pressurized cooling system, the coolant temperature in the radiator can be considerably higher than the boiling point of the solution at atmospheric pressure. Removal of the surge tank cap, while the cooling system is hot and under high pressure, causes the solution to boil instantaneously with explosive force. This will cause the solution to spew out over the engine, the fenders, and the person removing the cap. Serious bodily injury may result.

1. Drain the coolant. Refer to [Cooling System Draining and Filling](#) .
2. Remove the radiator surge tank. Refer to [Radiator Surge Tank Replacement](#) .



3. Remove the electronic control module(1) from the battery tray.



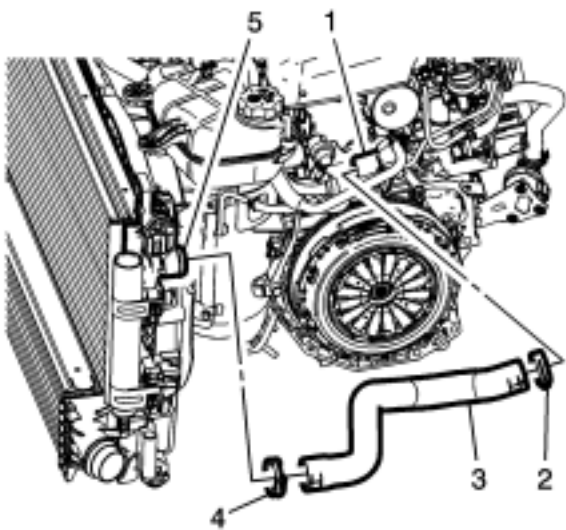
**Note:** Use a small screwdriver to unclip the retainer clip (black arrow) and pull the electronic control module out.

4. Unclip the retainer clip from the radiator inlet hose(3).
5. Remove the radiator inlet hose clamp(2) from the thermostat housing(1) using the *BO-38185* pliers .
6. Remove the radiator inlet hose clamp(4) from the radiator(5) using the *BO-38185* pliers .
7. Remove the radiator inlet hose(3).

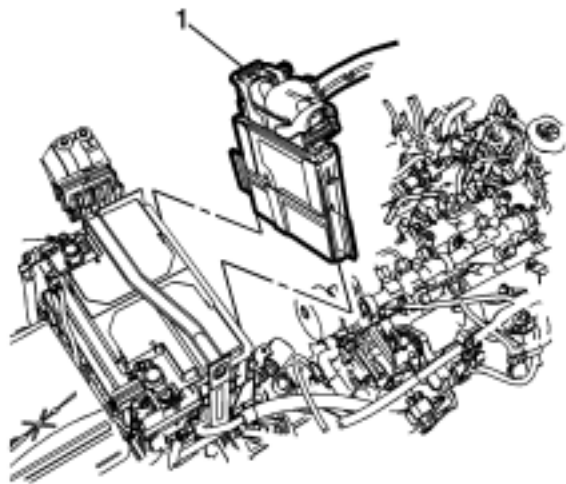


SONIC

Installation Procedure



- 1. Install the radiator inlet hose(3).
- 2. Install the radiator inlet hose clamp(4) to the radiator(5) using the *BO-38185* pliers .
- 3. Install the radiator inlet hose clamp(2) to the thermostat housing(1) using the *BO-38185* pliers .
- 4. install the radiator inlet hose(3) into the retainer clip.



- 5. Install the electronic control module(1) to the battery tray.
- 6. Install the radiator surge tank. Refer to [Radiator Surge Tank Replacement](#) .
- 7. Fill the coolant system. Refer to [Cooling System Draining and Filling](#)



SONIC

Radiator Outlet Hose Replacement (1.6L or 1.8L)

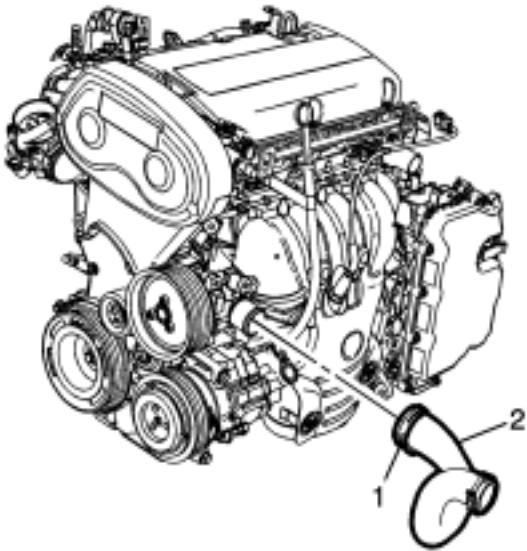
Special Tools

BO-38185 Hose Clamp Pliers

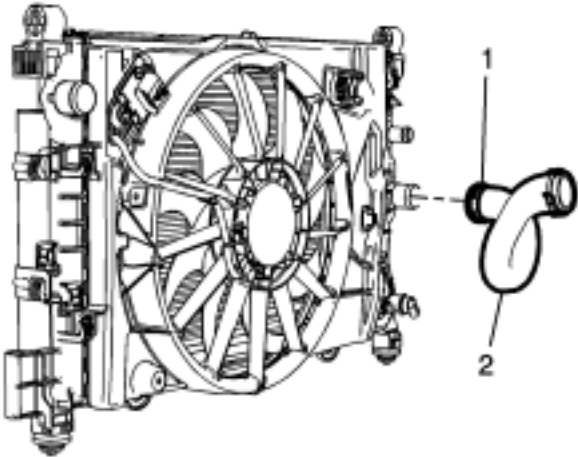
For equivalent regional tools, Refer to [Special Tools](#) .

Removal Procedure

- 1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#) .



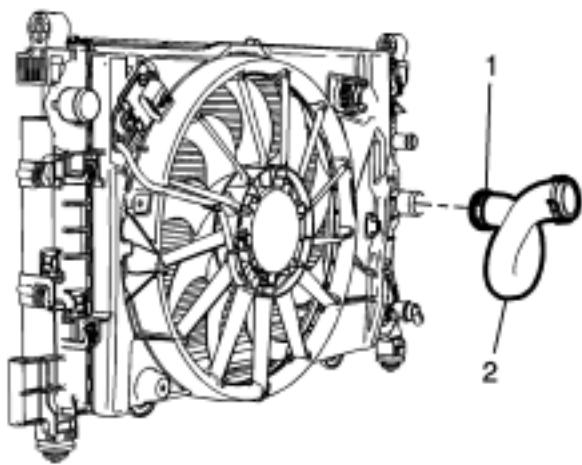
- 2. Remove the radiator outlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .
- 3. Remove the radiator outlet hose (2) from the engine.



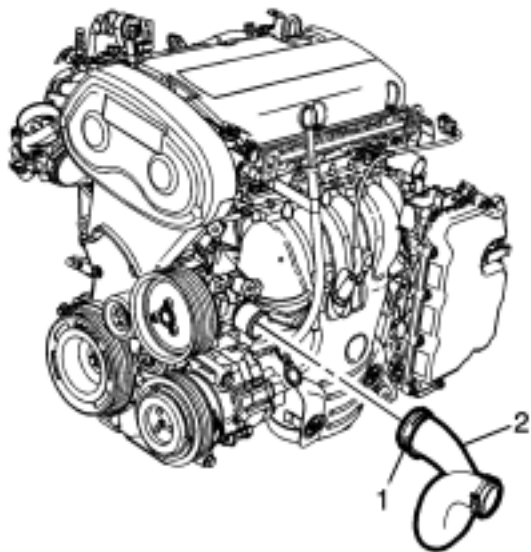
- 4. Remove the radiator outlet hose clamp (1) at the radiator using *BO-38185* Hose Clamp Pliers .
- 5. Remove the radiator outlet hose (2) from the radiator.
- 6. Remove the radiator outlet hose from the vehicle.

SONIC

Installation Procedure



- 1. Install the radiator outlet hose to the vehicle.
- 2. Install the radiator outlet hose(2) to the radiator.
- 3. Install the radiator outlet hose clamp (1) at the radiator using *BO-38185* Hose Clamp Pliers .



- 4. Install the radiator outlet hose(2) to the engine.
- 5. Install the radiator outlet hose clamp (1) at the engine using *BO-38185* Hose Clamp Pliers .
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#) .

SONIC

Radiator Outlet Hose Replacement (1.2L or 1.4L)

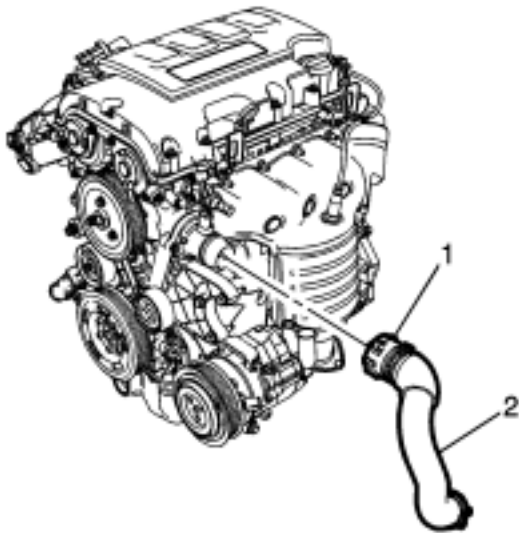
Special Tools

BO-38185 Hose Clamp Pliers

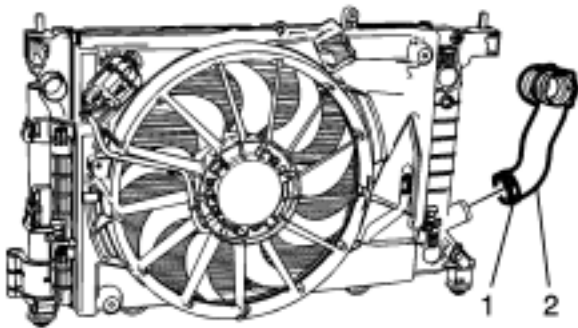
For equivalent regional tools, Refer to [Special Tools](#)

Removal Procedure

- 1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#)
- 2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)



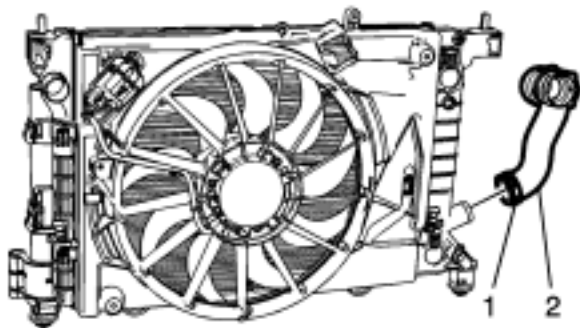
- 3. Disconnect the radiator outlet hose quick connect fitting (1) at the engine.
- 4. Remove the radiator outlet hose (2) from the engine.



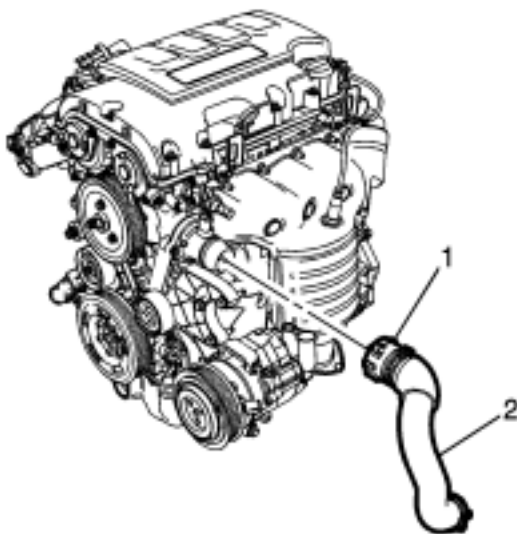
- 5. Remove the radiator outlet hose clamp (1) at the radiator using BO-38185 Hose Clamp Pliers .
- 6. Remove the radiator outlet hose (2) from the radiator.
- 7. Remove the radiator outlet hose from the vehicle.

SONIC

Installation Procedure



- 1. Install the radiator outlet hose to the vehicle.
- 2. Install the radiator outlet hose(2) to the radiator.
- 3. Install the radiator outlet hose clamp(1) at the radiator using *BO-38185* Hose Clamp Pliers .



- 4. Install the radiator outlet hose(2) to the engine.
- 5. Connect the radiator outlet hose quick connect fitting(1) at the engine.
- 6. Lower the vehicle.
- 7. Fill the cooling system. Refer to [Cooling System Draining and Filling](#)

SONIC

# Radiator Outlet Hose Replacement ( Diesel)

## Special Tools

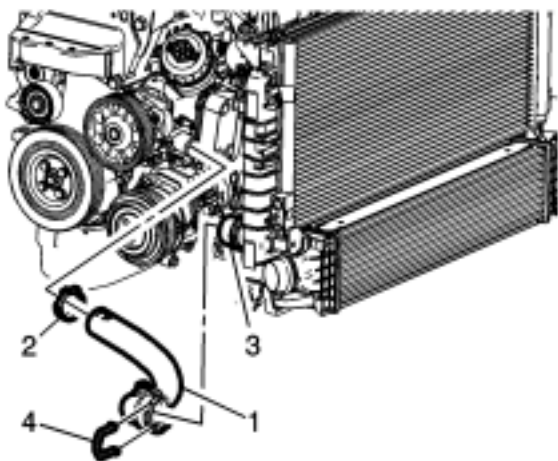
BO-38185 Hose Clamp Pliers

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

## Removal Procedure

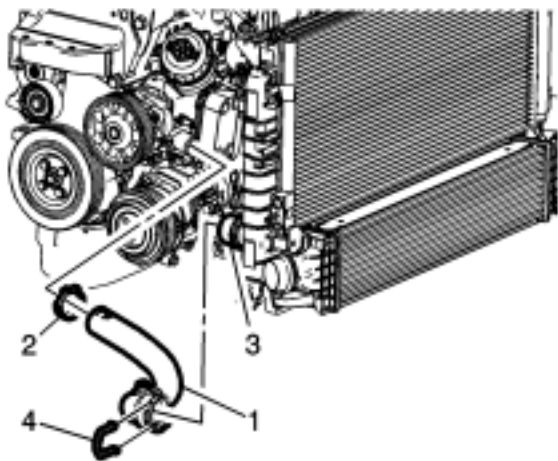
**Warning:** With a pressurized cooling system, the coolant temperature in the radiator can be considerably higher than the boiling point of the solution at atmospheric pressure. Removal of the surge tank cap, while the cooling system is hot and under high pressure, causes the solution to boil instantaneously with explosive force. This will cause the solution to spew out over the engine, the fenders, and the person removing the cap. Serious bodily injury may result.

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#) .
2. Remove the air cleaner outlet duct. Refer to [Air Cleaner Outlet Duct Replacement](#) .



3. Remove the radiator outlet hose clamp(2) Using the *BO-38185* pliers .
4. Remove the radiator outlet hose(1) from the oil filter housing.
5. Remove the retainer clip(4).
6. Remove the radiator outlet hose(1) from the radiator(3).

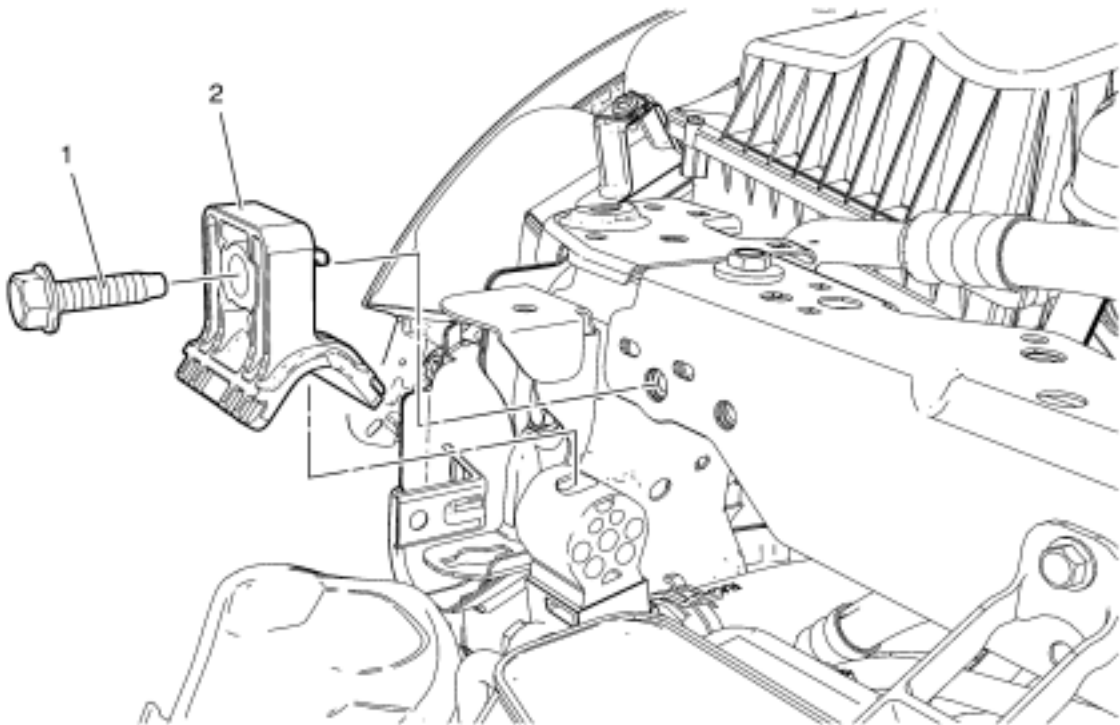
## Installation Procedure



1. Install the radiator outlet hose(1) to the radiator(3).
2. Install the retainer clip(4).
3. Install the radiator outlet hose(1) to the oil filter housing.
4. Install the radiator outlet hose clamp(2) Using the *BO-38185* pliers .
5. Install the air cleaner outlet duct. Refer to [Air Cleaner Outlet Duct Replacement](#) .
6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#) .

SONIC

Radiator Upper Bracket Replacement



Callout	Component Name
<p><b>Preliminary Procedure</b></p> <p>Remove the front bumper fascia. Refer to <a href="#">Front Bumper Fascia Replacement</a> .</p>	
1	<p>Radiator Support Bracket Bolt</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 9 N·m (80 lbin)</p>
2	<p>Radiator Support Bracket</p> <p><b>Procedure</b></p> <p>Pull the radiator forward until the bracket is reachable.</p>



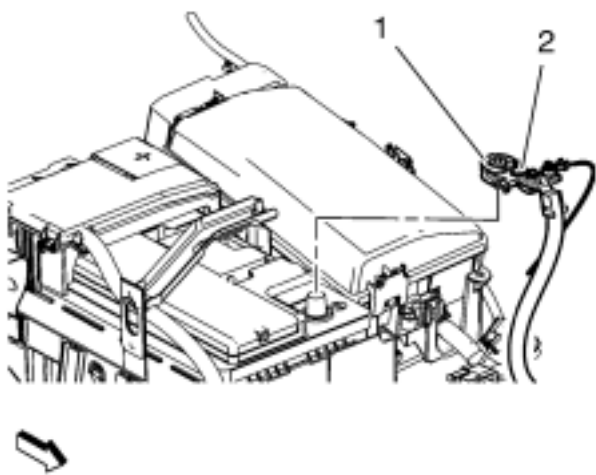
SONIC

Battery Negative Cable Disconnection and Connection (LCU,LDE)

Removal Procedure

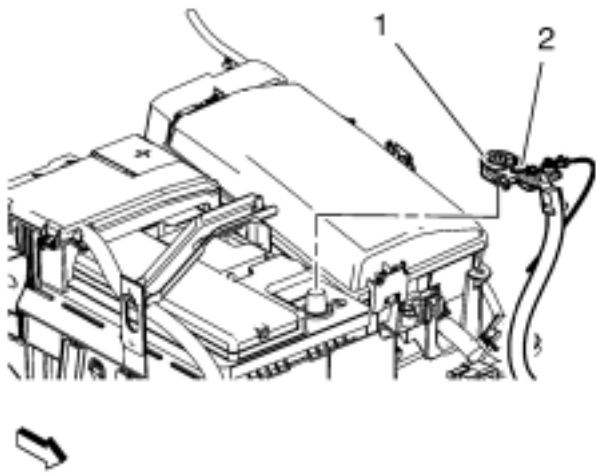
- 1. Turn on the radio and record all of the customer radio station presets.
- 2. Ensure that all lamps and accessories are turned off.
- 3. Turn the ignition OFF and remove the ignition key.

**Warning:** Refer to [Battery Disconnect Warning](#) .



- 4. Loosen the battery negative cable nut (2).
- 5. Remove the battery negative cable (1) from the battery.

Installation Procedure



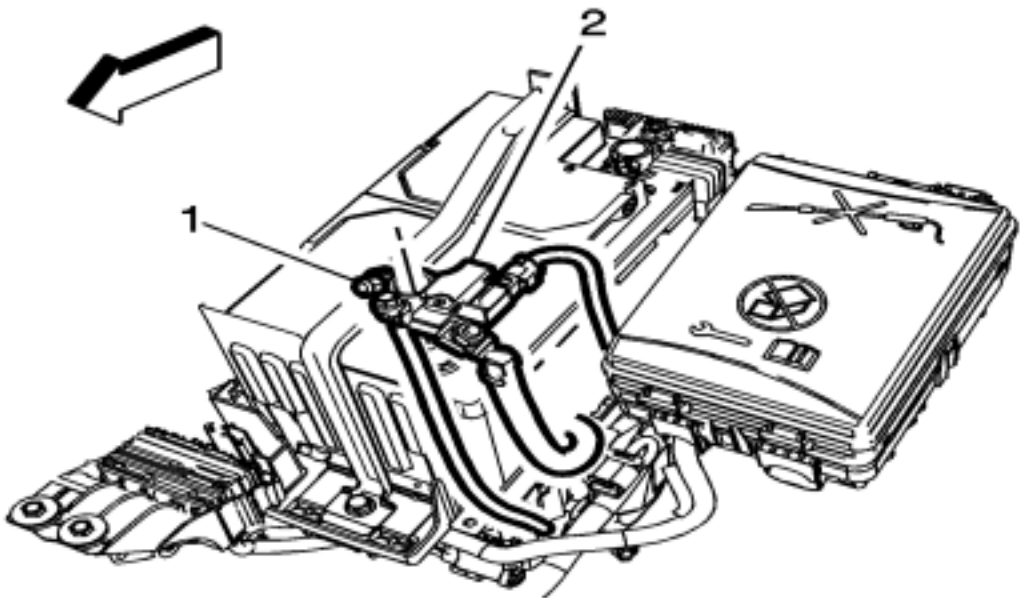
- 1. Install the battery negative cable (1) to the battery.

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

- 2. Fasten the battery negative cable nut (2) and tighten the nut to **4.5 N·m (40 lbin)** .
- 3. Insert the ignition key and turn the ignition to the ON position.
- 4. Program volatile memory. Refer to [Control Module References](#) .

SONIC

Battery Negative Cable Disconnection and Connection (LSF,LDV)



Callout	Component Name
<p><b>Preliminary Procedures</b></p> <p>1. Turn on the radio and record all of the radio pre-set stations.</p> <p>2. Ensure that all lamps and accessories are turned off.</p> <p>3. Turn the ignition OFF and remove the ignition key.</p>	
1	<p><b>Warning:</b> Refer to <a href="#">Battery Disconnect Warning</a> .</p> <p>Battery Negative Cable Nut</p> <p><b>Caution:</b> Refer to <a href="#">Fastener Caution</a> .</p> <p><b>Tighten</b> 4.5 N·m (40 lbin)</p>
2	<p>Battery Negative Cable</p> <p><b>Procedure</b></p> <p>1. Disconnect the battery negative cable from the battery.</p> <p>2. After connecting the battery negative cable, insert the ignition key and turn the ignition to the ON position.</p> <p>3. Program the volatile memory. Refer to <a href="#">Control Module References</a> .</p>



SONIC

Drive Belt Replacement

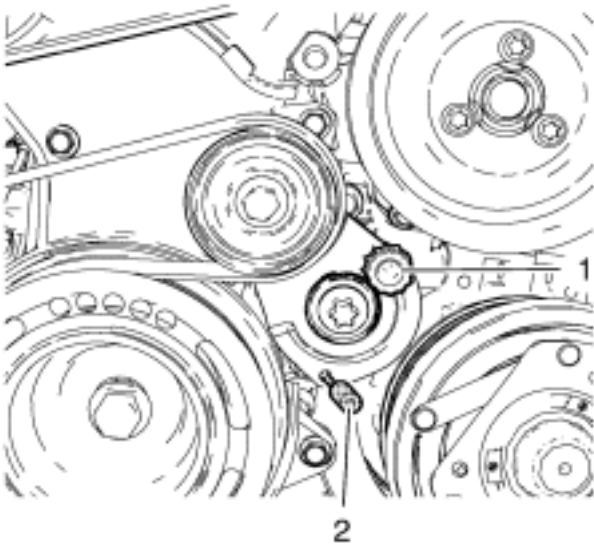
Special Tools

EN 6349 Locking Pin

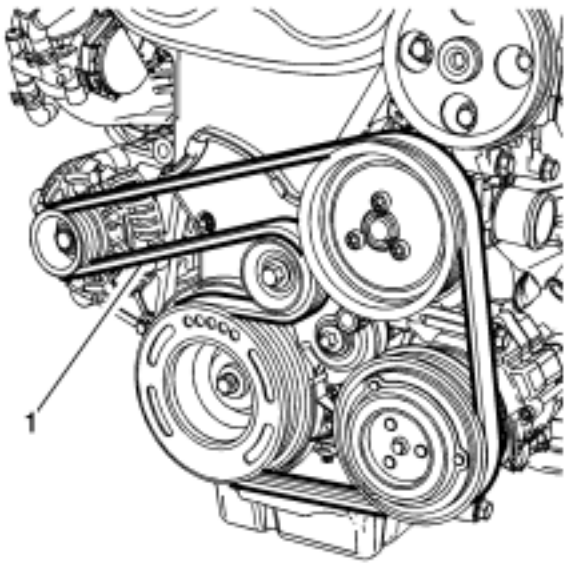
For equivalent regional tools, refer to [Special Tools](#) .

Removal Procedure

- 1. Remove the power steering pump belt, if equipped. Refer to [Power Steering Pump Belt Replacement](#) .
- 2. Remove the front wheelhouse liner inner front extension. Refer to [Front Wheelhouse Liner Inner Front Extension Replacement](#) .



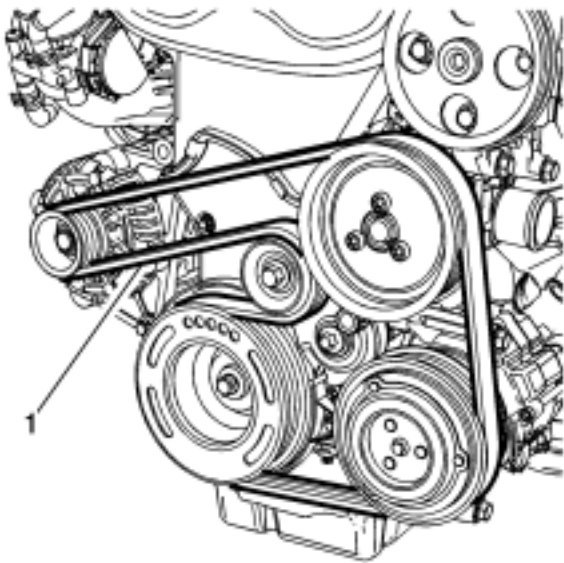
- 3. Release tension to the drive belt tensioner by rotating counterclockwise(1) and lock with *EN 6349* pin (2).



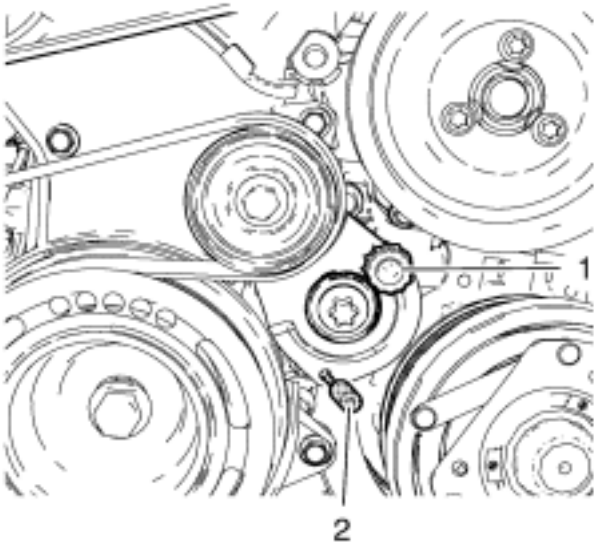
- 4. Remove the drive belt (1).

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Installation Procedure



1. Install the drive belt (1).



2. Release tension to the tensioner by rotating counterclockwise (1).
- Note:** Allow tensioner to slide back slowly.
3. Remove *EN 6349* pin (2).
4. Apply tension to the tensioner clockwise (1).
5. Install the front wheelhouse liner inner front extension. Refer to [Front Wheelhouse Liner Inner Front Extension Replacement](#) .
6. Install the power steering pump belt, if equipped. Refer to [Power Steering Pump Belt Replacement](#) .

SONIC

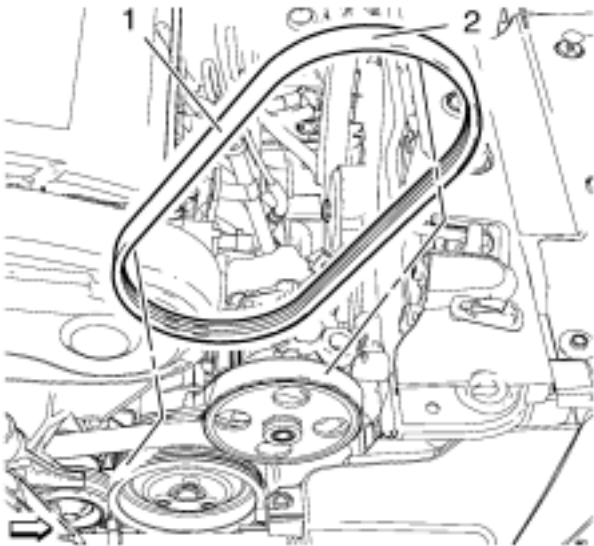
# Power Steering Pump Belt Replacement

## Special Tools

CH 49800 Installer Power Steering Pump Belt

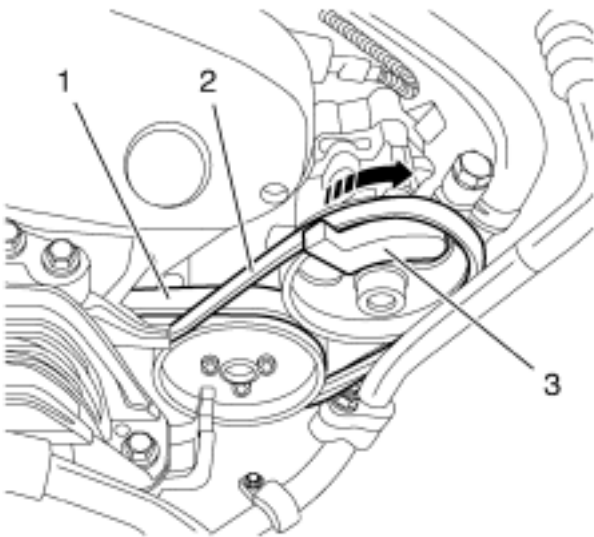
For equivalent regional tools, refer to [Special Tools](#) .

## Removal Procedure



1. Cut the power steering pump belt (2) with a appropriate cutting tool at position (1).
2. Remove the power steering pump belt (2)

## Installation Procedure



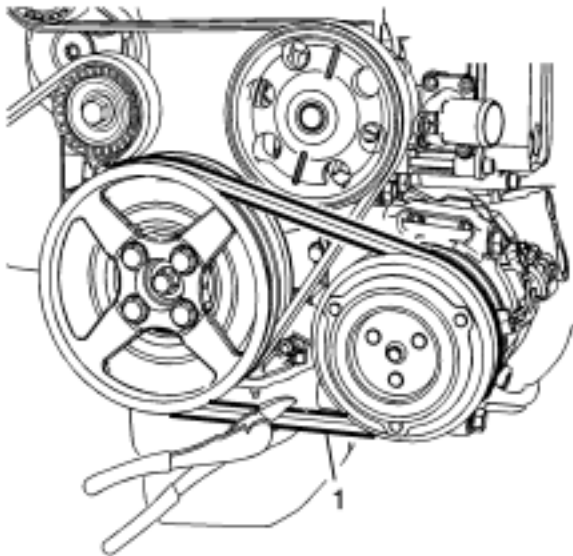
1. Relieve the tension of the drive belt (1). Refer to [Drive Belt Replacement](#) .
2. Install CH-49800 installer (3) on the power steering pump pulley.
3. Install NEW power steering belt (2) aligning pulley water pump.
4. Rotate the power steering pump pulley clockwise using hex wrench on the shaft power steering pump pulley.
5. Remove the CH-49800 installer (3).
6. Install the drive belt. Refer to [Drive Belt Replacement](#)

SONIC

# Air Conditioning Compressor Belt Replacement

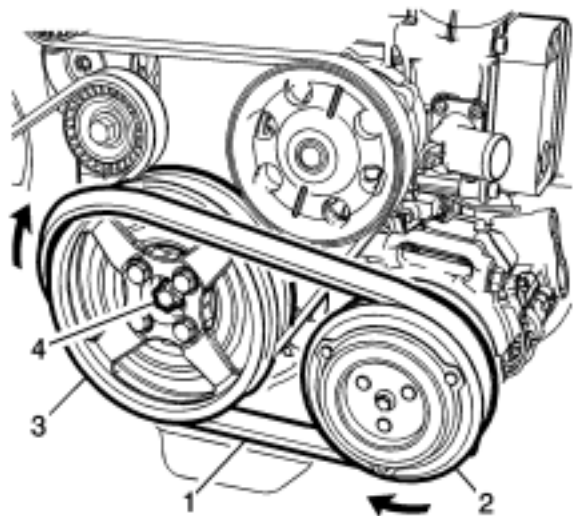
## Removal Procedure

1. Remove the front wheelhouse liner inner front extension. Refer to [Front Wheelhouse Liner Inner Front Extension Replacement](#)

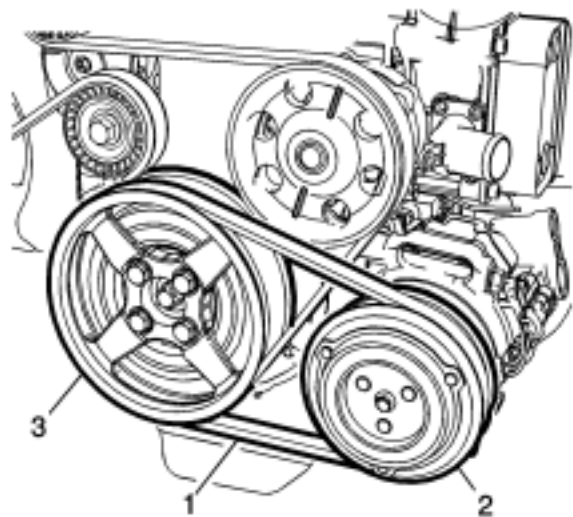


2. Cut the air conditioning (A/C) belt (1) with a appropriate cutting tool as shown.
3. Remove and discard the air conditioning (A/C) belt (1).

## Installation Procedure



1. Position a NEW air conditioning (A/C) belt (1) on the crankshaft pulley (3) and air conditioning (A/C) compressor (2) as shown.  
**Note:** Push the on belt while rotating the crankshaft pulley.
2. Using a socket and ratchet on the crankshaft pulley bolt (4), rotate the crankshaft in the direction of the arrow until the belt (1) is fully installed on the air conditioning (A/C) compressor (2).



3. After the belt is on the air conditioning (A/C) compressor pulley (2) , rotate the crankshaft (3) an additional complete revolution and ensure the air conditioning (A/C) belt (1) is fully seated on the crankshaft (3) and air conditioning (A/C) compressor (2).
4. Install the front wheelhouse liner inner front extension. Refer to [Front Wheelhouse Liner Inner Front Extension Replacement](#)