

2018 ACCESSORIES & EQUIPMENT

Lighting - Repair Instructions - Traverse

REPAIR INSTRUCTIONS

WIRE TO WIRE REPAIR - LIGHTING

Special Tools

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

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

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

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

NOTE: Do not splice wires in Door Harness Grommets.

NOTE: The DuraSeal splice sleeves have the following 2 critical features:

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

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

Splice Sleeve Selection

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

NOTE:

You must perform the following procedures in the listed order.

Repeat the procedure if any wire strands are damaged. You must obtain a clean strip with all of the wire strands intact.

1. Open the harness by removing any tape:

- Use a sewing seam ripper, available from sewing supply stores, in order to cut open the harness in order to avoid wire insulation damage.
- Use the DuraSeal splice sleeves on all types of insulation except Tefzel and coaxial.
- Do not use the crimp and DuraSeal splice sleeve to form a splice with more than 2 wires coming together.

2. Cut as little wire off the harness as possible. You may need the extra length of wire in order to change the location of a splice.

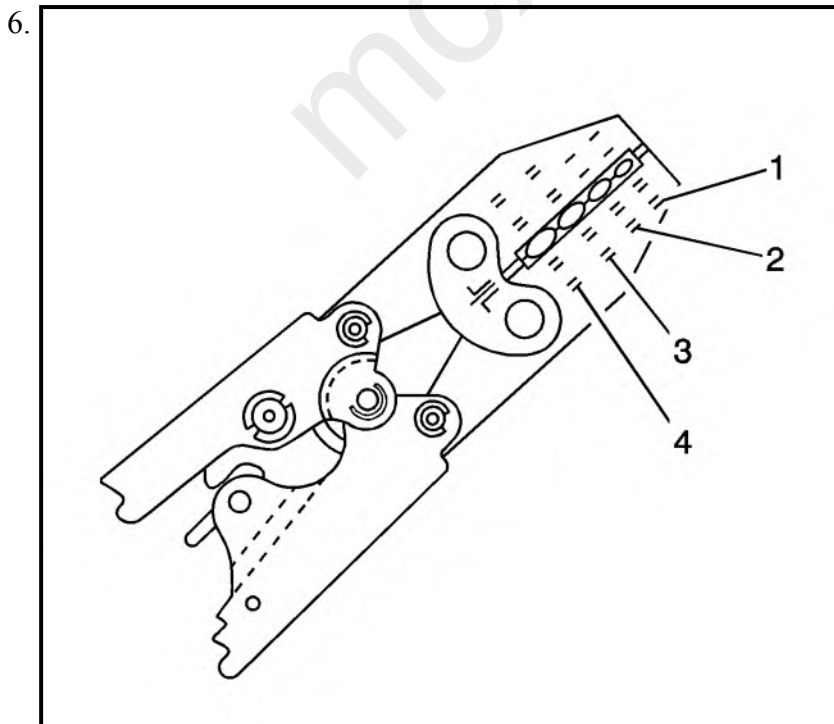
Adjust splice locations so that each splice is at least 40 mm (1.5 in) away from the other splices, harness branches, or connectors.

3. Strip the insulation:

- When adding a length of wire to the existing harness, use the same size wire as the original wire.
- Perform one of the following items in order to find the correct wire size:
 - Find the wire on the schematic and convert to regional wiring gauge size.
 - If you are unsure of the wire size, begin with the largest opening in the wire stripper and work down until achieving a clean strip of the insulation.
- Strip approximately 5.0 mm (0.20 in) of insulation from each wire to be spliced.
- Do not nick or cut any of the strands. Inspect the stripped wire for nicks or cut strands.
- If the wire is damaged, repeat this procedure after removing the damaged section.

4. For high temperature wiring, slide a section of high temperature SCT1 shrink tubing down the length of wire to be spliced. Ensure that the shrink tubing will not interfere with the splice procedure.

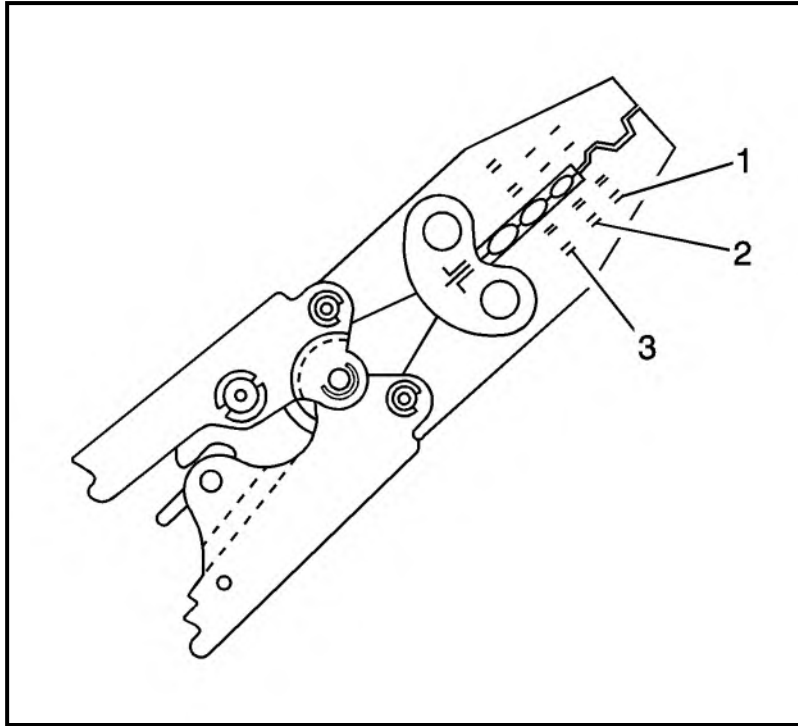
5. Select the proper DuraSeal splice sleeve according to the wire size. Refer to the above table at the beginning of the repair procedure for the color coding of the DuraSeal splice sleeves and the crimp tool nests.



The **EL-38125-10** splice sleeve crimping tool has four crimp nests. The largest crimp nest (4) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (3) is used for crimping 14 and 16 gauge wires. The third largest crimp nest (2) is used for crimping 18 and 20 gauge

wires. The smallest crimp nest (1) is used for crimping 22 to 26 gauge wires. The crimp nests are referenced in the table (farther above) under the crimp tool nest color.

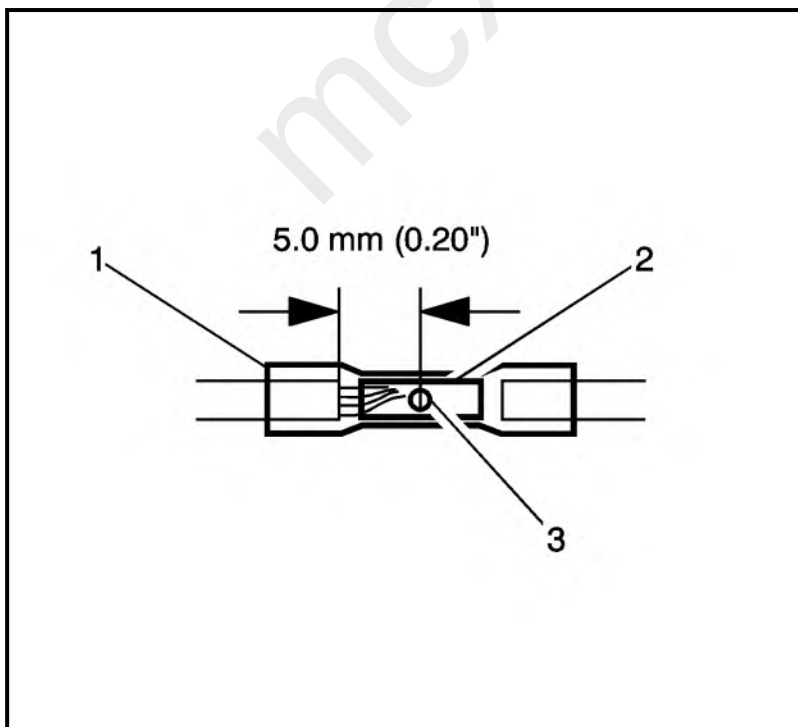
7.



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

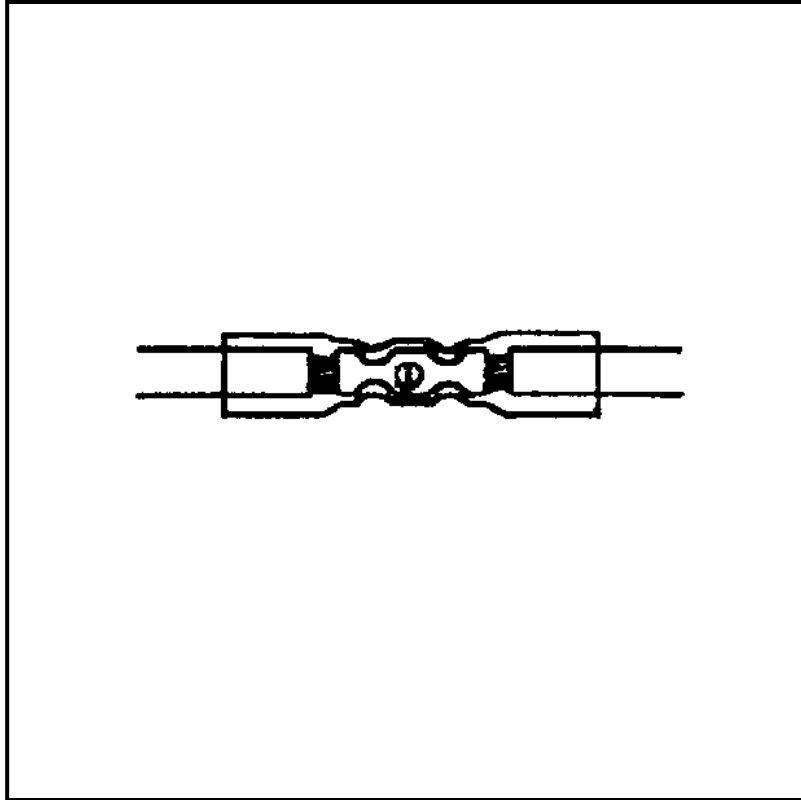
8. Use the splice sleeve crimp tool in order to position the DuraSeal splice sleeve in the proper color nest of the splice sleeve crimp tool. For the four crimp nest tool, use the three largest crimp nests to crimp the splice sleeves. For the three crimp nest tool, use all three crimp nests to crimp the splice sleeves. Use the four and three crimp tool diagrams (above) and the table (farther above) to match the splice sleeve with the correct crimp nest. The crimp tool diagram callout numbers match the numbers in the table (under crimp tool nest color).

9.



Place the DuraSeal splice sleeve in the nest. Ensure that the crimp falls midway between the end of the barrel and the stop. The sleeve has a stop (3) in the middle of the barrel (2) in order to prevent the wire (1) from going further. Close the hand crimper handles slightly in order to firmly hold the DuraSeal splice sleeve in the proper nest.

10.

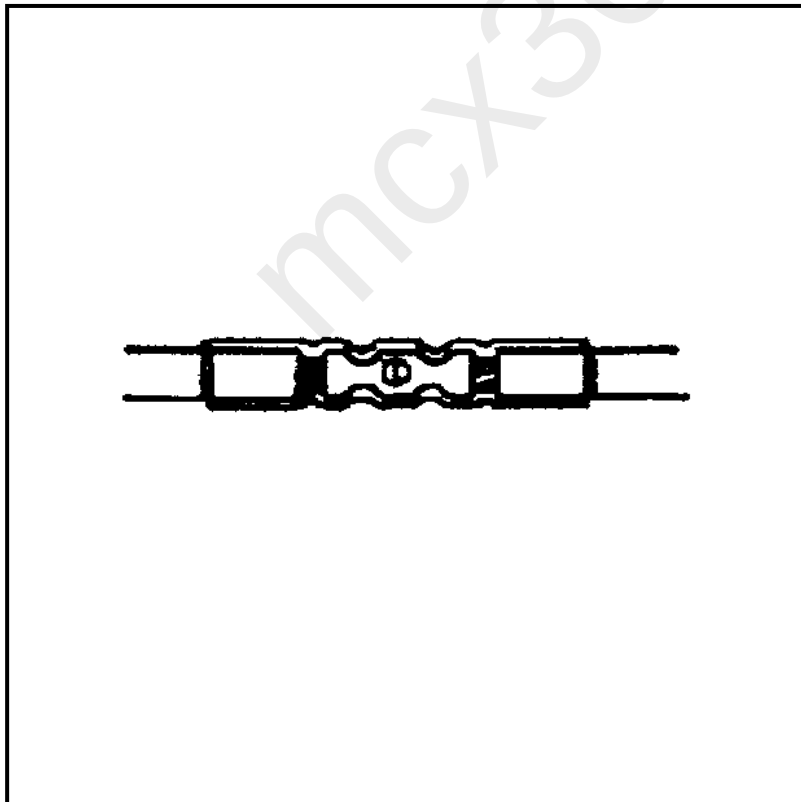


Insert the wire into the splice sleeve barrel until the wire hits the barrel stop. Refer to **Folded-Over Wire Repair** for splicing wires of 0.35 mm or less (22, 24, 26 gauge sizes) and for splicing wires of different gauges.

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

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

12.

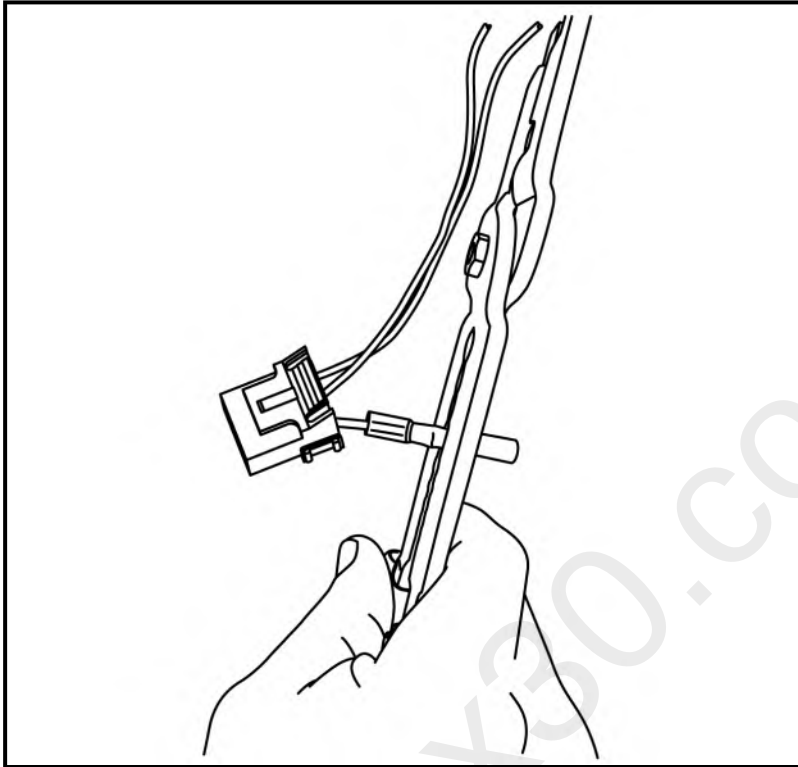


Using the heat torch, apply heat to the crimped area of the barrel.

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

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

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

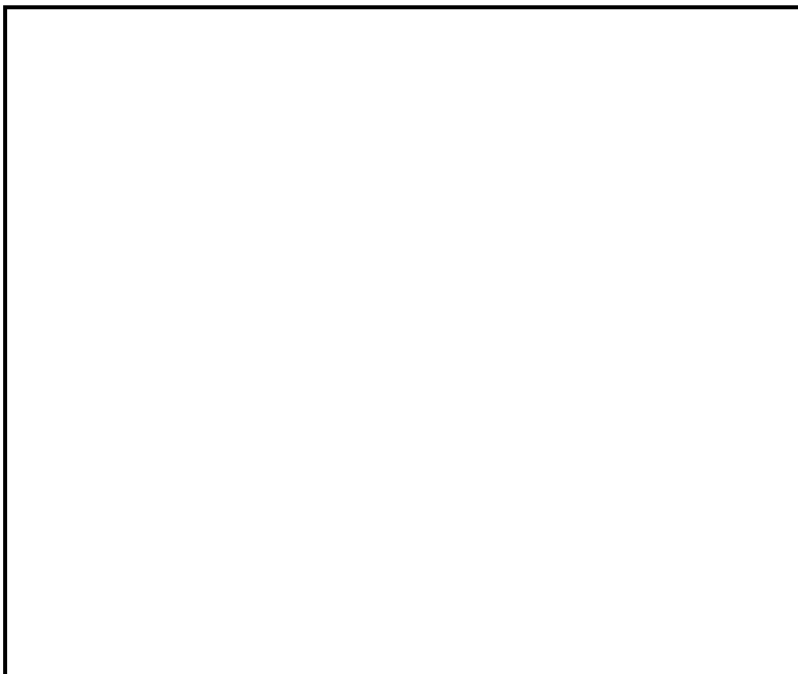


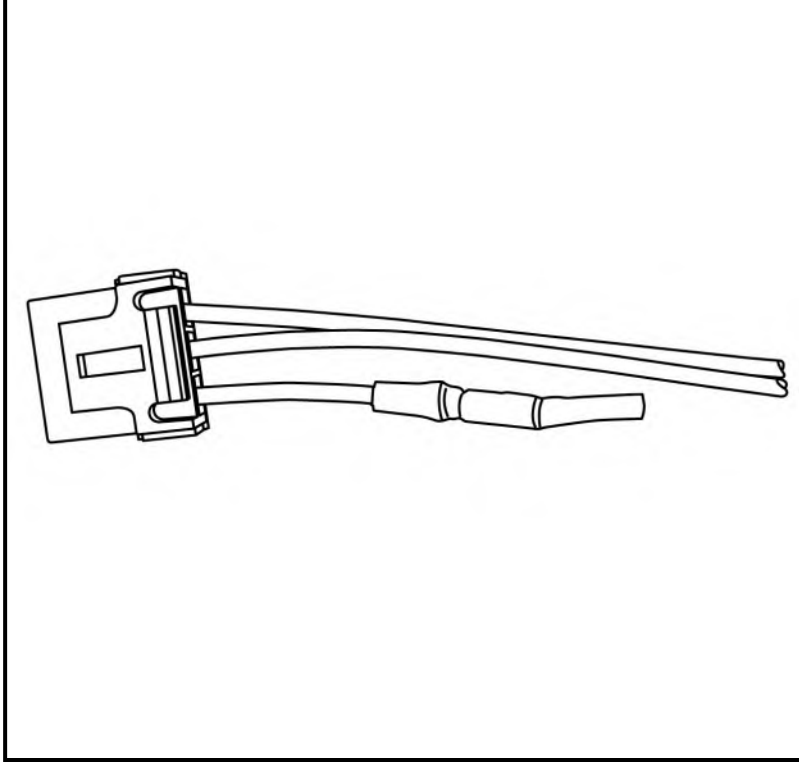
2. Tightly close the handles of the crimp tool until the crimper handles open when released.

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

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

4.

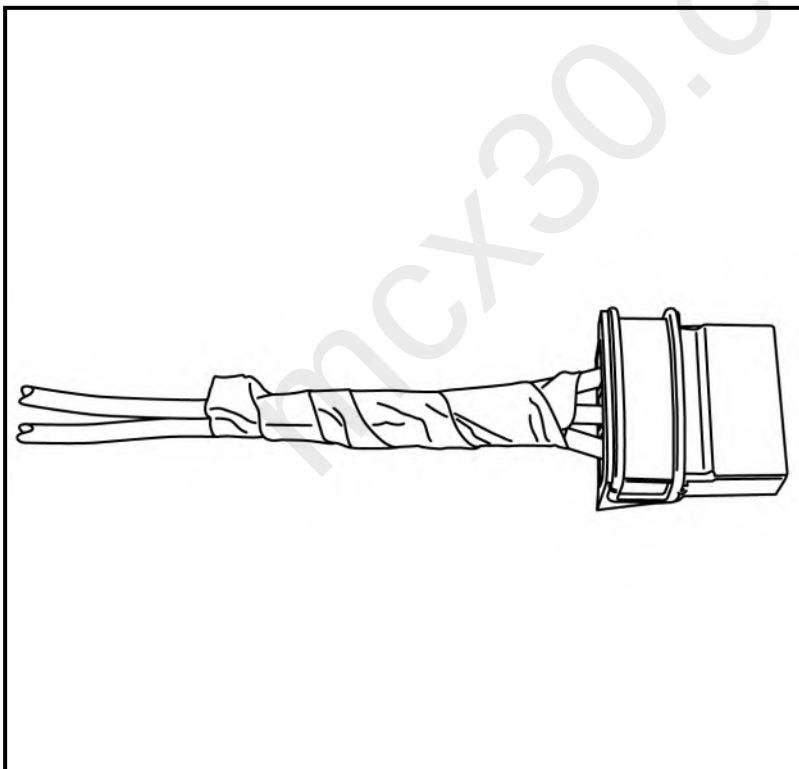




Start in the middle and gradually move the heat barrel to the open ends of the tubing:

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

5.



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

High Temperature Wiring Repairs

Use the following procedures to perform high temperature wiring repairs:

1. Center the high temperature SCT1 shrink tube over the DuraSeal splice sleeve.
2. Using the heat torch, apply heat to the high temperature heat shrink tubing.
3. Gradually move the heat from the center to the open end of the tubing:
 - The tubing will shrink completely as the heat is moved along the insulation.

- A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

4. Replace any reflective tape and clips that may have been removed during the repair.

CONNECTOR RECONNECTION - LIGHTING

Special Tools

EL-35616 Terminal Test Probe Kit

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

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

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

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

Testing for Terminal Fretting

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

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

Testing for Proper Terminal Contact

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

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

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

Testing for Proper Terminal Contact in Bussed Electrical Centers

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

Follow the procedure below in order to test terminal contact:

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

Flat Wire Connectors

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

Follow the procedure below in order to test terminal contact:

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

Control Module/Component Voltage and Grounds

Poor voltage or ground connections can cause widely varying symptoms.

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

be tested. Inspect grounds for clean and tight connections at the grounding point (screw or stud). Inspect the connections at the component and in splice packs, where applicable. Operate the component to test the ability of the circuit to carry sufficient current. Refer to [Circuit Testing](#) , and [Ground Distribution Wiring Schematics](#) .

Temperature Sensitivity

- An intermittent condition may occur when a component/connection reaches normal operating temperature. The condition may occur only when the component/connection is cold, or only when the component/connection is hot.
- Freeze Frame, Failure Records, Snapshot, or Vehicle Data Recorder data may help with this type of intermittent condition, where applicable.
- If the intermittent is related to heat, review the data for a relationship with the following:
 - High ambient temperatures
 - Underhood/engine generated heat
 - Circuit generated heat due to a poor connection, or high electrical load
 - Higher than normal load conditions, towing, etc.
- If the intermittent is related to cold, review the data for the following:
 - Low ambient temperatures - In extremely low temperatures, ice may form in a connection or component. Inspect for water intrusion.
 - The condition only occurs on a cold start.
 - The condition goes away when the vehicle warms up.
- Information from the customer may help to determine if the trouble follows a pattern that is temperature related.
- If temperature is suspected of causing an intermittent fault condition, attempt to duplicate the condition. Refer to [Inducing Intermittent Fault Conditions](#) in order to duplicate the conditions required.

Electromagnetic Interference and Electrical Noise

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

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

Incorrect Control Module

- There are only a few situations where reprogramming a control module is appropriate:
 - A new service control module is installed.
 - A control module from another vehicle is installed.
 - Revised software/calibration files have been released for this vehicle.

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

- Verify that the control module contains the correct software/calibration. If incorrect programming is found, reprogram the control module with the most current software/calibration. Refer to [Control Module References](#) for replacement, setup, and programming.

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, body control module (BCM), engine control module (ECM), or hybrid powertrain control module have been serviced. The calibration procedure will set the brake pedal position sensor home value. This value is used by the BCM and ECM/HPCM 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. Ignition ON, engine OFF, place the transmission in the PARK position for automatic transmission or NEUTRAL position for manual transmission.
3. Install a scan tool.
4. Clear all 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.
7. Navigate to the Configuration/Reset Functions menu of the ECM/HPCM.
8. Select the Learn Functions menu.
9. Select the Brake Pedal Position Sensor Learn procedure and follow the directions displayed on the screen.

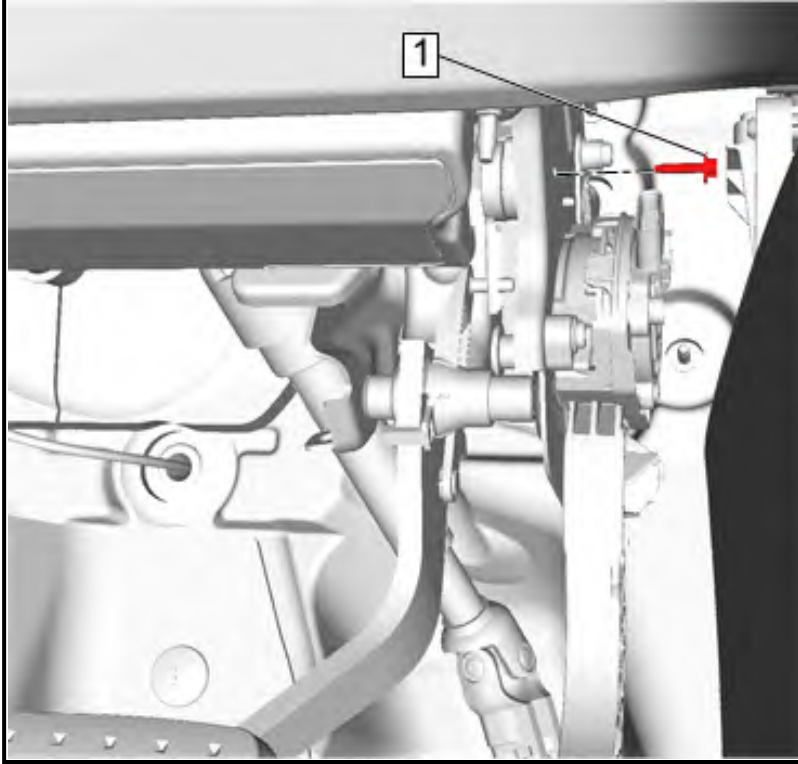
BRAKE PEDAL POSITION SENSOR REPLACEMENT

Removal Procedure

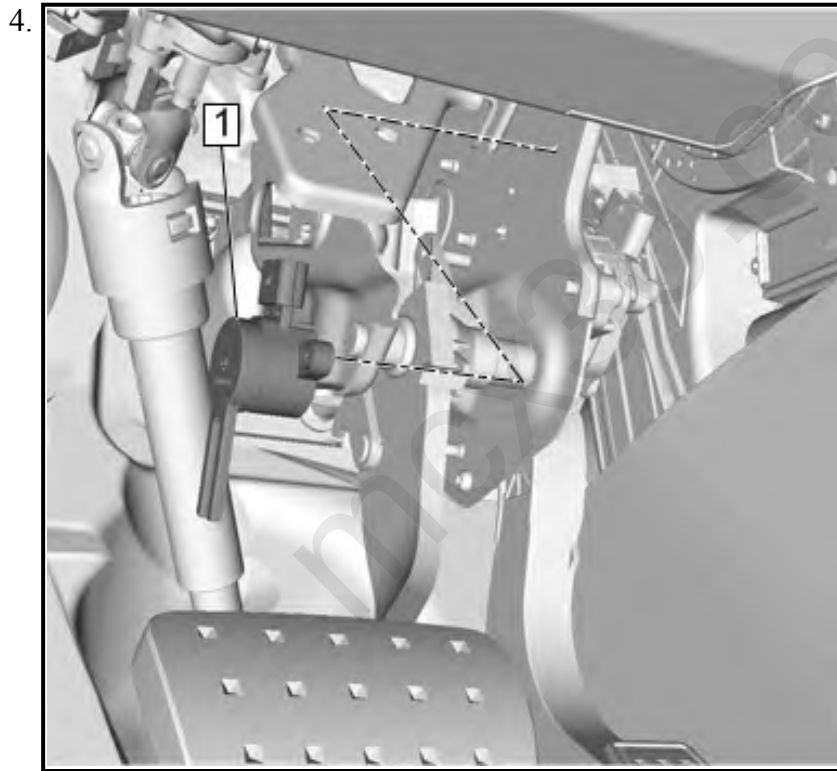
1. Floor Front Air Outlet Duct - Remove - [Floor Front Air Outlet Duct Replacement - Left Side](#)
2. Brake Pedal Position Sensor Electrical Connector - Disconnect

3.





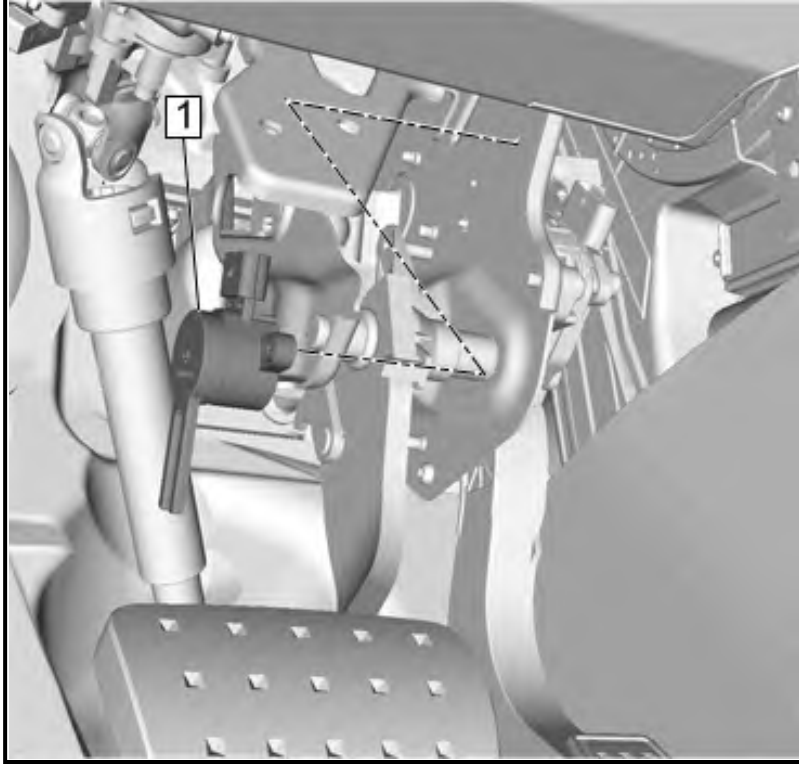
Brake Pedal Position Sensor Bolt (1) - Remove



Brake Pedal Position Sensor (1) - Remove

Installation Procedure

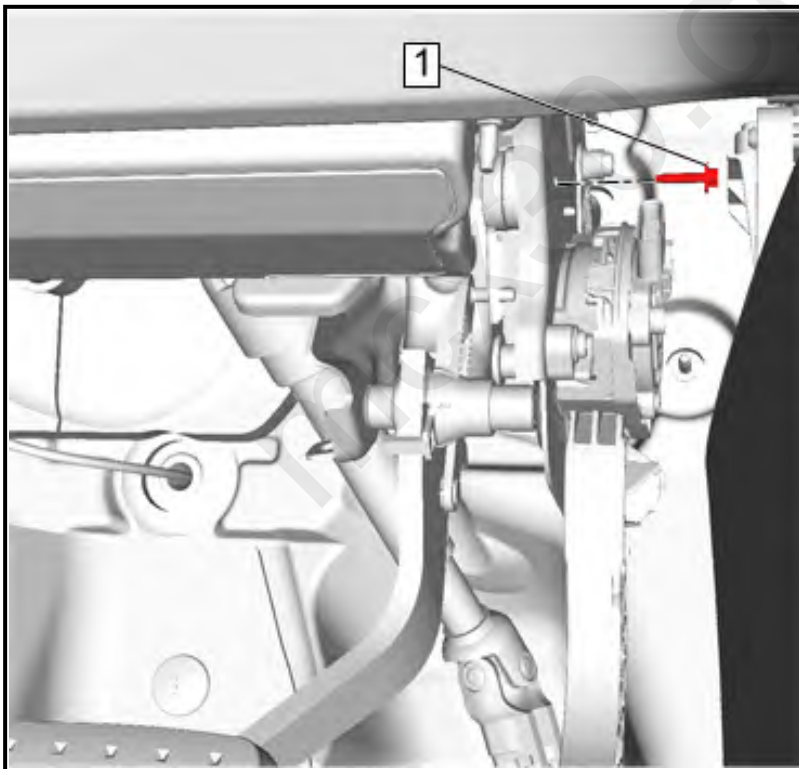




NOTE: Position the fork of the brake pedal position sensor over the brake pedal arm pin.

Brake Pedal Position Sensor (1) - Install

2.

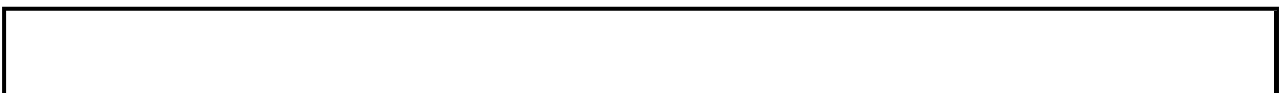


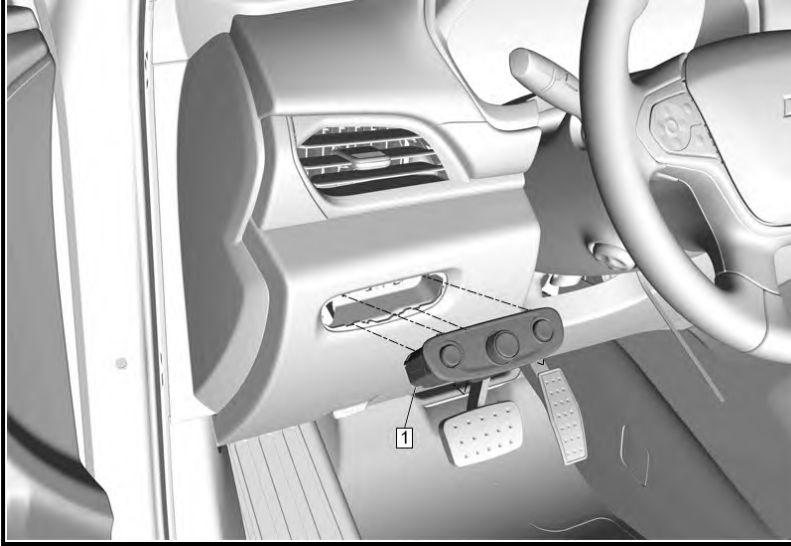
CAUTION: Fastener Caution

Brake Pedal Position Sensor Bolt (1) - Install and tighten 2.5 N.m (22 lb in)

3. Brake Pedal Position Sensor Electrical Connector - Connect
4. Floor Front Air Outlet Duct - Install - [Floor Front Air Outlet Duct Replacement - Left Side](#)
5. Calibrate the brake pedal position sensor. [Brake Pedal Position Sensor Calibration](#)

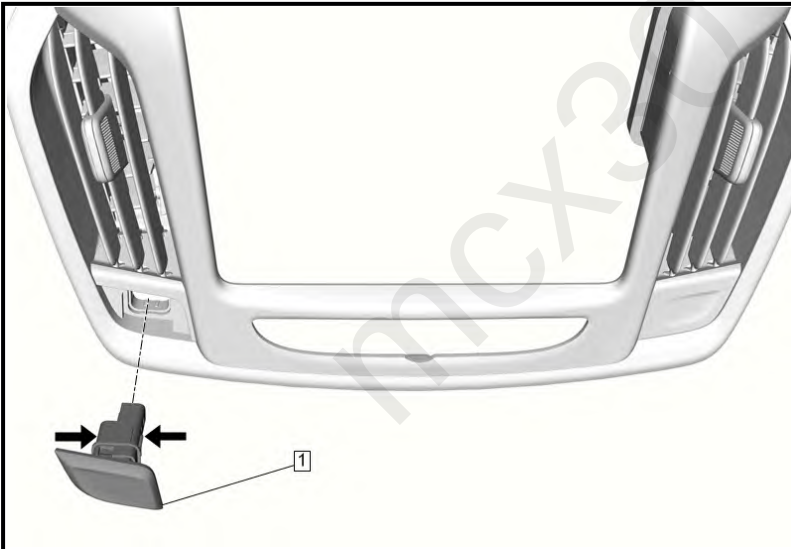
HEADLAMP SWITCH REPLACEMENT





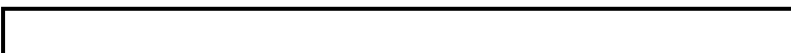
Callout	Component Name
Preliminary Procedure <u>Instrument Panel Knee Bolster Replacement</u>	
1	Headlamp Switch Procedure 1. Depress the tabs on the lamp switch to remove. 2. Disconnect the electrical connector.

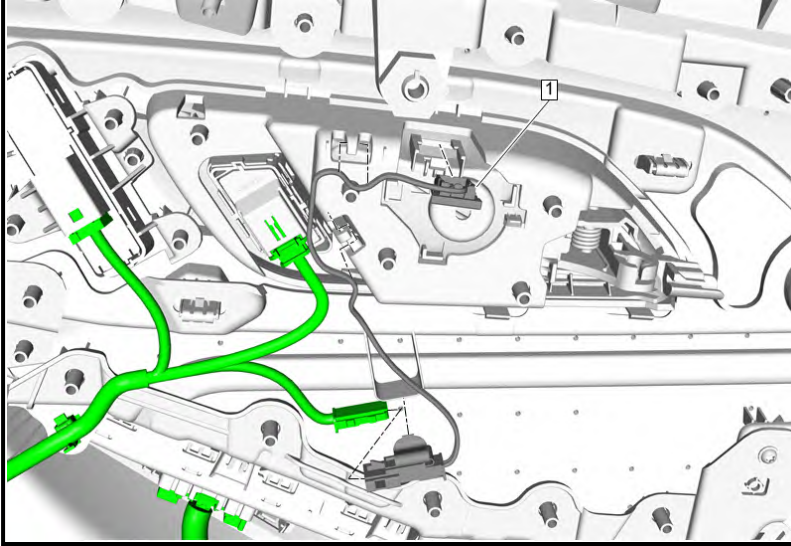
HAZARD WARNING SWITCH REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Instrument Panel Radio Front Trim Plate Replacement (RPO IOA)</u> , <u>Instrument Panel Radio Front Trim Plate Replacement (RPO IO5, IO6)</u>	
1	Hazard Warning Switch Procedure 1. Using a small flat-bladed tool, gently pry to release the tabs at either side of the switch. 2. Disconnect the electrical connector.

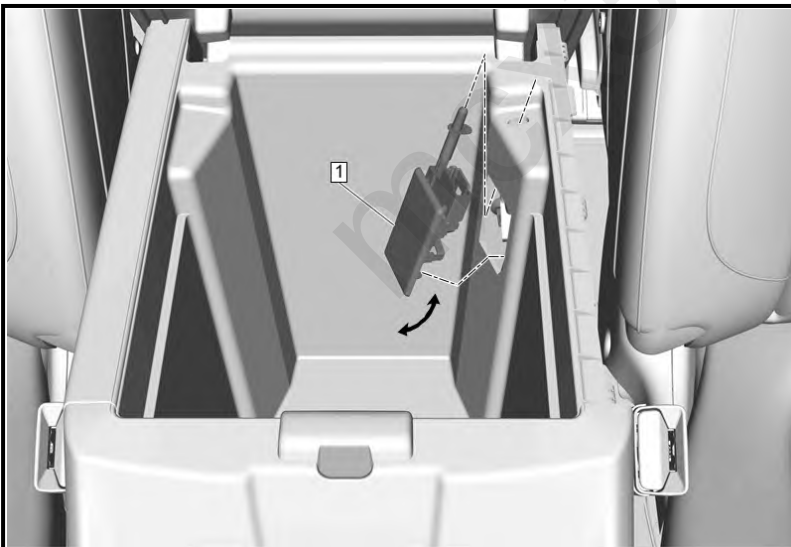
FRONT SIDE DOOR INSIDE HANDLE ILLUMINATION LAMP REPLACEMENT





Callout	Component Name
Preliminary Procedure <u>Front Side Door Trim Replacement</u>	
1	Front Side Door Inside Handle Illumination Lamp Procedure 1. Note the location and routing of the lamp prior to removal to ensure proper installation. 2. Disconnect the electrical connector. 3. Reposition the front side door trim insulator panel, if needed. 4. Unsnap lamp from trim panel tabs.

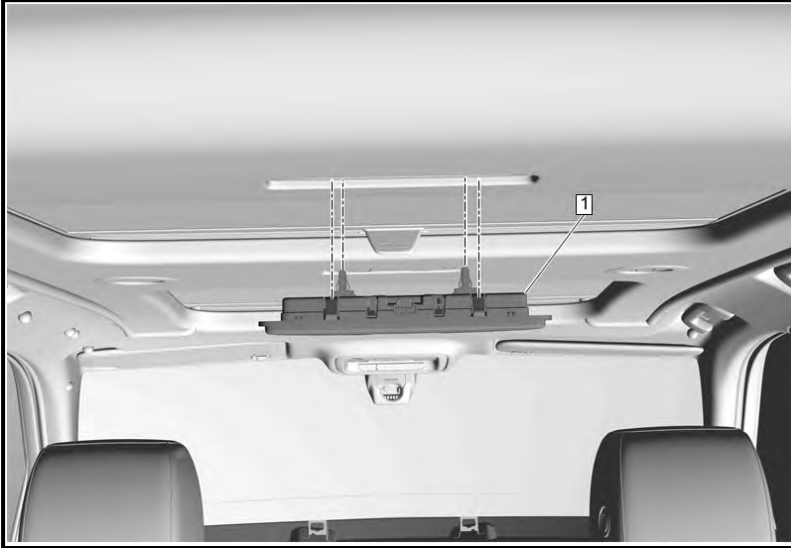
INSTRUMENT PANEL COMPARTMENT LAMP REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Front Floor Rear Console Side Trim Panel Replacement - Left Side</u>	
1	Instrument Panel Compartment Lamp Procedure 1. Open the armrest cover. 2. Disconnect the electrical connector. 3. Release the tab at the bottom of the lamp while guiding the switch out of the opening to remove the lamp assembly.

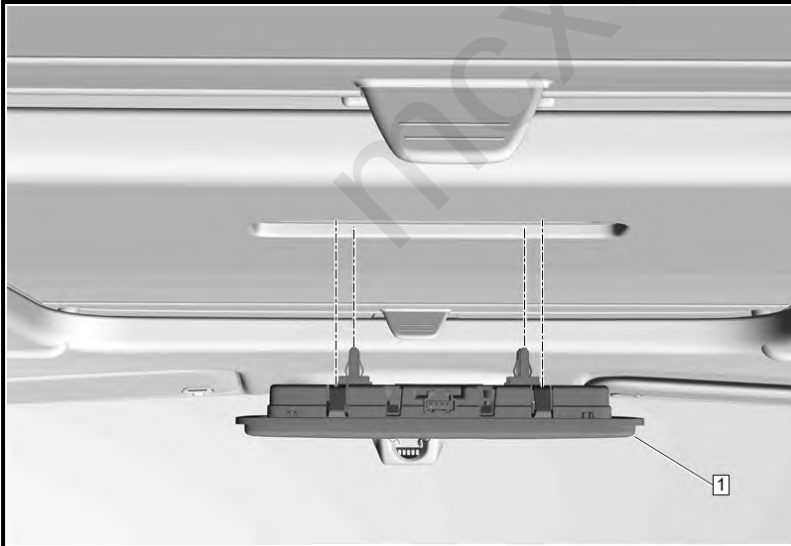
4. Using a flat-bladed tool, lift the bottom of the lamp and tilt inward from the console.

3RD ROW SEAT POSITION CENTER READING AND COURTESY LAMP REPLACEMENT



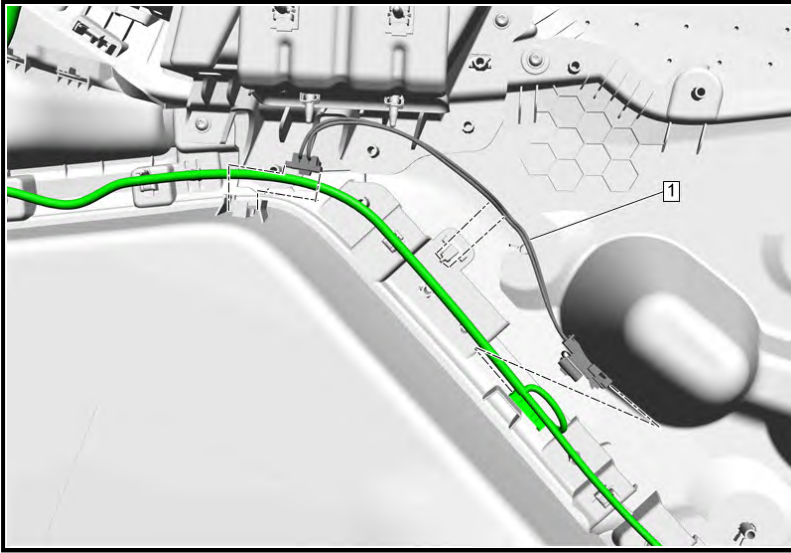
Callout	Component Name
1	3rd Row Seat Position Center Reading and Courtesy Lamp Procedure 1. Grasp the lamp and pull downward to release the retainer clips and magnets securing the lamp to the headliner. 2. Disconnect the electrical connector.

REAR SEAT POSITION CENTER READING LAMP REPLACEMENT



Callout	Component Name
1	Rear Seat Position Center Reading and Courtesy Lamp Procedure 1. Grasp the lamp and pull downward to release the retainer clips securing the lamp to the headliner. 2. Disconnect the electrical connector.

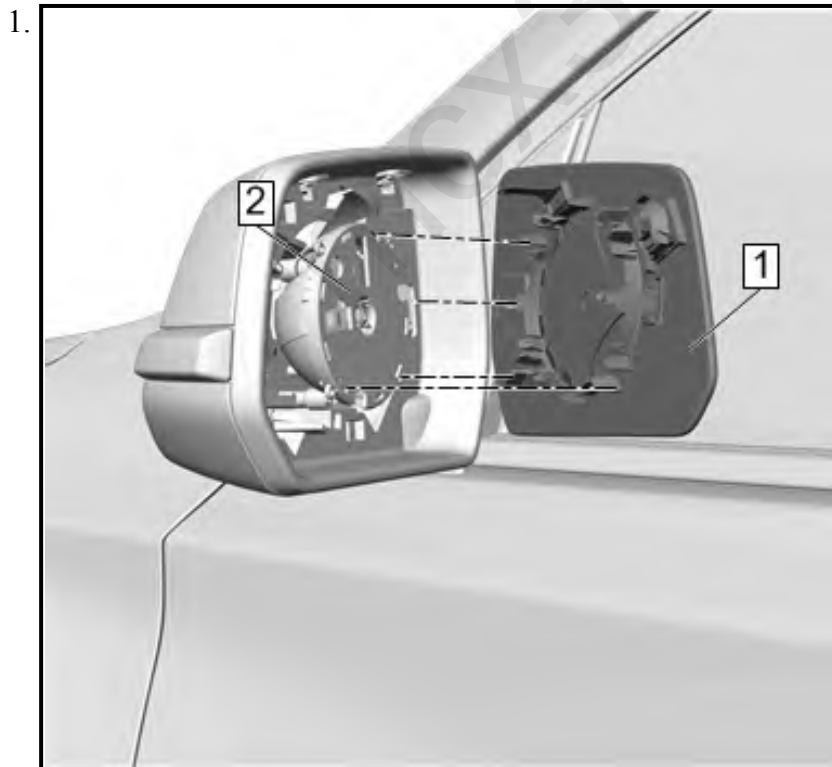
FRONT SIDE DOOR MAP POCKET ILLUMINATION LAMP REPLACEMENT



Callout	Component Name
Preliminary Procedure	
<u>Front Side Door Trim Replacement</u>	
	Front Side Door Map Pocket Illumination Lamp
	Procedure
1	1. Disconnect the electrical connector. 2. Remove the lamp wiring from the routing tabs. 3. Unsnap the lamp from the trim panel tabs.

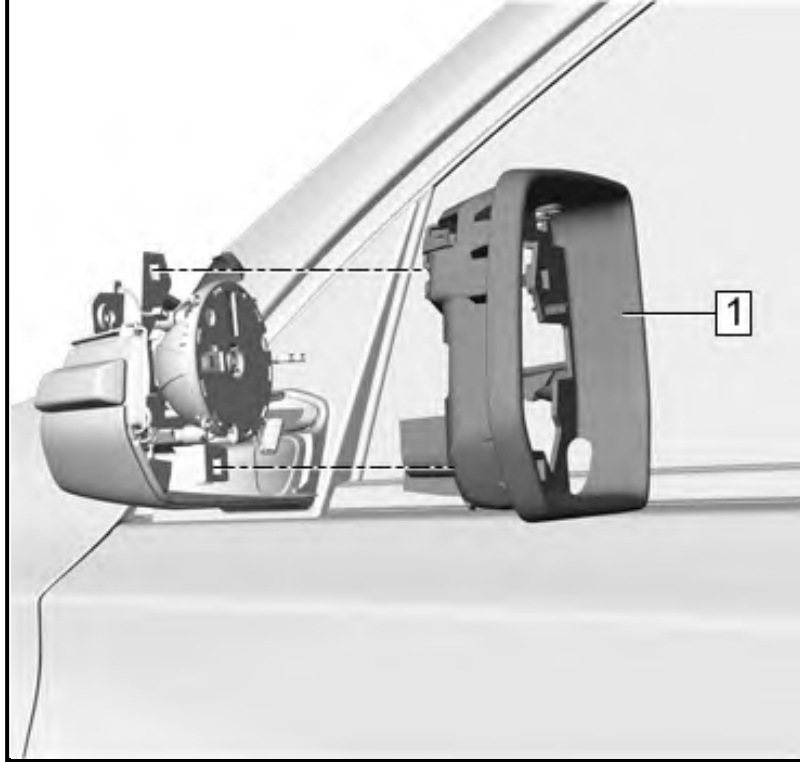
OUTSIDE REARVIEW MIRROR TURN SIGNAL LAMP REPLACEMENT

Removal Procedure

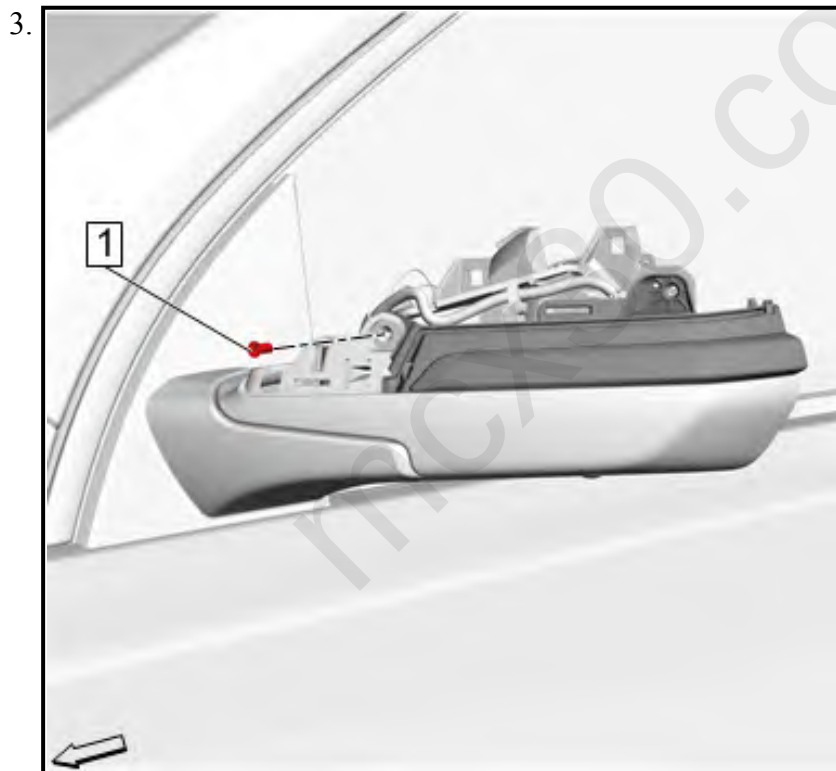


Outside Rearview Mirror Glass (1) - Remove - [**Outside Rearview Mirror Glass Replacement**](#)



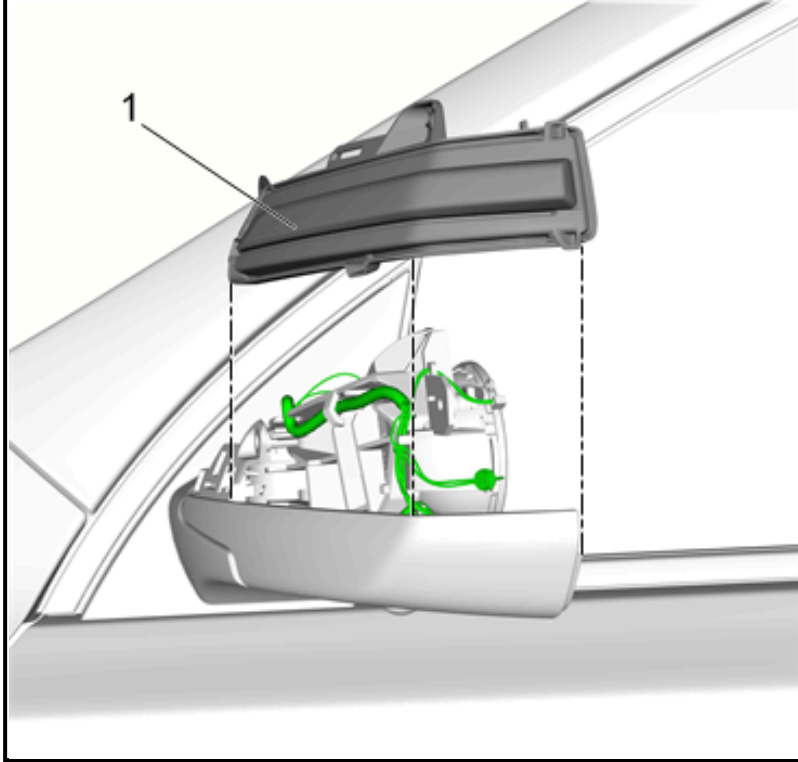


Outside Rearview Mirror Housing Bezel (1) - Remove - [Outside Rearview Mirror Housing Bezel Replacement](#)



Outside Rearview Mirror Turn Signal Lamp Screw (1) - Remove



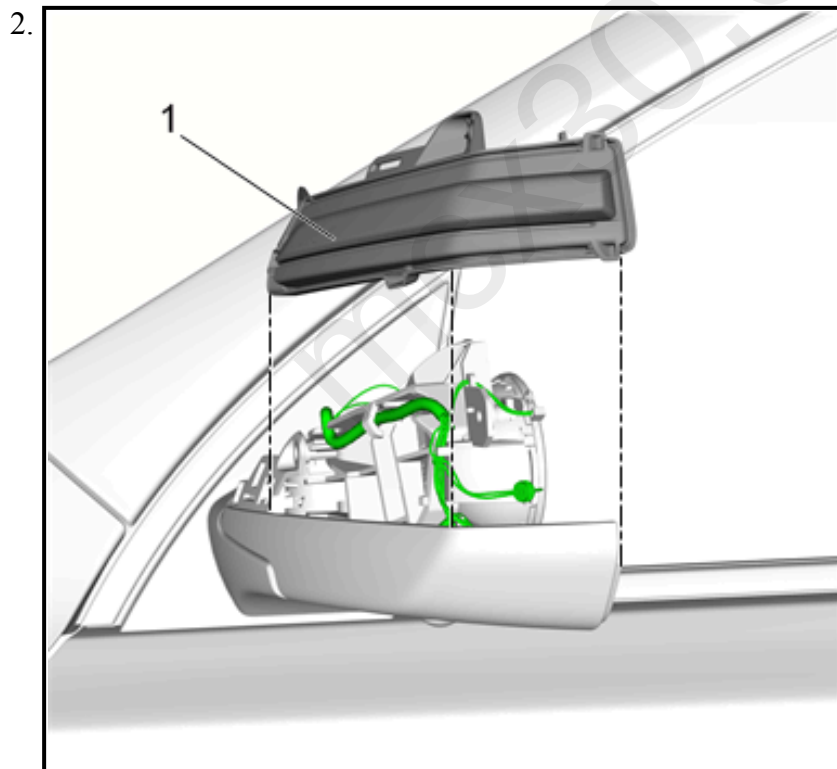


Outside Rearview Mirror Turn Signal Lamp (1) - Remove

5. Disconnect the electrical connector.

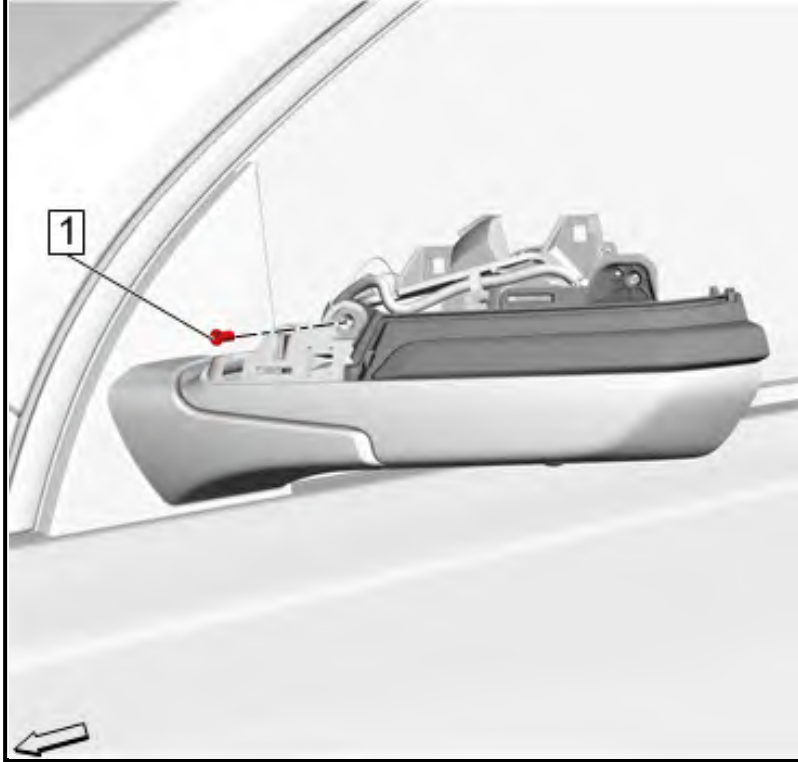
Installation Procedure

1. Connect the electrical connector.



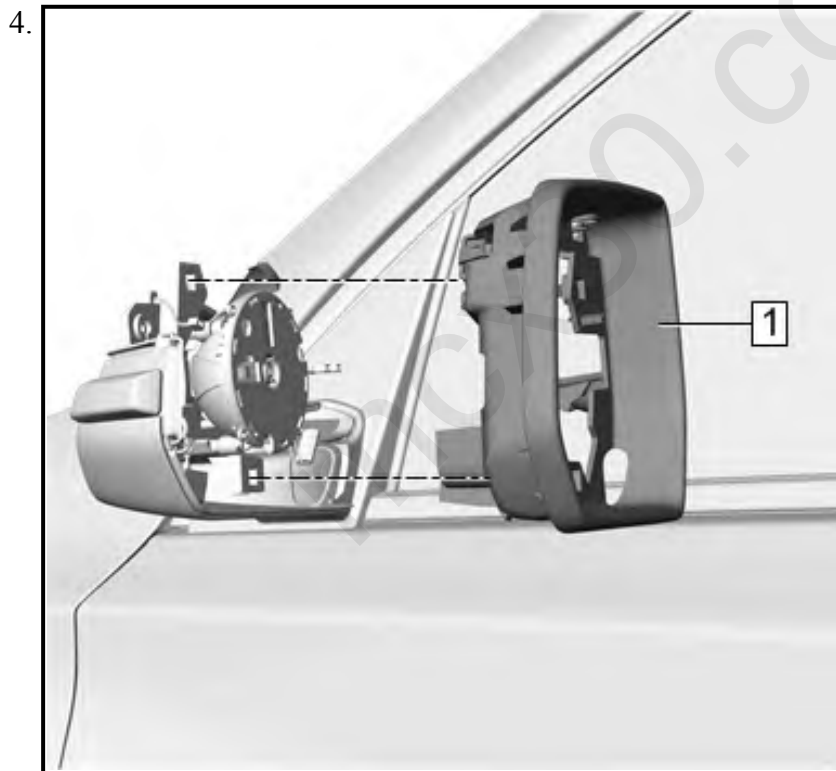
Outside Rearview Mirror Turn Signal Lamp (1) - Install

- 3.



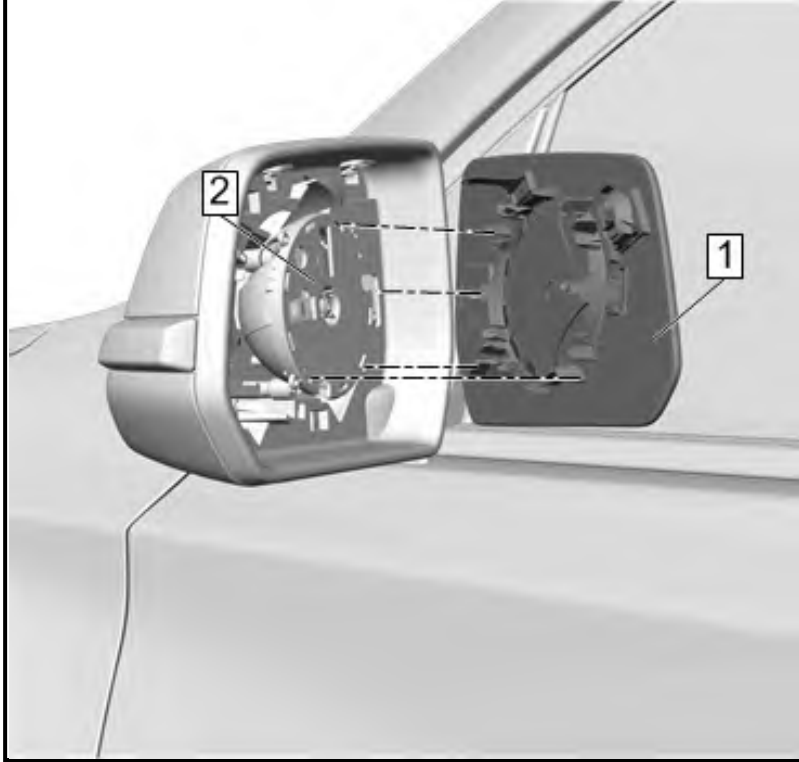
CAUTION: Refer to [Fastener Caution](#) .

Outside Rearview Mirror Turn Signal Lamp Screw (1) - Install and tighten 2N.m (18 lb in)



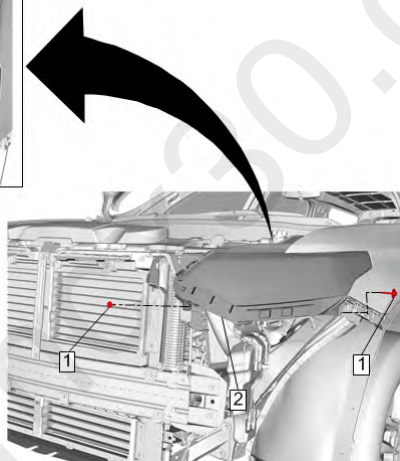
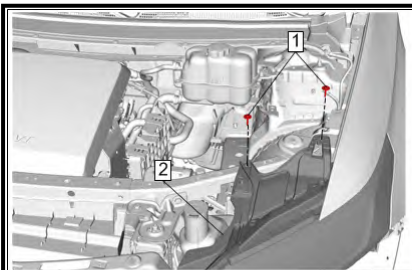
Outside Rearview Mirror Housing Bezel (1) - Install - [Outside Rearview Mirror Housing Bezel Replacement](#)





Outside Rearview Mirror Glass (1) - Install - [Outside Rearview Mirror Glass Replacement](#)

HEADLAMP REPLACEMENT



Callout	Component Name
Preliminary Procedure Front Bumper Fascia Replacement	
1	Headlamp Bolt[4x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)

Callout	Component Name
2	Headlamp Procedure 1. Disconnect all electrical connectors. 2. Transfer components as necessary. 3. After installation, aim the headlamps. Headlamp Aiming

HEADLAMP AIMING

Visual Aiming Preparation Procedure

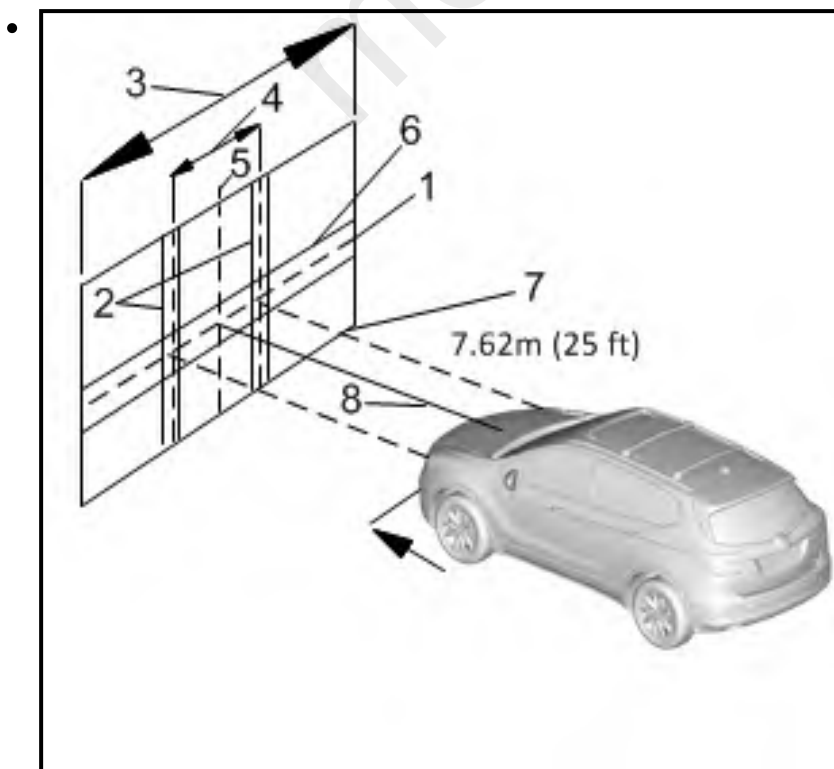
NOTE: Some state and local laws specify requirements for headlamp aim. Comply with all of these laws when performing any headlamp aiming operations.

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

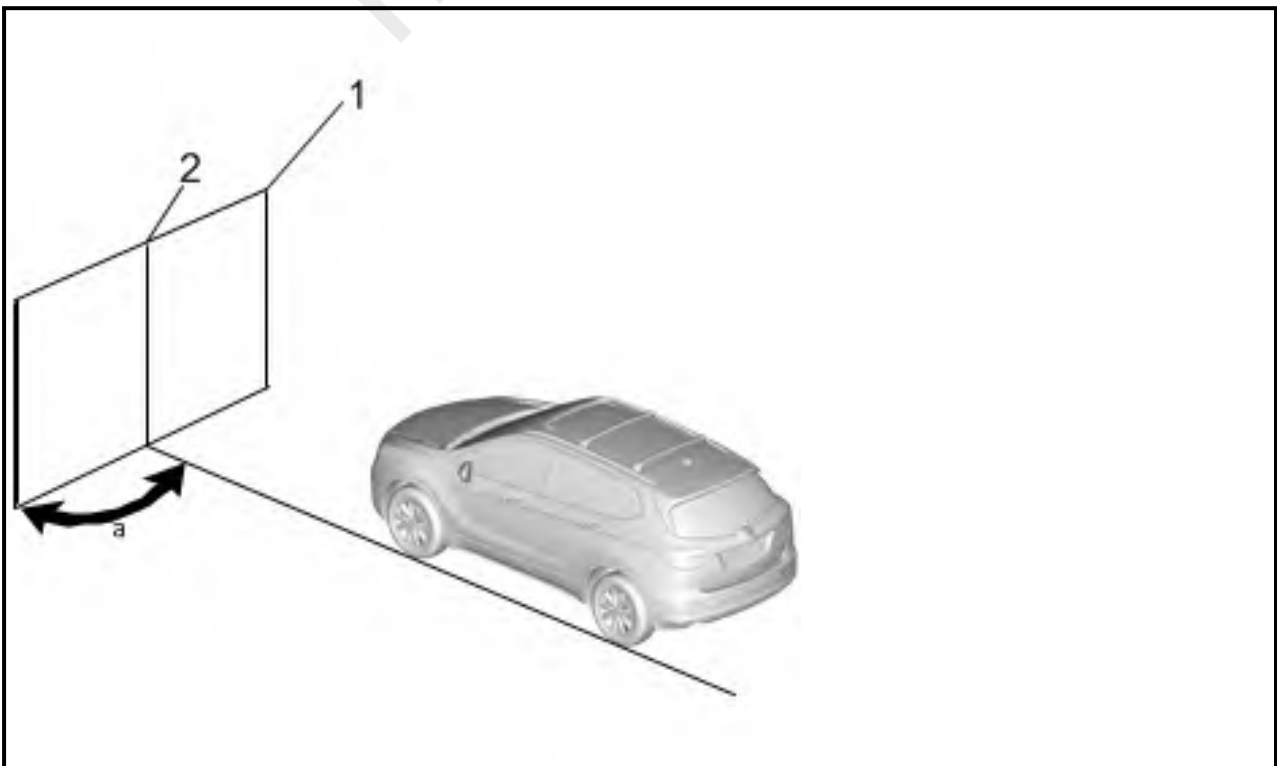
being aimed:

- 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

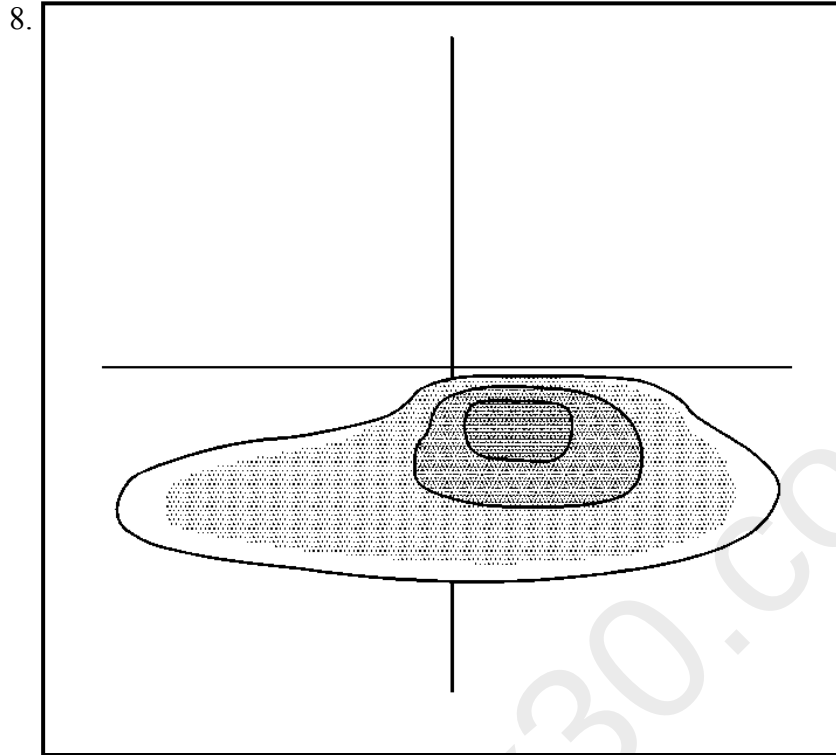
Prior to aiming the headlamps, the following steps must be taken:

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.
6. The vehicle left tires must be aligned with the reference line extending from the screen with the headlamps aligned with the reference line.
7. Do not load any cargo in the vehicle.
8. The vehicle must contain approximately 75 kg (165 lb) on the driver seat.
9. Inflate the tires to the proper pressure.
10. Simulate the vehicle loads if the intended use of the vehicle is for hauling heavy loads or towing a trailer.
11. Rock the vehicle in order to stabilize the suspension.
12. 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

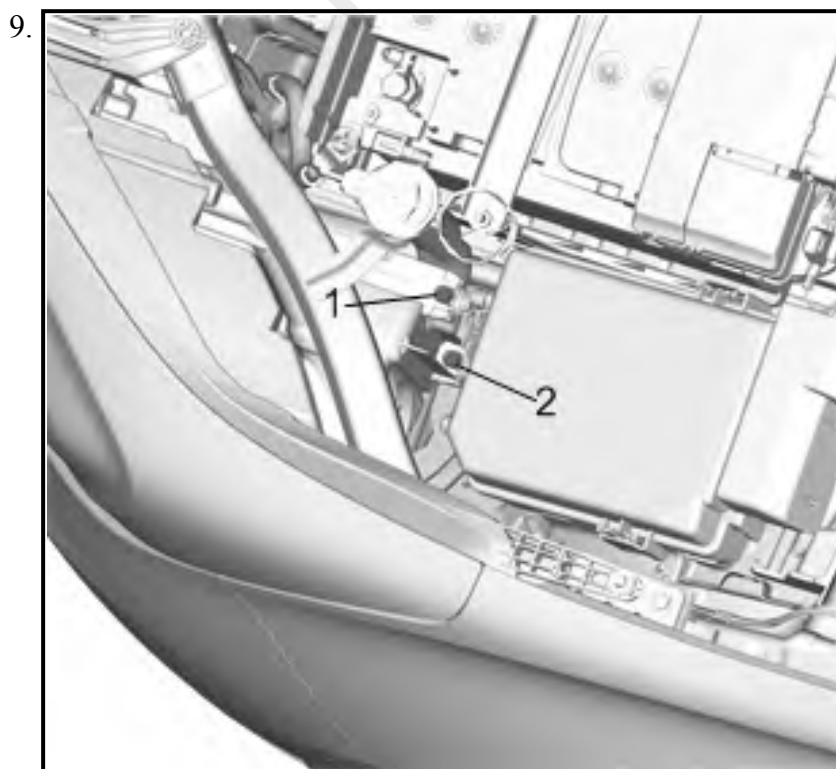


1. Open the hood.
2. Measure from the floor to the center of the headlamp bulb. Some headlamps have an aim dot marked on the headlamp lens.
3. At the screen, measure from the floor and place the horizontal tape at the measured distance.
4. Measure from the reference line on the floor to the left headlamp bulb centerline.
5. At the screen (1), measure from the reference line and place the vertical tape at the measured distance.
6. Measure from the reference line on the floor to the right headlamp bulb centerline.
7. At the screen, measure from the reference line and place the vertical tape (2) at the measured distance.



NOTE: DO NOT cover the headlamp. This may cause excessive heat build up.

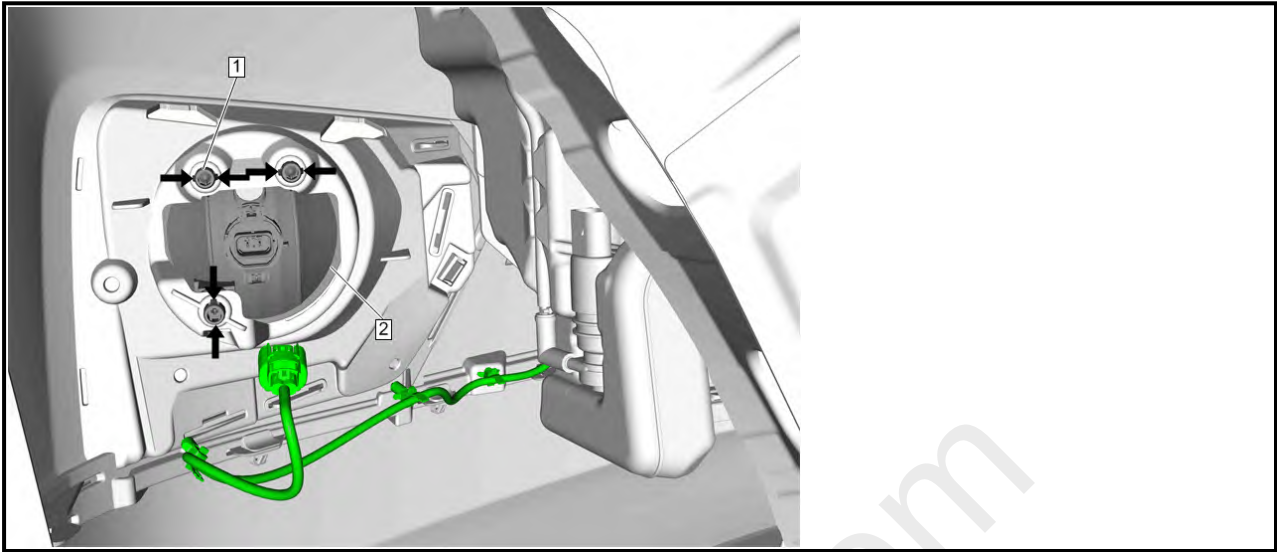
Turn ON the low beam headlamps. Block the light from projecting onto the screen from the passenger side headlamp.



Adjust the vertical aim screw (1) and the horizontal aim screw (2) of the headlamps to the specifications required by the state and the local authorities, or as shown in step number 8.

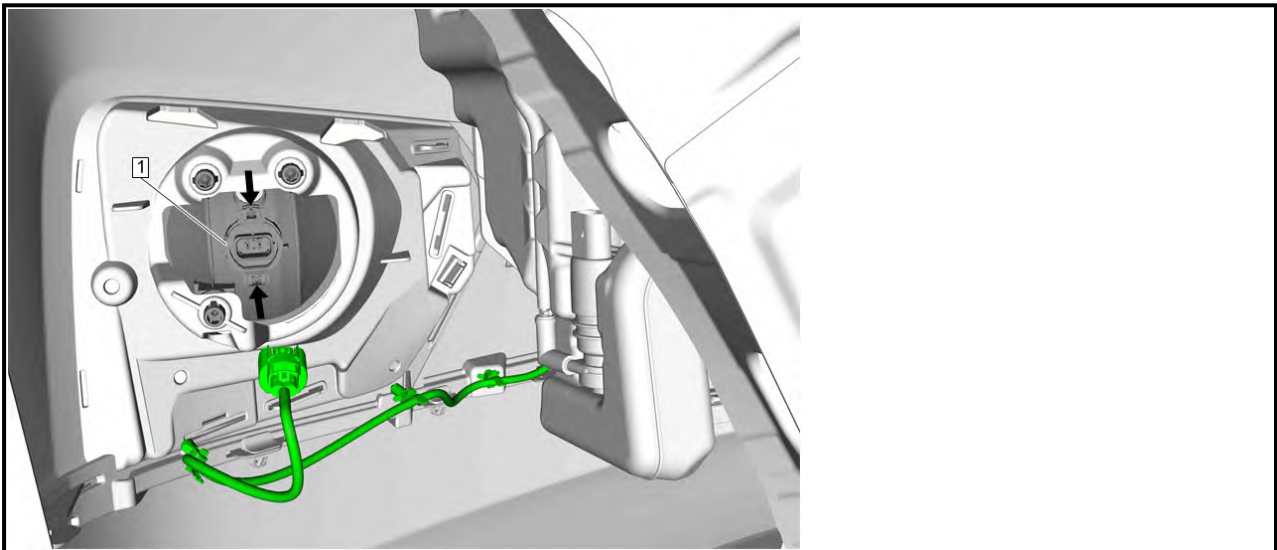
- 10. Repeat the aiming procedure for the passenger side headlamp while blocking the light from projecting onto the screen from the driver side headlamp.
- 11. Turn the headlamps OFF.
- 12. Close the hood.

FRONT FOG LAMP REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Front Fog Lamp Bezel Replacement</u>	
1	Front Fog Lamp Retainer [3x] Procedure Using an appropriate tool release the retainers [6x]
2	Front Fog Lamp Procedure 1. Disconnect the electrical connector. 2. Transfer components as necessary. 3. Front Fog Lamp - Adjust - <u>Fog Lamp Aiming</u>

FRONT FOG LAMP BULB REPLACEMENT



Callout	Component Name

Callout	Component Name
WARNING: Refer to Halogen Bulb Warning .	
Preliminary Procedure Reposition the forward half of front wheelhouse liner away to gain access to the component. Front Wheelhouse Liner Replacement	
1	Front Fog Lamp Bulb Procedure 1. Disconnect the electrical connector. 2. Squeeze the tabs and pull rearward to release the lamp socket and bulb from the housing. 3. Pull the bulb straight from the lamp socket

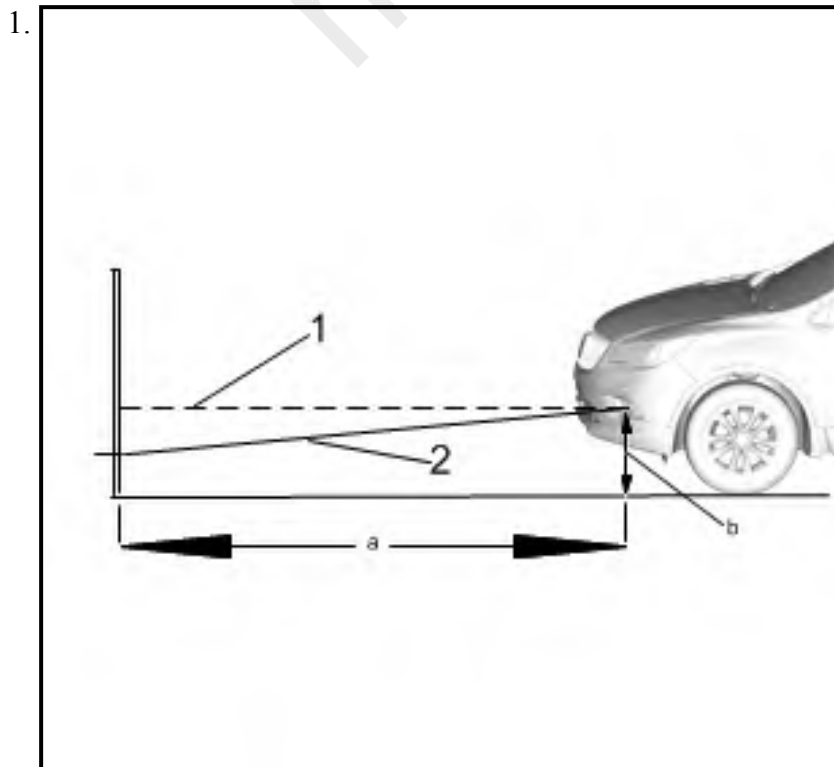
FOG LAMP AIMING

Preparation Procedure

NOTE: Horizontal aim is not adjustable on this vehicle. Adjust the fog lamp as required using the adjusting screw above the projector lens on the outside of the front bumper fascia. Prior to aiming the fog lamps, perform the following steps:

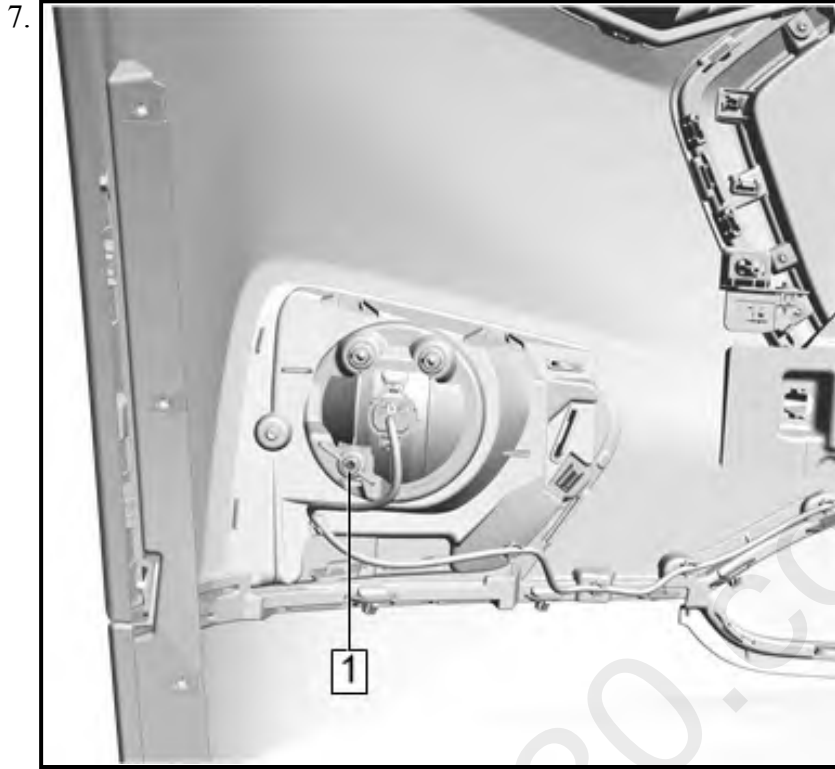
1. Completely assemble all of the components on the vehicle.
2. Place the vehicle on a level surface.
3. Stop all unnecessary operations or work that could affect the ride height of the vehicle.
4. Close the doors and verify that the luggage compartment is empty.
5. Stabilize the suspension by rocking 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 of approximately 75 kg (165 lbs) is in the vehicle driver seat.

Aiming Procedure



Park the vehicle 7.6 m (25 ft) away from the target screen (a).

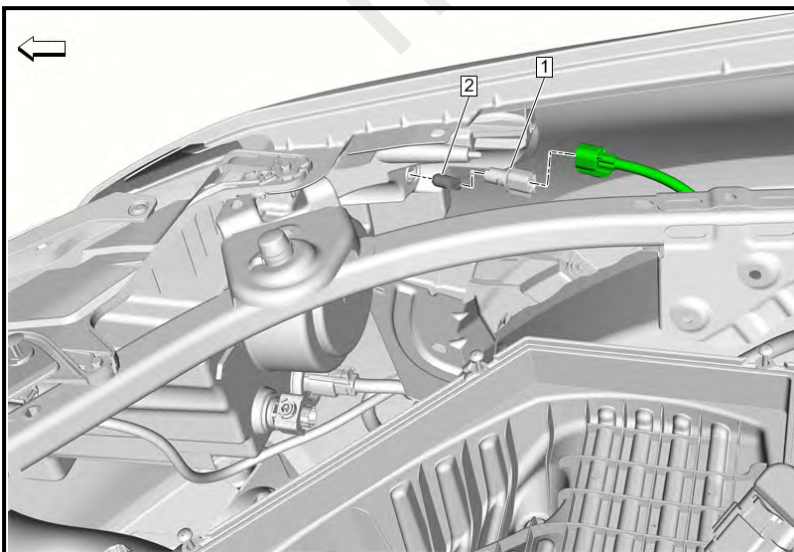
2. Measure the distance from the center of the fog lamp to the ground line (b).
3. Using this measurement, mark the horizontal centerline (1) of the fog lamp on the target screen directly in front of the vehicle.
4. Turn ON the fog lamps.
5. The top of the fog lamp beam image (2) on the target screen should be 102 mm (4 in) below the center of the fog lamp lens height (1).
6. Remove the front half of the wheelwell liner to access the back of the fog lamp assembly.



Adjust the fog lamp as required using the adjusting screw (1) below the projector lens on the back of the fog lamp assembly.

8. After the adjustments are made, turn OFF the fog lamps.

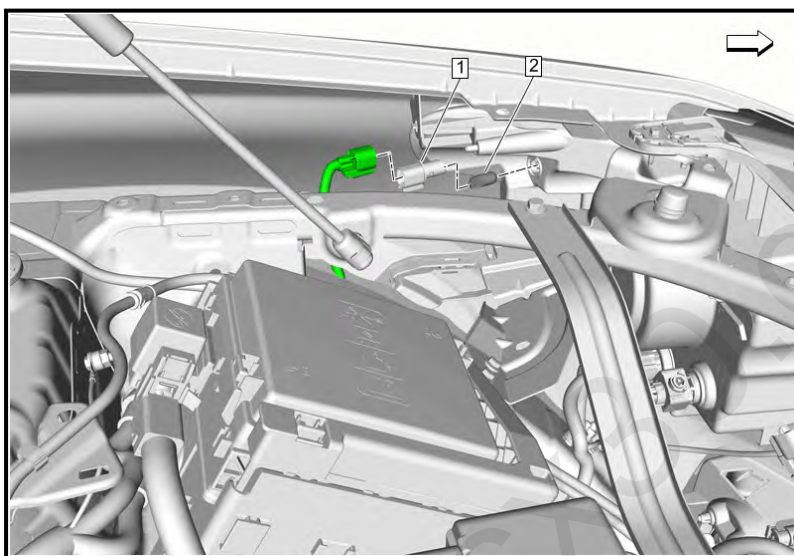
FRONT SIDE MARKER LAMP BULB REPLACEMENT (RIGHT SIDE)



Callout	Component Name

Callout	Component Name
1	Front Side Marker Lamp Socket- Right Side Procedure 1. Disconnect the electrical connector. 2. Disconnect and reposition harness as necessary. 3. Rotate the bulb socket a quarter turn counterclockwise and remove.
2	Front Side Marker Lamp Bulb- Right Side WARNING: Refer to Halogen Bulb Warning . Procedure Pull the bulb straight from the lamp socket.

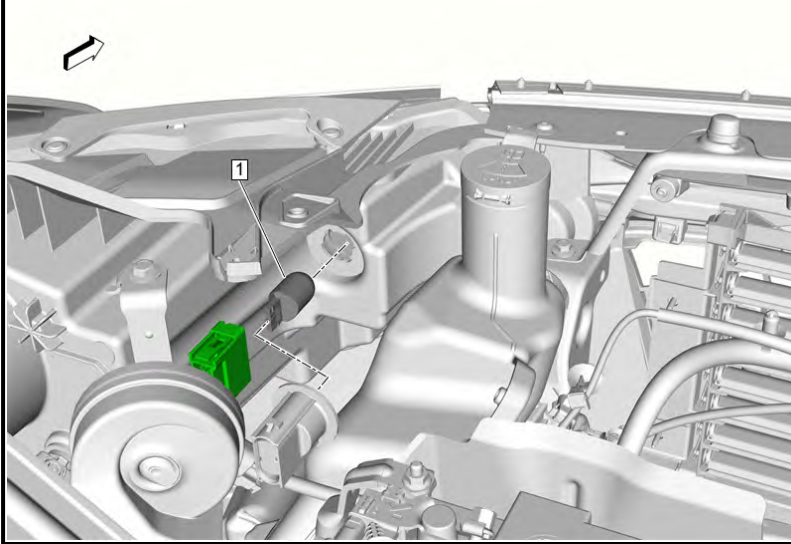
FRONT SIDE MARKER LAMP BULB REPLACEMENT (LEFT SIDE)



Callout	Component Name
1	Front Side Marker Lamp Socket- Left Side Procedure 1. Disconnect the electrical connector. 2. Disconnect and reposition harness as necessary. 3. Rotate the bulb socket a quarter turn counterclockwise and remove.
2	Front Side Marker Lamp Bulb- Left Side WARNING: Refer to Halogen Bulb Warning . Procedure Pull the bulb straight from the lamp socket.

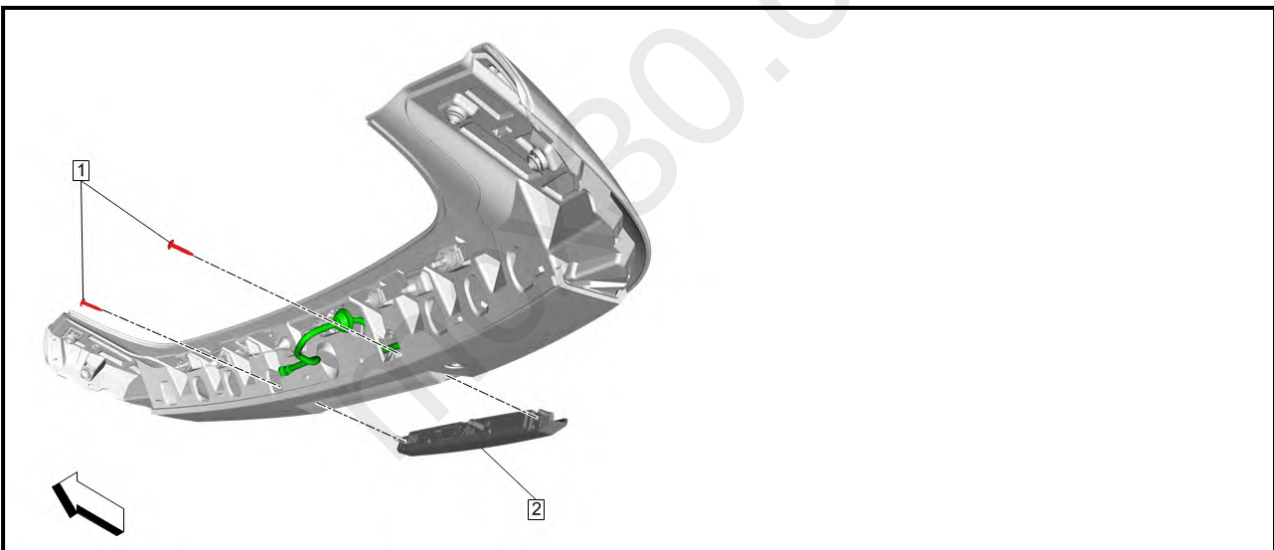
FRONT TURN SIGNAL LAMP BULB REPLACEMENT





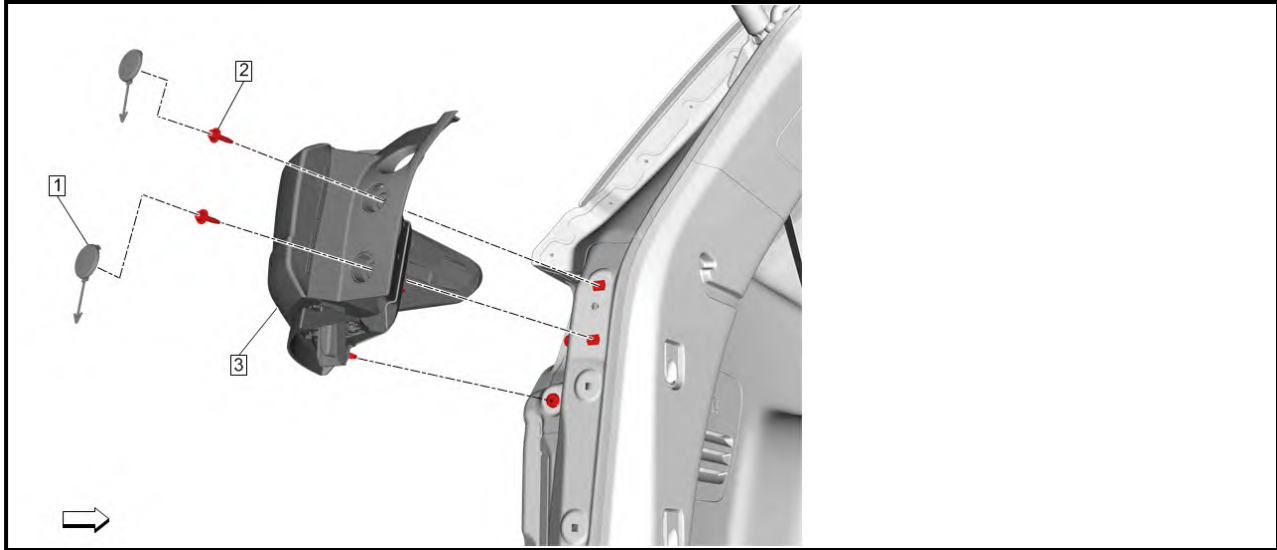
Callout	Component Name
1	Front Turn Signal Lamp Bulb Procedure 1. Disconnect the electrical connector. 2. Rotate the bulb socket a quarter turn counterclockwise and remove. 3. Pull the bulb straight from the lamp socket.

HIGH MOUNT STOP LAMP REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Rear End Spoiler Replacement</u>	
1	High Mount Stop Lamp Screw [2x] CAUTION: Refer to <u>Fastener Caution</u> . Tighten 2.5 N.m (22 lb in)
2	High Mount Stop Lamp Procedure Disconnect the electrical connector.

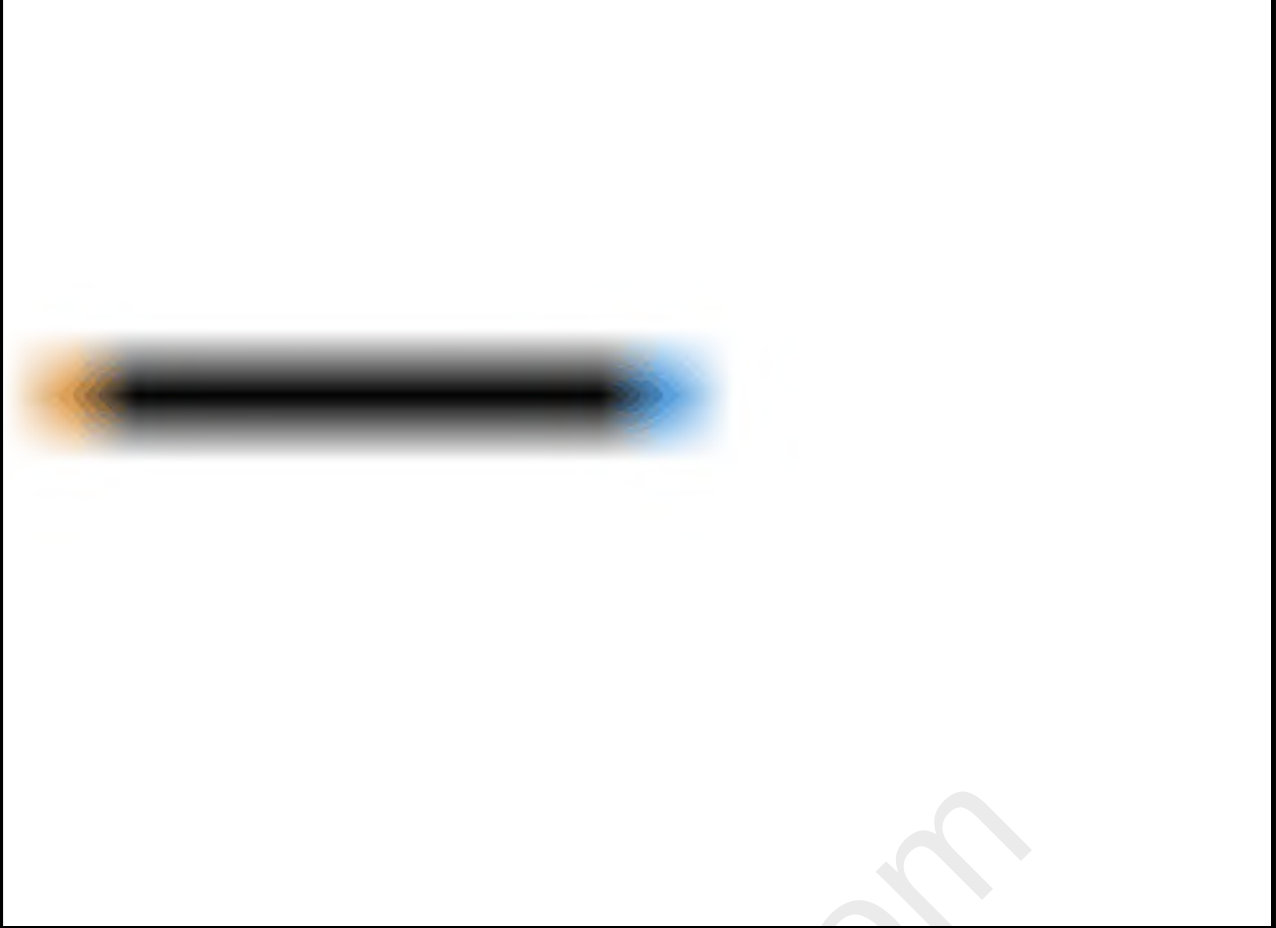
REAR BODY STRUCTURE STOP LAMP REPLACEMENT



Callout	Component Name
Procedure <u>Rear Bumper Fascia Replacement</u>	
1	Rear Bumper Fascia Bolt Cap [2x]
2	Rear Body Structure Stop Lamp Screw [2x] CAUTION: Refer to <u>Fastener Caution</u> . Tighten 2.5 N.m (22 lb in)
3	Rear Body Structure Stop Lamp Procedure 1. Carefully pull the lamp rearward in order to disengage the locator pins from the body side outer panel. 2. Disconnect the electrical connector. 3. Transfer components as necessary.

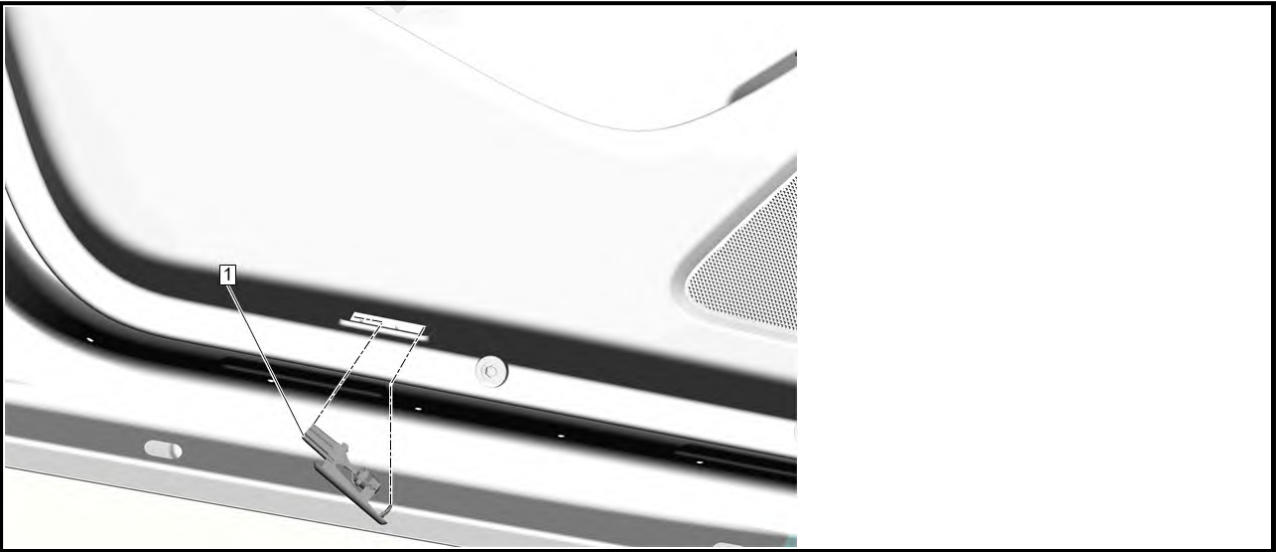
CARGO CENTER COURTESY LAMP BULB REPLACEMENT (LIFTGATE LOWER TRIM FINISH PANEL)





Callout	Component Name
Preliminary Procedure <u>Liftgate Lower Trim Finish Panel Replacement</u>	
1	Cargo Center Courtesy Lamp Bulb Procedure 1. Using a plastic trim tool, release the cargo center courtesy lamp bulb retaining tab from the liftgate lower trim finish panel and remove the cargo center courtesy lamp bulb.

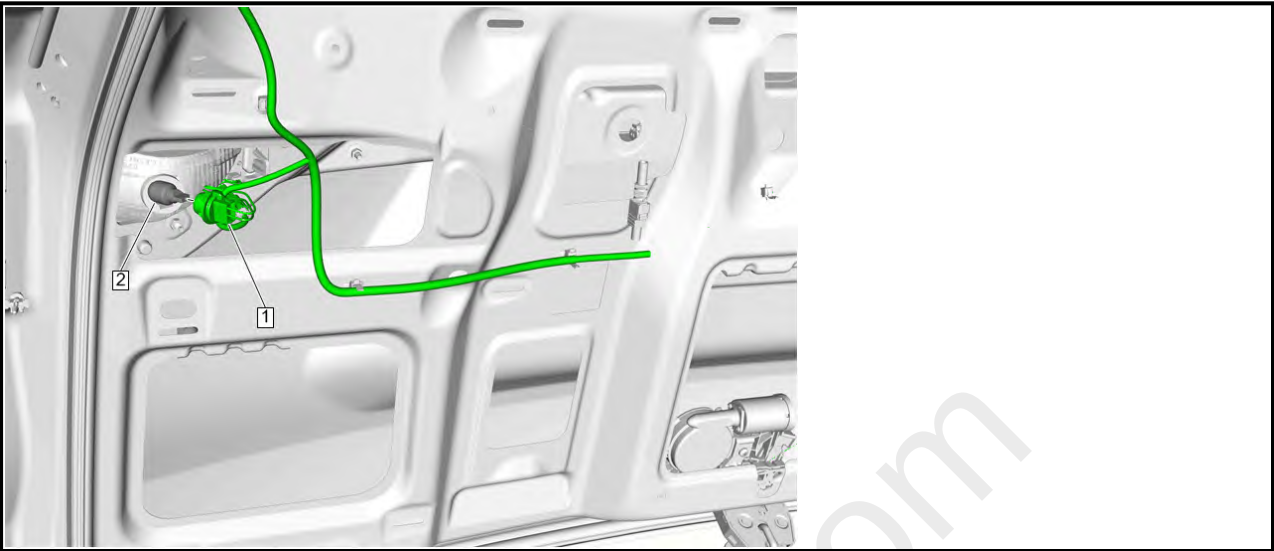
CARGO CENTER COURTESY LAMP BULB REPLACEMENT (FRONT SIDE DOOR TRIM)



Callout	Component Name
Preliminary Procedure <u>Front Side Door Trim Replacement</u>	

Callout	Component Name
1	Cargo Center Courtesy Lamp Bulb Procedure 1. Use a flat bladed plastic trim tool. 2. Disconnect the electrical connector.

BACKUP BULB REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Liftgate Lower Trim Finish Panel Replacement</u>	
1	Backup Lamp Wiring Harness Socket Procedure Rotate the bulb socket counterclockwise to remove it from the lamp housing.
2	Backup Bulb Procedure Pull the bulb from the bulb socket.

FORWARD LAMP WIRING HARNESS REPLACEMENT

Removal Procedure

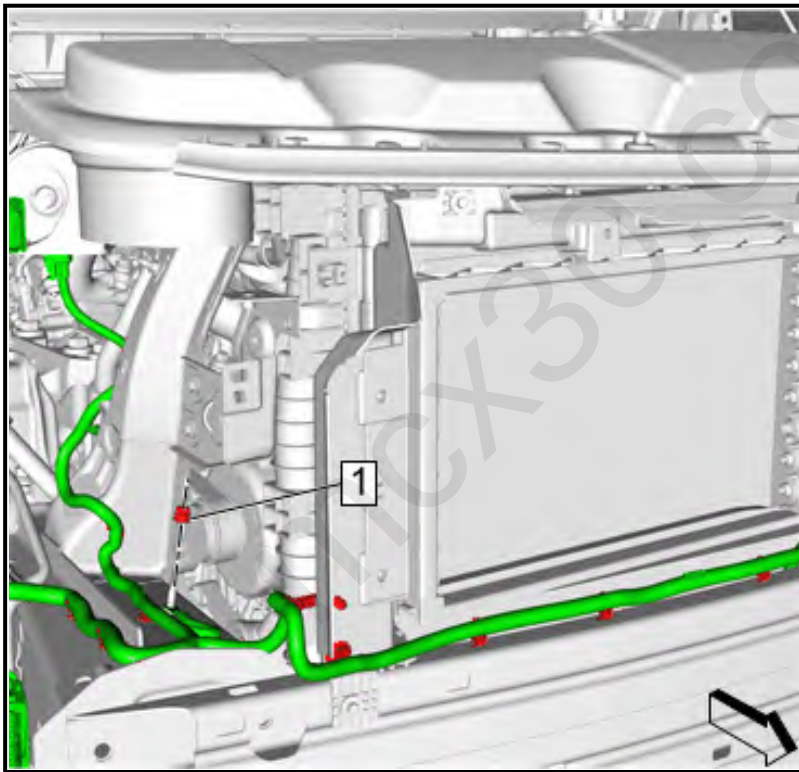
1. Remove the front bumper fascia. Front Bumper Fascia Replacement
2. Remove the left and right headlamp assemblies. Headlamp Replacement
3. Windshield Washer Solvent Container - Remove - Windshield Washer Solvent Container Replacement
4. Disconnect all electrical connectors.
5. Forward Lamp Wiring Harness @ Engine Wiring Harness Junction Block - Remove - Engine Wiring Harness Junction Block Replacement

6.



Wiring Harness Ground Nut (1) @ Drivetrain and Front Suspension Frame - Remove [2x]

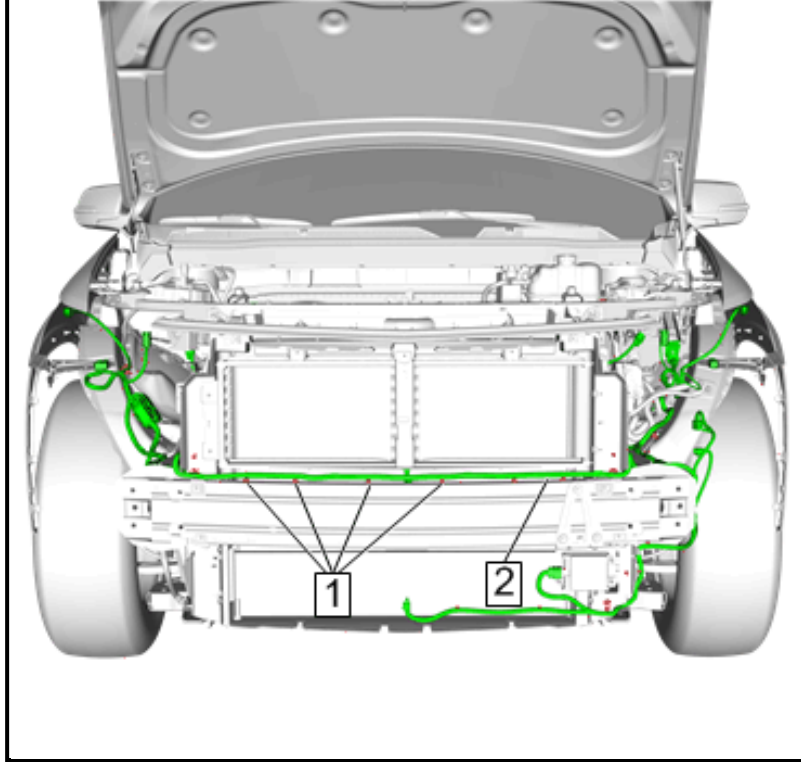
7.



Wiring Harness Ground Nut (1) @ Drivetrain and Front Suspension Frame - Remove

8.



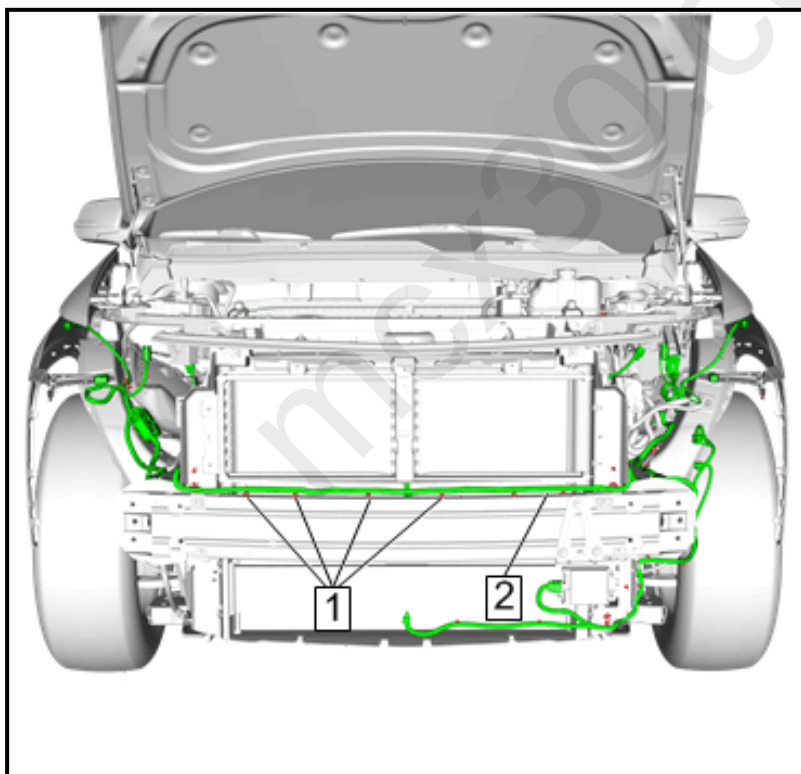


Remove the wiring harness retainers (1) from the forward lamp wiring harness. (2)

9. Forward Lamp Wiring Harness (2) - Remove

Installation Procedure

1.

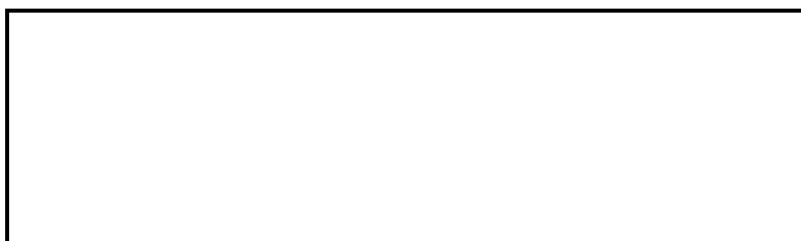


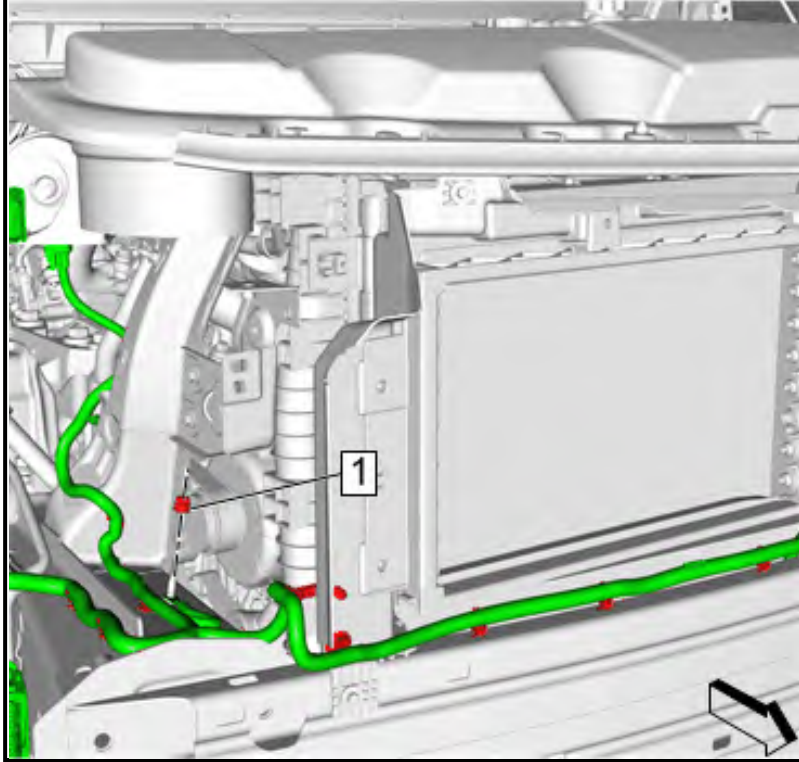
Forward Lamp Wiring Harness (2) - Install

2. Install the wiring harness retainers (1) to the forward lamp wiring harness. (2)

CAUTION: Refer to [Fastener Caution](#)

3.





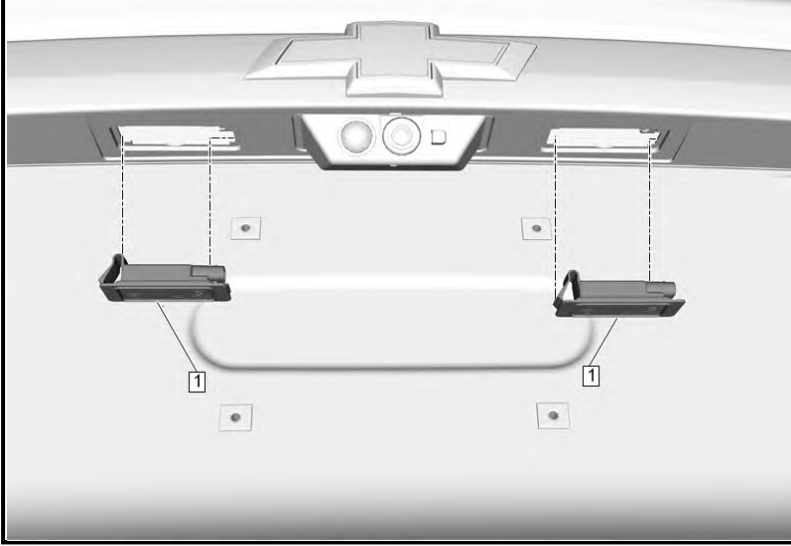
Wiring Harness Ground Nut (1) @ Drivetrain and Front Suspension Frame - Install and tighten 22 N.m (16 lb ft)



Wiring Harness Ground Nut (1) @ Drivetrain and Front Suspension Frame - Install and tighten [2x] 22 N.m (16 lb ft)

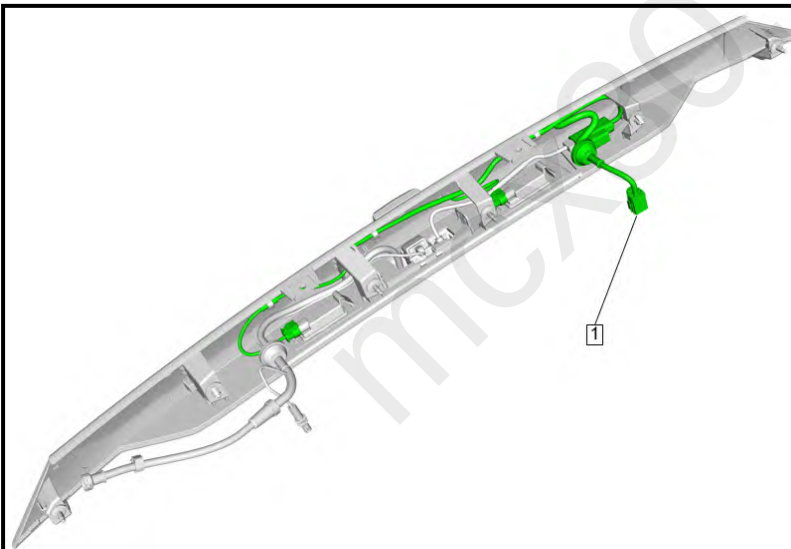
5. Forward Lamp Wiring Harness @ Engine Wiring Harness Junction Block - Install - [Engine Wiring Harness Junction Block Replacement](#)
6. Connect all electrical connectors.
7. Windshield Washer Solvent Container - Install - [Windshield Washer Solvent Container Replacement](#)
8. Install the left and right headlamp assemblies. [Headlamp Replacement](#)
9. Install the front bumper fascia. [Front Bumper Fascia Replacement](#)

REAR LICENSE PLATE LAMP REPLACEMENT



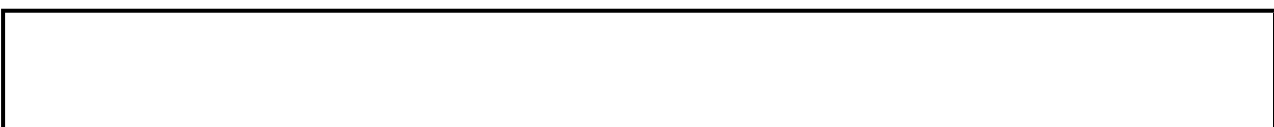
Callout	Component Name
1	Rear License Plate Lamp Procedure 1. Using a flat-bladed tool, depress the tab and pull downward to remove the lamp. 2. Disconnect the electrical connector. 3. Transfer components as necessary.

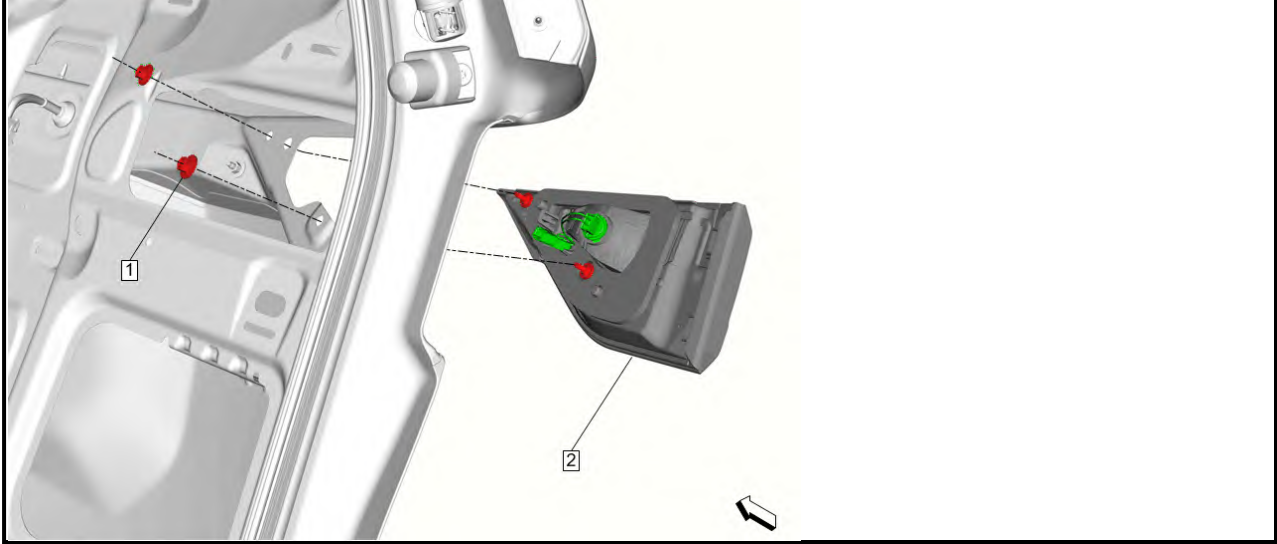
REAR LICENSE PLATE LAMP WIRING HARNESS REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Rear Closure Center Applique Replacement</u>	
1	Rear License Plate Lamp Wiring Harness Procedure 1. Disconnect the electrical connectors. 2. Transfer components as necessary.

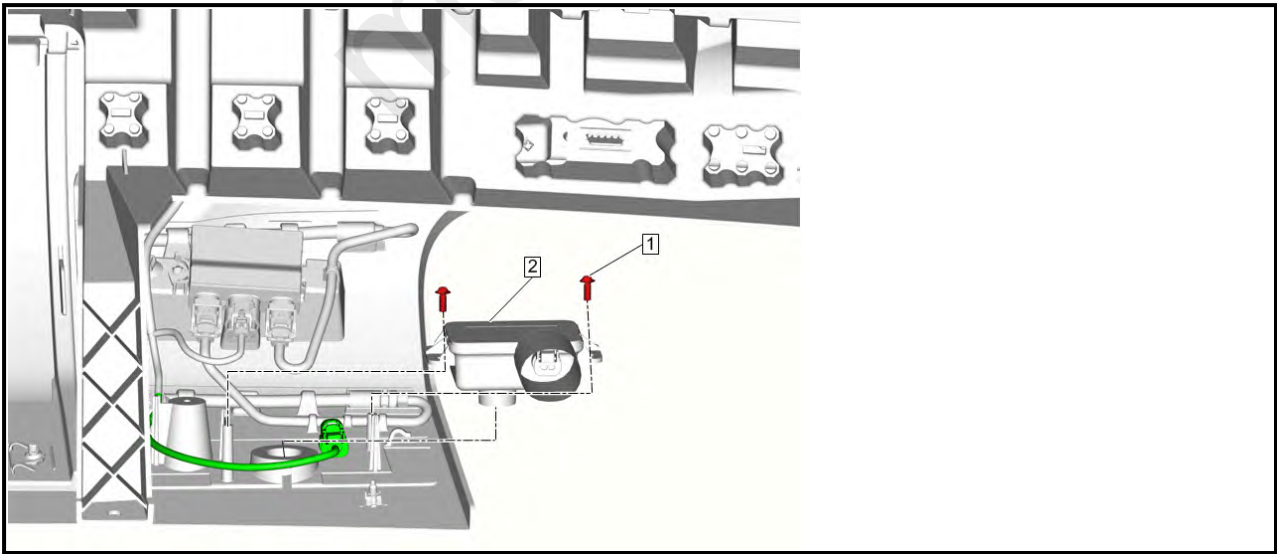
REAR CLOSURE SIGNAL LAMP REPLACEMENT





Callout	Component Name
Preliminary Procedure <u>Rear Closure Center Applique Replacement</u>	
1	Rear Closure Auxiliary Signal Lamp Nut [2x] CAUTION: Refer to <u>Fastener Caution</u> Tighten 2.5 N.m (22 lb in)
2	Rear Closure Signal Lamp Procedure 1. Disconnect the electrical connectors. 2. Pull lamp rearward and tilt outward to remove from liftgate.

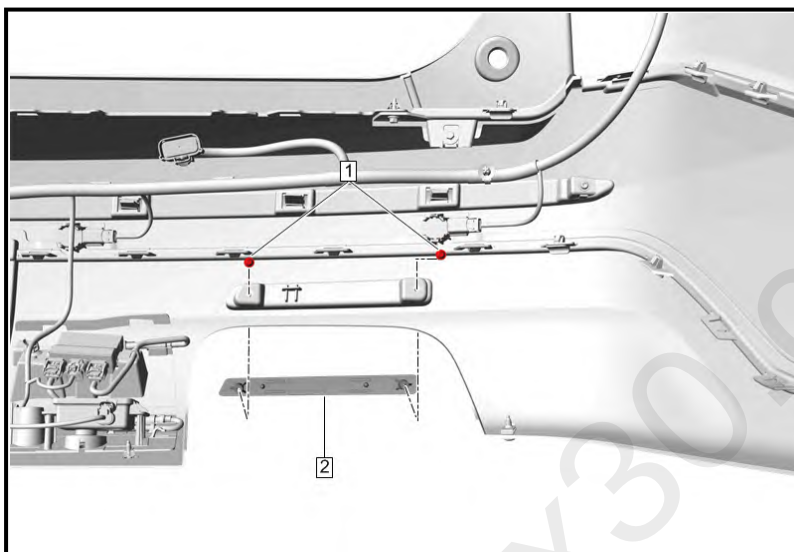
REAR CLOSURE HANDS FREE LAMP REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Rear Bumper Fascia Replacement</u>	

Callout	Component Name
1	Rear Closure Hands Free Lamp Screw [2x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	Rear Closure Hands Free Lamp Procedure 1. Disconnect all electrical connectors. 2. Transfer components as necessary.

REAR FASCIA LOWER SIGNAL LAMP REPLACEMENT



Callout	Component Name
Preliminary Procedure Rear Bumper Fascia Energy Absorber Replacement	
1	Rear Fascia Lower Signal Lamp Screw [2x] CAUTION: Refer to Fastener Caution Tighten 2.5 N.m (22 lb in)
2	Rear Fascia Lower Signal Lamp Procedure Use an appropriate tool to release the lamp from the rear bumper fascia.