

2008 ACCESSORIES & EQUIPMENT

Lighting - LaCrosse

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Assist Handle Screws	3 N.m	27 lb in
Brake Pedal Position Sensor Screw	2 N.m	18 lb in
Front Fog Lamp Assembly Retaining Nuts	10 N.m	89 lb in
Headlamp Switch Retaining Screws	2 N.m	18 lb in
High Mounted Stop Lamp Nuts	2 N.m	18 lb in
Side Rail Lamp Housing Screws	3 N.m	27 lb in

SCHEMATIC AND ROUTING DIAGRAMS

HEADLIGHTS/DAYTIME RUNNING LIGHTS (DRL) SCHEMATICS

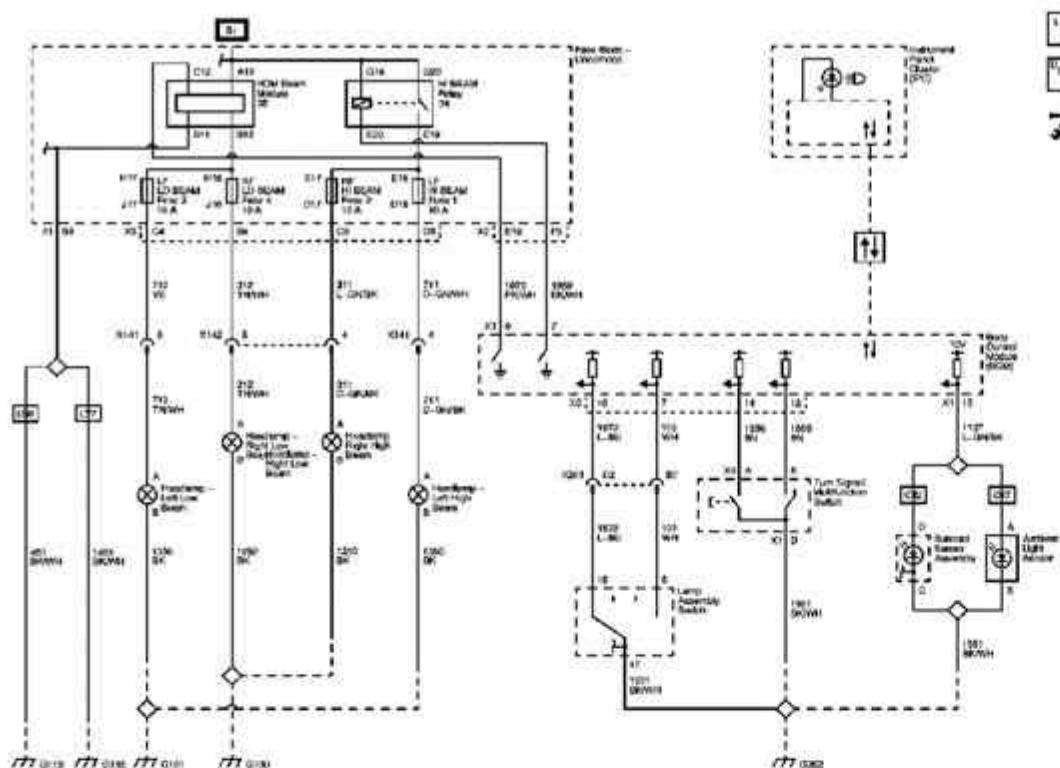


Fig. 1: Headlights/Daytime Running Lights (DRL) Schematic
 Courtesy of GENERAL MOTORS CORP.

FOG LIGHTS SCHEMATICS

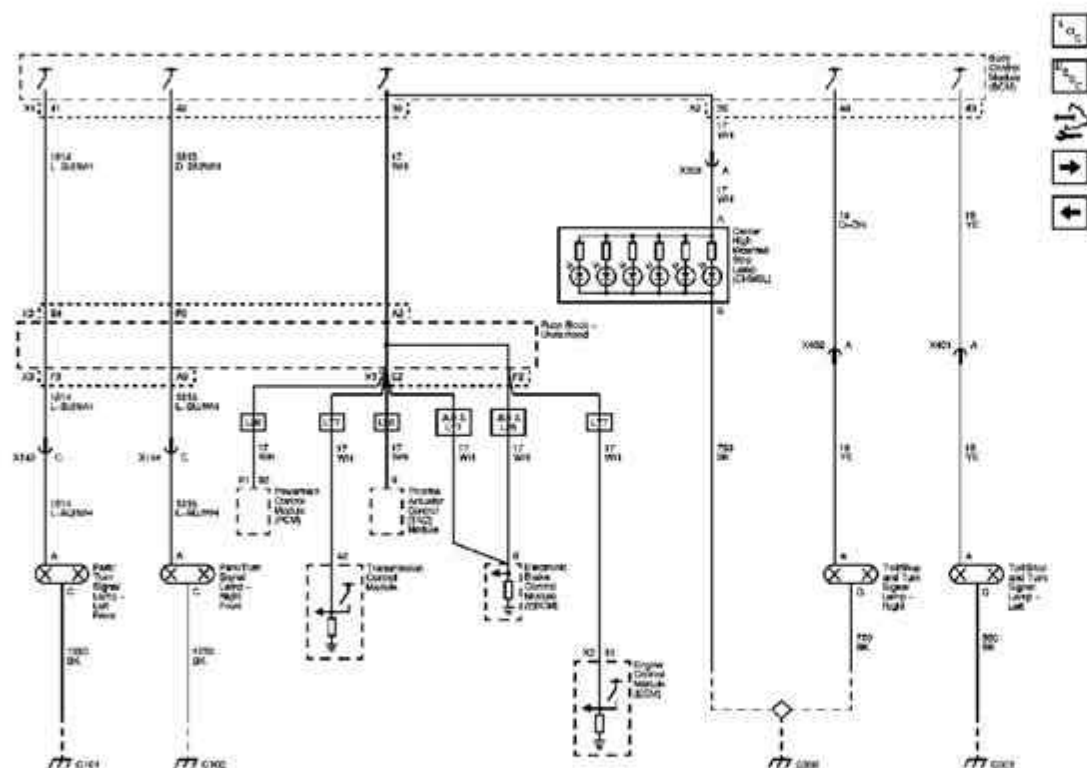


Fig. 4: Turn Signal, Hazard, and Stop Lamps Outputs Schematic
 Courtesy of GENERAL MOTORS CORP.

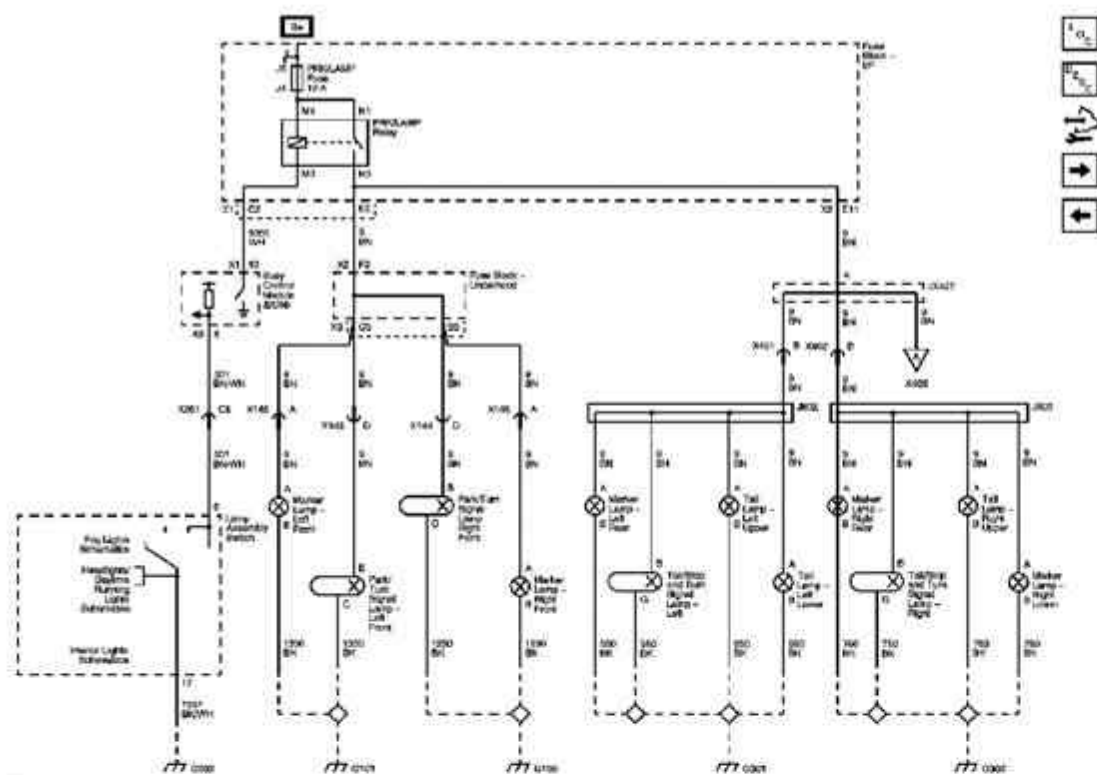


Fig. 5: Park Lamps Schematic
 Courtesy of GENERAL MOTORS CORP.

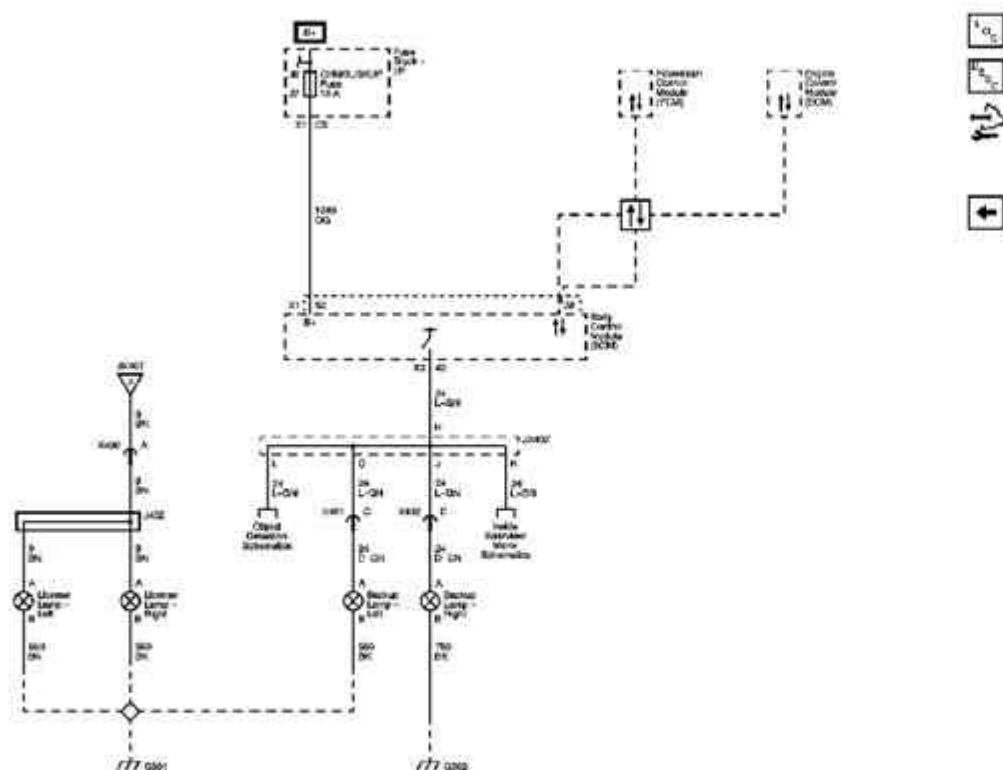


Fig. 6: Backup and License Lamps Schematic
Courtesy of GENERAL MOTORS CORP.

INTERIOR LIGHTS SCHEMATICS

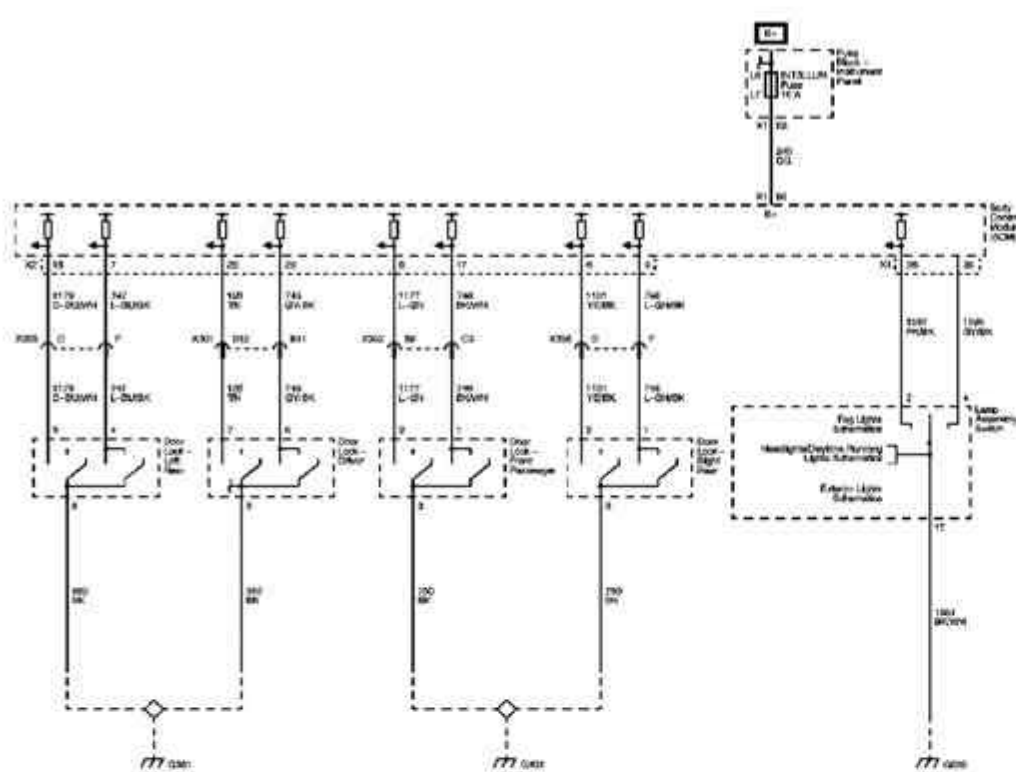


Fig. 7: Lamp Controls Schematic
Courtesy of GENERAL MOTORS CORP.

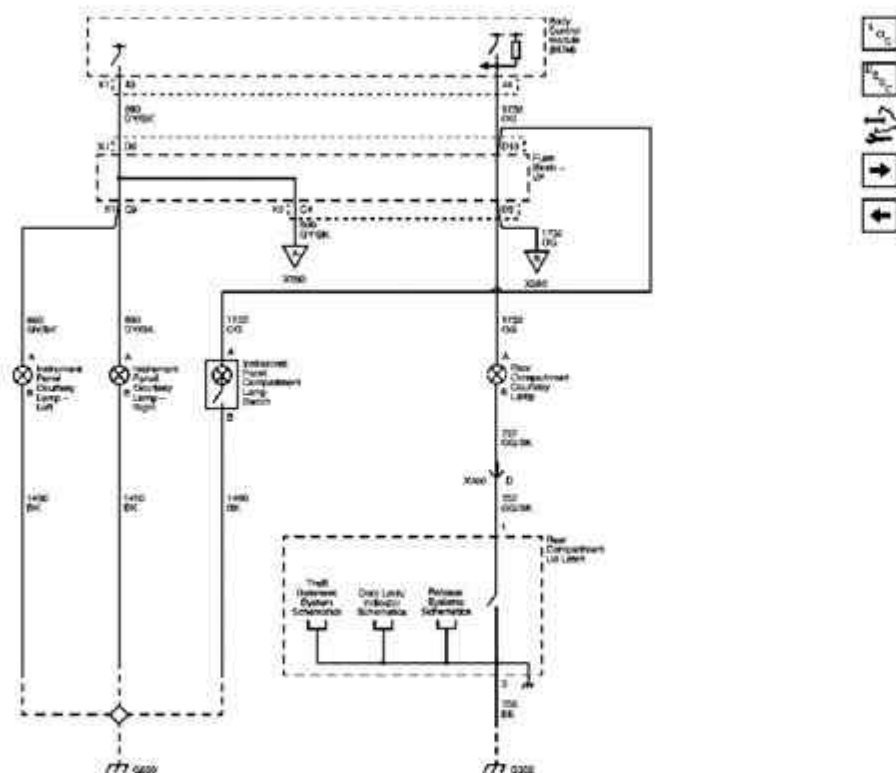


Fig. 8: Courtesy Lamps Schematic
 Courtesy of GENERAL MOTORS CORP.

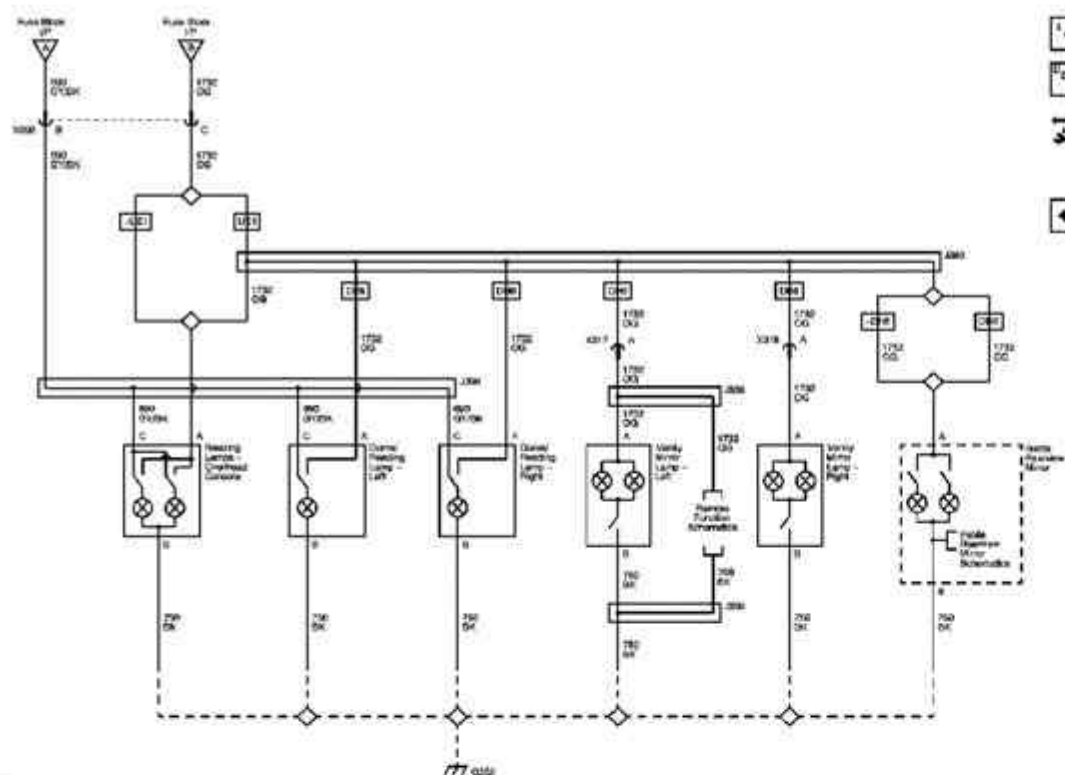


Fig. 9: Overhead Lighting Schematic
 Courtesy of GENERAL MOTORS CORP.

INTERIOR LIGHTS DIMMING SCHEMATICS

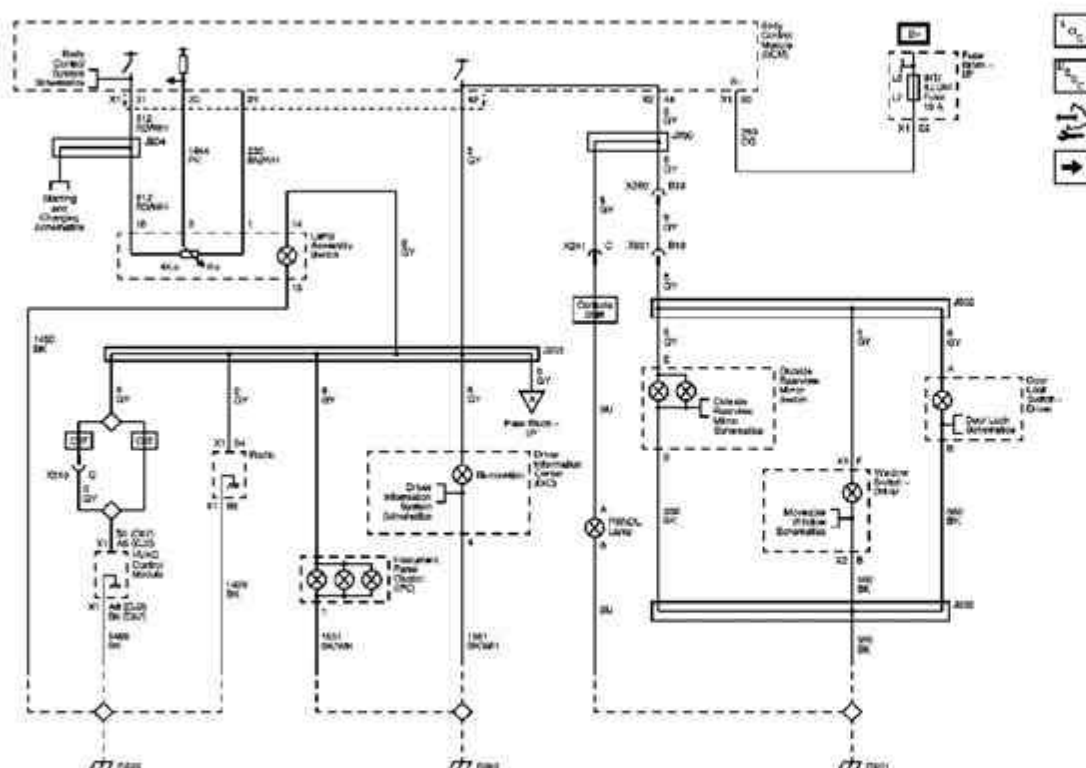


Fig. 10: Instrument Panel, Console, and Driver Door Lighting Schematic
 Courtesy of GENERAL MOTORS CORP.

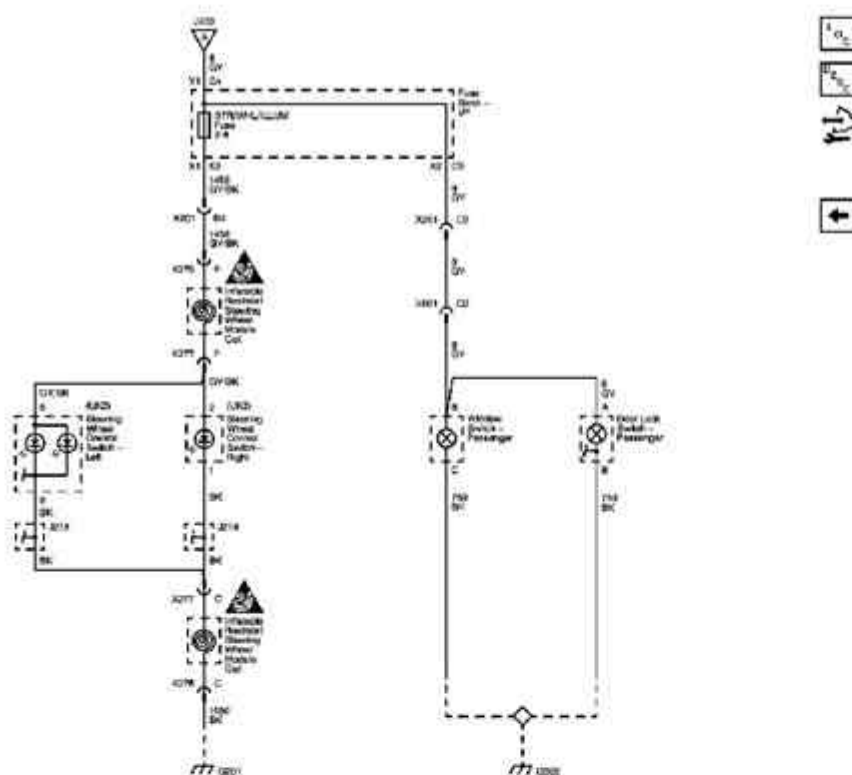


Fig. 11: Steering Wheel and Front Passenger Door Lighting Schematic
 Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B2545	B2545: Backup Lamps Circuit

2008 Buick LaCrosse CXL

2008 ACCESSORIES & EQUIPMENT Lighting - LaCrosse

<u>DTC B2580</u>	B2580: Headlamp High Beam Control Circuit
<u>DTC B2610</u>	B2610: Passenger Compartment Dimming 1 Circuit
<u>DTC B2645</u>	B2645: Ambient Light Sensor Circuit
<u>DTC B3445</u>	B3445: Stop Lamp Circuit
<u>DTC B3838</u>	B3838: Park Lamp Signal Circuit
<u>DTC B3948-B3951</u>	B3948: Left Front Turn Signal B3949: Right Front Turn Signal B3950: Left Rear Turn Signal B3951: Right Rear Turn Signal
<u>DTC C0277, C0278, or C0283</u>	C0277: Brake Pedal Position Sensor Circuit C0278: Brake Pedal Position Sensor Not Calibrated C0283: Brake Pedal Position Sensor Circuit Low
<u>DTC C0870</u>	C0870: Brake Pedal Position Sensor Circuit
<u>DTC P0572 or P0573</u>	P0572: Brake Switch Circuit 1 Low Voltage P0573: Brake Switch Circuit 1 High Voltage
<u>DTC P0504</u>	P0504: Brake Switch Circuit 1-2 Correlation

DIAGNOSTIC STARTING POINT - LIGHTING SYSTEMS

Begin the system diagnosis with the **Diagnostic System Check - Vehicle** . The Diagnostic System Check - Vehicle will provide the following information:

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

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

DTC B2545**Diagnostic Instructions**

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

DTC Descriptor**DTC B2545**

Backup Lamps Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Backup Lamp Supply Voltage	B2545	1	2	-
Backup Lamp Ground	-	1	1	-
1. Backup Lamp(s) Inoperative 2. Backup Lamp(s) Always On				

Circuit/System Description

When the transmission range selector is placed in the REVERSE position, a serial data message is sent from the powertrain control module (PCM)/engine control module (ECM) to the body control module (BCM). The BCM then applies voltage to the left and right backup lamps through the backup lamp supply voltage circuit.

Conditions for Running the DTC

The ignition is ON. The backup lamps are commanded ON.

Conditions for Setting the DTC

The BCM detects a short to ground on the backup lamp supply voltage circuit.

Action Taken When the DTC Sets

The BCM will deactivate the backup lamps for the remainder of the ignition cycle.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information**Schematic Reference****Exterior Lights Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References** for Scan Tool Information**Circuit/System Verification**

Ignition ON, place the transmission gear selector in the REVERSE position. The backup lamps should illuminate.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the right backup lamp.
2. Test for less than 10 ohms of resistance between the ground circuit terminal B and ground.
 - o If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit terminal A and ground.

4. Ignition ON, command the backup lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. Ignition OFF, connect the harness connector at the right backup lamp. Disconnect the harness connector at the left backup lamp.
6. Test for less than 10 ohm of resistance between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
7. Connect a test lamp between the control circuit terminal A and ground.
8. Ignition ON, command the backup lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance.
9. If all circuits test normal, test or replace the applicable backup lamp bulb.

Repair Procedures

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

- **Backup Lamp Bulb Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B2580

Diagnostic Instructions

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

DTC Descriptor

DTC B2580

Headlamp High Beam Control Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp High Beam Relay Control	B2580	B2580	1	-
1. High Beams Inoperative				

Circuit/System Description

B+ is applied at all times to the headlamp high beam relay. When the headlamp dimmer switch is placed in either the flash to pass (FTP) or HIGH position, ground is applied through the signal circuits to the body control module (BCM). The BCM then applies a ground to the headlamp high beam relay control circuit. This energizes the relay and applies voltage through the HI BEAM fuses to both left and right headlamp assembly.

Conditions for Running the DTC

The ignition is ON. The high beam headlamps are commanded ON.

Conditions for Setting the DTC

The BCM detects a short to ground or an open/high resistance on the headlamp high beam relay control circuit while trying to energize the relay.

Action Taken When the DTC Sets

The BCM disables the headlamp high beam relay control for the remainder of the ignition cycle.

Conditions for Clearing the DTC

- The conditions for setting the DTC are no longer present.
- A history DTC clears after 100 malfunction-free ignition cycles.

Reference Information**Schematic Reference****Headlights/Daytime Running Lights (DRL) Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References for Scan Tool Information****Circuit/System Verification**

Ignition ON, command the High Beams ON and OFF with a scan tool. The headlamp high beams should turn ON and OFF when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the HI BEAM relay.
2. Connect a test lamp between the control circuit terminal E20 and B+.
3. Ignition ON, command the High Beams ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the BCM.

- If the test lamp is always OFF, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
- 4. If the circuit tests normal, test or replace the HI BEAM relay.

Repair Procedures

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

Control Module References for BCM replacement, setup, and programming

DTC B2610**Diagnostic Instructions**

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

DTC Descriptor**DTC B2610**

Passenger Compartment Dimming 1 Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Instrument Panel Lamp Supply Voltage	B2610	2	1	-
1. Interior Backlighting Does Not Dim 2. Interior Backlighting Inoperative				

Circuit/System Description

The BCM supplies a voltage reference through the I/P dimming voltage reference circuit to the interior lamp dimmer switch. When the dimmer switch is placed in a desired brightness position, reference voltage is applied through the dimmer switch rheostat and the I/P dimming signal circuit to the BCM. The BCM interprets this voltage signal, then applies a variable voltage through the instrument panel lamp supply voltage circuit, illuminating the components listed below:

- Instrument Panel Cluster (IPC)
- HVAC control module
- Radio
- Headlamp switch
- Driver window switch
- Driver door lock switch
- Front passenger window switch
- Front passenger door lock switch
- Outside rearview mirror switch
- Traction control switch
- PRNDL lamp (console shift)
- Driver Information Center (DIC)

- Steering wheel controls (RPO UK3)

Conditions for Running the DTC

- The ignition is ON
- The headlamps or park lamps are ON

Conditions for Setting the DTC

The BCM detects a short to ground on the instrument panel lamp supply voltage circuit.

Action Taken When the DTC Sets

The BCM will not DIM or illuminate any backlighting.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists
- A history DTC will clear once 100 consecutive malfunction ignition cycles have occurred

Reference Information**Schematic Reference****Interior Lights Dimming Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Interior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References for Scan Tool Information****Circuit/System Verification**

Ignition ON, cover the ambient light sensor. Adjust the interior lamp dimming switch from dim to full bright. The backlighting lamps should dim and then become full bright.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connectors at all components fed by the instrument panel lamp supply voltage circuit.
2. Ignition ON, clear the DTC with a scan tool.
3. Operate the vehicle within the conditions for running the DTC and verify the DTC does not reset.

- If the DTC resets, test the instrument panel lamp supply voltage circuit for a short to ground. If the circuit tests normal, replace the BCM.
- 4. Reconnect each component one at a time and verify that the DTC does not reset.
 - If the DTC resets, test or replace the component responsible for setting the DTC.

Repair Procedures

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

Control Module References for BCM replacement, setup, and programming

DTC B2645

Diagnostic Instructions

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

DTC Descriptors

DTC B2645

Ambient Light Sensor Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
DRL Ambient Light Sensor Signal	B2645	B2645	B2645	-
Ambient Light Sensor Ground	-	B2645	B2645	-

Circuit/System Description

The ambient light sensor is used to monitor outside lighting conditions. The body control module (BCM) provides a 5-volt reference signal to the ambient light sensor. The sensor is a variable resistor, its resistance changes as outside lighting conditions change. With the headlamp switch in the AUTO position, the BCM monitors the sensor signal circuit to determine if the outside lighting conditions are correct for either daytime running lamps (DRL) or headlamp operation. In daylight conditions, the BCM will command the DRLs ON. In low light conditions, the BCM will command the headlamps ON.

Conditions for Running the DTC

- The ignition is ON.
- The headlamp switch in the AUTO position.

Conditions for Setting the DTC

The DTC will set when the BCM detects the ambient light sensor signal voltage is below 0.2 volts or above 4.9 volts.

Action Taken When the DTC Sets

The BCM defaults to low light status and commands the headlamps ON.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information**Schematic Reference****Exterior Lights Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References for Scan Tool Information****Circuit/System Testing**

1. Ignition OFF, disconnect the harness connector at the ambient light sensor (RPO C67) or sunload sensor assembly (RPO CJ2).
2. Ignition OFF, test for less than 5 ohms of resistance between the ground circuit terminal B (C67) or C (CJ2) and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Ambient Light Sensor parameter is greater than 4.65 volts.
 - If less than the specified range, test the signal circuit terminal A (C67) or D (CJ2) for a short to ground. If the circuit tests normal, replace the BCM.
4. Install a 3A fused jumper wire between the signal circuit terminal A (C67) or D (CJ2) and the low reference circuit terminal ground. Verify the scan tool Ambient Light Sensor parameter is less than 0.2 volts.
 - If greater than the specified range, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the ambient light sensor (C67) or sunload sensor assembly (CJ2).

Repair Procedures

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

- **Daytime Running Lamp (DRL) Ambient Light Sensor Replacement**
- **Sun Load Sensor Replacement**
- **Control Module References for BCM replacement, setup, and programming**

DTC B3445**Diagnostic Instructions**

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

DTC Descriptor**DTC B3445**

Stop Lamp Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Stop Lamp Switch Signal	B3445, P0573	P0573	P0572	-

Circuit/System Description

When the brake pedal is applied, the BCM receives a brake applied signal from the brake pedal position sensor (BPPS). The BCM applies B+ to the stop lamp switch signal circuit. This circuit supplies a B+ signal to the powertrain control module (PCM) (L26), engine control module (ECM) (LY7), transmission control module (TCM) (LY7), throttle actuator control (TAC) module, and electronic brake control module (EBCM) indicating the brakes are applied. B+ is also supplied to the center high mound stop lamp (CHMSL), illuminating it when the brakes are depressed.

Conditions for Running the DTC

- The ignition is ON
- The stop lamps are commanded ON

Conditions for Setting the DTC

The BCM detects a short to ground on the stop lamp switch signal circuit when the stop lamps are being commanded ON.

Action Taken When the DTC Sets

Output on the stop lamp switch signal circuit is disabled.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred

Reference Information**Schematic Reference****Exterior Lights Schematics****Connector End View Reference****Component Connector End Views**

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

1. Ignition ON, verify DTC P0572 or P0573 is not set.
 - o If either of the DTCs are set, refer to **DTC P0572 or P0573**.

Circuit/System Testing

RPO L26

1. Ignition OFF, disconnect the harness connector at the CHMSL.
2. Test for less than 5 ohms of resistance between the ground circuit terminal B and ground.
 - o If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the signal circuit terminal A and ground.
4. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - o If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - o If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. Ignition OFF, connect the harness connector at the CHMSL. Disconnect the harness connector at the TAC module.
6. Connect a test lamp between the signal circuit terminal 6 and ground.
7. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - o If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - o If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
8. Ignition OFF, connect the harness connector at the TAC module. Disconnect the harness connector at the EBCM.
9. Connect a test lamp between the signal circuit terminal 6 and ground.
10. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - o If the test lamp is always ON, test the signal circuit for a short to voltage.
 - o If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance.

11. Ignition OFF, connect the harness connector at the EBCM. Disconnect the X1 harness connector at the PCM.
12. Connect a test lamp between the signal circuit terminal 32 and ground.
13. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - If the test lamp is always ON, test the signal circuit for a short to voltage.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance.

RPO LY7

1. Ignition OFF, disconnect the harness connector at the CHMSL.
2. Test for less than 5 ohms of resistance between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the signal circuit terminal A and ground.
4. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. Ignition OFF, connect the harness connector at the CHMSL. Disconnect the harness connector at the TCM.
6. Connect a test lamp between the signal circuit terminal 42 and ground.
7. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
8. Ignition OFF, connect the harness connector at the TCM. Disconnect the harness connector at the EBCM.
9. Connect a test lamp between the signal circuit terminal 6 and ground.
10. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - If the test lamp is always ON, test the signal circuit for a short to voltage.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance.
11. Ignition OFF, connect the harness connector at the EBCM. Disconnect the X2 harness connector at the ECM.
12. Connect a test lamp between the signal circuit terminal 10 and ground.
13. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - If the test lamp is always ON, test the signal circuit for a short to voltage.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance.

Repair Procedures

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

Control Module References for BCM replacement, setup, and programming

DTC B3838**Diagnostic Instructions**

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

DTC Descriptor**DTC B3838**

Park Lamp Signal Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Lamp Relay Control	B2580	B2580	1	-
1. Park Lamps Inoperative				

Circuit/System Description

B+ is applied at all times to the park lamp relay. When the headlamp switch is placed in either the PARK or HEAD position, ground is applied through the park lamp switch on signal circuit to the body control module (BCM). The BCM then applies a ground to the park lamp relay control circuit. This energizes the relay and applies voltage through the park lamps.

Conditions for Running the DTC

The ignition is ON. The park lamps are commanded ON.

Conditions for Setting the DTC

The BCM detects a short to ground or an open/high resistance on the park lamp relay control circuit while trying to energize the relay.

Action Taken When the DTC Sets

The BCM disables the park lamp relay control for the remainder of the ignition cycle.

Conditions for Clearing the DTC

- The conditions for setting the DTC are no longer present
- A history DTC clears after 100 malfunction-free ignition cycles

Reference Information**Schematic Reference****Headlights/Daytime Running Lights (DRL) Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation**

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

Ignition ON, command the Parking Lamps ON and OFF with a scan tool. The park lamps should turn ON and OFF when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the PK LAMPS relay.
2. Connect a test lamp between the control circuit terminal M3 and B+.
3. Ignition ON, command the Parking Lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - o If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the BCM.
 - o If the test lamp is always OFF, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
4. If the circuit tests normal, test or replace the PK LAMPS relay.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for BCM replacement, setup, and programming

DTC B3948-B3951

Diagnostic Instructions

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

DTC Descriptors

DTC B3948

Left Front Turn Signal

DTC B3949

Right Front Turn Signal

DTC B3950

Left Rear Turn Signal

DTC B3951

Right Rear Turn Signal

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Turn Signal Lamp Supply Voltage	B3948	B3948	B3948	-
LF Park/Turn Signal Lamp Ground	1	1	1	-
Right Front Turn Signal Lamp Supply Voltage	B3949	B3949	B3949	-
RF Park/Turn Signal Lamp Ground	2	2	2	-
Left Rear Stop/Turn Signal Lamp Supply Voltage	B3950	B3950	B3950	-
Left Tail/Stop and Turn Signal Lamp Ground	3	3	3	-
Right Rear Stop/Turn Signal Lamp Supply Voltage	B3951	B3951	B3951	-
Left Tail/Stop and Turn Signal Lamp Ground	4	4	4	-
1. Left Front Park/Turn Signal Inoperative 2. Right Front Park/Turn Signal Inoperative 3. Left Rear Stop/Turn Signal Inoperative 4. Right Rear Stop/Turn Signal Inoperative				

Circuit/System Description

The Body Control Module (BCM) controls the turn signals based on an input from the turn signal switch, part of the multifunction turn signal lever. The BCM receives an input from one of two signal circuits to determine which turn signal function is requested. When the turn signal lever is placed in the LEFT position, the left turn signal switch signal circuit is grounded indicating that left turn signal operation is requested. When the turn signal lever is placed in the RIGHT position, the right turn signal switch signal circuit is grounded indicating that right turn signal operation is requested.

When a turn signal input is received from the turn signal switch, the BCM will activate the appropriate turn signals. The BCM pulses voltage to the applicable turn signals via the turn signal lamp supply voltage circuits, illuminating the required turn signal lamps.

Conditions for Running the DTC

A turn signal input is received from the turn signal switch.

Conditions for Setting the DTC**B3948**

A short to voltage, short to ground, or an open/high resistance is seen on the left front turn signal lamp supply voltage circuit.

B3949

A short to voltage, short to ground, or an open/high resistance is seen on the right front turn signal lamp supply voltage circuit.

B3950

A short to voltage, short to ground, or an open/high resistance is seen on the left rear stop/turn signal lamp supply voltage circuit.

B3951

A short to voltage, short to ground, or an open/high resistance is seen on the right rear stop/turn signal lamp supply voltage circuit.

Action Taken When the DTC Sets

The applicable turn signal is disabled.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information**Schematic Reference****Exterior Lights Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References** for Scan Tool Information**Circuit/System Verification**

Ignition ON, command the appropriate turn signal lamp ON and OFF with a scan tool. The appropriate turn signal lamp should turn ON and OFF when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate turn signal lamp bulb.
2. Test for less than 10 ohms between the ground circuit terminal G (Rear) or C (Front) and ground.

- If greater than the specified range, test the ground circuit for an open/high resistance.
- 3. Install a test lamp between the signal circuit terminal A and ground.
- 4. Ignition ON, command the appropriate turn signal lamp ON and OFF with a scan tool. The appropriate turn signal lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
- 5. If all circuits test normal, test or replace the appropriate turn signal lamp bulb.

Repair Procedures

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

- **Park/Turn Signal Lamp Bulb Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC C0277, C0278, OR C0283

Diagnostic Instructions

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

DTC Descriptor

DTC C0277

Brake Pedal Position Sensor Circuit

DTC C0278

Brake Pedal Position Sensor Not Calibrated

DTC C0283

Brake Pedal Position Sensor Circuit Low

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
10-Volt Reference	C0283, C0870	C0277	C0277, C0870	-
Stop Lamp Switch Signal	C0283	C0277	C0277	-
Low Reference	-	C0277	C0277	-

Circuit/System Description

The body control module (BCM) provides a 10-volt reference voltage and a low reference signal to the brake pedal position sensor (BPPS). When the brake pedal is applied, the BPPS sends a variable voltage signal through the brake apply sensor signal circuit to the BCM. The voltage signal will increase as the brake pedal is further depressed. In response to this signal, the BCM applies battery positive voltage to the stop lamp switch signal circuit and the rear stop/turn lamp supply voltage circuits.

Conditions for Running the DTC

Ignition is ON

Conditions for Setting the DTC**C0277**

The BCM detects a short to voltage on the stop lamp switch signal circuit

C0278

The BPPS does not have a calibration value

C0283

The BCM detects a short to ground or an open/high resistance on the stop lamp switch signal circuit

Action Taken When the DTC Sets

- The vehicle stop lamps will be inoperative
- Cruise control operation will be disabled

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred

Reference Information**Schematic Reference****Exterior Lights Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References** for Scan Tool Information**Circuit/System Verification**

1. Ignition ON, calibrate the BPPS. Refer to **Brake Pedal Position Sensor Calibration**.
2. Depress the brake pedal. The stop lamps should illuminate.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the BPPS.
2. Ignition OFF, test for less than 10 ohms of resistance between the low reference circuit terminal C and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the BCM.
3. Ignition ON, test for 9.8-10.2 volts between the 10-volt reference circuit terminal A and ground.
 - If greater than the specified range, test the 10-volt reference circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If less than the specified range, test the 10-volt reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
4. Install a 3A fused jumper between the signal circuit terminal B and the low reference circuit terminal C. Verify the scan tool BPP Sensor parameter is less than 4 counts.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
5. Install a 3A fused jumper between the signal circuit terminal B and the 10-volt reference circuit terminal A. Verify the scan tool BPP Sensor parameter is greater than 250 counts.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
6. If all circuits test normal, test or replace the BPPS.

Repair Procedures

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

- **Brake Pedal Position Sensor Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC C0870**Diagnostic Instructions**

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

DTC Descriptor**DTC C0870**

Brake Pedal Position Sensor Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
10-Volt Reference	C0283, C0870	C0277	C0277, C0870	-
Stop Lamp Switch Signal	C0283	C0277	C0277	-
Low Reference	-	C0277	C0277	-

Circuit/System Description

The body control module (BCM) provides a 10-volt reference voltage and a low reference signal to the brake pedal position sensor (BPPS). When the brake pedal is applied, the BPPS sends a variable voltage signal through the brake apply sensor signal circuit to the BCM. The voltage signal will increase as the brake pedal is further depressed. In response to this signal, the BCM applies battery positive voltage to the stop lamp switch signal circuit and the rear stop/turn lamp supply voltage circuits.

Conditions for Running the DTC

Ignition is ON

Conditions for Setting the DTC

The BCM detects an improper voltage on the 10-volt reference circuit

Action Taken When the DTC Sets

- The vehicle stop lamps will be inoperative
- Cruise control operation will be disabled

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred

Reference Information**Schematic Reference****Exterior Lights Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References for Scan Tool Information****Circuit/System Verification**

Depress the brake pedal. The stop lamps should illuminate.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the BPPS.

2. Ignition ON, test for 9.8-10.2 volts between the 10-volt reference circuit terminal A and ground.
 - If greater than the specified range, test the 10-volt reference circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If less than the specified range, test the 10-volt reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
3. If all circuits test normal, test or replace the BPPS.

Repair Procedures

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

- **Brake Pedal Position Sensor Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC P0572 OR P0573

Diagnostic Instructions

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

DTC Descriptor

DTC P0572

Brake Switch Circuit 1 Low Voltage

DTC P0573

Brake Switch Circuit 1 High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Stop Lamp Switch Signal	B3445, P0573	P0573	P0572	-

Circuit/System Description

When the brake pedal is applied, the BCM receives a brake applied signal from the brake pedal position sensor (BPPS). The BCM applies B+ to the stop lamp switch signal circuit. This circuit supplies a B+ signal to the powertrain control module (PCM) (L26), engine control module (ECM) (LY7), transmission control module (TCM) (LY7), throttle actuator control (TAC) module, and electronic brake control module (EBCM) indicating the brakes are applied. B+ is also supplied to the center high mound stop lamp (CHMSL), illuminating it when the brakes are depressed.

Conditions for Running the DTC

The ignition is ON

Conditions for Setting the DTC

P0572

The ECM/PCM detects a short to ground or an open/high resistance on the stop lamp switch signal circuit while the brakes are applied

P0573

The ECM/PCM detects a short to voltage on the stop lamp switch signal circuit while the brakes are not applied

Action Taken When the DTC Sets

- Stop lamp switch input is ignored. Brake apply status is obtained through serial data messages.
- Cruise control is disabled

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred

Reference Information**Schematic Reference****Exterior Lights Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References for Scan Tool Information****Circuit/System Verification**

Ignition ON, depress the brake pedal. The stop lamps should illuminate.

Circuit/System Testing

1. Ignition OFF, disconnect the X1(L26) or X2 (LY7) harness connector at the ECM/PCM.
2. Connect a test lamp between the signal circuit terminal 32 (L26) or terminal 10 (LY7) and ground.
3. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If

the circuit tests normal, replace the BCM.

4. If all circuits test normal, replace the ECM/PCM.

Repair Procedures

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

Control Module References for BCM, ECM, or PCM replacement, setup, and programming

DTC P0504

Diagnostic Instructions

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

DTC Descriptor

DTC P0504

Brake Switch Circuit 1-2 Correlation

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Stop Lamp Switch Signal	B3445, P0573	P0573	P0572	P0504

Circuit/System Description

When the brake pedal is applied, the BCM receives a brake applied signal from the brake pedal position sensor (BPPS). The BCM applies B+ to the stop lamp switch signal circuit. This circuit supplies a B+ signal to the engine control module (ECM) (LY7), transmission control module (TCM) (LY7), throttle actuator control (TAC) module, and electronic brake control module (EBCM) indicating the brakes are applied. B+ is also supplied to the center high mound stop lamp (CHMSL), illuminating it when the brakes are depressed. The BCM also reports the status of the brake pedal on the serial data line. The ECM monitors both the stop lamp switch signal circuit and the serial data message from the BCM to ensure that they are the same.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

The voltage value seen on the stop lamp switch signal circuit at the ECM and the brake pedal status report by the BCM do not match.

Action Taken When the DTC Sets

- Stop lamp switch input is ignored. Brake apply status is obtained exclusively through serial data messages.
- Cruise control is disabled.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.

- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

Ignition ON, depress the brake pedal. The stop lamps should illuminate.

- If the stop lamps do not illuminate, refer to Stop Lamps Malfunction.

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the ECM.
2. Connect a test lamp between the signal circuit terminal 10 and ground.
3. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when pressing and releasing the brake pedal.
 - If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
4. If all circuits test normal, replace the ECM.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for BCM or ECM replacement, setup, and programming

SYMPTOMS - LIGHTING SYSTEMS

IMPORTANT: The following steps must be completed before doing the Symptom tables.

1. Perform the **Diagnostic System Check - Vehicle** .
 - No DTCs are set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to **Exterior Lighting Systems Description and Operation** or **Interior Lighting Systems Description and Operation**.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the lighting system. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** .

Symptom List

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

- **Backup Lamps Malfunction**
- **Courtesy Lamps Malfunction**
- **Daytime Running Lamps Malfunction**
- **Front Fog Lamps Malfunction**
- **Hazard Lamps Malfunction**
- **Headlamps Malfunction**
- **Interior Backlighting Malfunction**
- **Park, License, and/or Tail Lamps Malfunction**
- **Reading Lamps Malfunction**
- **Rear Compartment Lamp Malfunction**
- **Stop Lamps Malfunction**
- **Turn Signal Lamps and/or Indicators Malfunction**
- **Vanity Mirror Lamp Malfunction**

BACKUP LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Backup Lamp Supply Voltage	B2545	1	2	-

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Backup Lamp Ground	-	1	1	-
1. Backup Lamp(s) Inoperative 2. Backup Lamp(s) Always On				

Circuit/System Description

When the transmission range selector is placed in the REVERSE position, a serial data message is sent from the powertrain control module (PCM)/engine control module (ECM) to the body control module (BCM). The BCM then applies voltage to the left and right backup lamps through the backup lamp supply voltage circuit.

Diagnostic Aids

The CHMSL/BKUP fuse supplies voltage to the BCM for the operation of the backup lamps and center high mount stop lamp (CHMSL). If both the CHMSL and backup lamps are inoperative, test the supply voltage circuit for an open/high resistance. If the CHMSL/BKUP fuse is found to be open, test the supply voltage circuit, the backup lamps control circuit, and the CHMSL control circuit for a short to ground.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

Ignition ON, place the transmission gear selector in the REVERSE position. The backup lamps should illuminate.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the right backup lamp.
2. Test for less than 10 ohm of resistance between the ground circuit terminal B and ground.
 - o If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit terminal A and ground.
4. Ignition ON, command the backup lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.

- If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. Ignition OFF, connect the harness connector at the right backup lamp. Disconnect the harness connector at the left backup lamp.
 6. Test for less than 10 ohm of resistance between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
 7. Connect a test lamp between the control circuit terminal A and ground.
 8. Ignition ON, command the backup lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance.
 9. If all circuits test normal, test or replace the applicable backup lamp bulb.

Repair Procedures

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

- **Backup Lamp Bulb Replacement**
- **Control Module References** for BCM replacement, setup, and programming

COURTESY LAMPS MALFUNCTION

Diagnostic Instructions

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

Circuit/System Description

When a courtesy lamp request is seen, ignition voltage is supplied to each of the courtesy lamps by the body control module (BCM) via the courtesy lamp supply voltage circuit. The courtesy lamp supply voltage circuit controls the following lamps:

- I/P Courtesy Lamp - Left and Right
- Dome/Reading Lamp - Left and Right
- Reading Lamps - Overhead Console

Reference Information

Schematic Reference

Interior Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

Ignition ON, verify the door ajar indicator is illuminated when each of the vehicle doors are open.

1. Verify the door ajar indicator is illuminated when each of the vehicle doors are open.
 - If opening any of the vehicle doors does not result in the door ajar indicator illuminating, refer to **Symptoms - Vehicle Access**.
2. Ignition ON, observe the scan tool Interior Light Switch parameter while cycling the dome lamp switch ON and OFF. The parameter should change between Off and On when changing between the commanded states.
 - If the parameter does not cycle between the specified value, refer to Dome Lamp Switch Circuit Malfunction in **Circuit/System Testing**.
3. Command the Interior Lamps ON and OFF with a scan tool. The courtesy lamps should turn ON and OFF when changing between the commanded states.
 - If the courtesy lamps do not turn ON and OFF, refer to Courtesy Lamp Circuit Malfunction in **Circuit/System Testing**.
4. With the driver door open, observe the courtesy lamps while cycling the dome lamp defeat switch ON and OFF. The courtesy lamps should turn ON and OFF when changing between the commanded states.
 - If the courtesy lamps do not turn ON and OFF, refer to Dome Lamp Defeat Switch Circuit Malfunction in **Circuit/System Testing**.

Circuit/System Testing

Dome Lamp Switch Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the headlamp switch.
2. Test for less than 10 ohms between the ground circuit terminal 17 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Interior Light Switch parameter is Off.
 - If not the specified value, test the signal circuit terminal 2 for a short to ground. If the circuit tests normal, replace the BCM.
4. Install a 3A fused jumper wire between the signal circuit terminal 2 and ground. Verify the scan tool Interior Light Switch parameter is On.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the headlamp switch.

Courtesy Lamp Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate courtesy lamp.
2. Test for less than 10 ohms between the ground circuit terminal B and ground:
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit terminal listed below and ground:
 - I/P Courtesy Lamp - Terminal A
 - Dome/Reading Lamp - Terminal C
 - Reading Lamps - Terminal C
4. Ignition ON, command the Interior Lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the appropriate courtesy lamp bulb.

Courtesy Lamp Circuit Malfunction

1. Driver door open, disconnect the harness connector at the headlamp switch. Verify the courtesy lamps are illuminated.
 - If the courtesy lamps are not illuminated, test the signal circuit terminal 4 for a short to ground. If the circuit tests normal, replace the BCM.
2. Install a 3A jumper wire between the signal circuit terminal 4 and ground. Verify the courtesy lamps are not illuminated.
 - If the courtesy lamps are illuminated, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
3. If all circuits test normal, test or replace the headlamp switch.

Repair Procedures

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

- **Headlamp Switch Replacement**
- **Door Courtesy Lamp and Reflector Replacement**
- **Instrument Panel Courtesy Lamp Bulb Replacement**
- **Overhead Console Courtesy Lamp Replacement (with Sunroof)** or **Overhead Console Courtesy Lamp Replacement (without Sunroof)**
- **Control Module References** for BCM replacement, setup, and programming

DAYTIME RUNNING LAMPS MALFUNCTION

Diagnostic Instructions

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

Circuit/System Description

The daytime running lamps (DRL) operate based on an input from the ambient light sensor. When the sensor indicates daylight conditions and the exterior lamps are not required to be on, the BCM will activate only the low

beam headlamps as the DRLs. The DRLs will operate with the ignition ON, the parking brake released, and the headlamp switch in the OFF or AUTO position.

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

1. Verify the headlamp switch is in the AUTO position and the park brake is released.
2. Ignition ON, verify DTC B2645 is not set.
 - If DTC B2645 is set, refer to **DTC B2645**.
3. Verify the scan tool BCM Park Lamp Switch parameter is Off.
 - If not the specified value, refer to **Park, License, and/or Tail Lamps Malfunction**.
4. Verify the following scan tool BCM parameters are Off.
 - Low Beam Switch
 - High Beam Switch
 - Flash to Pass Switch
 - If any of the parameters are not the specified value, refer to **Headlamps Malfunction**.
5. Verify the scan tool BCM Headlamp Off Switch parameter is Inactive.
 - If not the specified value, refer to **Headlamps Malfunction**.
6. Verify the scan tool BCM Park Brake Switch parameter is Released.
 - If not the specified value, refer to **Brake Warning Indicator Malfunction**.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the ambient light sensor (RPO C67) or sunload sensor assembly (RPO CJ2).
2. Ignition OFF, test for less than 5 ohms of resistance between the ground circuit terminal B (C67) or C (CJ2) and ground.

- If greater than the specified range, test the low reference circuit for an open/high resistance.
- 3. Ignition ON, verify the scan tool Ambient Light Sensor parameter is greater than 4.65 volts.
 - If less than the specified range, test the signal circuit terminal A (C67) or D (CJ2) for a short to ground. If the circuit tests normal, replace the BCM.
- 4. Install a 3A fused jumper wire between the signal circuit terminal A (C67) or D (CJ2) and the low reference circuit terminal ground. Verify the scan tool Ambient Light Sensor parameter is less than 0.2 volts.
 - If greater than the specified range, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
- 5. If all circuits test normal, test or replace the ambient light sensor (C67) or sunload sensor assembly (CJ2).

Repair Procedures

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

- **Daytime Running Lamp (DRL) Ambient Light Sensor Replacement**
- **Sun Load Sensor Replacement**
- **Control Module References** for BCM replacement, setup, and programming

FRONT FOG LAMPS MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamp Switch Signal	1	2	2	-
Fog Lamp Relay Control	2	1	1	-
Fog Lamp Control	2	2	1	-
Fog Lamp Ground	-	2	2	-
1. Fog Lamp(s) Always On 2. Fog Lamp(s) Inoperative				

Circuit/System Description

The vehicle fog lamps are controlled by the body control module (BCM) based on an input from the fog lamp switch. The fog lamp switch is a momentary switch integrated with the headlamp switch. When activated, the fog lamp switch provides a momentary ground to the BCM via the front fog lamp switch signal circuit, indicating the fog lamps are requested ON.

The BCM controls the fog lamps based on the inputs explained above. When a fog lamp request is received, the BCM grounds the fog lamp relay control circuit. This energizes the FOG LP relay. With the relay energized, B+ is applied to both fog lamps.

Reference Information

Schematic Reference

Fog Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

1. Ignition ON, observe the scan tool Front Fog Lamp Switch parameter while cycling the fog lamp switch between the On and Off positions. The parameter should cycle between On and Off.
 - If the parameter does not cycle between the specified values, refer to Fog Lamp Switch Circuit Malfunction in **Circuit/System Verification**.
2. Command the fog lamps ON and OFF with a scan tool. Verify the fog lamps turn ON and OFF when changing between the commanded states.
 - If the fog lamps do not cycle between the commanded states, refer to Fog Lamp Circuit Malfunction in **Circuit/System Verification**.

Circuit/System Testing

Fog Lamp Switch Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the headlamp switch.
2. Ignition OFF, test for less than 10 ohms of resistance between the ground circuit terminal 17 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Front Fog Lamp Switch parameter is Off.
 - If not the specified value, test the signal circuit terminal 7 for a short to ground. If the circuit tests normal, replace the BCM.
4. Install a 3A fused jumper wire between the signal circuit terminal 7 and the ground circuit terminal 17. Verify the scan tool Front Fog Lamp Switch parameter is On.
 - If not the specified value, test the signal circuit for a short to voltage or and open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the headlamp switch.

Fog Lamp Circuit Malfunction

1. Ignition OFF, disconnect the FOG LPS relay.
2. Ignition ON, verify a test lamp does not illuminate between the control circuit terminal A9 and ground.

- If the test lamp illuminates, test the control circuit for a short to voltage.
- 3. Verify a test lamp illuminates between the B+ circuit terminal C9 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal and the FOG LPS fuse is open, test the control circuit terminal A9 for a short to ground. If the circuit tests normal, test or replace the FOG LP relay.
- 4. Verify a test lamp illuminates between the B+ circuit terminal C10 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for an open/high resistance.
- 5. Disconnect the harness connector at the applicable fog lamp.
- 6. Test for less than 10 ohms of resistance between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
- 7. Connect the harness connector at the appropriate fog lamp.
- 8. Connect a 10A fused jumper wire between the B+ circuit terminal C10 and the control circuit terminal A9. Verify the fog lamps are activated.
 - If the fog lamps do not activate, test the control circuit for an open/high resistance. If the circuit tests normal, replace the applicable fog lamp bulb.
- 9. Connect a test lamp between the B+ circuit terminal C9 and the control circuit terminal A10.
- 10. Command the Fog Lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
- 11. If all circuits test normal, test or replace the appropriate FOG LPS relay.

Repair Procedures

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

- **Headlamp Switch Replacement**
- **Front Fog Lamp Bulb Replacement**
- **Control Module References** for BCM replacement, setup, and programming

HAZARD LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hazard Switch Signal	2	1	1	-
Driver Information Center Ground	-	1	1	-
1. Hazard Lamps Inoperative 2. Hazard Lamps Always On				

Circuit/System Description

The Body Control Module (BCM) controls the hazard lamps based an input from the hazard lamp switch. When the hazard lamp switch is depressed, a ground signal is provided to the BCM on the hazard switch signal circuit. This indicates to the BCM that the hazard lamps are requested. The BCM will then activate the hazards lamps by pulsing the turn signal lamp supply voltage circuits.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

1. Ignition ON, operate the left and right turn signals using the multifunction turn signal lever. Each of the turn signal lamps should pulse when commanded ON by the lever.
 - If the turn signal lamps do not function as specified, refer to **Turn Signal Lamps and/or Indicators Malfunction**.
2. Observe the scan tool Hazard Switch Signal parameter while cycling the hazard lamp switch ON and OFF. The parameter should change between On and Off.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the Driver Information Center (DIC).
2. Test for less than 10 ohms between the ground circuit terminal 4 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Hazard Switch Signal parameter is Off.
 - If not the specified value, test the signal circuit terminal 2 for a short to ground. If the circuit tests normal, replace the BCM.
4. Install a 3A fused jumper wire between the signal circuit terminal 2 and ground. Verify the scan tool Hazard Switch Signal parameter is On.
 - If not the specified value, test the signal circuit for a short to voltage or and open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the DIC.

Repair Procedures

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

- **Driver Information Display Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

HEADLAMPS MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
HDM B+	1	1	-	-
High Beam Relay Coil B+	2	2	-	-
High Beam Relay Switch B+	2	2	-	-
Headlamp Low Beam Control	1	1	3	-
Headlamp High Beam Control	2	4	4	-
Headlamp Low Beam Relay Control	3	1	1	-
Headlamp High Beam Relay Control	B2580	B2580	2	-
Exterior Lamps Off Input	1, 2	6	6	-
Headlamp Switch Headlamps On Signal	3, 4	7	7	-
Flash to Pass Switch Signal	4	8	8	-
Headlamp Dimmer Switch High Beam Signal	4	2	2	-
Low Beam Headlamp Ground	-	1	1	-
High Beam Headlamp Ground	-	2	2	-
Headlamp Switch Ground	-	6, 7	6, 7	-
Headlamp Dimmer Switch Ground	-	2	2	-
HDM Ground	-	1	1	-

1. Low Beam Headlamp(s) Inoperative
2. High Beam Headlamp(s) Inoperative
3. Low Beam Headlamp(s) Always On
4. High Beam Headlamp(s) Always On
5. Flash to Pass Inoperative
6. Headlamp Defeat Inoperative
7. Headlamps Inoperative From Headlamp Switch
8. Flash to Pass Inoperative

Circuit/System Description

The vehicle headlamps are controlled by the body control module (BCM) based on inputs from the headlamp switch and the headlamp dimmer switch. The headlamp switch has four positions: Off, Auto, Park, and Headlamps and is located in the turn signal/multifunction switch. The default headlamp switch position is Auto, in which the

BCM uses the ambient light sensor to determine when headlamps are needed. The Off portion of the headlamp switch is a momentary switch which overrides the automatic headlamps and will turn off the vehicle headlamps. When in the Off position, the headlamp switch grounds the exterior lamps off input circuit, prompting the BCM to turn off the headlamps. The Park position of the headlamp switch will only illuminate the vehicle parking lamps. The Headlamp position of the headlamp switch will illuminate both the parking lamps and the headlamps. With the headlamp switch in the Headlamp position, the headlamp switch headlamps on signal circuit is grounded, prompting the BCM to turn on the headlamps, regardless of other factors such as ambient light.

The headlamp high beams are controlled through the flash to pass switch and the headlamp dimmer switch, both located in the turn signal/multifunction switch. The flash to pass switch is a momentary type switch, designed to illuminate the high beams as long as the switch is held. With the switch closed, the flash to pass switch signal circuit is grounded, prompting the BCM to turn on the high beam lamps. The headlamp dimmer switch allows the operator to select between full time high or low beam operation. Unlike the flash to pass switch, it is not a momentary switch. When the headlamp dimmer switch is in the high beam position, the headlamp dimmer switch high beam signal circuit is grounded. This prompts the BCM to turn on the high beam lamps.

The BCM controls the headlamps based on the inputs explained above. When a low beam request is received, the BCM grounds the headlamp low beam relay control circuit. This energizes the headlamp driver module (HDM), a solid state relay. With the HDM energized, B+ is applied to both low beam headlamps through the LT LO BEAM and RT LO BEAM fuses, illuminating the low beam headlamps. When a high beam request is received, the BCM grounds the headlamp high beam relay control circuit. This energizes the coil in the HI BEAM relay, causing the relay switch to close. This then applies B+ to both high beam headlamps through the LT HI BEAM and RT HI BEAM fuses, illuminating the high beam headlamps.

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

1. Ignition ON, observe the scan tool Headlamp Off Switch parameter while cycling the headlamp switch between the Auto and Off positions. The parameter should cycle between Active and Inactive.
 - If the parameter does not cycle between the specified values, refer to Headlamp Switch Malfunction in

Circuit/System Testing.

2. Observe the scan tool Low Beam Switch parameter while cycling the headlamp switch between the Auto and Head position. The parameter should cycle between On and Off.
 - If the parameter does not cycle between the specified values, refer to Headlamp Switch Malfunction in **Circuit/System Testing.**
3. With the headlamps ON, observe the scan tool Flash to Pass Switch parameter while pulling and releasing the flash to pass switch. The parameter should cycle between Active and Inactive.
 - If the parameter does not cycle between the specified values, refer to Headlamp Dimmer Switch Malfunction in **Circuit/System Testing.**
4. With the headlamps ON, observe the scan tool High Beam Switch parameter while switching the headlamp dimmer switch between the low and high beam positions. The parameter should cycle between Active and Inactive.
 - If the parameter does not cycle between the specified values, refer to Headlamp Dimmer Switch Malfunction in **Circuit/System Testing.**
5. Command the Low Beam/DLR ON and OFF with a scan tool. Verify the low beam headlamps turn ON and OFF when changing between the commanded states.
 - If the low beam headlamps do not cycle between the commanded states, refer to Low Beam Headlamp Malfunction in **Circuit/System Testing.**
6. Command the High Beams ON and OFF with a scan tool. Verify the low beam headlamps turn ON and OFF when changing between the commanded states.
 - If the high beam headlamps do not cycle between the commanded states, refer to High Beam Headlamp Malfunction in **Circuit/System Testing.**

Circuit/System Testing**Headlamp Switch Malfunction**

1. Ignition OFF, disconnect the harness connector at the headlamp switch.
2. Ignition OFF, test for less than 5 ohms of resistance between the ground circuit terminal 17 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Headlamp Off Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 18 for a short to ground. If the circuit tests normal, replace the BCM.
4. Verify the scan tool Low Beam Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 5 for a short to ground. If the circuit tests normal, replace the BCM.
5. Install a 3A fused jumper wire between the signal circuit terminal 18 and ground. Verify the scan tool Headlamp Off Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or and open/high resistance. If the circuit tests normal, replace the BCM.
6. Install a 3A fused jumper wire between the signal circuit terminal 5 and ground. Verify the scan tool Low Beam Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or and open/high resistance. If the circuit tests normal, replace the BCM.
7. If all circuits test normal, test or replace the headlamp switch.

Headlamp Dimmer Switch Malfunction

1. Ignition OFF, disconnect the X1 harness connector at the multifunction turn signal lever.

2. Ignition OFF, test for less than 5 ohms of resistance between the ground circuit terminal D and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Flash to Pass Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal A for a short to ground. If the circuit tests normal, replace the BCM.
4. Verify the scan tool High Beam Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal E for a short to ground. If the circuit tests normal, replace the BCM.
5. Install a 3A fused jumper wire between the signal circuit terminal A and ground. Verify the scan tool Flash to Pass Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or and open/high resistance. If the circuit tests normal, replace the BCM.
6. Install a 3A fused jumper wire between the signal circuit terminal E and ground. Verify the scan tool High Beam Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or and open/high resistance. If the circuit tests normal, replace the BCM.
7. If all circuits test normal, test or replace the multifunction turn signal lever.

Low Beam Headlamp Malfunction

1. Ignition OFF, disconnect the HDM.
2. Ignition OFF, test for less than 1 ohm of resistance between the ground circuit terminal B11 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify a test lamp illuminates between the B+ circuit terminal A12 and ground.
 - If the test lamp does not illuminate, replace the underhood fuse block.
4. Install a test lamp between the B+ circuit terminal A12 and the control circuit terminal C12.
5. Command the Low Beam/DLR ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
6. Ignition OFF, connect the HDM. Disconnect the harness connector at the appropriate low beam headlamp bulb.
7. Ignition OFF, test for less than 5 ohm of resistance between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
8. Connect a test lamp between the control circuit terminal A and ground.
9. Ignition ON, command the Low Beam/DLR ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the HDM.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the HDM.
10. If all circuits test normal, test or replace the low beam headlamp bulb.

High Beam Headlamp Malfunction

1. Ignition OFF, disconnect the HI BEAM relay.
2. Ignition ON, verify a test lamp illuminates between the B+ circuit terminal G19 and ground.
 - o If the test lamp does not illuminate, replace the underhood fuse block.
3. Verify a test lamp illuminates between the B+ circuit terminal G20 and ground.
 - o If the test lamp does not illuminate, replace the underhood fuse block.
4. Install a test lamp between the B+ circuit terminal G19 and the control circuit terminal E20.
5. Command the High Beams ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - o If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the BCM.
 - o If the test lamp is always OFF, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
6. Ignition OFF, connect the HI BEAM relay. Disconnect the harness connector at the appropriate high beam headlamp bulb.
7. Ignition OFF, test for less than 5 ohm of resistance between the ground circuit terminal B and ground.
 - o If greater than the specified range, test the ground circuit for an open/high resistance.
8. Connect a test lamp between the control circuit terminal A and ground.
9. Ignition ON, command the High Beams ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - o If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the HI BEAM relay.
 - o If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the HI BEAM relay.
10. If all circuits test normal, test or replace the high beam headlamp bulb.

Repair Procedures

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

- **Headlamp Switch Replacement**
- **Turn Signal Multifunction Switch Replacement**
- **Headlamp Bulb Replacement**
- **Relay Replacement (Attached to Wire Harness)** or **Relay Replacement (Within an Electrical Center)**
- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, setup, and programming

INTERIOR BACKLIGHTING MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
I/P Dimming Voltage Reference	1	1	1	-

2008 Buick LaCrosse CXL

2008 ACCESSORIES & EQUIPMENT Lighting - LaCrosse

I/P Dimming Signal	2	2	1	-
Instrument Panel Lamp Supply Voltage	1	1	1	-
I/P Dimming Return	-	1	1	-
1. Interior Backlighting Does Not Dim 2. Interior Backing Inoperative				

Circuit/System Description

The body control module (BCM) supplies a voltage reference through the I/P dimming voltage reference circuit to the interior lamp dimmer switch, which is part of the interior lamp switch. When the dimmer switch is placed in a desired brightness position, reference voltage is applied through the dimmer switch rheostat and the I/P dimming signal circuit to the BCM. The BCM interprets this voltage signal, then applies a pulse width modulated (PWM) voltage through the instrument panel lamp supply voltage circuit to the lamps. At the same time the BCM sends a serial data message requesting the front door modules to illuminate the door switches.

Reference Information**Schematic Reference****Interior Lights Dimming Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Interior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References for Scan Tool Information****Circuit/System Verification**

1. Ignition ON, observe the I/P dimming lamps while commanding the Incandescent Dimming ON and OFF with a scan tool. The I/P dimming lamps should turn ON and OFF when changing between the commanded states.
 - If any of the lamps do not turn ON and OFF when commanded, refer to I/P Dimming Lamps Circuit Test in **Circuit/System Testing**.
2. Observe the I/P dimming lamps while operating the dimmer switch from high to low. The lamps should smoothly vary in brightness as the switch is rotated.
 - If the lamps do not smoothly vary in brightness as the switch is rotated, refer to Dimmer Switch Circuit Test in **Circuit/System Testing**.

Circuit/System Testing

I/P Dimming Lamps Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate component.
2. Test for less than 10 ohms between the ground circuit terminal listed below and ground:
 - Instrument Panel Cluster (IPC) - Terminal 1
 - Driver Information Center (DIC) - Terminal 4
 - PRNDL Lamp (Console Shift) - Terminal B
 - HVAC Control Module (CJ2) - X1 Terminal A6
 - HVAC Control Module (C67) - X1 Terminal B6
 - Radio - X1 Terminal B5
 - Headlamp Switch - Terminal 13
 - Driver Window Switch - X2 Terminal B
 - Driver Door Lock Switch - Terminal B
 - Passenger Window Switch - Terminal C
 - Passenger Door Lock Switch - Terminal B
 - Outside Rearview Mirror Switch - Terminal B
 - Right Steering Wheel Control (UK3) - Terminal 1
 - Left Steering Wheel Control (UK3) - Terminal 8
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the appropriate signal circuit terminal and ground:
 - Instrument Panel Cluster (IPC) - Terminal 13
 - Driver Information Center (DIC) - Terminal 1
 - PRNDL Lamp (Console Shift) - Terminal A
 - HVAC Control Module (CJ2) - X1 Terminal A5
 - HVAC Control Module (C67) - X1 Terminal B5
 - Radio - X1 Terminal B4
 - Headlamp Switch - Terminal 14
 - Driver Window Switch - X1 Terminal F
 - Driver Door Lock Switch - Terminal A
 - Passenger Window Switch - Terminal B
 - Passenger Door Lock Switch - Terminal A
 - Outside Rearview Mirror Switch - Terminal E
 - Right Steering Wheel Control (UK3) - Terminal 2
 - Left Steering Wheel Control (UK3) - Terminal 6
4. Ignition ON, command the Incandescent Dimming ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
 - If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the component.

Dimmer Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the headlamp switch.

2. Ignition OFF, test for less than 10 ohms between the low reference circuit terminal 1 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance.
3. Ignition ON, test for 9.8-10.2 volts between the 10-volt reference circuit terminal 10 and ground.
 - If greater than the specified range, test the 10-volt reference circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If less than the specified range, test the 10-volt reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
4. Verify the I/P dimming lamps are at their lowest intensity.
 - If the I/P dimming lamps are not at their lowest intensity, test the signal circuit terminal 9 for a short to voltage.
5. Install a 3A fused jumper wire between the signal circuit terminal 9 and the voltage reference circuit terminal 10. Verify the I/P dimming lamps are at their highest intensity.
 - If the I/P dimming lamps are not at their highest intensity, test the signal circuit for a short to ground or an open/high resistance.
6. If all circuits test normal, test or replace the headlamp switch.

Repair Procedures

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

- **Headlamp Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

PARK, LICENSE, AND/OR TAIL LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Lamp Relay Coil B+	1	1	-	-
Park Lamp Relay Switch B+	1	1	-	-
Park/License Lamp Control	1	1	2	-
Park Lamp Relay Control	B2580	B2580	1	-
Park Lamp Ground	-	1	1	-
License Lamp Ground	-	1	1	-
1. Park/License Lamp(s) Inoperative 2. Park/License Lamp(s) Always On				

Circuit/System Description

B+ is applied at all times to the park lamp relay. When the headlamp switch is placed in either the PARK or HEAD position, ground is applied through the park lamp switch on signal circuit to the body control module (BCM). The BCM then applies a ground to the park lamp relay control circuit. This energizes the relay and applies voltage through the park/license lamps.

Reference Information**Schematic Reference****Headlights/Daytime Running Lights (DRL) Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References for Scan Tool Information****Circuit/System Verification**

1. Ignition ON, observe the scan tool Park Lamp Switch parameter while cycling the headlamp switch between the PARK and OFF positions. The parameter should change between On and Off.
 - If the parameter does not change between the specified values, refer to Park Lamp Switch Circuit Malfunction in **Circuit/System Testing**.
2. Command the Parking Lamps ON and OFF with a scan tool. The park and license lamps should turn ON and OFF when changing between the commanded states.
 - If all the lamps are inoperative, refer to Park Lamp Relay Circuit Malfunction in **Circuit/System Testing**.
 - If one or more of the front park lamps are inoperative, refer to Front Park Lamp Circuit Malfunction in **Circuit/System Testing**.
 - If one or more of the rear park lamps are inoperative, refer to Rear Park Lamp Circuit Malfunction in **Circuit/System Testing**.
 - If one or more of the license lamps are inoperative, refer to License Lamp Circuit Malfunction in **Circuit/System Testing**.

Circuit/System Testing**Park Lamp Switch Circuit Malfunction**

1. Ignition OFF, disconnect the harness connector at the headlamp switch.
2. Test for less than 10 ohms of resistance between the ground circuit terminal 17 and ground.
 - If the test lamp does not illuminate, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Park Lamp Switch parameter is Off.
 - If not the specified value, test the signal circuit terminal 6 for a short to ground. If the circuit tests normal, replace the BCM.

4. Install a 3A fused jumper wire between the signal circuit terminal 6 and ground. Verify the scan tool Park Lamp Switch parameter is On.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the headlamp switch.

Park Lamp Relay Circuit Malfunction

1. Ignition OFF, disconnect the PRK/LAMP relay.
2. Ignition ON, verify a test lamp illuminates between the B+ circuit terminal N1 and ground.
 - If the test lamp does not illuminate, test the control circuit terminal N3 for a short to ground. If the circuit tests normal, test or replace the I/P fuse block.
3. Verify a test lamp illuminates between the B+ circuit terminal M1 and ground.
 - If the test lamp does not illuminate, test or replace the I/P fuse block.
4. Install a test lamp between the B+ circuit terminal M1 and the control circuit terminal M3.
5. Command the Parking Lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit terminal M3 for a short to ground. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the control circuit terminal M3 for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
6. Ignition OFF, connect the PRK/LAMP relay. Disconnect the harness connector at the left tail lamp.
7. Install a test lamp between the control circuit terminal A and ground.
8. Ignition ON, command the Parking Lamps ON with a scan tool. The test lamp should illuminate.
 - If the test lamp does not illuminate, test or replace the PRK/LAMP relay.
9. If all circuits test normal, test or replace the I/P fuse block.

Front Park Lamp Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the inoperative park lamp bulb.
2. Test for less than 10 ohms of resistance between the appropriate ground circuit terminal and ground:
 - Marker Lamp - Ground circuit terminal B
 - Park/Turn Signal Lamp - Ground circuit terminal C
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Install a test lamp between the appropriate control circuit terminal and ground:
 - Marker Lamp - Control circuit terminal A
 - Park/Turn Signal Lamp - Control circuit terminal B
4. Ignition ON, command the Parking Lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, test or replace the I/P fuse block.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the I/P fuse block.
5. If all circuits test normal, test or replace the appropriate park lamp bulb.

Rear Park Lamp Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the inoperative park lamp bulb.

2. Test for less than 10 ohms of resistance between the appropriate ground circuit terminal and ground:
 - Marker Lamp - Ground circuit terminal B
 - Tail/Stop and Turn Signal Lamp - Ground circuit terminal G
 - Tail Lamp Upper or Lower - Ground circuit terminal B
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Install a test lamp between the appropriate control circuit terminal and ground:
 - Marker Lamp - Control circuit terminal A
 - Tail/Stop and Turn Signal Lamp - Control circuit terminal B
 - Tail Lamp Upper or Lower - Control circuit terminal A
4. Ignition ON, command the Parking Lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, test or replace the I/P fuse block.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the I/P fuse block.
5. If all circuits test normal, test or replace the appropriate park lamp bulb.

License Lamp Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the inoperative license lamp bulb.
2. Test for less than 10 ohms of resistance between the ground circuit terminal B and ground:
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Install a test lamp between the control circuit terminal A and ground:
4. Ignition ON, command the Parking Lamps ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, test or replace the I/P fuse block.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the I/P fuse block.
5. If all circuits test normal, test or replace the appropriate license lamp bulb.

Repair Procedures

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

- **Headlamp Switch Replacement**
- **Front Side Marker Lamp Bulb Replacement**
- **Rear Side Marker Lamp Bulb Replacement**
- **Park/Turn Signal Lamp Bulb Replacement**
- **Rear License Lamp Replacement**
- **Tail Lamp Bulb Replacement**
- **Instrument Panel Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, setup, and programming

READING LAMPS MALFUNCTION

Diagnostic Instructions

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

Circuit/System Description

The reading lamps are made up of the overhead console reading lamp, the dome/reading lamps (left and right) (DH6), and the lamps located in the rearview mirror (UE1). The overhead console reading lamp and the dome/reading lamps (left and right) lamps also function as courtesy lamps. Ignition voltage is supplied at all times to the reading lamp switch by the BCM via the inadvertent power courtesy lamp circuit. When the reading lamp switch is pressed, the switch is closed and voltage is supplied to the lamp, illuminating the reading lamp bulb. The reading lamp switch is part of the reading lamp assembly.

Reference Information

Schematic Reference

Interior Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

1. Ignition ON, press each overhead console reading lamp switch. The appropriate reading lamp should illuminate.
 - If the lamp does not illuminate, refer to Overhead Console Reading Lamp Circuit Malfunction in **Circuit/System Testing**.
2. Press each dome/reading lamp switch. The appropriate dome/reading lamp should illuminate.
 - If the lamp does not illuminate, refer to Dome/Reading Lamp Circuit Malfunction in **Circuit/System Testing**.
3. Press each rearview mirror reading lamp switch. The appropriate reading lamp should illuminate.
 - If the lamp does not illuminate, refer to Rearview Mirror Reading Lamp Circuit Malfunction in **Circuit/System Testing**.

Circuit/System Testing

Overhead Console Reading Lamp Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the overhead console reading lamp.
2. Test for less than 10 ohms of resistance between the ground circuit terminal B and ground.
 - o If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify a test lamp illuminates between the control circuit terminal A and ground.
 - o If the test lamp does not illuminate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
4. If all circuits test normal, replace the overhead console reading lamp bulb. If replacing the bulb does not correct the concern, test or replace the overhead console reading lamp.

Dome/Reading Lamp Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate dome/reading lamp.
2. Test for less than 10 ohms of resistance between the ground circuit terminal B and ground.
 - o If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify a test lamp illuminates between the control circuit terminal A and ground.
 - o If the test lamp does not illuminate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
4. If all circuits test normal, replace the dome/reading lamp bulb. If replacing the bulb does not correct the concern, test or replace the dome/reading lamp.

Rearview Mirror Reading Lamp Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the inside rearview mirror.
2. Test for less than 10 ohms of resistance between the ground circuit terminal 8 and ground.
 - o If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify a test lamp illuminates between the control circuit terminal A and ground.
 - o If the test lamp does not illuminate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
4. If all circuits test normal, replace the inside rearview mirror bulb. If replacing the bulb does not correct the concern, test or replace the inside rearview mirror.

Repair Procedures

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

- **Overhead Console Courtesy Lamp Replacement (with Sunroof)** or **Overhead Console Courtesy Lamp Replacement (without Sunroof)**
- **Roof Rail Rear Courtesy Lamp Replacement**
- **Rearview Mirror Lamp Replacement**
- **Control Module References** for BCM replacement, setup, and programming

REAR COMPARTMENT LAMP MALFUNCTION

Diagnostic Instructions

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

Circuit/System Description

The rear compartment lamp is supplied voltage from the BCM via the inadvertent power courtesy lamp circuit. When the rear compartment lid is open, the rear compartment courtesy lamp switch is closed, providing a ground path for the rear compartment courtesy lamp and illuminating the lamp.

Reference Information**Schematic Reference****Interior Lights Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Interior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References** for Scan Tool Information**Circuit/System Verification**

Ignition ON, open the rear compartment lid. The rear compartment courtesy lamp should illuminate.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the rear compartment courtesy lamp.
2. Ignition ON, verify a test lamp illuminates between the control circuit terminal A and ground.
 - If the test lamp does not illuminate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
3. Ignition OFF, connect the harness connector at the rear compartment courtesy lamp. Disconnect the harness connector at the rear compartment lid latch.
4. Test for less than 10 ohms of resistance between the ground circuit terminal 3 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
5. Ignition ON, verify the rear compartment courtesy lamp is not illuminated.
 - If the rear compartment courtesy lamp is illuminated, test the control circuit terminal 1 for a short to ground.
6. Install a 5A fused jumper wire between the control circuit terminal 1 and ground. Verify the rear compartment courtesy lamp is illuminated.
 - If the rear compartment courtesy lamp does not illuminate, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, test or replace the rear compartment courtesy lamp bulb.

7. If all circuits test normal, test or replace the rear compartment lid latch.

Repair Procedures

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

- **Rear Compartment Courtesy Lamp Replacement**
- **Rear Compartment Lid Ajar Indicator Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

STOP LAMPS MALFUNCTION

Diagnostic Instructions

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

Circuit/System Description

The BCM controls the stop lamps based on the input from the Brake Pedal Position Sensor (BPPS). When the BCM detects the brake pedal is depressed, B+ is applied to the stop lamp switch signal circuit and both stop/turn lamp supply voltage circuits, illuminating the center high mount stop lamp (CHMSL) and both stop lamps.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

1. Ignition ON, verify DTC C0277, C0278, C0283, or C0870 is not set.
 - o If any of the DTCs are set, refer to **Diagnostic Trouble Code (DTC) List - Vehicle**.
2. With the brake pedal depressed, verify the stop lamps and CHMSL are illuminated.

- If the CHMSL does not illuminate, refer to CHMSL Circuit Malfunction in **Circuit/System Testing**.
- If one or more of the stop lamps do not illuminate, refer to Stop Lamp Circuit Malfunction in **Circuit/System Testing**.

Circuit/System Testing**CHMSL Circuit Malfunction**

1. Ignition OFF, disconnect the harness connector at the CHMSL.
2. Test for less than 10 ohms of resistance between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Install a test lamp between the signal circuit terminal A and ground.
4. Ignition ON, verify the test lamp turns ON and OFF when pressing and releasing the brake pedal.
 - If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the CHMSL.

Stop Lamp Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate stop lamp bulb.
2. Test for less than 10 ohms of resistance between the ground circuit terminal G and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Install a test lamp between the control circuit terminal A and ground.
4. Ignition ON, verify the test lamp turns ON and OFF when pressing and releasing the brake pedal.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the appropriate stop lamp bulb.

Repair Procedures

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

- **High Mount Stop Lamp Replacement**
- **License Lamp Bulb Replacement**
- **Control Module References** for BCM replacement, setup, and programming

TURN SIGNAL LAMPS AND/OR INDICATORS MALFUNCTION**Diagnostic Instructions**

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

Diagnostic Fault Information

2008 Buick LaCrosse CXL

2008 ACCESSORIES & EQUIPMENT Lighting - LaCrosse

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Turn Signal Switch Signal	1, 3	1, 3	1, 3	-
Right Turn Signal Switch Signal	2, 4	2, 4	2, 4	-
Left Front Turn Signal Lamp Supply Voltage	B3948	B3948	B3948	-
LF Park/Turn Signal Lamp Ground	1	1	1	-
Right Front Turn Signal Lamp Supply Voltage	B3949	B3949	B3949	-
RF Park/Turn Signal Lamp Ground	2	2	2	-
Left Rear Stop/Turn Signal Lamp Supply Voltage	B3950	B3950	B3950	-
Left Tail/Stop and Turn Signal Lamp Ground	3	3	3	-
Right Rear Stop/Turn Signal Lamp Supply Voltage	B3951	B3951	B3951	-
Left Tail/Stop and Turn Signal Lamp Ground	4	4	4	-
Turn Signal/Multifunction Switch Ground	-	1, 2, 3, 4	1, 2, 3, 4	-
1. Left Front Park/Turn Signal Inoperative 2. Right Front Park/Turn Signal Inoperative 3. Left Rear Stop/Turn Signal Inoperative 4. Right Rear Stop/Turn Signal Inoperative				

Circuit/System Description

The Body Control Module (BCM) controls the turn signals based on an input from the turn signal switch, part of the multifunction turn signal lever. The BCM receives an input from one of two signal circuits to determine which turn signal function is requested. When the turn signal lever is placed in the LEFT position, the left turn signal switch signal circuit is grounded indicating that left turn signal operation is requested. When the turn signal lever is placed in the RIGHT position, the right turn signal switch signal circuit is grounded indicating that right turn signal operation is requested.

When a turn signal input is received from the turn signal switch, the BCM will activate the appropriate turn signals. The BCM pulses voltage to the applicable turn signals via the turn signal lamp supply voltage circuits, illuminating the required turn signal lamps.

Reference Information**Schematic Reference****Exterior Lights Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Exterior Lighting Systems Description and Operation****Electrical Information Reference**

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

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Verification

1. Ignition ON, observe the scan tool BCM Left Turn Signal parameter while turning the left turn signal ON and OFF with the turn signal multifunction lever. The parameter should change between On and Off.
 - If the parameter does not change between the specified values, refer to Turn Signal Switch Circuit Malfunction in **Circuit/System Testing**.
2. Ignition ON, observe the scan tool BCM Right Turn Signal parameter while turning the right turn signal ON and OFF with the turn signal multifunction lever. The parameter should change between On and Off.
 - If the parameter does not change between the specified values, refer to Turn Signal Switch Circuit Malfunction in **Circuit/System Testing**.
3. Command the appropriate turn signal lamp ON and OFF with a scan tool. The appropriate turn signal lamp should turn ON and OFF when changing between the commanded states.
 - If the appropriate turn signal lamp does not cycle between the commanded states, refer to Turn Signal Circuit Malfunction in **Circuit/System Testing**.

Circuit/System Testing

Turn Signal Switch Circuit Malfunction

1. Ignition OFF, disconnect the X2 harness connector at the turn signal multifunction lever.
2. Test for less than 5 ohms between the ground circuit terminal G and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool BCM Left Turn Signal parameter is Off.
 - If not the specified value, test the signal circuit terminal F for a short to ground. If the circuit tests normal, replace the BCM.
4. Verify the scan tool BCM Right Turn Signal parameter is Off.
 - If not the specified value, test the signal circuit terminal H for a short to ground. If the circuit tests normal, replace the BCM.
5. Install a 3A fused jumper wire between the signal circuit terminal F and the ground circuit terminal A. Verify the scan tool BCM Left Turn Signal parameter is On.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
6. Install a 3A fused jumper wire between the signal circuit terminal H and the ground circuit terminal A. Verify the scan tool BCM Right Turn Signal parameter is On.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
7. If all circuits test normal, test or replace the turn signal multifunction lever.

Turn Signal Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate turn signal lamp bulb.

2. Test for less than 10 ohms between the ground circuit terminal C (Front) or G (Rear) and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Install a test lamp between the signal circuit terminal A and ground.
4. Ignition ON, command the appropriate turn signal lamp ON and OFF with a scan tool. The appropriate turn signal lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, replace the BCM.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the appropriate turn signal lamp bulb.

Repair Procedures

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

- **Turn Signal Multifunction Switch Replacement**
- **Park/Turn Signal Lamp Bulb Replacement**
- **Rear Turn Signal Lamp Bulb Replacement**
- **Control Module References** for BCM replacement, setup, and programming

VANITY MIRROR LAMP MALFUNCTION

Diagnostic Instructions

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

Circuit/System Description

The vanity mirror lamps are supplied voltage from the BCM via the inadvertent power courtesy lamp circuit. When the mirror cover is open, the mirror cover switch is closed, providing a ground path for the vanity mirror lamps and illuminating the lamp.

Reference Information

Schematic Reference

Interior Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Interior Lighting Systems Description and Operation

Electrical Information Reference

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

- **Wiring Repairs**

Scan Tool Reference**Control Module References** for Scan Tool Information**Circuit/System Verification**

Ignition ON, lower the sunshade and open the vanity mirror cover. The vanity mirror lamps should illuminate.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate sunshade.
2. Test for less than 10 ohms of resistance between the ground circuit terminal B and ground.
 - o If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify a test lamp illuminates between the control circuit terminal A and ground.
 - o If the test lamp does not illuminate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
4. If all circuits test normal, test or replace the appropriate vanity mirror lamp bulb.

Repair Procedures

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

- **Vanity Mirror Lamp Replacement**
- **Control Module References** for BCM replacement, setup, and programming

REPAIR INSTRUCTIONS**BRAKE PEDAL POSITION SENSOR CALIBRATION****Calibration Criteria**

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 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 the class 2 communication bus.

Calibration Procedure

1. Turn ON the ignition, with the engine OFF.
2. Install a scan tool, select the proper vehicle and options.
3. Select the BPP sensor calibration procedure from the BCM and follow the directions displayed on the screen.

BRAKE PEDAL POSITION SENSOR REPLACEMENT**Removal Procedure**

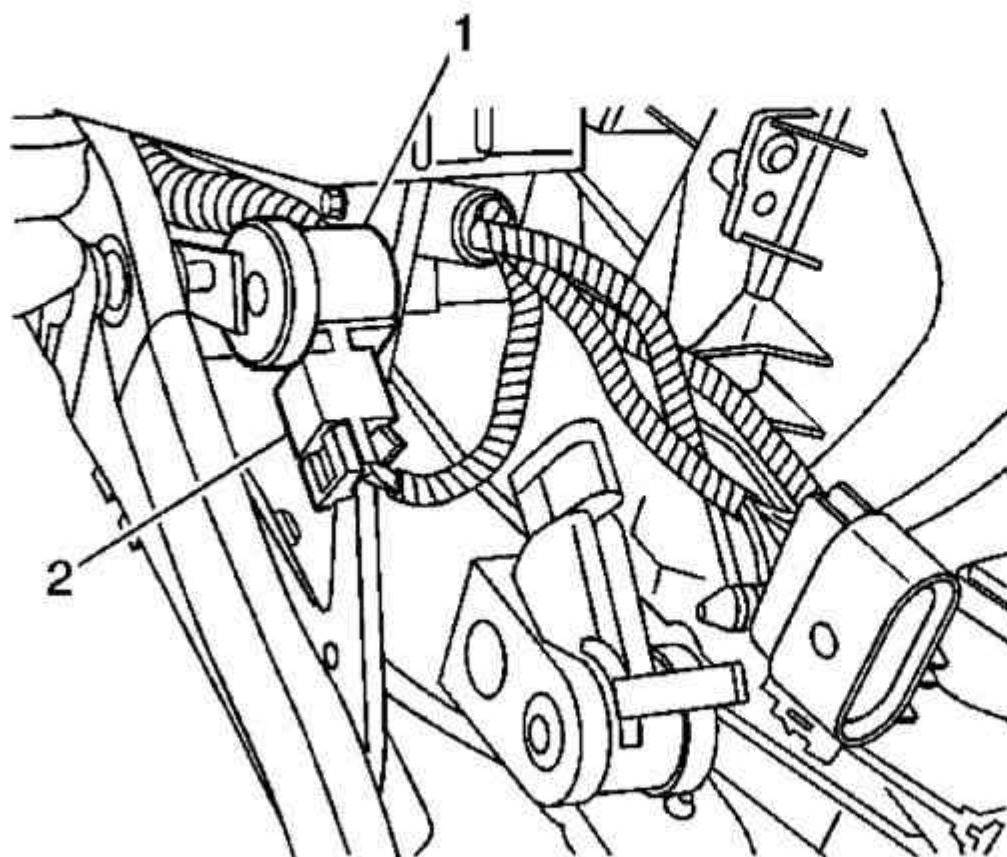


Fig. 12: View Of CPA Electrical Connector
Courtesy of GENERAL MOTORS CORP.

1. Remove the instrument panel (I/P) insulator. Refer to **Instrument Panel Insulator Panel Replacement - Left Side**.
2. Disengage but do not remove the connector position assurance (CPA) on the connector.

Disconnect the electrical connector (2).

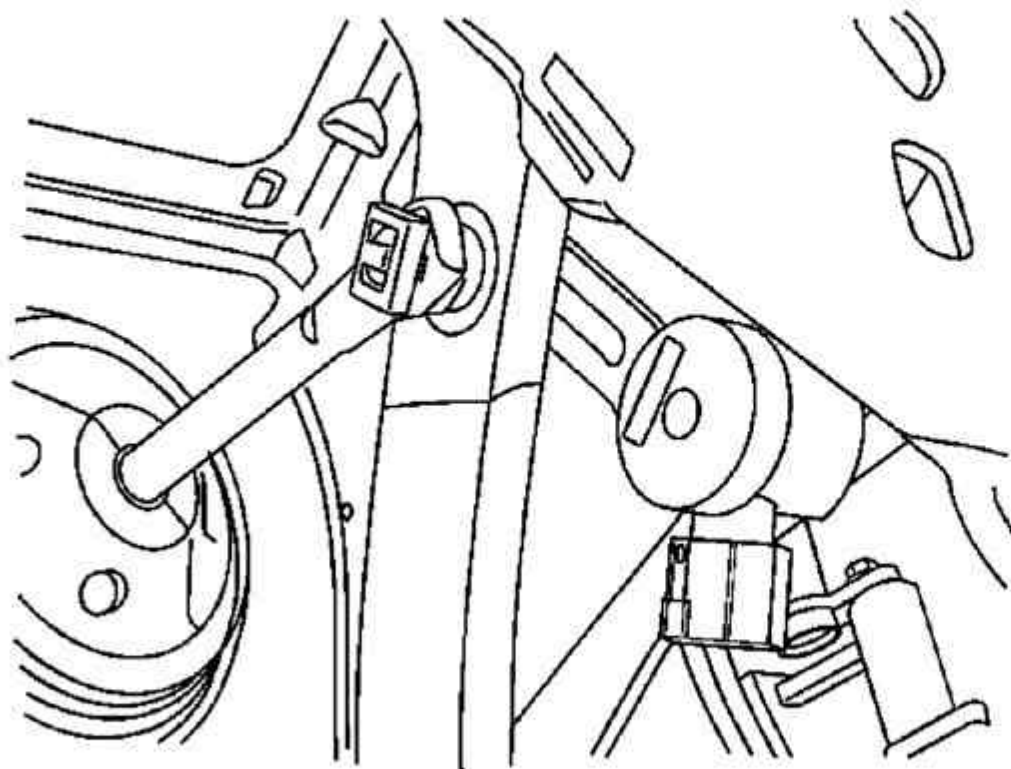


Fig. 13: Identifying Brake Pedal Position Sensor Screw
Courtesy of GENERAL MOTORS CORP.

3. Remove the bolt and discard.
4. Remove the brake pedal position sensor. Discard the sensor.

Installation Procedure

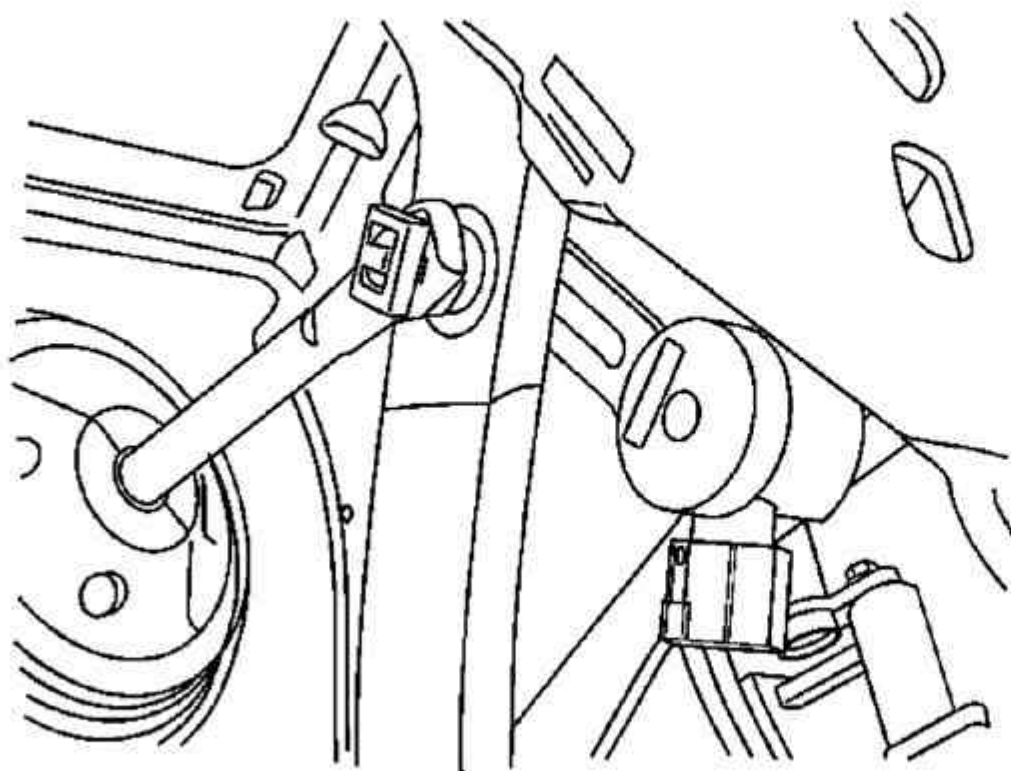


Fig. 14: Identifying Brake Pedal Position Sensor Screw
Courtesy of GENERAL MOTORS CORP.

1. Apply adhesive GM P/N 12345493 (Canadian P/N 10953488) to the screw.
2. Position the NEW sensors fork to the pin.
3. Rotate the sensor in order to align the sensor locator to the hole in the extension bracket.

NOTE: Refer to Fastener Notice .

4. Install a NEW brake pedal position sensor bolt.

Tighten: Tighten the bolt to 2.0 N.m (18 lb in).

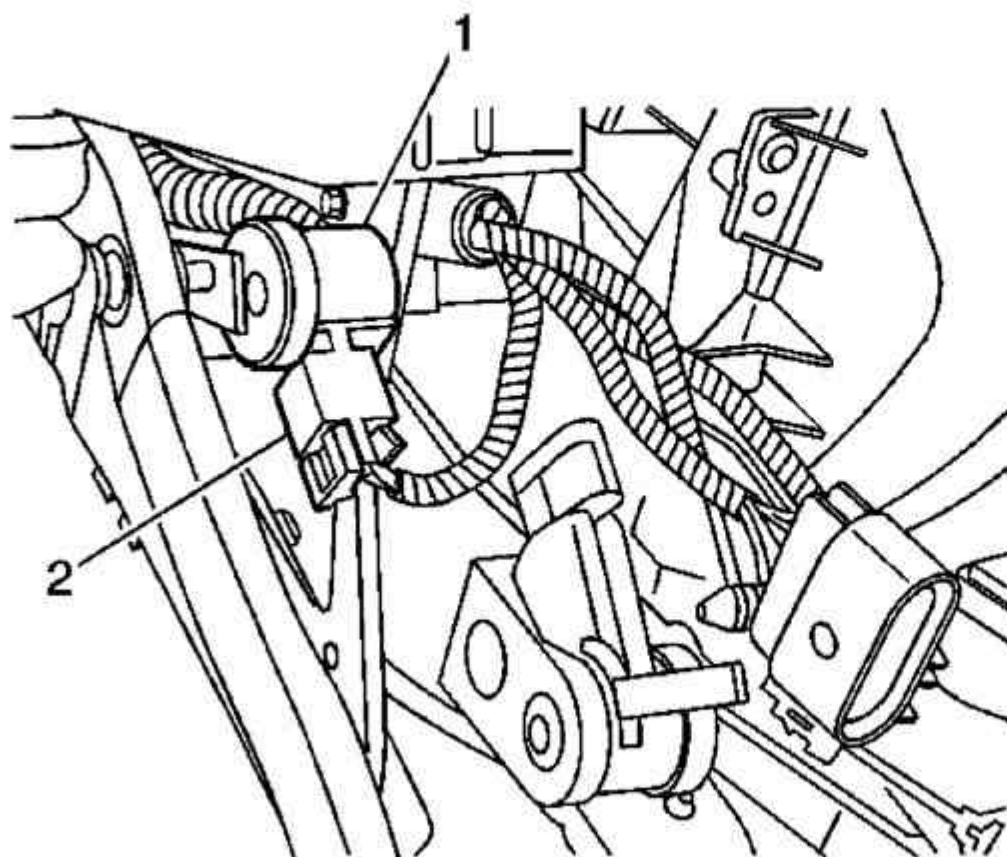


Fig. 15: View Of CPA Electrical Connector
Courtesy of GENERAL MOTORS CORP.

5. Connect the electrical connector (2).

Engage the CPA. The CPA will not engage if the connector is not attached properly.

6. Calibrate the sensor. Refer to **Brake Pedal Position Sensor Calibration**.
7. Install the I/P insulator. Refer to **Instrument Panel Insulator Panel Replacement - Left Side**.

HEADLAMP SWITCH REPLACEMENT

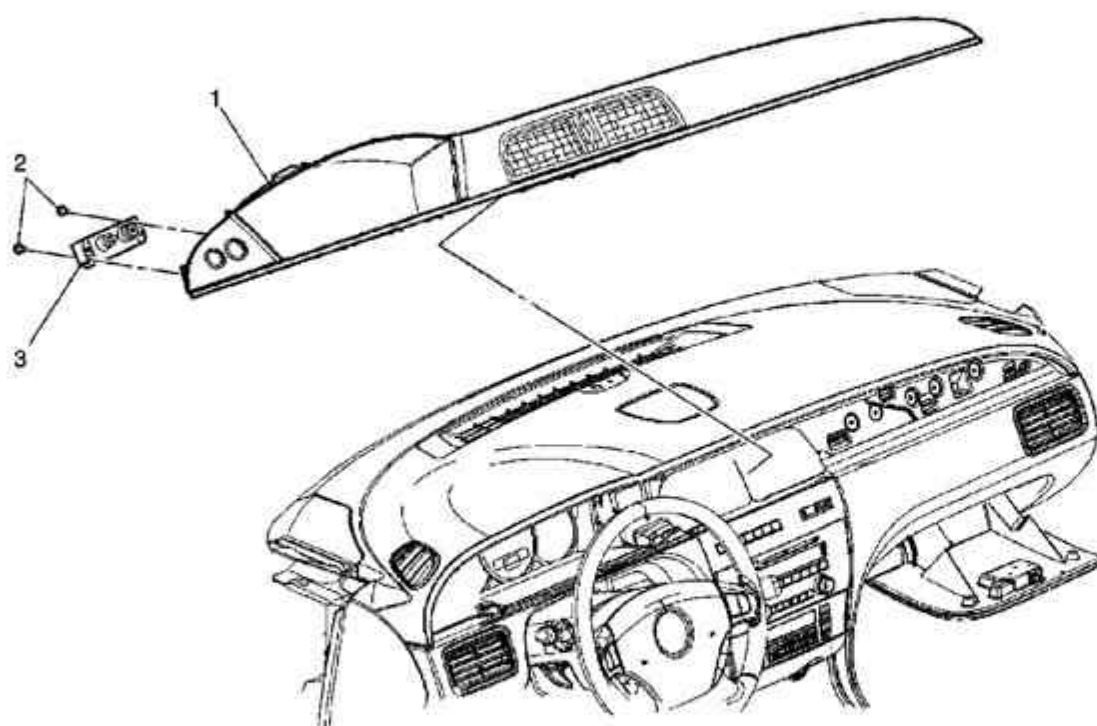


Fig. 16: Locating Headlamp Switch

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Instrument Panel Cluster Trim Plate Refer to Instrument Panel Cluster Trim Plate Bezel Replacement .
2	Instrument Panel Cluster Trim Plate Screw (Qty: 2) NOTE: Refer to Fastener Notice . Tighten: 2 N.m (18 lb in)
3	Fog Lamp and Headlamp Switch Assembly

DAYTIME RUNNING LAMP (DRL) AMBIENT LIGHT SENSOR REPLACEMENT

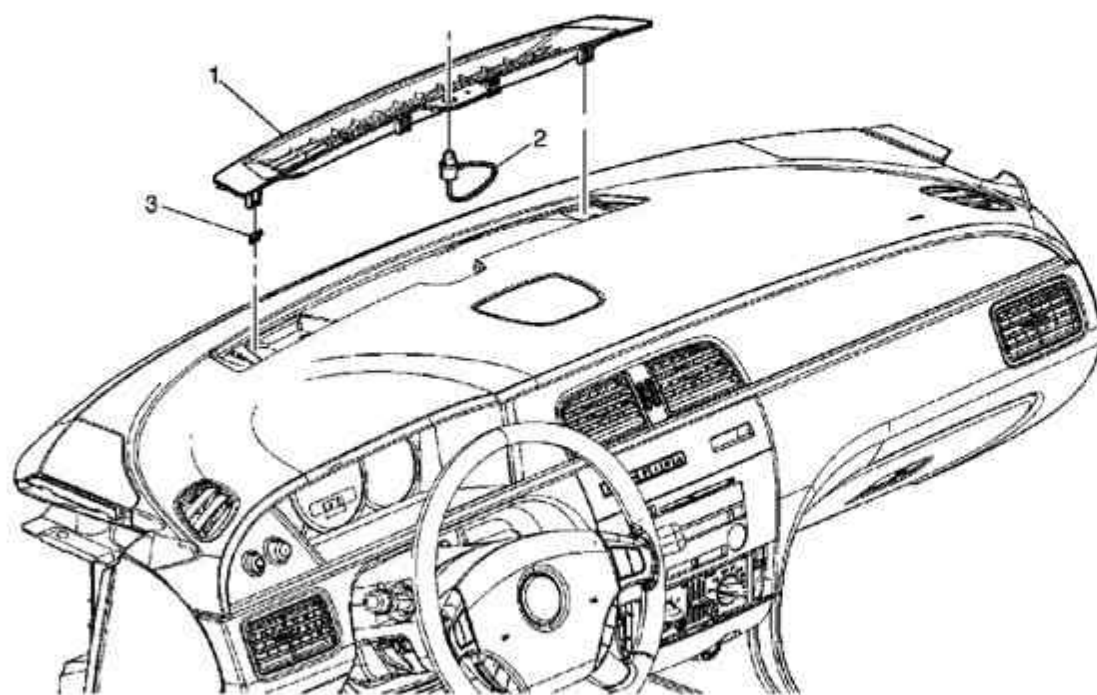


Fig. 17: Identifying Daytime Running Lamps (DRL) Ambient Light Sensor
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Fastener Tightening Specifications: Refer to Fastener Tightening Specifications .	
1	Grille, Windshield Defroster
2	Sensor, Daytime Running Light Tip: Disconnect electrical connector.
3	Clip, Windshield Defroster Grille

DOOR COURTESY LAMP AND REFLECTOR REPLACEMENT

Removal Procedure

1. Remove the front door trim panel enough to access the courtesy lamp. Refer to **Front Side Door Trim Panel Replacement**.

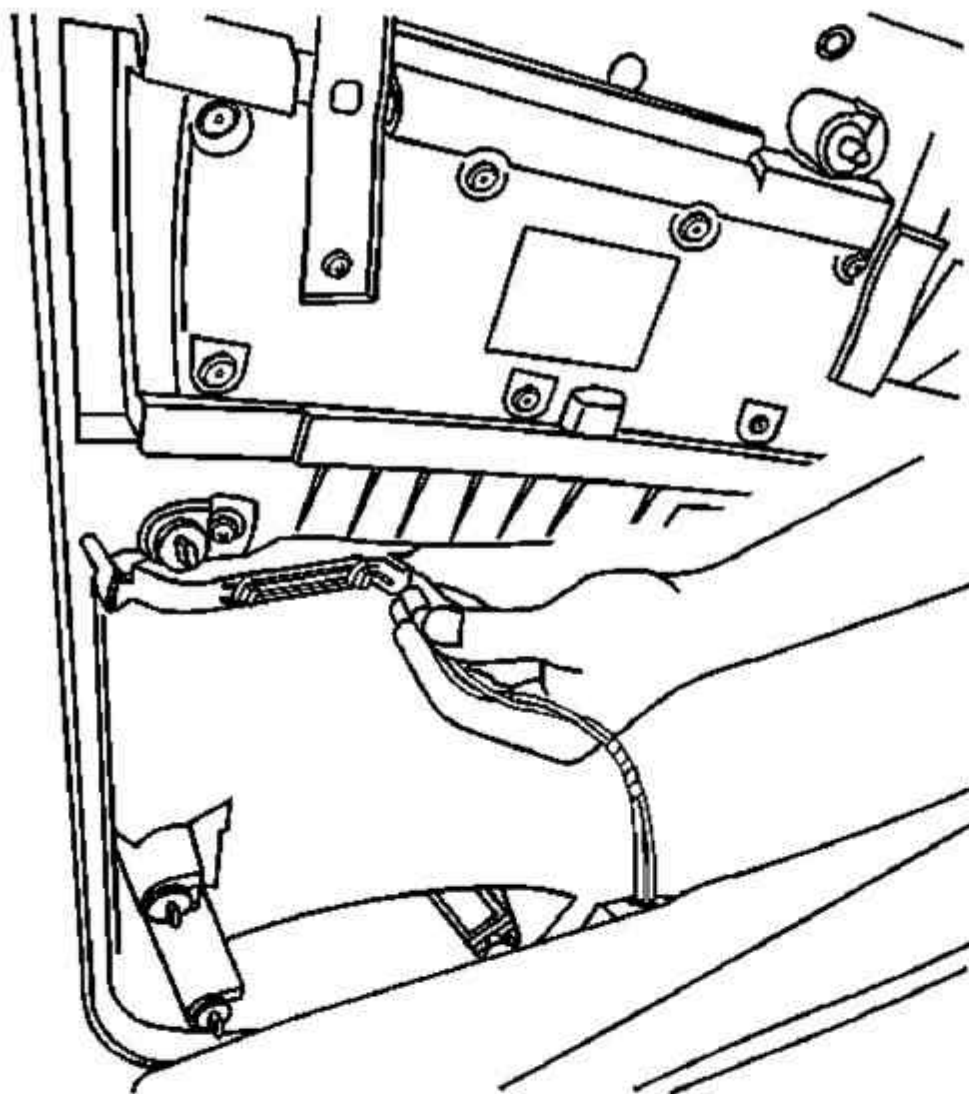


Fig. 18: Identifying Courtesy Lamp Electrical Connector
 Courtesy of GENERAL MOTORS CORP.

2. Disconnect the electrical connector from the courtesy lamp.

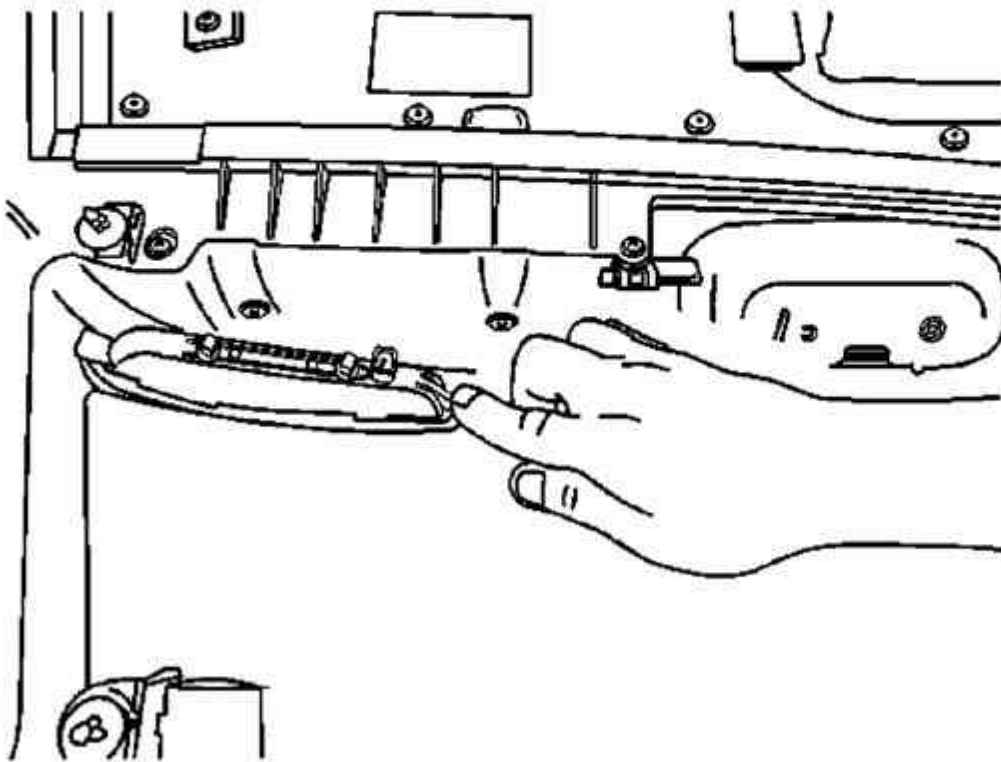


Fig. 19: Depressing Forward Retainer
Courtesy of GENERAL MOTORS CORP.

3. Release the courtesy lamp by depressing the forward retainer.

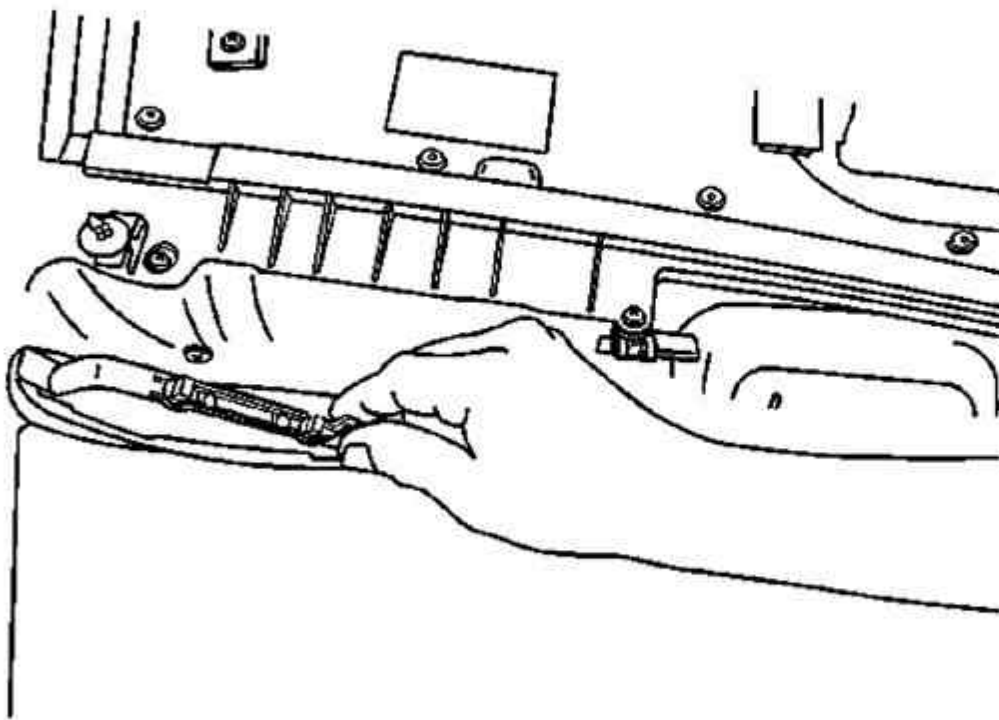


Fig. 20: Identifying Courtesy Lamp
Courtesy of GENERAL MOTORS CORP.

4. Remove the courtesy lamp out of the front door trim panel, by pressing outward on the courtesy lamp and pulling out from the front of the door trim panel.

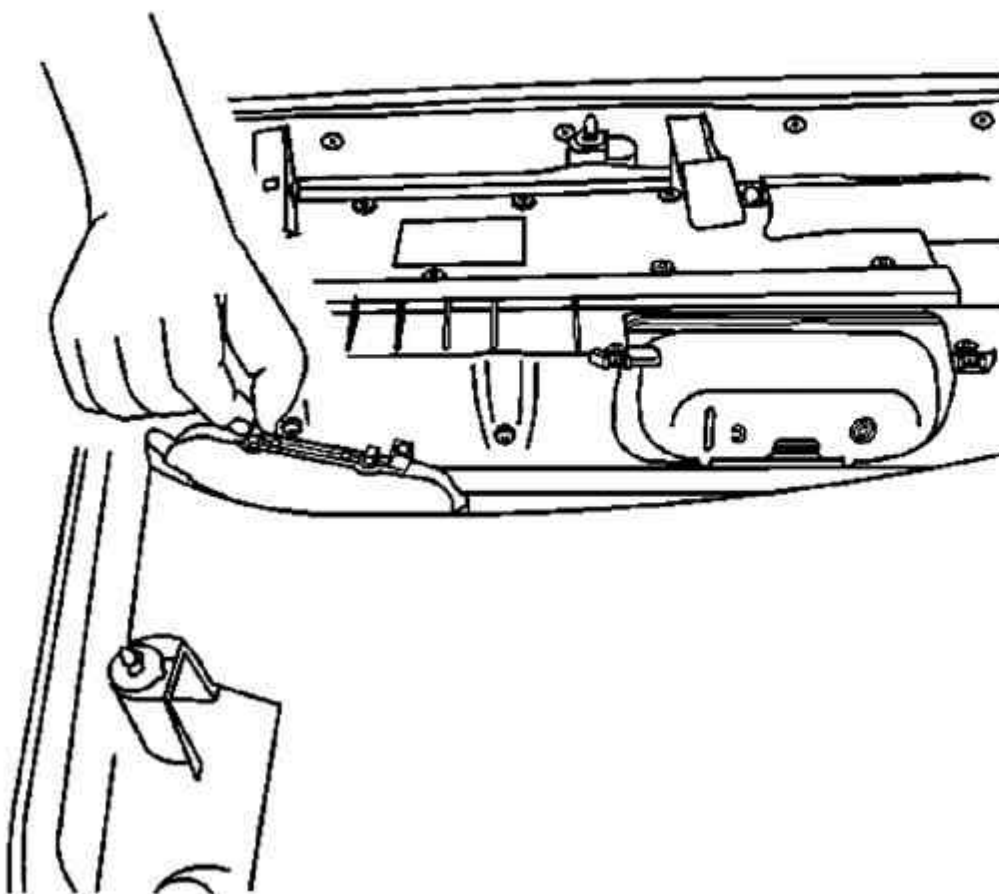


Fig. 21: Identifying Lamp Socket & Courtesy Lamp Housing
Courtesy of GENERAL MOTORS CORP.

5. Rotate the lamp socket counterclockwise to release the socket from the lamp housing, then remove the socket.

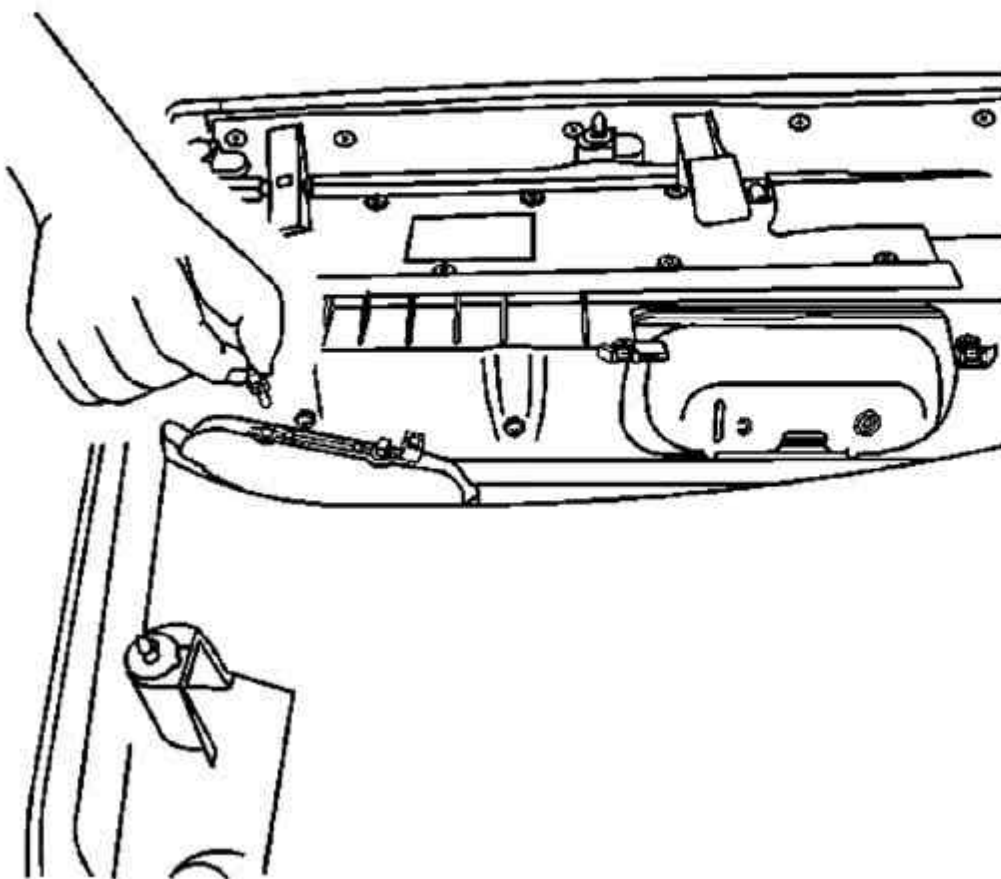


Fig. 22: Identifying Courtesy Lamp Bulb & Socket
Courtesy of GENERAL MOTORS CORP.

6. Remove the bulb from the socket.

Installation Procedure

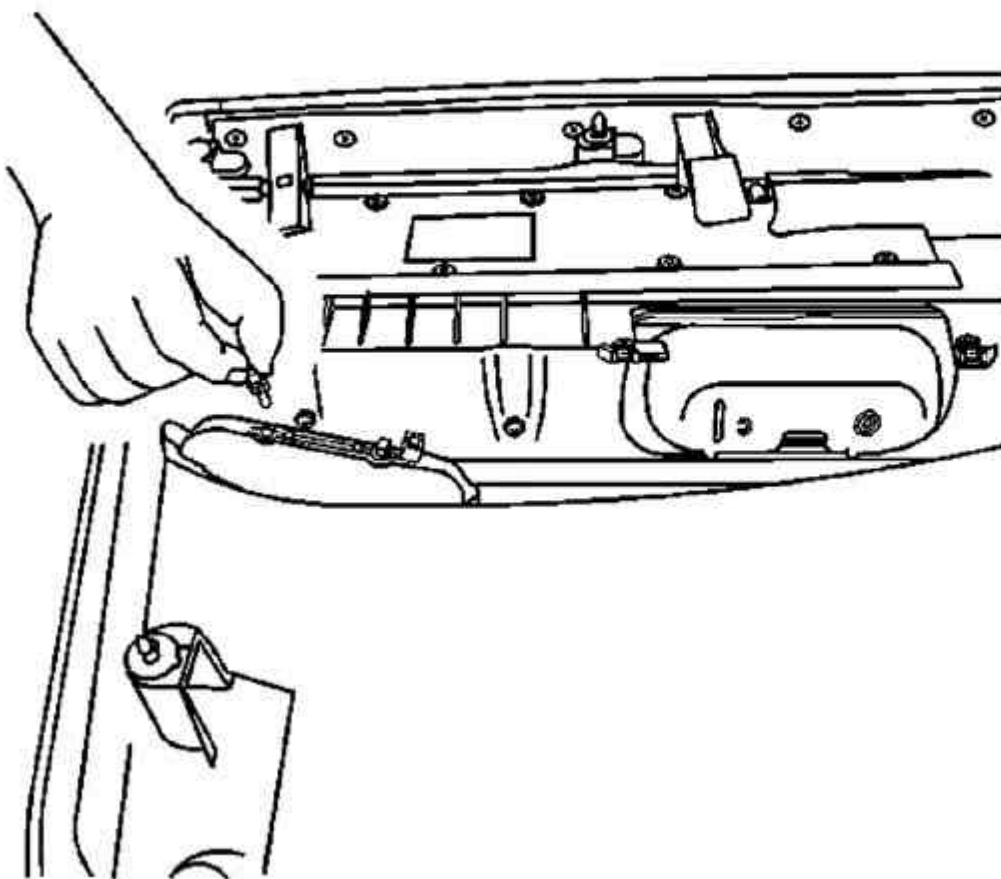


Fig. 23: Identifying Courtesy Lamp Bulb & Socket
Courtesy of GENERAL MOTORS CORP.

1. Install the bulb to the door courtesy lamp socket.

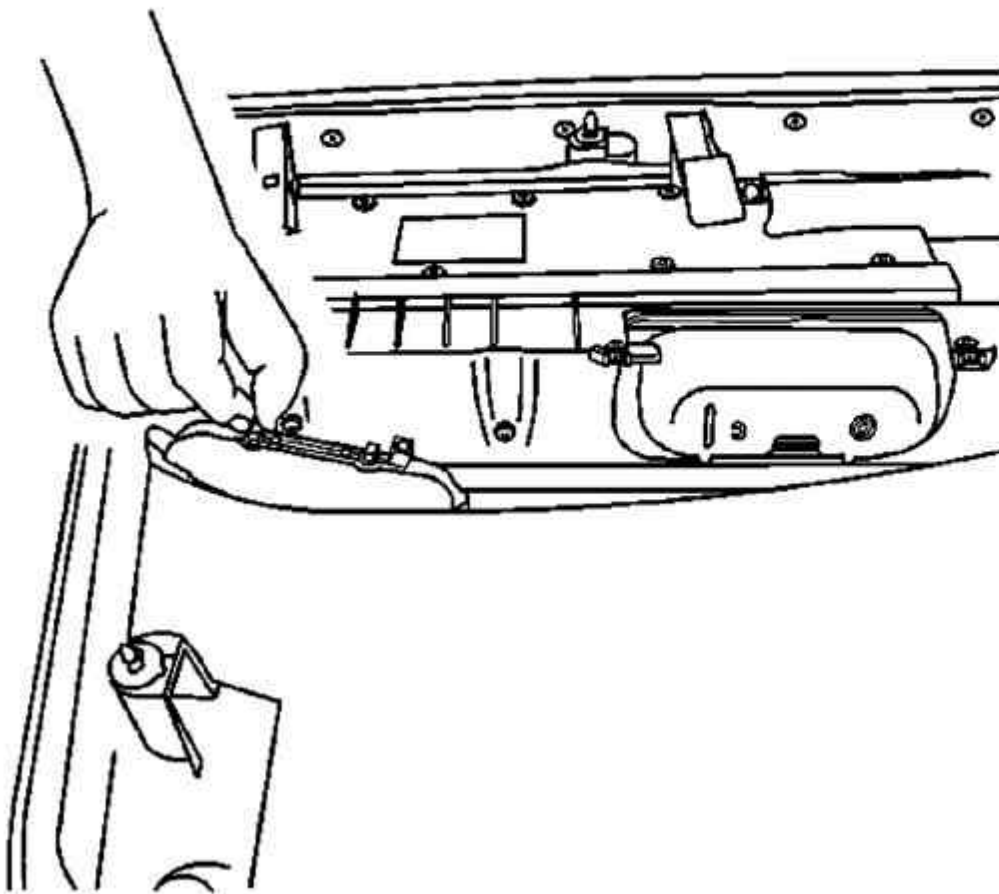


Fig. 24: Identifying Lamp Socket & Courtesy Lamp Housing
Courtesy of GENERAL MOTORS CORP.

2. Install the lamp socket to the courtesy lamp housing, then rotate the socket clockwise.

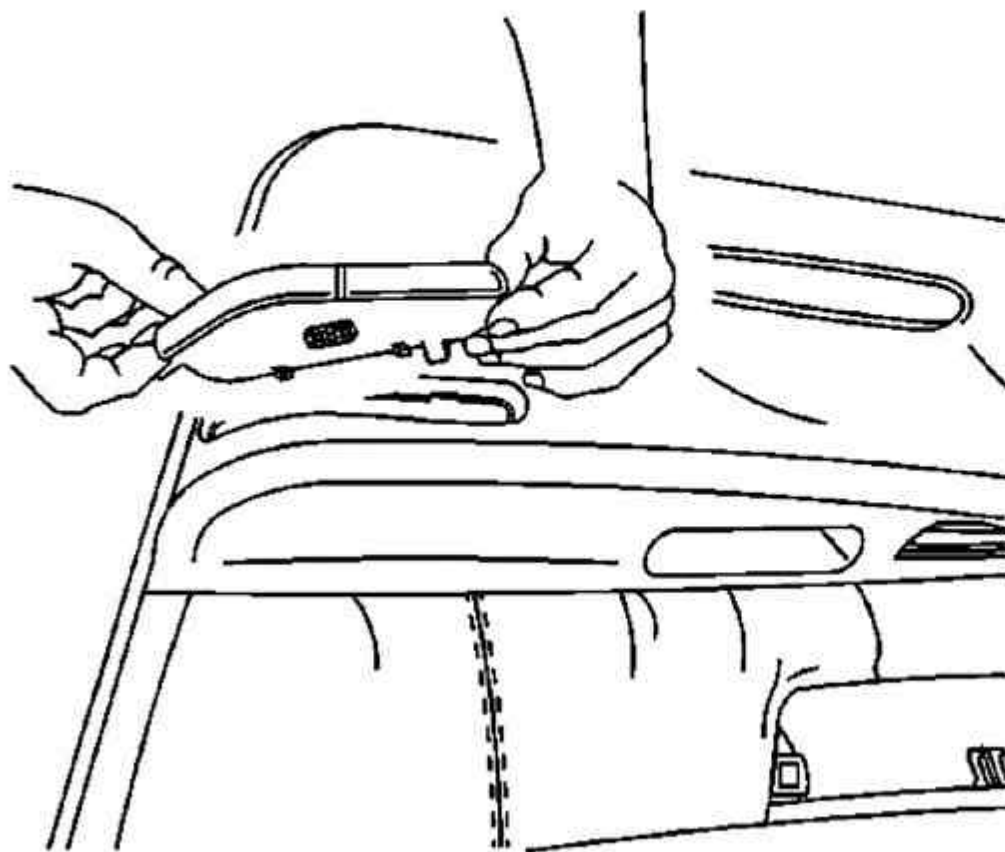


Fig. 25: Positioning Courtesy Lamp To Front Door Trim Panel
Courtesy of GENERAL MOTORS CORP.

3. Position the courtesy lamp to the front door trim panel.

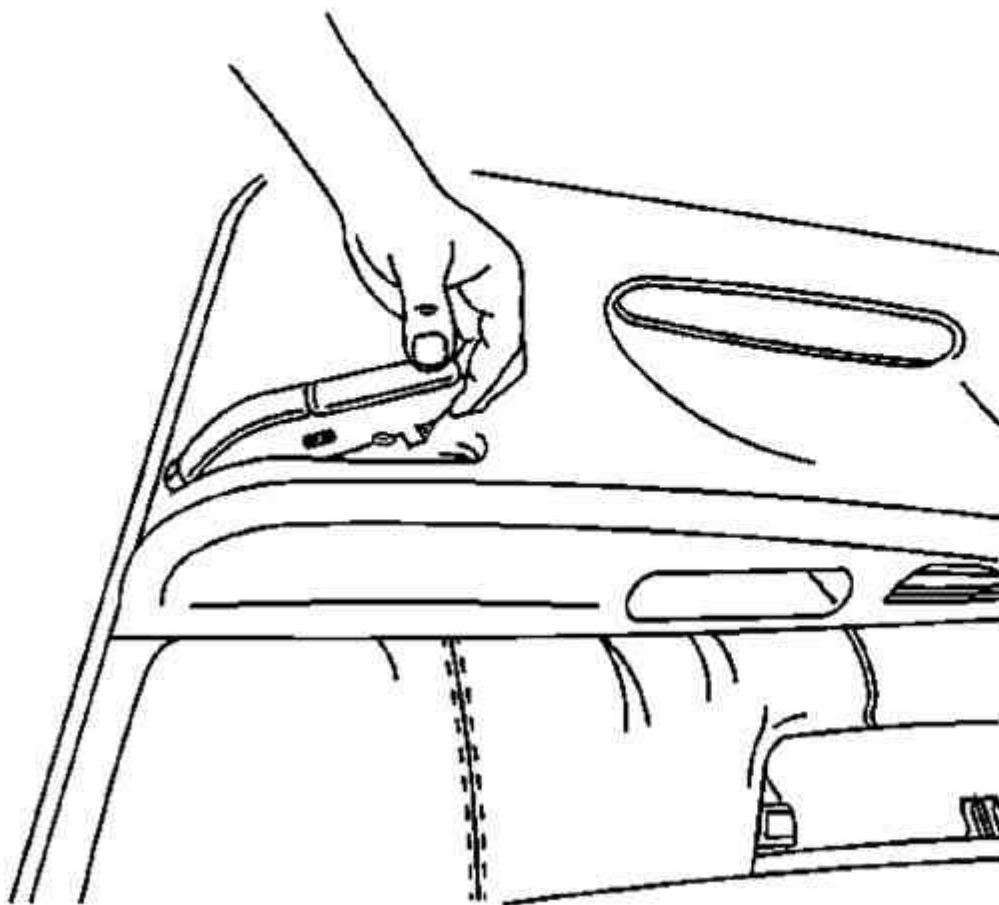


Fig. 26: Aligning Rear Edge Of Courtesy Lamp Retainer Tab To Front Door Trim Panel
Courtesy of GENERAL MOTORS CORP.

4. Align the rear edge of the courtesy lamp retainer tab to the front door trim panel.

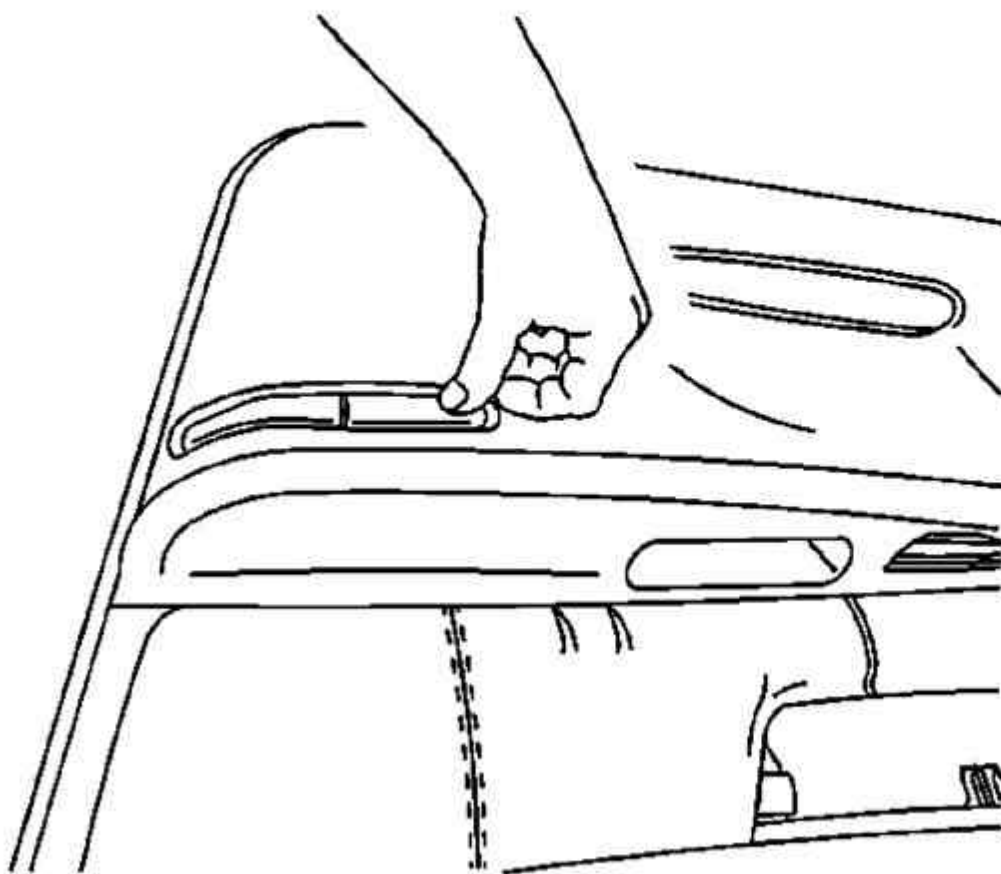


Fig. 27: Installing Courtesy Lamp To Front Door Trim Panel
Courtesy of GENERAL MOTORS CORP.

5. Install the courtesy lamp to the front door trim panel pressing the forward edge into place until the retainer is fully seated.

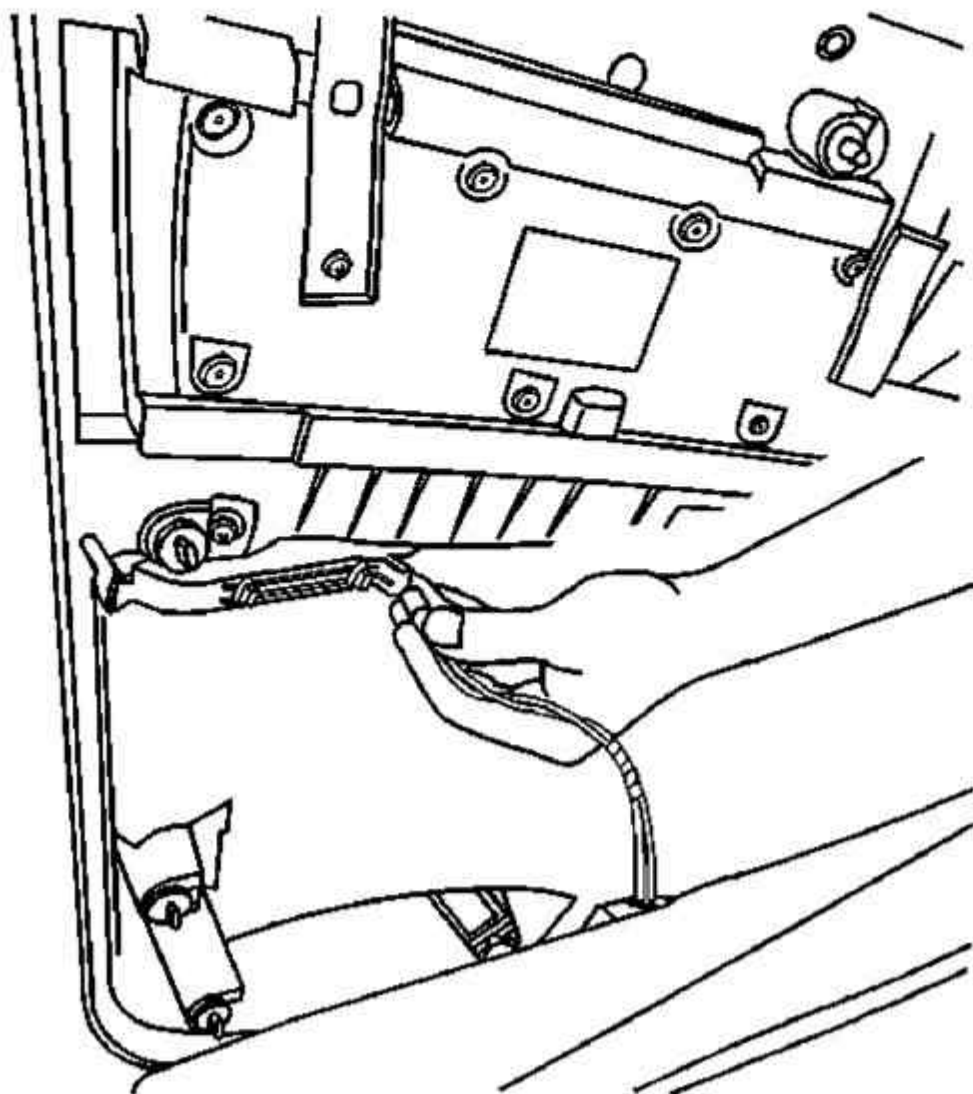


Fig. 28: Identifying Courtesy Lamp Electrical Connector
Courtesy of GENERAL MOTORS CORP.

6. Connect the electrical connector from the courtesy lamp.
7. Install the front door trim panel. Refer to **Front Side Door Trim Panel Replacement**.

INSTRUMENT PANEL COURTESY LAMP BULB REPLACEMENT

Removal Procedure

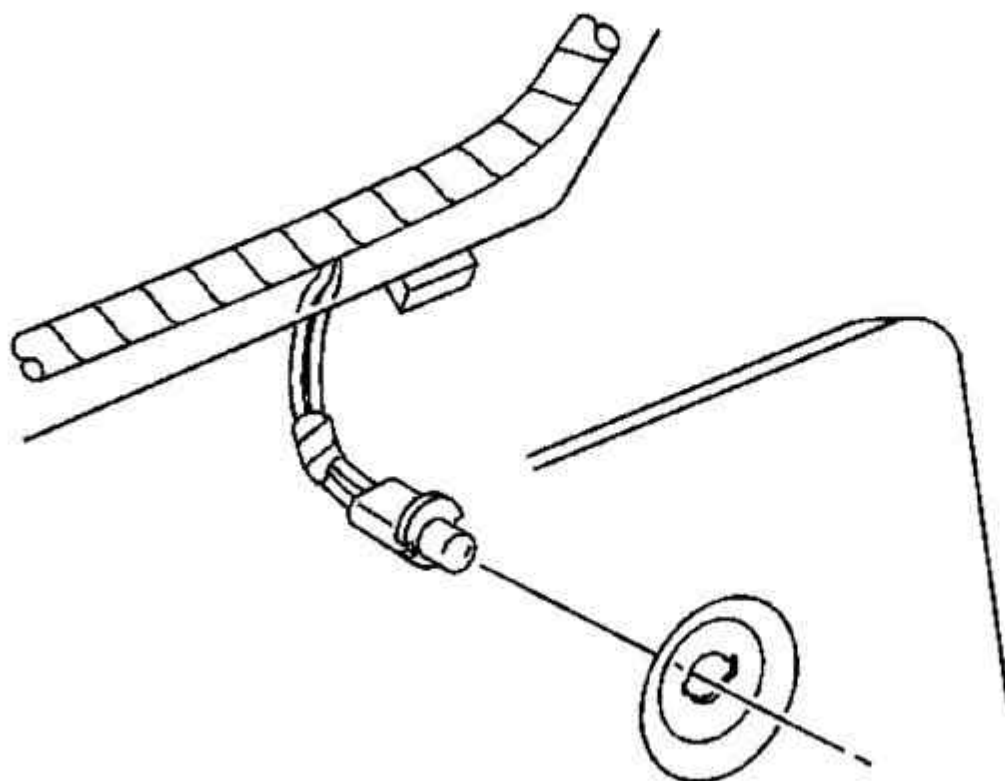


Fig. 29: Identifying I/P Courtesy Lamp Bulb & Lamp Socket
Courtesy of GENERAL MOTORS CORP.

1. Remove 3 fasteners from the instrument panel (I/P) insulator.
2. Rotate the lamp socket counterclockwise. Remove the lamp socket from the insulator.
3. Remove the I/P courtesy lamp bulb from the socket.

Installation Procedure

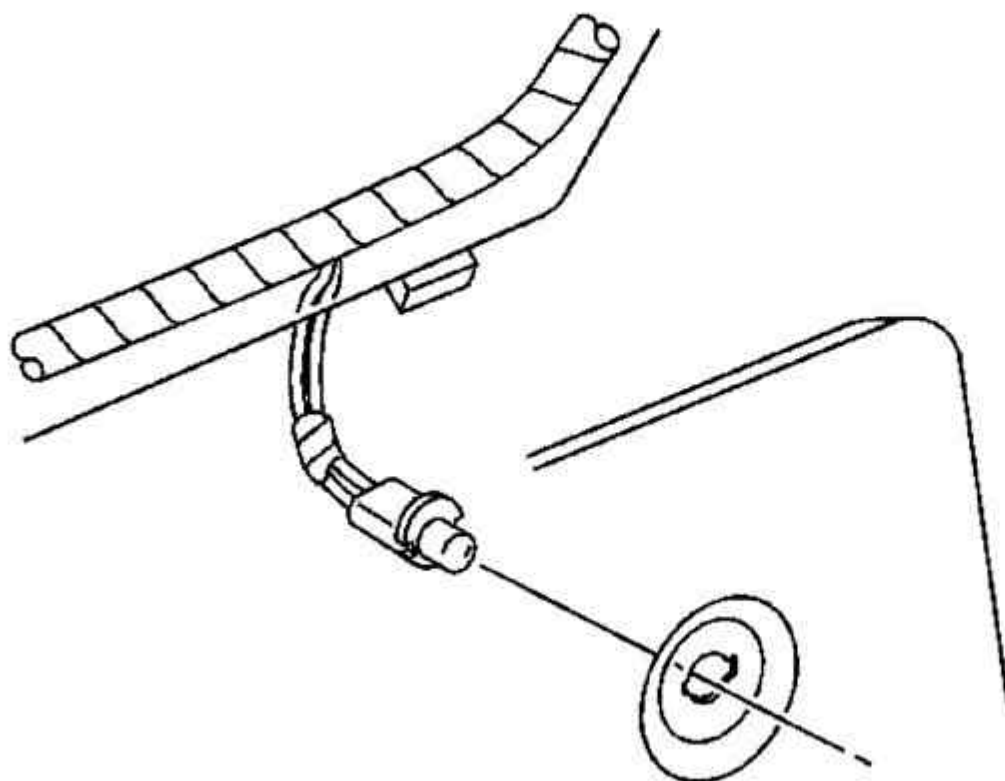


Fig. 30: Identifying I/P Courtesy Lamp Bulb & Lamp Socket
Courtesy of GENERAL MOTORS CORP.

1. Install the I/P courtesy lamp bulb to the socket.
2. Position the socket into the insulator opening. Rotate the socket clockwise to secure.
3. Align the insulator to the lower I/P.
4. Install 3 fasteners.

OVERHEAD CONSOLE COURTESY LAMP REPLACEMENT (WITH SUNROOF)

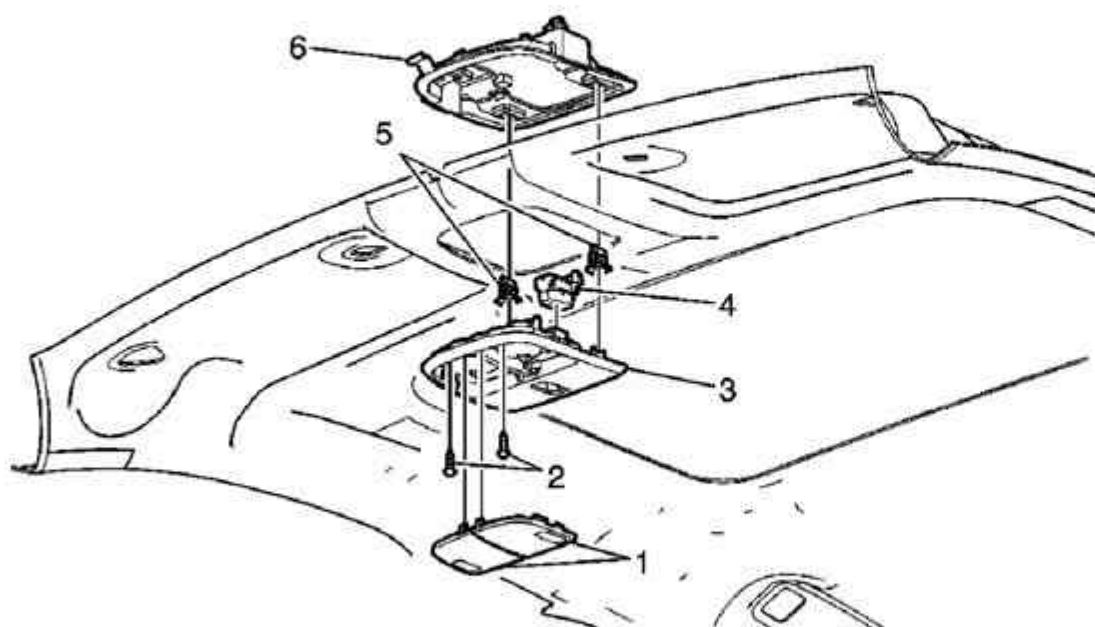


Fig. 31: Replacing Courtesy Lamp - Overhead Console (With Sunroof)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Reading Lamp Lens Tip: 1. Use a small flat-bladed tool to release the lens from the roof console. 2. The bulbs can be removed by pulling downward.
2	Roof Console Screw (Qty: 2) NOTE: Refer to <u>Fastener Notice</u> . Tighten: 2 N.m (18 lb in)
3	Roof Console Courtesy and Reading Lamp Assembly Tip: Disconnect the electrical connectors.
4	Sunroof Switch Tip: Disconnect the electrical connector.
5	Roof Console Courtesy Retaining Clip (Qty: 2)
6	Backing Plate Retainer Tip: The headliner must be lowered to remove the backing plate retainer. Refer to <u>Headlining Trim Panel Replacement</u> .

OVERHEAD CONSOLE COURTESY LAMP REPLACEMENT (WITHOUT SUNROOF)

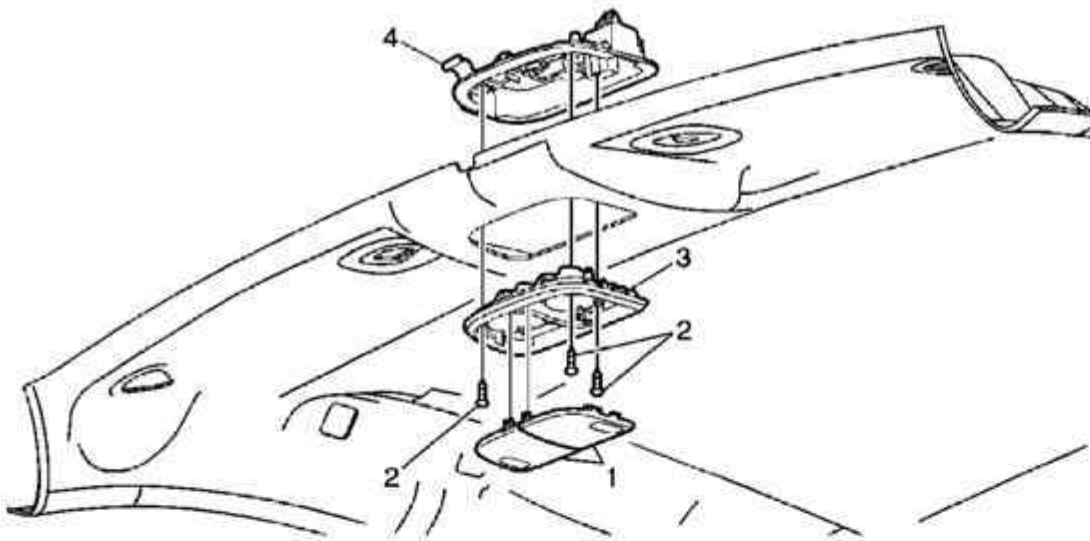


Fig. 32: Replacing Courtesy Lamp - Overhead Console (Without Sunroof)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Reading Lamp Lens Tip: 1. Use a small flat-bladed tool to release the lens from the roof console. 2. The bulbs can be removed by pulling downward.
2	Roof Console Screw (Qty: 3) NOTE: Refer to <u>Fastener Notice</u> .

	Tighten: 2 N.m (18 lb in)
3	Roof Console Courtesy and Reading Lamp Assembly Tip: Disconnect the electrical connectors.
4	Backing Plate Retainer Tip: The headliner must be lowered to remove the backing plate retainer. Refer to Headlining Trim Panel Replacement .

INSTRUMENT PANEL COMPARTMENT LAMP SWITCH REPLACEMENT

Removal Procedure

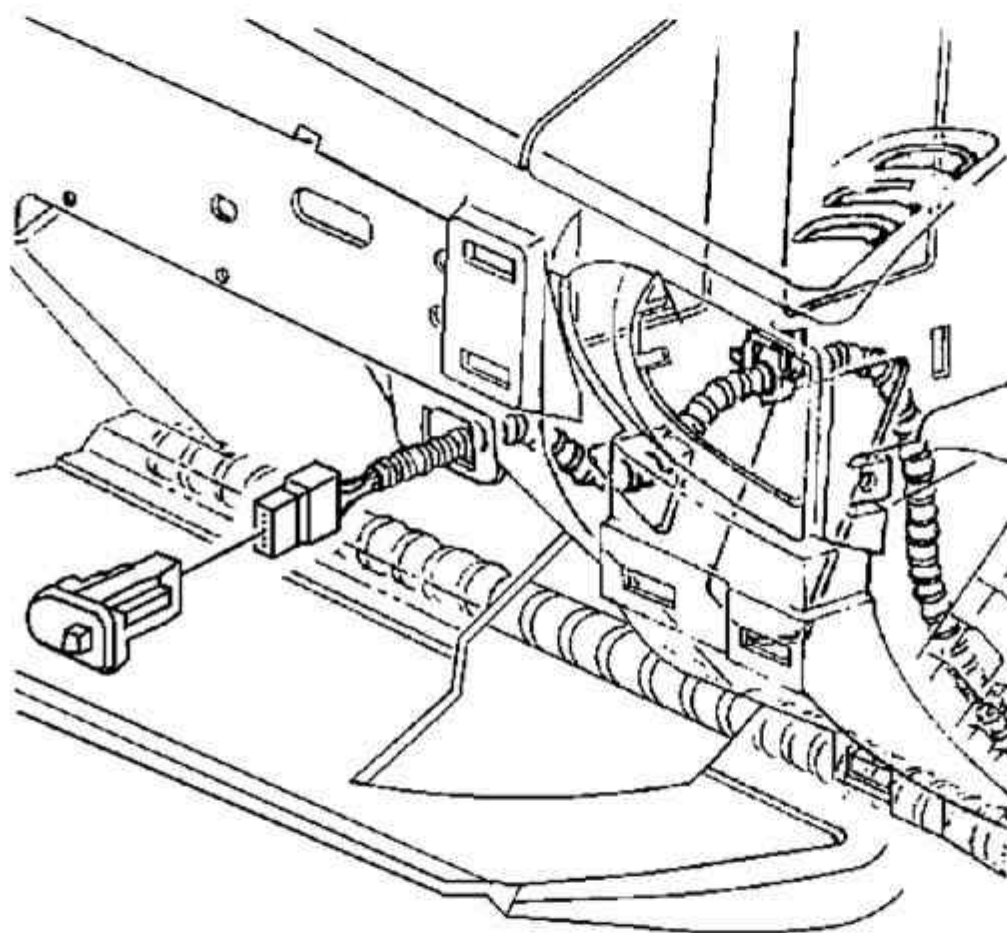


Fig. 33: Identifying I/P Compartment Lamp Switch
Courtesy of GENERAL MOTORS CORP.

1. Open the instrument panel (I/P) compartment door.
2. Depress the retaining tabs on the top and bottom of the I/P compartment lamp switch.
3. Push the switch out of the opening.
4. Disconnect the electrical connector from the IP compartment lamp switch.
5. Remove the I/P compartment lamp switch.

Installation Procedure

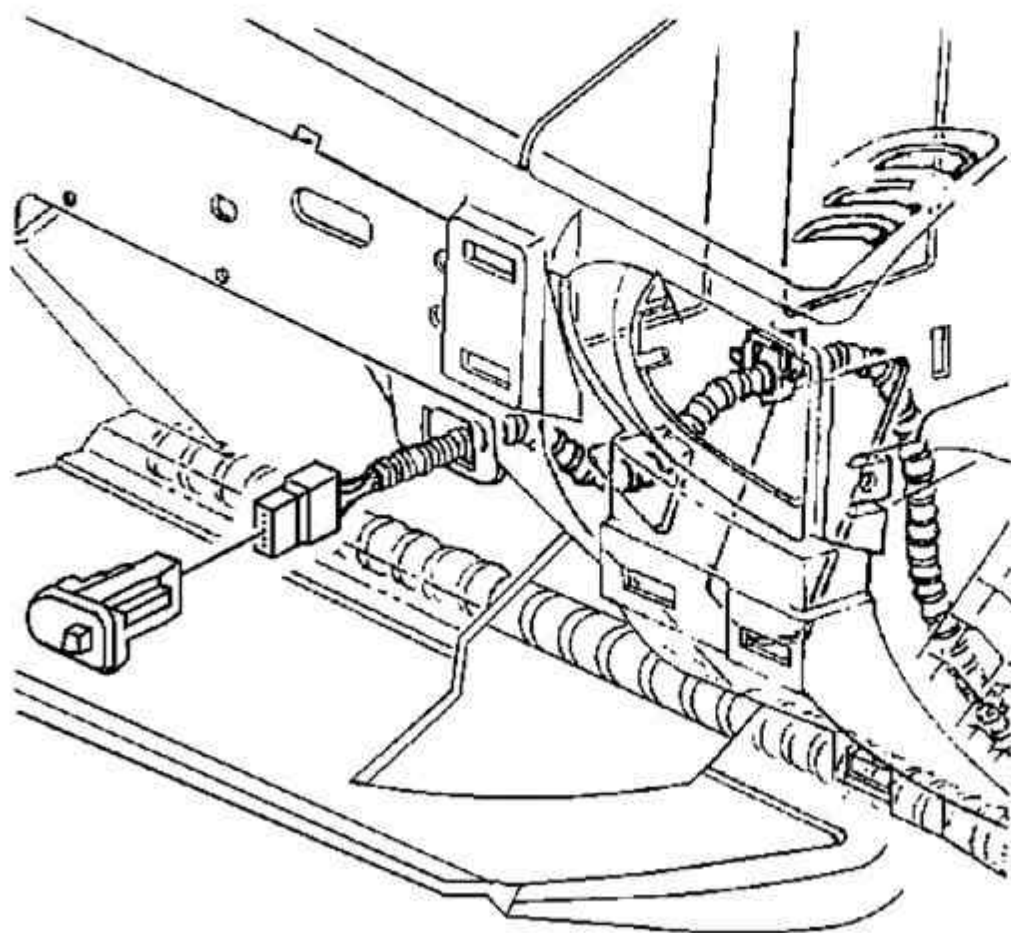


Fig. 34: Identifying I/P Compartment Lamp Switch
Courtesy of GENERAL MOTORS CORP.

1. Connect the electrical connector to the I/P compartment lamp switch.
2. Position the I/P compartment lamp switch to the opening. Press the switch into the opening.
3. Close the I/P compartment door.

INSTRUMENT PANEL COMPARTMENT LAMP BULB REPLACEMENT

Removal Procedure

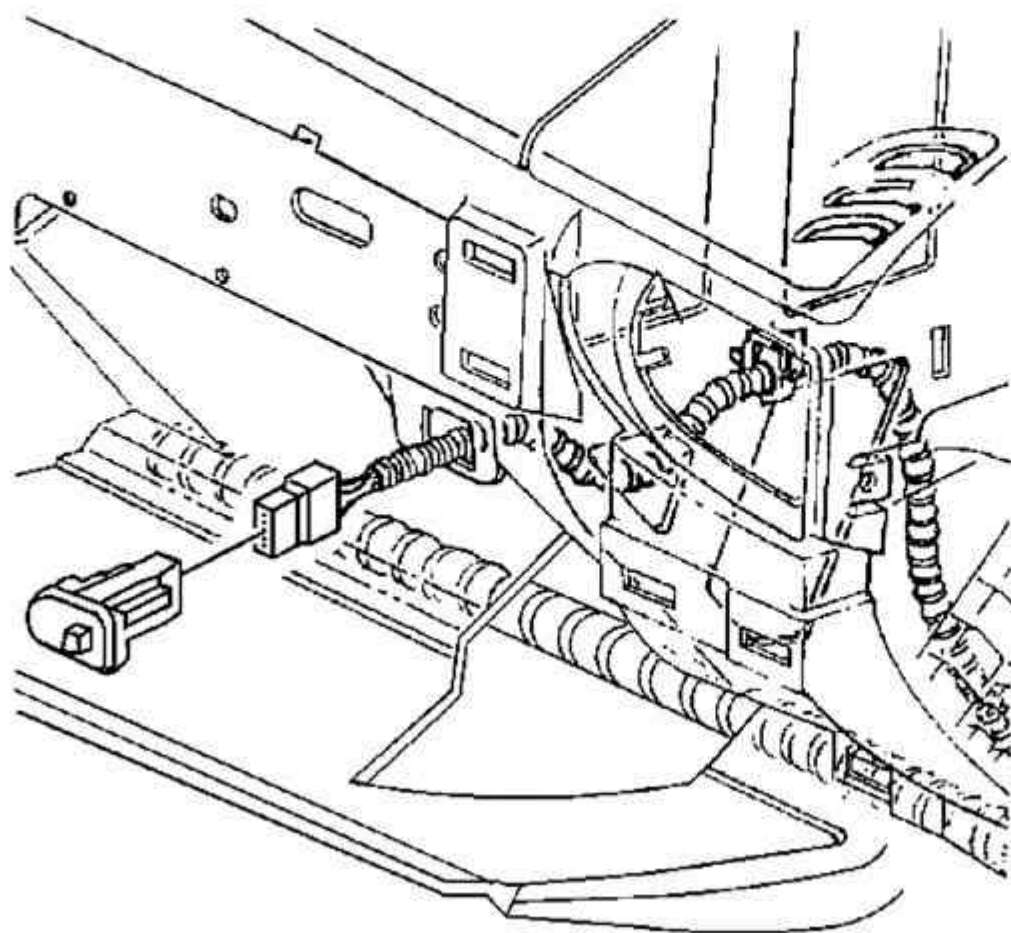


Fig. 35: Identifying I/P Compartment Lamp Switch
Courtesy of GENERAL MOTORS CORP.

1. Open the instrument panel (I/P) compartment door.
2. Depress the retaining tabs on the top and bottom of the I/P compartment lamp switch.
3. Push the switch out of the opening.
4. Pull the bulb from the switch.

Installation Procedure

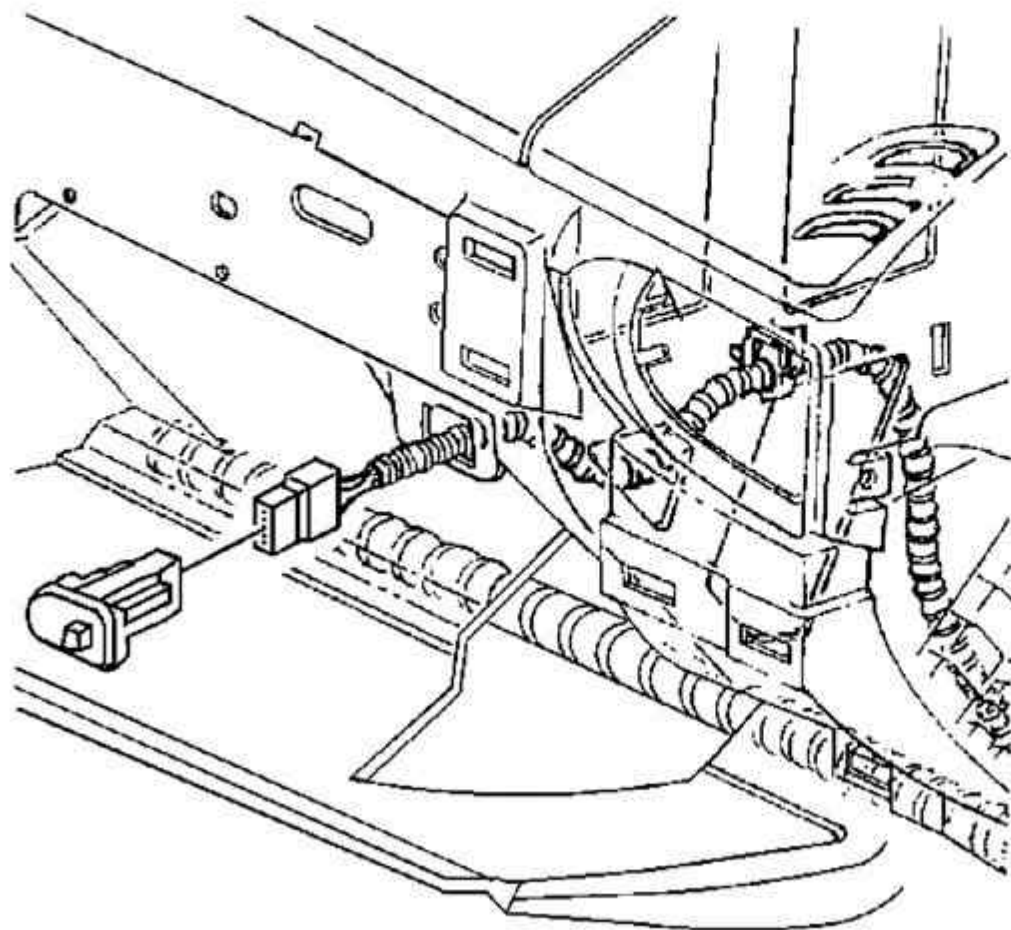


Fig. 36: Identifying I/P Compartment Lamp Switch
Courtesy of GENERAL MOTORS CORP.

1. Install the bulb to the I/P compartment lamp switch.
2. Press the switch into the opening.
3. Close the I/P compartment door.

ROOF RAIL REAR COURTESY LAMP REPLACEMENT

Removal Procedure

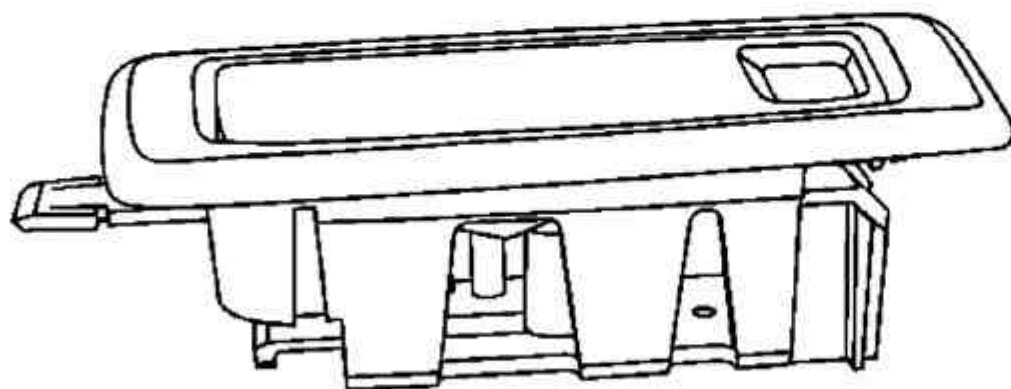


Fig. 37: Identifying Rear Quarter Courtesy Lamp
Courtesy of GENERAL MOTORS CORP.

1. Insert a flat-bladed tool at the rear end of the lens and pry out to remove the lens.
2. Remove the light bulb if necessary.
3. Insert a flat-bladed tool behind the lamp assembly at the switch end and pry that end out.
4. Disconnect the courtesy/reading lamp wiring harness from the socket.
5. Slide the lamp assembly out of the headliner.
6. Remove the lamp assembly from the vehicle.

Installation Procedure

1. Install the tab end of the lamp into the headliner.

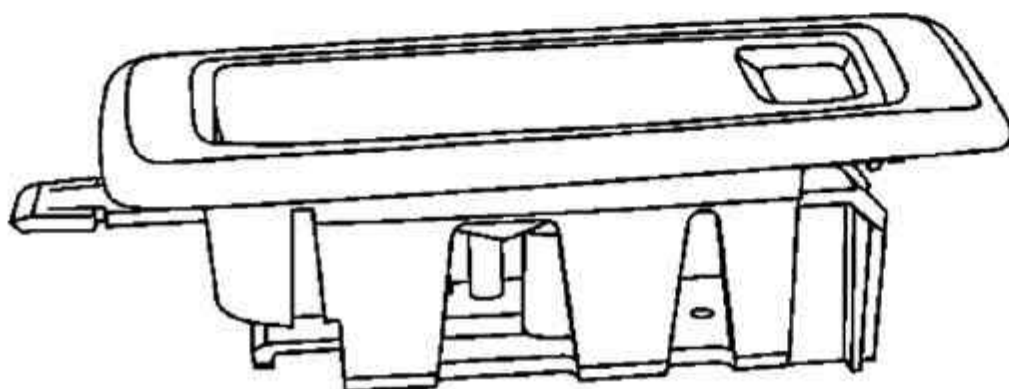


Fig. 38: Identifying Rear Quarter Courtesy Lamp
Courtesy of GENERAL MOTORS CORP.

2. Connect the wiring harness to the lamp.
3. Press the lamp into the headliner.
4. Install the lamp bulb if removed.
5. Position the tab end of the lens in the lamp and press in to install the lens.

REARVIEW MIRROR LAMP REPLACEMENT

Removal Procedure

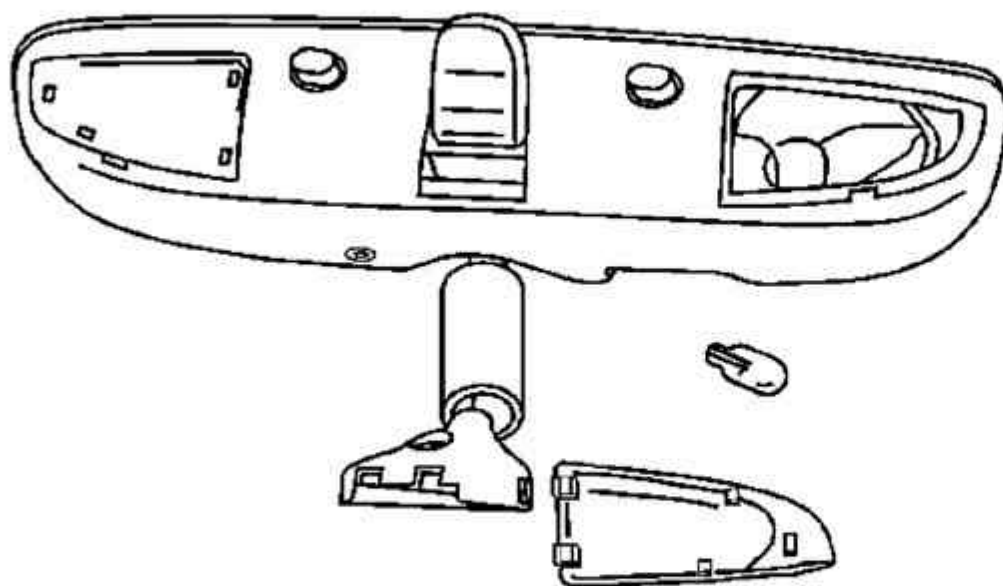


Fig. 39: View Of Socket & Bulb
Courtesy of GENERAL MOTORS CORP.

1. Use a small flat-bladed tool to disengage the lamp lens. Remove the lens from the rearview mirror.
2. Carefully remove the bulb from the socket.

Installation Procedure

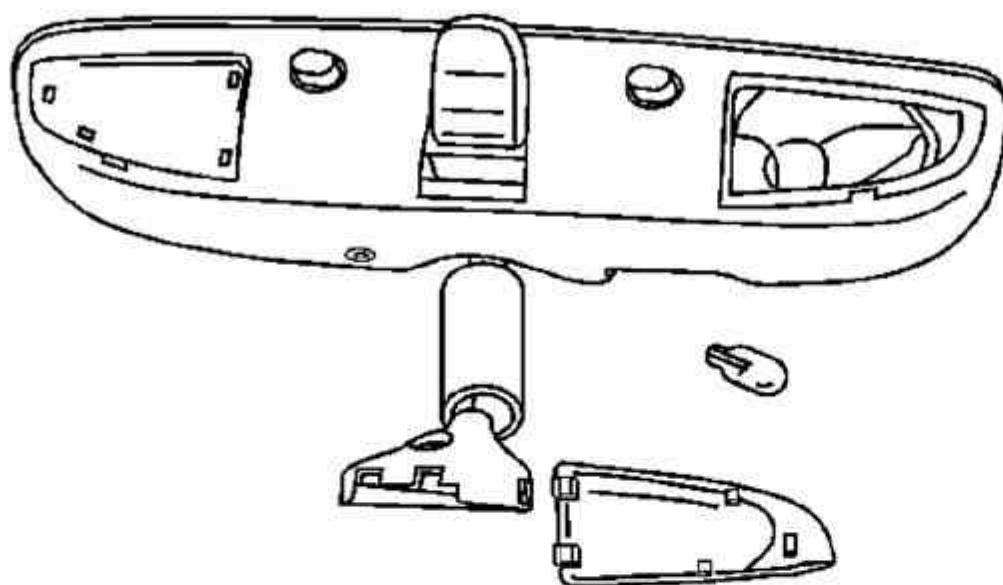


Fig. 40: View Of Socket & Bulb
Courtesy of GENERAL MOTORS CORP.

1. Install the bulb to the socket.
2. Align the lamp lens to the rearview mirror. Press the lens into place.

VANITY MIRROR LAMP REPLACEMENT**Removal Procedure**

1. Lower the sunshade and open the illuminated mirror door.
2. Insert a small flat-bladed tool at the upper edge of the lamp lens. Carefully press down to remove the lens.

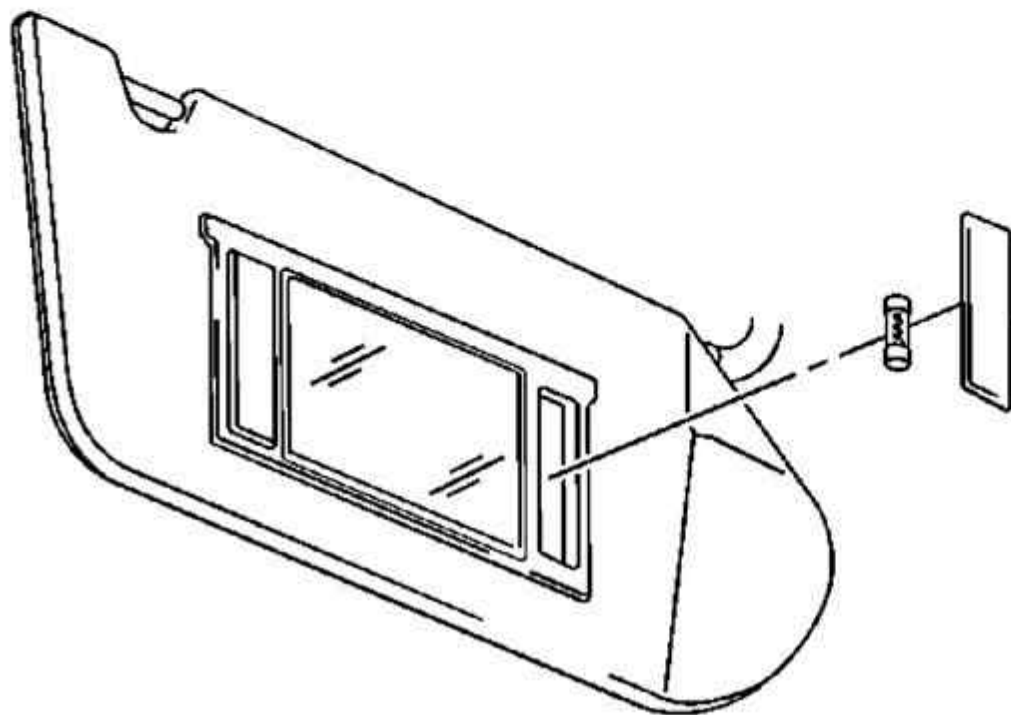


Fig. 41: Identifying Vanity Mirror Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

3. Remove the bulb.

Installation Procedure

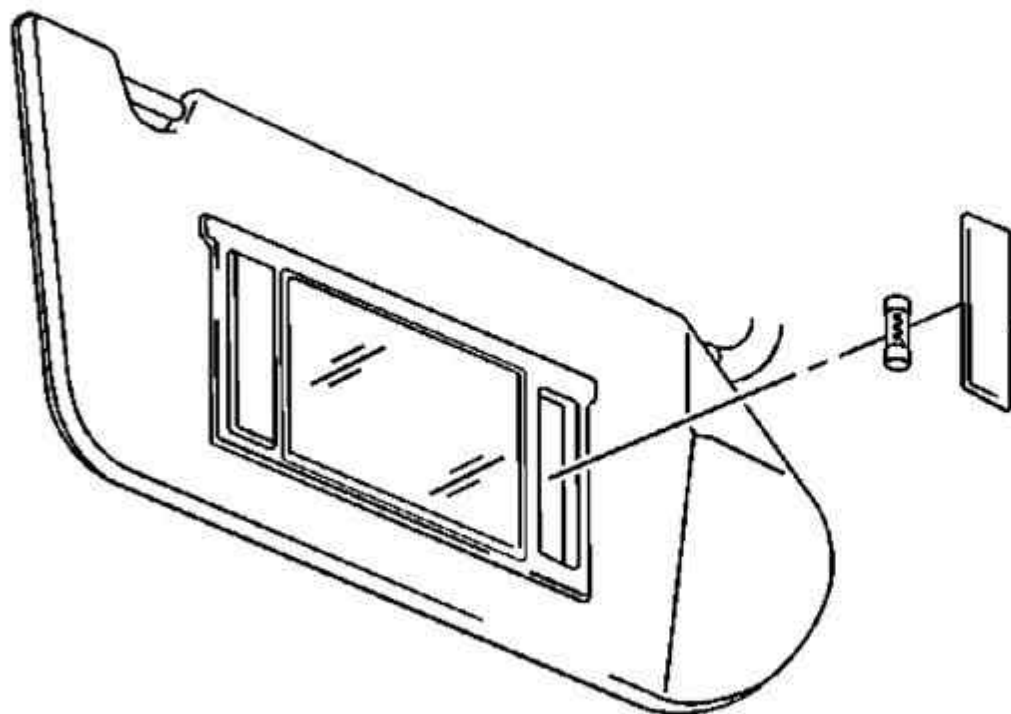


Fig. 42: Identifying Vanity Mirror Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

1. Install the bulb.

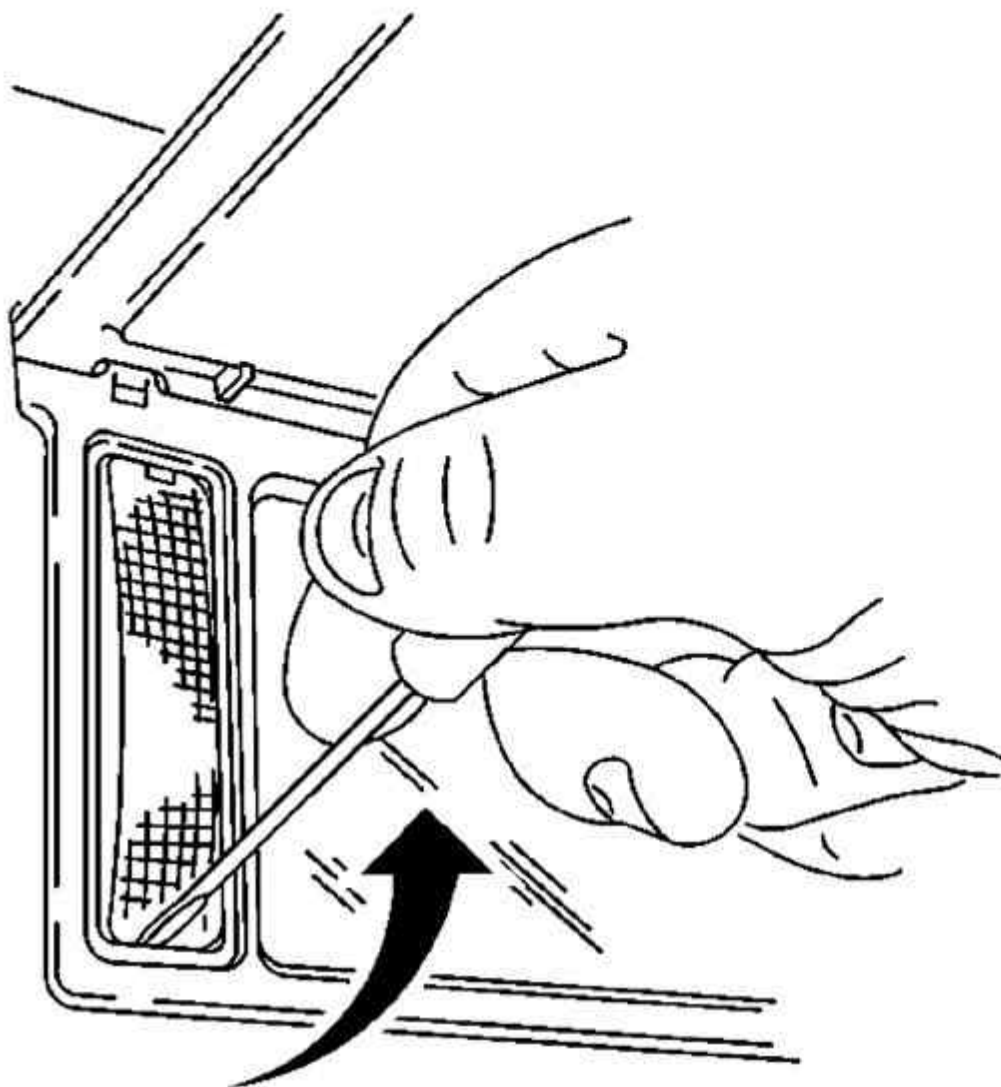


Fig. 43: Pressing Vanity Mirror Lamp Lens Into Sunshade
Courtesy of GENERAL MOTORS CORP.

2. Align the upper lens tab to the opening. Insert the upper edge of the lens.
3. Insert a small flat-bladed tool at the lower edge of the lamp lens. Carefully press up to install the lens.
4. Close the illuminated mirror door and raise the sunshade.

TRANSMISSION FLOOR SHIFT CONTROL INDICATOR LAMP REPLACEMENT

Removal Procedure

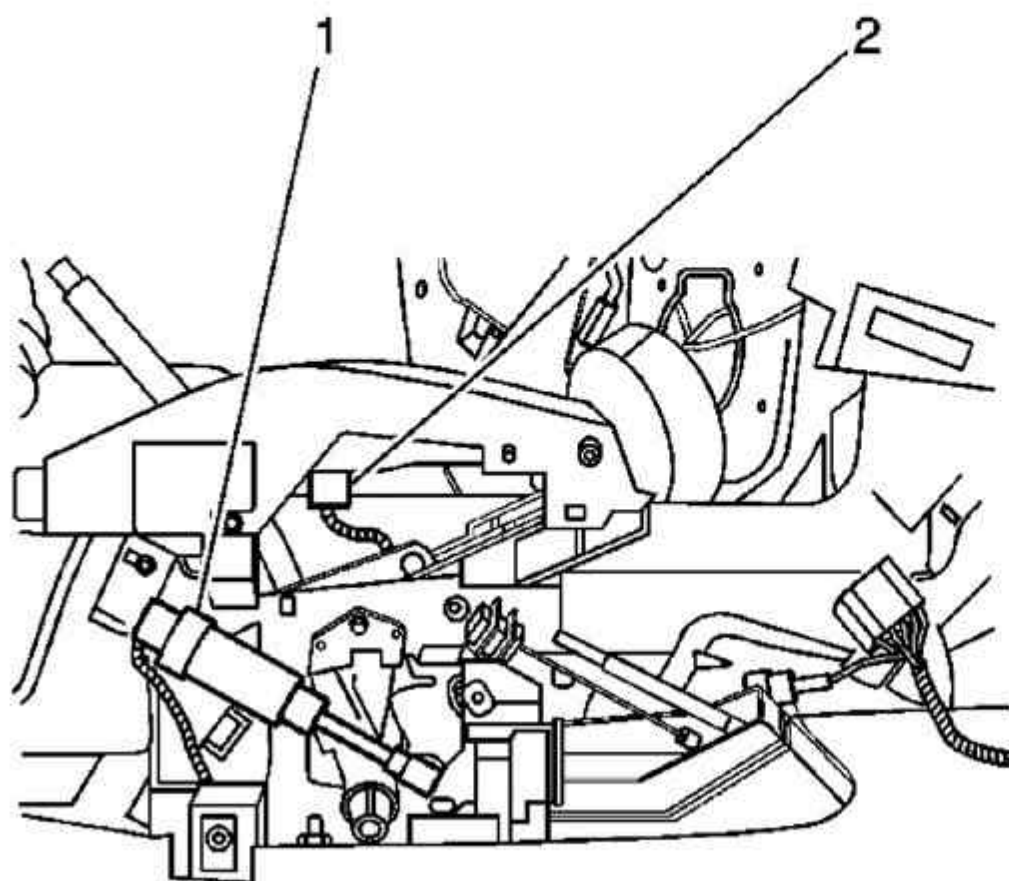


Fig. 44: Identifying Floor Shift Control Indicator Lamp Socket & Bulb
Courtesy of GENERAL MOTORS CORP.

1. Remove the front floor console. Refer to **Front Floor Console Replacement**.
2. Rotate the floor shift control indicator lamp socket (2). Pull the socket from the trim bezel.
3. Remove the bulb from the socket.

Installation Procedure

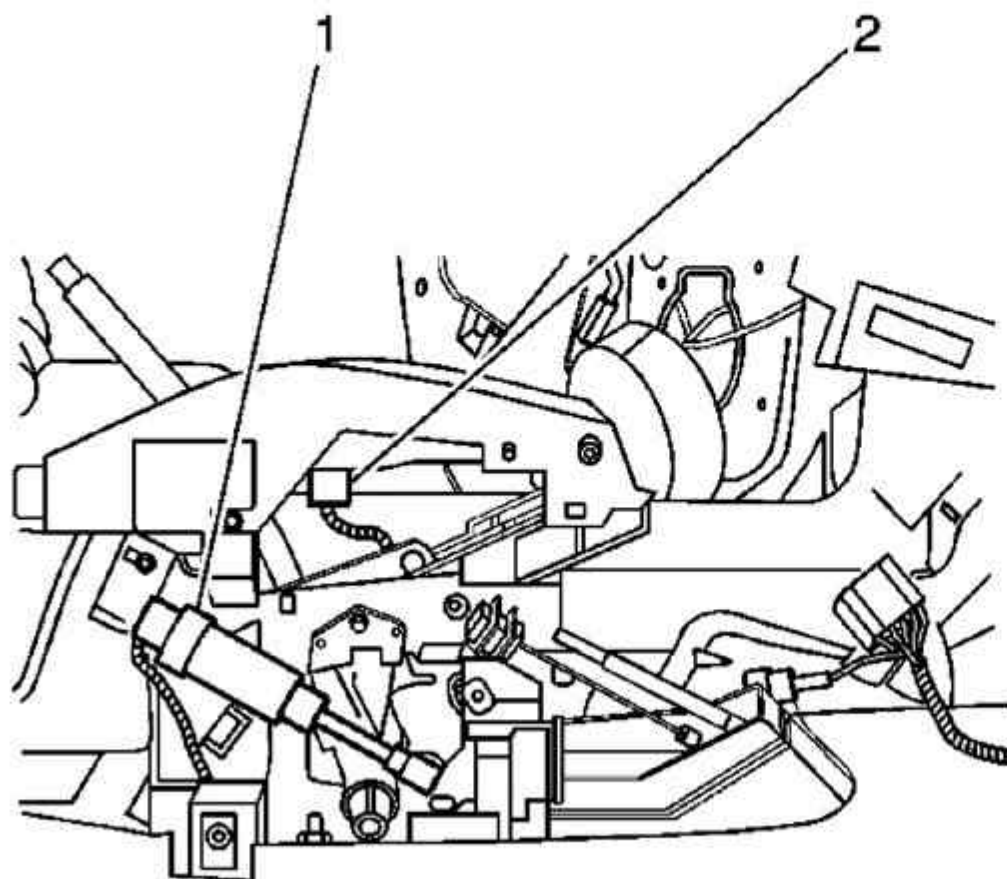


Fig. 45: Identifying Floor Shift Control Indicator Lamp Socket & Bulb
Courtesy of GENERAL MOTORS CORP.

1. Install the bulb to the socket.
2. Position the floor shift control indicator lamp socket (2) into the trim bezel opening. Rotate the socket.
3. Install the front floor console. Refer to **Front Floor Console Replacement**.

HEADLAMP ASSEMBLY OR HEADLAMP BULB REPLACEMENT

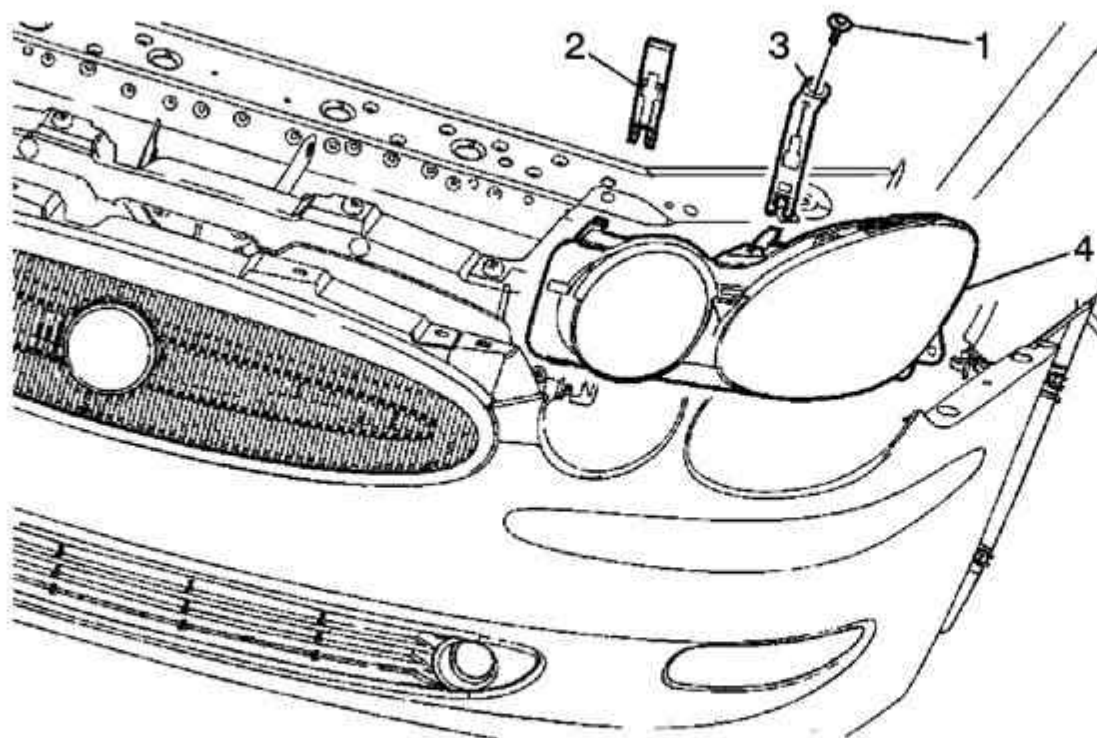


Fig. 46: View Of Headlamp Assembly
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Loosen either the LF or RF bumper fascia corner in order to flex the fascia when removing the headlamp assembly. Refer to Front Bumper Fascia Replacement .	
1	Headlamp Retainer Bolt NOTE: Refer to Fastener Notice . Tighten: 10 N.m (89 lb in)
2	Headlamp Retainer Tip: Lift the retainer straight upward in order to release the headlamp assembly from the headlamp mounting panel.
3	Headlamp Retainer Tip: Lift the retainer straight upward in order to release the headlamp assembly from the headlamp mounting panel.
4	Headlamp Assembly Tip: Carefully pull the headlamp assembly forward and disconnect the electrical harness connector

HEADLAMP BULB REPLACEMENT

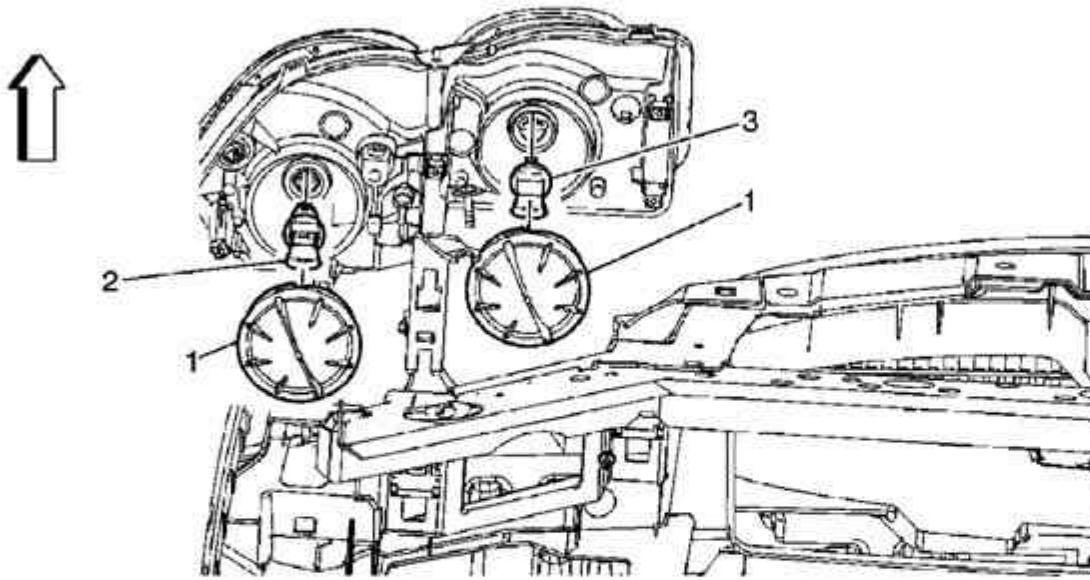


Fig. 47: Identifying Headlamp Bulb
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the LF or RF headlamp assembly. Refer to Headlamp Assembly or Headlamp Bulb Replacement .	
1	Headlamp Bulb Accessory Cover Tip: Turn the bulb covers a quarter turn counter-clockwise in order to access the headlamp bulb sockets.
2	Headlamp Bulb (Lo Beam) CAUTION: Refer to Halogen Bulb Caution . Tip: Disconnect the electrical connector from the bulb socket.
3	Headlamp Bulb (Hi Beam) Tip: Aim the headlamps after the bulb replacement has been completed. Refer to Headlamp Aiming .

HEADLAMP AIMING

The vehicle has a visual optical headlamp aiming system. The aim has been preset at the factory and should need no further adjustment.

However, If the vehicle is damaged in an accident, the headlamp aim may be affected and adjustment may be necessary.

If oncoming vehicles flash their high beams at you, this may also mean the vertical aim needs to be adjusted.

It is recommended that the vehicle is taken to your dealer for service if the headlamps need to be re-aimed. It is possible however, to re-aim the headlamps as described in the following procedure.

The vehicle should be properly prepared as follows:

- The vehicle should be placed so the headlamps are 7.6 m (25 ft) from a light colored wall or other flat surface.

- The vehicle must have all four tires on a perfectly level surface which is level all the way to the wall or other flat surface.
- The vehicle should be placed so it is perpendicular to the wall or other flat surface.
- The vehicle should not have any snow, ice or mud on it.
- The vehicle should be fully assembled and all other work stopped while headlamp aiming is being done.
- The vehicle should be normally loaded with a full tank of fuel and one person or 75 kg (160 lbs) on the driver's seat.
- Tires should be properly inflated.

Headlamp aiming is done with the vehicle's low-beam headlamps. The high-beam headlamps will be correctly aimed if the low-beam headlamps are aimed properly.

The vertical headlamp aiming screws are located under the hood near the headlamps.

The adjustment screw can be turned with a 6 mm male hex.

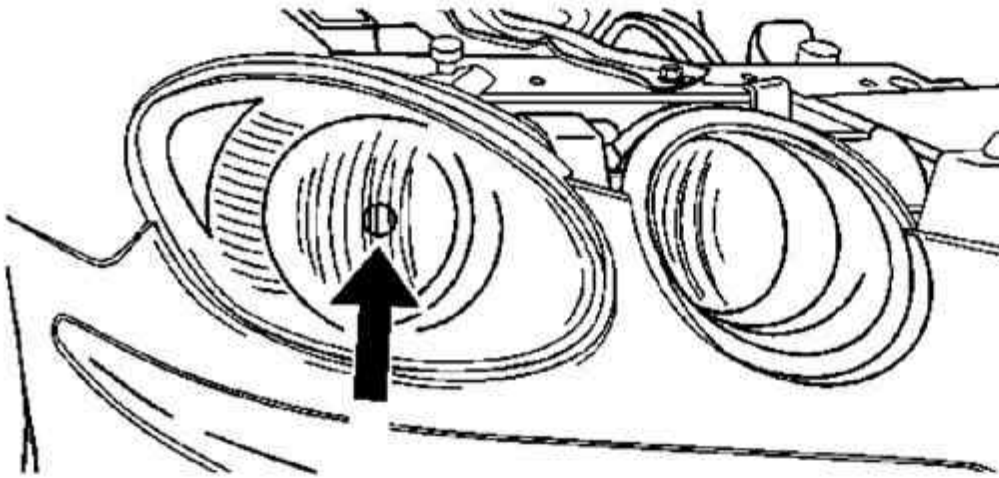


Fig. 48: Identifying Headlight Aiming Dot
Courtesy of GENERAL MOTORS CORP.

1. To adjust the vertical aim on the headlamps, do the following:
2. Find the aim dot on the lens of the low-beam lamp.
3. Measure the distance from the ground to the aim dot on the lamp. Record the distance.
4. At the wall or other flat surface, measure from the ground upward the recorded distance from Step 3 and draw or tape a horizontal line the width of the vehicle.

NOTE: Do not cover a headlamp to improve beam cut-off when aiming. Covering a headlamp may cause excessive heat build-up which may cause damage to the headlamp.

5. Turn on the low-beam headlamps and place a piece of cardboard or equivalent in front of the headlamp not being aimed. This should allow only the beam of light from the headlamp being aimed to be seen on the flat surface.

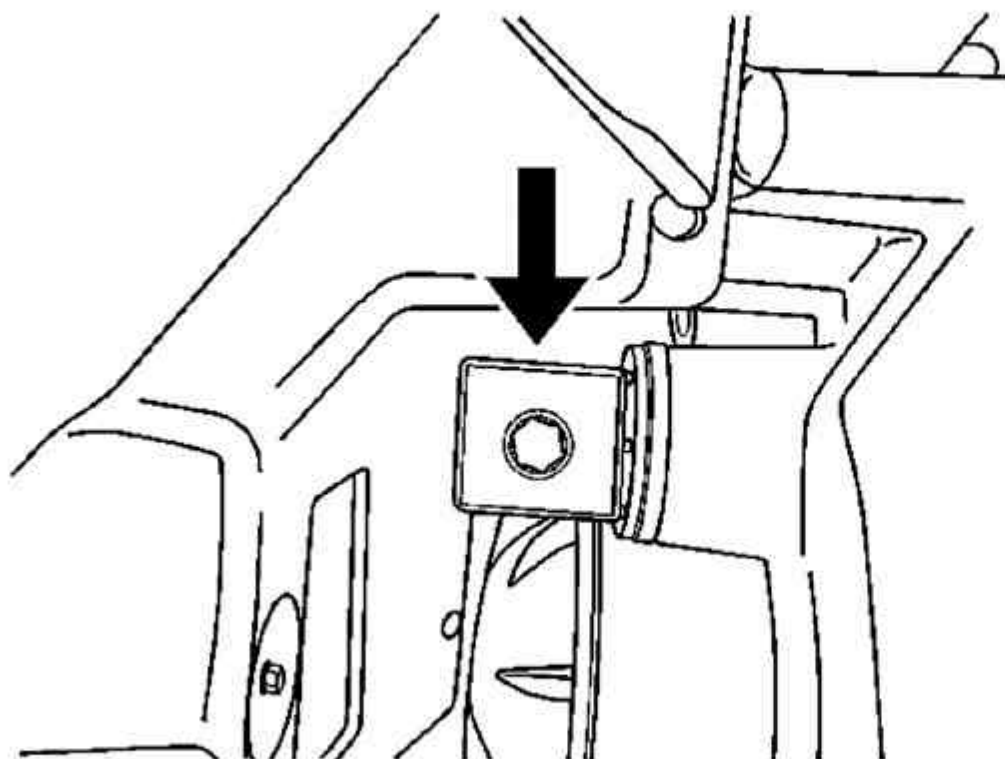


Fig. 49: Identifying Vertical Aiming Screw
Courtesy of GENERAL MOTORS CORP.

6. Turn the vertical aiming screw until the headlamp beam is aimed to the horizontal tape line. The top edge of the cut-off should be positioned at the bottom edge of the horizontal tape line.
7. Repeat Steps 5 and 6 for the opposite headlamp.

FRONT FOG LAMP REPLACEMENT

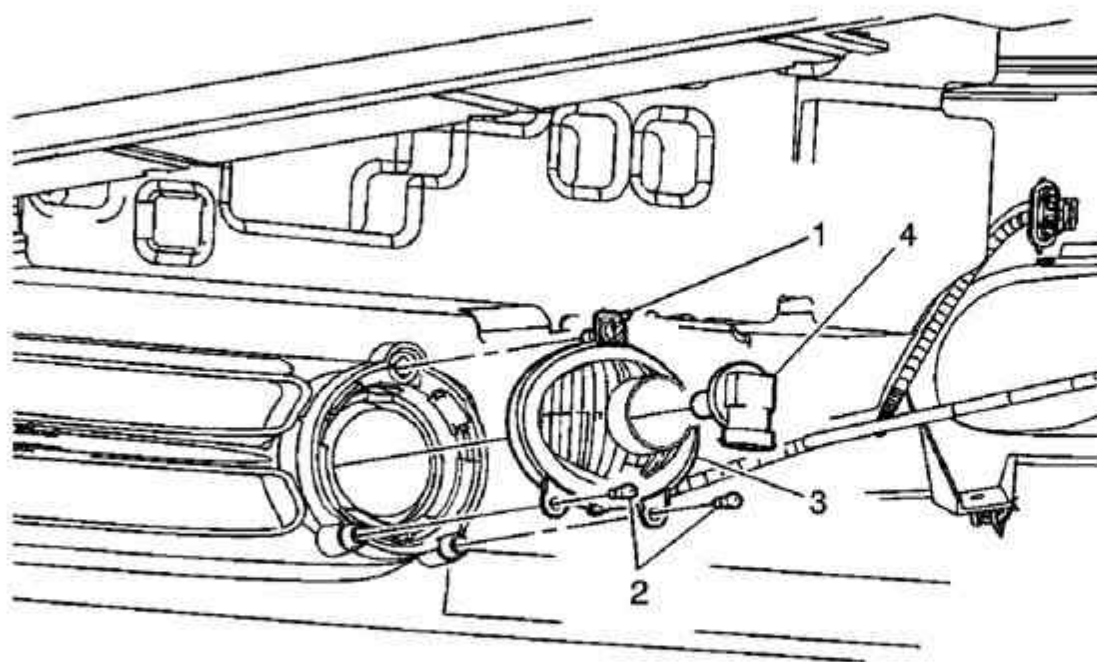


Fig. 50: Replacing Front Fog Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u>. 2. Remove the front bumper fascia lower air deflector. Refer to <u>Front Bumper Fascia Air Deflector Replacement</u>. 3. Disconnect the electrical connector from the fog lamp bulb socket.	
1	Front Fog Lamp Adjuster Screw Tip: 1. Remove the adjuster screw from the fog lamp bracket and lamp assembly. 2. Count the number of turns when removing the adjuster screw for a reference upon installation.
2	Front Fog Lamp Bracket Screw (Qty: 2) NOTE: Refer to <u>Fastener Notice</u> . Tighten: 2 N.m (18 lb in)
3	Fog Lamp Assembly Tip: Remove the fog lamp from the fog lamp bracket.
4	Front Fog Lamp Bulb CAUTION: Refer to <u>Halogen Bulb Caution</u> . Tip: Turn the bulb socket a quarter turn in order to remove from the lamp housing.

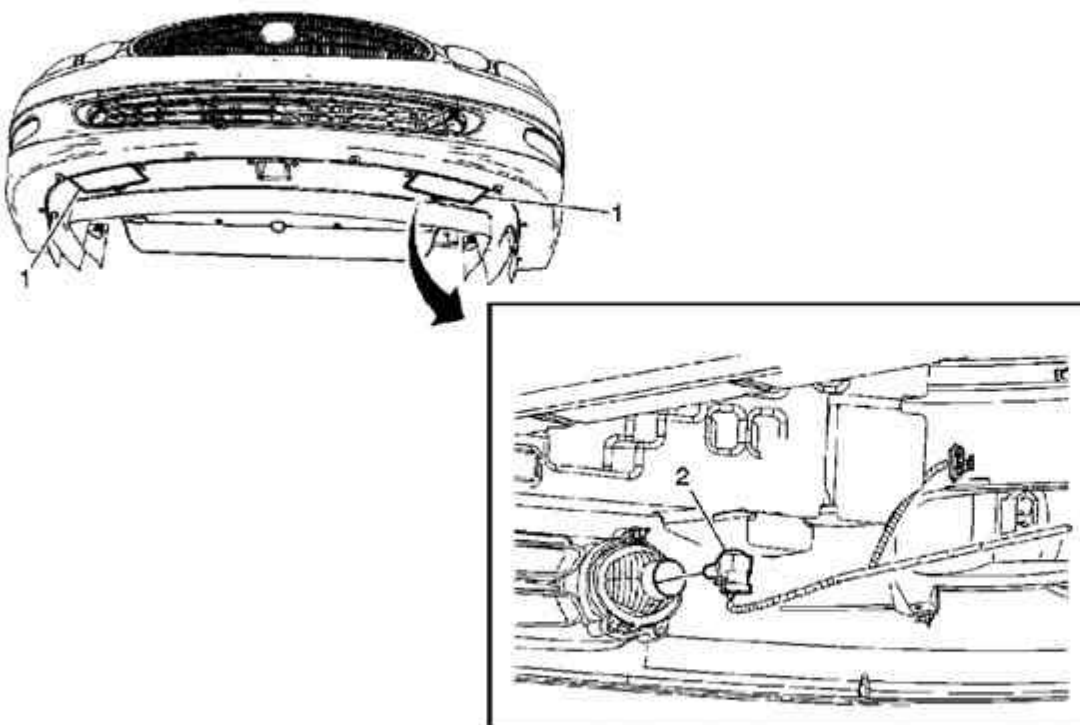
FRONT FOG LAMP BULB REPLACEMENT

Fig. 51: Replacing Front Fog Lamp Bulb
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Open the lower access panels located in the lower air deflector in order to access the fog lamp bulbs.	
1	Fog Lamp Bulb CAUTION: Refer to <u>Halogen Bulb Caution</u> . Tip: Disconnect the electrical connector and turn the bulb socket counterclockwise in order to remove the bulb from the lamp housing.

FOG LAMP AIMING

Adjustment Procedure

Proper road illumination and safety require the fog lamps to be aimed. The front fog lamp aim should be checked when a new front fog lamp assembly is installed, or if any service repairs have been performed to the vehicle which disturb the front fog lamp mounting or the vehicle ride height.

There are no horizontal adjustments for aiming the front fog lamp assemblies on this vehicle.

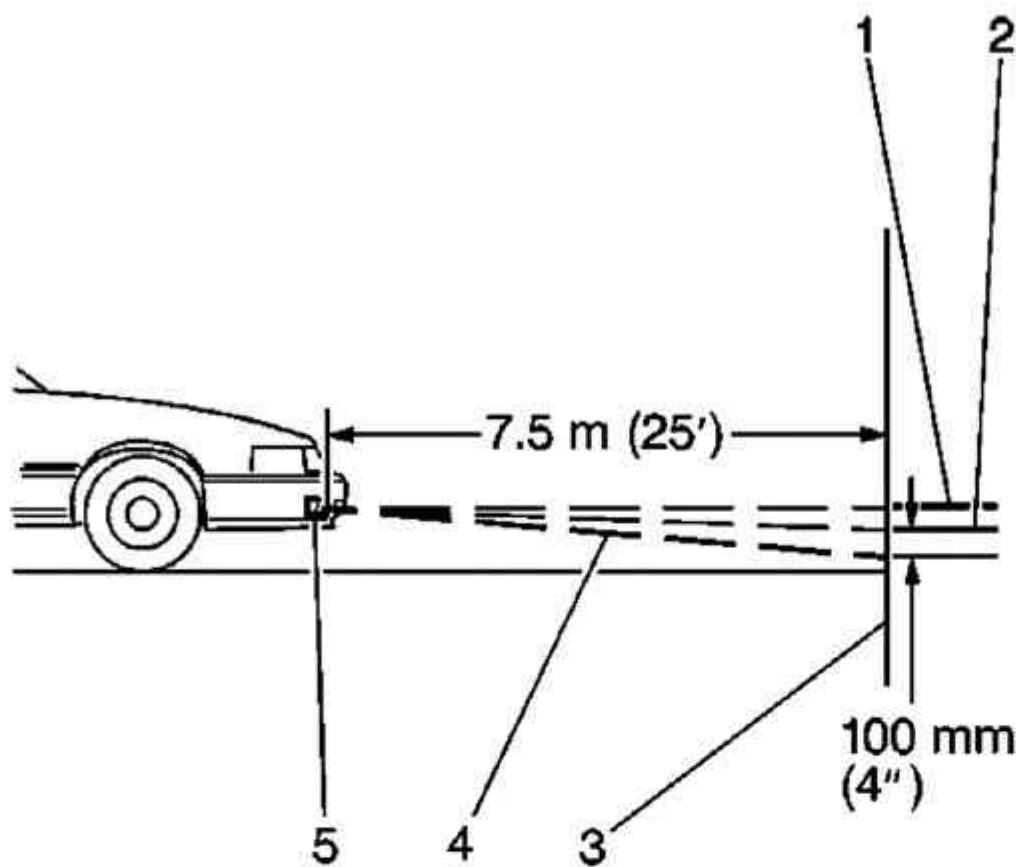


Fig. 52: Identifying Fog Lamp Aiming Procedure Distances
 Courtesy of GENERAL MOTORS CORP.

- To ensure accurate vertical front fog lamp aiming, first perform the following steps to prepare the vehicle.
 - Make sure that all the components are in place on the vehicle, the tires are properly inflated, and there is

not any mud or snow clinging to the vehicle.

- Stop all other operations of work on the vehicle.
 - Make sure the fuel level is 1/2 full or more.
 - Jounce the vehicle to settle the suspension.
 - Place the vehicle on a level surface 7.6 m (25 ft) from the target screen.
 - Measure the distance from the floor to the center of the fog lamp (5).
 - Using this measurement, mark the horizontal centerline of the fog lamp (1) on the target screen directly in front of the vehicle.
2. Turn the front fog lamps ON.

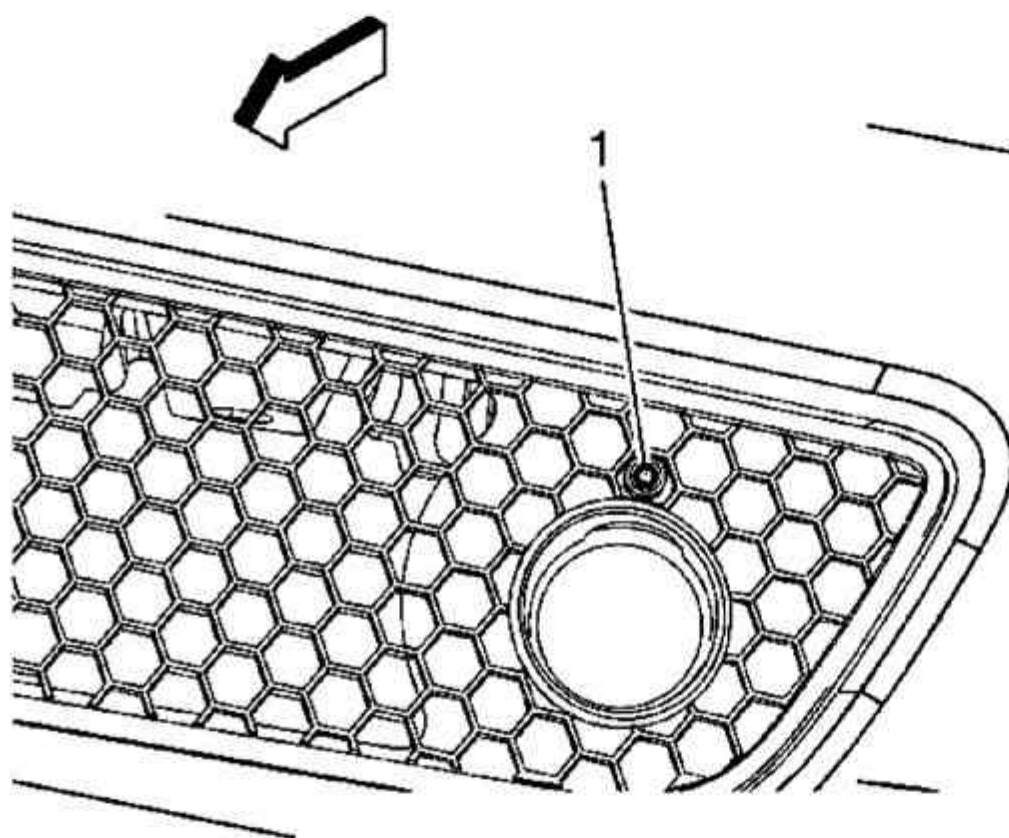


Fig. 53: Identifying Fog Lamp Vertical Adjuster Screw
Courtesy of GENERAL MOTORS CORP.

3. Through the opening in the lower front grille above the fog lamp, access the fog lamp vertical adjuster screw (1).
4. Adjust the fog lamp up or down until the top edge of the high intensity zone on the screen is 102 mm below the horizontal centerline.
5. Turn OFF the front fog lamps.

FRONT SIDE MARKER LAMP BULB REPLACEMENT

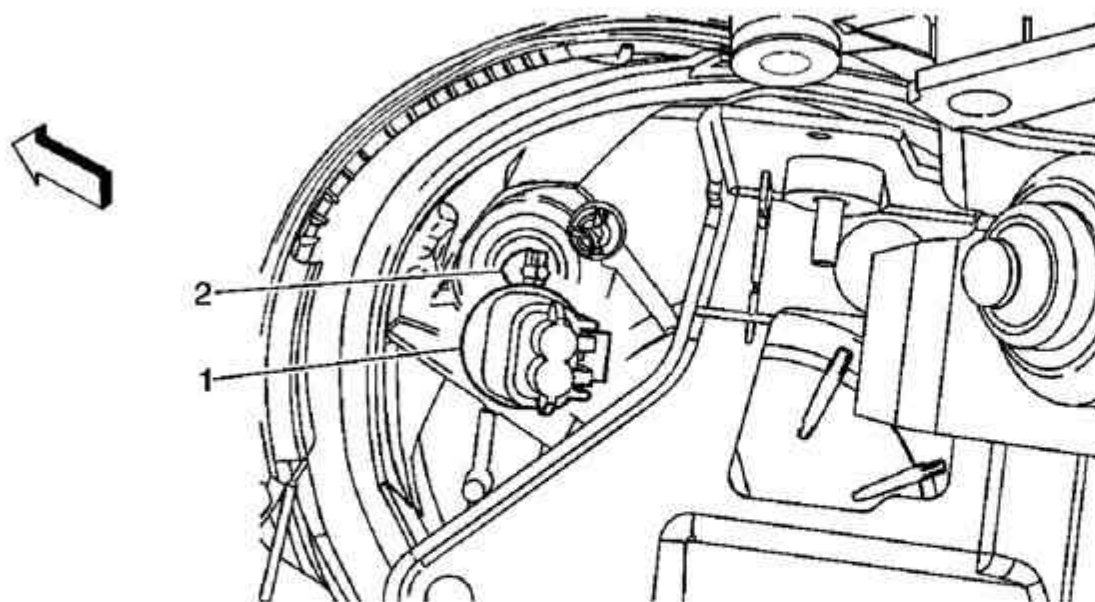


Fig. 54: Identifying Front Side Marker Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the LF or RF fender liner in order to access the front side marker lamp bulb. Refer to Front Fender Liner Replacement .	
1	Marker Lamp Bulb Socket Tip: Turn the socket a quarter turn counterclockwise in order to remove.
2	Marker Lamp Bulb Tip: Pull the bulb straight from the socket.

REAR SIDE MARKER LAMP BULB REPLACEMENT

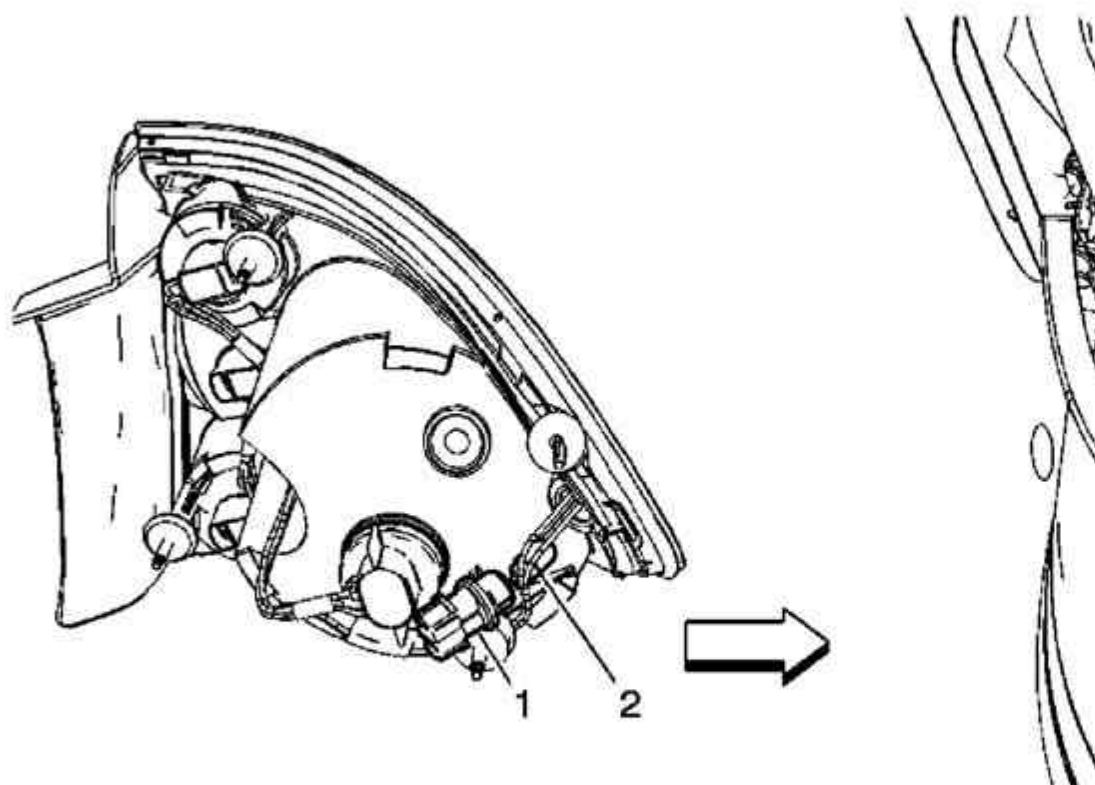


Fig. 55: Identifying Rear Side Marker Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the LR or RR tail lamp assembly. Refer to Tail Lamp Replacement .	
1	Rear Side Marker Lamp Bulb Socket Tip: Turn the lamp socket a quarter turn counter-clockwise and remove it from the lamp assembly.
2	Rear Side Marker Lamp Bulb Tip: Pull the bulb straight from the socket.

PARKING AND TURN SIGNAL LAMP REPLACEMENT

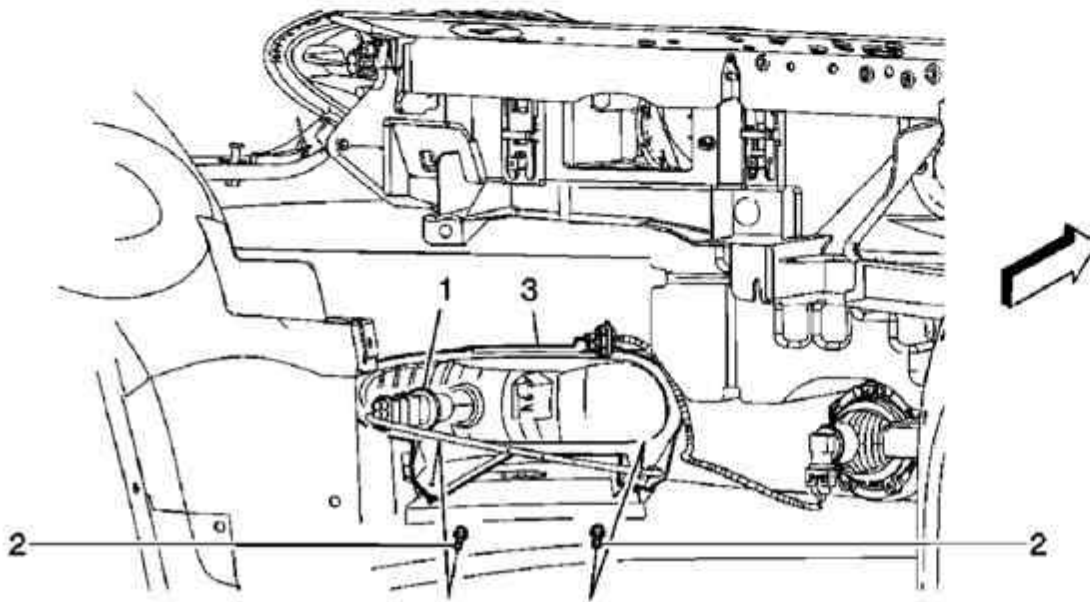


Fig. 56: Locating Park/Turn Signal Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 2. Remove the front bumper fascia lower air deflector. Refer to Front Bumper Fascia Air Deflector Replacement .	
1	Front Park and Turn Signal Lamp Socket Tip: Rotate the lamp socket counterclockwise in order to remove.
2	Front Park and Turn Signal Lamp Screw (Qty: 2) NOTE: Refer to Fastener Notice . Tighten: 2 N.m (18 lb in)
3	Front Park and Turn Signal Lamp Housing

PARK/TURN SIGNAL LAMP BULB REPLACEMENT

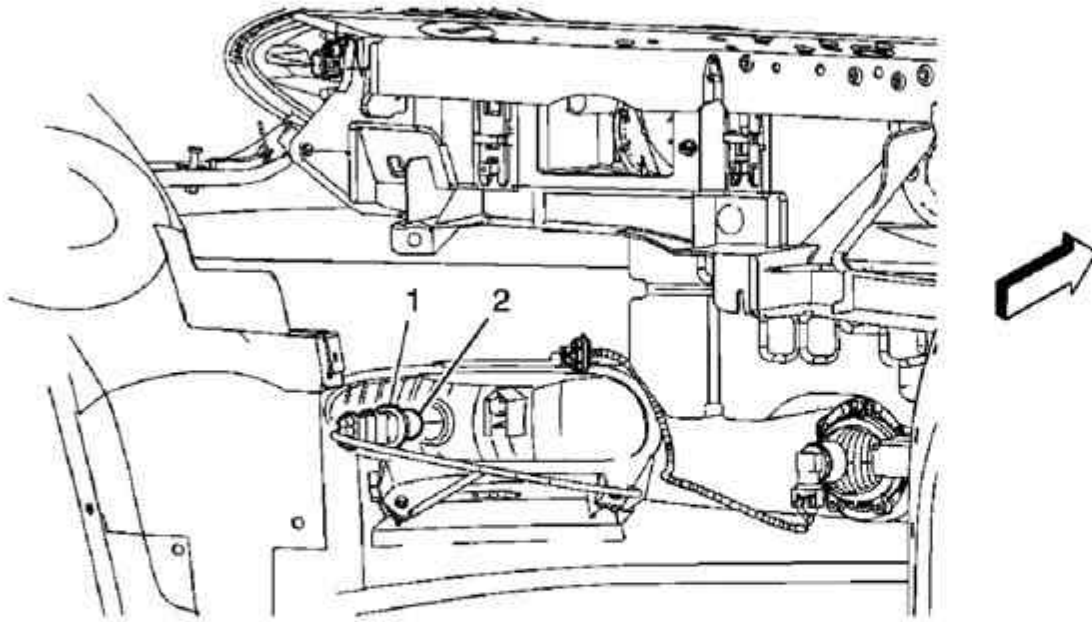


Fig. 57: Replacing Park/Turn Signal Lamp Bulb
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front bumper fascia lower air deflector. Refer to Front Bumper Fascia Air Deflector Replacement .	
1	Front Turn Signal Lamp Socket
2	Front Turn Signal Lamp Bulb CAUTION: Refer to Halogen Bulb Caution . Tip: Push the bulb inward and rotate a quarter turn counterclockwise to remove the bulb from the socket.

HIGH MOUNT STOP LAMP REPLACEMENT

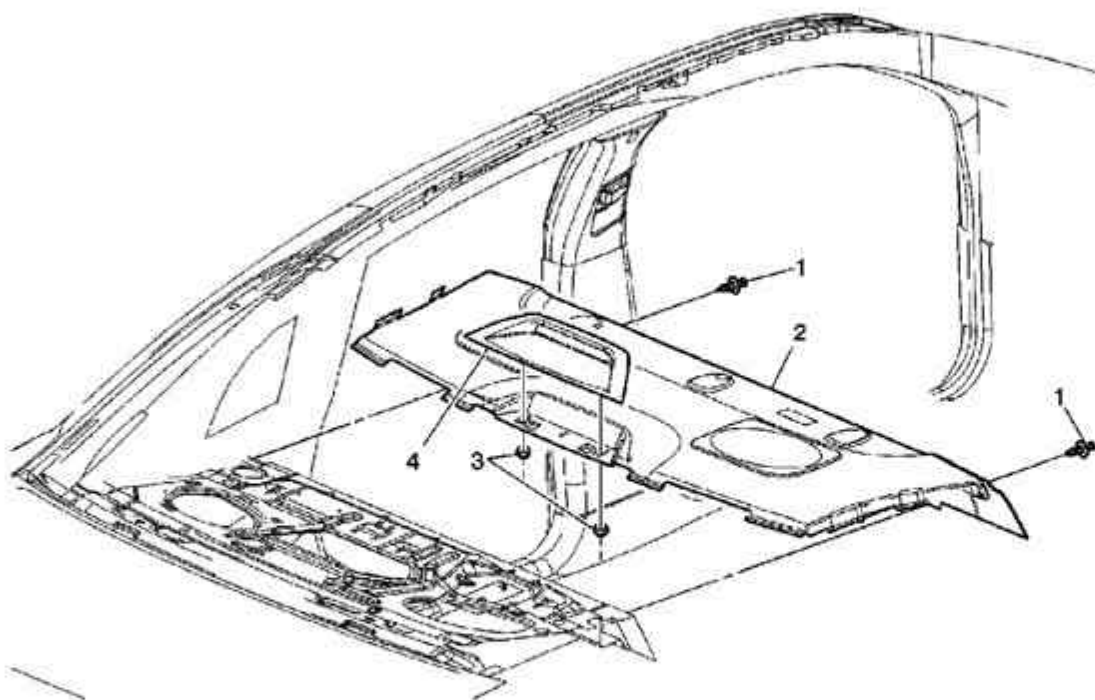


Fig. 58: Identifying Trim Panel - Rear Window Shelf
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Remove the rear seat cushion. Refer to <u>Rear Seat Cushion Replacement</u> . 2. Remove the rear seat back. Refer to <u>Rear Seat Back Replacement (Folding)</u> or <u>Rear Seat Back Replacement (Non-folding)</u> . 3. Remove the rear upper quarter trim panel. Refer to <u>Rear Quarter Upper Trim Panel Replacement</u> .	
1	Rear Window Panel Trim Retainer (Qty: 2)
2	Rear Window Panel Trim Assembly Tip: 1. Lift the panel and remove the outside seat belts through the slots in the trim panel. 2. Lift the panel and remove the center seat belt escutcheon, then pass it and the center seat belt through the slot in the trim panel. 3. Slide the panel forward to disengage the integral hook from the retaining hole. 4. Disconnect the electrical connector from the high mount stop lamp.
3	High Mount Stop Lamp Nut (Qty: 2) NOTE: Refer to <u>Fastener Notice</u> . Tighten: 2 N.m (18 lb in)
4	High Mount Stop Lamp Tip: The high mount stop lamp uses LED bulbs and must be serviced as an assembly.

BACKUP LAMP BULB REPLACEMENT

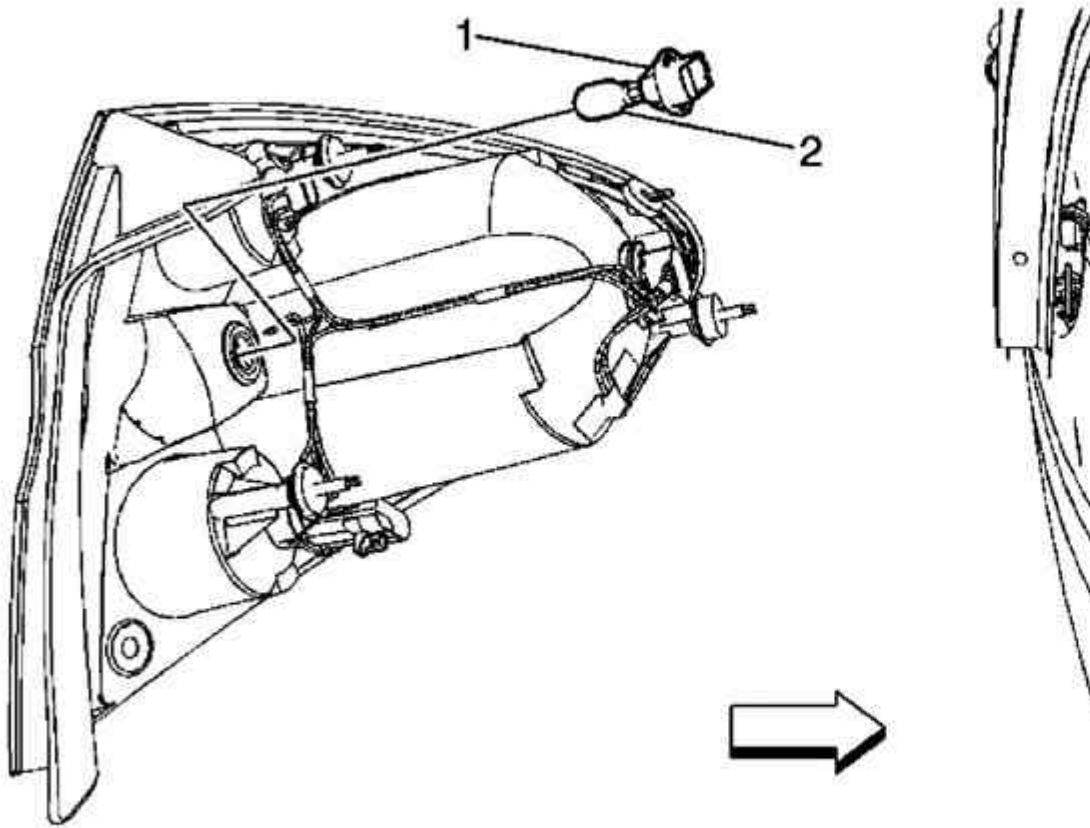


Fig. 59: Identifying Backup Lamp Bulb
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the LR or RR tail lamp assembly. Refer to <u>Tail Lamp Replacement</u> .	
1	Reverse Lamp Socket Tip: Turn the lamp socket a quarter turn counterclockwise and remove it from the lamp assembly.
2	Reverse Lamp Bulb CAUTION: Refer to <u>Halogen Bulb Caution</u> .

REAR LICENSE LAMP REPLACEMENT

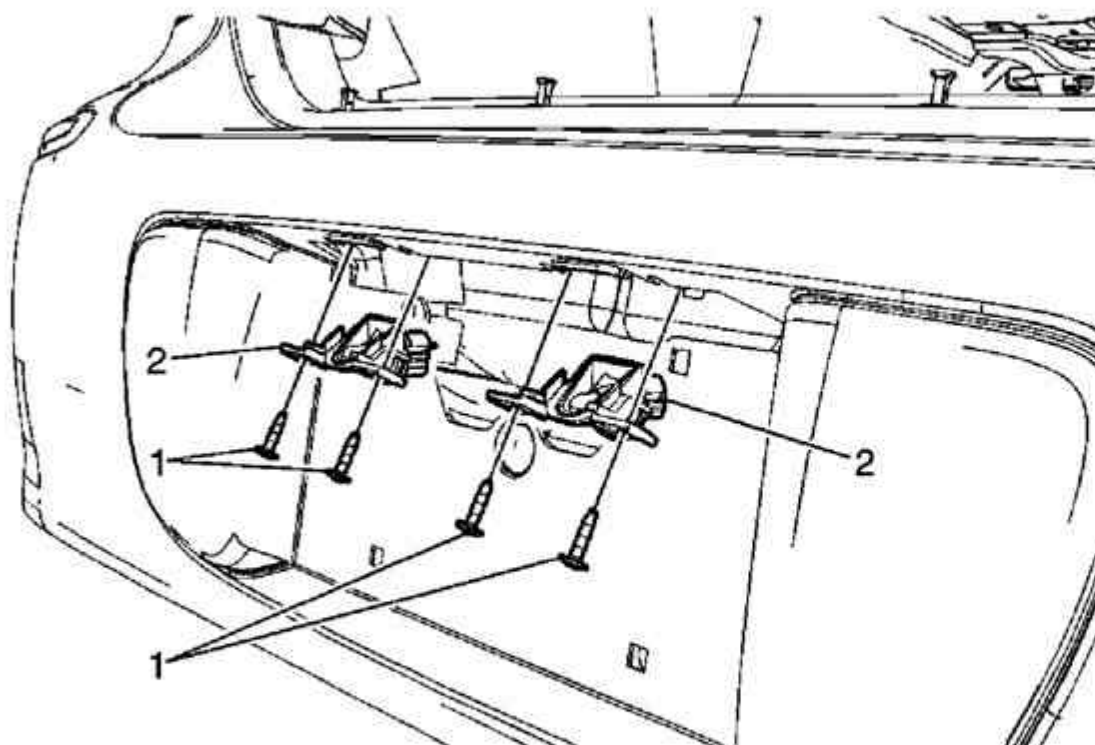


Fig. 60: View Of Rear License Lamp
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	License Plate Lamp Screw (Qty: 4) NOTE: Refer to <u>Fastener Notice</u> . Tighten: 1.9 N.m (17 lb in)
2	License Plate Lamps Tip: Remove the lens from the lamp sockets.

LICENSE LAMP BULB REPLACEMENT

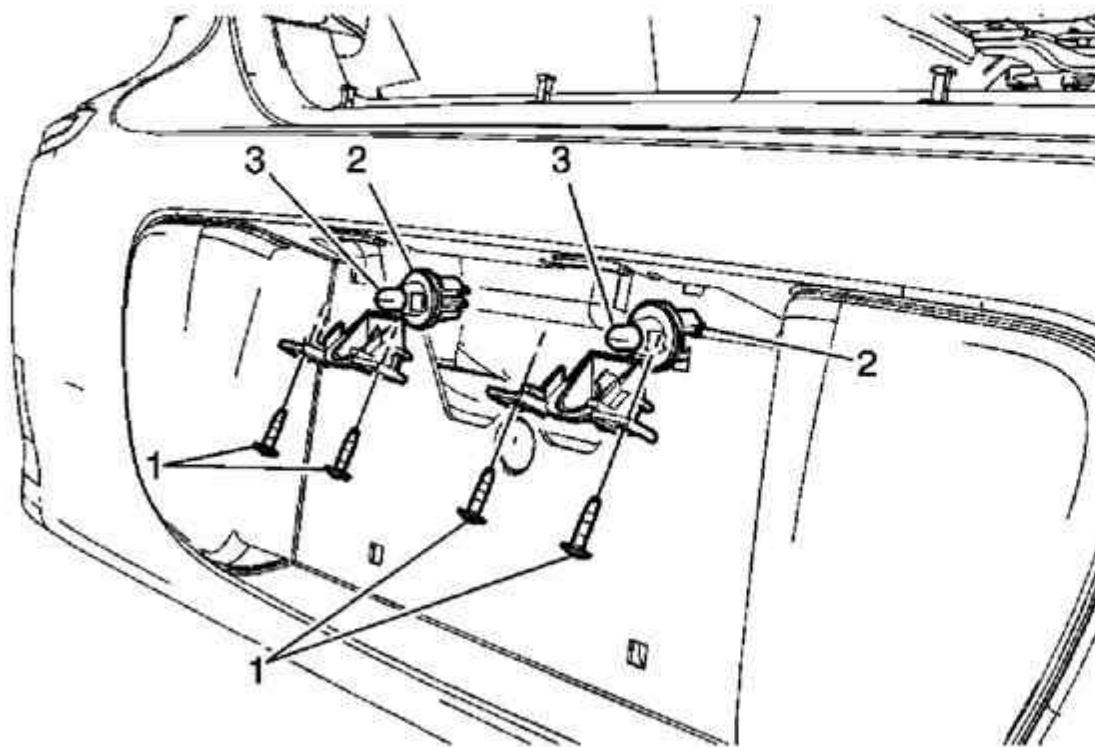


Fig. 61: Replacing License Lamp Bulb
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	License Plate Lamp Screw (Qty: 4) NOTE: Refer to <u>Fastener Notice</u> . Tighten: 1.9 N.m (17 lb in)
2	License Plate Lamp Bulb Sockets
3	License Plate Lamp Bulbs

TAIL LAMP REPLACEMENT

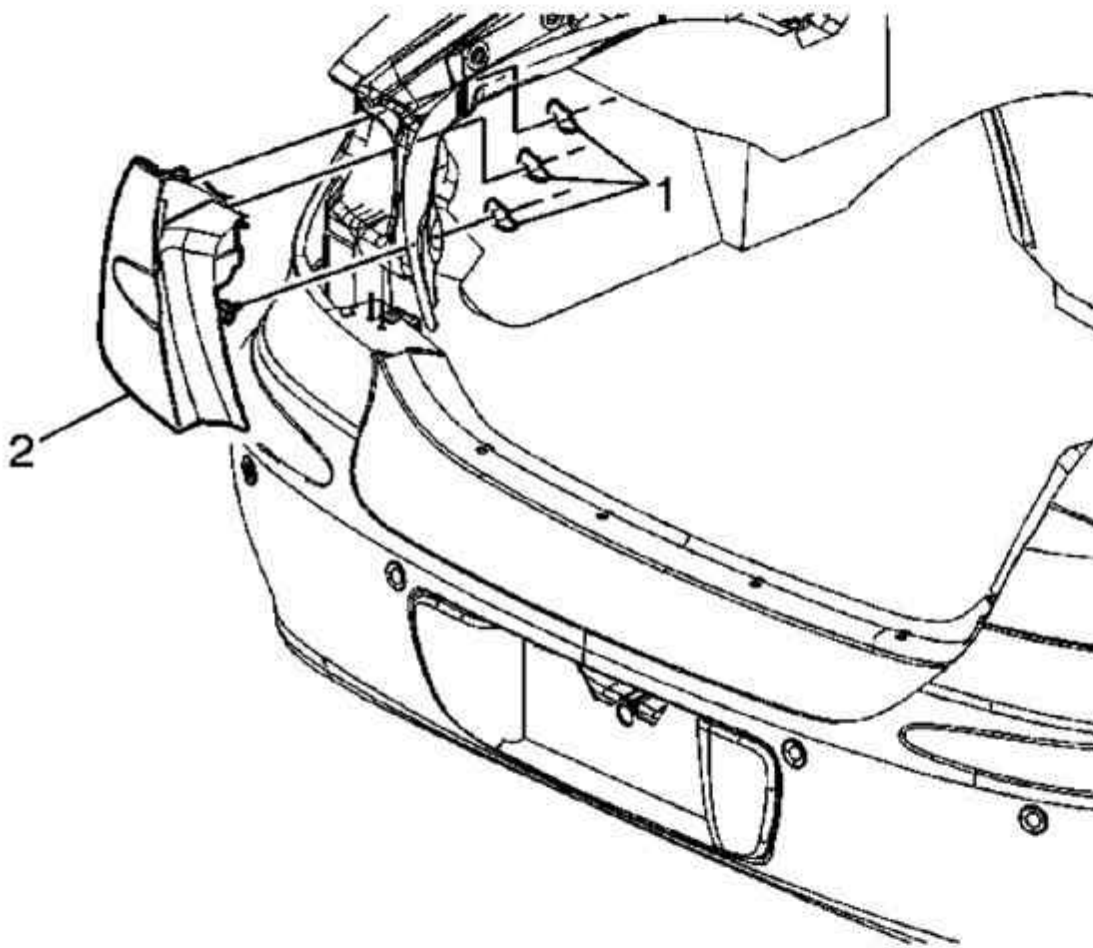


Fig. 62: View Of Tail Lamp
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Open the rear compartment lid. 2. Remove either the LH or RH three tie down nuts from the lamp assembly. 3. Pull the lamp assembly from the body rear end panel. 4. Disconnect the electrical connections.	
1	Tie Down Nut (Qty: 4) Tip: Reposition the carpet trunk liner prior to securing the tie down nuts.
	Rear Tail Lamp Assembly

- 2 **Tip:** Ensure the foam gaskets are not damaged and are in place on the lamp studs prior to installing the lamp to the body rear end panel.

TAIL LAMP BULB REPLACEMENT

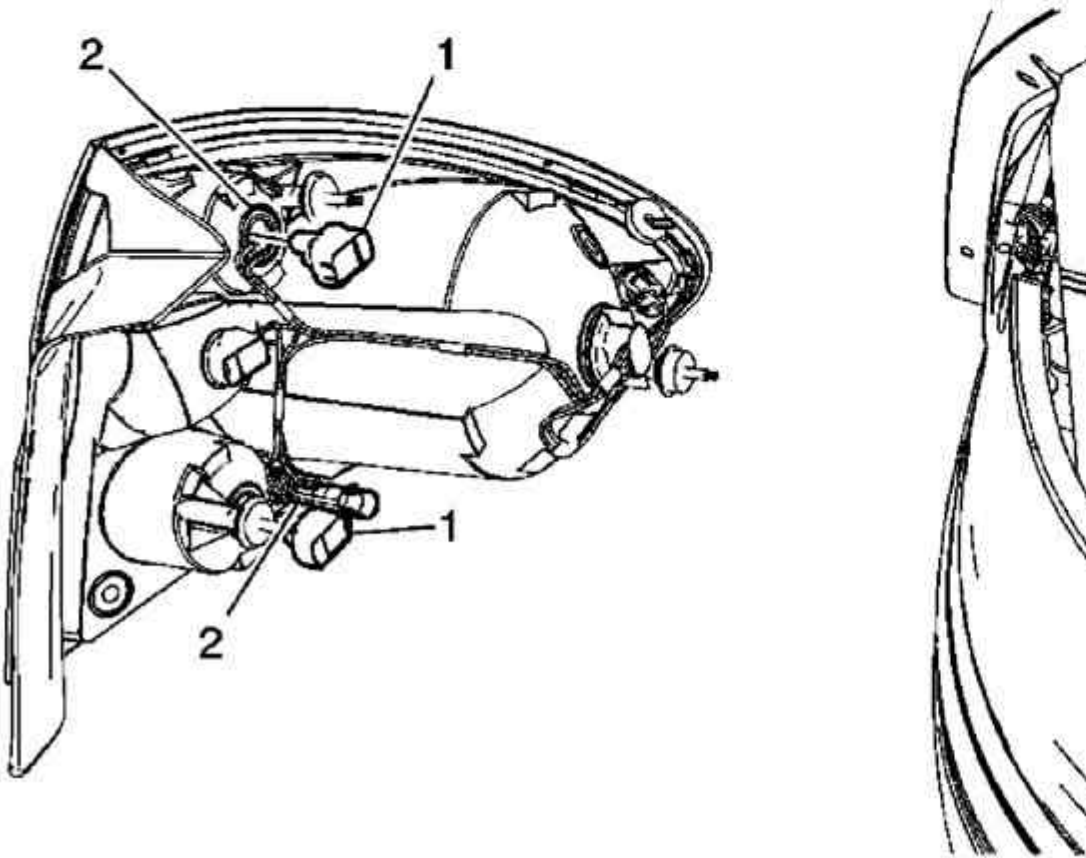


Fig. 63: Replacing Tail Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the LR or RR tail lamp assembly. Refer to <u>Tail Lamp Replacement</u> .	
1	Rear Tail Lamp Bulb Sockets Tip: Turn the lamp sockets a quarter turn counterclockwise and remove the lamp sockets from the lamp assembly.
2	Rear Marker Lamp Bulbs Tip: Pull the bulb straight from the lamp sockets.

REAR TURN SIGNAL LAMP BULB REPLACEMENT

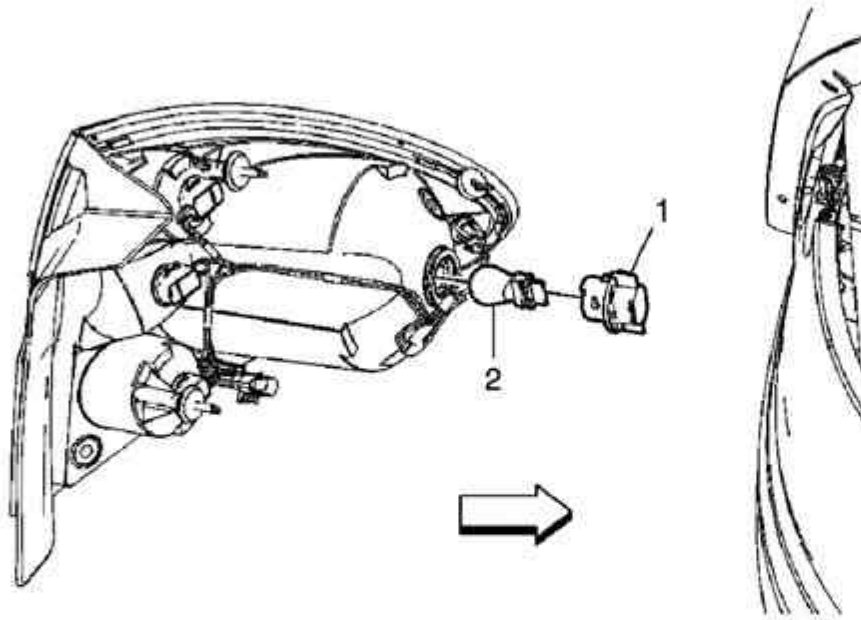


Fig. 64: Identifying Rear Turn Signal Lamp Bulb
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the LR or RR tail lamp assembly. Refer to Tail Lamp Replacement .	
1	Park Turn Directional Lamp Socket Tip: Turn the lamp socket a quarter turn counterclockwise and remove the socket from the lamp assembly.
2	Park Turn Directional Lamp Bulb Tip: Pull the bulb straight from the socket.

ROOF SIDE RAIL LAMP REPLACEMENT

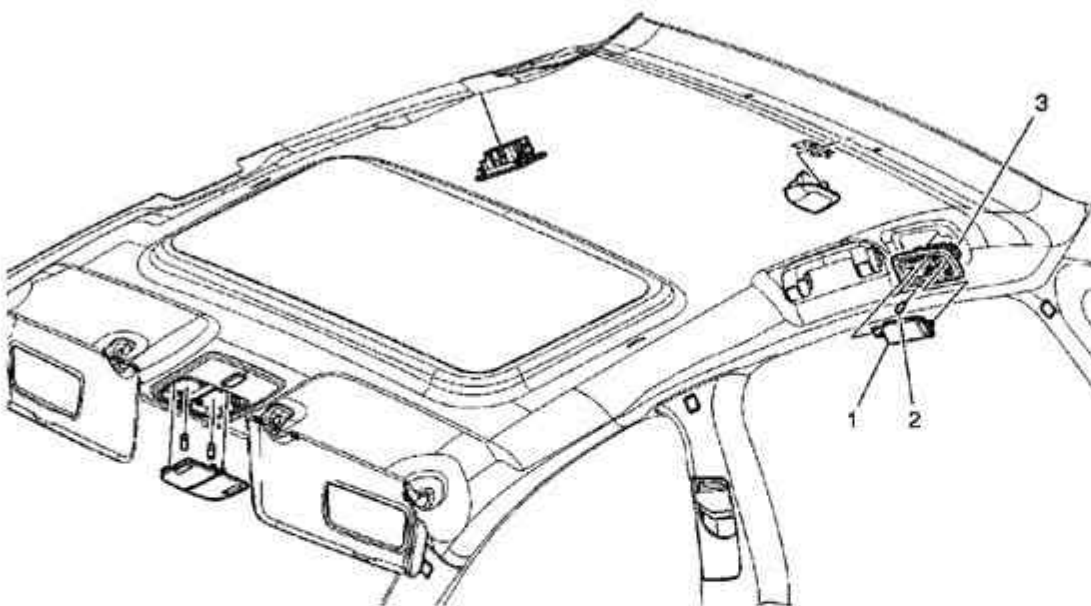


Fig. 65: Identifying Roof Side Rail Lamp
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Roof Rail Courtesy and Reading Lamp Lens Tip: Use a small flat-bladed tool at the rear edge of the lens in order to release the lens from

	the bracket.
2	Roof Rail Courtesy and Reading Lamp Bulb
3	Roof Rail Courtesy and Reading Lamp Assembly Tip: Disconnect the electrical connector.

REAR COMPARTMENT COURTESY LAMP REPLACEMENT

Removal Procedure

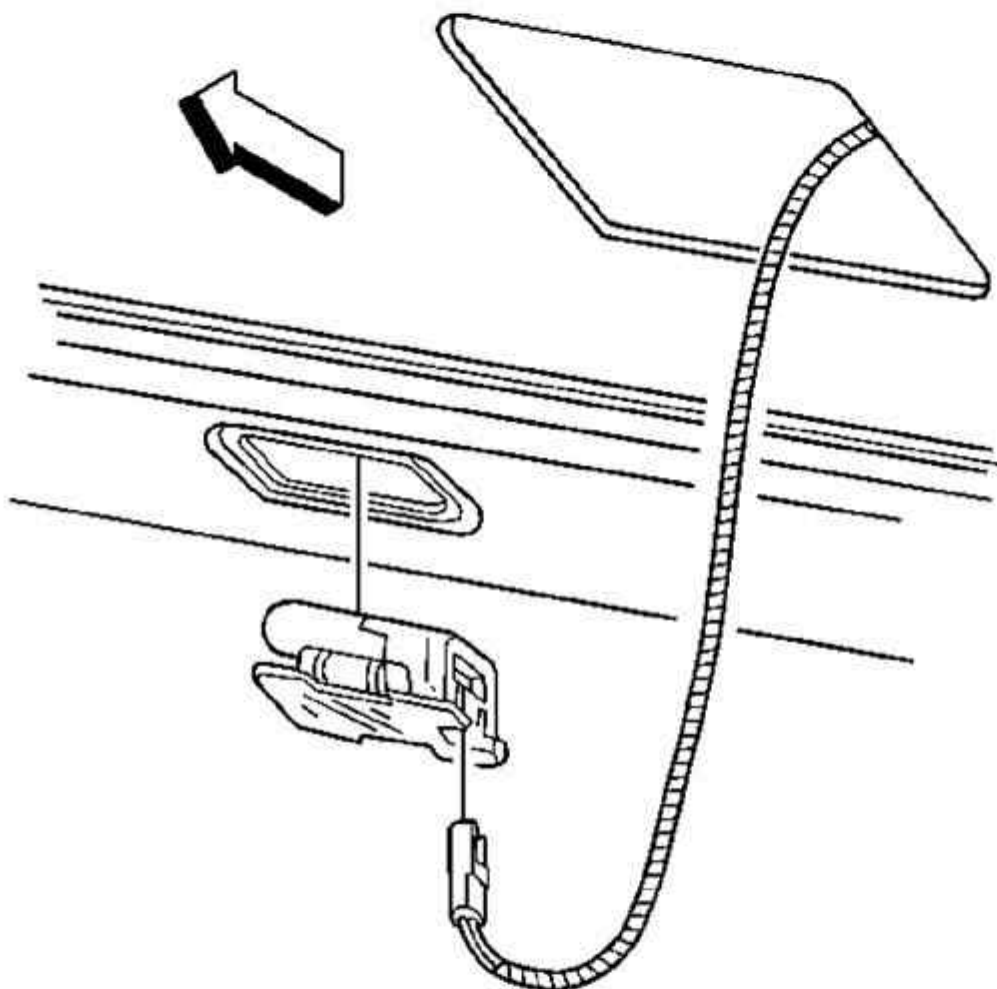


Fig. 66: Identifying Rear Compartment Lamp & Bulb
Courtesy of GENERAL MOTORS CORP.

1. Open the rear compartment.
2. Use a small flat-bladed tool to release the retaining tabs. Remove the rear compartment lamp.
3. Remove the bulb from the rear compartment lamp socket.

Installation Procedure

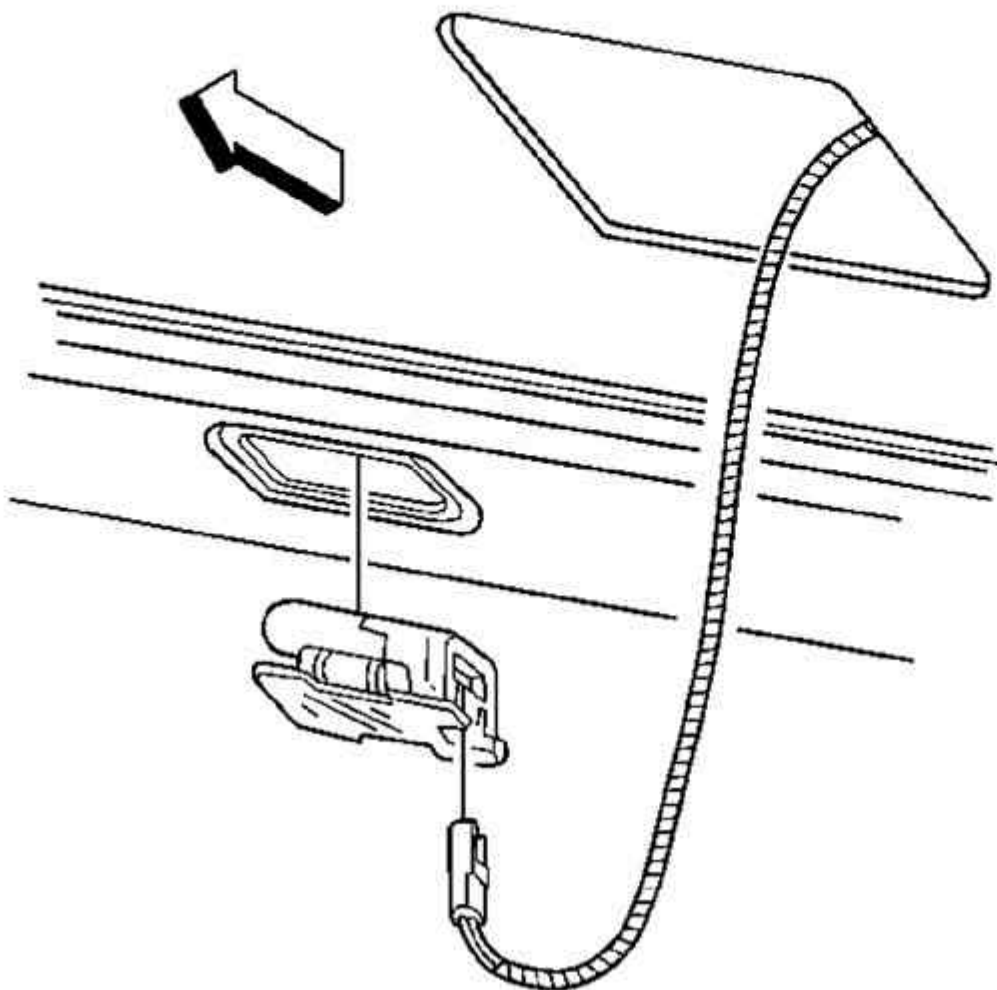


Fig. 67: Identifying Rear Compartment Lamp & Bulb
Courtesy of GENERAL MOTORS CORP.

1. Install the bulb to the rear compartment lamp socket.
2. Install the rear compartment lamp, pressing into the lamp place until fully seated.
3. Close the rear compartment.

DESCRIPTION AND OPERATION

EXTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

Exterior Lamps

The exterior lighting consist of the following lamps:

- The Headlamps
- The Fog Lamps
- The Park, Tail, License and Marker Lamps
- The Turn Signal Lamps
- The Stop Lamps
- The Backup Lamps

Headlamps

The headlamps may be turned ON 2 different ways. First, when the driver places the headlamp switch is placed in the ON position, for normal operation. Second, with the headlamp switch placed in the OFF position, for automatic lamp control (ALC). During ALC control the headlamps will be in day time running lamp (DRL) operation in daylight conditions, or low beam operation in low light conditions.

For low beam operation, battery positive voltage is applied at all times to the coil and switch side of the low beam relay in the underhood fuse block. Ground is applied at all times from G202 to the headlamp switch. When the headlamp switch is placed in the HEAD position, ground is applied to the headlamps ON signal circuit to the body control module (BCM). When either the headlamp switch is placed in the HEAD position or ALC is enabled, the BCM applies a ground to the low beam relay control circuit. This energizes the relay and applies battery positive voltage to the LEFT and RIGHT low beam fuses in the underhood fuse block. Battery positive voltage is then applied from the fuses through the headlamp supply voltage circuit to the headlamps. Ground is applied at all times to the left headlamp from G101 and to the right headlamp from G100.

For high beam operation, battery positive voltage is applied at all times to the coil and switch side of the high beam relay in the underhood fuse block. Ground is applied at all times from G202 to the headlamp dimmer switch. When the dimmer switch is placed in the HIGH position, ground is applied to the high beam signal circuit to the BCM. The BCM then applies a ground to the high beam relay control circuit. This energizes the relay, and applies battery positive voltage to the LEFT and RIGHT high beam fuses in the underhood fuse block. Battery positive voltage is then applied from the fuses, through the high beam headlamp supply voltage circuit to the headlamps. Ground is applied at all times to the left headlamp from G101 and to the right headlamp from G100.

For flash-to-pass (FTP) operation, when the headlamp dimmer switch is placed in the FTP position, ground is applied from G202 through the headlamp dimmer switch to the flash-to-pass signal circuit to the BCM. The BCM then turns the high beam headlamps ON as long as the headlamp dimmer switch is in the FTP position.

If the headlight switch is left in the ON position, the inadvertent power control feature will turn off the headlights 10 minutes after the ignition switch is turned to the OFF position. If the driver places the headlight switch in the ON position after the ignition switch has been turned OFF, or if the ignition switch is in the ACCY position, the headlights will remain on until turned off or the battery runs dead.

Lights On Warning

The body control module (BCM) activates the lights on warning as requested by the headlamp dimmer switch. The lights ON warning sounds when the following occurs:

- The key is out of the ignition.
- The BCM determines that the drivers door is open, signal is low.
- The BCM determines that the headlamp switch is in the park or head position.

Daytime Running Lamps (DRL)

The ambient light sensor is a light sensitive transistor that varies its signal to the body control module (BCM) in response to changes to the outside ambient light level any function or condition that turns on the headlamps will cancel the DRL lamps operation. With the headlamp switch in the OFF position, the turn signal lamps will either be turned ON or OFF after a 30 second delay, depending on whether daylight or low light conditions are sensed by the ambient light sensor. The DRL operates when the ignition switch is in the RUN position and the parking brake is not applied, or the transmission is not in PARK. When these conditions have been met and the ambient light sensor indicates daylight conditions, then the BCM will illuminate the front turn signal lamps ON steady.

Fog Lamps

The FOG LAMPS fuse in the underhood fuse block supplies battery positive voltage to the coil and switch side FOG LAMP relay in the underhood fuse block. When the fog lamp switch is placed in the ON position, ground is applied from G202 through the fog lamp switch to the body control module (BCM). The BCM then applies a

ground to the FOG LAMP relay control circuit. This energizes the FOG LAMP relay, and applies battery positive voltage to the fog lamp voltage supply circuit. Ground is applied to the left fog lamp from G101 and to the right fog lamp from G100. The park lamps or low beam headlights must be ON in order for the fog lamps to illuminate. In addition, the BCM will send the serial data class 2 message to illuminate the fog lamp indicator in the IPC. Fog lamp operation will be cancelled whenever the park lamps are turned OFF or the high beam headlamps are turned ON.

Park, Tail, Marker and License Lamps

The PARK LAMPS fuse in the instrument panel (I/P) fuse block applies battery positive voltage to both the coil and switch side of the PARK LAMP relay in the I/P fuse block. When the headlamp switch is placed in either the PARK or HEAD position, ground is applied from G202 to the headlamp switch. The headlamp switch then applies the ground through the park lamp switch ON signal circuit to the body control module (BCM). The BCM then applies a ground to the PARK LAMP relay enable circuit. This energizes the PARK LAMP relay, applying battery positive voltage to all the park, tail, marker and license lamps. The park, tail, marker and license lamps are also turned ON when the headlamps are commanded ON by the BCM for low light operation.

Remote Keyless Entry Exterior Lamp Illumination

When the remote function actuation (RFA) module receives a door unlock command from the remote function actuator transmitter, the RFA module will ground the door unlock signal circuit to the body control module (BCM), send a class 2 message to the BCM, indicating that an UNLOCK command has been received. The BCM will then flash the park lamps twice. With all the doors closed, and the RKE transmitter is used to lock the doors, the park lamps will flash twice. The park lamps will not flash if the rear compartment is opened using the RKE transmitter.

Turn Signal Lamps

The STOP/TURN/HAZARD fuse in the instrument panel (I/P) fuse block supplies battery positive voltage to the body control module (BCM) for the turn signal lamps. When the turn switch is placed in the LEFT TURN or RIGHT TURN position, ground is applied from G202 through the turn switch, to the turn signal switch signal circuit and to the BCM. The BCM then applies battery positive voltage to front and rear turn signal lamps supply voltage circuits. The left front turn signal lamp is grounded at G100, right front at G101, left rear at G301 and the right rear is at G302.

Turn Signal Reminder

The driver information center (DIC) activates the turn signal warning as requested by either turn signal switch. The turn signal warning sounds when the following occurs:

- The ignition is in RUN.
- The turn signal switch is in either turn position, sensing, within 1 second, an open to battery positive voltage transition in the turn signal control circuit, left or right turn.
- The vehicle has traveled a distance of 1.2 km (0.75 mi) by counting pulses in the rolling odometer class 2 message.

The DIC turns OFF the turn signal reminder when either the ignition switch is turned to the OFF position, or the turn signal switch returns to the OFF position, sensing within 1 second, no transitions from open to battery positive voltage in either of the turn signal control circuits, left turn or right turn.

Stop Lamps

The turn signal lamps are also used as stop lamps. The STOP/TURN/HAZARD fuse in the instrument panel (I/P) fuse block supplies battery positive voltage to the body control module (BCM) for the stop lamps.

A 10-volt reference signal and a low reference signal is applied from the BCM to the brake pedal position (BPP)

sensor. When the brake pedal is applied, the BPP sensor applies a signal to the BPP sensor signal circuit to the BCM. The BCM then applies battery positive voltage to the LR and RR stop/tail/turn lamps through the LR and RR stop/turn lamps supply voltage circuit. The BCM also supplies a battery positive voltage to the CHMSL through the stop lamp supply voltage circuit. The ground for the LR stop/tail/turn lamp is supplied from G301. The ground for the RR stop/tail/turn lamp and for the CHMSL is supplied from G302.

Backup Lamps

The CHMSL/BACKUP fuse in the instrument panel (I/P) fuse block supplies battery positive voltage to the body control module (BCM). When the driver places the gear selection into the REVERSE position, the powertrain control module (PCM) sends a class 2 message to the BCM. The message indicates that the gear selector lever is in the REVERSE position. The BCM then applies battery positive voltage from the CHMSL/BACKUP fuse supply circuit to the backup lamps voltage supply circuit. Ground for the backup lamps is supplied from G302.

Battery Rundown Protection / Inadvertent Power

The body control module (BCM) used in this vehicle controls the lighting system through circuits that enable both the exterior lamp functions of park, head and fog lamps as well as the interior lamps. The BCM opens these enabling circuits 20 minutes after the ignition switch is turned OFF with no lamp switch activity. If the ignition switch is turned to any position other than OFF, or if a lamp switch is activated, during this 20 minute period the timer will reset for another 20 minutes.

INTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

Interior Lighting

The interior lighting consist of lamps that may not be dimmed (Interior Lamps) and lamps that may be dimmed (Interior Lamps Dimming).

Interior Lamps

The first group of lamps are the interior courtesy lamps that may not be dimmed manually, these include:

- The dome lamp
- The instrument panel (I/P) compartment lamp
- The I/P courtesy lamps
- The overhead console courtesy lamps
- The rear compartment lamp
- The roof rail courtesy/reading lamps
- The sunshade vanity mirror lamps

Interior Lamps Features

The interior lamps system features the following functions:

- An illuminated entry feature that illuminates the courtesy lamps when entering the vehicle or activating the remote keyless entry system.
- An illuminated exit feature that illuminates the courtesy lamps when the ignition key has been removed from the ignition.
- An inadvertent power feature that supplies voltage to all interior lamps after the ignition is turned OFF. The inadvertent power feature will deactivate all interior lamps after 20 minutes to prevent battery rundown.
- A theatre dimming feature that will slowly dim the interior lamps from full brightness to off.
- An I/P dimmer switch that illuminates the courtesy lamps.
- Individual switches for control of each interior lamp that is not illuminate with the interior lamp switch.

Courtesy/Illuminated Entry Lamps

When the body control module (BCM) is in an active state (awake) it energizes the courtesy lamps supply voltage circuit. The courtesy lamps supply voltage circuit supplies voltage to all of the interior lamps, including the illuminated entry lamps (courtesy lamps). The illuminated entry lamps are turned on when they receive a battery positive voltage from the courtesy lamp supply voltage circuit of the BCM. When the ignition is in the LOCK position the BCM will apply the courtesy lamp supply voltage circuit under the following conditions:

- The door jamb input transitions to an active state (opening a door).
- The use of the remote keyless entry (RKE) to unlock the side doors.

When the courtesy lamps supply voltage circuit and the courtesy lamp low control circuit are active the courtesy/illuminated entry lamps will illuminate. The courtesy lamps/illuminated entry lamps include the following interior lamps:

- The dome lamp
- The roof rail courtesy lamps
- The I/P courtesy lamps
- The overhead console courtesy lamps

When the driver uses the remote function actuator transmitter to unlock the doors, the BCM will illuminate the courtesy lamps for approximately 40 seconds, unless another BCM function causes the lamps to remain active. If the ignition switch is turned to either the RUN or START position the courtesy lamps will turn off immediately.

When the door latch switch signal circuit is active with the ignition in the OFF position the BCM will illuminate the courtesy lamps. The courtesy lamps will remain illuminated for approximately 25 seconds, after the door latch switch signal circuit becomes inactive, unless another BCM function causes the lamps to remain active. If the ignition switch is turned to either the RUN or START position the courtesy lamps will turn off immediately.

Courtesy/Illuminated Exit

The illuminated exit feature will activate the courtesy lamps when the key IN input of the BCM transitions from an active state to an inactive state (removing the ignition key). When the key is removed from the ignition, the key IN input to the BCM becomes inactive. The BCM will illuminate the courtesy lamps for approximately 25 seconds, unless another BCM function causes the lamps to remain active.

Inadvertent Power Feature

Inadvertent power feature provides a similar function for the interior lamps as a retained accessory power feature. The BCM will energize the courtesy lamps supply voltage circuit when the BCM is in the active state (awake). When the courtesy lamps supply voltage circuit is energized, it supplies voltage to all the interior lights. The BCM will continue to supply voltage to the interior lamps after the ignition is turned OFF so that the interior lamps may be operated.

The inadvertent power feature will also act as battery run down protection by deactivate the courtesy lamps supply voltage circuit after 20 minutes once the BCM becomes inactive (ignition OFF and no BCM input activity.)

Theater Dimming

The theatre dimming feature that will slowly dim the interior lamps from full brightness to off. The following actions will over ride the theatre dimming feature causing the courtesy lamps to deactivate immediately if no other BCM function commands the courtesy lamps on:

- A transition from active to inactive of the interior lamps switch (turning off the interior lamps switch).
- A LOCK command from the remote keyless entry system.

- A last door closed locking function (locking and closing all the doors).

Courtesy Lamps Manual Operation

The courtesy lamps, may be manually operated by the I/P dimmer switch. When the I/P dimmer switch is placed in the DOME position the BCM receives a ground from the courtesy lamp switch signal circuit. Upon receiving the courtesy lamp switch signal the BCM then applies battery positive voltage to the courtesy lamp supply voltage circuit, which illuminates the courtesy lamps. The voltage for all interior lamps is supplied by the courtesy lamp supply voltage circuit of the BCM, whenever the BCM is active. The interior lamp switch will override any BCM operation of the interior lamps, such as entry illumination.

Dome Lamp

The dome lamp is turned ON by the I/P dimmer switch or during illuminated entry.

During illuminated entry or when the I/P dimmer switch is DOME the BCM wakes up and then energizes the courtesy lamps supply voltage circuit, supplying voltage to all interior lamps.

I/P Compartment Lamp

When the I/P compartment is opened the I/P compartment lamp illuminates, if the courtesy lamps supply voltage circuit of the BCM is activated (BCM awake).

The I/P compartment lamp illuminates when the courtesy lamps supply circuit of the BCM supplies voltage to the IP compartment lamp and the IP compartment switch closes, providing a ground path.

I/P Courtesy Lamp

The I/P courtesy lamp is turned ON by the IP dimmer switch or during illuminated entry.

During illuminated entry or when the I/P dimmer switch is DOME the BCM wakes up and then energizes the courtesy lamps supply voltage circuit, supplying voltage to all interior lamps.

Overhead Console Courtesy/Reading Lamp

The overhead console courtesy lamp is turned ON by the I/P dimmer switch, the overhead console reading lamp switch, or during illuminated entry.

Rear Compartment Lamp

When the rear compartment is opened, the rear compartment lamp illuminates.

When the rear compartment is opened, the rear compartment courtesy lamp switch sends a ground signal to the BCM, waking the BCM. When the BCM wakes up it will then energize the courtesy lamps supply voltage circuit, supplying voltage to the rear compartment courtesy lamp. The rear compartment courtesy lamp switch will provide a ground path for the rear compartment courtesy lamp in order to illuminate the lamp.

Roof Rail Courtesy/Reading Lamps

The roof rail courtesy lamps are turned ON by the I/P dimmer switch, the individual roof rail courtesy lamp switch, or during illuminated entry.

During illuminated entry or when the I/P dimmer switch is ON the BCM wakes up and then energizes the courtesy lamps supply voltage circuit, supplying voltage to all interior lamps.

The roof rail courtesy/reading lamps can be turned on from the individual roof rail courtesy lamp switch. The BCM supplies voltage through the courtesy lamps supply voltage circuit when the BCM is awake. Manually turning on

the roof rail courtesy lamp switch provides a ground path.

Sunshade Vanity Mirror Lamps

When the vanity mirror cover on the sunshade is opened, the sunshade mirror lamp illuminates.

The sunshade mirror lamps receive voltage from the courtesy lamps supply voltage circuit anytime the BCM is awake. The sunshade illuminated mirror lamps receive ground from their individual switches when the sunshade is open.

Interior Lamps Dimming

The second group of lamps include lamps which may be dimmed. This group uses a combination of class 2 dimming and incandescent lamps:

- PRNDL lamp
- Head-up display (HUD) switch
- Door switches and window switches
- HVAC control head assembly
- Outside rear view mirror switches
- Driver information center (DIC)
- Radio
- Steering wheel controls
- The instrument panel cluster (IPC)
- Traction control switch

When the headlamp switch is placed in the PARK position, ground is supplied through the headlamp switch to body control module (BCM). The BCM also applies a voltage reference and a low reference signal to the interior lamp switch. When the interior lamp switch is varied, the position of the switch is applied through the I/P dimming control circuit to the BCM. The BCM then applies a voltage to the interior lamps.

Incandescent Dimming

The incandescent lamps become illuminated when the park lamps are ON. The brightness of all the incandescent lamps is determined by a variable voltage signal from the dimmer switch and sent through the instrument panel (I/P) lamp supply voltage circuit. The incandescent lamps are located in various components, refer to **Interior Lights Dimming Schematics**.

Class 2 Dimming

The class 2 lamps will be at full brightness when the ignition is on and the park lamps are OFF. When the park lamps are turned on, the BCM applies a signal to the class 2 circuit to the IPC and DIC. The class 2 display will then dim to the level set by the dimmer switch. The brightness of all the class 2 displays is determined by a variable voltage signal produced by the dimmer switch. With the park lamps activated, the IPC and DIC will dim for night time viewing.

Driver Controls and Modules

The BCM module processes the inputs and the controls. The ambient light sensor supplies the BCM with a signal for daytime conditions or for low light conditions:

- The body control module (BCM)
- The driver information center (DIC)
- The instrument panel cluster (IPC)

Driver controls include the following components:

- The I/P dimmer switch
- The door jamb switches
- The headlamp switch
- The rear compartment lid ajar switch
- The overhead console courtesy reading lamp switch
- The roof rail courtesy reading lamp switch
- The sunshade vanity mirror lamps switch
- The IP compartment lamp switch

2008 Buick LaCrosse CXL
2008 ACCESSORIES & EQUIPMENT Lighting - LaCrosse

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