

2010 ACCESSORIES & EQUIPMENT

Lighting - Equinox & Terrain

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Brake Pedal Position Sensor Bolt	9 N.m	80 lb in
Front Fog Lamp Screw	2 N.m	18 lb in
Headlamp Mounting Bolt-Equinox	4 N.m	35 lb in
Headlamp Mounting Bolt-Terrain	4.4 N.m	39 lb in
High Mount Stop Lamp Screw	2.5 N.m	22 lb in
Tail Lamp Nut-Equinox	2.5 N.m	22 lb in
Tail Lamp Nut-Terrain	6.36 N.m	56 lb in
Tail Lamp Screw	2.5 N.m	22 lb in

SCHEMATIC AND ROUTING DIAGRAMS

HEADLIGHTS/DAYTIME RUNNING LIGHTS (DRL) SCHEMATICS

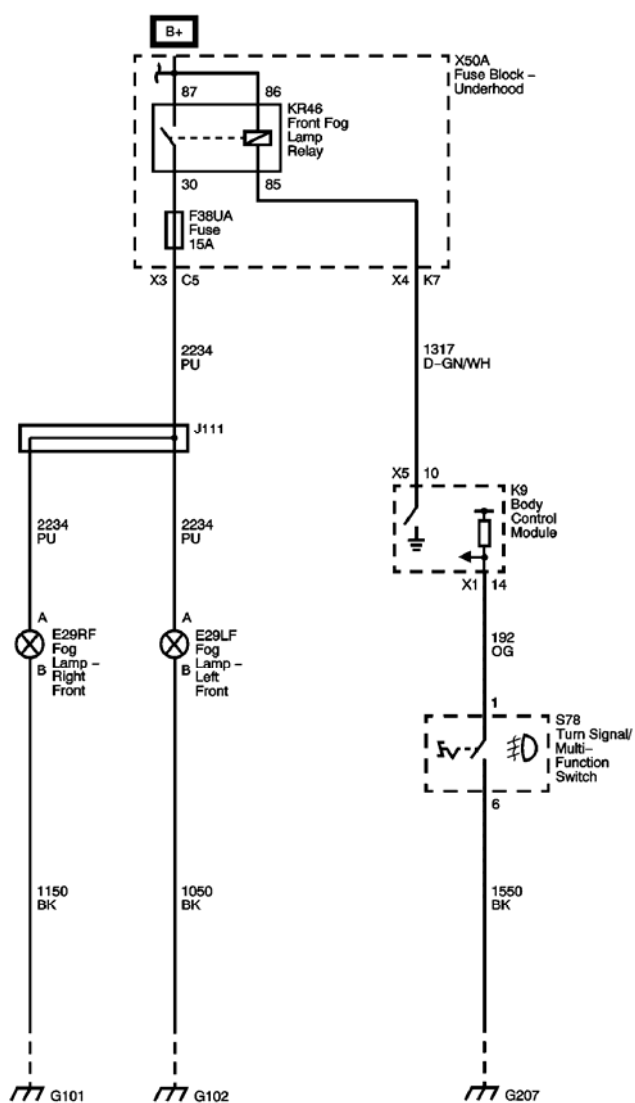


Fig. 2: Fog Lights

Courtesy of GENERAL MOTORS CORP.

EXTERIOR LIGHTS SCHEMATICS

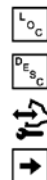
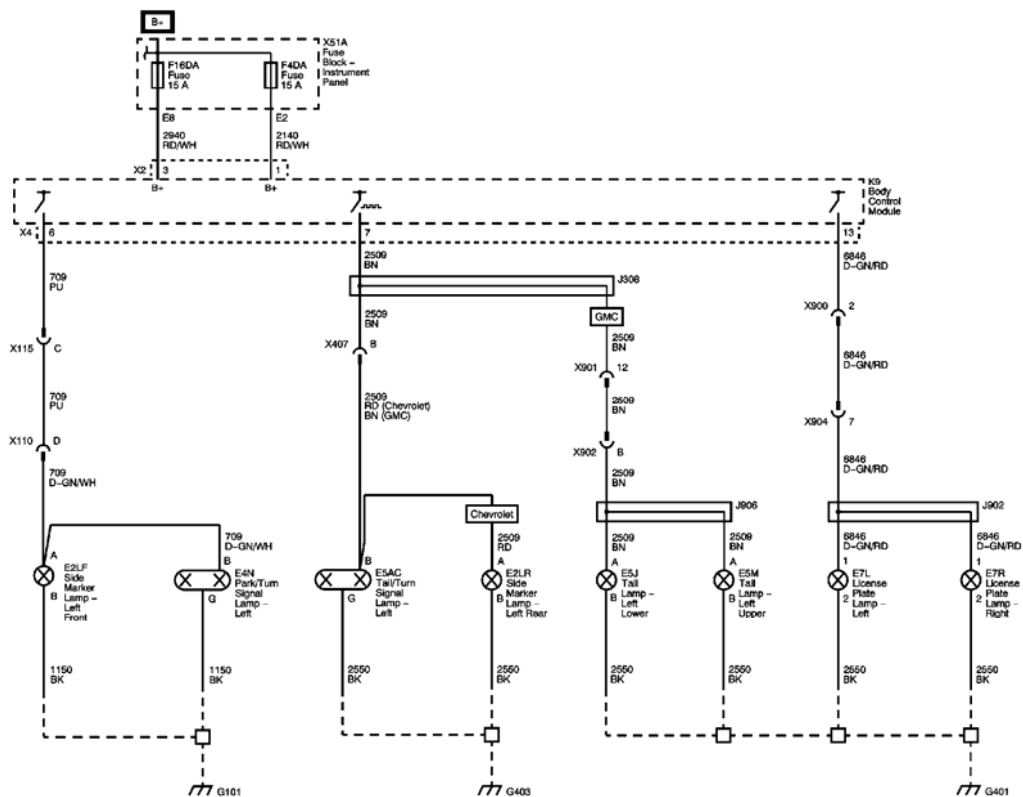


Fig. 3: Left Park and License Lamps
 Courtesy of GENERAL MOTORS CORP.

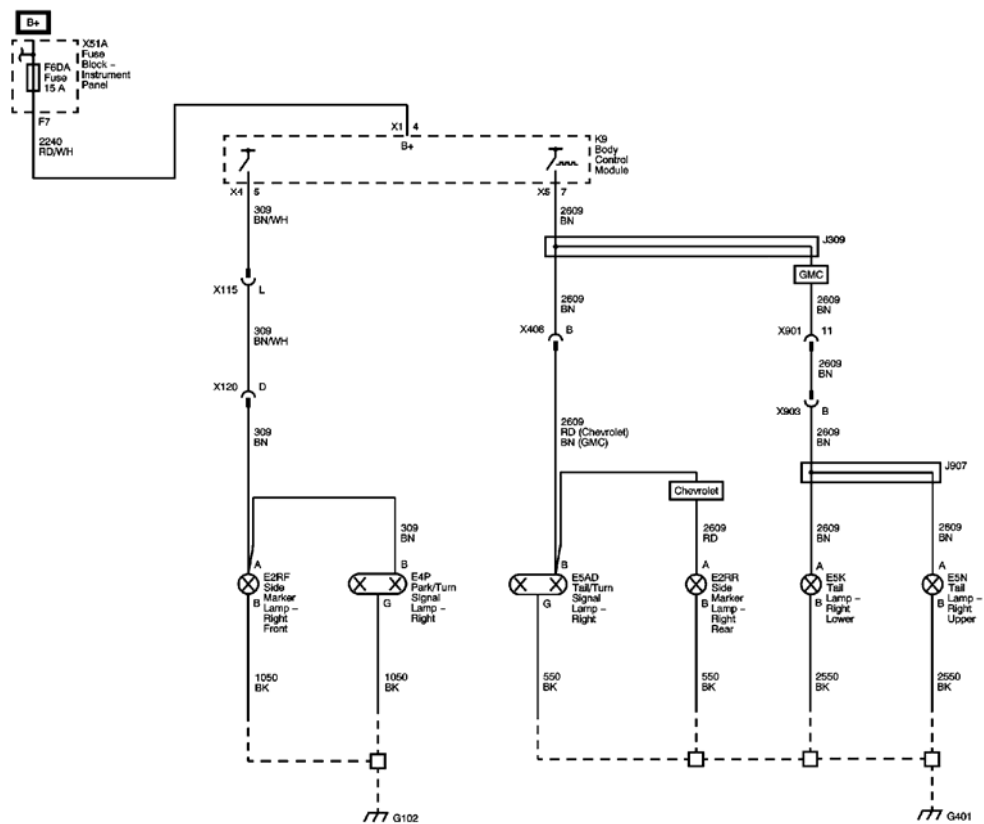


Fig. 4: Right Park Lamps

Courtesy of GENERAL MOTORS CORP.

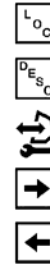
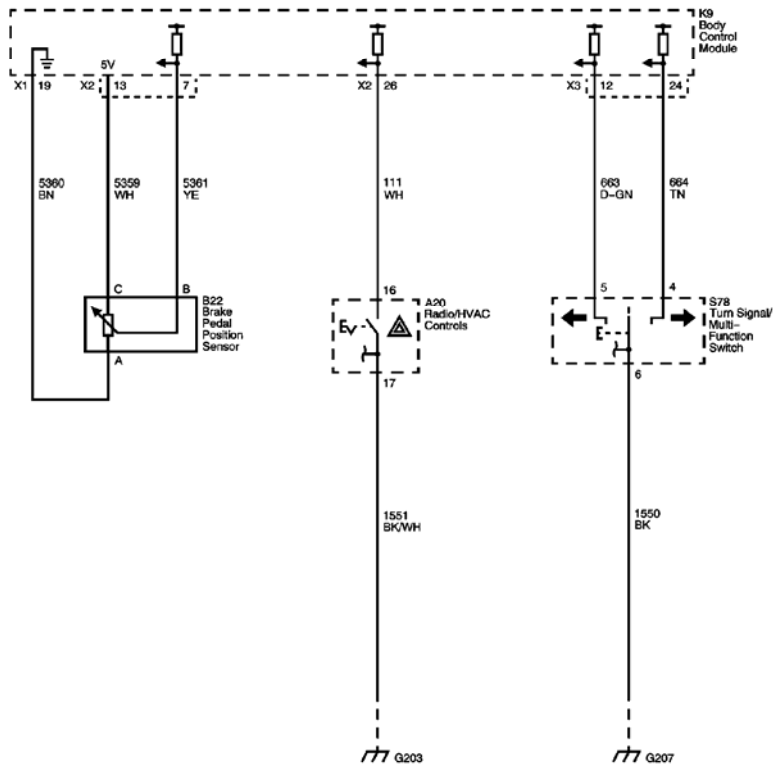


Fig. 5: Turn Signal and Stop Lamp Controls
 Courtesy of GENERAL MOTORS CORP.

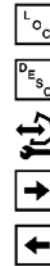
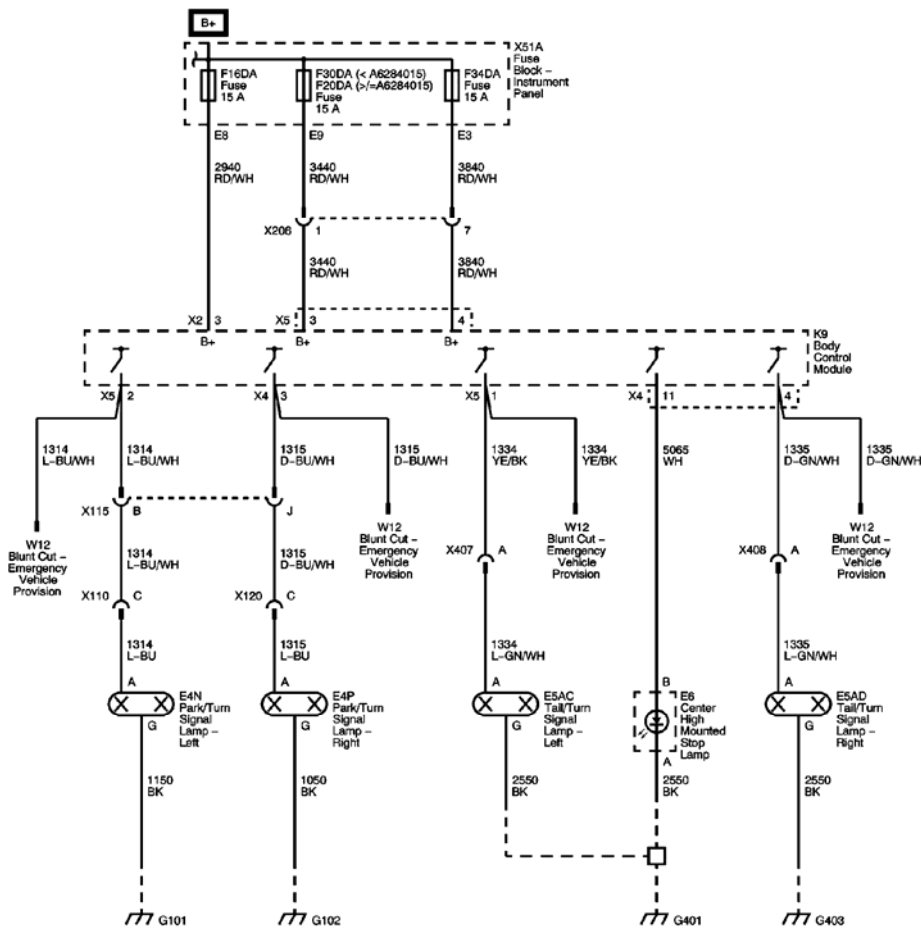


Fig. 6: Turn Signals and Stop Lamps
 Courtesy of GENERAL MOTORS CORP.

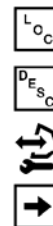
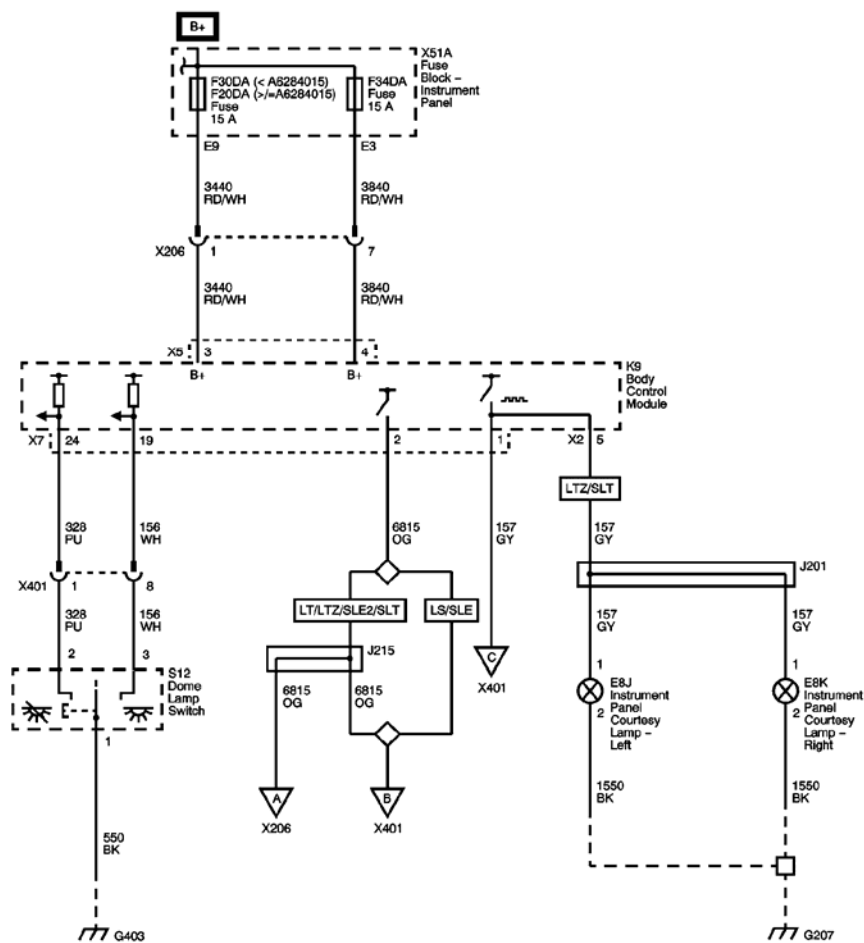


Fig. 8: Interior Lights (1 of 2)

Courtesy of GENERAL MOTORS CORP.

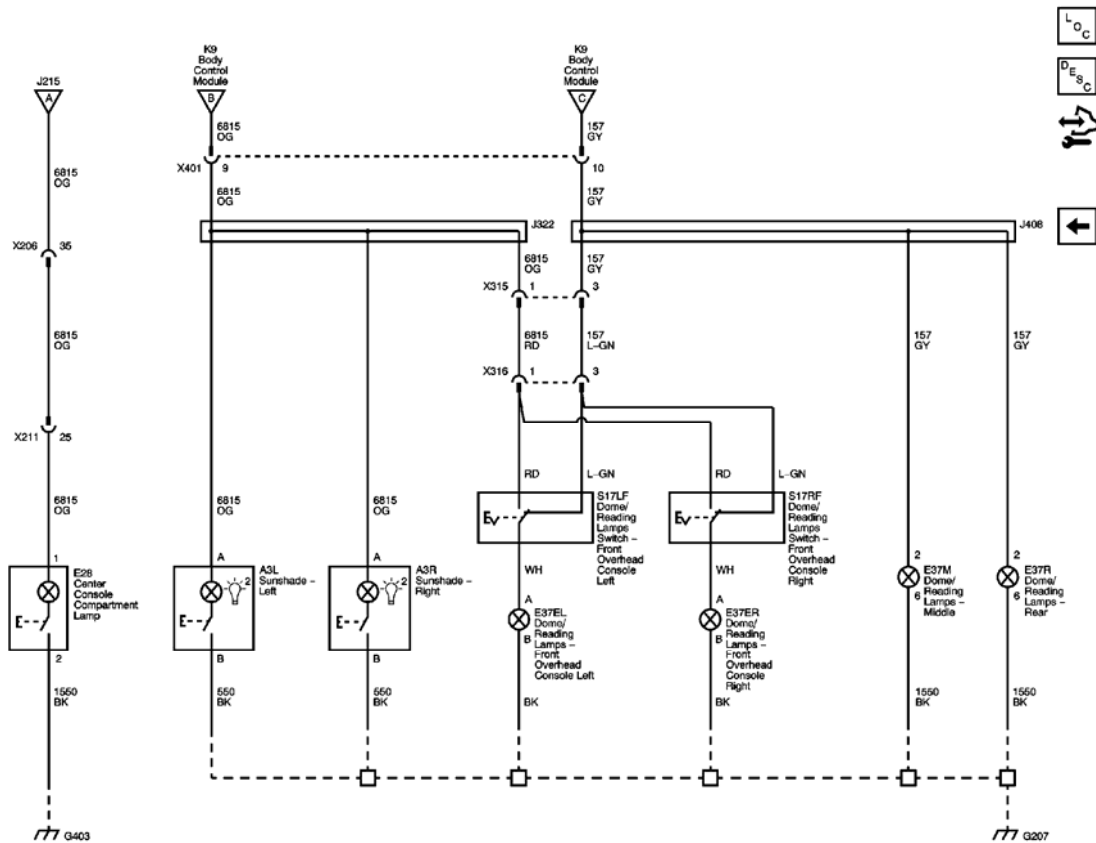


Fig. 9: Interior Lights (2 of 2)
 Courtesy of GENERAL MOTORS CORP.

INTERIOR LIGHTS DIMMING SCHEMATICS

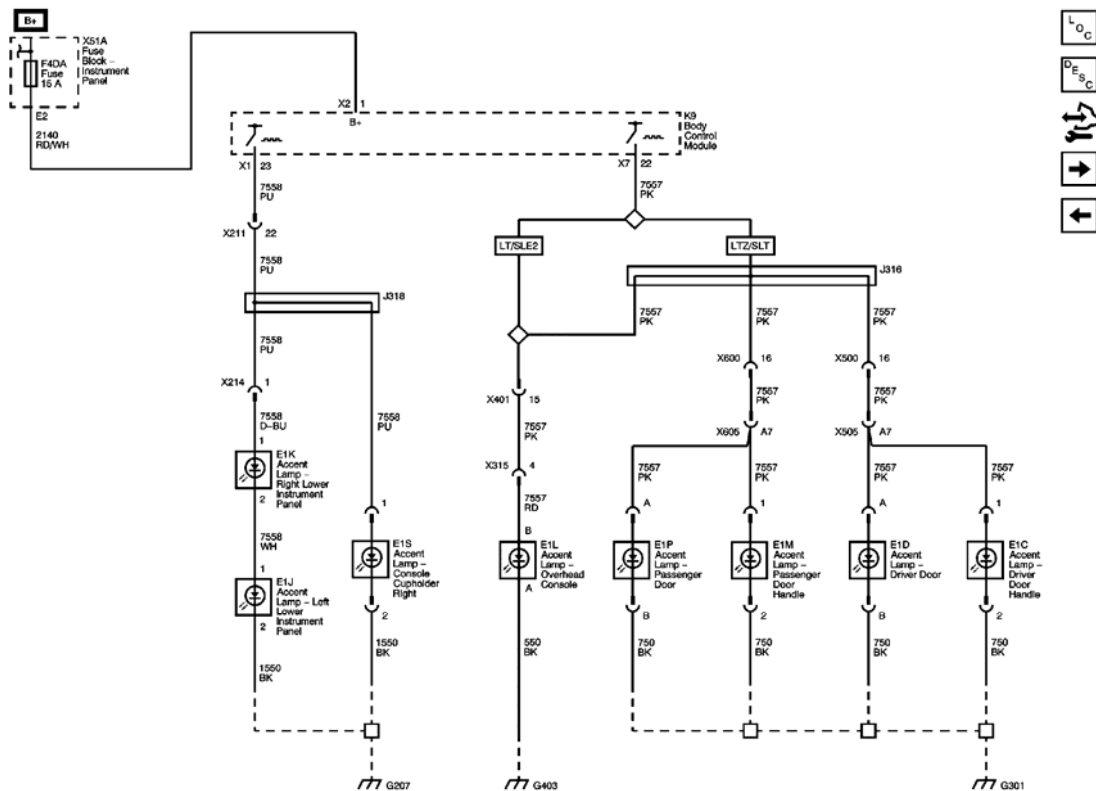


Fig. 11: Accent Lighting
Courtesy of GENERAL MOTORS CORP.

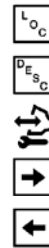
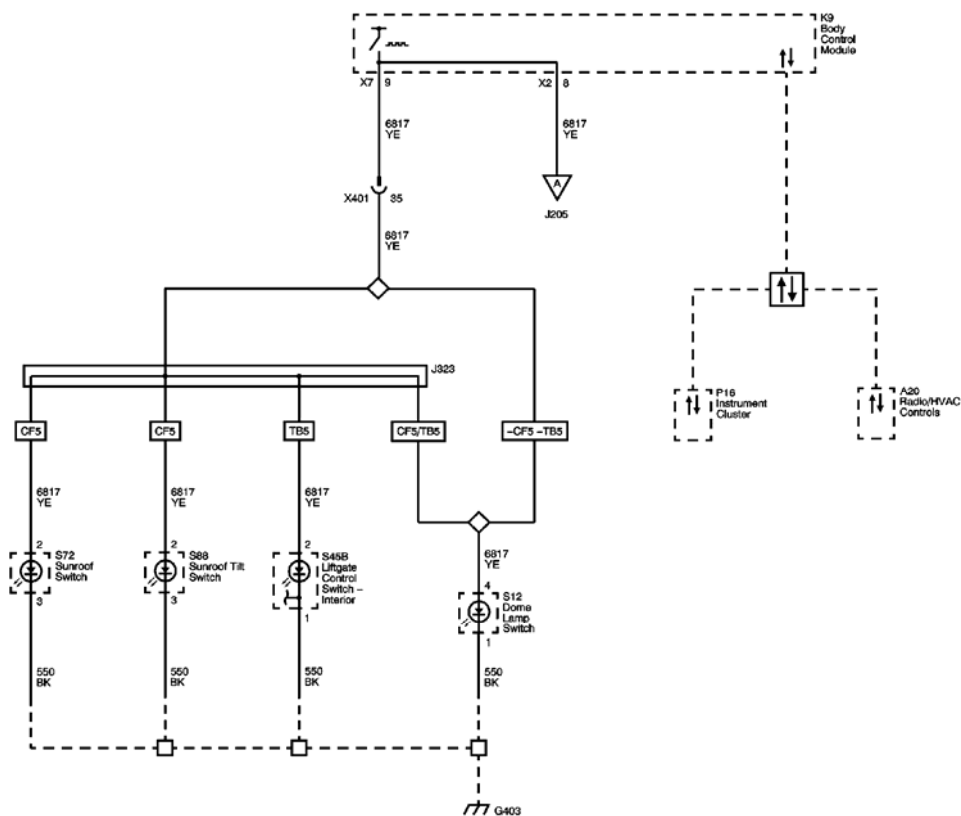


Fig. 12: Overhead Console Controls Illumination
 Courtesy of GENERAL MOTORS CORP.

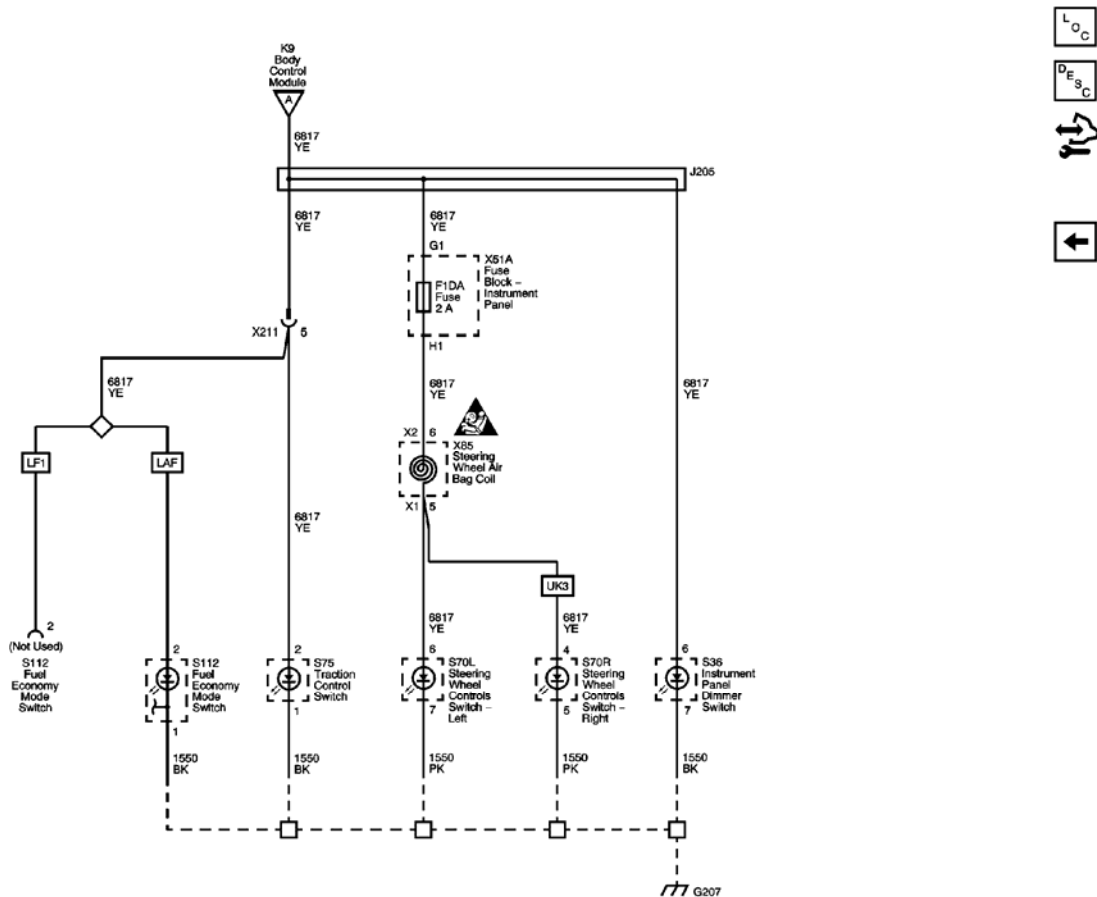


Fig. 13: I/P and Steering Wheel Switch Illumination
 Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B096A	B096A 01: Hazard Lamps Switch Backlight Circuit Short to Battery B096A 02: Hazard Lamps Switch Backlight Circuit Short to Ground B096A 04: Hazard Lamps Switch Backlight Circuit Open
DTC B1395	B1395 03: Control Module Voltage Reference Output 1 Circuit Low Voltage B1395 07: Control Module Voltage Reference Output 1 Circuit High Voltage
DTC B1480	B1480 02: Battery Rundown Protection Circuit Short to Ground
DTC B2530	B2530 01: Front Fog Lamps Control Circuit Short to Battery B2530 02: Front Fog Lamps Control Circuit Short to Ground

	B2530 04: Front Fog Lamps Control Circuit Open
<u>DTC B2545</u>	B2545 01: Backup Lamps Circuit Short to Battery B2545 02: Backup Lamps Circuit Short to Ground B2545 04: Backup Lamps Circuit Open
<u>DTC B2555</u>	B2555 02: Passenger Compartment Lamp Control Circuit Short to Ground
<u>DTC B2575 or B2699</u>	B2575 02: Headlamps Control Circuit Short to Ground B2699 02: Right Headlamp Control Circuit Short to Ground
<u>DTC B257A</u>	B257A 00: Headlamp Switch Input Signals Correlation Malfunction
<u>DTC B257B</u>	B257B 03: Lighting Control Switch Signal Low Voltage B257B 07: Lighting Control Switch Signal High Voltage
<u>DTC B2580</u>	B2580 01: Headlamp High Beam Control Circuit Short to Battery B2580 02: Headlamp High Beam Control Circuit Short to Ground B2580 04: Headlamp High Beam Control Circuit Open
<u>DTC B2585 or B3867</u>	B2585 01: Left Park Lamps Control Circuit Short to Battery B2585 02: Left Park Lamps Control Circuit Short to Ground B2585 04: Left Park Lamps Control Circuit Open B3867 02: Right Park Lamps Control Circuit Short to Ground
<u>DTC B258A</u>	B258A 02: Low Beam Control Circuit Short to Ground
<u>DTC B2600</u>	B2600 02: Left Daytime Running Lamps Control Circuit Short to Ground
<u>DTC B2605</u>	B2605 02: Right Daytime Running Lamps Control Circuit Short to Ground
<u>DTC B260A</u>	B260A 00: Backlight and Display Dimming Request Circuit Malfunction
<u>DTC B2625</u>	B2625 02: Display Dimming Pulse Width Modulation Output Circuit Short to Ground
<u>DTC B2645</u>	B2645 03: Ambient Light Sensor Circuit Low Voltage B2645 07: Ambient Light Sensor Circuit High Voltage
<u>DTC B2652</u>	B2652 02: Passenger Compartment Dimming 3 Circuit Short to Ground
<u>DTC B2740</u>	B2740 00: Front Fog Lamp Switch Circuit Malfunction
<u>DTC B3596</u>	B3596 00: Hazard Lamps Request Circuit Malfunction
<u>DTC B3600</u>	B3600 03: Passenger Compartment Dimming Request Signal Circuit Low Voltage B3600 07: Passenger Compartment Dimming Request Signal Circuit High Voltage
<u>DTC B3650</u>	B3650 08: High Beam Request Signal Circuit Performance - Signal Invalid
<u>DTC B3806</u>	B3806 00: High Beam and Headlamp Flash Select Circuit Malfunction
<u>DTC B3881 or B3882</u>	B3881 01: Tail Lamp Circuit Short to Battery B3881 02: Tail Lamp Circuit Short to Ground B3881 04: Tail Lamp Circuit Open B3882 01: Right Tail Lamp Circuit Short to Battery B3882 02: Right Tail Lamp Circuit Short to Ground B3882 04: Right Tail Lamp Circuit Open

<u>DTC B3883</u>	B3883 01: License Plate Lamp Circuit Short to Battery B3883 02: License Plate Lamp Circuit Short to Ground B3883 04: License Plate Lamp Circuit Open
<u>DTC B3884</u>	B3884 02: Center High Mounted Brake Lamp Circuit Short to Ground
<u>DTC B3887 or B3888</u>	B3887 01: Trailer Left Turn Signal Circuit Short to Voltage B3887 02: Trailer Left Turn Signal Circuit Short to Ground B3887 04: Trailer Left Turn Signal Circuit Open B3888 02: Trailer Right Turn Signal Circuit Short to Ground
<u>DTC B388A</u>	B388A 02: Trailer Park Lamps Circuit Short to Ground
<u>DTC B3890</u>	B3890 02: Trailer Backup Lamps Circuit Short to Ground
<u>DTC B3948 or B3949</u>	B3948 02: Left Front Turn Signal Circuit Short to Ground B3949 02: Right Front Turn Signal Circuit Short to Ground
<u>DTC B3950 or B3951</u>	B3950 02: Left Rear Turn Signal Circuit Short to Ground B3951 02: Right Rear Turn Signal Circuit Short to Ground
<u>DTC C0277 or C0890</u>	C0277 06: Brake Pedal Position Sensor Circuit Short to Ground or Open C0277 07: Brake Pedal Position Sensor Circuit High Voltage C0277 09: Brake Pedal Position Sensor Circuit Too Fast Transitions C0277 4B: Brake Pedal Position Sensor Circuit Calibration Not Learned C0890 03: Control Module Voltage Reference Output 3 Circuit Low Voltage C0890 07: Control Module Voltage Reference Output 3 Circuit High Voltage
<u>DTC C0297</u>	C0297 02: Brake Applied Output Circuit

DTC B096A

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 B096A 01

Hazard Lamps Switch Backlight Circuit Short to Battery

DTC B096A 02

Hazard Lamps Switch Backlight Circuit Short to Ground

DTC B096A 04

Hazard Lamps Switch Backlight Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hazard Lamps Switch Backlight Circuit	B096A 02	B096A 04	B096A 01	-

Circuit/System Description

The body control module (BCM) supplies a voltage reference through the instrument panel cluster dimming voltage reference circuit to the instrument panel cluster lamps dimmer switch. When the dimmer switch is placed in a desired brightness position, reference voltage is applied through the dimmer switch rheostat and the cluster lamps dimmer switch signal circuit to the BCM. The BCM interprets this voltage signal, then applies a pulse width modulated (PWM) voltage to the LED dimming supply circuit to all related interior lamps, illuminating them to the desired level of brightness.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

B096A 01

The BCM detects a short to battery on the LED backlight lamp control circuit.

B096A 02

The BCM detects a short to ground on the LED backlight lamp control circuit.

B096A 04

The BCM detects an open/high resistance on the LED backlight lamp control circuit.

Action Taken When the DTC Sets

The BCM will not dim or illuminate any LED backlighting supplied by the backlight lamp control circuits.

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

Exterior 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, vary the interior backlighting from dim to full bright by using the dimmer switch. The interior backlighting should dim and then become full bright.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the A20 Radio/HVAC Controls.
2. Test for less than 5 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. Connect a test lamp between the backlight control circuit terminal 16 and ground.
4. Ignition ON, vary the interior lamp dimming switch from dim to full bright. The test lamp should dim and then become full bright.
 - If the test lamp is always bright, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
 - If the test lamp is always OFF, test the control circuit for open/high resistance or short to ground. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, replace the A20 Radio/HVAC Controls.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Instrument Panel Lamp Dimmer Switch Replacement
- Radio Control Assembly Replacement
- Control Module References for BCM replacement, setup, and programming

DTC B1395

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 B1395 03

Control Module Voltage Reference Output 1 Circuit Low Voltage

DTC B1395 07

Control Module Voltage Reference Output 1 Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Instrument Panel Dimming B+ Reference	B1395 03	B1395 03	B1395 07	-
Instrument Panel Dimmer Switch Signal	B3600 03	B3600 03	B3600 07	-
Instrument Panel Dimmer Switch Low Reference	-	1	-	-
1. Interior Backlighting Malfunction				

Circuit/System Description

The body control module (BCM) supplies a voltage reference through the instrument panel dimming voltage reference circuit to the instrument panel dimmer switch. When the dimmer switch is placed in a desired brightness position, reference voltage is applied through the dimmer switch rheostat and the instrument panel lamps signal circuit to the BCM. The BCM interprets this voltage signal, then applies a pulse width modulated voltage through the instrument panel supply voltage circuit and the LED dimming supply circuit to all related interior lamps, illuminating them to the desired level of brightness.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

B1395 03

The BCM detects a voltage that is lower than 4.8 V on the instrument panel dimming 5 V reference circuit.

B1395 07

The BCM detects a voltage that is greater than 5.2 V on the instrument panel dimming 5 V reference circuit.

Action Taken When the DTC Sets

The instrument panel lamps are not illuminated.

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

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, vary the interior lamp dimming switch from dim to full bright. The instrument panel lamps should dim and then become full bright.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S36 instrument panel dimmer switch.
2. Ignition OFF, test for less than 60 ohms between the low reference circuit terminal 10 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 K9 BCM.
3. Ignition ON, test for B+ between the B+ circuit terminal 5 and ground.
 - If less than the specified range, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.

NOTE: **The BCM will automatically put in a default Incandescent Dimming Duty Cycle Command setting of 50%. The next step will look for a brief change in the Incandescent Dimming Duty Cycle Command parameter from 50% to 5% - returning after 3 seconds to the 50% default setting.**

-
4. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the B+ circuit terminal 5. Verify the scan tool Incandescent Dimming Duty Cycle Command briefly drops to 5%, returning after 3 seconds to the 50% default value.
 - 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 K9 BCM.
 5. If all circuits test normal, replace the S36 instrument panel dimmer switch.

Repair Procedures

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

- **Instrument Panel Lamp Dimmer Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B1480

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 B1480 02

Battery Rundown Protection Circuit Short to Ground

Circuit/System Description

With the Ignition OFF, the body control module (BCM) monitors the battery voltage to make sure that the voltage stays within the proper range. If the battery voltage is too low the BCM cuts several electrical circuits depending on the charging condition of the battery.

Conditions for Running the DTC

Ignition is OFF.

Conditions for Setting the DTC

The BCM detects a low battery voltage.

Action Taken When the DTC Sets

The BCM cuts several electrical circuits depending on the charging condition of the battery.

Conditions for Clearing the DTC

The condition for setting the DTC is not longer present.

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. Engine running, accessories OFF, measure and record the voltage at the C1 Battery terminals. The voltage must be between 12.6-15.0 V.
 - If not within the specified range, refer to **Charging System Test** .
2. Ignition OFF, measure and record the voltage at the C1 Battery terminals. The voltage must be between 12.45-12.75 V.
 - If not within the specified range, refer to **Battery Inspection/Test** .
3. Clear DTCs and verify the DTC B1480 does not reset.
 - If the DTC resets, replace the K9 BCM.

Repair Procedures

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

Control Module References for BCM replacement, setup and programming

DTC B2530

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle**
- Review **Strategy Based Diagnosis**
- **Diagnostic Procedure Instructions**

DTC Descriptors

DTC B2530 01

Front Fog Lamps Control Circuit Short to Battery

DTC B2530 02

Front Fog Lamps Control Circuit Short to Ground

DTC B2530 04

Front Fog Lamps Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp and Panel Dimmer Switch B+	B1405 03, B1529 03, B257B 03	B257B 03	-	-
Headlamp and Panel Dimmer	B257B 03	B257B 03	B257B 07	-

Switch Signal				
Front Fog Lamp Relay Control	1	1	-	-
Front Fog Lamp Control	B2530 02	B2530 04	B2530 01	-
Fog Lamp - Left Front Ground	-	1	-	-
Fog Lamp - Right Front Ground	-	1	-	-
1. Front Fog Lamps Malfunction				

Circuit/System Description

The front fog lamp relay is supplied with battery voltage at all times. The front fog lamp switch signal circuit is grounded momentarily by pressing the front fog lamp switch. The body control module (BCM) energizes the front fog lamp relay by applying ground to the front fog lamp relay control circuit. When the front fog lamp relay is energized, the relay switch contacts close and battery voltage is applied through the front fog lamp fuse to the front fog lamp supply voltage circuit which illuminates the front fog lamps.

Conditions for Running the DTC

Front fog lamps activated.

Conditions for Setting the DTC

B2530 01

The BCM detects a short to battery on the control circuit.

B2530 02

The BCM detects a short to ground on the control circuit.

B2530 04

The BCM detects an open control circuit.

Action Taken When the DTC Sets

The front fog lamps will not operate.

Conditions for Clearing the DTC

The condition for setting the DTC is not longer present.

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

Ignition ON, command the Front Fog Lamps Relay Command ON and OFF with a scan tool. The front fog lamps should turn ON and OFF when commanded.

Circuit/System Testing

1. Ignition OFF, disconnect the X4 harness connector at the X50A underhood fuse block.
2. Connect a test lamp between B+ and the control circuit terminal K7.
3. Ignition ON, use the fog lamp switch to turn the front fog lamps ON and OFF. The test lamp should turn ON and OFF when changing between the selected states.
 - If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the K9 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 K9 BCM.
4. If all circuits test normal, replace the X50A underhood fuse block.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Accessory Wiring Junction Block Replacement
- Control Module References for BCM replacement, setup, and programming

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 Descriptors

DTC B2545 01

Backup Lamps Circuit Short to Battery

DTC B2545 02

Backup Lamps Circuit Short to Ground

DTC B2545 04

Backup Lamps Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Backup Lamp Switch Signal (MV5/M10)	1	1	1	-
Backup Lamp Switch Ground (MV5/M10)	-	1	-	-
Backup Lamps Control	B2545 02	B2545 04	B2545 01	-
Backup Lamp - Left Ground	-	1	-	-
Backup Lamp - Right Ground	-	1	-	-
1. Backup Lamps Malfunction				

Circuit/System Description

Automatic Transmission

When the transmission is placed in the REVERSE position, the transmission control module (TCM) sends a serial data message to the body control module (BCM). The message indicates that the gear selector is in the REVERSE position. The BCM applies battery voltage to the backup lamps and inside rearview mirror. The backup lamps are permanently grounded. Once the driver moves the gear selector out of the REVERSE position, a message is sent by the TCM via serial data requesting the BCM to remove battery voltage from the backup lamps control circuit.

Manual Transmission

The engine control module (ECM) provides a signal circuit to the backup lamp switch which is permanently grounded. When the transmission is placed in the REVERSE position, the backup lamp switch signal circuit is pulled low and the ECM responds by sending a serial data message to the body control module (BCM). The message indicates that the gear selector is in the REVERSE position. The BCM applies battery voltage to the backup lamps. Once the driver moves the gear selector out of the REVERSE position, a message is sent by the ECM via serial data requesting the BCM to remove battery voltage from the backup lamps control circuit.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B2545 01

The BCM detects a short to voltage in the backup lamps control circuit.

B2545 02

The BCM detects a short to ground in the backup lamps control circuit.

B2545 04

The BCM detects an open/high resistance in the backup lamps control circuit.

Actions Taken When the DTC Sets

The backup lamps will not operate.

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 appropriate E5 backup lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5.0 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 A and ground.
4. Ignition ON, shift the vehicle between the park and reverse positions. The test lamp should turn ON and OFF when changing between the different positions.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 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 K9 BCM.
5. If all circuits test normal, test or replace the E5 backup lamp.

Repair Procedures

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

- **Tail Lamp Replacement (Equinox)** or **Tail Lamp Replacement (Terrain)**
- **Control Module References** for BCM replacement, setup, and programming

DTC B2555

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 B2555 02

Passenger Compartment Lamp Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Interior Backlighting Control	B2555 02	2	1	-
1. Accent Lamp LEDs at Full Intensity and Cannot be Dimmed or Turned OFF 2. Accent Lamp LEDs do Not Illuminate				

Circuit/System Description

The body control module (BCM) supplies a voltage reference through the instrument panel cluster dimming voltage reference circuit to the instrument panel cluster lamps dimmer switch. When the dimmer switch is placed in a desired brightness position, reference voltage is applied through the dimmer switch rheostat and the instrument panel cluster lamps dimmer switch signal circuit to the BCM. The BCM interprets this voltage signal, then applies a variable voltage through the LED backlight lamp control circuit illuminating the components listed below:

- Accent Lamp - driver door
- Accent Lamp - passenger door
- Accent Lamp - driver door handle
- Accent Lamp - passenger door handle
- Accent Lamp - over head console

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 LED backlight lamp control circuit.

Action Taken When the DTC Sets

The BCM will not dim or illuminate any LED backlighting supplied by the backlight lamp control circuits.

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

Command the Interior Ambient Lighting ON and OFF with a scan tool. The appropriate accent lamps should be ON and OFF when changing between the selected states.

Circuit/System Testing

NOTE: Each back lighted component may need to be disconnected to isolate a short to voltage or short to ground. Use the schematic to identify the following:

- **Back lighted components the vehicle is equipped with.**
- **Component locations on the back lighting dimming control circuit**
- **Each component's control and ground circuit terminals**

1. Ignition OFF, disconnect the harness connector at any component with inoperative backlighting.
2. Ignition OFF, scan tool disconnected, interior lamps OFF, doors CLOSED, test for less than 5 ohms between the ground circuit 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 and ground.
4. Command the Interior Ambient Lighting 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 control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.

- If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.

5. If all circuits test normal, test or replace the component with the inoperative backlighting.

Repair Procedures

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

- **Courtesy Lamp Replacement**
- **Control Module References** for BCM, HVAC control module, and radio replacement, setup, and programming

DTC B2575 OR B2699

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 B2575 02

Headlamps Control Circuit Short to Ground

DTC B2699 02

Right Headlamp Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamps Control	B2575 02	1	1	-
Right Headlamp Control	B2699 02	2	2	-
1. Headlamps Control Malfunction 2. Right Headlamp Control Malfunction				

Circuit/System Description

When the headlight switch is placed in low beam position, the body control module (BCM) applies a voltage to the head lamps through their respective voltage supply circuits.

Conditions for Running the DTC

The headlamps are turned ON.

Conditions for Setting the DTC

The BCM detects a short to ground on the control circuit.

Action Taken When the DTC Sets

The appropriate headlamp is inoperative.

Conditions for Clearing the DTC

The condition responsible for setting the DTC no longer exists.

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 appropriate Headlamp Low Beam ON and OFF with a scan tool. The low beam head 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 E4 headlamp.

- 2. Test for less than 5 ohms between the headlamp ground circuit terminal listed below and ground.
 - E4G Headlamp - Left low beam terminal B.
 - E4H Headlamp - Right low beam terminal B.
 - If greater than the specified value, test the ground circuit for an open/high resistance.
- 3. Connect a test lamp between the headlamp control circuit harness connector listed below and ground.
 - E4G Headlamp - Left low beam terminal A.
 - E4H Headlamp - Right low beam terminal A.
- 4. Command the appropriate Headlamp Low Beam test 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 signal circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
 - If the test lamp is always OFF, test the Signal circuit for a short to ground or an open/high resistance. If the circuits test normal, replace the K9 BCM.
- 5. If all the circuits test normal, replace the E4 headlamp.

Repair Procedures

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

- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **Control Module References** for headlamp control module replacement, setup, and programming

DTC B257A

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 the diagnostic category.

DTC Descriptor

DTC B257A 00

Headlamp Switch Input Signals Correlation Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Lamp Switch ON Signal	1	B257A 00	1	-
Turn Signal/Multifunction Switch Ground	-	1	-	-

Headlamp Switch Headlamps ON Signal	B257A 00	1	1	-
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	-
1. Headlamp Switch Malfunction				

Circuit/System Description

When the headlamp switch is placed in the AUTO position, the body control module (BCM) receives a ground signal through the headlamp switch headlamps OFF signal circuit. The headlamp switch headlamps ON signal circuit and the park lamp switch signal circuit are both open and have no ground signal. When the headlamp switch is placed in the PARK or HEAD position, the BCM will receive a ground signal through the headlamp switch headlamps ON signal circuit and the park lamp switch signal circuit. The headlamp switch headlamps OFF signal circuit will be open and have no ground signal.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

The BCM detects a short to ground on the headlamp switch headlamps OFF signal circuit or the headlamp switch headlamps ON signal circuit.

Actions Taken When the DTC Sets

- When DTC B257A 00 is present on the headlamp switch headlamps OFF signal circuit, the low beam headlamps are always ON in the AUTO position. The headlamp switch operates in all positions other than AUTO. The AUTO headlamp defeat is inoperative.
- When DTC B257A 00 is present on the headlamp switch headlamps ON signal circuit, the low beam headlamps are always ON. The BCM disregards all headlamp switch inputs.

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

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 Testing

1. Ignition OFF, disconnect the X1 harness connector at the S78 Turn Signal/Multi-Function Switch.
2. Ignition OFF, test for less than 5 ohms between the ground circuit terminal 6 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Park Lamps Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 7 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 7 and the ground circuit terminal 6. Verify the scan tool Park Lamps Switch parameter is Active.
 - 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 K9 BCM.
5. Verify the scan tool Headlamps On Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 2 for a short to ground. If the circuit tests normal, replace the K9 BCM.
6. Install a 3 A fused jumper wire between the signal circuit terminal 2 and the ground circuit terminal 6. Verify the scan tool Headlamps On Switch is Active.
 - 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 K9 BCM.
7. Verify the scan tool Automatic Headlamps Disable Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 9 for a short to ground. If the circuit tests normal, replace the K9 BCM.
8. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the ground circuit terminal 6. Verify the scan tool Automatic Headlamps Disable Switch is Active.
 - 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 K9 BCM.
9. If all circuits test normal, test or replace the S78 Turn Signal/Multi-Function Switch.

Repair Procedures

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

- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B257B

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 B257B 03

Lighting Control Switch Signal Low Voltage

DTC B257B 07

Lighting Control Switch Signal High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Dimming 5 V Reference	B257B 03*	B257B 03*	-	-
Instrument Panel Lamps Dimmer Switch Signal	B257B 03*	B257B 03*	B257B 07*	-
* Interior Backlighting at Full Intensity and Cannot be Dimmed.				

Circuit/System Description

The body control module (BCM) supplies a reference voltage to the backlight dimmer switch. When the backlight dimmer switch is placed in a desired brightness position, reference voltage is applied through the backlight dimmer switch rheostat to the BCM. The BCM interprets this voltage signal, then applies a pulse width modulated (PWM) voltage to the LED dimming supply circuit to all related interior lamps, illuminating them to the desired level of brightness.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

B257B 03

The BCM detects a voltage that is lower than 0.3 V on the dimming voltage circuit.

B257B 07

The BCM detects a voltage that is greater than 5.2 V on dimming voltage circuit.

Action Taken When the DTC Sets

The BCM will not dim or illuminate any LED backlighting supplied by the backlight lamp control circuits.

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, switch ON exterior lighting, vary the interior backlight from dim to full bright by using the dimmer switch. The interior backlighting should dim and then become full bright.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S36 instrument panel dimmer switch.
2. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 5 and ground.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
3. Ignition ON, test for less than 0.3 V between dimming signal circuit terminal 9 and ground.
 - If greater than the specified range, test the dimming signal circuit terminal 9 for a short to voltage. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the voltage reference circuit terminal 5. The interior backlighting should now be dimmed.
 - If the interior backlighting is not dimmed, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, replace the S36 instrument panel dimmer switch.

Repair Procedures

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

- **Instrument Panel Lamp Dimmer Switch 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 Descriptors

DTC B2580 01

Headlamp High Beam Control Circuit Short to Battery

DTC B2580 02

Headlamp High Beam Control Circuit Short to Ground

DTC B2580 04

Headlamp High Beam Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Flash to Pass Switch Signal	B3806 00	2	B3806 00	-
Turn Signal/Multifunction Switch High Beam Signal	B3650 08	2	2	-
Turn Signal/Multifunction Switch Ground	-	2	-	-
Headlamp Switch Headlamps ON Signal	B257A 00	1	1	-
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	-
Headlamp High Beam Relay Control	B2580 02	B2580 04	B2580 01	-
Left Headlamp High Beam Control	3	3	4	-
Right Headlamp High Beam Control	5	5	6	-
Left Headlamp Ground	-	3	-	-
Right Headlamp Ground	-	5	-	-
1. Headlamp Switch Malfunction 2. Turn Signal/Multifunction Switch Malfunction 3. Left High Beam Inoperative 4. Left High Beam Always ON 3. Right High Beam Inoperative 4. Right High Beam Always ON				

Circuit/System Description

When the turn signal/multifunction switch is placed in the headlamps high or flash to pass position, ground is applied to the body control module (BCM) through the headlamp high beam signal circuit or the flash to pass switch signal circuit. The BCM applies ground to the headlamp high beam relay control circuit which energizes the high beam relay. With the high beam relay energized, the switch contacts close allowing battery voltage to flow through the left and right HIGH BEAM fuses to the high beam headlamps.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- High beam headlamps ON.

Conditions for Setting the DTC

B2580 01

The BCM detects a short to voltage in the headlamp high beam relay control circuit.

B2580 02

The BCM detects a short to ground in the headlamp high beam relay control circuit.

B2580 04

The BCM detects an open/high resistance in the headlamp high beam relay control circuit.

Actions Taken When the DTC Sets

The high beam headlamps and flash to pass will not operate.

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

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, headlamps ON, turn the high beam headlamps ON and OFF using the Turn Signal/Multi-Function Switch. The high beam headlamps should turn ON and OFF when changing between the selected states.

Circuit/System Testing

1. Ignition OFF, disconnect the KR48 Headlamp High Beam Relay.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuit terminal 30 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage.
3. Verify that a test lamp illuminates between the B+ circuit terminal 86 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
4. Verify that a test lamp illuminates between the B+ circuit terminal 87 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 appropriate E4 Headlamp - High Beam.
6. Test for less than 5 ohms 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 E4 Headlamp - High Beam.
8. Connect a 10 A fused jumper wire between the B+ circuit terminal 87 and the control circuit terminal 30. Verify the E4 Headlamp - High Beam is activated.
 - If the E4 Headlamp - High Beam does not activate and the circuit fuse is good, test the control circuit for an open/high resistance. If the circuit tests normal, test or replace the E4 Headlamp - High Beam.
 - If the E4 Headlamp - High Beam does not activate and the circuit fuse is open, test the control circuit for a short to ground. If the circuit tests normal, test or replace the headlamp.
9. Connect a test lamp between the B+ circuit terminal 86 and the control circuit terminal 85.
10. Turn the high beam headlamps ON and OFF using the S78 Turn Signal/Multi-Function Switch. The test lamp should turn ON and OFF when changing between the selected states.
 - If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the K9 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 K9 BCM.
11. If all circuits test normal, test or replace the KR48 Headlamp High Beam Relay.

Repair Procedures

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

- **Relay Replacement (Attached to Wire Harness)** or **Relay Replacement (Within an Electrical Center)**
- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **Control Module References** for BCM replacement, setup, and programming

DTC B2585 OR B3867

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 B2585 01

Left Park Lamps Control Circuit Short to Battery

DTC B2585 02

Left Park Lamps Control Circuit Short to Ground

DTC B2585 04

Left Park Lamps Control Circuit Open

DTC B3867 02

Right Park Lamps Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Lamp Switch ON Signal	B257A 00	B257A 00	B257A 00	-
Left Front Park Lamps Control	B2585 02	B2585 04	B2585 01	-
Left Front Park Lamps Ground	-	1	-	-
Right Front Park Lamps Control	B3867 02	1	1	-
Right Front Park Lamps Ground	-	1	-	-
Left Rear Park Lamps Control	B3881 02	1	1	-
Right Rear Park Lamps Control	B3882 02	1	1	-
Left Front Side Marker Lamp Ground	-	1	-	-
Right Front Side Marker Lamp Ground	-	1	-	-
Left Rear Stop/Tail/Turn Signal Lamps Ground	-	1	-	-
Right Rear Stop/Tail/Turn Signal Lamps Ground	-	1	-	-
License Lamp Control	B3883 02	3	3	-
License Lamp Ground	-	3	-	-
Headlamp Switch Ground	-	2	-	-

1. Park, License, and/or Tail Lamps Malfunction

- | |
|--|
| <ul style="list-style-type: none">2. Park Lamp Switch Malfunction3. License Lamps Malfunction |
|--|

Circuit/System Description

When the headlamp switch is placed in either the HEAD or PARK position, ground is applied to the park lamp signal circuit to the body control module (BCM). The BCM responds by applying voltage to the park lamps, tail lamps, and license lamps control circuits illuminating the park, tail, side marker, and license lamps.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Park lamps ON.

Conditions for Setting the DTC

B2585 01

The BCM detects a short to voltage in the left front park lamp control circuit.

B2585 02

The BCM detects a short to ground in the left front park lamp control circuit.

B2585 04

The BCM detects an open in the left front park lamp control circuit.

B3867 02

The BCM detects a short to ground in the right front park lamp control circuit.

Actions Taken When the DTC Sets

The park lamps will not operate.

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 appropriate E2 or E4 park lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5 ohms between the ground circuit terminal listed below and ground:
 - E2 Side Marker Lamp - terminal B
 - E4 Park/Turn Signal Lamp - terminal G
 - 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.
 - E2 Side Marker Lamp - terminal A
 - E4 Park/Turn Signal Lamp - terminal B
4. Command the appropriate Front Park Lamp Test 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 K9 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 K9 BCM.
5. If all circuits test normal, test or replace the E2 or E4 park lamp.

Repair Procedures

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

- **Parking and Turn Signal Lamp Bulb Replacement (Equinox)** or **Parking and Turn Signal Lamp Bulb Replacement (Terrain)**
- **Front Side Marker Lamp Bulb Replacement (Equinox)** or **Front Side Marker Lamp Bulb Replacement (Terrain)**

- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **Control Module References** for BCM replacement, setup, and programming

DTC B258A

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 B258A 02

Low Beam Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Low Beam Control	B258A 02	1	1	-
1. Low Beam Malfunction				

Circuit/System Description

The headlamp switch signal circuit is grounded by turning the headlamp switch. The body control module (BCM) energizes the headlamp low beams by applying battery voltage.

Conditions for Running the DTC

The headlamp switch in OFF or AUTO position.

Conditions for Setting the DTC

The BCM detects a short to ground on the control circuit.

Action Taken When the DTC Sets

Headlamp low beam malfunction.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

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 Headlamp Low Beam On and OFF with a scan tool. The low beam headlamp should turn ON and OFF when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate E4 low beam headlamp.
2. Test for less than 5 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 A and the ground circuit terminal B.
4. Command Headlamp Low Beam 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 K9 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 K9 BCM.
5. If all circuits test normal, test or replace the E4 low beam headlamp.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **Control Module References** for BCM replacement, setup and programming

DTC B2600

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 B2600 02

Left Daytime Running Lamps Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Daytime Running Lamps Control	B2600 02	2	1	-
1. Left Daytime Running Lamps Always ON 2. Left Daytime Running Lamps Always OFF				

Circuit/System Description

When the headlight switch is placed in low beam position, the body control module (BCM) applies a voltage to the head lamps through there respective voltage supply circuits.

Conditions for Running the DTC

The engine is running, headlamp switch in AUTO position, and the ambient light is day.

Conditions for Setting the DTC

The BCM detects a short to ground on the control circuit.

Action Taken When the DTC Sets

The left daytime running lamp is inoperative.

Conditions for Clearing the DTC

The condition responsible for setting the DTC no longer exists.

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 Low Beam Relay Command ON and OFF with a scan tool. The low beam headlamp should turn ON and OFF when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the E4G Headlamp-Left Low Beam.
2. Test for less than 5 ohms between the E4G Headlamp-Left Low Beam ground circuit terminal B and ground.
 - If greater than the specified value, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the E4G Headlamp-Left Low Beam control circuit terminal A and ground.
4. Command the Low Beam Relay Command 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 signal circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
 - If the test lamp is always OFF, test the Signal circuit for a short to ground or an open/high resistance. If the circuits test normal, replace the K9 BCM.
5. If all the circuits test normal, replace the E4G Headlamp-Left Low Beam.

Repair Procedures

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

- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **Control Module References** for headlamp control module and BCM replacement, setup, and programming

DTC B2605

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 B2605 02

Right Daytime Running Lamps Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Right Daytime Running Lamps Control	B2605 02	2	1	-
1. Right Daytime Running Lamps Always ON 2. Right Daytime Running Lamps Always OFF				

Circuit/System Description

When the headlight switch is placed in low beam position, the body control module (BCM) applies a voltage to the head lamps through there respective voltage supply circuits.

Conditions for Running the DTC

The engine is running, headlamp switch in AUTO position, and the ambient light is day.

Conditions for Setting the DTC

The BCM detects a short to ground on the control circuit.

Action Taken When the DTC Sets

The right daytime running lamp is inoperative.

Conditions for Clearing the DTC

The condition responsible for setting the DTC no longer exists.

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 Low Beam Relay Command ON and OFF with a scan tool. The low beam headlamp should turn ON and OFF when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the E4H Headlamp-Right Low Beam.
2. Test for less than 5 ohms between the E4H Headlamp-Right Low Beam ground circuit terminal B and ground.
 - If greater than the specified value, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the E4H Headlamp-Right Low Beam control circuit terminal A and ground.
4. Command the Low Beam Relay Command 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 signal circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.

- If the test lamp is always OFF, test the Signal circuit for a short to ground or an open/high resistance. If the circuits test normal, replace the K9 BCM.

5. If all the circuits test normal, replace the E4H Headlamp-Right Low Beam.

Repair Procedures

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

- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **Control Module References** for headlamp control module and BCM replacement, setup, and programming

DTC B260A

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 B260A 00

Backlight and Display Dimming Request Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Backlight and Display Dimming Request Signal	-	-	-	B260A

Circuit/System Description

The body control module (BCM) supplies a reference voltage to the backlight dimmer switch, which is part of the headlamp switch. When the backlight dimmer switch is placed in a desired brightness position, reference voltage is applied through the backlight dimmer switch rheostat to the BCM. The BCM interprets this voltage signal, then applies a pulse width modulated (PWM) voltage to the LED dimming supply circuit to all related interior lamps, illuminating them to the desired level of brightness.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

The BCM detects the instrument panel dimmer switch is ON for greater than 60 seconds.

Action Taken When the DTC Sets

The BCM will not dim or illuminate any LED backlighting supplied by the backlight lamp control circuits.

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, switch ON exterior lighting, vary the interior backlight from dim to full bright by using the dimmer switch. The interior backlighting should dim and then become full bright.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S36 instrument panel dimmer switch.
2. Ignition OFF, test for less than 5 ohms between the low reference circuit terminal 10 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 K9 BCM.

3. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 5 and ground.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
4. Verify the scan tool LED Backlight Dimming Command is less than 5%.
 - If greater than the specified range, test the signal circuit terminal 9 for a short to voltage. If the circuit tests normal, replace the K9 BCM.
5. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the 5 V reference circuit terminal 5. Verify the scan tool LED Backlight Dimming Command is greater than 95%.
 - If less than the specified range, test the signal circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
6. If all circuits test normal, test or replace the S36 instrument panel dimmer switch.

Repair Procedures

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

- **Instrument Panel Lamp Dimmer Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B2625

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 B2625 02

Display Dimming Pulse Width Modulation Output Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Interior Backlighting Control	B2625 02	2	1	-
1. Appropriate Switch at Full Intensity And Cannot be Dimmed or Turned OFF				
2. Appropriate Switch Backlighting do Not Illuminate				

Circuit/System Description

The body control module (BCM) supplies a reference voltage to the backlight dimmer switch. When the backlight dimmer switch is placed in a desired brightness position, reference voltage is applied through the backlight dimmer switch rheostat to the BCM. The BCM interprets this voltage signal, then applies a pulse width modulated (PWM) voltage through the backlight lamp control circuit, and the LED dimming control circuit illuminating the LEDs and the components.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

The BCM detects a short to ground on the LED dimming control circuit.

Action Taken When the DTC Sets

The BCM will not attempt to illuminate the LED indicator lamps when a short circuit to ground is detected.

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, switch ON exterior lighting, vary the interior backlight from dim to full bright by using the dimmer switch. The LEDs should dim and then become full bright.

Circuit/System Testing

NOTE: Each backlight component may need to be disconnected to isolate a short to voltage or short to ground. Use the schematic to identify the following:

- Backlight components the vehicle is equipped with.
- Component locations on the backlighting dimming control circuit
- Each component's control and ground circuit terminals

1. Ignition OFF, disconnect the harness connector at any component with inoperative backlighting.
2. Ignition OFF, scan tool disconnected, interior lamps OFF, doors CLOSED, test for less than 5 ohms between the ground circuit and ground.
 - If greater than the specified value, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit and ground.
4. 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 control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, test or replace the component with the inoperative backlighting.

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 03

Ambient Light Sensor Circuit Low Voltage

DTC B2645 07

Ambient Light Sensor Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Control	B2645 03	B2645 07	B2645 07	-
Ground	-	B2645 07	-	-
1. Daytime Running Light Malfunction				

Circuit/System Description

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 1.4-4.5 V depending on outside lighting conditions. The body control module (BCM) monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lights or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the daytime running lights ON. During low light conditions the BCM will command the low beam headlamps ON.

Conditions for Running the DTC

Ignition ON

Conditions for Setting the DTC

B2645 03

The BCM detects a voltage below threshold on the signal circuit.

B2645 07

The BCM detects a voltage above threshold on the signal circuit.

Action Taken When the DTC Sets

The condition for setting the DTC is not longer present.

Conditions for Clearing the DTC

The condition for setting the DTC is not longer present.

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, observe the scan tool Ambient Light Sensor parameter. The reading should be between 1.4-4.5 V and change with ambient light changes.

Circuit/System Testing

1. Ignition OFF, RAP OFF, disconnect the harness connector at the B10 ambient light/sunload sensor.
2. Wait for 60 seconds, then test for less than 10 ohms between the ground circuit harness connector terminal 6 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance.
3. Ignition ON, test for 4.8-5.2 V between the signal circuit harness connector terminal 5 and ground.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
 - 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 K9 BCM.
4. If all circuits test normal, test or replace the B10 ambient light/sunload sensor.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- **Headlamp Automatic Control Ambient Light Sensor Replacement**
- **Control Module References** for BCM replacement, setup and programming

DTC B2652

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 B2652 02

Passenger Compartment Dimming 3 Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Interior Accent Light Control	B2652 02	2	1	-
1. Interior Accent Light at Full Intensity and Does Not Dim 2. Interior Accent Light do Not Illuminate				

Circuit/System Description

The body control module (BCM) uses the ambient light sensor to determine which brightness of the accent lighting is needed. The BCM applies a pulse width modulated (PWM) voltage through the accent light LED control circuit, daylight conditions 70%, night conditions 40% and as welcome light 100% illumination.

Conditions for Running the DTC

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

Conditions for Setting the DTC

The BCM detects a short to ground on the accent lighting control circuit.

Action Taken When the DTC Sets

The BCM does not attempt to illuminate the accent lighting.

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

When opening the driver door, the ambient illumination should go ON. When closing the driver door and locking the vehicle, the accent light illumination should go OFF after 5 seconds.

Circuit/System Testing

NOTE: Each back lighted component may need to be disconnected to isolate a short to voltage or short to ground. Use the schematic to identify the following:

- Back lighted components the vehicle is equipped with.
- Component locations on the back lighting dimming control circuit
- Each component's control and ground circuit terminals

1. Ignition OFF, disconnect the harness connector at any component with inoperative backlighting.
2. Ignition OFF, scan tool disconnected, interior lamps OFF, doors CLOSED, test for less than 5 ohms between the ground circuit 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 and ground.
- 4. 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 control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
- 5. If all circuits test normal, test or replace the component with the inoperative backlighting.

Repair Procedures

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

Control Module References for BCM replacement, setup, and programming

DTC B2740

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 B2740 00

Front Fog Lamp Switch Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamps Switch Signal	-	-	-	B2740 00

Circuit/System Description

The front fog lamp relay is supplied with battery voltage at all times. The front fog lamp switch signal circuit is grounded momentarily by pressing the front fog lamp switch. The body control module (BCM) energizes the front fog lamp relay by applying ground to the front fog lamp relay control circuit. When the front fog lamp relay is energized, the relay switch contacts close and battery voltage is applied through the front fog lamp fuse to the front fog lamp supply voltage circuit which illuminates the front fog lamps.

Conditions for Running the DTC

- The ignition is turned ON.
- Front fog lamp switch activated.

Action Taken When the DTC Sets

The front fog lamps malfunction.

Conditions for Setting the DTC

The front fog lamp switch stuck is on for more than 60 seconds.

Conditions for Clearing the DTC

The condition for setting the DTC is not longer present.

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

Ignition ON, observe the scan tool Front Fog Lamps Switch parameter while pressing and releasing the front fog lamps switch. The parameter should change between Active and Inactive when changing between the selected states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S78 Turn Signal/Multi-Function Switch.
2. Test for less than 5 ohms between the ground circuit terminal 6 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 Lamps Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 1 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 1 and the ground circuit terminal 6. Verify the scan tool Front Fog Lamps Switch is Active.
 - 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 K9 BCM.
5. If all circuits test normal, test or replace the S78 Turn Signal/Multi-Function Switch.

Component Testing

1. Ignition OFF, disconnect the harness connector at the S78 Turn Signal/Multi-Function Switch.
2. Test for infinite resistance between the signal terminal 1 and the ground terminal 6 with the switch in the open position.
 - If not the specified value, replace the S78 Turn Signal/Multi-Function Switch.
3. Test for less than 5 ohms between the signal terminal 1 and the ground terminal 6 with the switch in the closed position.
 - If greater than the specified range, replace the S78 Turn Signal/Multi-Function Switch.

Repair Procedures

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

- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B3596

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 B3596 00

Hazard Lamps Request Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hazard Lamps Request Signal	-	-	-	B3596 00

Circuit/System Description

The hazard flashers may be activated in any power mode. The hazard switch signal circuit is momentarily grounded when the hazard switch is pressed. The body control module (BCM) supplies battery voltage to all turn signal lamps in an ON and OFF duty cycle. When the hazard switch is activated, the BCM sends a serial data message to the instrument cluster requesting both turn signal indicators to be cycled ON and OFF.

Conditions for Running the DTC

Hazard warning switch activated.

Conditions for Setting the DTC

Hazard warning switch stuck.

Action Taken When the DTC Sets

Hazard flashers malfunction.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

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, observe the scan tool Hazard Warning Switch parameter. While pressing and releasing the hazard switch, the scan tool parameter should toggle between Active and Inactive.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the A20 radio/HVAC controls.
2. Ignition OFF and all vehicle systems OFF. It may take up to 2 minutes for all vehicle systems to power down. 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 Hazard Warning Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 16 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 16 and the ground circuit terminal 17. Verify the scan tool Hazard Warning Switch parameter is Active.
 - 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 K9 BCM.
5. If all circuits test normal, test or replace the A20 radio/HVAC controls.

Component Testing

Static Test

1. Ignition OFF, disconnect the harness connector at the A20 Radio/HVAC Controls.
2. Test for infinite resistance between the terminal 16 and terminal 17.
 - If less than the specified value, replace the A20 Radio/HVAC Controls.
3. Press and hold the Hazard Warning Switch, test for less than 5 ohms between the terminal 16 and terminal 17.
 - If not within the specified range, replace the A20 Radio/HVAC Controls.

Repair Procedures

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

- **Radio Control Assembly Replacement**
- **Control Module References** for BCM replacement, setup and programming

DTC B3600

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 B3600 03

Passenger Compartment Dimming Request Signal Circuit Low Voltage

DTC B3600 07

Passenger Compartment Dimming Request Signal Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Instrument Panel Dimming B+ Reference	B1395 03	B1395 03	B1395 07	-
Instrument Panel Dimmer Switch Signal	B3600 03	B3600 03	B3600 07	-
Instrument Panel Dimmer Switch Low Reference	-	1	-	-
1. Interior Backlighting Malfunction				

Circuit/System Description

The instrument panel lamp dimmer switch is used to increase and decrease the brightness of the interior backlighting components. The instrument panel dimmer switch provides a voltage signal that will increase as the brightness of the lights are increased and decrease as the brightness of the lights are decreased. The body control module (BCM) provides a low reference circuit, signal circuit, and a B+ voltage reference circuit to the instrument panel dimmer switch. When the instrument panel dimmer switch is placed in the desired position, the dimmed voltage setting is applied from the instrument panel dimmer switch through the instrument panel dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies the dimmed voltage to the instrument panel lamps supply voltage circuit and the interior backlighting components dim to the requested level.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B3600 03

The BCM detects a short to ground or an open/high resistance on the instrument panel dimmer switch signal circuit.

B3600 07

The BCM detects a short to voltage on the instrument panel dimmer switch signal circuit.

Actions Taken When the DTC Sets

The instrument panel dimmer switch will not operate. After a 3 second delay, the instrument panel dimming lamps will light at 50% intensity.

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

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 Testing

1. Ignition OFF, disconnect the harness connector at the S36 instrument panel dimmer switch.
2. Ignition OFF, test for less than 60 ohms between the low reference circuit terminal 10 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 K9 BCM.
- 3. Ignition ON, test for B+ between the B+ circuit terminal 5 and ground.
 - If less than the specified range, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.

NOTE: **The BCM will automatically put in a default Incandescent Dimming Duty Cycle Command setting of 50%. The next step will look for a brief change in the Incandescent Dimming Duty Cycle Command parameter from 50% to 5% - returning after 3 seconds to the 50% default setting.**

- 4. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the B+ circuit terminal 5. Verify the scan tool Incandescent Dimming Duty Cycle Command briefly drops to 5%, returning after 3 seconds to the 50% default value.
 - If less than the specified range, test the signal circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
- 5. If all circuits test normal, test or replace the S36 instrument panel dimmer switch.

Repair Procedures

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

- **Instrument Panel Lamp Dimmer Switch Replacement**
- **Control Module References** for BCM replacement, programming and setup

DTC B3650

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 B3650 08

High Beam Request Signal Circuit Performance - Signal Invalid

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
High Beam Request Signal	-	-	-	B3650 08

Circuit/System Description

When the low beam is activated and the turn signal/multi-function switch is placed in the high beam position, the body control module (BCM) will receive a ground signal through the turn signal/multi-function switch signal circuit to illuminate the high beam lamps.

Conditions for Running the DTC

Low beam is ON and high beam is activated

Conditions for Setting the DTC

The BCM reports stuck turn signal/multi-function switch.

Action Taken When the DTC Sets

The BCM will not attempt to switch ON the high beam lamps.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

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, headlamp low beams ON, turn the high beam lamps ON and OFF using the turn signal/multifunction switch. The high beam lamps should turn ON and OFF when changing between the selected states.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the S78 Turn Signal/Multi-Function Switch.
2. Ignition OFF and all vehicle systems OFF. It may take up to 2 minutes for all vehicle systems to power down. Test for less than 5 ohms between the ground circuit terminal 6 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool High Beam Select Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 11 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 11 and the ground circuit terminal 6. Verify the scan tool High Beam Select Switch parameter is Active.
 - 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 K9 BCM.
5. If all circuits test normal, test or replace the S78 Turn Signal/Multi-Function Switch.

Component Testing

Flash to Pass Switch Test

1. Ignition OFF, disconnect the harness connector at the S78 turn signal/multi-function switch.
2. Test for infinite resistance between the signal terminal 12 and the ground terminal 6 with the switch in the open position.
 - If not the specified value, replace the S78 turn signal/multi-function switch.
3. Test for less than 5 ohms between the signal terminal 12 and the ground terminal 6 with the switch in the closed position.
 - If greater than the specified range, replace the S78 turn signal/multi-function switch.

High Beam Switch Test

1. Ignition OFF, disconnect the harness connector at the S78 turn signal/multi-function switch.
2. Test for infinite resistance between the signal terminal 11 and the ground terminal 6 with the switch in the open position.
 - If not the specified value, replace the S78 turn signal/multi-function switch.
3. Test for less than 5 ohms between the signal terminal 11 and the ground terminal 6 with the switch in the closed position.
 - If greater than the specified range, replace the S78 turn signal/multi-function switch.

Repair Procedures

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

- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for BCM replacement, setup and programming

DTC B3806

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 B3806 00

High Beam and Headlamp Flash Select Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Flash to Pass Signal	B3806 00	1	1	-
High Beam Signal	1	1	1	B3650 08
Ground	-	2	-	-
1. Headlamps Malfunction - High Beam 2. Turn Signal/Multifunction Switch Malfunction				

Circuit/System Description

When the turn signal/multifunction switch is placed in the headlamps high or flash to pass position, ground is applied to the body control module (BCM) through the headlamp high beam signal circuit or the flash to pass switch signal circuit. The BCM applies ground to the headlamp high beam relay control circuit which energizes the high beam relay. With the high beam relay energized, the switch contacts close allowing battery voltage to flow through the HIGH BEAM fuses to the high beam headlamps.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Headlamps ON.

Conditions for Setting the DTC

Short to ground on the flash to pass switch signal circuit.

Actions Taken When the DTC Sets

Flash to pass will not operate.

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

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 Testing

1. Ignition OFF, disconnect the harness connectors at the S78 turn signal/multifunction switch.
2. Ignition OFF, test for less than 5 ohms between the ground circuit terminal 6 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Headlamps Flash Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 12 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 12 and ground. Verify the scan tool Headlamps Flash Switch parameter is Active.
 - 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 K9 BCM.

5. If all circuits test normal, test or replace the S78 turn signal/multifunction switch.

Repair Procedures

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

- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B3881 OR B3882

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 B3881 01

Tail Lamp Circuit Short to Battery

DTC B3881 02

Tail Lamp Circuit Short to Ground

DTC B3881 04

Tail Lamp Circuit Open

DTC B3882 01

Right Tail Lamp Circuit Short to Battery

DTC B3882 02

Right Tail Lamp Circuit Short to Ground

DTC B3882 04

Right Tail Lamp Circuit Open

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Tail Lamp Control	B3881 02	2	1	-
Right Tail Lamp Control	B3882 02	4	3	-
1. Tail Lamps Always ON 2. Tail Lamps Always OFF 3. Right Tail Lamps Always ON 4. Right Tail Lamps Always OFF				

Circuit/System Description

The headlamp switch is supplied with ground at all times. When the headlamp switch is placed in either the park or low beam position, ground is applied to the Tail lamp signal circuit to the body control module (BCM). The BCM responds by applying battery voltage to the left and to the right tail lamp control circuits. This energizes the tail lamps.

Conditions for Running the DTC

The headlamp switch is in park or low beam position.

Conditions for Setting the DTC

The BCM detects a short to ground on the control circuit.

Action Taken When the DTC Sets

The appropriate tail lamp is inoperative.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

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 Rear Park Lamp ON and OFF with a scan tool. The tail 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 E5 Tail/Turn Signal Lamp.
2. Test for less than 5 ohms between the ground circuit terminal G and ground.
 - If greater than the specified value, test the appropriate ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit terminal A and ground.
4. Command the appropriate rear brake/park lamp 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 K9 Body Control Module.
 - 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 K9 Body Control Module.
5. If all circuits test normal, test or replace the E5 Tail/Turn Signal Lamp.

Repair Procedures

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

- **Tail Lamp Replacement (Equinox)** or **Tail Lamp Replacement (Terrain)**
- **Control Module References** for BCM replacement, setup and programming

DTC B3883

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 B3883 01

License Plate Lamp Circuit Short to Battery

DTC B3883 02

License Plate Lamp Circuit Short to Ground

DTC B3883 04

License Plate Lamp Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
License Plate Lamp Control	B3883 02	1	1	-
License Plate Lamp Ground	-	1	-	-
1. License Plate Lamp Malfunction				

Circuit/System Description

The headlamp switch is supplied with ground at all times. When the headlamp switch is placed in either the park or low beam position, ground is applied to the license plate lamp signal circuit to the body control module (BCM). The BCM responds by applying battery voltage to the license plate lamp control circuit. This energizes the left and right license lamp.

Conditions for Running the DTC

Headlamp switch in park or low beam position.

Conditions for Setting the DTC

The BCM detects a short to ground on the licence plate lamp control circuit.

Action Taken When the DTC Sets

The appropriate license plate lamp is inoperative.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

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 License Plate Lamps Command ON and OFF with a scan tool. The license plate lamps should turn ON and OFF when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate E7 license plate lamp.
2. Test for less than 5 ohms between the ground circuit terminal 2 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 1 and ground.
4. Command the License Plate Lamps Command 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 K9 Body Control Module.
 - 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 K9 Body Control Module.
5. If all circuits test normal, test or replace the E7 license plate lamp.

Repair Procedures

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

- **Rear License Plate Lamp Replacement (Equinox)** or **Rear License Plate Lamp Replacement**

(Terrain)

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

DTC B3884

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 B3884 02

Center High Mounted Brake Lamp Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Control	B3884 02	1	2	-
Ground	-	1	-	-
1. Center High Mounted Stop Lamp Inoperative 2. Center High Mounted Stop Lamp Always ON				

Circuit/System Description

The brake pedal position sensor is used to sense the action of the driver application of the brake pedal. The brake pedal position sensor provides an analog voltage signal that will increase as the brake pedal is applied. The body control module (BCM) provides a low reference signal and a 5 V reference voltage to the brake pedal position sensor. When the variable signal reaches a voltage threshold indicating the brakes have been applied, the BCM will apply battery voltage to the stop lamp relay control circuit, and the center high mounted stop lamp control circuit.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Brakes APPLIED.

Conditions for Setting the DTC

The BCM detects a short to ground in the center high mounted stop lamp control circuit when the stop lamps are being commanded ON.

Actions Taken When the DTC Sets

The BCM will not illuminate the center high mounted stop lamp.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 100 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, observe the center high mounted stop lamp while pressing and releasing the brake pedal. The center high mounted stop lamp should turn ON and OFF when changing between the selected states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the E6 center high mounted stop lamp.
2. Ignition OFF, test for less than 5.0 ohms between the ground circuit terminal A 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 B and the ground circuit terminal A.
4. Command the Center Brake Lamp Command Test 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 K9 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 K9 BCM.

5. If all circuits test normal, replace the E6 center high mounted stop lamp.

Repair Procedures

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

- **High Mount Stop Lamp Replacement (Equinox)** or **High Mount Stop Lamp Replacement (Terrain)**
- **Control Module References** for BCM replacement, setup, and programming

DTC B3887 OR B3888

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 B3887 01

Trailer Left Turn Signal Circuit Short to Voltage

DTC B3887 02

Trailer Left Turn Signal Circuit Short to Ground

DTC B3887 04

Trailer Left Turn Signal Circuit Open

DTC B3888 02

Trailer Right Turn Signal Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Left Turn Signal	B3887 02	B3887 04	B3887 01	-
Trailer Right Turn Signal	B3888 02	1	1	-

1. Trailer Right Turn Signal Malfunction

Circuit/System Description

Ground is applied at all times to the turn signal/multifunction switch. When the turn signal/multifunction switch is placed in either the turn right or turn left position, ground is applied to the body control module (BCM) through either the right turn or left turn signal switch signal circuit. The BCM then applies a voltage to the appropriate trailer turn signal lamps through their respective relays.

Conditions for Running the DTC

The appropriate trailer turn signal is active.

Conditions for Setting the DTC

B3887 01

The BCM detects a short to voltage on the control circuits.

B3887 02 or B3888 02

The BCM detects a short to ground on the control circuit.

B3887 04

The BCM detects an open control circuit.

Action Taken When the DTC Sets

The appropriate trailer turn signal lamp is inoperative.

Conditions for Clearing the DTC

The condition for setting the DTC is not longer present.

Action Taken When the DTC Sets

The appropriate trailer turn signal lamp is inoperative.

Reference Information

Schematic Reference

Trailer Connector/Provision 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, turn the trailer turn signal lamps ON and OFF by turning the turn signal/multi-function switch between the left turn and right turn positions. The trailer turn signal lamp should turn ON and OFF when changing between the selected states.

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the X50A underhood fuse block.
2. Connect a test lamp between the control circuit terminal listed below and B+.
 - Trailer Stop/Turn Lamp Right - Terminal A7
 - Trailer Stop/Turn Lamp Left - Terminal A6
3. Switch the turn signal/multi-function switch between the left turn and right turn positions. The test lamp should turn ON and OFF when changing between the selected states.
 - If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the K9 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 K9 BCM.
4. Ignition OFF, connect the X2 harness connector at the X50A underhood fuse block.
5. Test for less than 5 ohms between the X88 Trailer Connector ground circuit terminal D and ground
 - If greater than the specified range, test the ground circuit for an open/high resistance.
6. Connect a test lamp between the control circuit terminal listed below and ground.
 - Trailer Stop/Turn Lamp Right - Terminal C
 - Trailer Stop/Turn Lamp Left - Terminal B
7. Switch the turn signal/multi-function switch between the left turn and right turn positions. The test lamp should turn ON and OFF when changing between the selected states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the X88 Trailer Connector.

- If the test lamp is always OFF and the circuit fuse is good, test the control circuit for an open/high resistance. If the circuit tests normal, test or replace the X88 Trailer Connector.
 - If the test lamp is always OFF and the circuit fuse is open, test the control circuit for a short to ground. If the circuit tests normal, test or replace the X88 Trailer Connector.
8. If all circuits test normal, test or replace the X50A underhood fuse block.

Repair Procedures

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

- **Accessory Wiring Junction Block Replacement**
- **Control Module References** for trailer lighting converter replacement, setup and programming

DTC B388A

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 B388A 02

Trailer Park Lamps Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Park Lamps Control	B388A 02	1	1	-
1. Trailer Park Lamps Malfunction				

Circuit/System Description

The trailer park lamps are turned ON when the headlamp switch is placed in the PARKING LIGHT or LOW BEAM position or anytime the headlights are requested. When the body control module (BCM) receives a request from the headlamp switch to turn ON the park lamps the BCM sends out a PWM signal, which illuminates the trailer park lamps.

Conditions for Running the DTC

The appropriate trailer park lamp signal is active.

Conditions for Setting the DTC

The BCM detects a short to ground on the control circuit.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

Action Taken When the DTC Sets

The appropriate trailer park lamp is inoperative.

Reference Information

Schematic Reference

Trailer Connector/Provision 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, turn the headlamp switch between the OFF and park light positions. The trailer park lamps should turn ON and OFF when changing between the selected states.

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the X50A underhood fuse block.
2. Connect a test lamp between the control circuit terminal K1 and B+.
3. Turn the headlamp switch between the OFF and park light positions. 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 K9 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 K9 BCM.
4. Ignition OFF, connect the X2 harness connector at the X50A underhood fuse block.
 5. Test for less than 5 ohms between the X88 Trailer Connector ground circuit terminal D and ground
 - If greater than the specified range, test the ground circuit for an open/high resistance.
 6. Connect a test lamp between the control circuit terminal B and ground.
 7. Turn the headlamp switch between the OFF and park light positions. 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 X88 Trailer Connector.
 - If the test lamp is always OFF and the circuit fuse is good, test the control circuit for an open/high resistance. If the circuit tests normal, test or replace the X88 Trailer Connector.
 - If the test lamp is always OFF and the circuit fuse is open, test the control circuit for a short to ground. If the circuit tests normal, test or replace the X88 Trailer Connector.
 8. If all circuits test normal, test or replace the X50A underhood fuse block.

Repair Procedures

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

- **Accessory Wiring Junction Block Replacement**
- **Control Module References** for trailer lighting converter replacement, setup and programming

DTC B3890

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 B3890 02

Trailer Backup Lamps Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Backup Lamps	B3890 02	1	1	-

1. Trailer Backup Lamps Malfunction

Circuit/System Description

When the transmission is placed in the reverse position, the engine control module (ECM) sends a serial data message to the body control module (BCM). The message indicates that the gear selector is in the reverse position. The BCM then applies a voltage to the trailer backup lamps through their supply circuit.

Conditions for Running the DTC

The appropriate trailer backup lamp signal is active.

Conditions for Setting the DTC

The BCM detects a short to ground on the control circuit.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

Action Taken When the DTC Sets

The appropriate trailer backup lamp is inoperative.

Reference Information

Schematic Reference

Trailer Connector/Provision 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

Engine running, shift the transmission into and out of the reverse position. The trailer backup lamps should turn ON and OFF when shifting between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the X50A underhood fuse block.
2. Connect a test lamp between the control circuit terminal K1 and B+.
3. Turn the headlamp switch between the OFF and park light positions. 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 K9 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 K9 BCM.
4. Ignition OFF, connect the X2 harness connector at the X50A underhood fuse block.
5. Test for less than 5 ohms between the X88 Trailer Connector ground circuit terminal D and ground
 - If greater than the specified range, test the ground circuit for an open/high resistance.
6. Connect a test lamp between the control circuit terminal B and ground.
7. Turn the headlamp switch between the OFF and park light positions. 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 X88 Trailer Connector.
 - If the test lamp is always OFF and the circuit fuse is good, test the control circuit for an open/high resistance. If the circuit tests normal, test or replace the X88 Trailer Connector.
 - If the test lamp is always OFF and the circuit fuse is open, test the control circuit for a short to ground. If the circuit tests normal, test or replace the X88 Trailer Connector.
8. If all circuits test normal, test or replace the X50A underhood fuse block.

Repair Procedures

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

- **Accessory Wiring Junction Block Replacement**
- **Control Module References** for trailer lighting converter replacement, setup and programming

DTC B3948 OR B3949

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 02

Left Front Turn Signal Circuit Short to Ground

DTC B3949 02

Right Front Turn Signal Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Turn Signal	B3948 02	2	1	-
Right Front Turn Signal	B3949 02	4	3	-
1. Left Front Turn Signal Always ON 2. Left Front Turn Signal Always OFF 3. Right Front Turn Signal Always ON 4. Right Front Turn Signal Always OFF				

Circuit/System Description

Ground is applied at all times to the turn signal/multifunction switch. When the turn signal/multifunction switch is placed in either the turn right or turn left position, ground is applied to the body control module (BCM) through either the right turn or left turn signal switch signal circuit. The BCM then applies a voltage to the front/side and rear turn signal lamps through their respective voltage supply circuits.

Conditions for Running the DTC

The appropriate turn signal is active.

Conditions for Setting the DTC

B3948 02

The BCM detects a short to ground on the left front turn signal control circuit.

B3949 02

The BCM detects a short to ground on the right front turn signal control circuit.

Action Taken When the DTC Sets

The appropriate turn signal lamp is inoperative.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

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 Right and Left Front Turn Signal/Hazard Lamp Command ON and OFF with a scan tool. The right and left front turn signal lamps and turn signal repeater lights should turn ON and OFF when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate E4 park/turn signal lamp.
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. Connect a test lamp between the control circuit terminal A and ground.
4. Command the appropriate Front Turn Signal/Hazard Lamp Command 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 signal circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.

- If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuits test normal, replace the K9 BCM.
5. If all the circuits test normal, replace the E4 turn signal lamp.

Repair Procedures

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

- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **Control Module References** for BCM replacement, setup and programming

DTC B3950 OR 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 B3950 02

Left Rear Turn Signal Circuit Short to Ground

DTC B3951 02

Right Rear Turn Signal Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Rear Turn Signal	B3950 02	2	1	-
Right Rear Turn Signal	B3951 02	4	3	-
1. Left Rear Turn Signal Always ON 2. Left Rear Turn Signal Always OFF 3. Right Rear Turn Signal Always ON 4. Right Rear Turn Signal Always OFF				

Circuit/System Description

Ground is applied at all times to the turn signal/multifunction switch. When the turn signal/multifunction switch is placed in either the turn right or turn left position, ground is applied to the body control module (BCM) through either the right turn or left turn signal switch signal circuit. The BCM then applies a voltage to the front/side and rear turn signal lamps through their respective voltage supply circuits.

Conditions for Running the DTC

The appropriate turn signal is active

Conditions for Setting the DTC

The BCM detects a short to ground on the control circuit.

Action Taken When the DTC Sets

The appropriate turn signal lamp is inoperative.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

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 Left and Right Rear Turn Signal/Hazard Lamp ON and OFF with a scan tool. The left and right rear turn signal/hazard lamps should turn ON and OFF when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate E5 tail/turn signal lamp.
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. Connect a test lamp between the control circuit terminal A and ground.
4. Command the appropriate Rear Turn Signal Lamp test 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 signal circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuits test normal, replace the K9 BCM.
5. If all the circuits test normal, replace the E5 tail/turn signal lamp.

Repair Procedures

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

- **Tail Lamp Replacement (Equinox)** or **Tail Lamp Replacement (Terrain)**
- **Control Module References** for BCM replacement, setup and programming

DTC C0277 OR C0890

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 C0277 06

Brake Pedal Position Sensor Circuit Short to Ground or Open

DTC C0277 07

Brake Pedal Position Sensor Circuit High Voltage

DTC C0277 09

Brake Pedal Position Sensor Circuit Too Fast Transitions

DTC C0277 4B

Brake Pedal Position Sensor Circuit Calibration Not Learned

DTC C0890 03

Control Module Voltage Reference Output 3 Circuit Low Voltage

DTC C0890 07

Control Module Voltage Reference Output 3 Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
5 V Reference	C0277 06, C0890 03	C0277 06	C0277 07, C0890 07	-
Signal	C0277 06, C0890 03	C0277 06	C0277 07, C0890 07	C0277 09
Low Reference	-	1	-	-
1. Stop Lamps Always ON				

Circuit/System Description

The brake pedal position sensor is used to sense the action of the driver application of the brake pedal. The brake pedal position sensor provides an analog voltage signal that will increase as the brake pedal is applied. The body control module provides a low reference signal and a 5 V reference voltage to the brake pedal position sensor. When the variable signal reaches a voltage threshold indicating the brakes have been applied, the BCM will apply battery voltage to the stop lamp control circuit and center high mounted stop lamp control circuit. When the control circuit is energized the stop lamps are illuminated.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Brakes applied.

Conditions for Setting the DTC

C0277 06 or C0890 03

- The BCM detects a short to ground or an open/high resistance in the brake pedal position sensor signal circuit.
- The BCM detects a short to ground or an open/high resistance in the brake pedal position sensor 5 V reference circuit.

C0277 07 or C0890 07

- The BCM detects a short to battery voltage in the brake pedal position sensor signal circuit.

- The BCM detects an open/high resistance in the brake pedal position sensor low reference circuit.

C0277 09

The BCM detects the brake pedal position sensor signal is changing faster than possible under normal operating conditions.

C0277 4B

The brake pedal position sensor home position is not learned.

Action Taken When the DTC Sets

Brake lights always ON.

Conditions for Clearing the DTC

The condition for setting the DTC is not longer present.

Diagnostic Aids

C0277 4B

If the DTC is set, recalibrate the brake pedal position sensor.

C0277 09

If the DTC is set, replace the brake pedal position sensor. If the DTC resets, replace the BCM.

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, observe the scan tool Brake Lamps Command parameter. The reading should be between Inactive and Active when the brake pedal is pushed or released.

Circuit/System Testing

C0277 06, C0277 07, C0090 03 and C0890 07

1. Ignition OFF, disconnect the harness connector at the B22 brake pedal position sensor.
2. Ignition OFF, test for less than 5 ohms between the low reference circuit terminal A 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 K9 BCM.
3. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal C and ground.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
4. Test for less than 0.3 V between the signal circuit terminal B and ground.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
5. Test for 4.8-5.2 V between the 5 V reference circuit terminal C and the signal circuit terminal B.
 - If less than the specified range, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the K9 BCM.
6. Ignition OFF, disconnect the X2 harness connector at the K9 BCM.
7. Test for infinite resistance between the signal circuit terminal 7 and ground.
 - If less than the specified range, test the signal circuit for a short to ground.
8. If all circuits test normal, test or replace the B22 brake pedal position sensor.

C0277 09

1. If the DTC is set, replace the B22 brake pedal position sensor.
2. Perform the brake pedal position sensor recalibration procedure. Refer to **Brake Pedal Position Sensor Calibration**.
3. Operate the vehicle within the Conditions for Running and Setting the DTC and verify the DTC does not reset.

- If the DTC resets, replace the K9 BCM.
- 4. If the DTC is set, recalibrate the B22 brake pedal position sensor.

C0277 4B

1. Verify that the DTC sets under the conditions for running and setting.
2. Perform the brake pedal position sensor recalibration procedure. Refer to **Brake Pedal Position Sensor Calibration**.
3. Operate the vehicle within the Conditions for Running and Setting the DTC and verify the DTC does not reset.
 - If the DTC resets, replace the B22 brake pedal position sensor.

Component Testing

Static Test

1. Ignition OFF, disconnect the harness connector at the B22 brake pedal position sensor.
2. Test for 2.7-3.1 k ohms between the 5 V reference terminal C and the low reference terminal A.
 - If not within the specified range, replace the B22 brake pedal position sensor.
3. Sweep the sensor through the entire range while monitoring the resistance between the signal terminal B and the low reference terminal A. The resistance should vary between 1.5-2.3 k ohms without any spikes or dropouts.
 - If not within the specified range or is erratic, replace the B22 brake pedal position sensor.

Dynamic Test

1. Install a 3 A fused jumper wire between the 5 V reference terminal C and 5 V. Install a jumper wire between the low reference terminal A and ground.
2. Sweep the sensor through the entire range while monitoring the voltage between the signal terminal B and the low reference terminal A. The voltage should vary between 0.8-2.1 V without any spikes or dropouts.
 - If not within the specified range or is erratic, replace the B22 brake pedal position sensor.

Repair Procedures

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

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

DTC C0297

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 C0297 02

Brake Applied Output Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Brake Applied Output Signal	C0297 02	-	-	-

Circuit/System Description

The brake pedal position sensor is used to sense the action of the driver application of the brake pedal. The brake pedal position sensor provides an analog voltage signal that will increase as the brake pedal is applied. The body control module provides a low reference signal and a 5 V reference voltage to the brake pedal position sensor. When the variable signal reaches a voltage threshold indicating the brakes have been applied, the BCM will apply a 12 V signal to the brake applied output circuit to the engine control module.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

The BCM detects a short to ground on the control circuit.

Action Taken When the DTC Sets

None.

Conditions for Clearing the DTC

The condition for setting the DTC is not longer present.

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

Verify that DTC C0277 is not set

- If DTC is set, refer to **DTC C0277 or C0890**.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the K20 ECM.
2. Connect a test lamp between the harness connector terminal 57 and ground.
3. Ignition ON, apply and release the brake pedal. The test lamp should turn ON and OFF when changing between the selected states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 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 K9 BCM.
4. If all circuits test normal, replace the K20 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

NOTE: **The following steps must be completed before using a symptom table.**

- Perform the **Diagnostic System Check - Vehicle** before using a symptom table in order to verify that all of the following conditions are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
- Review the system description and operation in order to familiarize yourself with the system functions. Refer to the following:
 - **Exterior Lighting Systems Description and Operation**
 - **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

Thoroughly inspect the wiring and connectors. An incomplete inspection of the wiring and connectors may result in misdiagnosis causing part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, 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 Accent Lighting Malfunction**
- **Interior Backlighting Malfunction**
- **Park, License, and/or Tail Lamps Malfunction**
- **Stop Lamps Malfunction**
- **Turn Signal Lamps and/or Indicators 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 Signal	1	1	2	-
1. Backup Lamp Inoperative 2. Backup Lamp Always ON				

Circuit/System Description

When the transmission is placed in the reverse position, the engine control module (ECM) sends a serial data message to the body control module (BCM). The message indicates that the gear selector is in the reverse position. The BCM applies battery voltage to the backup lamps. The backup lamps are permanently grounded. Once the driver moves the gear selector out of the reverse position, a message is sent by the ECM via serial data requesting the BCM to remove battery voltage from the backup lamp control circuit.

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, shift the vehicle between the park and reverse positions. The backup lamps should turn ON and OFF when changing between the selected states.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate E5 backup lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5.0 ohms 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, shift the vehicle between the park and reverse positions. The test lamp should turn ON and OFF when changing between the selected 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 K9 BCM.
 - 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 K9 BCM.
5. If all circuits test normal, test or replace the E5 backup lamp.

Repair Procedures

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

- **Tail Lamp Replacement (Equinox)** or **Tail Lamp Replacement (Terrain)**
- **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.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Dome/Courtesy Lamp Control	2	2	1	-
Courtesy Lamp Control	-	2	-	-
1. Dome/Courtesy Lamps Always Illuminated 2. Dome/Courtesy Lamps Do Not Illuminate				

Circuit/System Description

Battery voltage for the courtesy lamps is supplied at all times to the body control module (BCM). When the

BCM receives a signal to command the courtesy lamps ON, it then applies voltage through the dome/courtesy lamps control circuit to the courtesy lamps.

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, observe the scan tool Door Ajar Switch parameter while opening and closing each vehicle door. The parameter should change between Inactive and Active.
 - If the parameter does not change between the selected states, refer to **Door Ajar Indicator Malfunction** .
2. Observe the scan tool Rear Closure Ajar Switch parameter while opening and closing the rear liftgate. The parameter should change between Active and Inactive.
 - If the parameter does not change between the selected states, refer to **Liftgate Ajar Indicator Malfunction (Manual Liftgate)** or **Liftgate Ajar Indicator Malfunction (Power Liftgate)** .
3. Command the Courtesy Lamps Duty Cycle Command ON and OFF with a scan tool. The courtesy lamps should turn ON and OFF when changing between the commanded states.
 - If one or more courtesy lamps do not turn ON and OFF when changing between the commanded states, refer to Courtesy Lamp Malfunction below.
4. Cycle the Dome/Reading Lamps switch in all positions while observing the scan tool Dome Lamp Switch parameter. The parameter should change between Inactive and Active.
 - If the parameter does not change, refer to Dome Lamp Switch Malfunction below.

5. Command the Courtesy Lamps Duty Cycle Command ON and OFF with a scan tool. The reading lamps should turn ON and OFF while changing between the commanded states.
 - If the reading lamps do not turn ON and OFF when changing between the commanded states, refer to Reading Lamp Malfunction below.
6. Turn the center console compartment lamp ON and OFF by using the center console compartment lamp switch. The center console compartment lamp should turn ON and OFF while changing between the selected states.
 - If the center console compartment lamp does not turn ON and OFF when changing between the selected states, refer to Center Console Illumination Malfunction below.
7. Turn the sunshade lamp ON and OFF by using the sunshade lamp switch. The sunshade lamp should turn ON and OFF while changing between the selected states.
 - If the sunshade lamp does not turn ON and OFF when changing between the selected states, refer to Sunshade Illumination Malfunction below.

Circuit/System Testing

Courtesy Lamp Malfunction

1. Disconnect the harness connector at the appropriate courtesy lamp.
2. Ignition OFF, scan tool OFF, doors CLOSED, interior lamps OFF, test for less than 5.0 ohms between the ground circuit terminal listed below and ground:
 - E8 Instrument Panel Courtesy Lamp - terminal 2
 - E37 Dome/Reading Lamp Middle - terminal 6
 - E37 Dome/Reading Lamp Rear - terminal 6
 - E37 Dome/Reading Lamp Front - terminal B
 - 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:
 - E8 Instrument Panel Courtesy Lamp - terminal 1
 - E37 Dome/Reading Lamp Middle - terminal 2
 - E37 Dome/Reading Lamp Rear - terminal 2
 - E37 Dome/Reading Lamp Front - terminal A
4. Command the Courtesy Lamps Duty Cycle Command 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 control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, replace the courtesy lamp.

Dome Lamp Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S12 dome lamp switch.

2. Scan tool disconnected, doors CLOSED, interior lamps OFF, test for less than 5 ohms between the ground circuit terminal 1 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/Courtesy Lighting Master Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 2 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Verify the scan tool Dome Lamp Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 3 for a short to ground. If the circuit tests normal, replace the K9 BCM.
5. Connect a 3 A fused jumper wire between the signal circuit terminal 2 and ground. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to B+ or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
6. Connect a 3 A fused jumper wire between the signal circuit terminal 3 and ground. Verify the scan tool Dome Lamp Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to B+ or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
7. If all circuits test normal, replace the S12 dome lamp switch.

Reading Lamp Malfunction

1. Ignition OFF, disconnect the harness connector at the E37 dome/reading lamp - front.
2. Test for less than 5 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 A and ground.
4. Ignition ON, turn the dome/reading lamp ON and OFF with the S17 dome/reading lamp switch. The test lamp should turn ON and OFF when changing between the selected states.
 - 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 K9 BCM.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, test or replace the E37 dome/reading lamp - front.

Center Console Illumination Malfunction

1. Ignition OFF, disconnect the harness connector at the E28 center console compartment lamp.
2. Test for less than 5 ohms between the ground circuit terminal 2 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between the control circuit terminal 1 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 K9 BCM.
4. If all circuits test normal, tests or replace the E28 center console compartment lamp.

Sunshade Illumination Malfunction

1. Ignition OFF, disconnect the harness connector at the A3 sunshade.
2. Test for less than 5 ohms between the ground circuit terminal B and ground.
 - o If greater than the specified value, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit terminal A and ground.
4. Turn the sunshade lamp ON and OFF with the sunshade switch. The test lamp should turn ON and OFF when changing between the selected states.
 - 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 K9 BCM.
 - 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 K9 BCM.
5. If all circuits test normal, test or replace the A3 sunshade.

Repair Procedures

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

- **Dome and Reading Lamp Switch Replacement**
- Refer to the appropriate replacement procedure for the lighting component that requires replacement.
- **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.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	B2645 03	B2645 07	B2645 07	-
Ground	-	1	-	-
1. Daytime Running Lamps Inoperative				

Circuit/System Description

The body control module (BCM) receives a signal from the ambient light/sunload sensor indicating a low or high ambient outside light level. Under daylight conditions the daytime running lamps are being supplied by battery voltage. The now closed relay supplies voltage to the day time running lamps. If the headlamps are illuminated the daytime running lamps (DRL) will not illuminate.

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, Headlamps OFF, command the Low Beams Relay Command ON and OFF with a scan tool. The low beam headlamps should turn ON and OFF when changing between the commanded states.
 - If the low beam headlamps do not change between the commanded states, refer to **Headlamps Malfunction**.
2. Observe the scan tool Ambient Light Status parameter while supplying sufficient light to simulate daylight conditions to the ambient light sensor. After 30 seconds, the parameter should be Daylight.
 - If not the specified value, refer to Circuit/System Testing.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the B10B ambient light/sunload sensor.
2. Ignition OFF, test for less than 5 ohms between the ground circuit terminal 6 and B+.
 - If greater than the specific range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Ambient Light Sensor parameter is greater than 4.65 V.
 - If less than the specified range, test the signal circuit terminal 5 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the ground circuit terminal 6. Verify the scan tool Ambient Light Sensor parameter is less than 0.196 V.

- If greater than the specified range, test the signal circuit for a short to voltage an open/high resistance. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, replace the B10B ambient light/sunload sensor.

Repair Procedures

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

- **Headlamp Automatic Control Ambient Light Sensor Replacement**
- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **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 Control	B2530 02	B2530 04	B2530 01	-
Right Front Fog Lamp Ground	-	1	-	-
Left Front Fog Lamp Ground	-	2	-	-
1. Right Front Fog Lamp Inoperative 2. Left Front Fog Lamp Inoperative				

Circuit/System Description

The front fog lamp relay is supplied with battery voltage at all times. The front fog lamp switch signal circuit is grounded momentarily by pressing the front fog lamp switch. The body control module (BCM) energizes the front fog lamp relay by applying ground to the front fog lamp relay control circuit. When the front fog lamp relay is energized, the relay switch contacts close and battery voltage is applied through the front fog lamp fuse to the front fog lamp supply voltage circuit which illuminates the front fog lamps. With the front fog lamp switch activated the BCM sends a message via serial data to the instrument cluster requesting the instrument cluster to illuminate the front fog indicator.

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 Lamps Switch parameter while turning the front fog lamps switch ON and OFF. The parameter should change between Active and Inactive.
 - If the parameter does not change between the commanded states, refer to Front Fog Lamp Switch Malfunction below.
2. Ignition ON, command the Front Fog Lamps Relay Command ON and OFF with a scan tool. The fog lamps should turn ON and OFF.
 - If the front fog lamps do not turn ON and OFF, refer to Front Fog Lamp Malfunction.
3. Command the All Indicators Test ON and OFF with a scan tool. The front fog lamps indicator should turn ON and OFF when changing between the commanded states.
 - If the front fog lamps indicator illuminates during the test, replace the K9 BCM.
 - If the front fog lamps indicator does not illuminate during the test or remains illuminated at all times, replace the P16 instrument cluster.

Circuit/System Testing

Front Fog Lamp Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S78 turn signal/multi-function switch.
2. Test for less than 5 ohms between the ground circuit terminal 6 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 Lamps Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 1 for a short to ground. If the circuit tests normal, replace the K9 BCM.

4. Install a 3 A fused jumper wire between the signal circuit terminal 1 and the ground circuit terminal 6. Verify the scan tool Front Fog Lamps Switch parameter is Active.
 - 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 K9 BCM.
5. If all circuits test normal, test or replace the S78 turn signal/multi-function switch.

Front Fog Lamps Malfunction

1. Ignition OFF, disconnect the X4 harness connector at the X50A fuse block - underhood.
2. Connect a test lamp between the control circuit terminal K7 and B+.
3. Command the Front Fog Lamps Relay Command 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 X50A fuse block - underhood.
 - 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 X50A fuse block - underhood.
4. Ignition OFF, connect the X4 harness connector at the X50A fuse block - underhood. Disconnect the harness connector at the appropriate E29 fog lamp - front.
5. Test for less than 5 ohms between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
6. Connect a test lamp between the control circuit terminal A and ground.
7. Command the Front Fog Lamps Relay Command 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 X50A fuse block - underhood.
 - If the test lamp is always OFF and the circuit fuse is good, test the control circuit for an open/high resistance. If the circuit tests normal, test or replace the X50A fuse block - underhood.
 - If the test lamp is always OFF and the circuit fuse is open, test the control circuit for a short to ground. If the circuit tests normal, test or replace the E29 fog lamp - front.
8. If all circuits test normal, test or replace the E29 fog lamp - front.

Repair Procedures

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

- **Front Fog Lamp Replacement (Equinox)** or **Front Fog Lamp Replacement (Terrain)**
- **Accessory Wiring Junction Block Replacement**
- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for BCM or instrument panel cluster 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	-
Hazard Switch Ground	-	1	-	-
Hazard Lamps Switch Backlight Signal	B096A 02	B096A 04	B096A 01	-
1. Hazard Lamps Inoperative 2. Hazard Lamps Always ON				

Circuit/System Description

The hazard flashers may be activated in any power mode. The hazard switch signal circuit is momentarily grounded when the hazard switch is pressed. The body control module (BCM) supplies battery voltage to all turn signal lamps in an ON and OFF duty cycle. When the hazard switch is activated, the BCM sends a serial data message to the instrument cluster requesting both turn signal indicators to be cycled ON and OFF.

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 Hazard Warning Switch parameter while applying and releasing the hazard switch. The reading should change between Active and Inactive.
 - If the parameter does not change between the commanded states, refer to Circuit/System Testing.
2. Observe the right and left turn signal lamps while applying and releasing the hazard lamp switch. The right and left turn signal lamps should flash ON and OFF while the hazard lamp switch is ON and remain OFF when the hazard lamp switch is OFF.
 - If the turn signal lamps do not cycle between the selected states, refer to **Turn Signal Lamps and/or Indicators Malfunction**.
3. Command the All Indicators Test ON and OFF with a scan tool. The left and right turn signal indicators should turn ON and OFF when changing between the commanded states.
 - If the left and right turn signal indicators illuminate during the test, replace the K9 BCM.
 - If the left and right turn signal indicators do not illuminate during the test or remain illuminated at all times, replace the P16 instrument panel cluster.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the A20 radio/HVAC controls.
2. Ignition OFF and all vehicle systems OFF. It may take up to 2 minutes for all vehicle systems to power down. 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 Hazard Warning Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 16 for a short to ground. If the circuits tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 16 and the ground circuit terminal 17. Verify the scan tool Hazard Warning Switch parameter is Active.
 - 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 K9 BCM.
5. If all circuits test normal, test or replace the A20 radio/HVAC controls.

Repair Procedures

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

- **Radio Control Assembly Replacement**
- **Control Module References** for BCM or instrument cluster 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
Low Beam Headlamp Supply Voltage	1	1	3	-
Low Beam Headlamp Ground	-	1	-	-
High Beam Headlamp Supply Voltage	2	2	4	-
High Beam Headlamp Ground	-	2	-	-
Headlamp High Beam Relay Control	4	2	1	-
Headlamp Switch Headlamps OFF Signal	B257A 00	6	6*	-
Headlamp Switch Headlamps ON Signal	B257A 00	1	1*	-
Headlamp Switch Ground	-	1, 2	-	-
Flash to Pass Switch Signal	B3806 00	5	B3806 00	-
Headlamp High Beam Signal	B3650 08	2	2	-
Low Beam Headlamp Ground	-	1	-	-
High Beam Headlamp Ground	-	2	-	-
Headlamp Switch Ground	-	1, 2	-	-
Turn Signal/Multifunction Switch Ground	-	2, 5	-	-
* Internal damage to the headlamp switch may occur if shorted to B+ 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				

Circuit/System Description

The vehicle headlamps are controlled by the body control module (BCM) based on inputs from the headlamp switch and the turn signal/multifunction switch. The headlamp switch has four positions: OFF, Automatic Light, Parking Light, and Low Beam. The default headlamp switch position is Automatic Light, 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 headlamp and will turn OFF the vehicle headlamps. When in the OFF position, the headlamp switch grounds the headlamp switch headlamps OFF signal circuit, prompting the BCM to turn OFF the headlamps. The park position of the headlamp switch will only illuminate the vehicle parking lamps. The Low Beam position of the headlamp switch will illuminate both the parking lamps, as well as the headlamps. With the headlamp switch in the Low Beam 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 high beam select 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 high beam select 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 high beam select switch is in the high beam position, the high beam select signal circuit is grounded. This prompts the BCM to turn on the high beam 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 Headlamp On Switch parameter while turning the headlamp switch ON and OFF. The reading should toggle between Active and Inactive.
 - If the reading does not change between the commanded states, refer to Headlamp Switch Malfunction.
2. Observe the scan tool Automatic Headlamp Disable Switch parameter while applying and releasing the automatic lamp control disable switch. The reading should toggle between Active and Inactive.
 - If the reading does not change between the commanded states, refer to Headlamp Switch Malfunction.
3. Observe the scan tool Headlamps Flash Switch parameter while applying and releasing the flash to pass

switch. The reading should toggle between Active and Inactive.

- If the reading does not change between the commanded states, refer to Turn Signal/Multifunction Switch Malfunction below.
- 4. Observe the scan tool High Beam Select Switch parameter while applying and releasing the high beam select switch. The reading should toggle between Active and Inactive.
 - If the reading does not change between the commanded states, refer to Turn Signal/Multifunction Switch Malfunction below.
- 5. Command the Low Beam Relay Command ON and OFF with a scan tool. The low beam headlamps should turn ON and OFF when commanded.
 - If the low beam headlamps do not turn ON and OFF when commanded, refer to Headlamps Malfunction - Low Beam below.
- 6. Command the High Beam Command ON and OFF with a scan tool. The high beam headlamps should turn ON and OFF when commanded.
 - If the high beam headlamps do not turn ON and OFF when commanded, refer to Headlamps Malfunction - High Beam below.
- 7. Command the All Indicators Test ON and OFF with a scan tool. The high beam indicator should turn ON and OFF when changing between the commanded states.
 - If the high beam indicator illuminates during the test, replace the K9 BCM.
 - If the high beam indicator does not illuminate during the test or remains illuminated at all times, replace the P16 instrument cluster.

Circuit/System Testing

Headlamp Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S78 turn signal/multifunction switch.
2. Ignition OFF, test for less than 5 ohms between the ground circuit terminal 6 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 On Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 2 for short to ground. If the circuit tests normal, replace the K9 BCM.
4. Verify the scan tool Automatic Headlamp Disable Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 9 for short to ground. If the circuit tests normal, replace the K9 BCM.
5. Install a 3 A fused jumper wire between the signal circuit terminal 2 and ground. Verify the scan tool Headlamp On Switch parameter is Active.
 - 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 K9 BCM.
6. Install a 3 A fused jumper wire between the signal circuit terminal 9 and ground. Verify the scan tool Automatic Headlamp Disable Switch parameter is Active.
 - 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 K9 BCM.

7. If all circuits test normal, test or replace the S78 turn signal/multifunction switch.

Turn Signal/Multifunction Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the turn S78 turn signal/multifunction switch.
2. Ignition OFF, test for less than 5.0 ohms between the ground circuit terminal 6 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Headlamps Flash Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 12 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Verify the scan tool High Beam Select Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 11 for a short to ground. If the circuit tests normal, replace the K9 BCM.
5. Install a 3 A fused jumper wire between the signal circuit terminal 12 and ground. Verify the scan tool Headlamps Flash 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 K9 BCM.
6. Install a 3 A fused jumper wire between the signal circuit terminal 11 and ground. Verify the scan tool High Beam Select 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 K9 BCM.
7. If all circuits test normal, test or replace the S78 turn signal/multifunction switch.

Headlamps Malfunction - Low Beam

1. Ignition OFF, disconnect the harness connector at the appropriate E4 low beam headlamp.
2. Ignition OFF, scan tool disconnected, exterior lamps OFF, test for less than 5.0 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 A and ground.
4. Command the Low Beam Relay Command 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 K9 BCM.
 - If the test lamp is always OFF, test the control circuit for a short to ground or open/high resistance. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, test or replace the E4 low beam headlamp.

Headlamps Malfunction - High Beam

1. Ignition OFF, disconnect the KR48 headlamp high beam relay.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuit terminal 30 and

ground.

- If the test lamp illuminates, test the control circuit for a short to voltage.
- 3. Verify that a test lamp illuminates between the B+ circuit terminal 86 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
- 4. Verify that a test lamp illuminates between the B+ circuit terminal 87 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 appropriate E4 headlamp - high beam.
- 6. Test for less than 5 ohms 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 E4 headlamp - high beam.
- 8. Connect a 10 A fused jumper wire between the B+ circuit terminal 87 and the control circuit terminal 30. Verify the E4 headlamp - high beam is activated.
 - If the E4 headlamp - high beam does not activate and the circuit fuse is good, test the control circuit for an open/high resistance. If the circuit tests normal, test or replace the E4 headlamp - high beam.
 - If the E4 headlamp - high beam does not activate and the circuit fuse is open, test the control circuit for a short to ground. If the circuit tests normal, test or replace the E4 headlamp - high beam.
- 9. Connect a test lamp between the B+ circuit terminal 86 and the control circuit terminal 85.
- 10. Command the High Beam Command 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 K9 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 K9 BCM.
- 11. If all circuits test normal, test or replace the KR48 headlamp high beam relay.

Repair Procedures

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

- **Turn Signal Multifunction Switch Replacement**
- **Relay Replacement (Attached to Wire Harness)** or **Relay Replacement (Within an Electrical Center)**
- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **Headlamp Bulb Replacement (High Beam Equinox)** or **Headlamp Bulb Replacement (Low Beam Equinox)** or **Headlamp Bulb Replacement (High Beam Terrain)** or **Headlamp Bulb Replacement (Low Beam Terrain)**
- **Control Module References** for BCM and instrument panel cluster replacement, setup and programming

INTERIOR ACCENT LIGHTING 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
Interior Accent Light Control	2	2	1	-
1. Interior Accent Light at Full Intensity and Does Not Dim 2. Interior Accent Light do Not Illuminate				

Circuit/System Description

The body control module (BCM) uses the ambient light sensor to determine which brightness of the accent light is needed. The BCM applies a pulse width modulated (PWM) voltage through the accent LED control circuit, daylight conditions 0%, night conditions 20% and as welcome light 50% illumination.

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. Observe the driver information center while opening and closing each vehicle door and the liftgate. The driver information center should display the door ajar/liftgate ajar message only when the door/liftgate is open.
 - If the driver information center displays the door ajar/liftgate ajar message when a door or the liftgate is closed, refer to **Door Ajar Indicator Malfunction**.
2. When opening the driver door the ambient illumination should go ON. When closing the driver door and locking the vehicle the accent light illumination should go OFF after 5 seconds.
 - If the backlighting does not go ON and OFF, refer to Circuit/System Testing below.

Circuit/System Testing

NOTE: Each back lighted component may need to be disconnected to isolate a short to voltage or short to ground. Use the schematic to identify the following:

- Back lighted components the vehicle is equipped with.
 - Component locations on the back lighting dimming control circuit
 - Each component's control and ground circuit terminals
1. Ignition OFF, disconnect the harness connector at any component with inoperative backlighting.
 2. Ignition OFF, scan tool disconnected, interior lamps OFF, doors CLOSED, test for less than 5 ohms between the ground circuit and ground.
 - If greater than the specified value, test the ground circuit for an open/high resistance.
 3. Connect a test lamp between the control circuit and ground.
 4. Command the Accent Lighting Command 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 control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
 5. If all circuits test normal, test or replace the backlighting component.

Repair Procedures

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

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
Dimming B+ Circuit	B1395 03, B3600 03	B3600 03	B3600 07	-
Instrument Panel Lamps Dimmer Switch Signal	B1395 03, B3600 03	B3600 03	B257B 07	-
Interior Backlighting Control	2	2	1	-
Interior Backlighting Ground	-	2	-	-
1. Interior Backlighting At Full Intensity And Cannot Be Dimmed 2. Interior Backlighting Will Not Illuminate				

Circuit/System Description

The body control module (BCM) supplies a voltage reference to the backlight dimmer switch. When the backlight dimmer switch is placed in a desired brightness position, reference voltage is applied through the backlight dimmer switch rheostat to the BCM. The BCM interprets this voltage signal, then applies a pulse width modulated (PWM) voltage through the backlight lamp control circuit, and the LED dimming control circuit illuminating them to the desired level of brightness.

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 scan tool LED Backlight Dimming parameter while operating the dimmer switch from low to high. The parameter should indicate between 5-50% when the dimmer switch is moved up and down.
 - If the parameter does not change between the selected states, refer to Dimmer Switch Malfunction below.
2. Command the LED Backlight Dimming Command ON and OFF with a scan tool. The LED backlighting components should turn ON and OFF when changing between the commanded states.
 - If the LED backlighting components do not change between the commanded states, refer to Interior Backlighting Malfunction below.

Circuit/System Testing

Dimmer Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S36 instrument panel dimmer switch.
2. Ignition OFF, test for less than 60 ohms between the low reference circuit terminal 10 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 K9 BCM.
3. Ignition ON, test for B+ between the B+ circuit terminal 5 and ground.
 - If less than the specified range, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.

NOTE: **The BCM will automatically put in a default Incandescent Dimming Duty Cycle Command setting of 50%. The next step will look for a brief change in the Incandescent Dimming Duty Cycle Command parameter from 50% to 5% - returning after 3 seconds to the 50% default setting.**

4. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the B+ circuit terminal 5. Verify the scan tool Incandescent Dimming Duty Cycle Command briefly drops to 5%, returning after 3 seconds to the 50% default value.
 - If less than the specified range, test the signal circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, test or replace the S36 instrument panel dimmer switch.

Interior Backlighting Malfunction

1. Ignition OFF, disconnect the harness connector at the inoperative backlighting component.
2. Ignition OFF, scan tool disconnected, interior lamps OFF, doors CLOSED, test for less than 5 ohms between the ground circuit and ground.
 - If greater than the specified value, test the ground circuit for an open/high resistance.

- 3. Connect a test lamp between the control circuit and ground.
- 4. Command the LED Backlight Dimming Command 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 OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
 - o If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the BCM.
- 5. If all circuits test normal, replace the inoperative backlighting component.

Repair Procedures

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

- **Instrument Panel Lamp Dimmer Switch Replacement**
- Refer to the appropriate replacement procedure for the component causing the condition.
- **Control Module References** for BCM, HVAC, instrument panel cluster, or radio 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 Switch On Signal	1	2	-	-
Left/Right Park Lamp Control	1	2	-	-
License Plate Light Control	4	4	3	-
Park Lamps Ground	-	2	-	-
License Plate Lights Ground	-	4	-	-
1. Park Lamps Always ON 2. Park Lamps Always OFF 3. License Plate Lights Always ON 4. License Plate Lights Always OFF				

Circuit/System Description

The park lamps, tail lamps and license plate lights are turned ON when the headlamp switch is placed in the PARKING LIGHT or LOW BEAM position or anytime the headlights are requested. When the body control

module (BCM) receives a request from the headlamp switch to turn ON the park lamps the BCM a sends out a PWM signal, which illuminates the park lamps, tail lamps and license plate lights.

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, turn the park lamps ON and OFF using the S78 turn signal/multifunction switch. The scan tool Park Lamps Switch parameter should cycle between Active and Inactive when changing between the selected states.
 - If the parameter does not cycle between the selected states, refer to Park Lamp Switch Malfunction below.
2. Turn the park, license plate and tail lamps ON and OFF using the S78 turn signal/multifunction switch. The park, license plate and tail lamps should turn ON and OFF when changing between the selected states.
 - If any park, license plate or tail lamp does not turn ON and OFF when changing between the selected states, refer to Park, License and/or Tail Lamp Malfunction below.

Circuit/System Testing

Park Lamp Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S78 turn signal/multifunction switch.

2. Verify that a test lamp illuminates between the ground circuit terminal 6 and B+.
 - If the test lamp does not illuminate, test the ground circuit for an open/high resistance.
3. Ignition ON, test for B+ between the park lamp signal circuit terminal 7 and ground.
 - If less than the specified value, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the park lamp ON signal circuit terminal 7 and ground. Verify the scan tool Park Lamps Switch parameter changes from Inactive to Active.
 - If always Inactive, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
 - If always Active, test the signal circuit for a short to ground. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, replace the S78 turn signal/multifunction switch.

Park, License and/or Tail Lamp Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate park, license and/or tail lamp.
2. Test for less than 5 ohms between the ground circuit terminal listed below and ground:
 - E2 Side Marker Lamp - Terminal B
 - E4 Park/Turn Signal Lamp - Terminal G
 - E5 Tail/Turn Signal Lamp - Terminal G
 - E7 License Plate Lamp - Terminal 2
 - If greater than the specified value, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit terminal listed below and ground:
 - E2 Side Marker Lamp - Terminal A
 - E4 Park/Turn Signal Lamp - Terminal B
 - E5 Tail/Turn Signal Lamp - Terminal B
 - E7 License Plate Lamp - Terminal 1
4. Turn the park, license and tail lamps ON and OFF using the S78 turn signal/multifunction switch. The test lamp should turn ON and OFF when changing between the selected states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 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 K9 BCM.
5. If all circuits test normal, test or replace the park, license and/or tail lamp.

Repair Procedures

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

- **Rear License Plate Lamp Replacement (Equinox)** or **Rear License Plate Lamp Replacement (Terrain)**

- Headlamp Replacement (Equinox) or Headlamp Replacement (Terrain)
- Turn Signal Multifunction Switch Replacement
- Tail Lamp Replacement (Equinox) or Tail Lamp Replacement (Terrain)
- Control Module References for BCM replacement, setup, and programming

STOP LAMPS MALFUNCTION

NOTE: Brake system does not use a brake switch, stoplight switch or brakelight switch. System uses a Brake Pedal Position Sensor to control these functions.

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
5 V Reference	C0277 06	C0277 06	C0277 07	-
Signal	C0277 06	C0277 06	C0277 07	C0277 09
Low Reference	-	1	-	-
1. Stop Lamps Malfunction				

Circuit/System Description

The brake pedal position (BPP) sensor is used to sense the action of the driver application of the brake pedal. The brake pedal position (BPP) sensor provides an analog voltage signal that will increase as the brake pedal is applied. The body control module (BCM) provides a low reference signal and a 5 V reference voltage to the brake pedal position sensor. When the variable signal reaches a voltage threshold indicating the brakes have been applied, the BCM will apply battery voltage to the stop lamp control circuit and center high mounted stop lamp control circuit. When the control circuit is energized the stop lamps are illuminated.

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 Brake Lamps Command parameter while pressing and releasing the brake pedal. The parameter should change between Active and Inactive.
 - If the parameter does not change between the commanded states, refer to the Brake Pedal Position Sensor Malfunction.
2. Observe the left and right stop lamps while pressing and releasing the brake pedal. The stop lamps should turn ON and OFF when changing between the selected states.
 - If the left or right stop lamps do not change between the selected states, refer to the Stop Lamp Malfunction below.
3. Observe the center high mount stop lamp while pressing and releasing the brake pedal. The center high mount stop lamp should turn ON and OFF when changing between the selected states.
 - If the center high mount stop lamp does not change between the selected states, refer to Center High Mount Stop Lamp Malfunction below.

Circuit/System Testing

Brake Pedal Position Sensor Malfunction

1. Ignition OFF, disconnect the harness connector at the B22 brake pedal position sensor.
2. Ignition OFF, test for less than 5 ohms between the low reference circuit terminal A 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 K9 BCM.
3. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal C and ground.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
4. Test for less than 0.3 V between the signal circuit terminal B and ground.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.

5. Test for 4.8-5.2 V between the 5 V reference circuit terminal C and the signal circuit terminal B.
 - If less than the specified range, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the K9 BCM.
6. Ignition OFF, disconnect the X2 harness connector at the K9 BCM.
7. Test for infinite resistance between the signal circuit terminal 7 and ground.
 - If less than the specified range, test the signal circuit for a short to ground.
8. If all circuits test normal, test or replace the B22 brake pedal position sensor.

Stop Lamp Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate E5 tail/turn signal lamp.
2. Test for less than 5.0 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. Connect a test lamp between the control circuit terminal A and ground.
4. Ignition ON, press and release the brake pedal. The test lamp should turn ON and OFF when changing between the selected 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.
5. If all circuits test normal, test or replace the E5 tail/turn signal lamp.

Center High Mount Stop Lamp Malfunction

1. Ignition OFF, disconnect the harness connector at the E6 center high mounted stop lamp.
2. Test for less than 5 ohms between the ground circuit terminal A and ground.
 - If greater than the specified value, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit terminal B and ground.
4. Ignition ON, command the Center Brake Lamp 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 K9 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 K9 BCM.
5. If all circuits test normal, test or replace the E6 center high mounted stop lamp.

Repair Procedures

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

- **High Mount Stop Lamp Replacement (Equinox)** or **High Mount Stop Lamp Replacement (Terrain)**
- **Tail Lamp Replacement (Equinox)** or **Tail Lamp Replacement (Terrain)**
- **Tail Lamp Bulb Replacement (Equinox)** or **Tail Lamp Bulb Replacement (Terrain)**

- **Stop and Turn Signal Lamp Bulb Replacement (Equinox) or Stop and Turn Signal Lamp Bulb Replacement (Terrain)**
- **Brake Pedal Position Sensor 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

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Turn Signal Lamp Control	B3948 02	4	4	-
Right Front Turn Signal Lamp Control	B3949 02	5	5	-
Left Rear Turn Signal Lamp Control	B3950 02	6	6	-
Right Rear Turn Signal Lamp Control	B3951 02	7	7	-
Left Repeater Lamp Control	B3948 02	8	8	-
Right Repeater Lamp Control	B3949 02	9	9	-
Left Turn Signal Switch Signal	2	2	2	-
Right Turn Signal Switch Signal	3	3	3	-
Left Tail Lamp Ground	-	6	-	-
Left Repeater Lamp Ground	-	8	-	-
Right Repeater Lamp Ground	-	9	-	-
Right Tail Lamp Ground	-	7	-	-
Turn Signal/Multi-Function Switch Ground	-	1	-	-
Left Front Turn Signal Lamp Ground	-	4	-	-
Right Front Turn Signal Lamp Ground	-	5	-	-
1. All Turn Signals Lamps and/or Indicators Inoperative 2. Left Turn Signals Malfunction 3. Right Turn Signals Malfunction 4. Left Front Turn Signal Malfunction 5. Right Front Turn Signal Malfunction 6. Left Rear Turn Signal Malfunction 7. Right Rear Turn Signal Malfunction 8. Left Repeater Lamp Malfunction 9. Right Repeater Lamp Malfunction				

Circuit/System Description

Ground is applied at all times to the turn signal/multi-function switch. The turn signal lamps may only be activated with the ignition switch in the ON or START position. When the turn signal/multi-function switch is placed in either the TURN RIGHT or TURN LEFT position, ground is applied to the body control module through either the right turn or left turn signal switch signal circuit. The BCM then applies a pulsating voltage to the front and rear turn signal lamps through their respective voltage supply circuits. When a turn signal request is received by the BCM, a serial data message is sent to the instrument cluster requesting the respective turn signal indicator be pulsed ON and OFF.

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 Right Turn Signal Switch and Left Turn Signal Switch parameters while cycling the turn signal switch between the left and right positions. The parameters should change between Active and Inactive.
 - If the parameters do not change between the selected states, refer to Turn Signal Switch Malfunction.
2. Ignition ON, observe the right and left turn signal lamps while cycling the turn signal switch between the right and left positions. Verify the turn signal lamps turn ON and OFF.
 - If the turn signal lamps do not cycle between the selected states, refer to Turn Signal Lamps Malfunction below.
3. Command the All Indicators Test ON and OFF with a scan tool. The left and right turn signal indicators should turn ON and OFF when changing between the commanded states.

- If the left and right turn signal indicators illuminate during the test, replace the K9 BCM.
- If the left and right turn signal indicators do not illuminate during the test or remain illuminated at all times, replace the P16 instrument cluster.

Circuit/System Testing

Turn Signal Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S78 Turn Signal/Multi-Function Switch.
2. Test for less than 5 ohms between the ground circuit terminal 6 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Left Turn Signal Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 1 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Verify the scan tool Right Turn Signal Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 7 for a short to ground. If the circuit tests normal, replace the K9 BCM.
5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground. Verify the scan tool Left Turn Signal Switch parameter is Active.
 - 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 K9 BCM.
6. Install a 3 A fused jumper wire between the signal circuit terminal 7 and ground. Verify the scan tool Right Turn Signal Switch parameter is Active.
 - 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 K9 BCM.
7. If all circuits test normal, test or replace the S78 Turn Signal/Multi-Function Switch.

Turn Signal Lamps Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate E4 or E5 turn signal lamp.
2. Test for less than 5.0 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. Connect a test lamp between the control circuit terminal A and ground.
4. Command the appropriate Turn Signal Lamp 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 K9 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 K9 BCM.
5. If all circuits test normal, replace the E4 or E5 turn signal lamp.

Component Testing

Static Test

Turn Signal Switch

1. Ignition OFF, disconnect the harness connector at the S78 turn signal/multi-function switch.
2. Test for infinite resistance between the signal circuit terminal 5 and the ground terminal 6.
 - If less than the specified value, replace the S78 Turn Signal/Multi-Function Switch.
3. Push the signal/multifunction switch in the turn left position, test for less than 5 ohms between signal terminal 5 and ground terminal 6.
 - If greater than the specified value, replace the S78 turn signal/multi-function switch.
4. Test for infinite resistance between the signal circuit terminal 4 and the ground terminal 6.
 - If less than the specified value, replace the S78 turn signal/multi-function switch.
5. Push the signal/multifunction switch in the turn right position, test for less than 5 ohms between signal terminal 4 and ground terminal 6.
 - If greater than the specified value, replace the S78 turn signal/multi-function switch.

Repair Procedures

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

- **Headlamp Replacement (Equinox)** or **Headlamp Replacement (Terrain)**
- **Tail Lamp Replacement (Equinox)** or **Tail Lamp Replacement (Terrain)**
- **Headlamp Bulb Replacement (High Beam Equinox)** or **Headlamp Bulb Replacement (Low Beam Equinox)** or **Headlamp Bulb Replacement (High Beam Terrain)** or **Headlamp Bulb Replacement (Low Beam Terrain)**
- **Tail Lamp Bulb Replacement (Equinox)** or **Tail Lamp Bulb Replacement (Terrain)**
- **Control Module References** for BCM or instrument cluster replacement, setup, and programming

REPAIR INSTRUCTIONS

BRAKE PEDAL POSITION SENSOR CALIBRATION

NOTE: Brake system does not use a brake switch, stoplight switch or brakelight switch. System uses a Brake Pedal Position Sensor to control these functions.

Calibration Criteria

NOTE: Do not apply the brake pedal during the brake pedal position sensor calibration procedure. Any movement of the brake pedal during this procedure will cause the calibration procedure to fail. If this occurs, the brake pedal position sensor calibration must be repeated.

Brake pedal position sensor calibration must be performed after the brake pedal position sensor or body control module (BCM) have been serviced. The calibration procedure will set the brake pedal position sensor home

value. This value is used by the BCM to determine the action of the driver applying the brake system and to provide this information to the vehicle subsystems via serial data.

Calibration Procedure

1. Apply the parking brake.
2. Place the transmission in the PARK position.
3. Install a scan tool.
4. Clear all BCM DTCs before proceeding.
5. Navigate to the Module Diagnosis menu.
6. Select BCM menu item.
7. Select Configuration/Reset Functions menu item.
8. Select the Brake Pedal Position Sensor Learn procedure and follow the directions displayed on the screen.

BRAKE PEDAL POSITION SENSOR REPLACEMENT

NOTE: **Brake system does not use a brake switch, stoplight switch or brakelight switch. System uses a Brake Pedal Position Sensor to control these functions.**

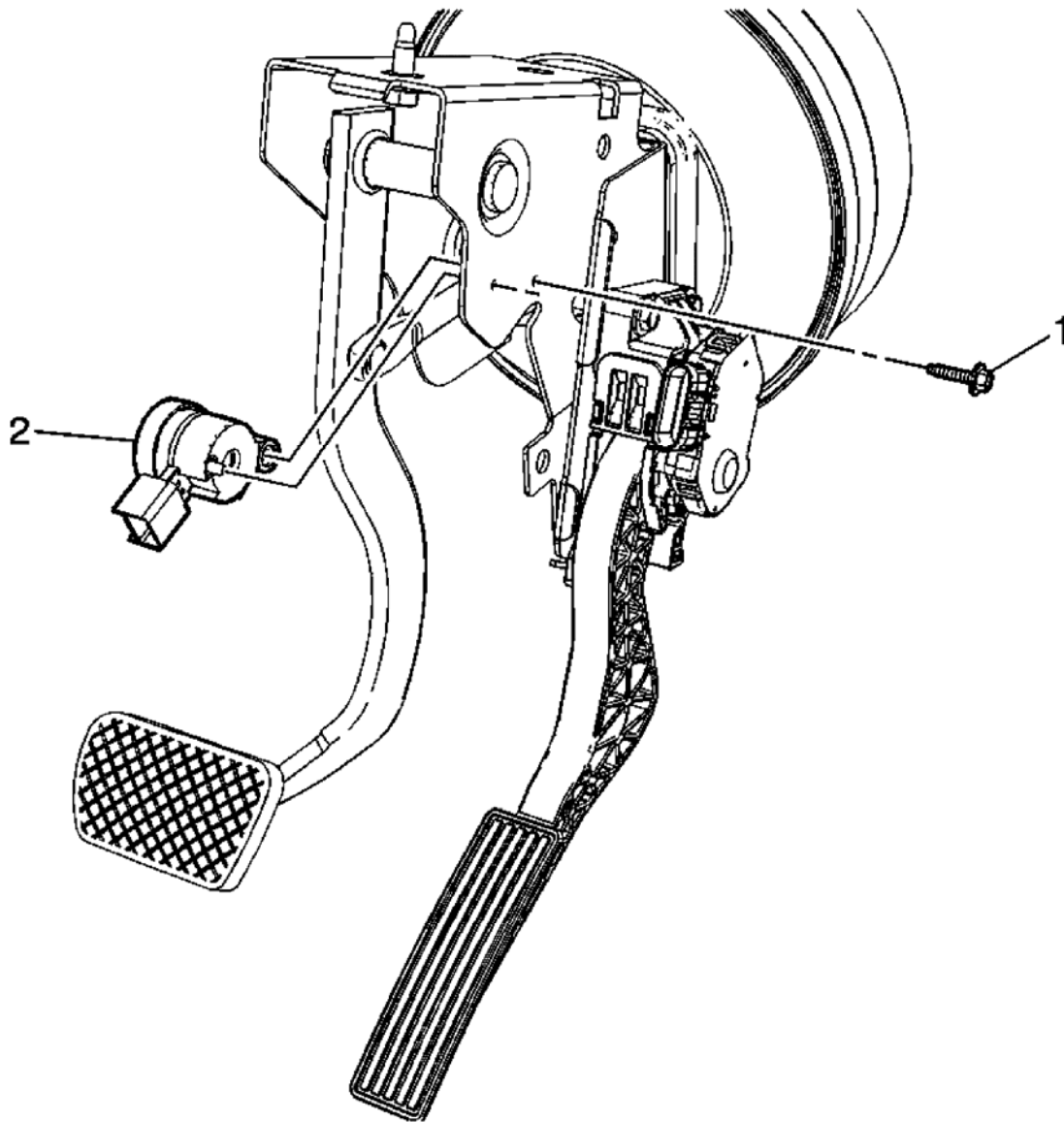


Fig. 14: Brake Pedal Position Sensor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1.	Remove the instrument panel insulator panel left side. Refer to <u>Instrument Panel Insulator Panel Replacement - Left Side (Equinox)</u> or <u>Instrument Panel Insulator Panel Replacement - Left Side (Terrain)</u> .
2.	Remove the communication interface module. Refer to <u>Communication Interface Module Replacement</u>
	Brake Pedal Position Sensor Bolt

1	CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 9 N.m (80 lb in)
2	Brake Pedal Position Sensor Procedure 1. Disconnect the electrical connector. 2. Pull the sensor away from the bracket. 3. Recalibrate the brake pedal position sensor. Refer to <u>Brake Pedal Position Sensor Calibration</u>.

INSTRUMENT PANEL LAMP DIMMER SWITCH REPLACEMENT

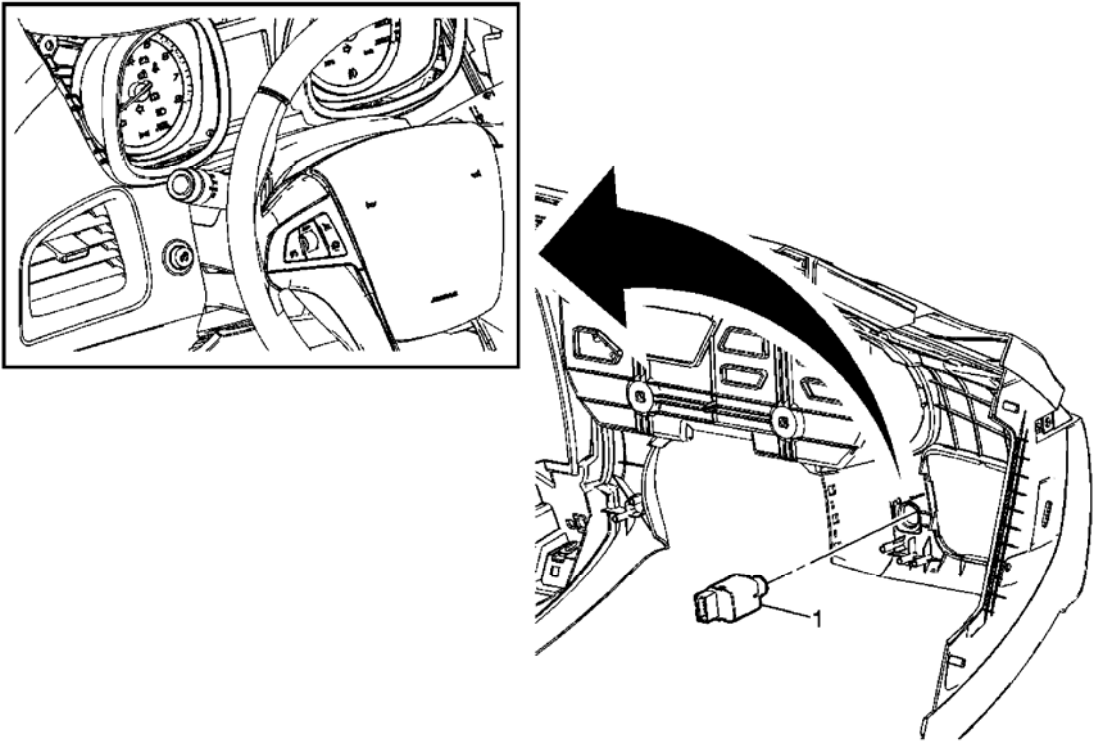


Fig. 15: Instrument Panel Lamp Dimmer Switch
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1.	Remove the instrument panel insulator, left side. Refer to <u>Instrument Panel Insulator Panel Replacement - Left Side (Equinox)</u> or <u>Instrument Panel Insulator Panel Replacement - Left</u>

Side (Terrain)

- 2. Remove the driver knee bolster panel. Refer to **Driver Knee Bolster Panel Replacement (Equinox)** or **Driver Knee Bolster Panel Replacement (Terrain)**
- 3. Remove the driver knee bolster reinforcement. Refer to **Driver Knee Bolster Reinforcement Replacement (Equinox)** or **Driver Knee Bolster Reinforcement Replacement (Terrain)**

Instrument Panel Lamp Dimmer Switch

Procedure

1

- 1. Disconnect the electrical connector.
- 2. From underneath, carefully insert a long appropriate tool into the switch bracket from the inner side of the instrument panel and release the tabs fastening the dimmer switch to the dimmer switch bracket. At the same time, push forward on the switch from a surface side to separate it from the tabs. Use care not to damage the bracket while releasing the fastening tabs.

HEADLAMP AUTOMATIC CONTROL AMBIENT LIGHT SENSOR REPLACEMENT

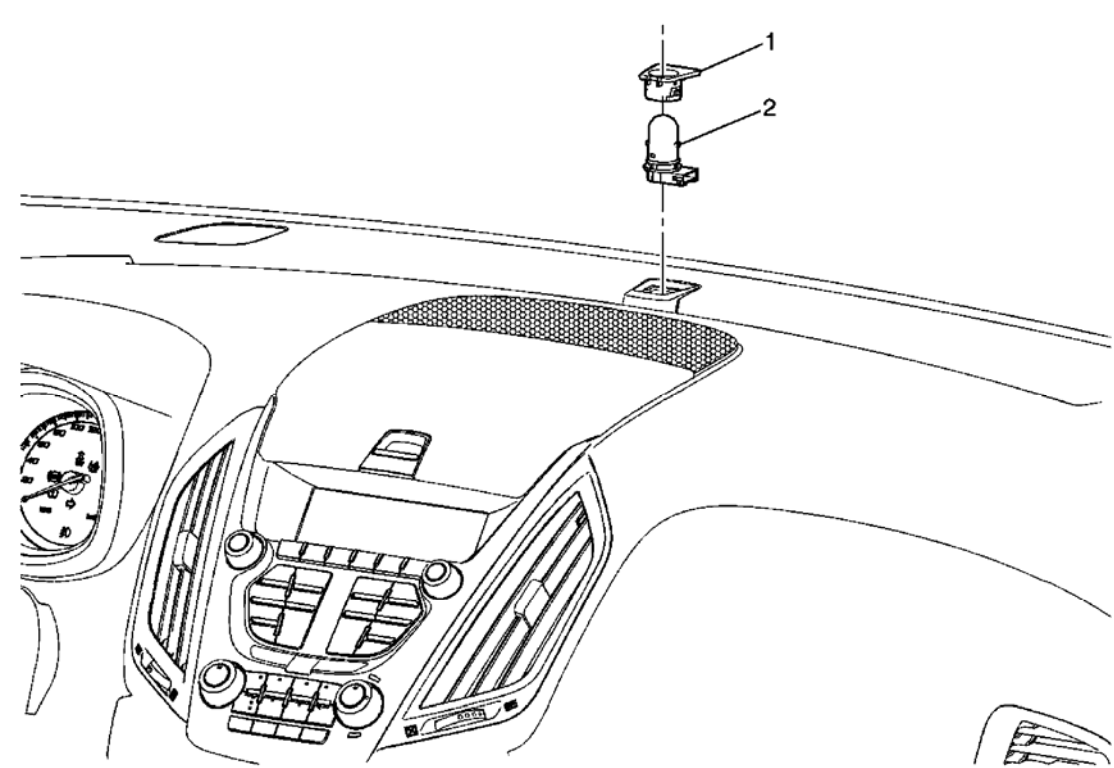


Fig. 16: Headlamp Automatic Control Ambient Light Sensor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
	Instrument Panel Accessory Trim Plate

1	Refer to <u>Instrument Panel Accessory Trim Plate Replacement (Equinox)</u> or <u>Instrument Panel Accessory Trim Plate Replacement (Terrain)</u> .
2	Headlamp Automatic Control Ambient Light Sensor Procedure: Depress tabs to remove sensor from trim plate.

READING LAMP SWITCH PUSHBUTTON REPLACEMENT

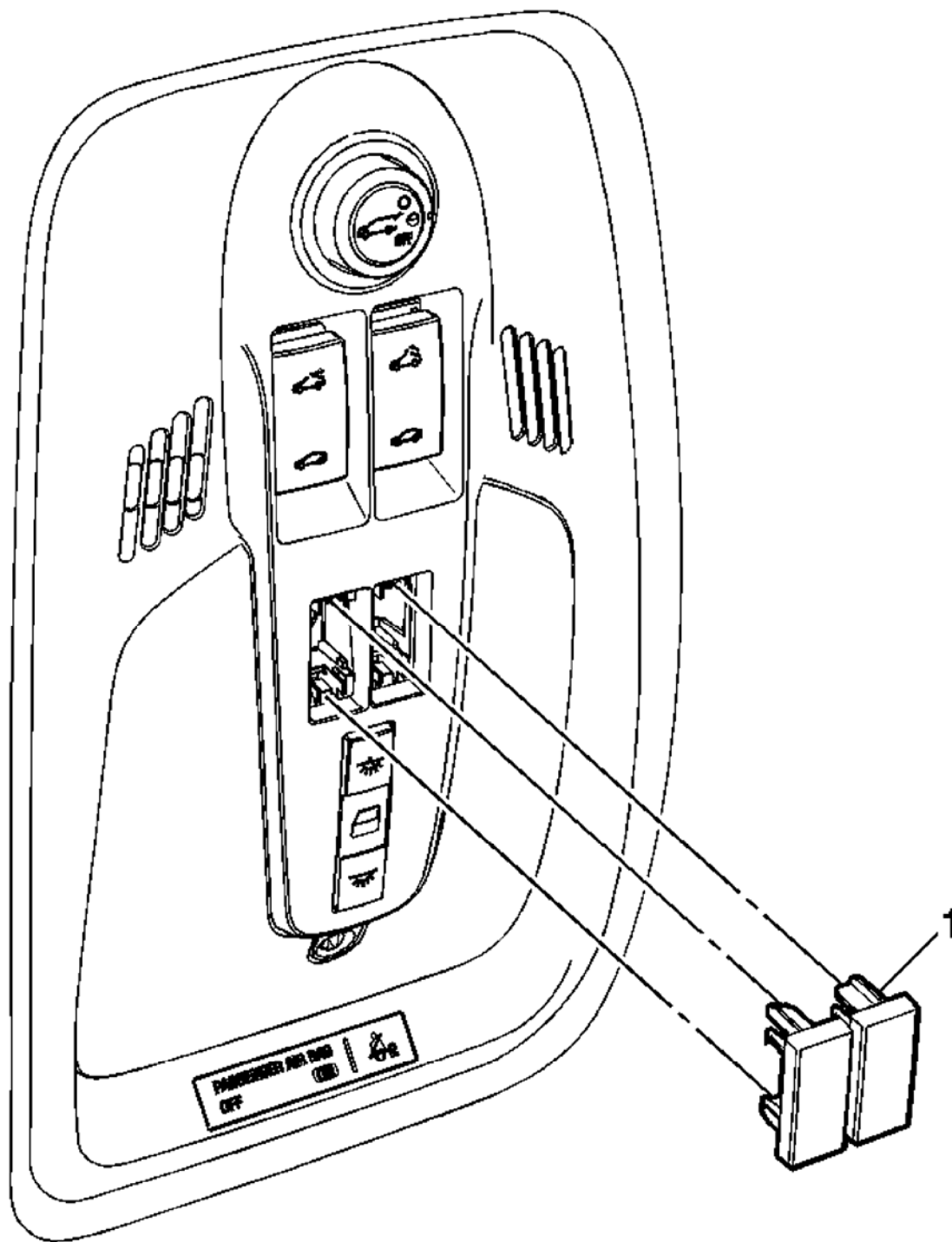


Fig. 17: Reading Lamp Switch Pushbutton
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure:	

Remove the roof console. Refer to **Roof Console Replacement** .

1	Reading Lamp Switch Pushbutton Procedure: Press tabs together and remove switch.
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DOME AND READING LAMP SWITCH REPLACEMENT

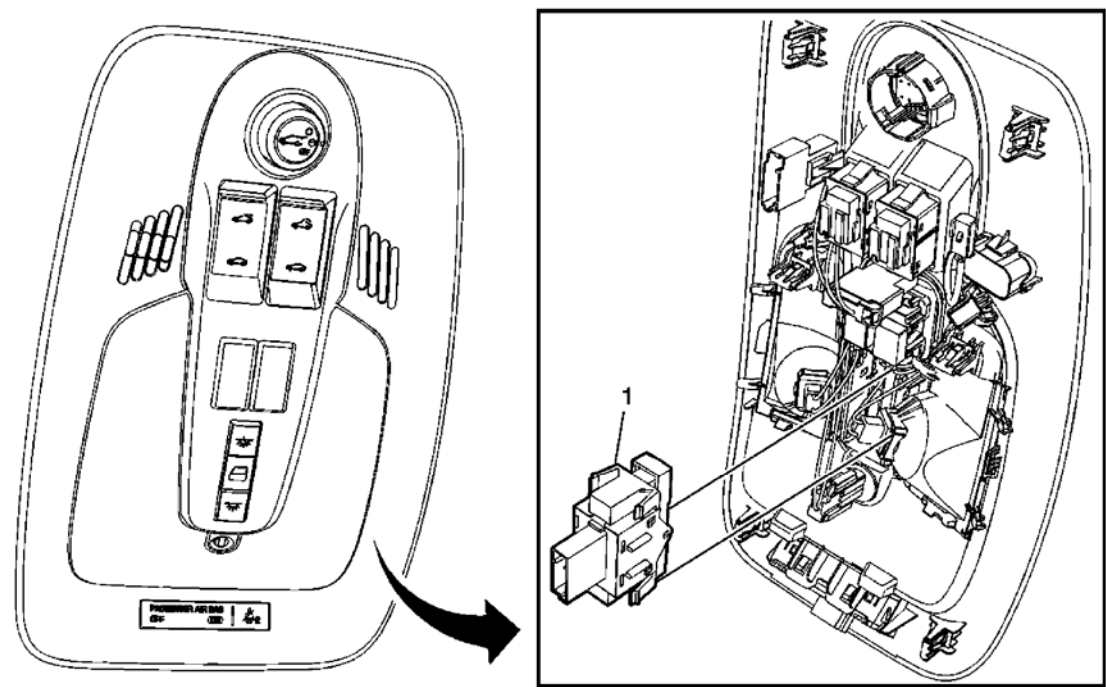


Fig. 18: Dome & Reading Lamp Switch
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the roof console. Refer to Roof Console Replacement .	
1	Dome and Reading Lamp Switch Procedure: Press tabs together and remove switch.

DOME AND READING LAMP LENS REPLACEMENT

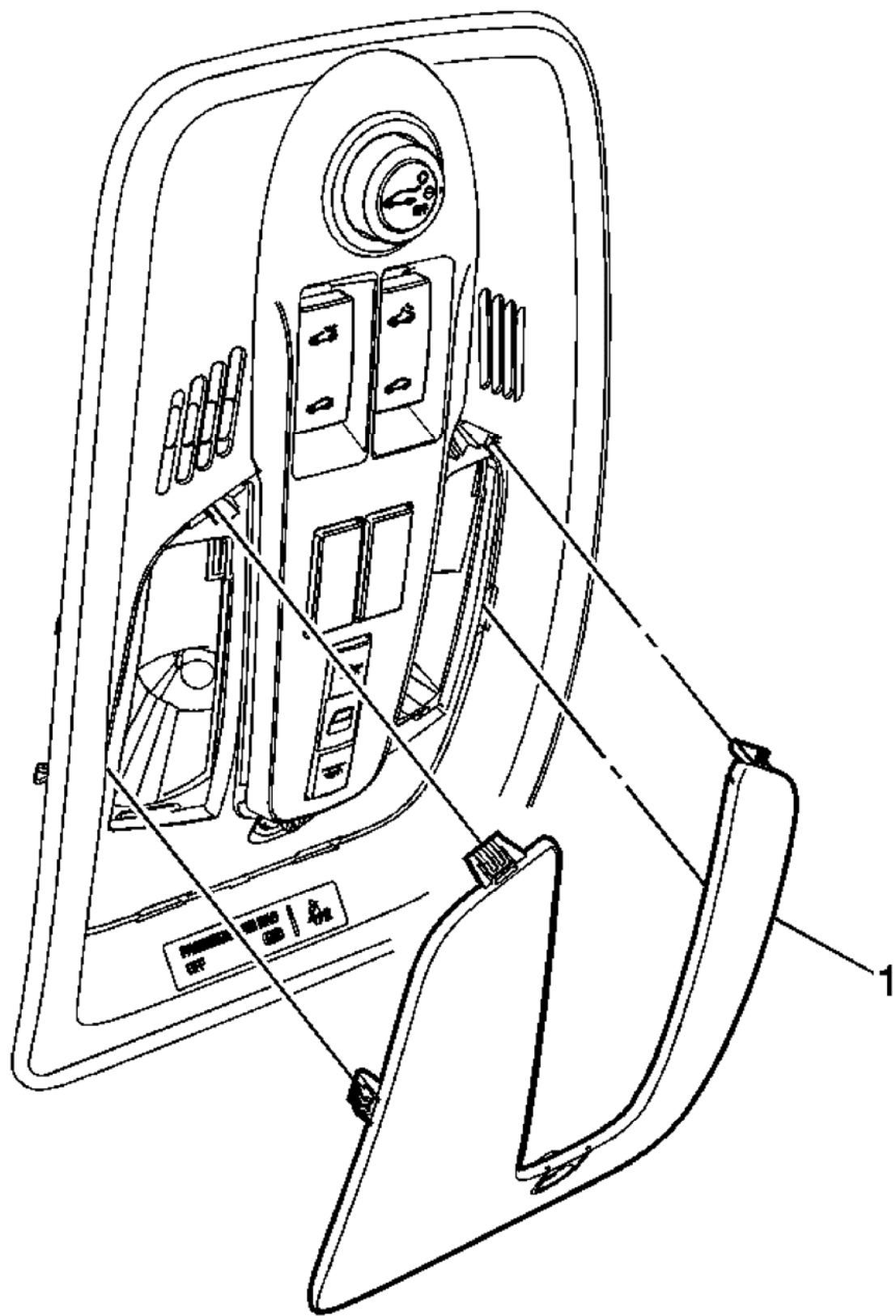


Fig. 19: Dome & Reading Lamp Lens
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Dome Lamp Lens Procedure: Using a nylon flat bladed tool release the four integral tabs on the lens from the roof console.

COURTESY LAMP REPLACEMENT

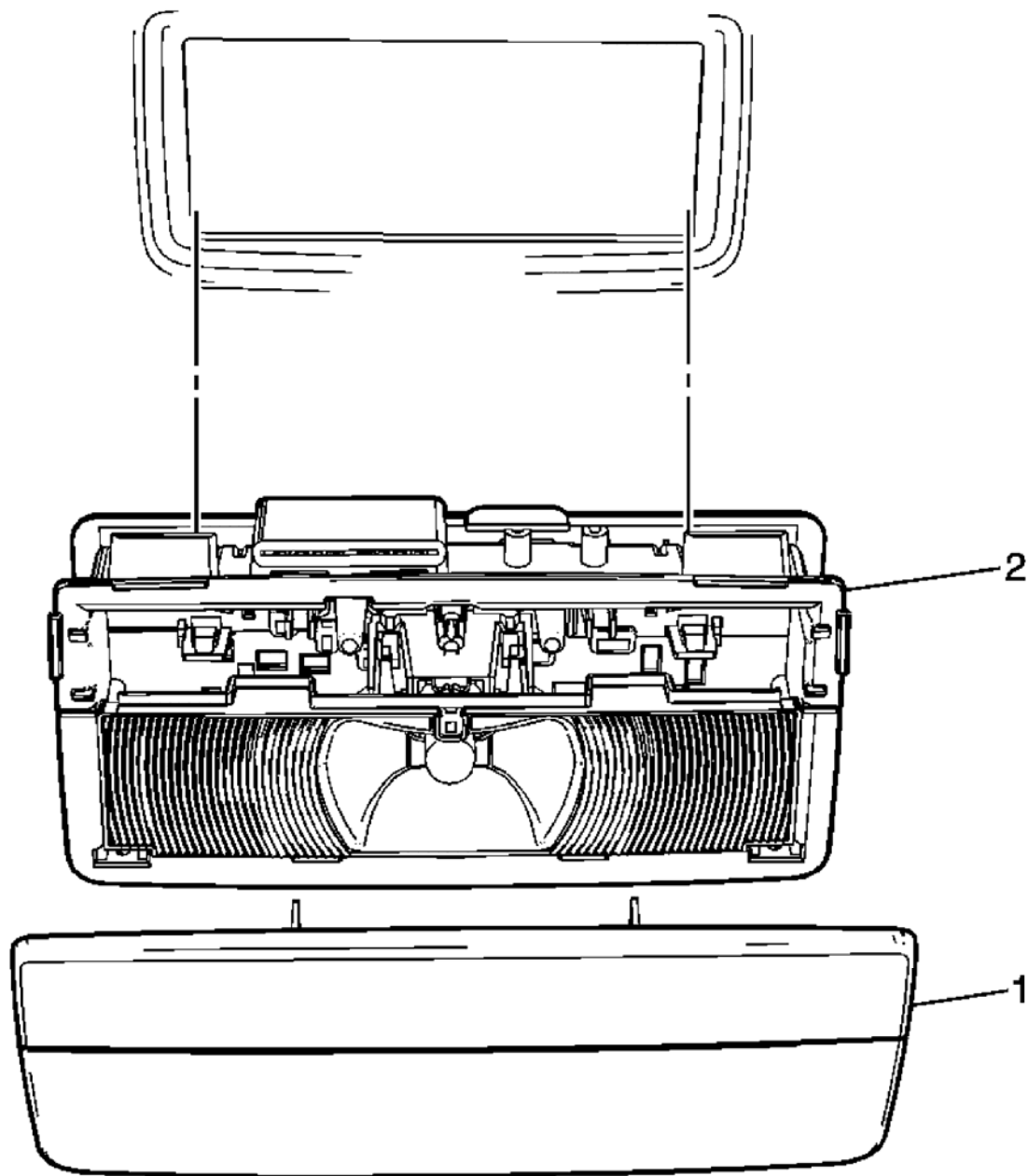


Fig. 20: Courtesy Lamp
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Courtesy Lamp Lens and Bezel Procedure: Using a nylon flat bladed tool release the lens and bezel.
2	Courtesy Lamp Procedure: Release the retaining tabs and remove the courtesy lamp from the headliner.

COURTESY LAMP BULB REPLACEMENT

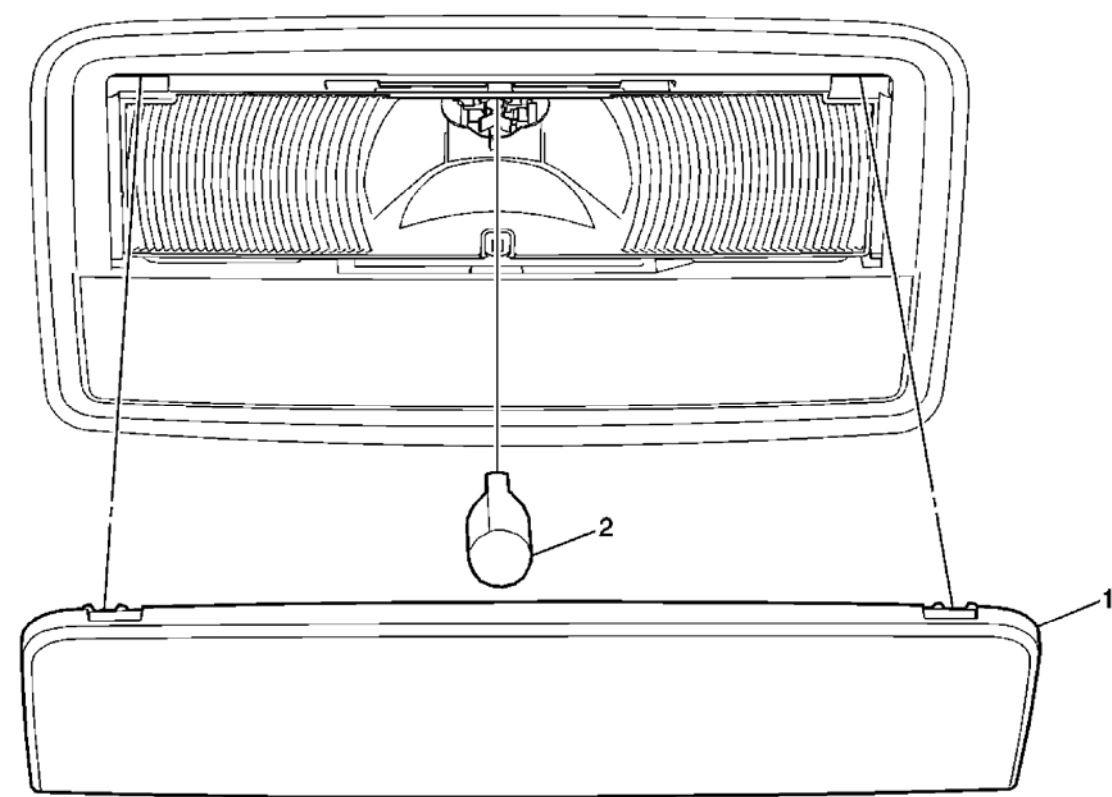


Fig. 21: Courtesy Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Courtesy Lamp Lens Procedure: Using a nylon flat bladed tool release the lens to gain access to the bulb.
2	Courtesy Lamp Bulb

INSTRUMENT PANEL COURTESY LAMP REPLACEMENT - LEFT SIDE

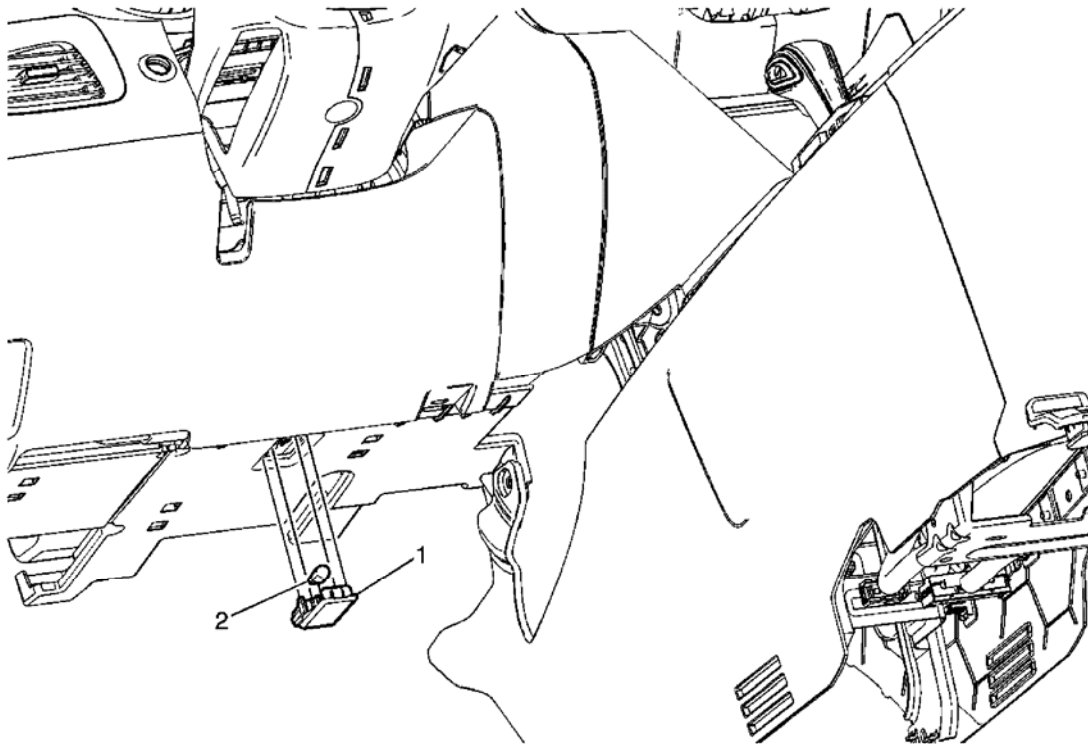


Fig. 22: Instrument Panel Courtesy Lamp - Left Side
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the instrument panel insulator panel left side. Refer to <u>Instrument Panel Insulator Panel Replacement - Left Side (Equinox)</u> or <u>Instrument Panel Insulator Panel Replacement - Left Side (Terrain)</u> .	
1	Instrument Panel Courtesy Lamp Procedure 1. Use a plastic flat-bladed trim tool in order to release the lamp assembly from the drivers side knee bolster. 2. Disconnect the electrical connection.
2	Instrument Panel Courtesy Lamp Bulb

INSTRUMENT PANEL COURTESY LAMP REPLACEMENT - RIGHT SIDE

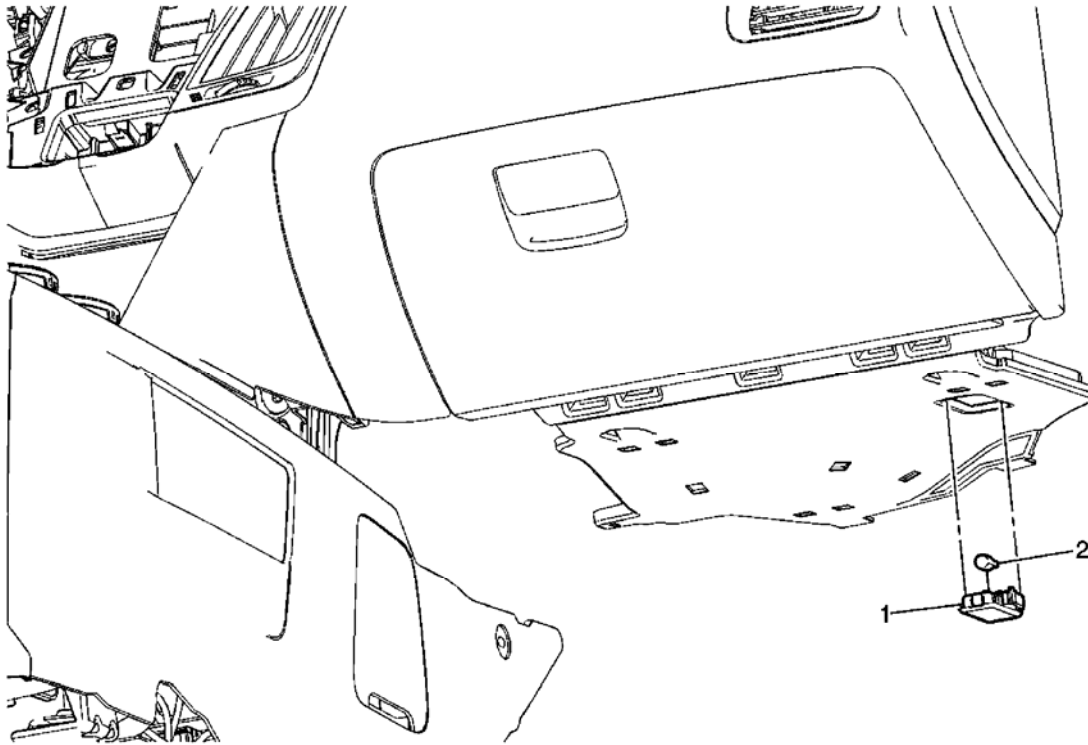


Fig. 23: Instrument Panel Courtesy Lamp - Right Side
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the instrument panel insulator panel right side. Refer to <u>Instrument Panel Insulator Panel Replacement - Right Side (Equinox)</u> or <u>Instrument Panel Insulator Panel Replacement - Right Side (Terrain)</u> .	
1	Instrument Panel Courtesy Lamp Procedure 1. Use a plastic flat-bladed trim tool in order to release the lamp assembly from the instrument panel compartment housing. 2. Disconnect the electrical connection.
2	Instrument Panel Courtesy Lamp Bulb

FRONT FLOOR CONSOLE FLOOD LAMP REPLACEMENT

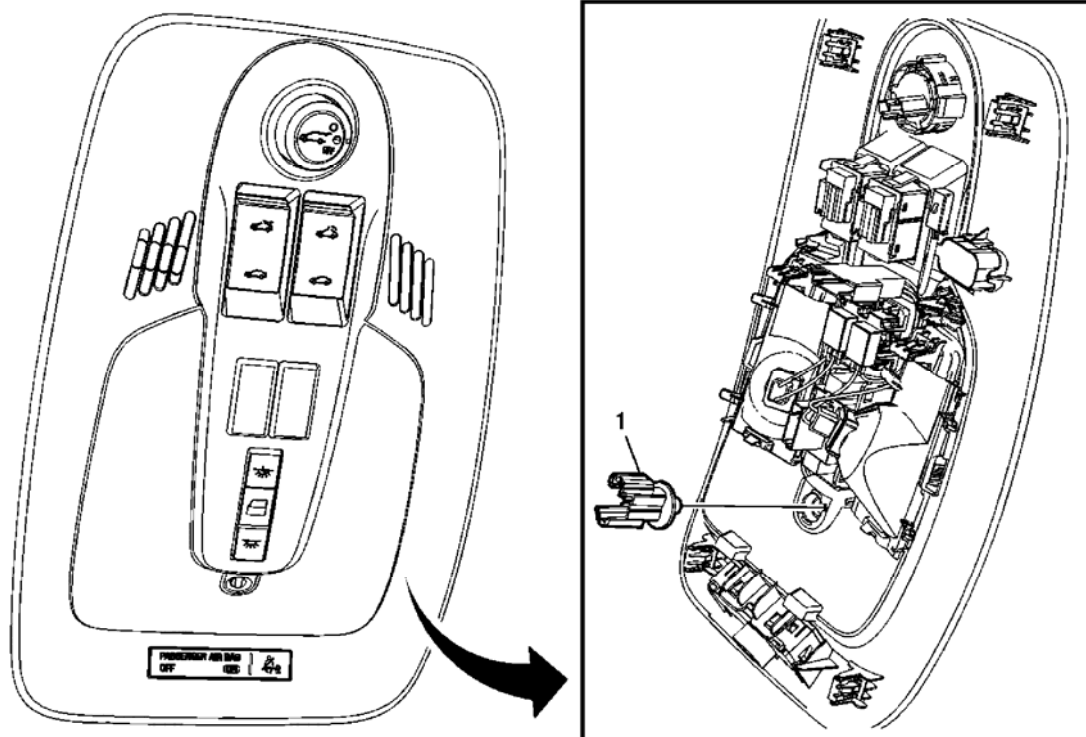


Fig. 24: Front Floor Console Flood Lamp
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the roof console. Refer to <u>Roof Console Replacement</u> .	
1	Front Floor Console Flood Lamp Procedure: Disconnect electrical connector.

FRONT FLOOR CONSOLE ARMREST COMPARTMENT LAMP REPLACEMENT

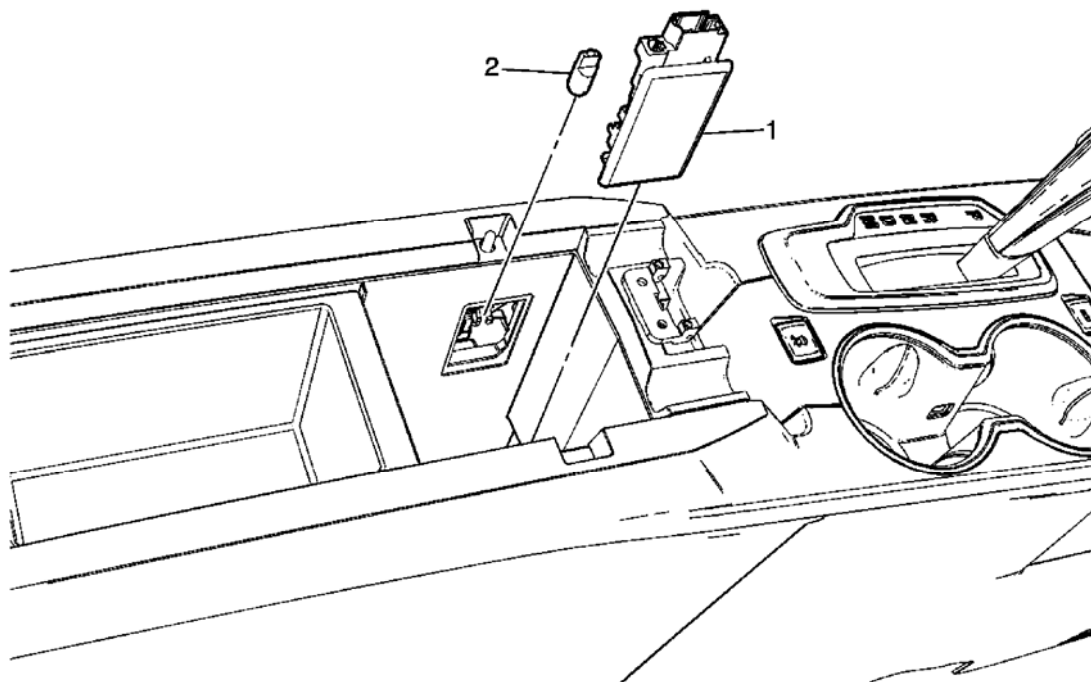


Fig. 25: Front Floor Console Armrest Compartment Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Front Floor Console Armrest Compartment Lamp Procedure 1. Open arm rest and using the appropriate tool, release the bottom of the lamp. 2. Pull lamp downward to remove. 3. Guide switch button through hole in the console. 4. Disconnect the electrical connector.
2	Front Floor Console Armrest Compartment Lamp Bulb

FRONT SIDE DOOR COURTESY LAMP REPLACEMENT

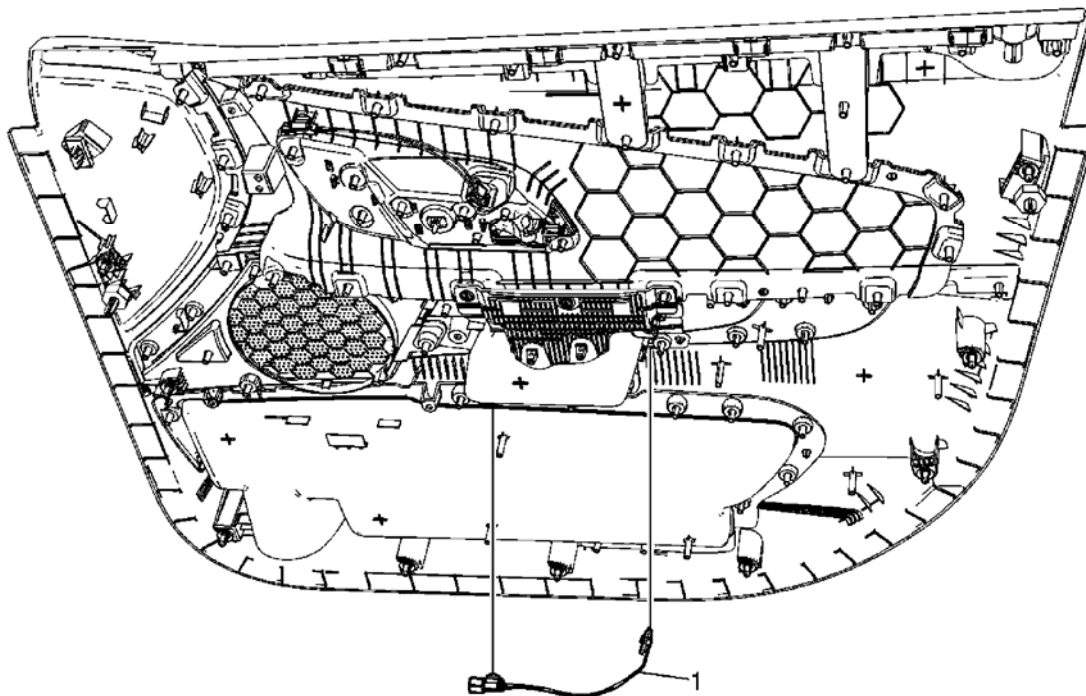


Fig. 26: Front Side Door Courtesy Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front side door trim panel. Refer to Front Side Door Trim Panel Replacement	
1	Front Side Door Courtesy Lamp Procedure: Disconnect the electrical connector.

FRONT SIDE DOOR WARNING LAMP REPLACEMENT

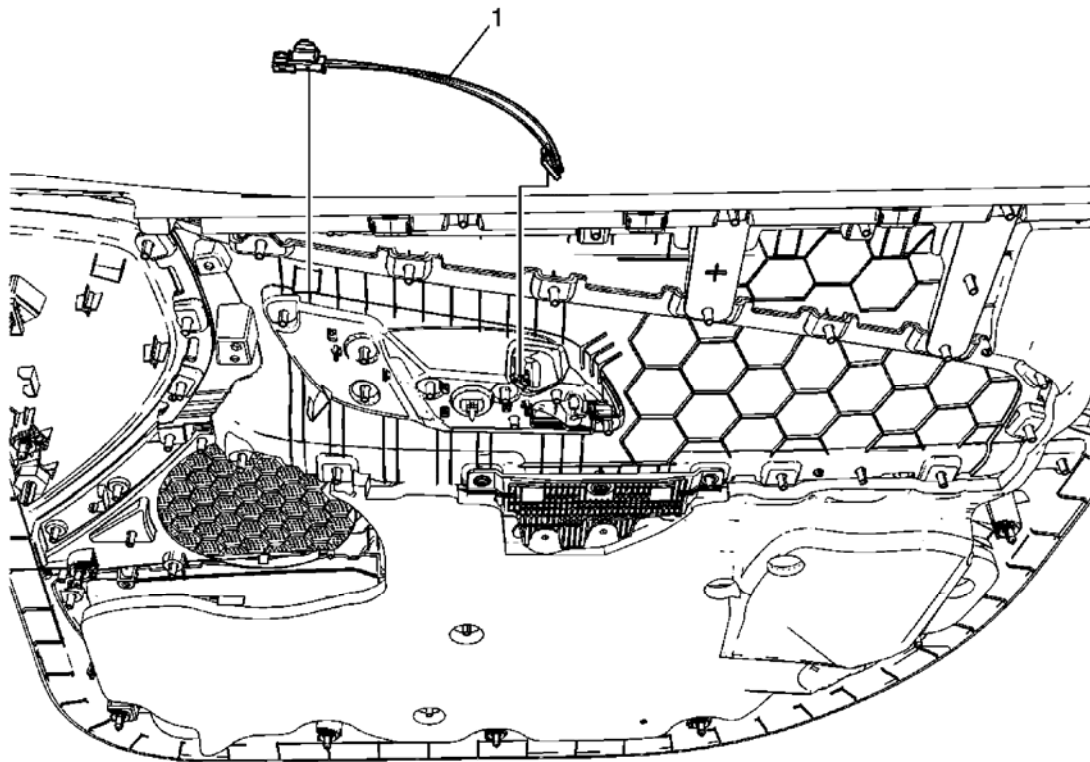


Fig. 27: Front Side Door Warning Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front side door trim panel. Refer to Front Side Door Trim Panel Replacement	
1	Front Side Door Warning Lamp Procedure: Disconnect the electrical connector.

SUNSHADE ILLUMINATED MIRROR LAMP BULB REPLACEMENT

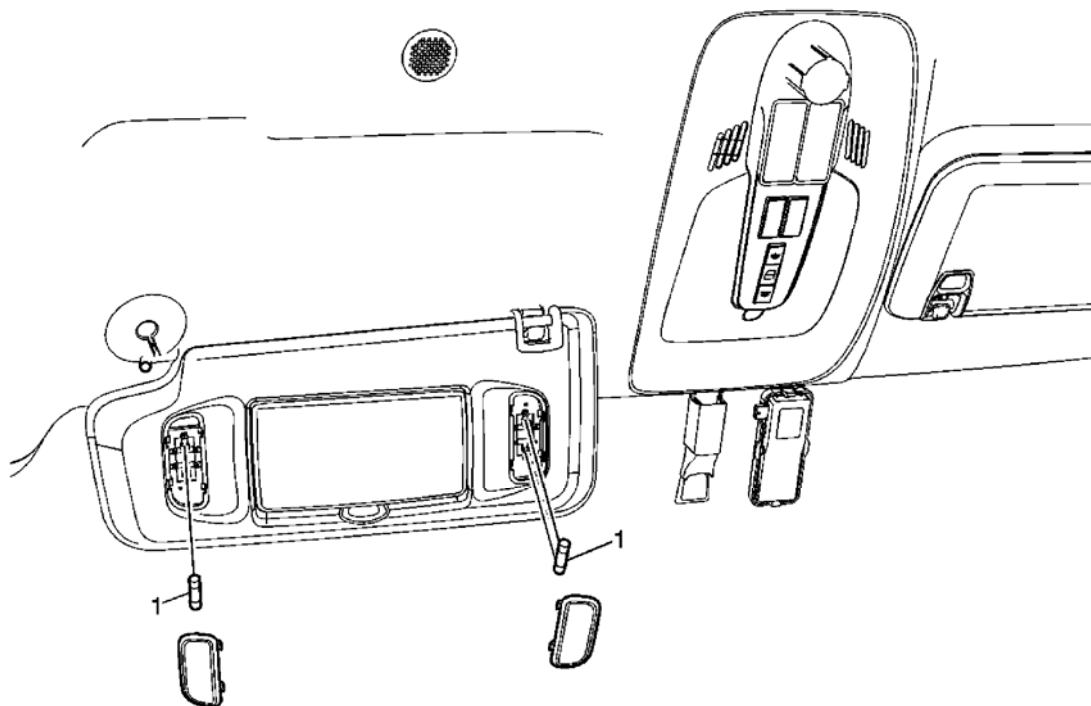


Fig. 28: Sunshade Illuminated Mirror Lamp Bulb
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the sunshade illuminated mirror lamp lens with bezel. Refer to <u>Sunshade Illuminated Mirror Lamp Lens Replacement</u>	
1	Sunshade Illuminated Mirror Lamp Bulb

SUNSHADE ILLUMINATED MIRROR LAMP LENS REPLACEMENT

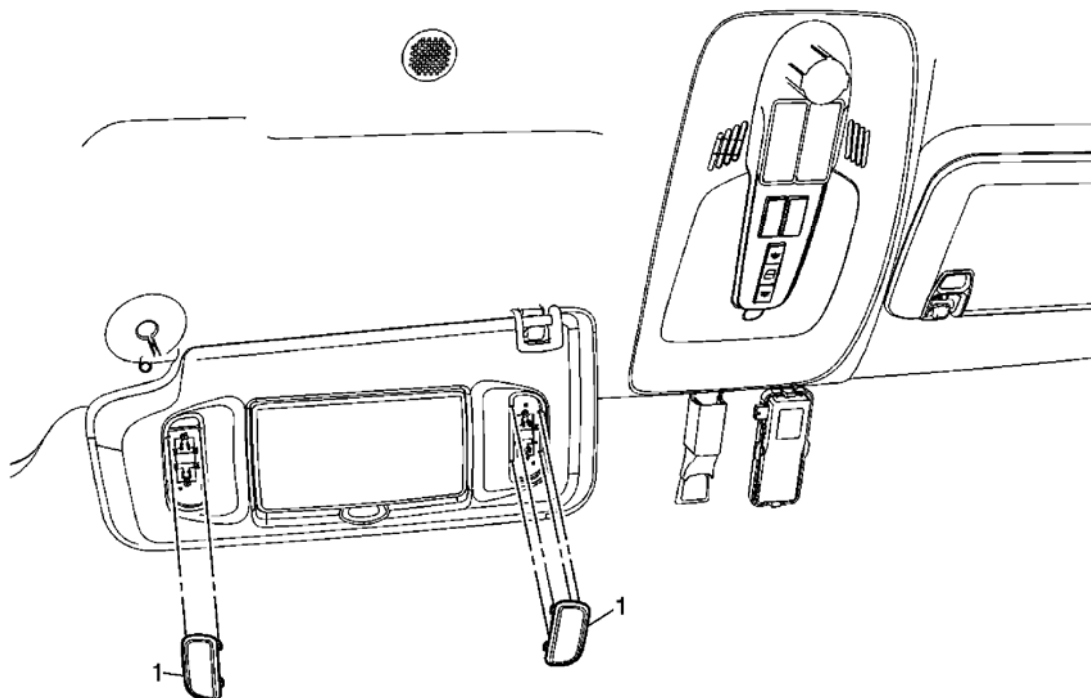


Fig. 29: Sunshade Illuminated Mirror Lamp Lens
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Sunshade Illuminated Mirror Lamp Lens Procedure: Carefully use a flat bladed tool, and release the tabs retaining the lamp lens and bezel to the sunshade assembly.

DOME LAMP BULB REPLACEMENT

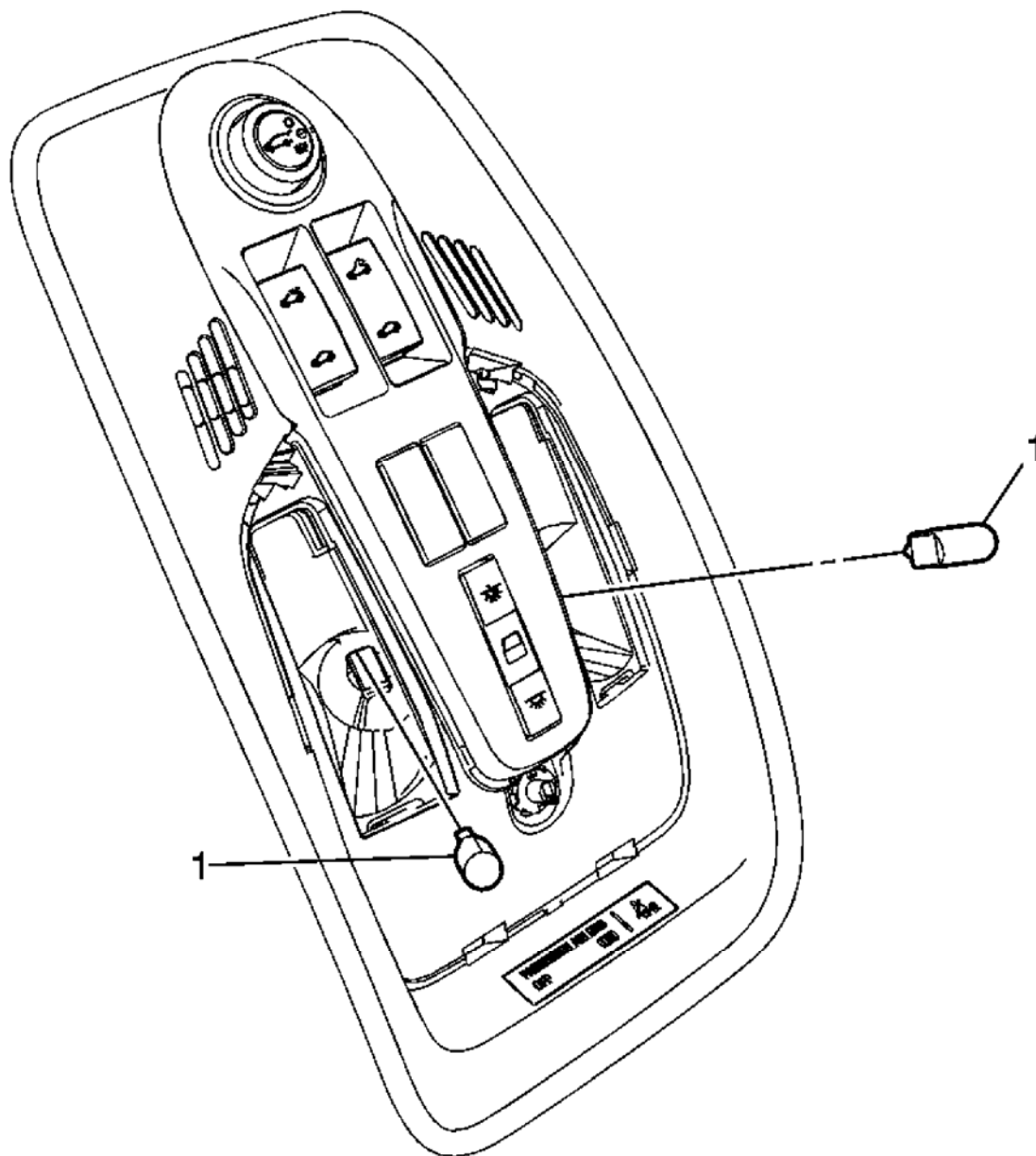


Fig. 30: Dome Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the dome lamp lens. Refer to <u>Dome and Reading Lamp Lens Replacement.</u>	
1	Dome Lamp Bulbs

HEADLAMP REPLACEMENT (EQUINOX)

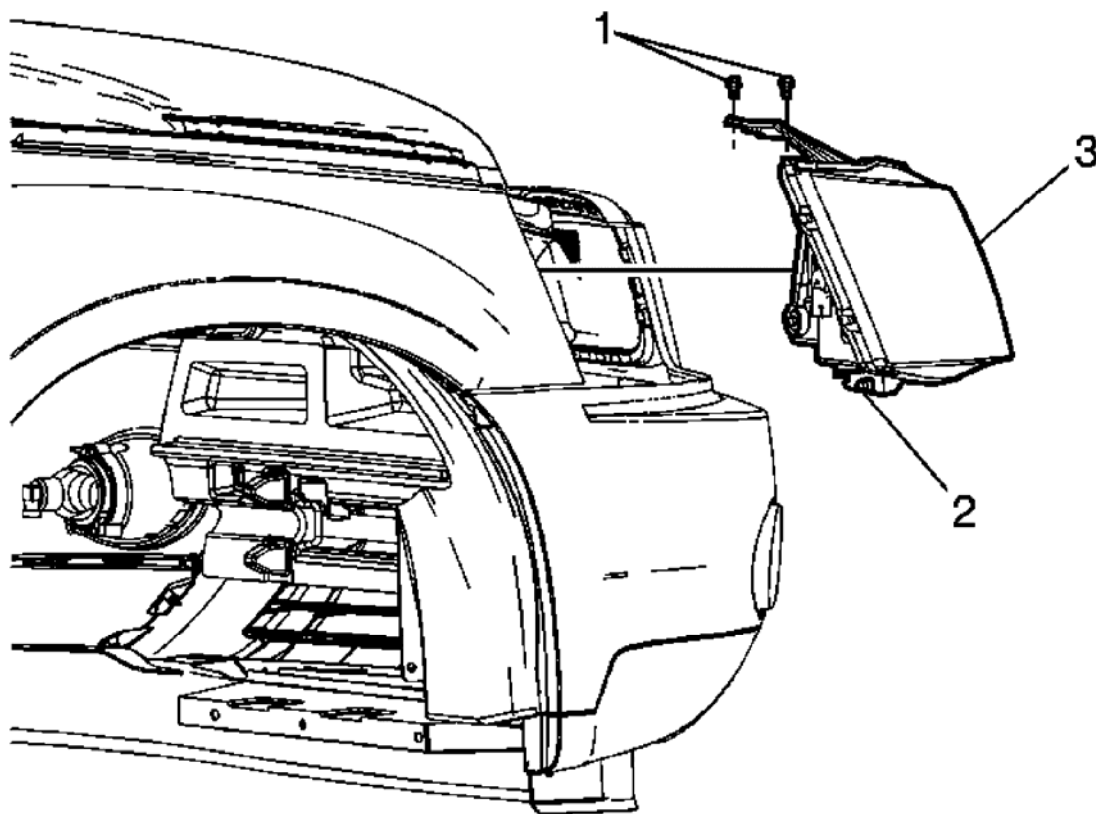


Fig. 31: Headlamp (Equinox)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure 1. Open the hood. 2. Remove the front bumper fascia. Refer to <u>Front Bumper Fascia Replacement (Equinox)</u> or <u>Front Bumper Fascia Replacement (Terrain)</u> .	
1	Headlamp Mounting Bolt / Screw (Qty: 4) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 4 N.m (56 lb in) Tip: One screw is located at the front lower edge of the front fender outer panel at the bottom edge of the headlamp.
	Headlamp Ball Socket Locator Pin

	Procedure
2	1. Pull from the bottom of the headlamp forward in order to release the headlamp locator pin from the front outer corner of the body rail. 2. Disconnect the forward lamp harness electrical connector on the headlamp being serviced.
3	Headlamp Assembly Procedure: Check and adjust the front headlamp aim after the headlamp have been reinstalled. Refer to <u>Headlamp Aiming</u> .

HEADLAMP REPLACEMENT (TERRAIN)

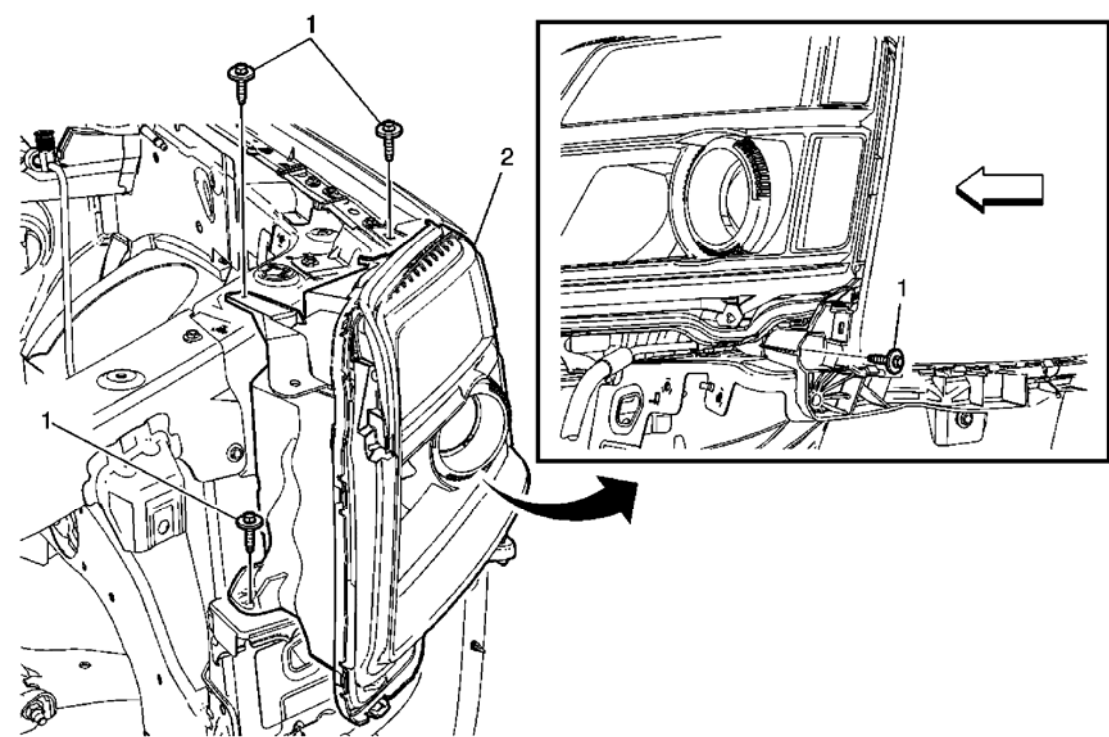


Fig. 32: Headlamp (Terrain)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1. Open the hood. 2. Remove the front bumper fascia. Refer to <u>Front Bumper Fascia Replacement (Equinox)</u> or <u>Front Bumper Fascia Replacement (Terrain)</u> .	
	Headlamp Assembly Bolt / Screw (Qty: 4)

1	CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 4 N.m (56 lb in) Tip: One screw is located inside the front bumper fascia side retainer assembly.
2	Headlamp Assembly Procedure 1. Pull from the bottom of the headlamp forward in order to release the headlamp locator pin from the front outer corner of the body rail. 2. Disconnect the forward lamp harness electrical connector on the headlamp being serviced. 3. Check and adjust the front headlamp aim after the headlamps have been reinstalled. Refer to <u>Headlamp Aiming</u>.

HEADLAMP BULB REPLACEMENT (HIGH BEAM EQUINOX)

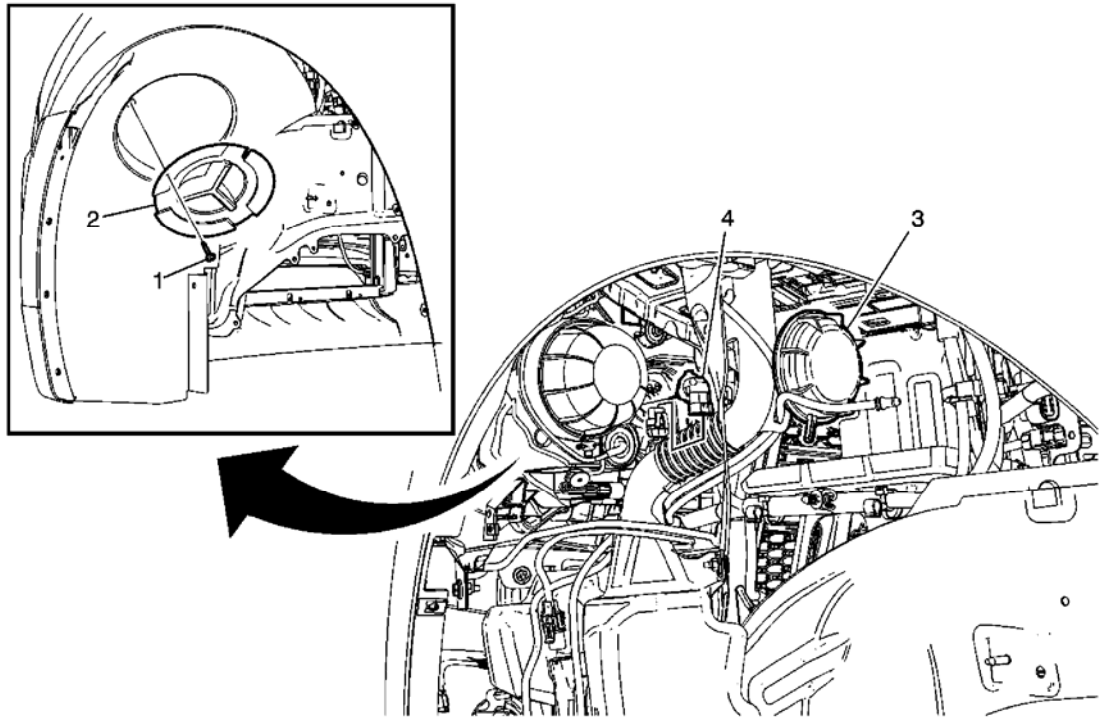


Fig. 33: Headlamp Bulb (High Beam Equinox)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
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Preliminary Procedure	
1. Turn the tire and wheel assembly in order to access the wheelhouse panel hole cover and screw. 2. Remove the screw and cover from the wheelhouse panel liner.	
1	Wheelhouse Panel Hole Cover Screw CAUTION: Refer to <u>Fastener Caution</u> . Hand tighten the screw.
2	Wheelhouse Panel Hole Cover Tip: Rotate the cover counter-clockwise and remove.
3	Headlamp Bulb Accessory Cover Tip: Rotate the cover counter-clockwise and remove.
4	Headlamp Bulb Assembly (High Beam) WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure 1. Disconnect the electrical connector from the bulb socket. 2. Rotate the bulb socket counter-clockwise and remove from the headlamp assembly.

HEADLAMP BULB REPLACEMENT (LOW BEAM EQUINOX)

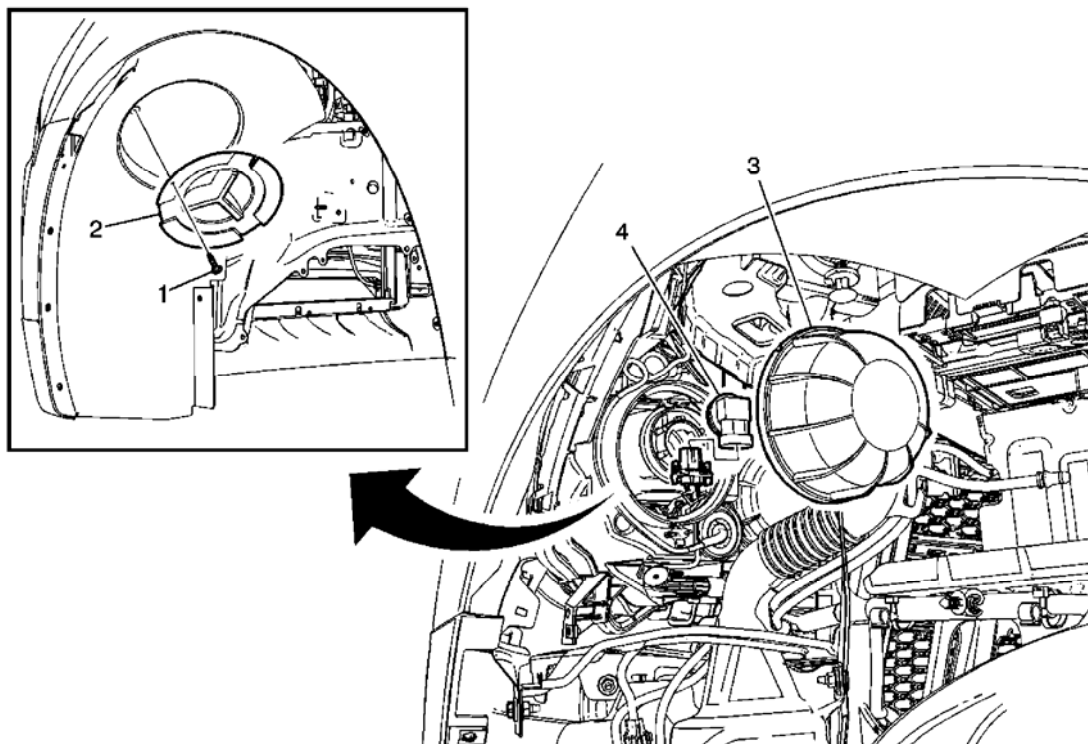


Fig. 34: Headlamp Bulb (Low Beam Equinox)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1. Turn the tire and wheel assembly in order to access the wheelhouse panel hole cover and screw. 2. Remove the screw and cover from the wheelhouse panel liner.	
1	Wheelhouse Panel Hole Cover Screw CAUTION: Refer to <u>Fastener Caution</u> . Hand tighten the screw.
2	Wheelhouse Panel Hole Cover Tip: Rotate the cover counter-clockwise and remove.
3	Headlamp Bulb Accessory Cover Tip: Rotate the cover counter-clockwise and remove.
	Headlamp Bulb Assembly (Low Beam) WARNING: Refer to <u>Halogen Bulb Warning</u> .

Procedure	
4	1. Disconnect the electrical connector from the bulb socket. 2. Rotate the bulb socket counter-clockwise and remove from the headlamp assembly.

HEADLAMP BULB REPLACEMENT (HIGH BEAM TERRAIN)

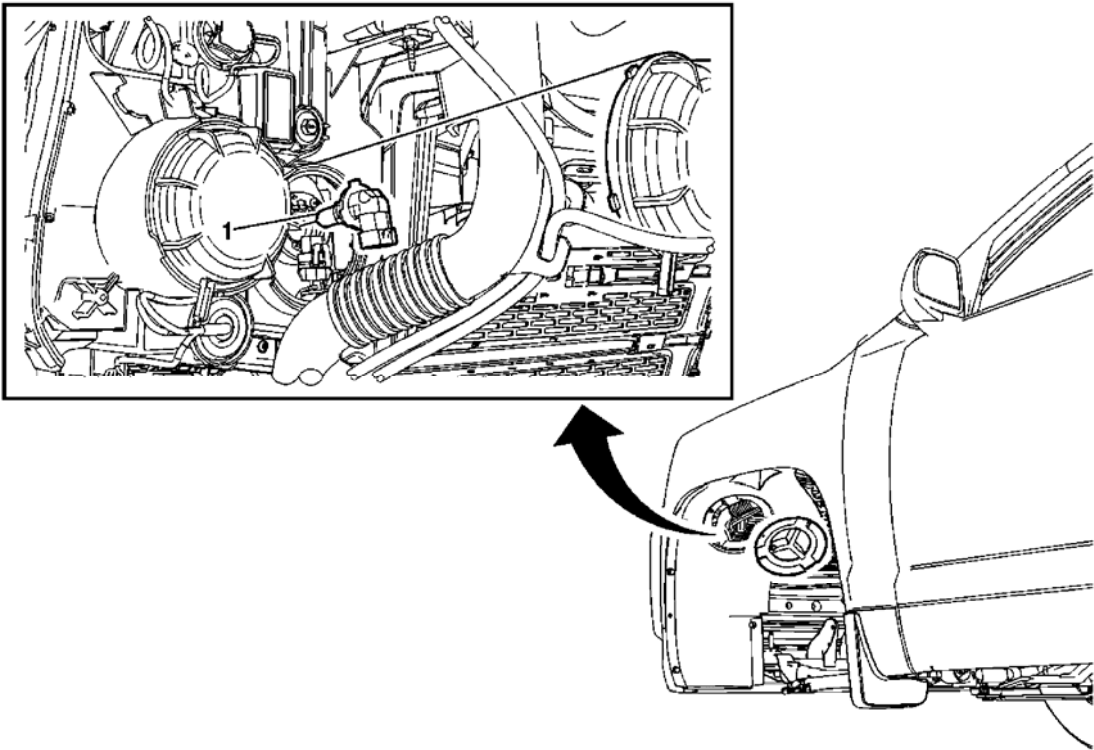


Fig. 35: Headlamp Bulb (High Beam Terrain)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front wheelhouse front panel hole cover. Refer to Front Wheelhouse Front Panel Hole Cover Replacement (Terrain) .	
1	Headlamp Bulb Assembly-High Beam Procedure WARNING: Refer to Halogen Bulb Warning . 1. Remove the headlamp bulb access cover assembly.

2. Turn the cover a quarter turn counter-clockwise.
3. Disconnect the high beam bulb socket electrical connector.
4. Rotate the bulb socket a quarter turn counter-clockwise and remove from the headlamp assembly.

HEADLAMP BULB REPLACEMENT (LOW BEAM TERRAIN)

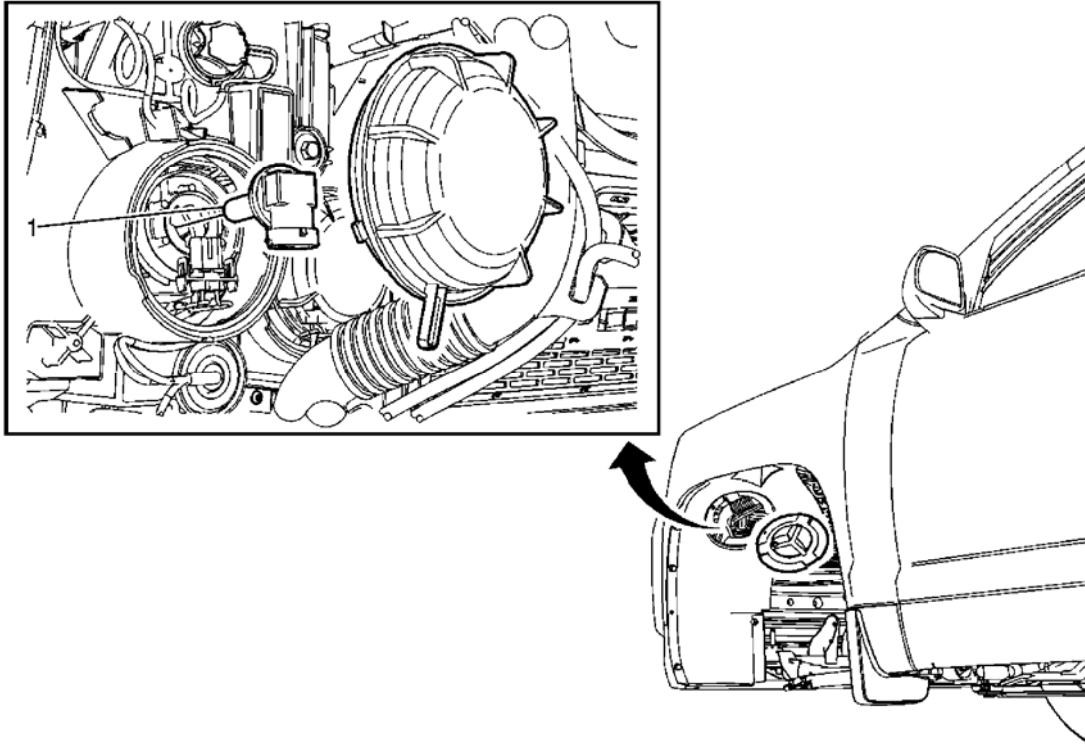


Fig. 36: Headlamp Bulb (Low Beam Terrain)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front wheelhouse front panel hole cover. Refer to <u>Front Wheelhouse Front Panel Hole Cover Replacement (Terrain)</u> .	
1	Headlamp Bulb Assembly-Low Beam Procedure WARNING: Refer to <u>Halogen Bulb Warning</u> . 1. Remove the headlamp bulb access cover assembly.

- | |
|--|
| <ol style="list-style-type: none">2. Turn the cover a quarter turn counter-clockwise.3. Disconnect the low beam bulb socket electrical connector.4. Rotate the bulb socket a quarter turn counter-clockwise and remove from the headlamp assembly. |
|--|

HEADLAMP AIMING

Aiming Headlamps (Visual Aim)

NOTE: **Some state and local laws specify requirements for headlamp aim. All of these laws must be complied with when performing any headlamp aiming operations.**

Headlamp aim should be checked:

- When a new headlamp assembly is installed
- If service or repairs to the front end area have (or may have) disturbed the headlamps or their mounting
- The area will consist of a level surface large enough to allow for a vehicle and an additional 7.62 m (25 feet) measured from face of lamps to the front of the aiming screen.
- The screen will be 1.52 m (5 ft) high x 3.66 m (12 ft) wide with a matte white surface well shaded from extraneous light, and properly adjusted to the floor on which the vehicle stands. Provisions may be made for moving the screen so it can be aligned parallel with the vehicle.
- The screen shall be provided with a fixed vertical centerline, two laterally adjustable vertical tapes, and one vertically adjustable horizontal tape.
- If a regular commercial aiming screen is not available, the screen may consist of a vertical wall having a clear uninterrupted area approximately 1.83 m (6 ft) high and 3.66 m (12 ft) wide. The surface should be finished with a washable non-gloss white paint.
- After the aiming screen has been set up in its permanent location, it is necessary to paint a reference line on the floor directly under the lens of the lamps to indicate the proper location of the headlamps when they are being aimed:
 - Distance between headlamps
 - Center line of screen
 - Adjustable vertical pointer
 - Adjustable horizontal tape
 - Diagram of light screen
 - Vertical center line ahead of right headlamp pointer position
 - 7.62 m (25 ft)
 - Car axis
 - Adjustable vertical pointer
 - Horizontal center line of lamps
 - Vertical center line ahead of left headlamp

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

1. Remove any snow, ice or mud from the vehicle.
2. The vehicle must have a full tank of gas.
3. Stop all other work on the vehicle.
4. If any service has been performed on the vehicle, make sure that all of the components are back in their original place.
5. The vehicle must be on a level surface.

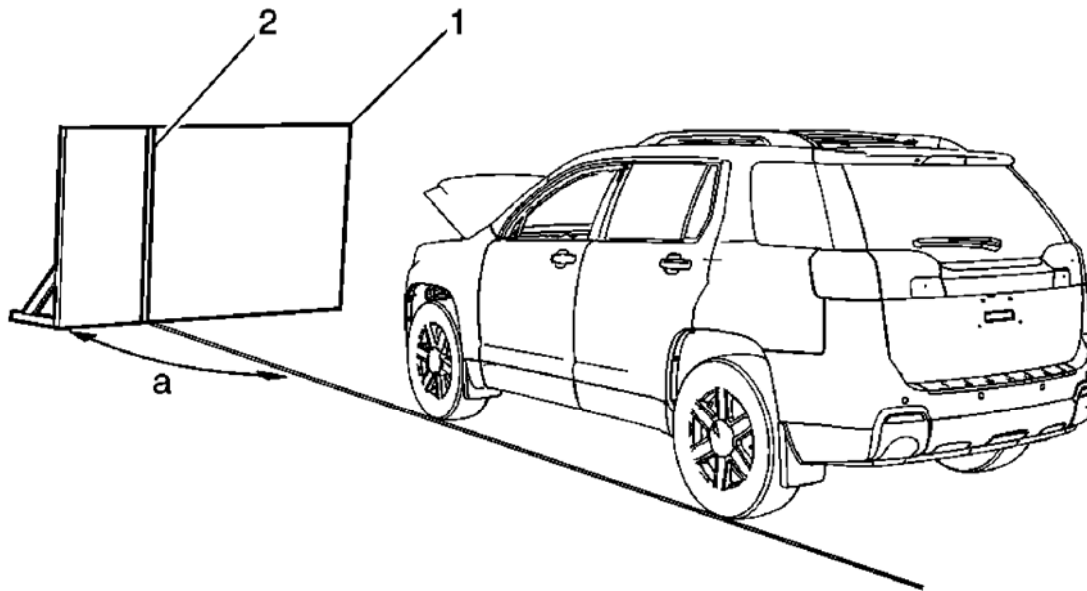


Fig. 37: Aligning Vehicle For Aiming
Courtesy of GENERAL MOTORS CORP.

6. The vehicle left tires must be aligned with the reference line (a) extending from the screen with the headlamps aligned with the vertical reference line (2).
7. Do not load any cargo in the vehicle.
8. The vehicle must contain one person or 72.56 kg (160 lb) on the driver seat.
9. Inflate the tires to the proper pressure.
10. Simulate the vehicle loads if the intended use of the vehicle is for hauling heavy loads or towing a trailer.
11. Rock the vehicle in order to stabilize the suspension.
12. Turn on the headlamps to low beam and observe the left and the top edges of the high intensity zone on the screen. The edges of the high intensity zone should fall within the specifications.

Headlamp Aiming Procedure

1. Open the hood.

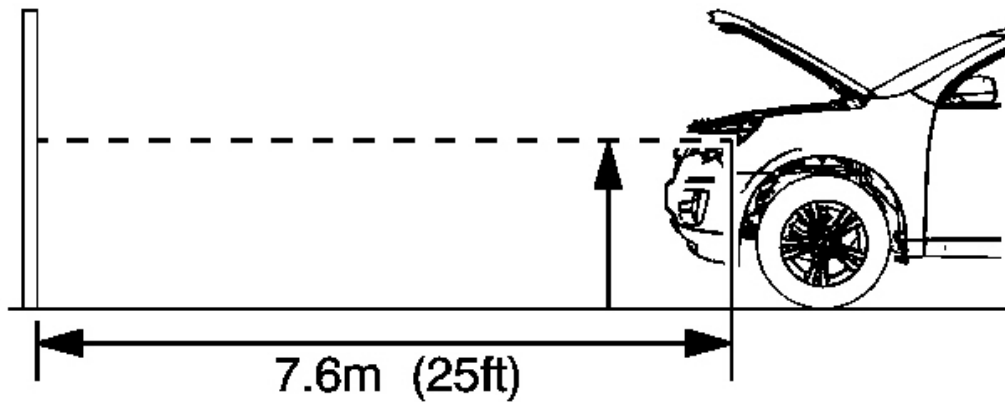


Fig. 38: Determining Measured Distances For Aiming
Courtesy of GENERAL MOTORS CORP.

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

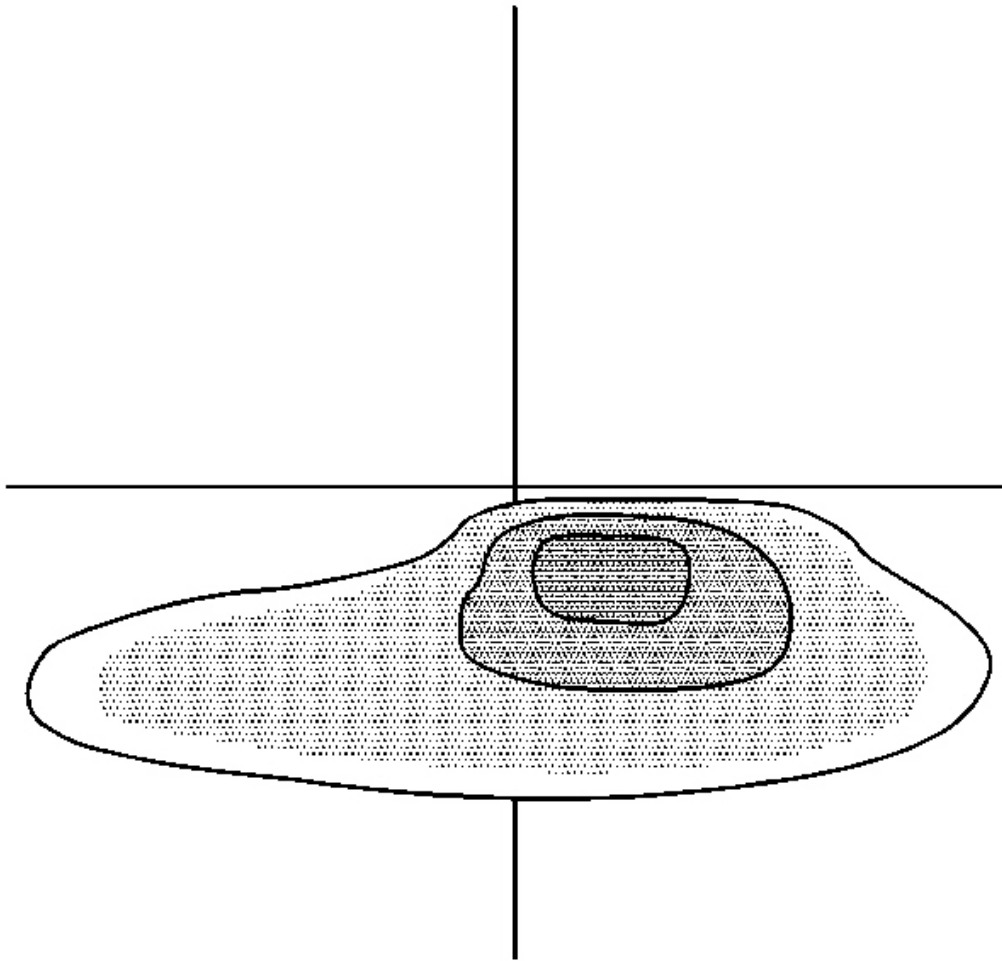


Fig. 39: Identifying Right Side Low Beam Proper Screen Positioning
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not cover the headlamp, this may cause excessive heat build up.

8. Turn ON the low beam headlamps and block the light from projecting onto the screen from the passenger side headlamp.

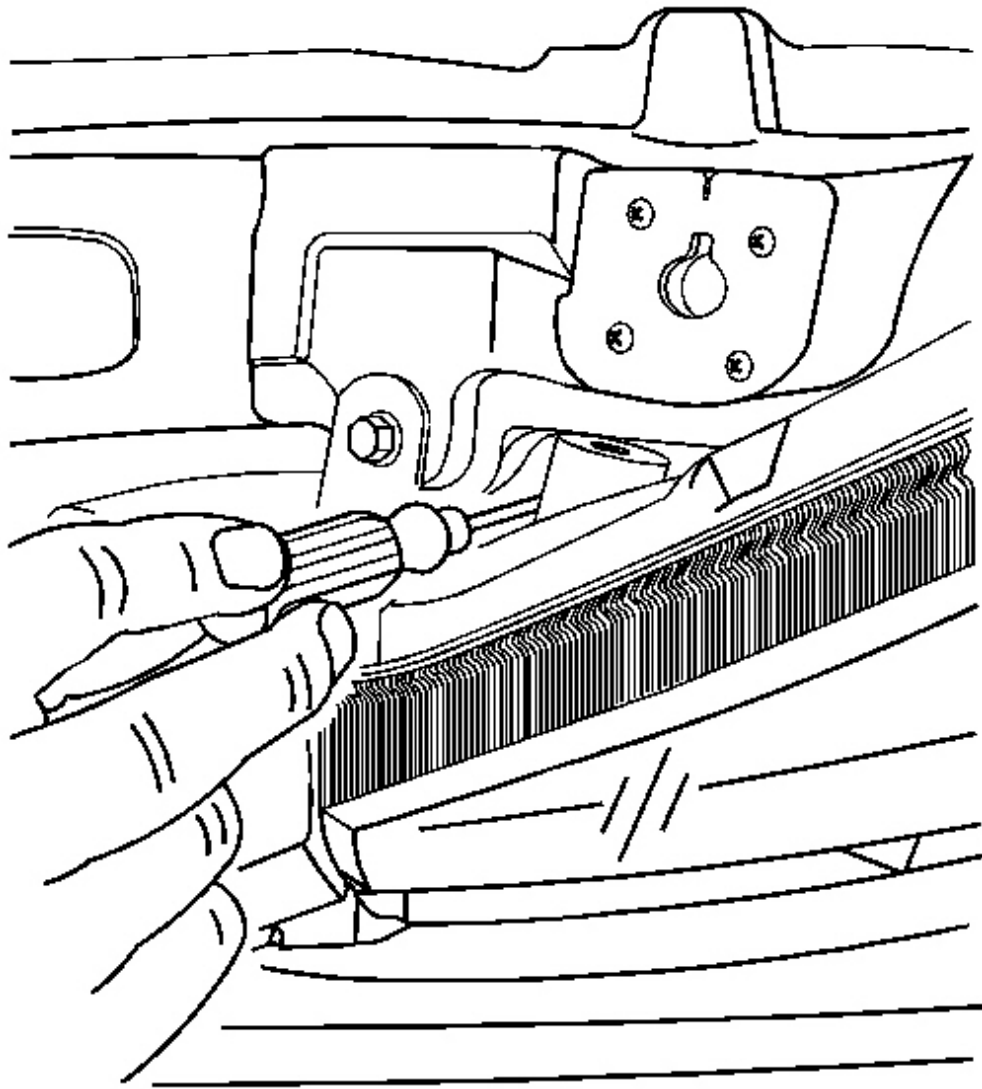


Fig. 40: Adjusting Headlight Vertical Aim
Courtesy of GENERAL MOTORS CORP.

NOTE: **Horizontal headlamp adjustment does not exist.**

9. Adjust the vertical aim of the headlamps to the specifications required by the state and the local authorities, or as shown in step number 8.
10. Rotate the headlamp adjuster to change the vertical aim of the headlamp.

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

FRONT FOG LAMP REPLACEMENT (EQUINOX)

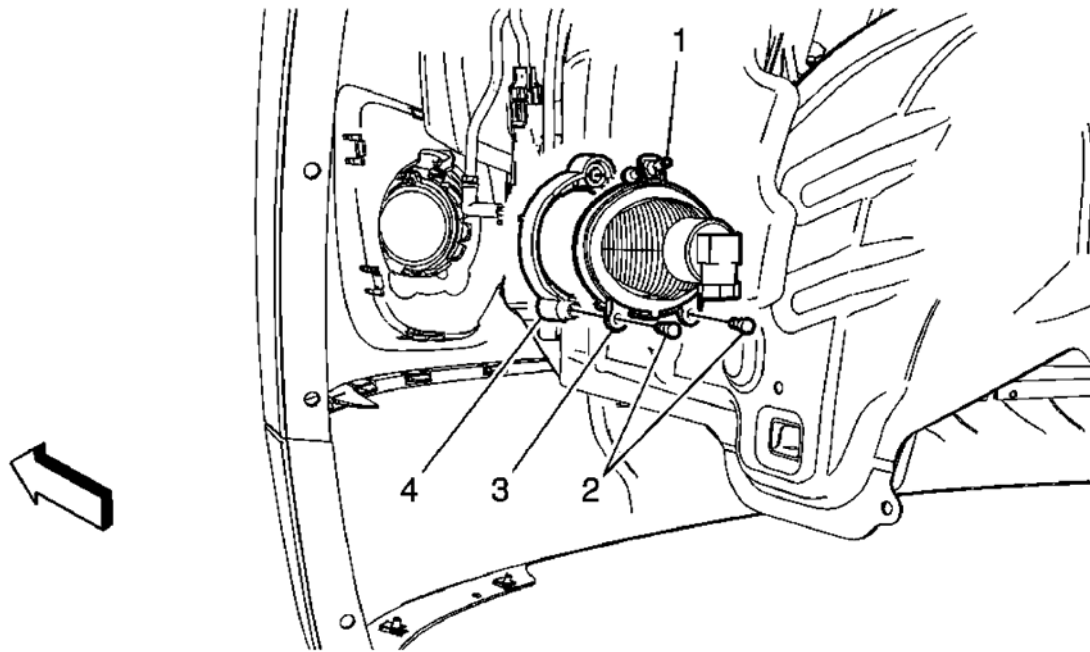


Fig. 41: Front Fog Lamp (Equinox)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . 2. Remove either the left front or right front wheelhouse liner. Refer to <u>Front Wheelhouse Liner Replacement (Equinox)</u> or <u>Front Wheelhouse Liner Replacement (Terrain)</u> . 3. Disconnect the fog lamp bulb socket electrical connector.	
1	Front Fog Lamp Adjuster Screw Tip: Remove the adjuster screw in order to access the locking ring.
2	Front Fog Lamp Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 2 N.m (18 lb in)
	Front Fog Lamp Assembly

3	Procedure: Remove the lamp projector assembly from the fog lamp locking ring. Tip: The fog lamp is replaced as an assembly.
4	Front Fog Lamp Locking Ring Procedure 1. Release the locking ring from the tabs on the front bumper fascia. 2. Replace the fog lamp as an assembly. 3. Aim the fog lamps after replacement. Refer to Fog Lamp Aiming (Equinox).

FRONT FOG LAMP REPLACEMENT (TERRAIN)

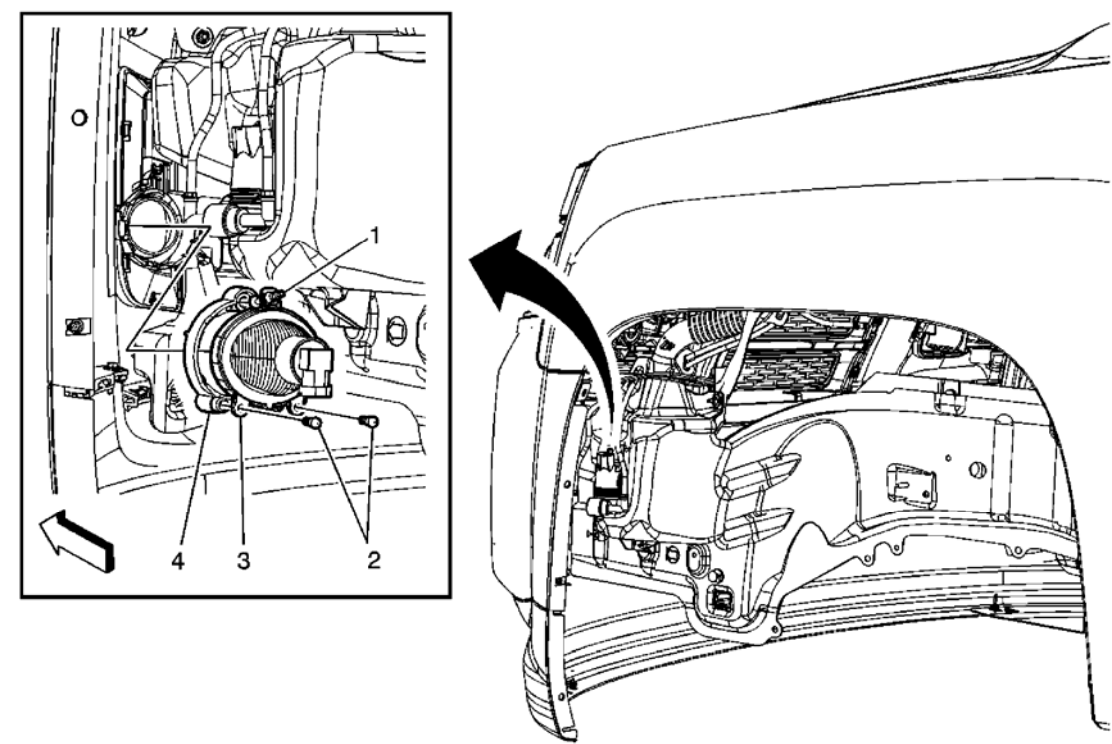


Fig. 42: Front Fog Lamp (Terrain)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 2. Remove either the left front or right front wheelhouse liner. Refer to Front Wheelhouse Liner Replacement (Equinox) or Front Wheelhouse Liner Replacement (Terrain) . 3. Disconnect the fog lamp bulb socket electrical connector.	

1	Front Fog Lamp Adjuster Screw Tip: Remove the adjuster screw in order to access the locking ring.
2	Front Fog Lamp Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 2 N.m (18 lb in)
3	Front Fog Lamp Assembly Procedure: Remove the lamp projector assembly from the fog lamp locking ring. Tip: The fog lamp is replaced as an assembly.
4	Front Fog Lamp Locking Ring Procedure 1. Release the locking ring from the tabs on the front bumper fascia. 2. Replace the fog lamp as an assembly. 3. Aim the fog lamps after replacement. Refer to <u>Fog Lamp Aiming (Equinox)</u>.

FRONT FOG LAMP BULB REPLACEMENT

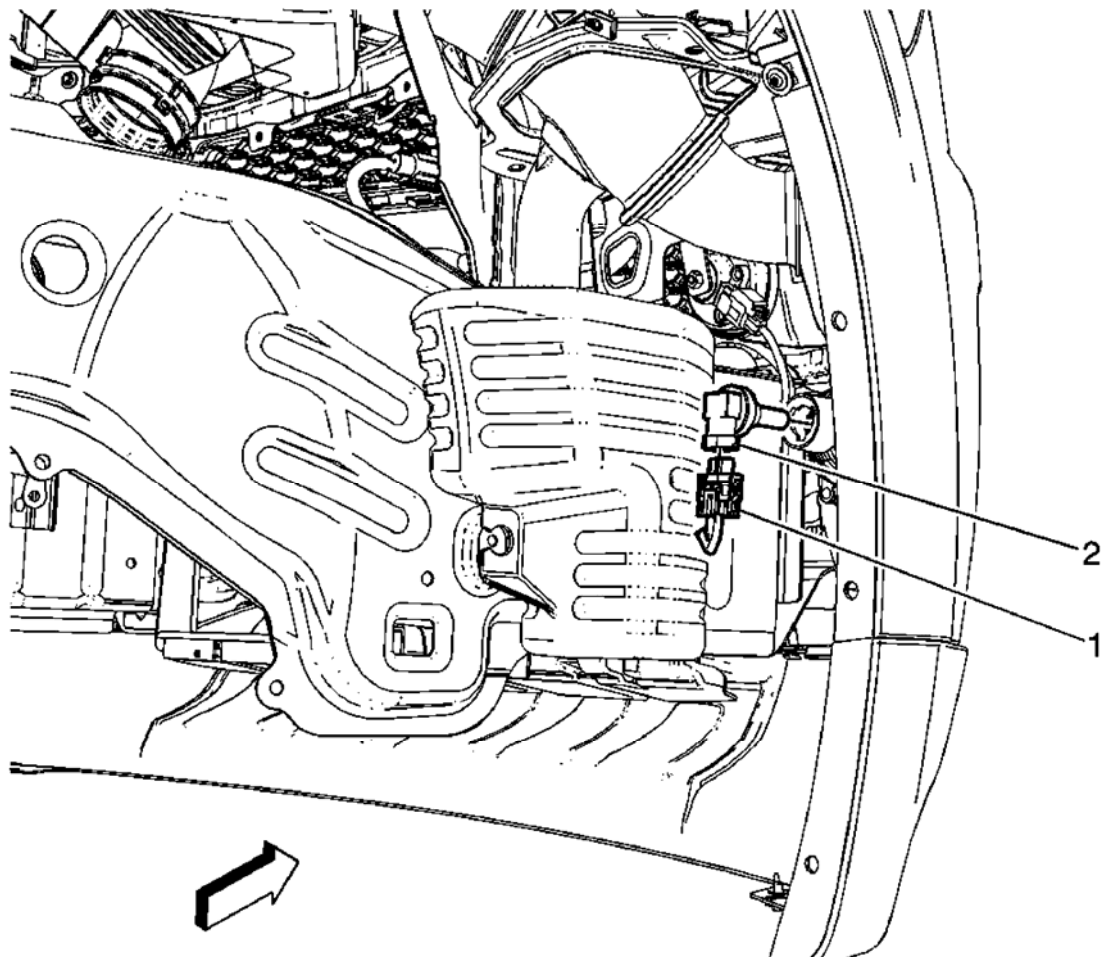


Fig. 43: Front Fog Lamp Bulb
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Remove the front wheelhouse liner. Refer to Front Wheelhouse Liner Replacement (Equinox) or Front Wheelhouse Liner Replacement (Terrain) . 2. Disconnect the fog lamp bulb electrical connector.	
1	Fog Lamp Bulb Electrical Connector
2	Front Fog Lamp Bulb WARNING: Refer to Halogen Bulb Warning . Procedure:

Rotate the fog lamp bulb socket counter-clockwise and remove from the fog lamp projector.

FOG LAMP AIMING (EQUINOX)

The front fog lamps must be aimed for proper illumination of the road. The front fog lamp aim should be checked when a new front fog lamp assembly is installed, or if service or repairs in the front end area may have disturbed the front fog lamp mounting.

Preparation Procedure

NOTE: **Horizontal aim is not adjustable on this vehicle. Vertical aim is done by an adjusting screw located on the front of the fog lamp. Prior to aiming the headlamps, perform the following steps:**

1. Completely assemble all of the components on the vehicle.
2. Place the vehicle on a level surface.
3. Stop all unnecessary operations or work that could affect the ride height of the vehicle.
4. Close the doors and verify that the luggage compartment is empty.
5. Stabilize the suspension by rocking the vehicle sideways.
6. Ensure that the fuel level is full.
7. Ensure that the tires are inflated to the proper pressure.
8. Ensure that the driver or a similar weight, approximately 75 kg (165 lbs) is in the vehicle driver seat.

Aiming Procedure

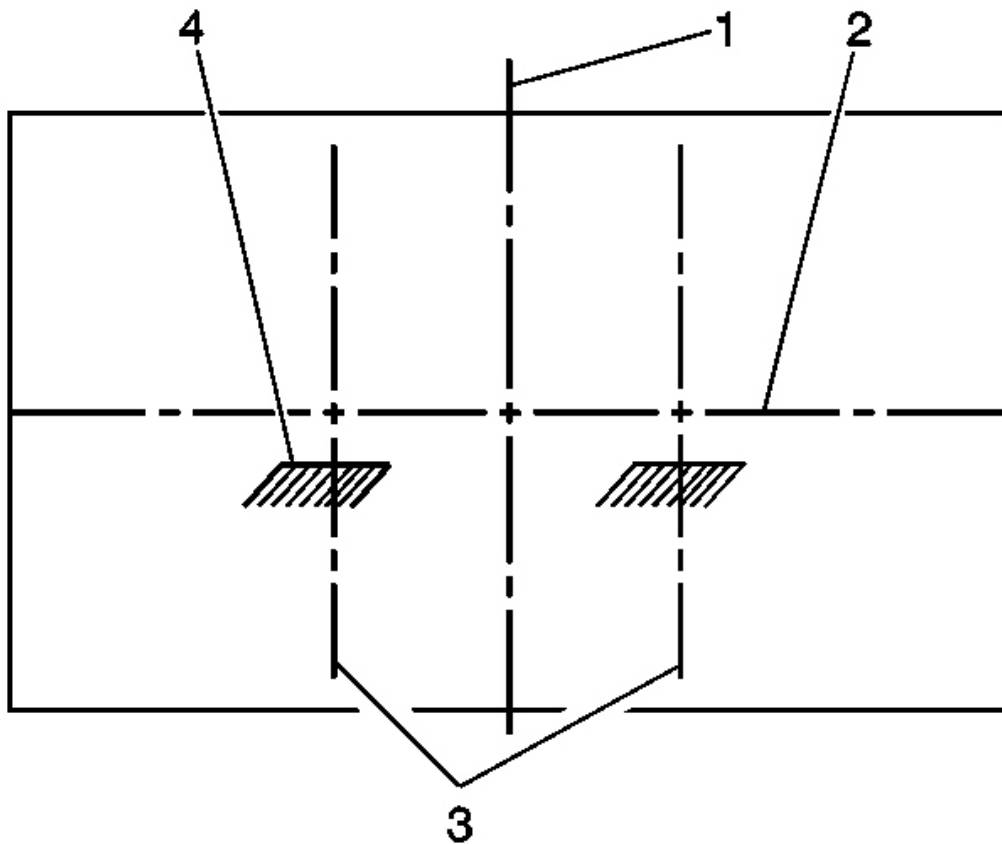


Fig. 44: Locating Alignment Points On Target Screen
Courtesy of GENERAL MOTORS CORP.

1. Park the vehicle 7.6 m (25 ft) away from the target screen.
2. Measure from the center of the fog lamp to the ground line. Using this measurement, mark the horizontal centerline (2) of the fog lamp on the target screen directly in front of the vehicle.
3. Turn ON the fog lamps. The top of the fog lamp beam image (4) on the target screen should be 102 mm (4 in) below the center of the fog lamp lens height.

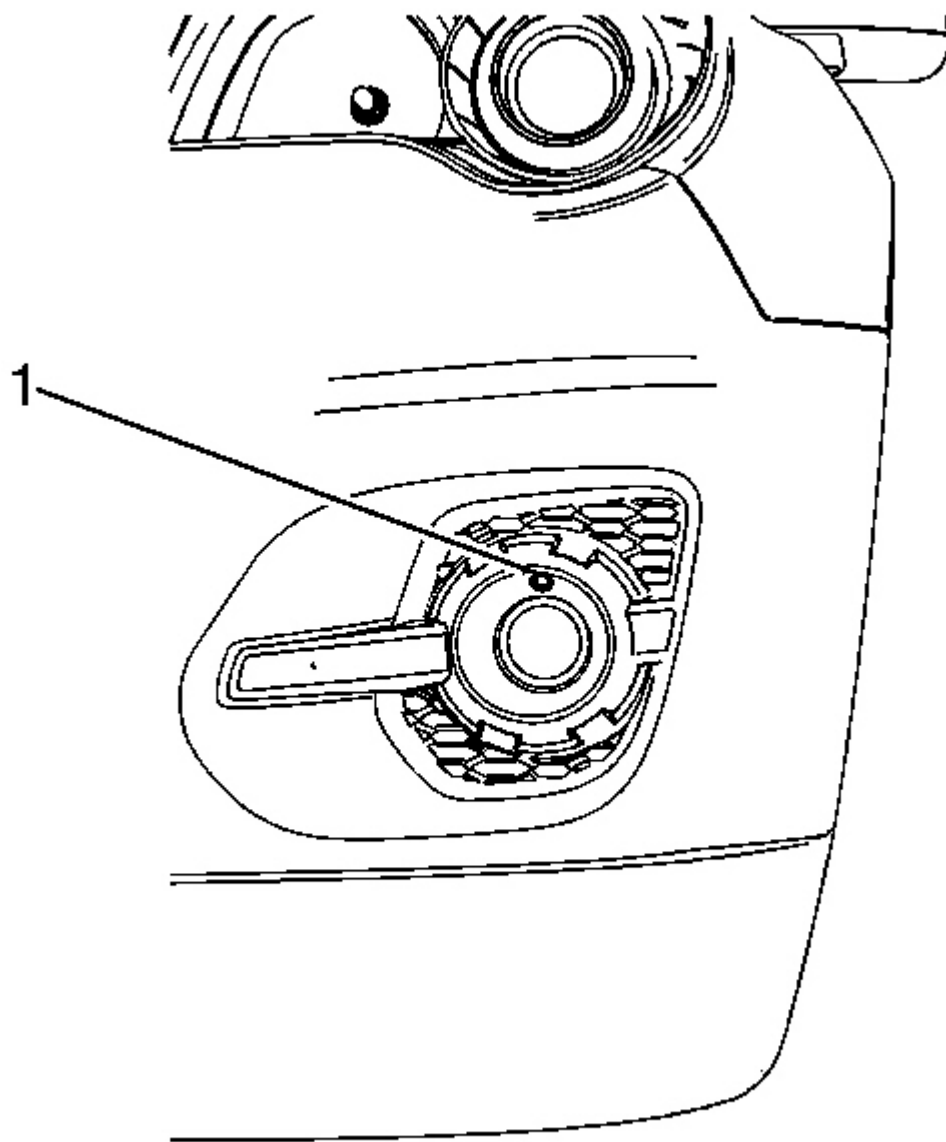


Fig. 45: Identifying Adjusting Screw
Courtesy of GENERAL MOTORS CORP.

4. Adjust the fog lamp as required, using the adjusting screw (1) on the top of the fog lamp.
5. Turn OFF the fog lamps.

FRONT SIDE MARKER LAMP BULB REPLACEMENT (EQUINOX)

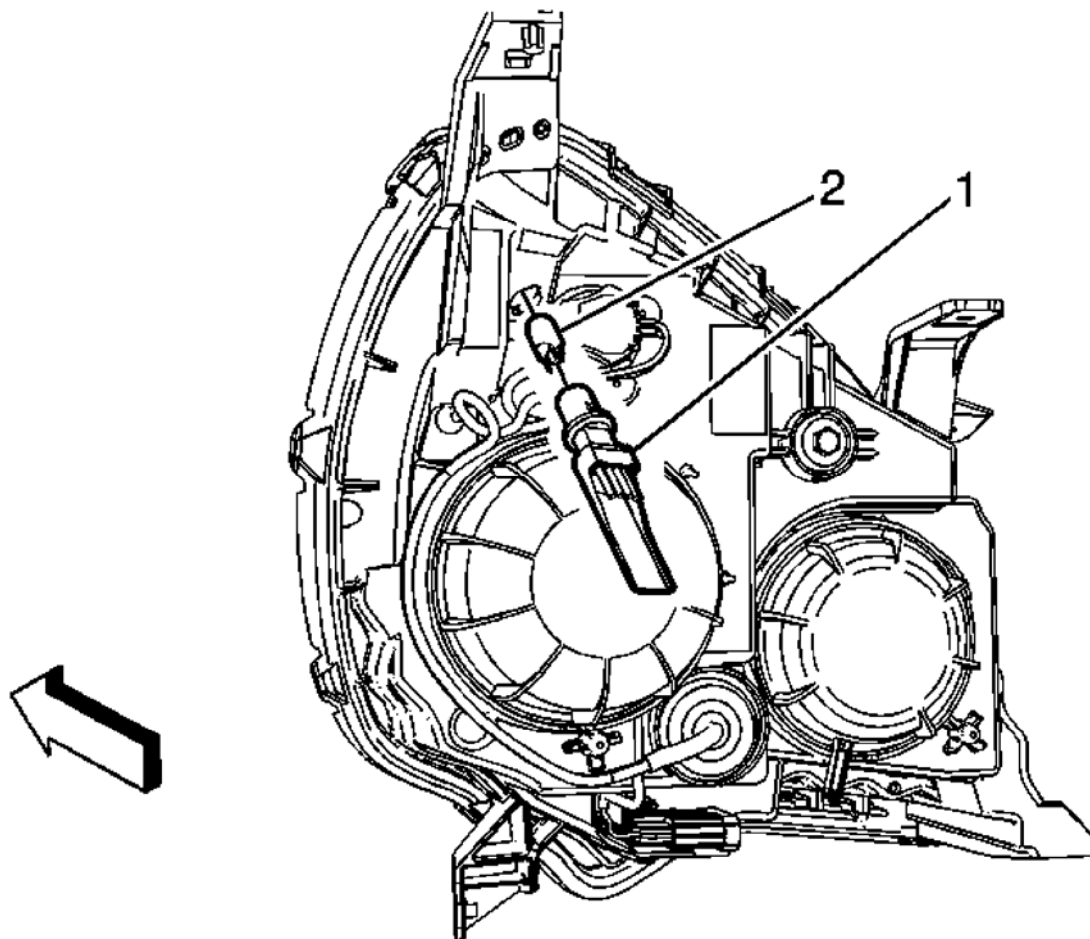


Fig. 46: Front Side Marker Lamp Bulb (Equinox)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the headlamp assembly. Refer to <u>Headlamp Replacement (Equinox)</u> or <u>Headlamp Replacement (Terrain)</u> .	
1	Front Side Marker Lamp Bulb Socket Procedure: Rotate the bulb socket counter-clockwise and remove from the headlamp.
2	Front Side Marker Lamp Bulb Tip: Pull the bulb straight from the lamp bulb socket.

FRONT SIDE MARKER LAMP BULB REPLACEMENT (TERRAIN)

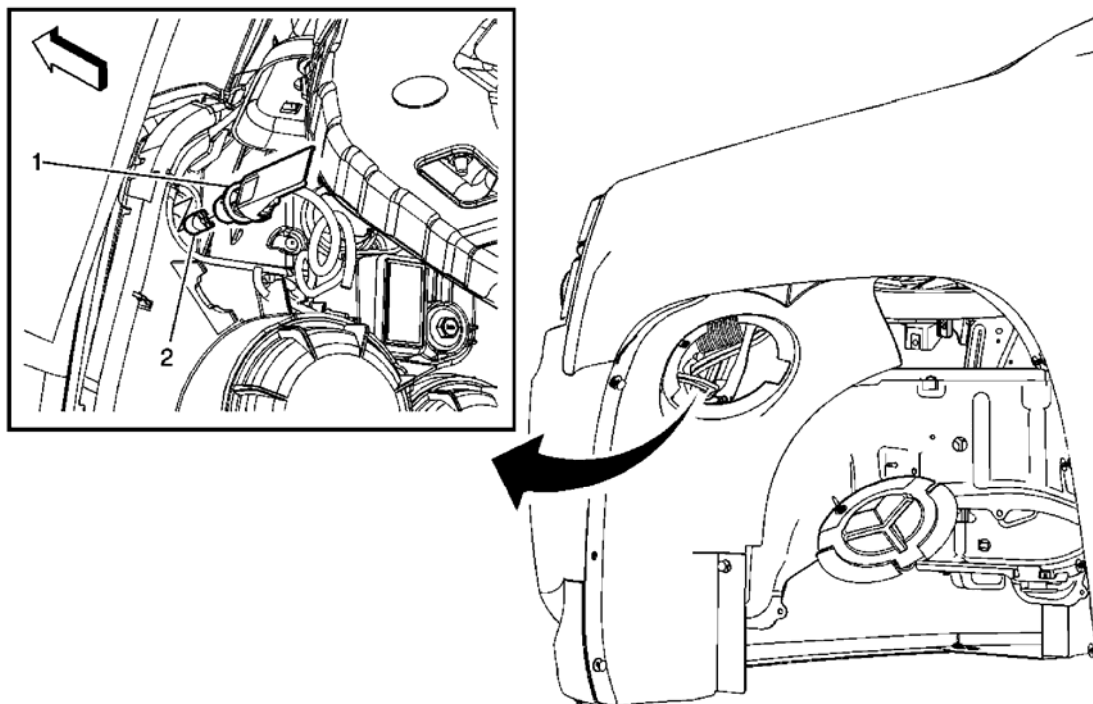


Fig. 47: Front Side Marker Lamp Bulb (Terrain)

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front wheelhouse front panel hole cover. Refer to <u>Front Wheelhouse Front Panel Hole Cover Replacement (Terrain)</u> .	
1	Front Side Marker Lamp Bulb Socket Procedure: Rotate the bulb socket counter-clockwise and remove from the headlamp.
2	Front Side Marker Lamp Bulb Tip: Pull the bulb straight from the lamp bulb socket.

PARKING AND TURN SIGNAL LAMP BULB REPLACEMENT (EQUINOX)

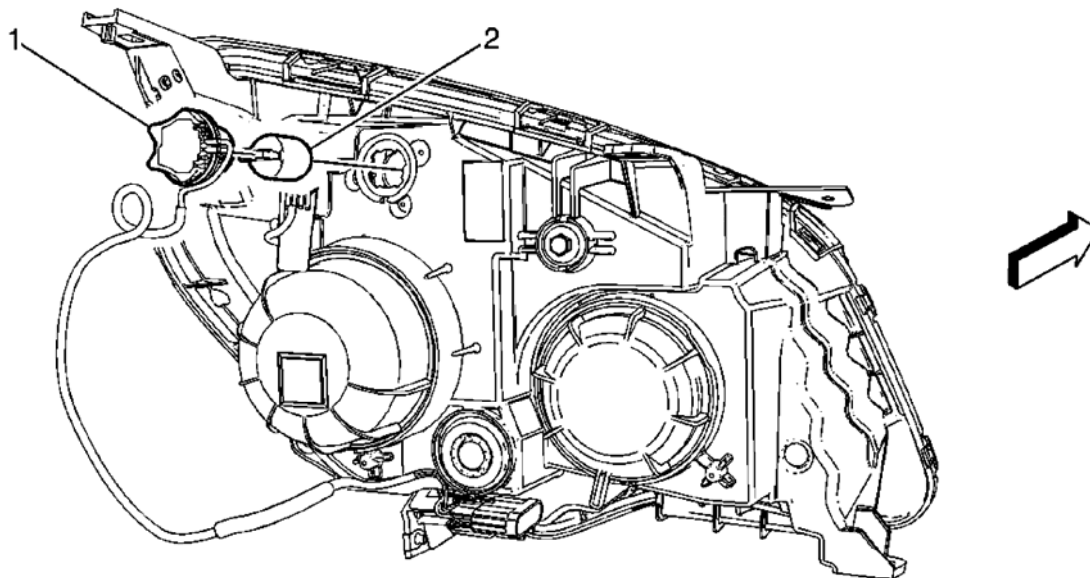


Fig. 48: Parking & Turn Signal Lamp Bulb (Equinox)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the headlamp assembly. Refer to <u>Headlamp Replacement (Equinox)</u> or <u>Headlamp Replacement (Terrain)</u> .	
1	Park Turn Signal Lamp Bulb Socket WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure: Rotate the bulb socket counter-clockwise and disengage the socket from the headlamp capsule.
2	Park Turn Signal Lamp Bulb

PARKING AND TURN SIGNAL LAMP BULB REPLACEMENT (TERRAIN)

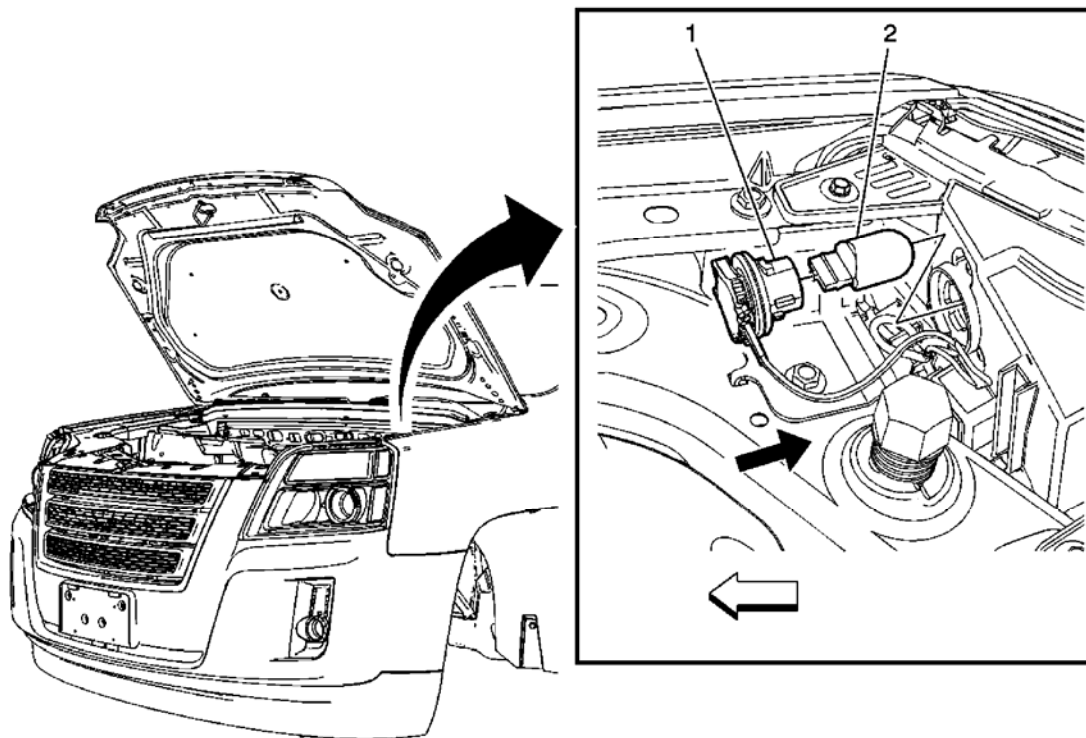


Fig. 49: Parking & Turn Signal Lamp Bulb (Terrain)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Open and support the hood. 2. Remove the front bumper fascia opening cover. Refer to <u>Front Bumper Fascia Opening Cover Replacement (Equinox)</u> or <u>Front Bumper Fascia Opening Cover Replacement (Terrain)</u> .	
1	Park Turn Signal Lamp Bulb Socket WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure: Rotate the bulb socket counter-clockwise and disengage the socket from the headlamp capsule.
2	Park Turn Signal Lamp Bulb Tip: Remove and replace the bulb as needed.

HIGH MOUNT STOP LAMP REPLACEMENT (EQUINOX)

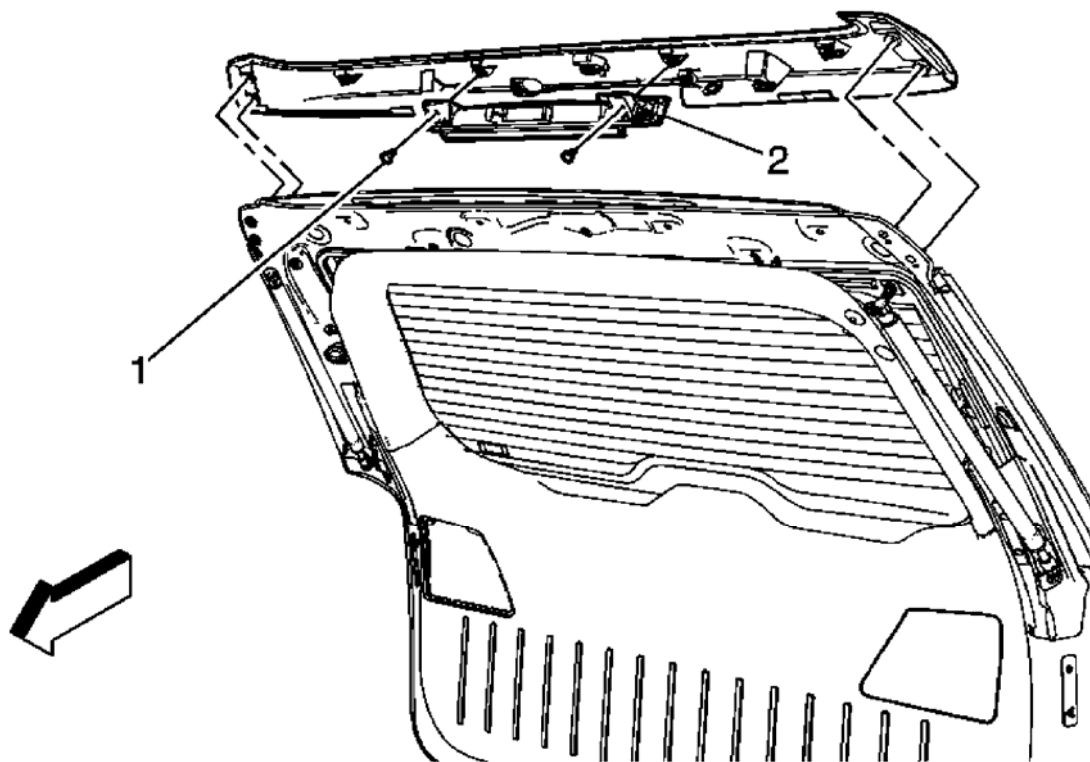


Fig. 50: High Mount Stop Lamp (Equinox)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear end spoiler assembly. Refer to <u>Rear End Spoiler Replacement (Equinox)</u> or <u>Rear End Spoiler Replacement (Terrain)</u>	
1	High Mount Stop Lamp Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 2.5 N.m (22 lb in)
2	High Mount Stop Lamp Assembly Tip: The high mount stop lamp is (LED) light emitting diode and is replaced as an assembly.

HIGH MOUNT STOP LAMP REPLACEMENT (TERRAIN)

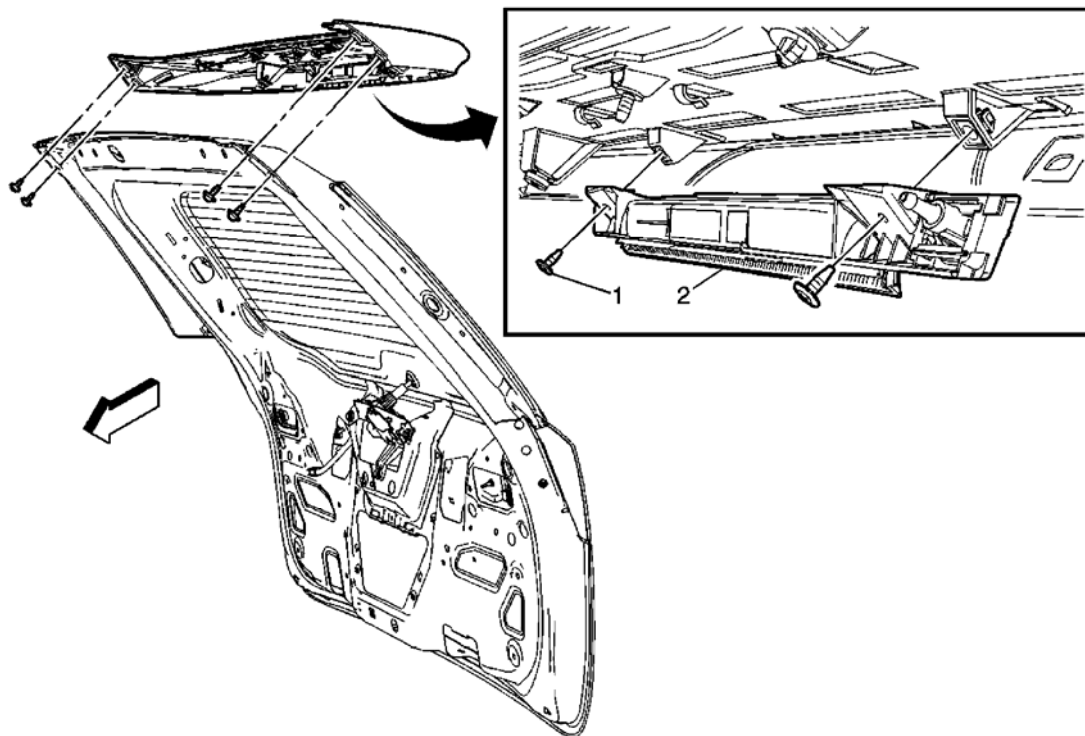


Fig. 51: High Mount Stop Lamp (Terrain)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear end spoiler assembly. Refer to <u>Rear End Spoiler Replacement (Equinox)</u> or <u>Rear End Spoiler Replacement (Terrain)</u>	
1	High Mount Stop Lamp Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 2.5 N.m (22 lb in)
2	High Mount Stop Lamp Assembly Procedure 1. The high mount stop lamp is (LED) light emitting diode and is replaced as an assembly. 2. Remove and transfer the rear window washer nozzle to the new high mount stop lamp.

BACKUP LAMP BULB REPLACEMENT (EQUINOX)

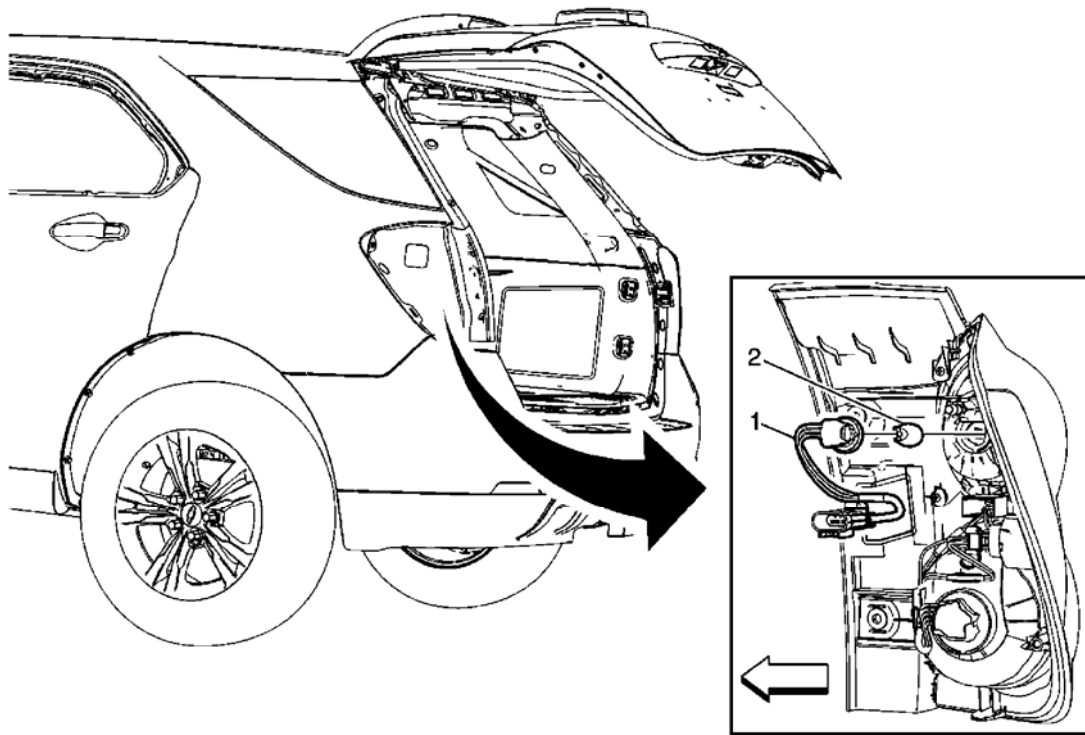


Fig. 52: Backup Lamp Bulb (Equinox)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the Left or Right tail lamp assembly. Refer to <u>Tail Lamp Replacement (Equinox)</u> or <u>Tail Lamp Replacement (Terrain)</u> .	
1	Back Up Lamp Bulb WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure 1. Disengage the bulb socket from the lamp assembly by turning the socket counterclockwise a quarter turn. 2. Remove the bulb from the socket.

BACKUP LAMP BULB REPLACEMENT (TERRAIN)

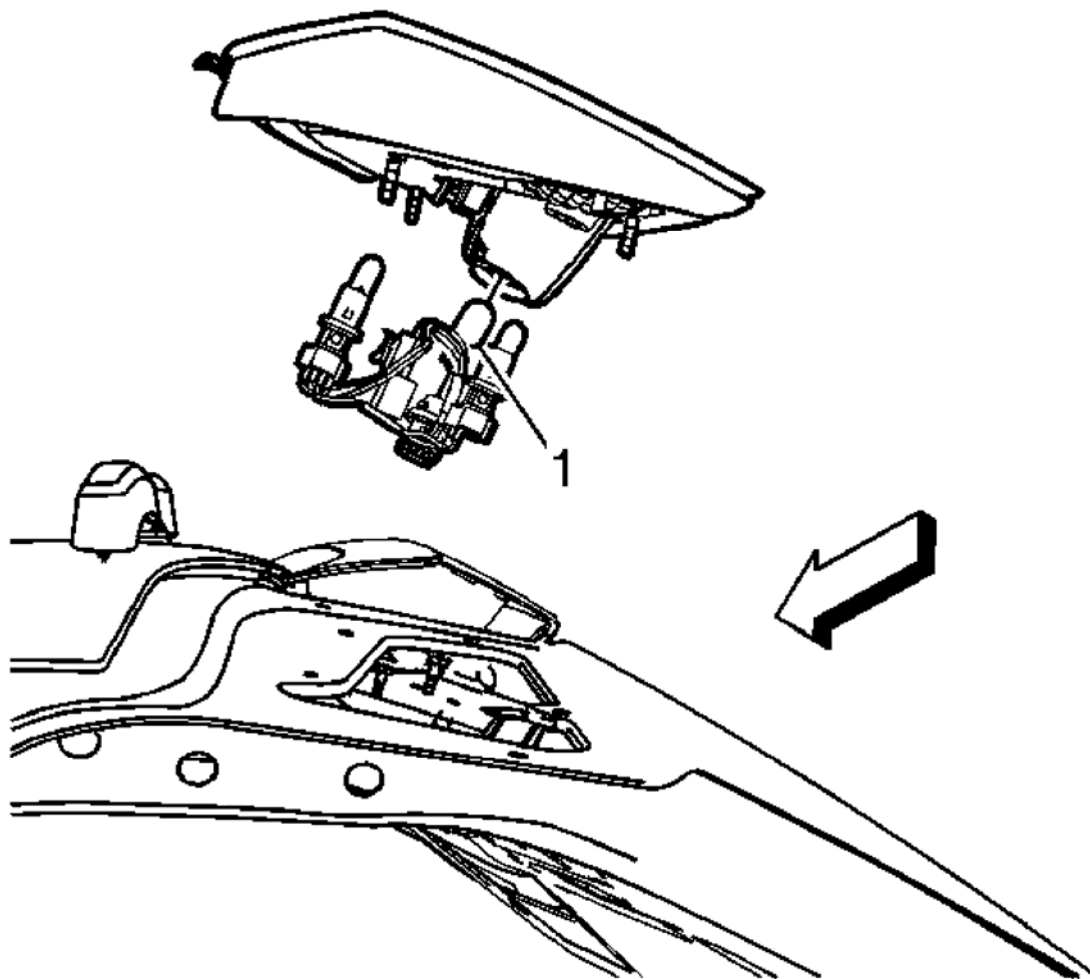


Fig. 53: Backup Lamp Bulb (Terrain)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the tail lamp applique. Refer to <u>Tail Lamp Applique Replacement (Terrain)</u> .	
1	Back Up Bulb WARNING: When working with any type of glass or sheet metal with exposed or rough edges, wear approved safety glasses and gloves in order to reduce the chance of personal injury. Procedure 1. Rotate the back up bulb socket counterclockwise and remove from the tail lamp applique. 2. Remove the back up lamp bulb from the bulb socket.

REAR LICENSE PLATE LAMP REPLACEMENT (EQUINOX)

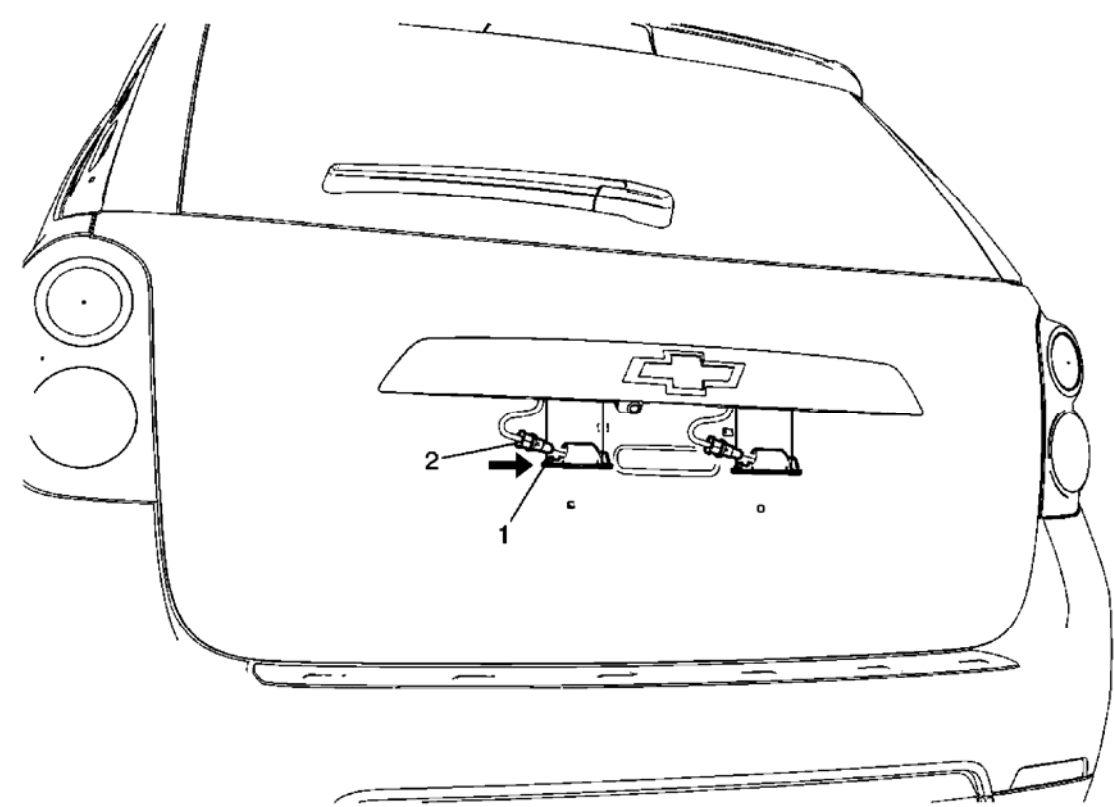


Fig. 54: Rear License Plate Lamp (Equinox)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	License Lamp Assembly (Qty: 2) Tip: Depress the driver side of the lamp with a small flat-bladed tool and pull the lamps downward to remove from the liftgate applique.
2	License Lamp Bulb Socket Tip: Rotate the bulb sockets counter-clockwise and remove from the lamp assembly. Replace bulbs as needed.

REAR LICENSE PLATE LAMP REPLACEMENT (TERRAIN)

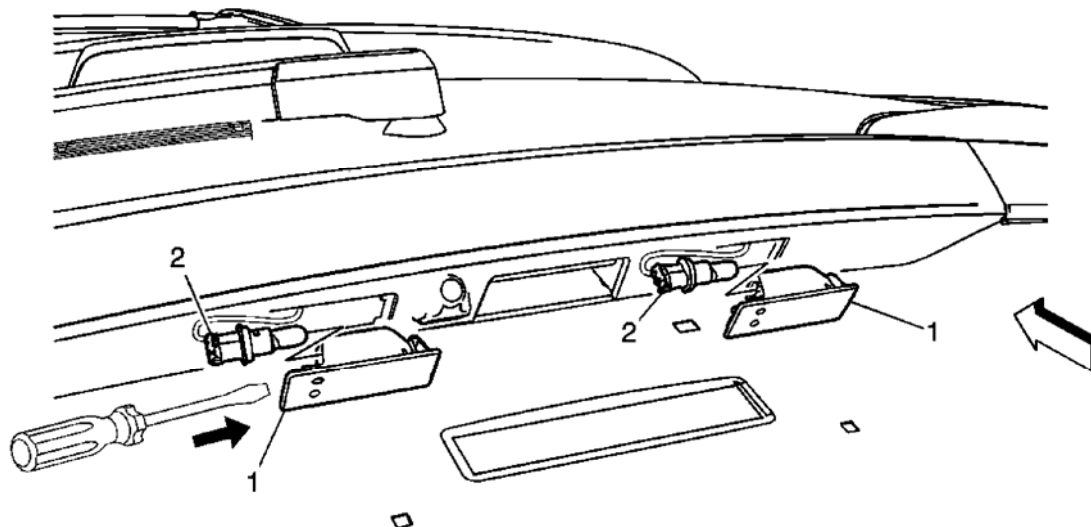


Fig. 55: Rear License Plate Lamp (Terrain)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	License Lamp Assembly (Qty: 2) Tip: Depress the driver side of the lamp with a small flat-bladed tool and pull the lamps downward to remove from the liftgate applique.
2	License Lamp Bulb Socket Procedure 1. Rotate the bulb sockets counter-clockwise and remove from the lamp assembly. 2. Replace the bulbs as needed.

TAIL LAMP APPLIQUE REPLACEMENT (TERRAIN)

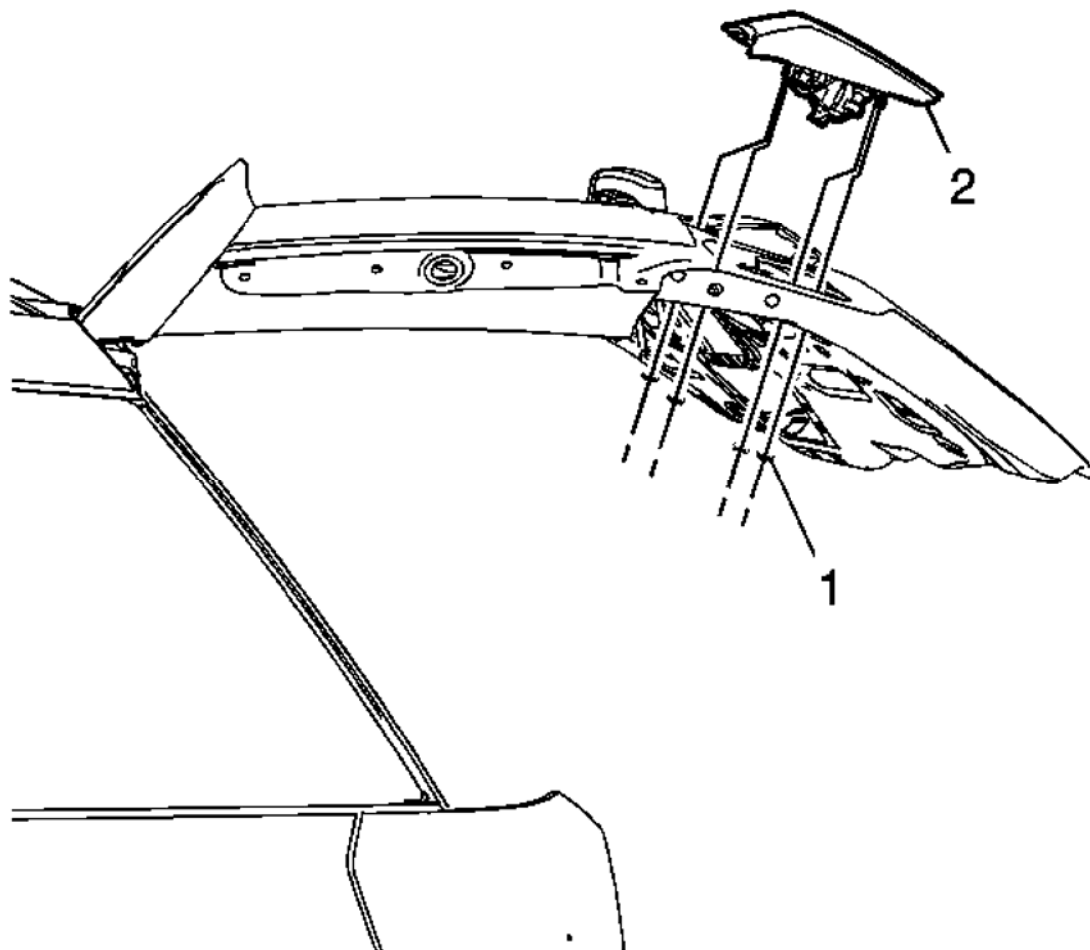
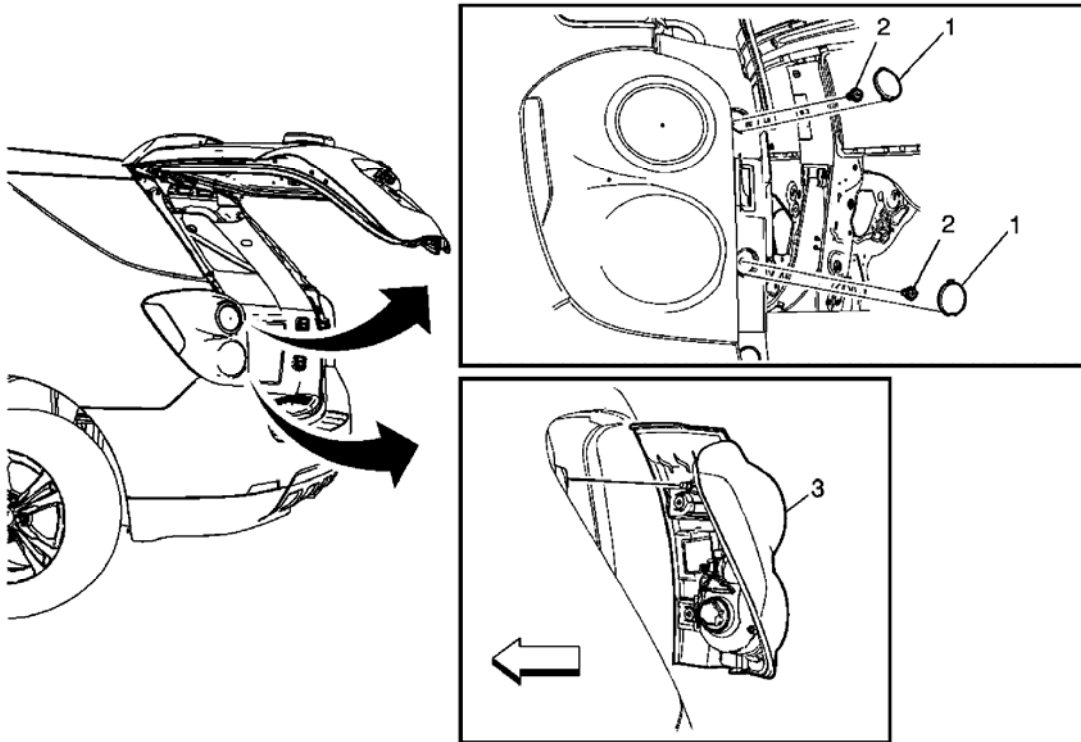


Fig. 56: Tail Lamp Applique (Terrain)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Open and suitably support the rear liftgate. 2. Remove the liftgate lower trim finish panel. Refer to <u>Liftgate Lower Trim Finish Panel Replacement</u>.	
1	Tail Lamp Applique Nut (Qty: 5) WARNING: When working with any type of glass or sheet metal with exposed or rough edges, wear approved safety glasses and gloves in order to reduce the chance of personal injury. Procedure: Disconnect the tail lamp harness connector from the liftgate main electrical harness.

TAIL LAMP REPLACEMENT (EQUINOX)**Fig. 57: Tail Lamp (Equinox)**

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Open and support the liftgate assembly.	
1	Tail Lamp Access Hole Cover (Qty: 2) Tip: Use a small flat bladed tool to aid in the removal of the access hole covers.
2	Tail Lamp Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 2.5 N.m (22 lb in)
	Tail Lamp Assembly Procedure

3

1. Pull outward at the forward edge of the tail lamp assembly to disengage the upper locator pin and lower tab from the tail lamp pocket.
2. Disconnect the electrical connector.
3. Remove the tail lamp assembly from the vehicle.

TAIL LAMP REPLACEMENT (TERRAIN)

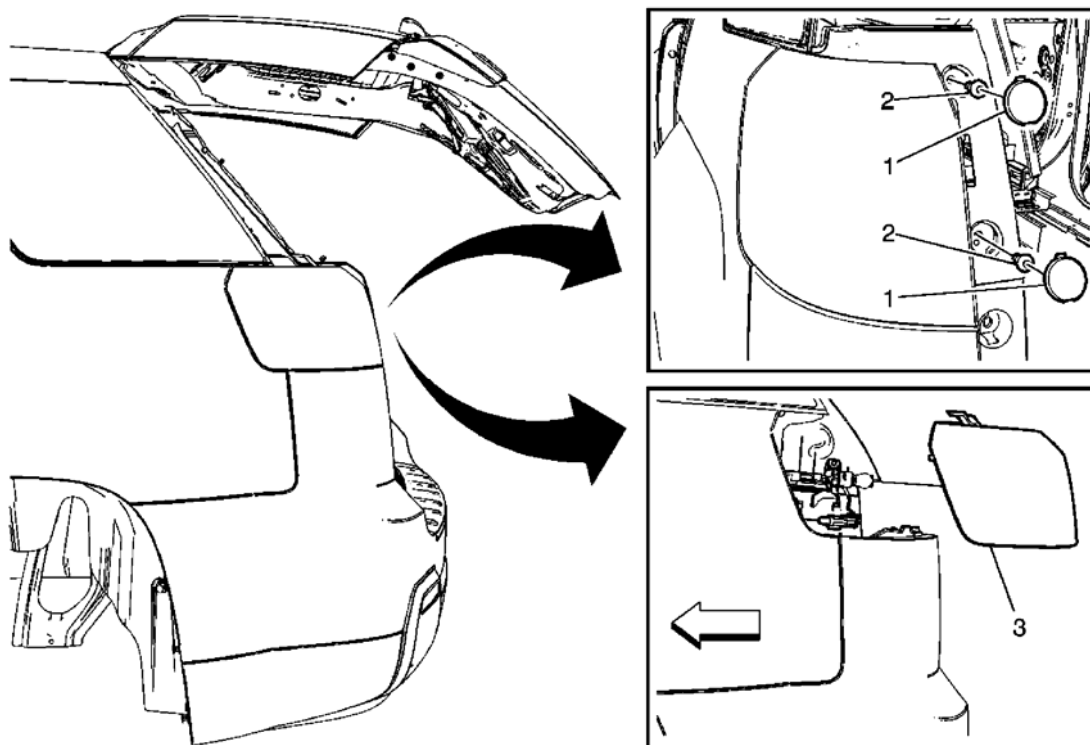


Fig. 58: Tail Lamp (Terrain)

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Open and support the liftgate assembly.	
1	Tail Lamp Access Hole Cover (Qty: 2) Tip: Use a small flat bladed tool to aid in the removal of the access hole covers.
2	Tail Lamp Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 2.5 N.m (22 lb in)
	Tail Lamp Assembly

Procedure	
3	1. Pull outward at the forward edge of the tail lamp assembly to disengage the upper locator pin and lower tab from the tail lamp pocket. 2. Disconnect the electrical connector. 3. Remove the tail lamp assembly from the vehicle.

TAIL LAMP BULB REPLACEMENT (EQUINOX)

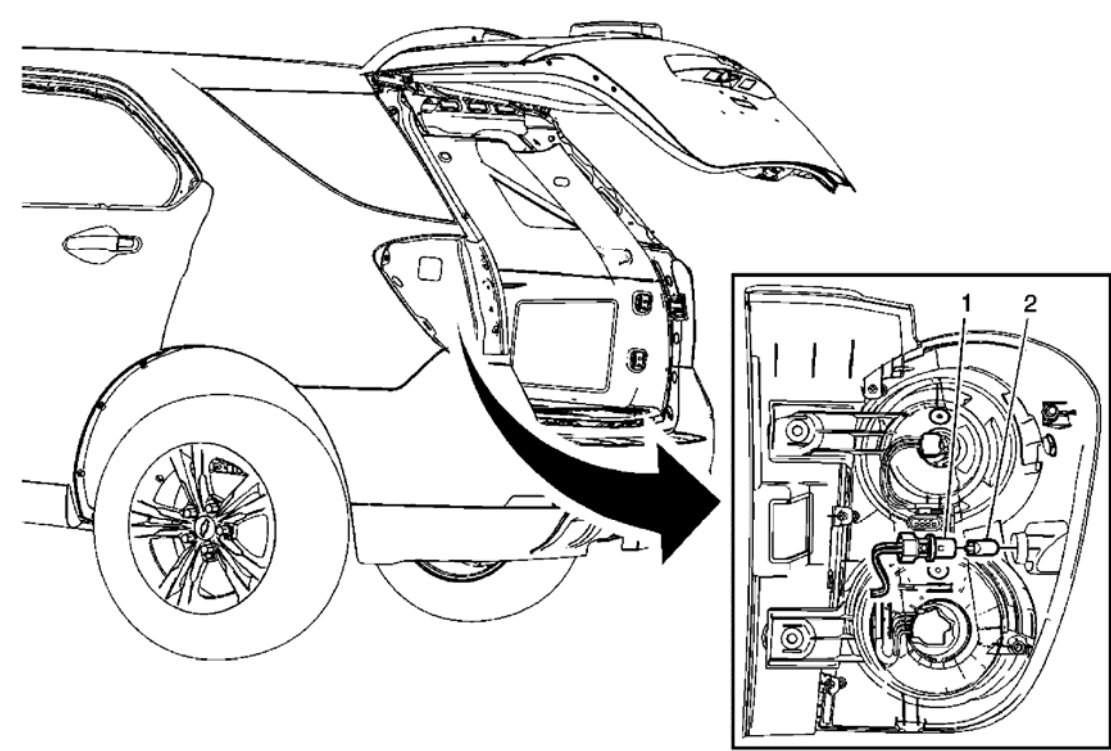


Fig. 59: Tail Lamp Bulb (Equinox)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the Left or Right tail lamp assembly. Refer to <u>Tail Lamp Replacement (Equinox)</u> or <u>Tail Lamp Replacement (Terrain)</u> .	
1	Tail Lamp Bulb Socket WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure:

	Disengage the tail lamp bulb socket from the lamp assembly by turning the socket counterclockwise a quarter turn.
2	Tail Lamp Bulb

TAIL LAMP BULB REPLACEMENT (TERRAIN)

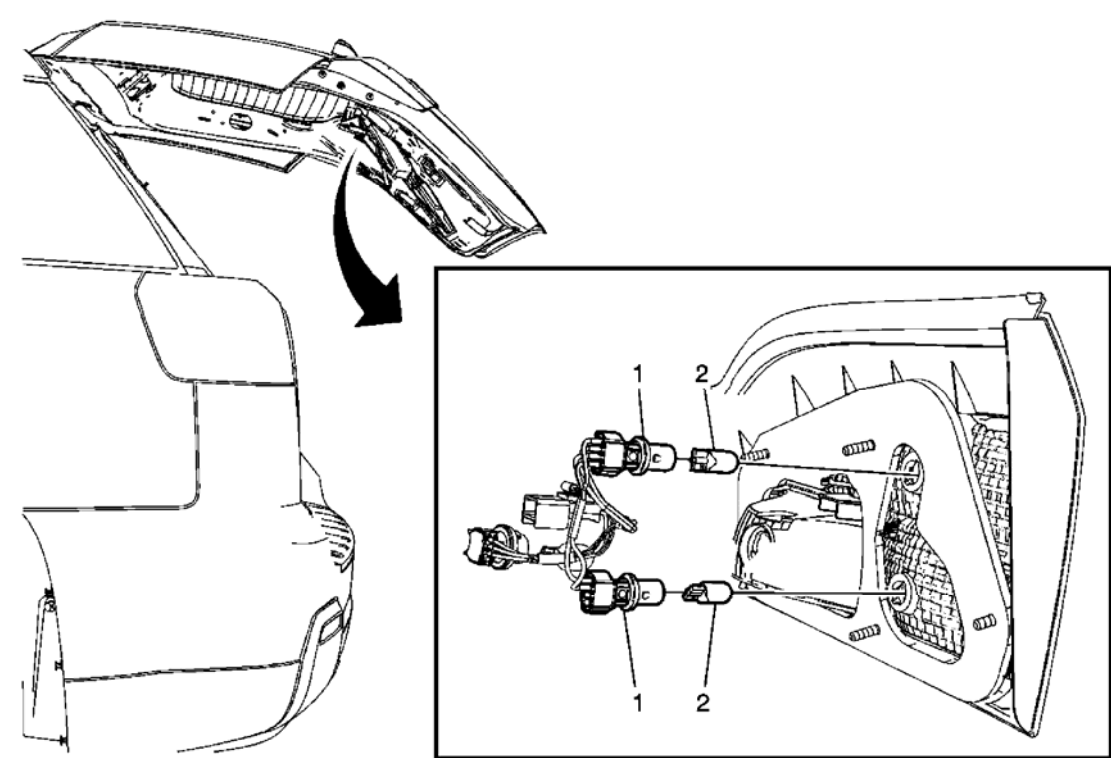


Fig. 60: Tail Lamp Bulb (Terrain)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the tail lamp applique. Refer to Tail Lamp Applique Replacement (Terrain) .	
1	Auxiliary Tail Lamp Bulb Socket (Qty :2) Procedure: WARNING: When working with any type of glass or sheet metal with exposed or rough edges, wear approved safety glasses and gloves in order to reduce the chance of personal injury. Disengage the auxiliary tail lamp bulb socket from the tail lamp applique by turning the socket counterclockwise a quarter turn.
2	Auxiliary Tail Lamp Bulb (Qty: 2)

Tip: Pull the bulb straight out of the bulb sockets.

STOP AND TURN SIGNAL LAMP BULB REPLACEMENT (EQUINOX)

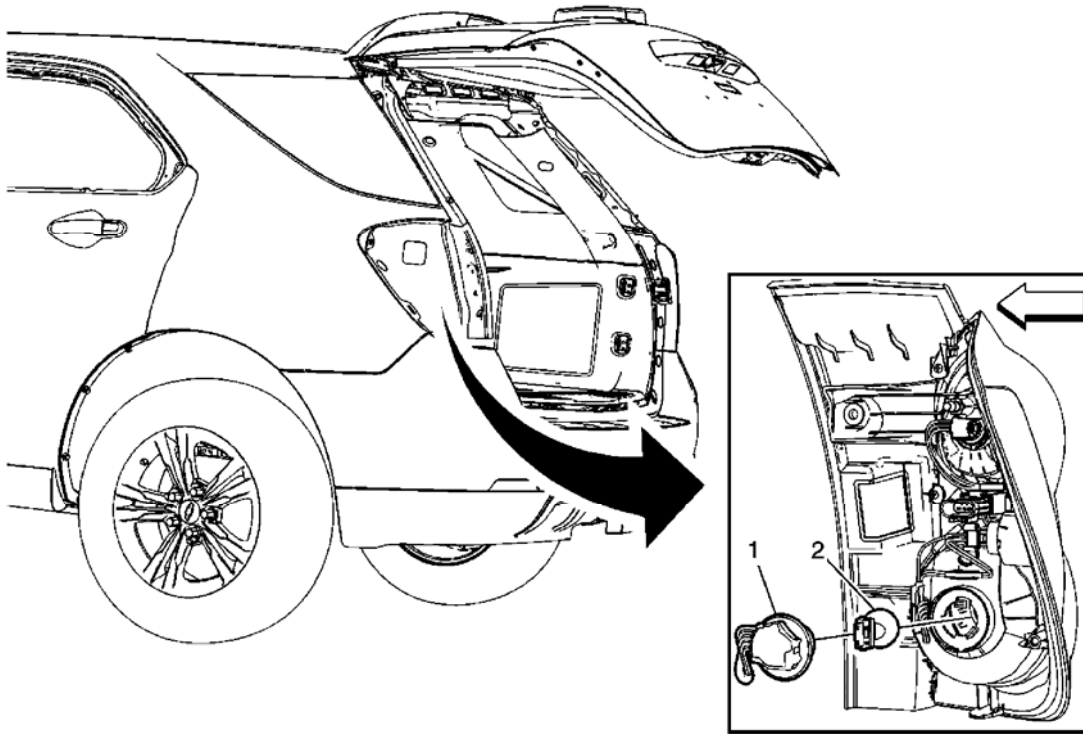


Fig. 61: Stop & Turn Signal Lamp Bulb (Equinox)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the Left or Right tail lamp assembly. Refer to <u>Tail Lamp Replacement (Equinox)</u> or <u>Tail Lamp Replacement (Terrain)</u> .	
1	Stop Turn Signal Lamp Bulb Socket WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure 1. Disengage the bulb socket from the lamp assembly by turning the socket counterclockwise a quarter turn. 2. Remove the bulb from the socket.
2	Stop Turn Signal Lamp Bulb

STOP AND TURN SIGNAL LAMP BULB REPLACEMENT (TERRAIN)

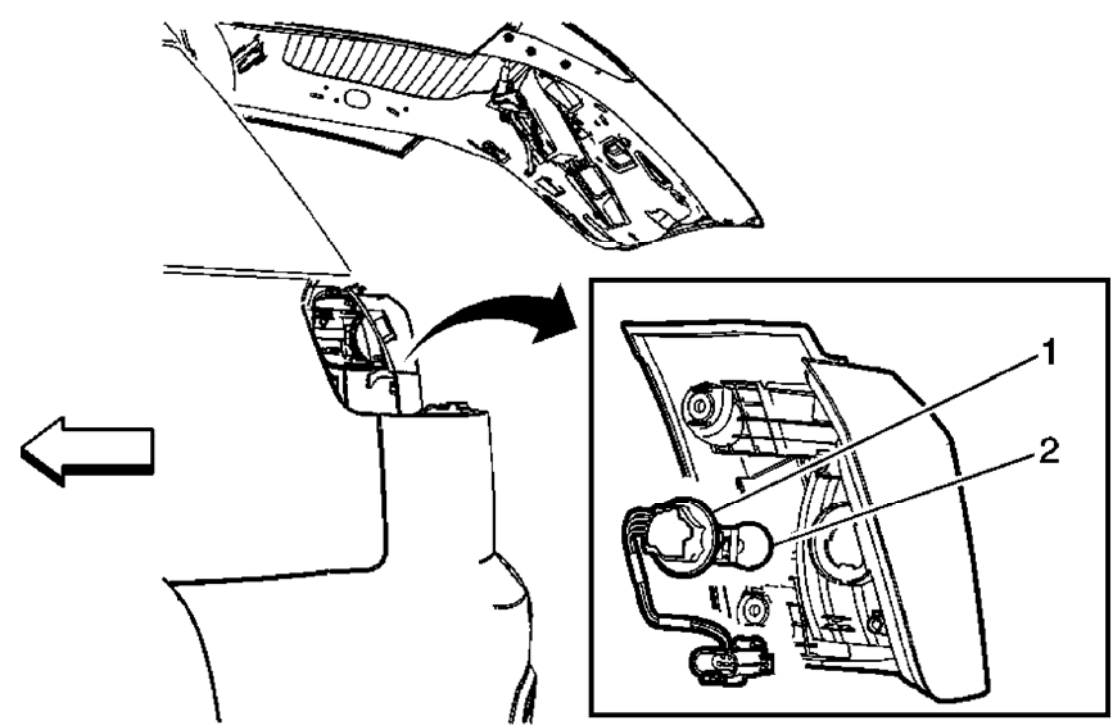


Fig. 62: Stop & Turn Signal Lamp Bulb (Terrain)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove either the left or right tail lamp assembly. Refer to <u>Tail Lamp Replacement (Equinox)</u> or <u>Tail Lamp Replacement (Terrain)</u> .	
1	Stop and Turn Signal Bulb Socket WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure: Disengage the stop and turn signal lamp bulb socket from the lamp assembly by turning the socket counterclockwise a quarter turn.
2	Stop and Turn Signal Lamp Bulb

DESCRIPTION AND OPERATION

EXTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

Exterior Lamps

The exterior lighting system consist of the following lamps:

- Automatic Headlamp Leveling
- Headlamps
- Adaptive Forward Lighting
- Daytime Running Lamps (DRL)
- Front Fog Lamps
- Rear Fog Lamps
- Park, Tail, License and Marker Lamps
- Turn Signal Lamps
- Hazard Warning Lamps
- Repeater Lamps
- Stop Lamps
- Backup Lamps
- Position Lamps

Low Beam Headlamps (Standard) RPO TT4

The headlamps consist of 2 interchangeable single filament bulbs or 2 high intensity discharge (HID) arc tubes and ballast on each side of the vehicle which provide high and low beams. The lower bulb in the headlamp is the high beam and the upper bulb is the low beam.

The headlamps may be turned ON in 3 different ways:

- When the headlamp switch is placed in the ON position, for normal operation
- When the headlamp switch is placed in the AUTOMATIC LIGHT position, for automatic lamp control
- When the headlamp switch is placed in the AUTOMATIC LIGHT position, with the windshield wipers ON in daylight conditions, after a 6 seconds delay

The body control module (BCM) controls the headlamps based on the inputs explained above. When a low beam request is received, the BCM supplies an B+ through the headlamp low beam relay for the left headlamp and through daytime running lamp relay - right for the right headlamp. This then applies B+ to the low beam headlamps, 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 headlamp high beam relay, causing the relay switch to close. This then applies B+ to both high beam headlamps through the left high beam and right high beam fuses, illuminating the high beam headlamps.

Adaptive Forward Lighting

The adaptive forward lighting consist of the following components:

- Headlamp control module

- Headlamp actuator - left
- Headlamp actuator - right

Dynamic Curve Light

Bend lighting is a function depending on the following signal input values:

- Steering angle
- Vehicle speed
- Yaw Rate

The appropriate swivel angle is calculated based on vehicle speed and the steering angle value.

Cornering Light

The cornering lamp is activated automatically at vehicle speeds below 40 km/h (25 MPH) when the direction indicator is switched ON and/or when the steering angle is changed from the straight-ahead position towards the side the vehicle is going to turn and passes a programmable angle threshold. The cornering lamp is deactivated automatically when the direction indicator is switched OFF and/or the steering angle has returned in the straight-ahead position. The cornering lamps are deactivated at vehicle speeds above 40 km/h (25 MPH). If reverse gear is active, the cornering lamps go into park function. Both lamps will be switched on. They will switch off 20 seconds after leaving reverse gear or if the vehicle speed exceeds 7 km/h (4 MPH). The cornering lamps also provide a protection against overheating. When having been continuously switched on for 2 minutes, adaptive forward lighting will deactivate the lamps for 2 minutes to enable cooling down.

Town Light

Town Light is activated while the vehicle speed is below 55 km/h (34 MPH) as well as the light sensor detects street lights and the town road category is detected. The light distribution is reduced to an area near the car due to low speeds.

Motorway Light

If vehicle speed is above 100 km/h (62 MPH) for at least 20 seconds (or once above 126 km/h (78 MPH) and the corresponding road category is identified, the headlamps will be switched to a motorway light distribution. During motorway light the light output of the HID bulb is increased to 38 W by electrical power management. This improves the visibility range at the far end of the road.

Country Light

Country light replaces the current low beam and will be controlled based on programmable vehicle thresholds as well as corresponding road detection. The vehicle speed has to be between 55 km/h (34 MPH) and 100 km/h (62 MPH). Country light is the default light distribution at 35 W. Light distribution is reduced on the left side to prevent oncoming traffic from being dazzled.

Tourist Mode

The tourist mode functionality switches the adaptive forward lighting headlamps into a non dazzling mode, if the traffic regulation moves from left hand traffic to right hand traffic and vice versa. The functionality is switched on/off with the same stalk/switch combination. The "flash to pass" stalk needs to be activated while ignition is switched on (System Power Mode = RUN). The "flash to pass" stalk remains activated until the warning indicator within the instrument panel cluster starts flashing (4 seconds) and an acoustic indication is sent. The activation period takes about 3 seconds. An activation flag must be set within the adaptive forward lighting ECM and stored in non-volatile memory. Each time the ignition is switched on and the tourist mode is active, the warning indicator is flashing about 4 seconds. The tourist mode is deactivated with the same procedure described above. The function is switched OFF, if an acoustic signal is sent (Warning indicator remains inactive).

Adverse Weather Light

Adverse weather light will be switched on while the vehicle speed is below 100 km/h (62 MPH) and the windscreen wipers are activated. The HID bulbs will be powered with different values:

- Left: 32 W
- Right: 38 W

The main advantage is that reflections on the wet floor are reduced to a minimum. This is noticeable as well for oncoming traffic as for the driver. In front of the car a less illuminated area is realized.

The following conditions must be met before the adaptive forward lighting will operate:

Automatic Lamp Control

Automatic Light is switched ON as default. It can be switched OFF by turning the light switch to OFF position. It will be switched ON again by doing so again. Automatic Light is only available if a rain sensor or rain/light sensor module is installed in the car. The rain/light sensor module will send the actual ambient light state (day/night) to the BCM. If Automatic Light is enabled, BCM will react on the message received from the rain/light sensor module by switching ON/OFF low beams.

Flash to Pass (Standard) RPO TT4

When the low beam headlamps are on and the turn signal/multifunction switch is momentarily placed in the flash to pass position, ground is applied to the turn signal/multifunction switch. The turn signal/multifunction switch applies ground to the BCM through the flash to pass switch signal circuit. The BCM then applies ground to the high beam relay control circuit. This energizes the high beam relay, closing the switch side contacts of the high beam relay, applying battery voltage to the left and right high beam fuses. Battery voltage is applied from the high beam fuses through the high beam voltage supply circuit to the high beam headlamp assemblies. This causes the high beam headlamps to illuminate at full brightness momentarily or until the flash to pass switch is released.

Flash to Pass (up level) RPO TT2/TT6

When the low beam headlamps are ON and the turn signal/multifunction switch is momentarily placed in the flash to pass position, ground is applied to the turn signal/multifunction switch. The turn signal/multifunction switch applies ground to the BCM through the flash to pass switch signal circuit. The BCM sends a message to

the headlamp control module to lift the shutter from the Xenon lamp. This causes the Xenon lamp to illuminate the headlamp at full brightness momentarily or until the flash to pass switch is released.

Automatic Headlamp Leveling

The Automatic Headlamp Leveling Systems consist of the following components:

- Ballast module - left
- Ballast module - right
- Headlamp leveling actuator - left
- Headlamp leveling actuator - right
- Headlamp control module
- Headlamp leveling sensor - front
- Headlamp leveling sensor - rear

The automatic headlamp leveling system automatically maintains the vertical alignment of the headlamps when the vehicle load and driving conditions change. The headlamp control module receives inputs from the front and rear headlamp leveling sensors to determine vehicle pitch. The headlamp leveling sensors send an output to the headlamp control module as the vehicle suspension compresses and rebounds. The headlamp control module calculates the difference in vehicle pitch and sends a command to the (HID) ballast. The ballast then drive the headlamp leveling actuators to the position commanded by the headlamp control module. The headlamp leveling system also monitors the performance of the HID bulb and ballast. When the headlamp switch is placed in the ON position the headlamps will go down, and then back up to the center position.

Daytime Running Lamps (DRL) without HID RPO TT4

The DRL bulbs are combined with the park lamps. One filament is for the DRL and one for the park lamps. The DRL will operate when the following conditions are met:

1. Engine is running.
2. Headlamp switch in AUTOMATIC LIGHT position.
3. The high and low beam headlamps are OFF.

By turning the headlamp switch in the OFF position the automatic light function and the DRL will be deactivated.

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2-4.9 V depending on outside lighting conditions. The HVAC control module provides a low reference ground and 5 V reference signals to the ambient light sensor. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either DRL or low beam when the headlamp switch is in the AUTOMATIC LIGHT position. In daylight conditions, the BCM will command the DRL ON by applying ground to the left and right DRL relays via separate left and right DRL relay control circuits. When the BCM applies ground to the relay control circuits, the left and right DRL relay coils energize causing both relay switch contacts to close. With the left and right DRL relay switch contacts closed, battery voltage flows to the left and right DRL lamps. Any function or condition that turns on the headlamps will cancel DRL operation.

Daytime Running Lamps (DRL) with HID RPO TT2/TT6

The DRL are LEDs which are continuously illuminated when:

- Ignition is switched ON.
- Engine is running.
- High and low beam headlamps are ON or OFF.
- Headlamp switch is in PARKING LIGHT, AUTOMATIC LIGHT or LOW BEAM position.

By turning the headlamp switch in the OFF position the automatic light function and the DRL will be deactivated.

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2-4.9 V depending on outside lighting conditions. The HVAC control module provides a low reference ground and 5 V reference to the ambient light sensor. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for only DRL or DRL and low beam when the headlamp switch is in the AUTOMATIC LIGHT position. In daylight conditions the BCM will command the DRL ON.

Front Fog Lamps

The front fog lamp relay is supplied with battery voltage at all times. The front fog lamp switch signal circuit is grounded momentarily by pressing the front fog lamp switch. The body control module (BCM) energizes the front fog lamp relay by applying ground to the front fog lamp relay control circuit. When the front fog lamp relay is energized, the relay switch contacts close and battery voltage is applied through the front fog lamp fuse to the front fog lamp supply voltage circuit which illuminates the front fog lamps.

Rear Fog Lamps

When the rear fog lamp switch is placed in the ON position, battery voltage is applied from the BCM to the rear fog lamps. Ground for the rear fog lamps is applied at all times.

The BCM will send a message via GMLAN serial data to the instrument panel cluster to enable the rear fog lamp indicator.

Park, Tail, License and Marker Lamps

The park lamps, tail lamps/LEDs and number plate lights are turned ON when the headlamp switch is placed in the Parking lights or Low beam position or anytime the headlights are requested. When the BCM receives a request from the headlamp switch to turn ON the park lamps the BCM sends out a PWM signal, which illuminates the park lamps, tail lamps and number plate lights.

Turn Signal Lamps

Ground is applied at all times to the turn signal/multifunction switch. The turn signal lamps may only be activated with the ignition switch in the ON or START position. When the turn signal/multifunction switch is placed in either the TURN RIGHT or TURN LEFT position, ground is applied to the BCM through either the

right turn or left turn signal switch signal circuit. The BCM then applies a pulsating voltage to the front and rear turn signal lamps through their respective voltage supply circuits. When a turn signal request is received by the BCM, a serial data message is sent to the instrument cluster requesting the respective turn signal indicator be pulsed ON and OFF.

Repeater Lamps

The repeater lamps are located in the front fender. The repeater lamps are used as additional turn signal lamps, and operate as described in the Turn Signal/Hazard Flasher Lamps description.

Hazard Flasher Lamps

The hazard flashers may be activated in any power mode. The hazard switch signal circuit is momentarily grounded when the hazard switch is pressed. The BCM supplies battery voltage to all turn signal lamps in an ON and OFF duty cycle. When the hazard switch is activated, the BCM sends a serial data message to the instrument cluster requesting both turn signal indicators to be cycled ON and OFF.

Stop Lamps

The brake pedal position (BPP) sensor is used to sense the action of the driver application of the brake pedal. The BPP sensor provides an analog voltage signal that will increase as the brake pedal is applied. The BCM provides a low reference signal and a 5 V reference voltage to the BPP sensor. When the variable signal reaches a voltage threshold indicating the brakes have been applied, the BCM will apply battery voltage to the stop lamp control circuit and center high mounted stop lamp control circuit. When the control circuit is energized the stop lamps are illuminated.

Backup Lamps

When the transmission is placed in the reverse position, the engine control module (ECM) sends a serial data message to the BCM. The message indicates that the gear selector is in the reverse position. The BCM applies battery voltage to the backup lamps. The backup lamps are permanently grounded. Once the driver moves the gear selector out of the reverse position, a message is sent by the ECM via serial data requesting the BCM to remove battery voltage from the backup lamp control circuit.

Battery Run Down Protection/Inadvertent Power

To provide battery run down protection, the exterior lamps will be deactivated automatically under certain conditions. The BCM monitors the state of the headlamp switch. If the park or headlamp switch is ON when the ignition switch is placed in either the CRANK or RUN position and then placed in the OFF position, the BCM initiates a 10 minute timer. At the end of the 10 minutes, the BCM will turn OFF the control power output to the park and headlamp relay coils, deactivating the exterior lamps. This feature will be cancelled if any power mode other than OFF becomes active. The BCM will disable battery run down protection if any of the following conditions exist. The park or headlamp switch is placed in the ON to OFF position, and back to the ON position during battery run down protection. The BCM determined that the park or headlamp switch was not active when the ignition was turned OFF.

INTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

Interior Lamps

The interior lamps consist of 2 groups, those which can dim from the instrument panel cluster lamps dimmer switch and those that can not dim.

Courtesy/Illuminated Entry Lamps

The following lamps may be manually turned ON by placing the interior lamp switch in the ON position, or by opening a door while the switch is in the AUTO position.

- The dome lamp
- The liftgate lamps
- Courtesy lamps

The courtesy lamp supply voltage circuit of the body control module (BCM) supplies battery positive voltage to the dome lamp, the liftgate lamps and courtesy lamps. When any door is opened, the door jamb switch contacts close providing a door open input to the BCM. The BCM then provides a B+ to the interior lamps with the switch in the AUTO position. The interior lamps receive a ground when the switch is in the ON position.

NOTE: If the liftgate is opened after all the modules go to sleep, the dome light will not come on. The liftgate ajar switch input to the BCM will not wake up the BCM once it has gone to sleep, so the dome light will not come on. Once the BCM gets an input to wake it up, from remote keyless entry or a door handle, the dome light will turn on when the liftgate is opened.

If the driver inadvertently leaves any interior lamp ON, the BCM will turn it OFF after a 20 minute time-out.

The courtesy lamps will turn OFF immediately if the ignition switch is turned to the ON position or approximately 20 seconds after all doors are closed.

Keyless Entry Interior Illumination

When the BCM receives a door unlock command from the remote keyless entry transmitter, the BCM will flash the park lamps several times, illuminate the courtesy and park lamps, and illuminate the low beam headlamps at low intensity. The lamps will remain on until the ignition key is turned from the OFF position, a keyless entry transmitter door lock command is received, or after an approximate 20 second delay.

Interior Lamps Dimming

This group includes lamps which may dim. This group may use a combination of vacuum fluorescent illumination, LEDs and incandescent lamps.

- HVAC control module, head assembly
- Rear HVAC control module, head assembly
- Radio
- Rear seat audio

- The instrument panel cluster
- The PRNDL lamp, with the exception of the current gear select position
- Power window switches
- Various switches

When the ignition switch is turned to the ON position, the vacuum fluorescent display, radio, turns ON at maximum brightness. When the park lamps are ON, all incandescent back lighting turn ON at the dimming level indicated by the instrument panel cluster dimmer switch. At the same time all fluorescent display displays dim to match the indicated dimming level. When the headlamp switch is placed in the PARK position, the park lamp supply voltage circuit provides an input to the BCM. The BCM then supplies voltage to the instrument panel cluster dimmer switch through the dimming control circuit. The setting of the instrument panel cluster dimmer switch determines the amount of voltage that the instrument panel cluster dimmer switch supplies to the BCM. The BCM then sends a PWM voltage to all the interior lamps. All the fluorescent display and incandescent back lighting lamps are provided a specific voltage and are then grounded. When the headlight switch is turned to the park lamp or headlamp position, all incandescent back lighting turn ON at the dimming level indicated by the instrument panel cluster dimmer switch. When the instrument panel cluster dimmer switch is moved from minimum to maximum, all fluorescent display displays, as well as all incandescent back lighting respond from minimum intensity to maximum brightness in response to the instrument panel cluster dimmer switch.

Inadvertent Power

The BCM used in this vehicle controls the lighting system through circuits that enable the interior lamps. The BCM opens these enabling circuits shortly 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 period, the timer will reset itself.