2010 ACCESSORIES & BODY, CAB

Lighting - Camaro

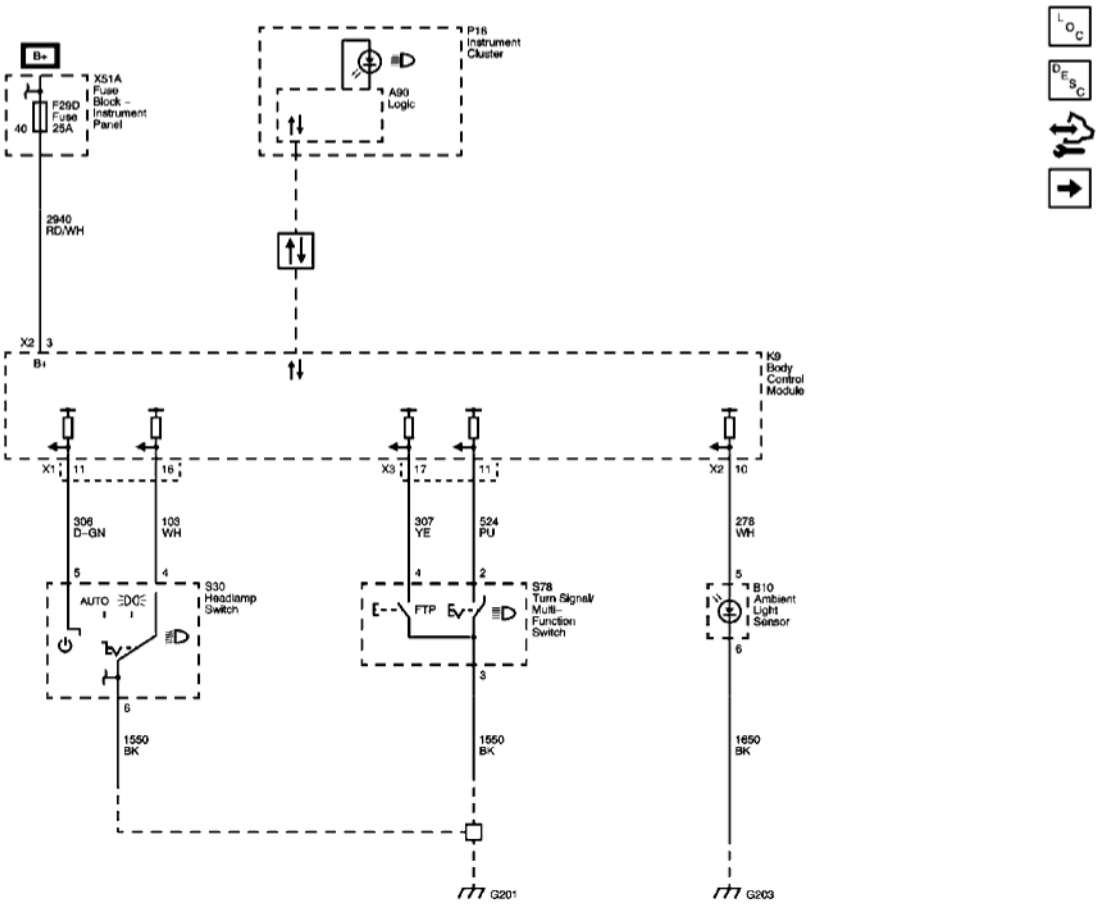
SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Brake Pedal Position Sensor Bolt	9 N.m	80 lb in
Headlamp Capsule Bolt	2.5 N.m	22 lb in
Overhead Console Reading Lamp Screw	2 N.m	18 lb in
Tail Lamp to the Body Panel Nut	2.5 N.m	22 lb in

SCHEMATIC AND ROUTING DIAGRAMS

HEADLIGHTS SCHEMATICS



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Fig. 1: Headlamps and DRL Switches
Courtesy of GENERAL MOTORS CORP.

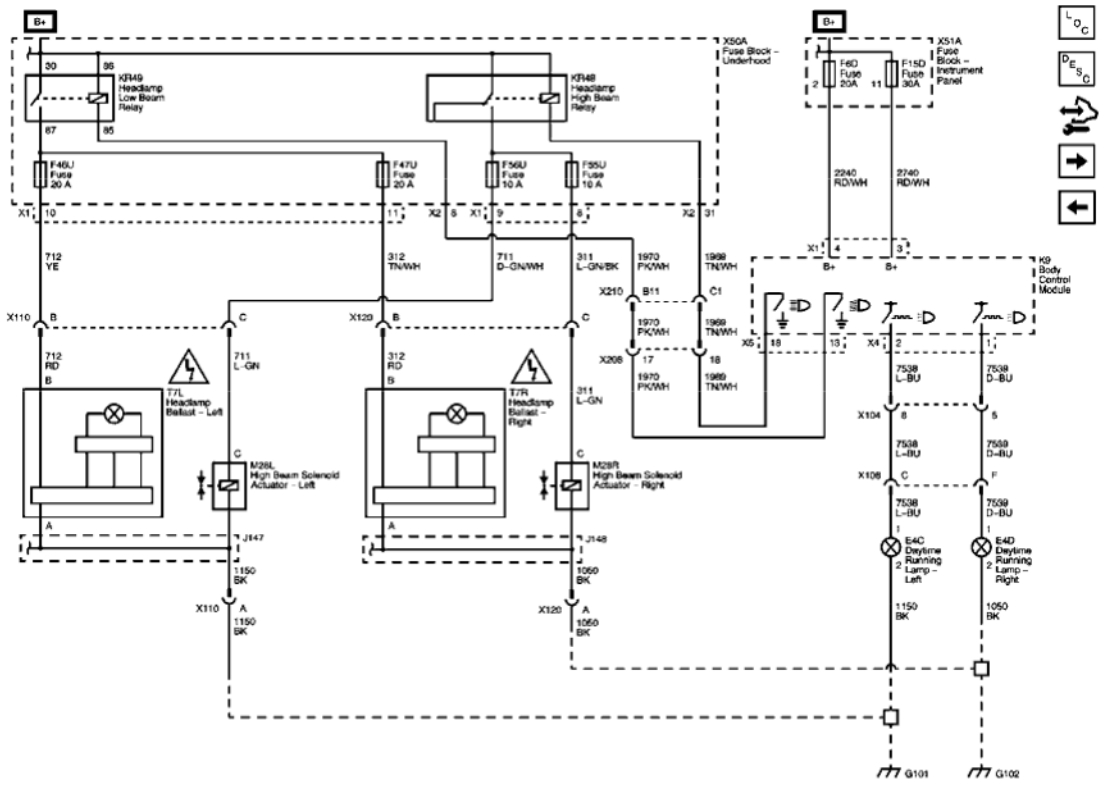


Fig. 2: Headlamps and DRL (T4F)
Courtesy of GENERAL MOTORS CORP.

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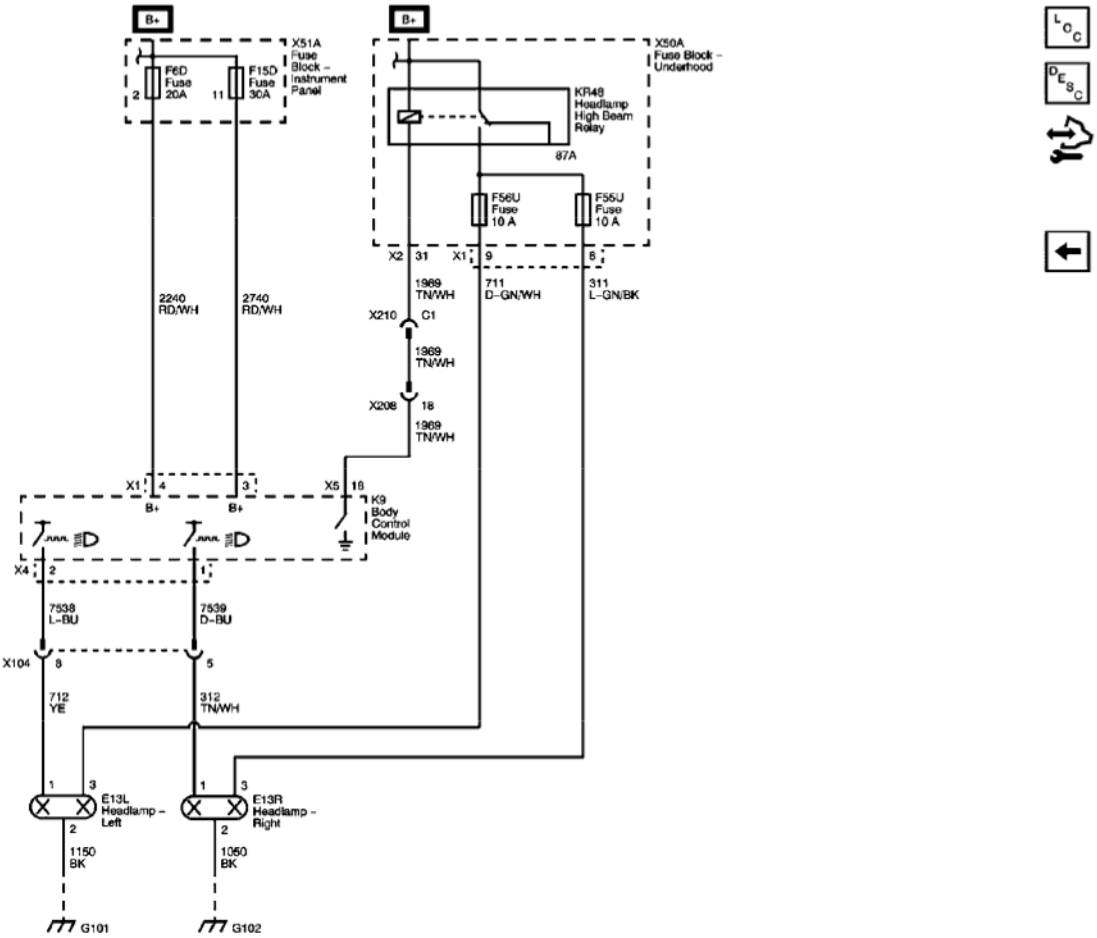


Fig. 3: Headlamps (T4A)
Courtesy of GENERAL MOTORS CORP.

FOG LIGHTS SCHEMATICS

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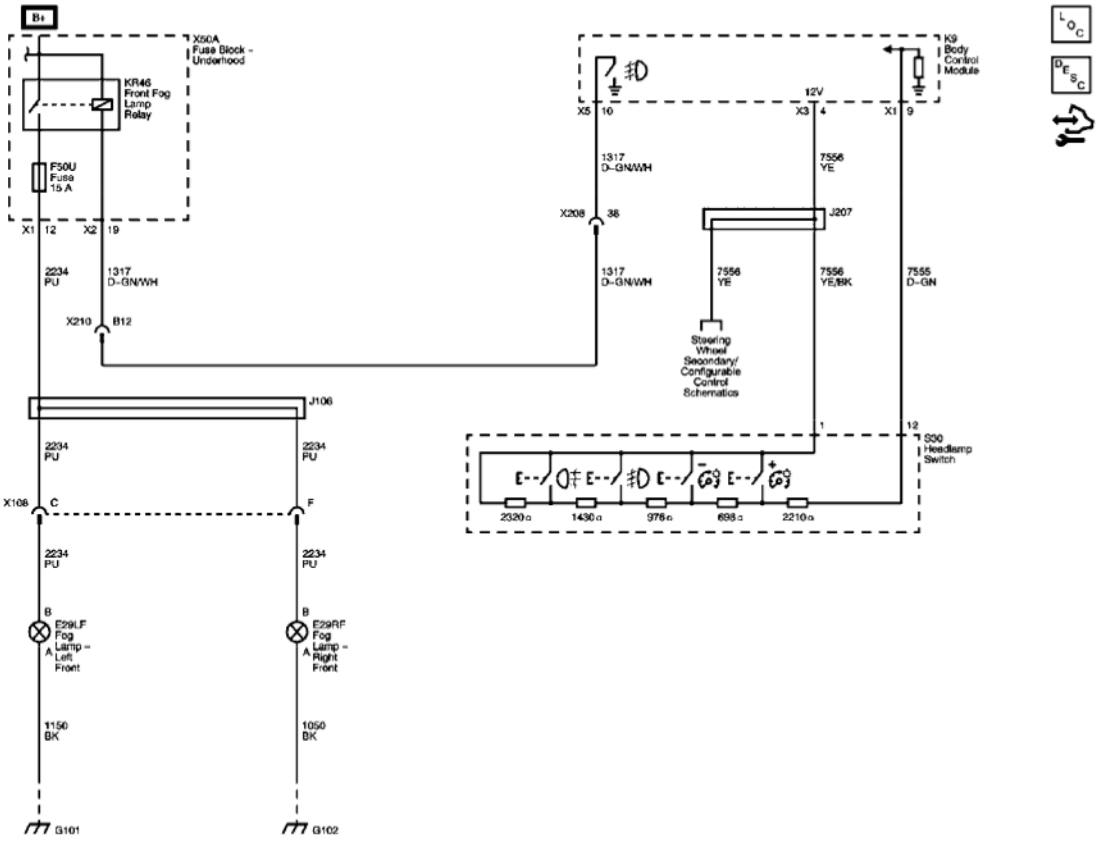


Fig. 4: Fog Lamps (T3U)
Courtesy of GENERAL MOTORS CORP.

EXTERIOR LIGHTS SCHEMATICS

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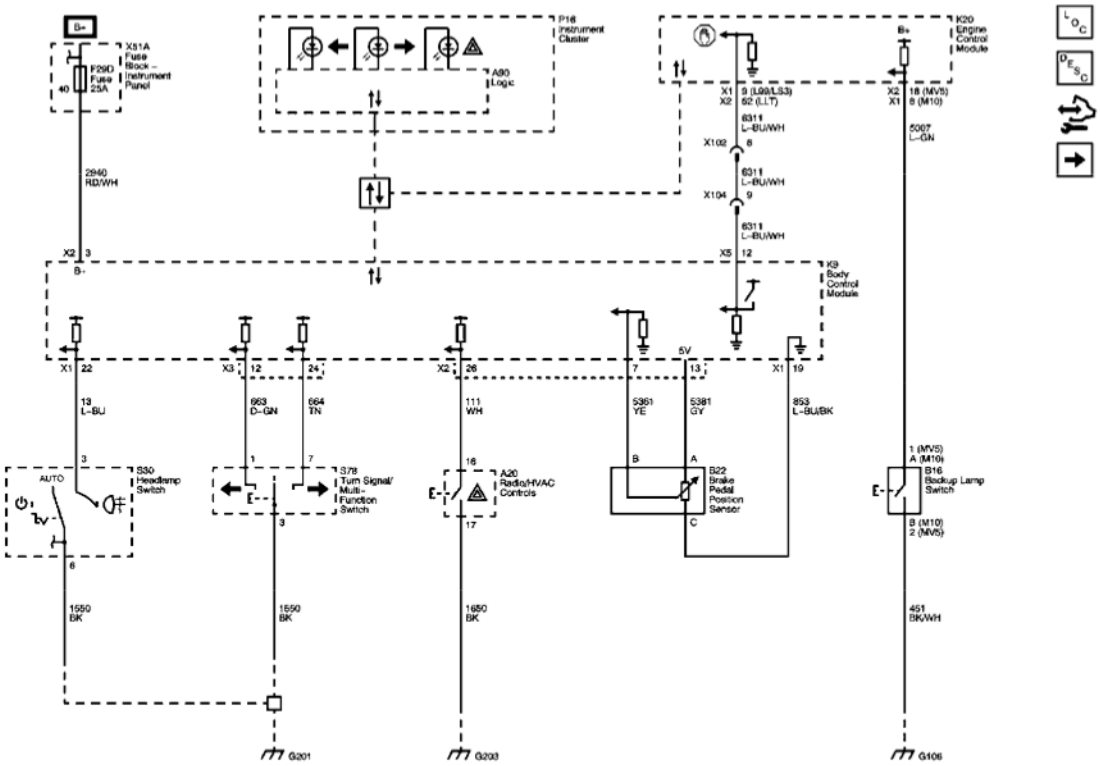


Fig. 5: Exterior Lamps Controls
Courtesy of GENERAL MOTORS CORP.

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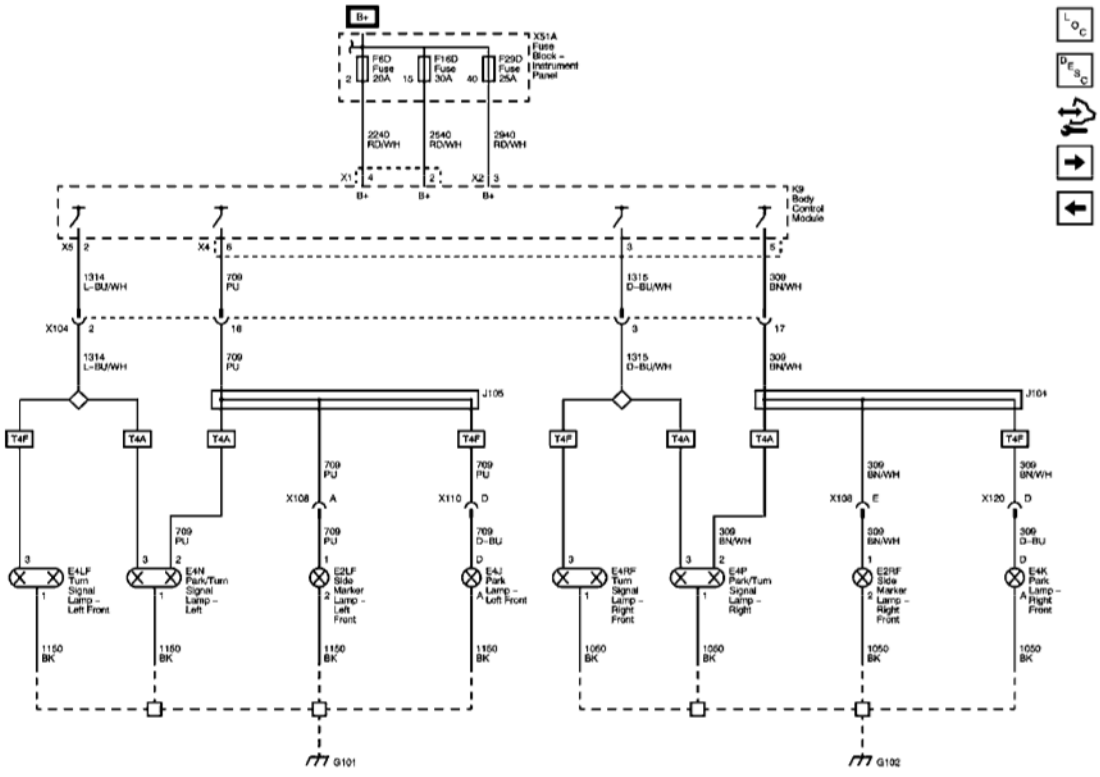


Fig. 6: Park and Turn Signal Lamps
Courtesy of GENERAL MOTORS CORP.

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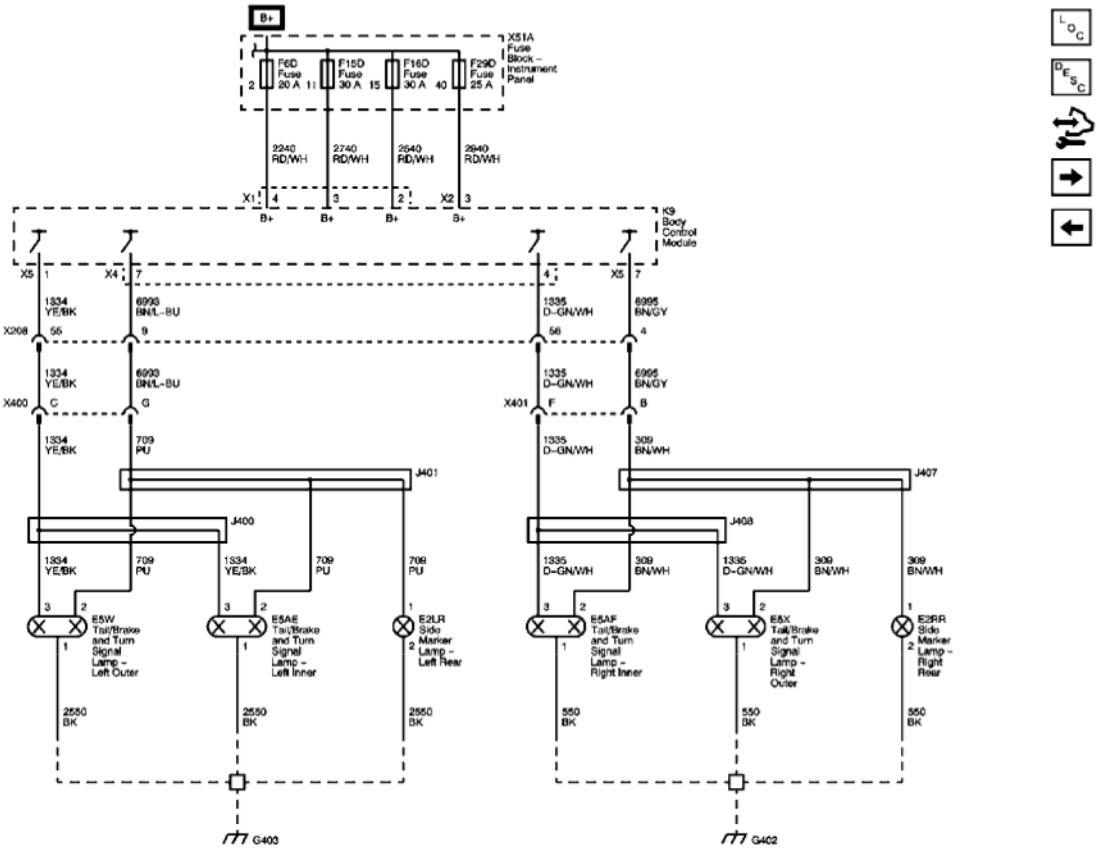


Fig. 7: Tail/Stop and Turn Signal Lamps
Courtesy of GENERAL MOTORS CORP.

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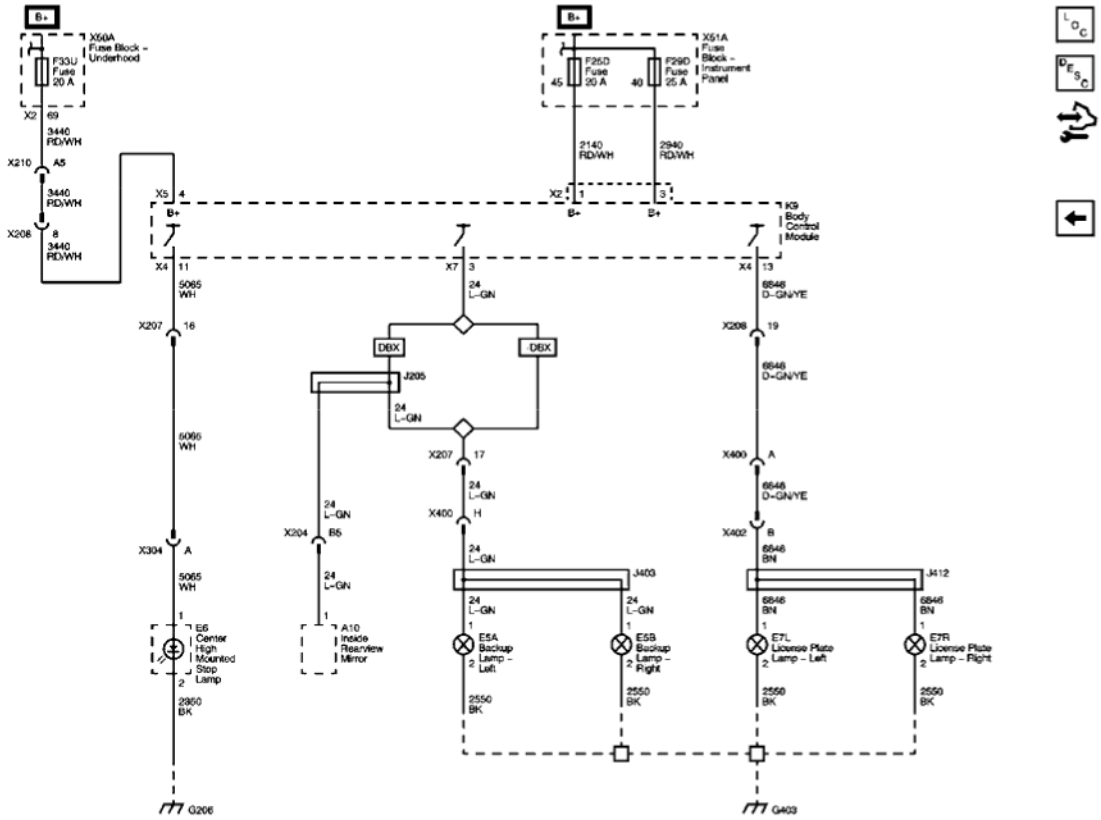


Fig. 8: Backup, Center High Mounted Stop Lamps (CHMSL) and License Lamps
Courtesy of GENERAL MOTORS CORP.

INTERIOR LIGHTS SCHEMATICS

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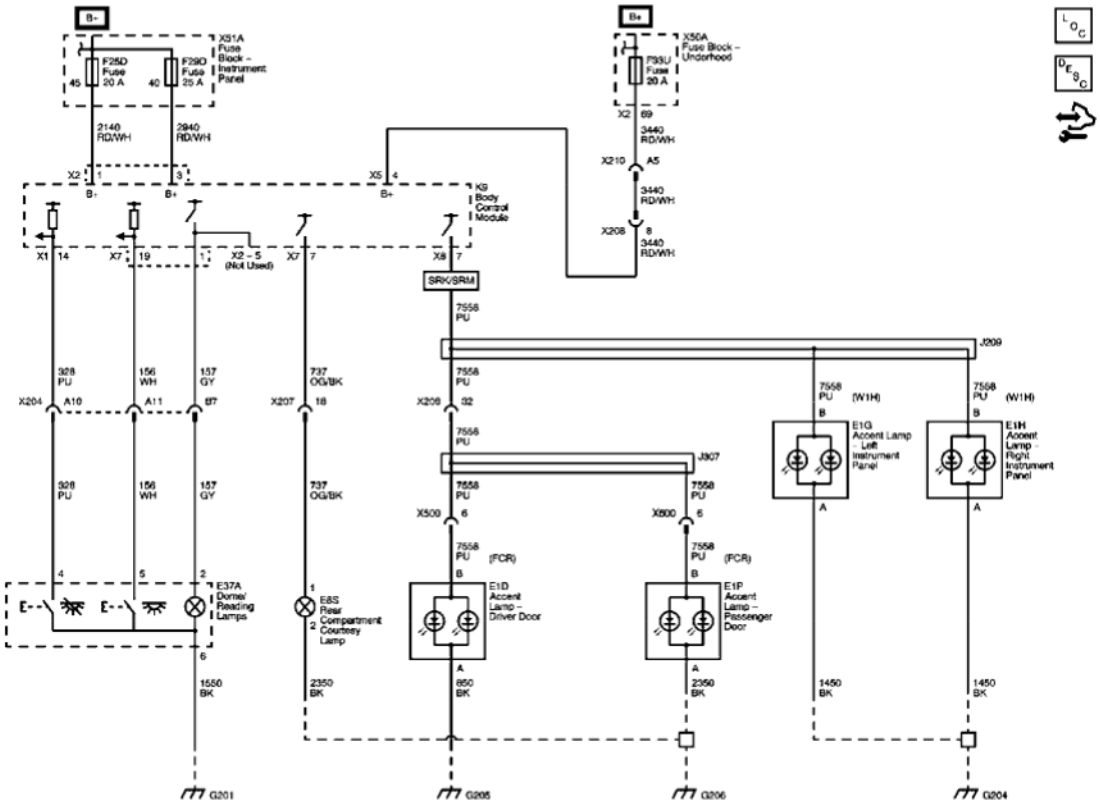


Fig. 9: Interior Lights
Courtesy of GENERAL MOTORS CORP.

INTERIOR LIGHTS DIMMING SCHEMATICS

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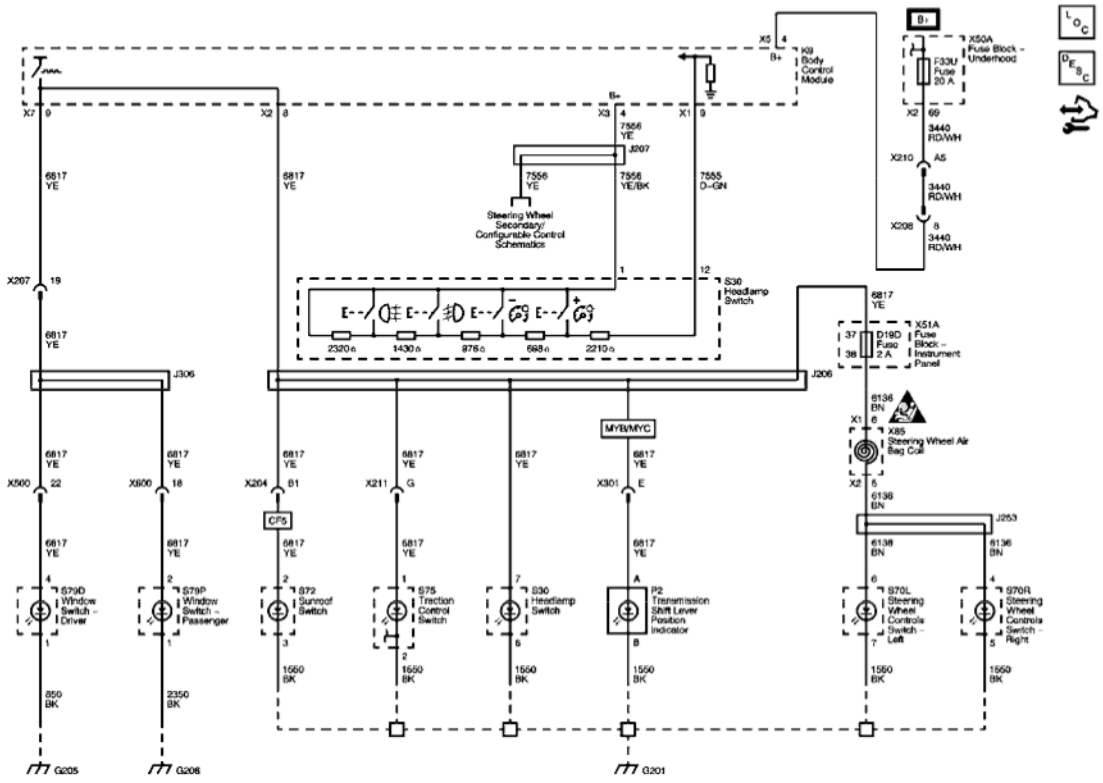


Fig. 10: Interior Lamps Dimming
Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
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
DTC B2545	B2545 01: Backup Lamps Control Circuit Short to Battery B2545 02: Backup Lamps Control Circuit Short to Ground B2545 04: Backup Lamps Control Circuit Open
DTC B255D	B255D 02: Passenger Compartment Lamp Control 2 Circuit Short to Ground
DTC B2560	B2560 01: Cargo Lamp Control Circuit Short to Battery B2560 02: Cargo Lamp Control Circuit Short to Ground B2560 04: Cargo Lamp Control Circuit Open
DTC B2575 or B2699	B2575 01: Headlamps Control Circuit Short to Battery B2575 02: Headlamps Control Circuit Short to Ground B2575 04: Headlamps Control Circuit Open

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	B2699 01: Right Headlamp Control Circuit Short to Battery B2699 02: Right Headlamp Control Circuit Short to Ground B2699 04: Right Headlamp Control Circuit Open
DTC B257A	B257A 00: Headlamp Switch Input Signals Mismatch
DTC B257B	B257B 03: Lighting Control Switch Signal Low Voltage B257B 07: Lighting Control Switch Signal High Voltage
DTC B2580	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
DTC B2585 or B3867	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 01: Right Park Lamps Control Circuit Short to Battery B3867 02: Right Park Lamps Control Circuit Short to Ground B3867 04: Right Park Lamps Control Circuit Open
DTC B258A	B258A 01: Low Beam Control Circuit Short to Battery B258A 02: Low Beam Control Circuit Short to Ground B258A 04: Low Beam Control Circuit Open
DTC B2600 or B2605	B2600 01: Left Daytime Running Lamps Control Circuit short to Battery B2600 02: Left Daytime Running Lamps Control Circuit Short to Ground B2600 04: Left Daytime Running Lamps Control Circuit Open B2605 01: Right Daytime Running Lamps Control Circuit short to Battery B2605 02: Right Daytime Running Lamps Control Circuit Short to Ground B2605 04: Right Daytime Running Lamps Control Circuit Open
DTC B2610	B2610 02: Passenger Compartment Dimming 1 Circuit Short to Ground
DTC B2615	B2615 02: Passenger Compartment Dimming 2 Circuit Short to Ground
DTC B2645	B2645 03: Ambient Light Sensor Circuit Voltage Below Threshold B2645 07: Ambient Light Sensor Circuit Voltage Above Threshold
DTC B2652	B2652 02: Passenger Compartment Dimming 3 Circuit Short to Ground
DTC B3596	B3596 00: Hazard Lamps Request Circuit
DTC B3650	B3650 08: High Beam Request Signal Circuit Signal Invalid
DTC B3806	B3806 00: High Beam and Headlamp Flash Select Circuit
DTC B3881 or B3882	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
DTC B3883	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
DTC B3884	B3884 02: Center High Mounted Brake Lamp Circuit Short to Ground

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DTC B3948 or B3949	B3948 01: Left Front Turn Signal Circuit Short to Battery B3948 02: Left Front Turn Signal Circuit Short to Ground B3948 04: Left Front Turn Signal Circuit Open B3949 01: Right Front Turn Signal Circuit Short to Battery B3949 02: Right Front Turn Signal Circuit Short to Ground B3949 04: Right Front Turn Signal Circuit Open
DTC B3950 or B3951	B3950 01: Left Rear Turn Signal Circuit Short to Battery B3950 02: Left Rear Turn Signal Circuit Short to Ground B3950 04: Left Rear Turn Signal Circuit Open B3951 01: Right Rear Turn Signal Circuit Short to Battery B3951 02: Right Rear Turn Signal Circuit Short to Ground B3951 04: Right Rear Turn Signal Circuit Open
DTC C0277 or C0890	C0277 06: Brake Pedal Position Sensor Circuit Low Voltage/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 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
DTC C0297	C0297 02: Brake Applied Output Circuit Short to Ground

DTC B2530

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 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

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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 Switch Signal	B257B 03	B257B 03	B257B 07	-
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.

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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 ON and OFF with a scan tool. The front fog lamps should turn ON and OFF when changing 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 B+ and the control circuit terminal 19.
3. Ignition ON, command the Front Fog 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 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.

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- **Accessory Wiring Junction Block Retainer 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 Control Circuit Short to Battery

DTC B2545 02

Backup Lamps Control Circuit Short to Ground

DTC B2545 04

Backup Lamps Control 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

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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 which 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 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 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

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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 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. Ignition ON, engine running, command the Backup Lamps 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 E5 backup lamp.

Repair Procedures

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

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

DTC B255D

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.

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- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B255D 02

Passenger Compartment Lamp Control 2 Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Interior Backlighting Control	B255D 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, which is part of the headlamp 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.

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

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- **Interior Lights Schematics**
- **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, command the Interior Accent Lighting 2 ON and OFF with a scan tool. The interior accent lighting should turn ON and OFF when changing between the commanded 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 components 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 Control 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

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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.

- Refer to the appropriate replacement procedure for the component causing the condition.
- **Control Module References** for BCM replacement, setup, and programming

DTC B2560

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 B2560 01

Cargo Lamp Control Circuit Short to Battery

DTC B2560 02

Cargo Lamp Control Circuit Short to Ground

DTC B2560 04

Cargo Lamp Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Courtesy Lamps Switch On Signal	B2615 00	B2615 00	B2615 00	-
Courtesy Lamp Defeat Signal	4	4	4	-
Courtesy Lamps Switch Ground	-	1	-	-
Rear Compartment Courtesy Lamp Control	B2560 02	B2560 04	B2560 01	-
Rear Compartment Courtesy Lamp Ground	-	3	-	-

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Accent Lamp Control	1	1	1	-
Accent Lamp Ground	-	1	-	-
Dome Lamp Ground	-	2	-	-
1. Courtesy Lamps Malfunction 2. Dome Lamp Malfunction 3. Rear Compartment Courtesy Lamp Malfunction 4. Dome Lamp Defeat Switch Malfunction				

Circuit/System Description

The cargo lamp is controlled by the body control module (BCM). When the trunk is opened, the BCM receives a door ajar signal from the trunk latch assembly indicating the trunk is open. The BCM responds by applying voltage to the rear compartment courtesy lamp control circuit illuminating the rear compartment courtesy lamp. The rear compartment courtesy lamp is permanently grounded.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Trunk OPEN.

Conditions for Setting the DTC

B2560 01

The BCM detects a short to voltage in the cargo lamp control circuit.

B2560 02

The BCM detects a short to ground in the cargo lamp control circuit.

B2560 04

The BCM detects an open in the cargo lamp control circuit.

Actions Taken When the DTC Sets

The BCM will disable the rear compartment courtesy lamp control circuit.

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

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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 Testing

1. Ignition OFF, disconnect the harness connector at the E8S rear compartment courtesy lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5.0 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. Ignition ON, command the Trunk 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, replace the E8S rear compartment courtesy lamp.

Repair Procedures

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

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

DTC B2575 OR B2699

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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 01

Headlamps Control Circuit Short to Battery

DTC B2575 02

Headlamps Control Circuit Short to Ground

DTC B2575 04

Headlamps Control Circuit Open

DTC B2699 01

Right Headlamp Control Circuit Short to Battery

DTC B2699 02

Right Headlamp Control Circuit Short to Ground

DTC B2699 04

Right Headlamp 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	-	3	-	-
Park Lamp Switch ON Signal	4	B257A 00	4	-
Headlamp Switch Headlamps ON Signal	B257A 00	1	1	-
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	-

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Headlamp High Beam Relay Control	B2580 02	B2580 04	B2580 01	-
Headlamp Low Beam Relay Control (T4F)	B258A 02	B258A 04	B258A 01	-
Left Headlamp High Beam Control	2	2	2	-
Right Headlamp High Beam Control	2	2	2	-
Left Headlamp Low Beam Control (T4A)	B2575 02	B2575 01, B2575 04	B2575 01	-
Right Headlamp Low Beam Control (T4A)	B2699 02	B2699 01, B2699 04	B2699 01	-
Left Headlamp Ground	-	B2575 01, B2575 04	-	-
Right Headlamp Ground	-	B2699 01, B2699 04	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
1. Headlamp Switch Malfunction 2. Headlamps Malfunction - High Beam 3. Turn Signal/Multifunction Switch Malfunction 4. Park Lamp Switch Malfunction				

Circuit/System Description

With the headlamp switch in the ON position, the headlamp switch headlamp ON signal circuit is grounded through the headlamp and panel dimmer switch. The body control module (BCM) responds by applying a pulse width modulated (PWM) voltage to the left and right low beam headlamp control circuits illuminating the low beam headlamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

B2575 01

The BCM detects a short to voltage in the left headlamp low beam control circuit.

B2575 02

The BCM detects a short to ground in the left headlamp low beam control circuit.

B2575 04

The BCM detects an open in the left headlamp low beam control circuit.

B2699 01

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The BCM detects a short to voltage in the right headlamp low beam control circuit.

B2699 02

The BCM detects a short to ground in the right headlamp low beam control circuit.

B2699 04

The BCM detects an open in the right headlamp low beam control circuit.

Actions Taken When the DTC Sets

When DTC B2575 or B2699 is present, the associated low beam headlamp 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 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 T7 or E13 headlamp assembly.

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2. Ignition OFF, wait one minute, then test for less than 5 ohms between the ground circuit terminal listed below and ground:
    - T7 headlamps - terminal A
    - E13 headlamps - terminal 2
    - 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 Low Beam 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 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 T7 or E13 headlamp assembly.

Repair Procedures

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

- **Headlamp Replacement**
- **Headlamp Bulb Replacement (SS HID)** or **Headlamp Bulb Replacement (RS)**
- **Control Module References** for BCM 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 Mismatch

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				

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Ground	-	3	-	-
Park Lamp Switch ON Signal	4	B257A 00	4	-
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	-
Headlamp Low Beam Relay Control (T4F)	B258A 02	B258A 04	B258A 01	-
Left Headlamp High Beam Control	2	2	2	-
Right Headlamp High Beam Control	2	2	2	-
Left Headlamp Low Beam Control (T4A)	B2575 02	B2575 01, B2575 04	B2575 01	-
Right Headlamp Low Beam Control (T4A)	B2699 02	B2699 01, B2699 04	B2699 01	-
Left Headlamp Ground	-	B2575 01, B2575 04	-	-
Right Headlamp Ground	-	B2575 01, B2575 04	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
1. Headlamp Switch Malfunction 2. Headlamps Malfunction - High Beam 3. Turn Signal/Multifunction Switch Malfunction 4. Park Lamp 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

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- 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 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 S30 headlamp 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 3 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 3 and the ground circuit terminal 6.

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Verify the scan tool Park 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. Verify the scan tool Headlamps On Switch parameter is Inactive.
   - If not the specified value, test the signal circuit terminal 4 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 4 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 5 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 5 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 S30 headlamp switch.

Repair Procedures

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

- **Headlamp, Instrument Panel Lamp Dimmer, and Fog Lamp 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

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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 Switch Signal	B257B 03	B257B 03	B257B 07	-
Front Fog Lamp Relay Control	1	1	-	-
Front Fog Lamp Control	B2530 02	B2530 04	1	-
Fog Lamp - Left Front Ground	-	1	-	-
Fog Lamp - Right Front Ground	-	1	-	-
1. Front Fog Lamps 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 lamp 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 signal and a B+ voltage reference to the instrument panel lamp dimmer switch. When the instrument panel lamp dimmer switch is placed in the desired position, the dimmed voltage setting is applied from the instrument panel dimmer switch through the instrument panel lamp dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies the dimmed voltage to the instrument panel lamp 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.
- Park lamps ON.

Conditions for Setting the DTC

B257B 03

The BCM detects a short to ground in the instrument panel dimmer switch signal circuit.

B257B 07

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

Action Taken When the DTC Sets

The BCM will not DIM or illuminate any instrument panel lamps supplied by the instrument panel lamps dimmer switch signal circuit.

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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 Testing

1. Ignition OFF, disconnect the harness connector at the S30 headlamp switch.
2. Ignition ON, test for B+ between the B+ reference circuit terminal 1 and ground.
    - If less than the specified range, test the B+ 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 B+ reference circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
3. Verify the scan tool Incadescent Dimming Duty Cycle Command parameter is greater than 45%.
    - If less than the specified range, test the signal circuit terminal 12 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 12 and the B+ reference circuit terminal 1. Verify the scan tool Incadescent Dimming Duty Cycle Command parameter is less than 8%
    - If greater 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.

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5. If all circuits test normal, test or replace the S30 headlamp switch.

Repair Procedures

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

- **Headlamp, Instrument Panel Lamp Dimmer, and Fog Lamp 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	-	3	-	-
Park Lamp Switch ON Signal	4	B257A 00	4	-
Headlamp Switch Headlamps ON Signal	B257A 00	1	1	-
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	-

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Headlamp High Beam Relay Control	B2580 02	B2580 04	B2580 01	-
Headlamp Low Beam Relay Control (T4F)	B258A 02	B258A 04	B258A 01	-
Left Headlamp High Beam Control	2	2	2	-
Right Headlamp High Beam Control	2	2	2	-
Left Headlamp Low Beam Control (T4A)	B2575 02	B2575 01, B2575 04	B2575 01	-
Right Headlamp Low Beam Control (T4A)	B2699 02	B2699 01, B2699 04	B2699 01	-
Left Headlamp Ground	-	B2575 01, B2575 04	-	-
Right Headlamp Ground	-	B2575 01, B2575 04	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
1. Headlamp Switch Malfunction 2. Headlamps Malfunction - High Beam 3. Turn Signal/Multifunction Switch Malfunction 4. Park Lamp 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 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 in the headlamp high beam relay control circuit.

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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 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 X2 harness connector at the X50A underhood fuse block.
2. Connect a test lamp between the control circuit terminal 31 and the B+.
3. Ignition ON, 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 open/high resistance. If the circuit tests normal, replace the K9 BCM.
4. If all circuits test normal, test or replace the X50A underhood fuse block.

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Repair Procedures

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

- **Accessory Wiring Junction Block Retainer Replacement**
- **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 01

Right Park Lamps Control Circuit Short to Battery

DTC B3867 02

Right Park Lamps Control Circuit Short to Ground

DTC B3867 04

Right Park Lamps Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Lamp Switch ON Signal	-	B257A 00	2	-

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Left Front Park Lamps Control	B2585 02	B2585 04	B2585 01	-
Left Front Park Lamps Ground	-	1	-	-
Right Front Park Lamps Control	B3867 02	B3867 04	B3867 01	-
Right Front Park Lamps Ground	-	1	-	-
Left Rear Park Lamps Control	B3881 02	B3881 04	B3881 01	-
Right Rear Park Lamps Control	B3882 02	B3882 04	B3882 01	-
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	B3883 04	B3883 01	-
License Lamp Ground	-	3	-	-
Headlamp Switch Ground	-	2	-	-
1. Park, License, and/or Tail Lamps Malfunction 2. Park Lamp Switch Malfunction 3. 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.

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B3867 01

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

B3867 02

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

B3867 04

The BCM detects an open 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

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1. Ignition OFF, disconnect the harness connector at the appropriate park lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5 ohms between the ground circuit terminal listed below and ground:
    - E4 Front Turn Signal Lamp - Terminal 1
    - E4 Park/Turn Signal Lamp - Terminal 1
    - E2 Side Marker Lamp - Terminal 2
    - E4 Front Park Lamp - Terminal A
    - E5 Tail/Brake and Turn Signal Lamp - Terminal 1
    - 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.
    - E4 Front Turn Signal Lamp - Terminal 3
    - E4 Park/Turn Signal Lamp - Terminal 1
    - E2 Side Marker Lamp - Terminal 1
    - E4 Front Park Lamp - Terminal D
    - E5 Tail/Brake and Turn Signal Lamp - Terminal 2
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 park lamp.

Repair Procedures

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

- **Parking and Turn Signal Lamp Bulb Replacement**
- **Front Side Marker Lamp Replacement**
- **Front Side Marker Lamp Bulb Replacement**
- **Rear Side Marker Lamp Replacement**
- **Rear Side Marker Lamp Bulb Replacement**
- **Tail Lamp Replacement - Inboard**
- **Tail Lamp Replacement - Outboard**
- **Tail Lamp Bulb Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B258A

Diagnostic Instructions

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- 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 B258A 01

Low Beam Control Circuit Short to Battery

DTC B258A 02

Low Beam Control Circuit Short to Ground

DTC B258A 04

Low 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	-	3	-	-
Park Lamp Switch ON Signal	4	B257A 00	4	-
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	-
Headlamp Low Beam Relay Control (T4F)	B258A 02	B258A 04	B258A 01	-
Left Headlamp High Beam Control	2	2	2	-
Right Headlamp High Beam Control	2	2	2	-
Left Headlamp Low Beam Control (T4A)	B2575 02	B2575 01, B2575 04	B2575 01	-
Right Headlamp Low Beam Control (T4A)	B2699 02	B2699 01, B2699 04	B2699 01	-
Left Headlamp Ground	-	B2575 01, B2575 04	-	-
Right Headlamp Ground	-	B2575 01,	-	-

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		B2575 04		
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
1. Headlamp Switch Malfunction 2. Headlamps Malfunction - High Beam 3. Turn Signal/Multifunction Switch Malfunction 4. Park Lamp Switch Malfunction				

Circuit/System Description

When the headlamp switch is placed in the headlamp position, ground is applied to the body control module (BCM) through the headlamp low beam signal circuit. The BCM responds to this input by applying ground to the headlamp low beam relay control circuit which energizes the low beam relay. With the low beam relay energized, the switch contacts close allowing battery voltage to flow through the left and right HID fuses to the low beam headlamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

B258A 01

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

B258A 02

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

B258A 04

The BCM detects an open in the headlamp low beam relay control circuit.

Actions Taken When the DTC Sets

The low beam headlamps 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

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Headlights 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 KR49 headlamp low beam relay.
2. Connect a test lamp between the control circuit terminal 85 and the B+ circuit terminal 86.
3. Command the Headlamp Low 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 open/high resistance. If the circuit tests normal, replace the K9 BCM.
4. If all circuits test normal, test or replace the KR49 headlamp low 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)**
- **Control Module References** for BCM replacement, setup, and programming

DTC B2600 OR B2605

Diagnostic Instructions

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- 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 B2600 01

Left Daytime Running Lamps Control Circuit short to Battery

DTC B2600 02

Left Daytime Running Lamps Control Circuit Short to Ground

DTC B2600 04

Left Daytime Running Lamps Control Circuit Open

DTC B2605 01

Right Daytime Running Lamps Control Circuit short to Battery

DTC B2605 02

Right Daytime Running Lamps Control Circuit Short to Ground

DTC B2605 04

Right Daytime Running Lamps Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ambient Light Sensor Signal	B2645 03	B2645 07	B2645 07	-
Ambient Light Sensor Ground	-	B2645 07	2	-
Daytime Running Lamp Control - Left (T4F)	B2600 02	B2600 04	B2600 01	-
Daytime Running Lamp Ground - Left (T4F)	-	2	-	-
Daytime Running Lamp Control - Right (T4F)	B2605 02	B2605 04	B2605 01	-
Daytime Running Lamp Ground - Right (T4F)	-	2	-	-
Left Low Beam Headlamp Control	B2575 02	B2575 04	B2575 01	-

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(T4A)				
Left Front Headlamp Low Beam Ground	-	1	-	-
Right Low Beam Headlamp Control (T4A)	B2699 02	B2699 04	B2699 01	-
Right Front Headlamp Low Beam Ground	-	1	-	-
1. Headlamps Malfunction 2. Daytime Running Lamps 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 0.2 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor which is permanently grounded. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lights (DRL) or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions, the BCM will command the DRLs ON by applying a pulse width modulated (PWM) voltage to the left and right DRL control circuits illuminating the DRLs. Any function or condition that turns on the headlamps will cancel DRL operation.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Headlamp switch in AUTO position.

Conditions for Setting the DTC

B2600 01

The BCM detects a short to voltage in the left DRL control circuit.

B2600 02

The BCM detects a short to ground in the left DRL control circuit.

B2600 04

The BCM detects an open in the left DRL control circuit.

B2605 01

The BCM detects a short to voltage in the left DRL control circuit.

B2605 02

The BCM detects a short to ground in the left DRL control circuit.

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B2605 04

The BCM detects an open in the left DRL control circuit.

Actions Taken When the DTC Sets

The BCM will disable the appropriate DRL control circuit.

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 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 E4 daytime running lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5.0 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 Dedicated Daytime Running Lamp Command ON and OFF with a scan tool. The test lamp

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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 daytime running lamp.

Repair Procedures

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

- **Daytime Running Lamp Bulb Replacement (RS)** or **Daytime Running Lamp Bulb Replacement (SS)**
- **Daytime Running Lamp Replacement (RS)**
- **Control Module References** for BCM replacement, setup, and programming

DTC B2610

Diagnostic Instructions

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

DTC Descriptor

DTC B2610 02

Passenger Compartment Dimming 1 Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
LED Backlight Dimming Control Terminal 8 X2	B2610 02	1	1	-
LED Backlight Dimming Control Terminal 9 X7	B2610 02	1	1	-
Automatic Transmission Shift Lever Position Indicator Ground	-	1	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
Steering Wheel Control Switch - Left Ground	-	1	-	-
Steering Wheel Control Switch -				

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Right Ground	-	1	-	-
Sunroof Switch Ground	-	1	-	-
Traction Control Switch Ground	-	1	-	-
Window Switch Driver Ground	-	1	-	-
Window Switch Passenger Ground	-	1	-	-
1. Interior Backlighting Malfunction				

Circuit/System Description

The up/down dimmer controls located on the headlamp and panel dimmer switch is used to increase and decrease the brightness of the interior backlighting components. Each dimmer control 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) supplies each dimmer control switch with a signal circuit. When either the up or down dimmer control switch is placed in the desired position, the dimmed voltage setting is applied from the appropriate dimmer control switch through the dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies a pulse width modulated (PWM) voltage to the LED backlight dimming control circuits and the interior backlighting components dim to the requested level.

Conditions for Running the DTC

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

Conditions for Setting the DTC

The BCM detects a short to ground in the LED backlight dimming control circuits.

Action Taken When the DTC Sets

The BCM will not dim or illuminate any LED backlighting supplied by the backlight dimming 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

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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

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

- **Accent lighting components the vehicle is equipped with.**
- **Component locations on the accent lighting control circuit**
- **Each component's control and ground circuit terminals**

1. Ignition OFF, disconnect the harness connector at any component with inoperative accent lighting.
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 Interior Accent Lighting 1 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 accent lighting.

Repair Procedures

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

- Refer to the appropriate replacement procedure for the component causing the condition.
- **Control Module References** for BCM replacement, setup, and programming

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DTC B2615

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 B2615 02

Passenger Compartment Dimming 2 Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Dome/Reading Lamps Control	B2615 02	1	1	-
Dome/Reading Lamps Ground	1	1	1	1
1. Courtesy Lamps Malfunction				

Circuit/System Description

The body control module (BCM) applies battery voltage to the dome/reading lamps through the dome/reading lamp control circuit. When any door is opened, the jam switch contacts close and the BCM receives a door-ajar input. If the BCM receives a door lock or unlock input or a rear hatch open input, the BCM will activate the dome/reading lamp control circuit, providing battery voltage to dome/reading lamps. In the event that the dome/reading lamp were to remain illuminated for more than 20 minutes with the ignition switch in the OFF position, the BCM will deactivate the dome/reading lamp control circuit to prevent a total battery discharge condition.

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 in the dome/reading lamp control circuit.

Action Taken When the DTC Sets

The BCM will not illuminate the dome/reading lamp control circuit.

Conditions for Clearing the DTC

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

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

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 Testing

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

- **Accent lighting components the vehicle is equipped with.**
- **Component locations on the accent lighting control circuit**
- **Each component's control and ground circuit terminals**

1. Ignition OFF, disconnect the harness connector at any component with inoperative accent lighting.
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 Interior Accent Lighting 1 ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.

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- 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 accent lighting.

Repair Procedures

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

- Refer to the appropriate replacement procedure for the component causing the condition.
- **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 Voltage Below Threshold

DTC B2645 07

Ambient Light Sensor Circuit Voltage Above Threshold

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ambient Light Sensor Signal	B2645 03	B2645 07	B2645 07	-
Ambient Light Sensor Ground	-	B2645 07	2	-
Daytime Running Lamp Control - Left (T4F)	B2600 02	B2600 04	B2600 01	-
Daytime Running Lamp Ground - Left (T4F)	-	2	-	-
Daytime Running Lamp Control - Right (T4F)	B2605 02	B2605 04	B2605 01	-
Daytime Running Lamp Ground - Right (T4F)	-	2	-	-

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Left Front Low Beam Headlamp Control (T4A)	B2575 02	B2575 04	B2575 01	-
Left Front Headlamp Low Beam Ground	-	1	-	-
Right Front Low Beam Headlamp Control (T4A)	B2699 02	B2699 04	B2699 01	-
Right Front Headlamp Low Beam Ground	-	1	-	-
1. Headlamps Malfunction 2. Daytime Running Lamps 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 0.2 and 4.9 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 (DRL) or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the DRLs ON. During low light conditions the BCM will command the DRLs ON. Any function or condition that turns on the headlamps will cancel DRL operation.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B2645 03

The BCM detects a short to ground in the ambient light sensor signal circuit.

B2645 07

The BCM detects a short to voltage or an open/high resistance in the ambient light sensor signal circuit.

Actions Taken When the DTC Sets

- Automatic lamp control is inoperative.
- The BCM defaults to low light status and commands the low beam headlamps ON.

Conditions for Clearing the DTC

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

Reference Information

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Schematic Reference

Headlights 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 B10 ambient light sensor.
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 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 or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, replace the B10 ambient light 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

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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
Accent Lamp Control	B2652 02	1	1	-
Accent Lamp - Driver Door Ground	-	1	-	-
Accent Lamp - Passenger Door Ground	-	1	-	-
Accent Lamp - Left Instrument Panel Ground	-	1	-	-
Accent Lamp - Right Instrument Panel Ground	-	1	-	-
1. Courtesy Lamps Malfunction				

Circuit/System Description

The body control module (BCM) applies a pulse width modulated (PWM) voltage to the interior accent lamps through the accent lamps control circuit. When any door is opened, the jam switch contacts close and the BCM receives a door-ajar input. If the BCM receives a door lock or unlock input or a rear hatch open input, the BCM will activate the accent lamps control circuit, providing battery voltage to accent lamps.

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 in the accent lamps control circuit.

Action Taken When the DTC Sets

The BCM will not illuminate the accent lamps.

Conditions for Clearing the DTC

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- 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 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

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

- **Accent lighting components the vehicle is equipped with.**
- **Component locations on the accent lighting control circuit**
- **Each component's control and ground circuit terminals**

1. Ignition OFF, disconnect the harness connector at any component with inoperative accent lighting.
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 Interior Accent Lighting 1 ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.

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- 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 accent lighting.

Repair Procedures

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

- Refer to the appropriate replacement procedure for the component causing the condition.
- **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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hazard Switch Signal	1	1	B3596 00	-
Hazard Switch Ground	-	1	-	-
1. Hazard Lamps Malfunction				

Circuit/System Description

The hazard flashers may be activated in any power mode. When the hazard switch signal circuit is momentarily grounded when the hazard switch is pressed. The BCM supplies battery voltage to all four 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

- Battery voltage must be between 9-16 V.

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- Hazard lamps ON.

Conditions for Setting the DTC

The BCM detects a short to voltage in the hazard switch signal circuit.

Actions Taken When the DTC Sets

The hazard lamps will not operate when the hazard switch is active.

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 A20 radio/HVAC controls.
2. Ignition OFF, 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. Ignition ON, verify the scan tool Hazard Lamps Switch parameter is Inactive.

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- 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 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, 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 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 Signal Invalid

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	-	3	-	-
Park Lamp Switch ON Signal	4	B257A 00	4	-
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	-
Headlamp Low Beam Relay Control				

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(T4F)	B258A 02	B258A 04	B258A 01	-
Left Headlamp High Beam Control	2	2	2	-
Right Headlamp High Beam Control	2	2	2	-
Left Headlamp Low Beam Control (T4A)	B2575 02	B2575 01, B2575 04	B2575 01	-
Right Headlamp Low Beam Control (T4A)	B2699 02	B2699 01, B2699 04	B2699 01	-
Left Headlamp Ground	-	B2575 01, B2575 04	-	-
Right Headlamp Ground	-	B2575 01, B2575 04	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
1. Headlamp Switch Malfunction 2. Headlamps Malfunction - High Beam 3. Turn Signal/Multifunction Switch Malfunction 4. Park Lamp 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 HI 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

The BCM detects an invalid signal on the headlamp high beam signal circuit.

Actions Taken When the DTC Sets

The high beam headlamps 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

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Schematic Reference

Headlights Schematics

Connector End View Reference

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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 and the ground circuit terminal 3 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 2 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 2 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 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 B3806

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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

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	-	3	-	-
Park Lamp Switch ON Signal	4	B257A 00	4	-
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	-
Headlamp Low Beam Relay Control (T4F)	B258A 02	B258A 04	B258A 01	-
Left Headlamp High Beam Control	2	2	2	-
Right Headlamp High Beam Control	2	2	2	-
Left Headlamp Low Beam Control (T4A)	B2575 02	B2575 01, B2575 04	B2575 01	-
Right Headlamp Low Beam Control (T4A)	B2699 02	B2699 01, B2699 04	B2699 01	-
Left Headlamp Ground	-	B2575 01, B2575 04	-	-
Right Headlamp Ground	-	B2575 01, B2575 04	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
1. Headlamp Switch Malfunction 2. Headlamps Malfunction - High Beam 3. Turn Signal/Multifunction Switch Malfunction 4. Park Lamp Switch Malfunction				

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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

The BCM detects a short to ground on the Flash to Pass switch signal circuit.

Actions Taken When the DTC Sets

When DTC B3806 is present, 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 Schematics

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Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

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

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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 3 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 Flash Switch parameter is Inactive.
    - If not the specified value, test the signal circuit terminal 4 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 4 and ground. Verify the scan tool Flash to Pass Switch parameter is Active.
    - If not the specified value, test the signal circuit for a short to voltage or 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

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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

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

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Conditions for Running the DTC

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

Conditions for Setting the DTC

B3881 01

The BCM detects a short to voltage in the left rear tail lamp control circuit.

B3881 02

The BCM detects a short to ground in the left rear tail lamp control circuit.

B3881 04

The BCM detects an open in the left rear tail lamp control circuit.

B3882 01

The BCM detects a short to voltage in the right rear tail lamp control circuit.

B3882 02

The BCM detects a short to ground in the right rear tail lamp control circuit.

B3882 04

The BCM detects an open in the right rear tail lamp control circuit.

Actions Taken When the DTC Sets

The appropriate tail lamp 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

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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 tail lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5 ohms between the ground circuit terminal listed below and ground:
    - E5 Tail/Stop and Turn Signal Lamp - terminal 1
    - E2 Side Marker Lamp-Rear - terminal 2
    - 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:
    - E5 Tail/Stop and Turn Signal Lamp - terminal 2
    - E2 Side Marker Lamp-Rear - terminal 1
4. Ignition ON, command the Rear 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 tail lamp.

Repair Procedures

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

- **Tail Lamp Replacement - Inboard**
- **Tail Lamp Replacement - Outboard**
- **Rear Side Marker Lamp Replacement**

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- **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 Lamp Control	B3883 02	B3883 04	B3883 01	-
License Lamp Ground	-	1	-	-
1. Park, License, and/or Tail 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

B3883 01

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The BCM detects a short to voltage in the license lamp control circuit.

B3883 02

The BCM detects a short to ground in the license lamp control circuit.

B3883 04

The BCM detects an open in the license lamp control circuit.

Actions Taken When the DTC Sets

The BCM will not illuminate the license lamps.

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 Testing

1. Ignition OFF, disconnect the harness connector at the appropriate E7 license plate lamp.

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2. Ignition OFF, exterior lamps OFF, 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. Ignition ON, command the License Plate Lamps 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 E7 license plate lamp.

Repair Procedures

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

- **Rear License Plate Lamp Replacement**
- **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
Brake Pedal Position Sensor 5 V Reference	C0161 00, C0277 06, C0890 03, U0418 00	C0161 00, C0277 06, U0418 00	C0161 00, C0890 07, U0418 00	-
Brake Pedal Position Sensor Signal	C0161 00, C0277 06, U0418 00	C0161 00, C0277 06, U0418 00	C0161 00, C0277 07, U0418 00	C0277 09
Brake Pedal Position Sensor Low				

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Reference	-	1	1	-
Left Rear Tail/Stop and Turn Signal Lamp Control	B3950 02	B3950 04	B3950 01	-
Left Rear Tail/Stop and Turn Signal Lamp Ground	-	1	-	-
Right Rear Tail/Stop and Turn Signal Lamp Control	B3951 02	B3951 04	B3951 01	-
Right Rear Tail/Stop and Turn Signal Lamp Ground	-	1	-	-
Center High Mounted Stop Lamp Control	B3884 02	B3884 02	2	-
Center High Mounted Stop Lamp Ground	-	2	-	-
1. Stop Lamps Malfunction 2. Center High Mounted Stop Lamp Malfunction				

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 right and left stop lamp control circuits, transmission control module (TCM), engine control module (ECM), and 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

B3884 02

The BCM detects a short to ground in the center high mounted stop lamp control circuit.

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

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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 E6 center high mounted stop lamp.
2. Ignition OFF, test for less than 5.0 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 the ground circuit terminal 2.
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**
- **Control Module References** for BCM replacement, setup, and programming

DTC B3948 OR B3949

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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 01

Left Front Turn Signal Circuit Short to Battery

DTC B3948 02

Left Front Turn Signal Circuit Short to Ground

DTC B3948 04

Left Front Turn Signal Circuit Open

DTC B3949 01

Right Front Turn Signal Circuit Short to Battery

DTC B3949 02

Right Front Turn Signal Circuit Short to Ground

DTC B3949 04

Right Front Turn Signal Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Turn Signal Switch Signal	1	1	2	-
Right Turn Signal Switch Signal	1	1	2	-
Turn Signal/Multifunction Switch Ground	-	1	-	-
Left Front Turn Signal Lamp Ground	B3948 02	B3948 04	B3948 01	-
Right Front Turn Signal Lamp Control	-	1	-	-
Right Front Turn Signal Lamp Ground	B3949 02	B3949 04	B3949 01	-
Left Rear Stop/Turn Signal Lamp				

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Control	-	1	-	-
Left Rear Stop/Tail/Turn Signal Lamp Ground	B3950 02	B3950 04	B3950 01	-
Left Rear Stop/Tail/Turn Signal Lamp Ground	-	1	-	-
Right Rear Stop/Turn Signal Lamp Control	B3951 02	B3951 04	B3951 01	-
Right Rear Stop/Tail/Turn Signal Lamp Ground	-	1	-	-
1. Turn Signal Lamps and/or Indicators Malfunction 2. Hazard Lamps Malfunction				

Circuit/System Description

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 body control module (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 control circuits.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B3948 01

The BCM detects a short to voltage in the Left Front turn signal control circuit.

B3948 02

The BCM detects a short to ground in the Left Front turn signal control circuit.

B3948 04

The BCM detects an open in the Left Front turn signal control circuit.

B3949 01

The BCM detects a short to voltage in the Right Front turn signal control circuit.

B3949 02

The BCM detects a short to ground in the Right Front turn signal control circuit.

B3949 04

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The BCM detects an open in the Right Front turn signal control circuit.

Actions Taken When the DTC Sets

B3948 01

The Left Front turn signal lamp will be ON at all times.

B3948 02

The Left Front turn signal lamp will not operate.

B3948 04

The Left Front turn signal lamp will be inoperative.

B3949 01

The Right Front turn signal lamp will be ON at all times.

B3949 02

The Right Front turn signal lamp will not operate.

B3949 04

The Right Front turn signal lamp will be inoperative.

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.

Diagnostic Aids

- Check the Left Front turn signal bulb. If the bulb is open, DTC B3948 04 will set as current only.
- Check the Right Front turn signal bulb. If the bulb is open, DTC B3949 04 will set as current only.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

Component Connector End Views

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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 E4 turn signal lamp.
2. Ignition OFF, exterior 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. Connect a test lamp between the control circuit terminal 3 and ground.
4. Command the 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 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 turn signal lamp.

Repair Procedures

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

- **Parking and Turn Signal Lamp Bulb Replacement**
- **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.

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DTC Descriptors

DTC B3950 01

Left Rear Turn Signal Circuit Short to Battery

DTC B3950 02

Left Rear Turn Signal Circuit Short to Ground

DTC B3950 04

Left Rear Turn Signal Circuit Open

DTC B3951 01

Right Rear Turn Signal Circuit Short to Battery

DTC B3951 02

Right Rear Turn Signal Circuit Short to Ground

DTC B3951 04

Right Rear Turn Signal Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Turn Signal Switch Signal	1	1	2	-
Right Turn Signal Switch Signal	1	1	2	-
Turn Signal/Multifunction Switch Ground	-	1	-	-
Left Front Turn Signal Lamp Ground	B3948 02	B3948 04	B3948 01	-
Right Front Turn Signal Lamp Control	-	1	-	-
Right Front Turn Signal Lamp Ground	B3949 02	B3949 04	B3949 01	-
Left Rear Stop/Turn Signal Lamp Control	-	1	-	-
Left Rear Stop/Tail/Turn Signal Lamp Ground	B3950 02	B3950 04	B3950 01	-
Left Rear Stop/Tail/Turn Signal Lamp Ground	-	1	-	-
Right Rear Stop/Turn Signal Lamp				

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Control	B3951 02	B3951 04	B3951 01	-
Right Rear Stop/Tail/Turn Signal Lamp Ground	-	1	-	-
1. Turn Signal Lamps and/or Indicators Malfunction 2. Hazard Lamps Malfunction				

Circuit/System Description

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 body control module (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 control circuits.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B3950 01

The BCM detects a short to voltage in the Left Rear turn signal control circuit.

B3950 02

The BCM detects a short to ground in the Left Rear turn signal control circuit.

B3950 04

The BCM detects an open in the Left Rear turn signal control circuit.

B3951 01

The BCM detects a short to voltage in the Right Rear turn signal control circuit.

B3951 02

The BCM detects a short to ground in the Right Rear turn signal control circuit.

B3951 04

The BCM detects an open in the Right Rear turn signal control circuit.

Actions Taken When the DTC Sets

B3950 01

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The Left Rear turn signal lamp will be ON at all times.

B3950 02

The Left Rear turn signal lamp will not operate.

B3950 04

The Left Rear turn signal lamp will be inoperative.

B3951 01

The Right Rear turn signal lamp will be ON at all times.

B3951 02

The Right Rear turn signal lamp will not operate.

B3951 04

The Right Rear turn signal lamp will be inoperative.

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.

Diagnostic Aids

- Check the Left Rear turn signal bulb. If the bulb is open, DTC B3950 04 will set as current only.
- Check the Right Rear turn signal bulb. If the bulb is open, DTC B3951 04 will set as current only.

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

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- **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 turn signal lamp.
2. Ignition OFF, exterior 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. Connect a test lamp between the control circuit terminal 3 and ground.
4. Command the 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 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 turn signal lamp.

Repair Procedures

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

- **Tail Lamp Replacement - Inboard**
- **Tail Lamp Replacement - Outboard**
- **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

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Brake Pedal Position Sensor Circuit Low Voltage/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 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
Brake Pedal Position Sensor 5 V Reference	C0161 00, C0277 06, C0890 03, U0418 00	C0161 00, C0277 06, U0418 00	C0161 00, C0890 07, U0418 00	-
Brake Pedal Position Sensor Signal	C0161 00, C0277 06, U0418 00	C0161 00, C0277 06, U0418 00	C0161 00, C0277 07, U0418 00	C0277 09
Brake Pedal Position Sensor Low Reference	-	1	1	-
Left Rear Tail/Stop and Turn Signal Lamp Control	B3950 02	B3950 04	B3950 01	-
Left Rear Tail/Stop and Turn Signal Lamp Ground	-	1	-	-
Right Rear Tail/Stop and Turn Signal Lamp Control	B3951 02	B3951 04	B3951 01	-
Right Rear Tail/Stop and Turn Signal Lamp Ground	-	1	-	-
Center High Mounted Stop Lamp Control	B3884 02	B3884 02	B3884 01	-
Center High Mounted Stop Lamp				

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Ground	-	2	-	-
1. Stop Lamps Malfunction 2. Center High Mounted Stop Lamp 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 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-volt 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 illuminating the left and right tail/stop and turn signal lamps and the center high mounted stop lamp. The BCM also applies battery voltage to the transmission control module (TCM) and engine control module (ECM) via the brake applied signal circuit.

Conditions for Running the DTC

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

Conditions for Setting the DTC

C0277 06

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

C0277 07

The BCM detects a short to battery voltage in the BPP sensor signal circuit or the 5 V reference circuit.

C0277 09

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

C0277 4B

The DTC will set when the BPP sensor home position is not learned.

C0890 03

The BCM detects a short to ground in the BPP sensor voltage reference circuit for 0.5 seconds or greater.

C0890 07

The BCM detects a short to battery voltage in the BPP sensor voltage reference circuits.

Actions Taken When the DTC Sets

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- The Traction Control indicator is commanded ON.
- If the DTC sets while the vehicle is running, the BCM will activate the brake lights when the vehicles transmission is not in the PARK position and the vehicle is not accelerating.
- For DTC C0277 4B the stop lamps may not activate at the expected BPPs.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- For DTC C0277 07 the ignition must be cycled before the code can be cleared.
- For DTC C0277 4B a successful BPP sensor calibration has been performed.
- A history DTC will clear once 50 malfunction-free ignition cycles have occurred.
- A DTC will not clear the current status until the next ignition cycle.

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

C0277 06, C0277 07, C0890 03, and C0890 07

1. Ignition OFF, disconnect the harness connector at the B22 BPP sensor.
2. Ignition OFF, test for less than 5 ohms between the ground circuit terminal C and ground.

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- 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 B+ and the low reference circuit terminal C.
   - If the test lamp does not illuminate, test the low reference circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
4. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal A 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.
5. Verify the scan tool BPP Sensor parameter is less than 1 V.
   - If greater than the specified range, test the signal circuit terminal B for a short to voltage. If the circuit tests normal, replace the K9 BCM.
6. Install a 3 A fused jumper wire between the signal circuit terminal B and the 5-volt reference circuit terminal A. Verify the scan tool BPP Sensor parameter is greater than 4 V.
   - 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.
7. If all circuits test normal, test or replace the B22 BPP sensor.

C0277 09

1. Replace the B22 BPP sensor.
2. Perform the BPP 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.

C0277 4B

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

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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 Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Brake Applied Signal	C0297 02, P0572	P0572	P0573	-

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 right and left stop lamp control circuits, engine control module (ECM), and 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 brake applied signal circuit.

Actions Taken When the DTC Sets

- The BCM stores the DTC to memory.
- The Service Brake Assist indicator is commanded ON.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 50 malfunction-free ignition cycles have occurred.

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Diagnostic Aids

Verify that the brake pedal position sensor is properly calibrated.

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 appropriate harness connector listed below.
   - K20 ECM harness connector X1 - with L99 and LS3
   - K20 ECM harness connector X2 - with LLT
2. Connect a test lamp between the appropriate signal circuit terminal listed below and ground.
   - Brake applied signal terminal 9 - with L99 and LS3
   - Brake applied signal terminal 52 - with LLT
3. Ignition ON, turn the stop lamps ON and OFF by applying and releasing 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 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 circuit tests normal, replace the K9 BCM.
4. If all circuits test normal, replace the K20 ECM.

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Repair Procedures

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

- **Brake Pedal Position Sensor Calibration**
- **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 (Automatic Transmission)** or **Backup Lamps Malfunction (Manual Transmission)**
- **Courtesy Lamps Malfunction**
- **Daytime Running Lamps Malfunction**
- **Front Fog Lamps Malfunction**
- **Hazard Lamps Malfunction**
- **Headlamps Malfunction (T4A)** or **Headlamps Malfunction (T4F)**

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- **High Intensity Discharge Lamp Malfunction**
- **Interior Backlighting Malfunction**
- **Park, License, and/or Tail Lamps Malfunction**
- **Stop Lamps Malfunction**
- **Turn Signal Lamps and/or Indicators Malfunction**

BACKUP LAMPS MALFUNCTION (AUTOMATIC TRANSMISSION)

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 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

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.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

Component Connector End Views

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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 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. Engine running, command the Backup Lamps 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 E5 backup lamp.

Repair Procedures

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

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

BACKUP LAMPS MALFUNCTION (MANUAL TRANSMISSION)

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.

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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

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 which 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 lamps 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

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Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, engine running, command the Backup Lamps Relay Command ON and OFF with a scan tool. The backup lamps should turn ON and OFF when changing between the commanded states.
    - If the backup lamps turn ON and OFF when changing between the commanded states, refer to Backup Lamps Switch Malfunction.
2. Engine running, shift the vehicle between the park and reverse gears. The backup lamps should turn ON and OFF when changing between the selected states.
    - If the backup lamps do not turn ON and OFF when changing between the selected states, refer to Backup Lamps Malfunction.

Circuit/System Testing

Backup Lamps Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the B16 backup lamp switch.
2. Ignition OFF, exterior lamps OFF, test for less than 5.0 ohms between the ground circuit terminal listed below and ground.
    - Terminal B (M10)
    - Terminal 2 (MV5)
    - 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 signal circuit terminal listed below and ground.
    - Terminal A (M10)
    - Terminal 1 (MV5)
    - If the test lamp does not illuminate, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K20 ECM.
4. Install a 3 A fused jumper wire between the signal circuit terminal and the ground circuit terminal. The backup lamps should illuminate.
    - If the backup lamps do not illuminate, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K20 ECM.
5. If all circuits test normal, test or replace the B16 backup lamp switch.

Backup Lamps Malfunction

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 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. Engine running, command the Backup Lamps Test ON and OFF with a scan tool. The test lamp should

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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 E5 backup lamp.

Repair Procedures

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

- **Backup Lamp Replacement**
- **Backup Lamp Switch Replacement**
- **Control Module References** for ECM or 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
Courtesy Lamps Switch On Signal	B2615 00	B2615 00	B2615 00	-
Courtesy Lamp Defeat Signal	7	7	7	-
Courtesy Lamps Switch Ground	-	1	-	-
Rear Compartment Courtesy Lamp Control	B2560 02	B2560 04	B2560 01, 6	-
Rear Compartment Courtesy Lamp Ground	-	5	-	-
Accent Lamp Control	1	1	2	-
Accent Lamp Ground	-	1	-	-
Dome Lamp Control	3	3	4	-
Dome Lamp Ground	-	3	-	-

1. Courtesy Lamps Inoperable
2. Courtesy Lamps Always ON
3. Dome Lamp Inoperable
4. Dome Lamp Always ON
5. Rear Compartment Courtesy Lamp Inoperable
6. Rear Compartment Courtesy Lamp Always ON

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7. Dome Lamp Defeat Switch Malfunction

Circuit/System Description

The body control module (BCM) applies battery voltage to the accent lamps through the accent lamp supply voltage circuits. When any door is opened, the door ajar switch contacts close and the BCM receives a door-ajar input and will supply system voltage to the accent lamps. If the BCM receives a trunk open input, the BCM will activate the rear compartment courtesy lamp supply voltage circuit, providing system voltage to rear compartment courtesy lamp.

Reference Information

Schematic Reference

Interior Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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 trunk. The parameter should change between Active and Inactive.
    - If the parameter does not change between the selected states, refer to **Trunk Ajar Indicator Malfunction** .
3. Observe the scan tool Interior/Courtesy Lighting Master Switch parameter while turning the courtesy

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lamp defeat switch ON and OFF. The parameter should change between Active and Inactive.

- If the courtesy lamps do not turn ON and OFF when commanded, refer to Dome Lamp Switch Malfunction.

4. Courtesy lamp defeat switch OFF, observe the scan tool Dome Lamp Switch parameter while turning the dome lamp switch ON and OFF. The parameter should change between Active and Inactive.
   - If the courtesy lamps do not turn ON and OFF when commanded, refer to Dome Lamp Switch Malfunction.
5. Command the Courtesy Lamps ON and OFF with a scan tool. The courtesy lamps should turn ON and OFF when changing between the commanded states.
   - If the courtesy lamps do not turn ON and OFF when commanded, refer to Dome Lamp Malfunction.
6. Command the Interior Accent Lighting ON and OFF with a scan tool. The accent lamps should turn ON and OFF when changing between the commanded states.
   - If the accent lamps do not turn ON and OFF when commanded, refer to Accent Lamp Malfunction.
7. Command the Trunk Lamp ON and OFF with a scan tool. Rear compartment courtesy lamp should turn ON and OFF when changing between the commanded states.
   - If the rear compartment courtesy lamp does not turn ON and OFF when commanded, refer to Rear Compartment Courtesy Lamp Malfunction.

Circuit/System Testing

Dome Lamp Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the E37A dome/reading lamps.
2. Scan tool OFF, doors CLOSED, interior lamps 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 Interior/Courtesy Lighting Master Switch parameter is Inactive.
   - If not the specified value, test the signal circuit terminal 4 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 5 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 4 and ground. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Active.
   - If not the specified value, test the signal circuit terminal 4 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 5 and ground. Verify the scan tool Dome Lamp Switch parameter is Active.
   - If not the specified value, test the signal circuit terminal 5 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, replace the E37A dome/reading lamps.

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Dome Lamp Malfunction

1. Ignition OFF, disconnect the harness connector at the E37A dome/reading lamps.
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. Connect a test lamp between the control circuit terminal 2 and ground.
4. Ignition ON, command the Courtesy Lamps Duty Cycle Command ON and OFF with a scan tool, the test lamp should turn ON and OFF while 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 E37A dome/reading lamps.

Accent Lamp Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate E1 accent lamp.
2. Test for less than 5 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 ground.
4. Ignition ON, command the 1st Row Interior/Courtesy Lamps Command ON and OFF with a scan tool, the test lamp should turn ON and OFF while 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 E1 accent lamp.

Rear Compartment Courtesy Lamp Malfunction

1. Ignition OFF, disconnect the harness connector at the E8S rear compartment courtesy 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. Ignition ON, command the Trunk Lamp Command ON and OFF with a scan tool, the test lamp should turn ON and OFF while 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 E8S rear compartment courtesy lamp.

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Repair Procedures

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

- Refer to the appropriate replacement procedure for the component causing the condition.
- **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
Ambient Light Sensor Signal	B2645 03	B2645 07	B2645 07	-
Ambient Light Sensor Ground	-	B2645 07	2	-
Daytime Running Lamp Control - Left (T4F)	B2600 02	B2600 04	B2600 01	-
Daytime Running Lamp Ground - Left (T4F)	-	2	-	-
Daytime Running Lamp Control - Right (T4F)	B2605 02	B2605 04	B2605 01	-
Daytime Running Lamp Ground - Right (T4F)	-	2	-	-
Left Front Low Beam Headlamp Control (T4A)	B2575 02	B2575 04	B2575 01	-
Left Front Headlamp Low Beam Ground	-	1	-	-
Right Front Low Beam Headlamp Control (T4A)	B2699 02	B2699 04	B2699 01	-
Right Front Headlamp Low Beam Ground	-	1	-	-
1. Headlamps Malfunction 2. Daytime Running Lamps Malfunction				

Circuit/System Description

Daytime Running Lamps (T4A)

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a

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voltage signal that will vary between 0.2 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor which is permanently grounded. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lights (DRL) or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the low beam headlamps ON by applying a pulse width modulated (PWM) voltage to the left and right low beam headlamp control circuits illuminating the low beam headlamps. Any function or condition that turns on the headlamps will cancel DRL operation.

Daytime Running Lamps (T4F)

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 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor which is permanently grounded. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lights (DRL) or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions, the BCM will command the DRLs ON by applying a pulse width modulated (PWM) voltage to the left and right DRL control circuits illuminating the DRLs. Any function or condition that turns on the headlamps will cancel DRL operation.

Reference Information

Schematic Reference

Headlights 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

Daytime Running Lamps (T4A)

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1. Ignition ON, headlamps OFF, command the Low Beam Headlamps 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 (T4A)** or **Headlamps Malfunction (T4F)**.
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 the Ambient Light Sensor Malfunction.

Daytime Running Lamps (T4F)

1. Ignition ON, headlamps OFF, command the Low Beam Headlamps 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 (T4A)** or **Headlamps Malfunction (T4F)**.
2. Headlamps OFF, command the Left or Right Dedicated Daytime Running Lamp Command ON and OFF with a scan tool. The daytime running lights should turn ON and OFF when changing between the commanded states.
    - If the daytime running lamps do not change between the commanded states, refer to Daytime Running Lamp Malfunction.
3. 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 Day.
    - If not the specified value, refer to the Ambient Light Sensor Malfunction.

Circuit/System Testing

Ambient Light Sensor Malfunction

1. Ignition OFF, disconnect the harness connector at the B10 ambient light sensor.
2. Ignition OFF, test for less than 5 ohms between the ground circuit terminal 6 and ground.
    - 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 B10 ambient light sensor.

Daytime Running Lamp Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate E4 daytime running lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5.0 ohms between the ground circuit terminal 2 and

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ground.

- If greater than the specified range, test the ground circuit for an open/high resistance.

3. Connect a test lamp between the signal circuit terminal 1 and ground.
4. Command the Dedicated Daytime Running 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 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 daytime running lamp.

Repair Procedures

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

- **Headlamp Automatic Control Ambient Light Sensor Replacement**
- **Daytime Running Lamp Replacement (RS)**
- **Daytime Running Lamp Bulb Replacement (RS)** or **Daytime Running Lamp Bulb Replacement (SS)**
- **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
Headlamp and Panel Dimmer Switch B+	B1405 03, B1529 03, B257B 03	B257B 03	-	-
Headlamp and Panel Dimmer Switch Signal	B257B 03	B257B 03	B257B 07	-
Front Fog Lamp Relay Control	1	1	-	-
Front Fog Lamp Control	B2530 02	B2530 04	1	-
Fog Lamp - Left Front Ground	-	1	-	-
Fog Lamp - Right Front Ground	-	1	-	-
1. Front Fog Lamps Malfunction				

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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 FOG LAMP fuse to the front fog lamp control circuit which illuminates the front fog lamps.

Reference Information

Schematic Reference

Fog Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, observe the scan tool Front Fog 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.
2. Observe the scan tool Front Fog Lamps Relay Command 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 Lamps Malfunction.
3. Command the All Indicators Test ON and OFF with a scan tool. The font 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.

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- 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 S30 headlamp switch.
2. Ignition ON, verify that a test lamp illuminates between the 12 V reference circuit terminal 1 and ground.
   - If the test lamp does not illuminate, test the 12 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal and the circuit fuse is open, test the signal circuit terminal 12 for a short to ground.
3. Verify the scan tool Front Fog Lamps Switch parameter is Inactive.
   - If not the specified value, test the signal circuit terminal 12 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 12 and the 12 V reference circuit terminal 1. Verify the scan tool Front Fog Lamps Switch parameter is Active.
   - If not the specified value, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, test or replace the S30 headlamp switch.

Front Fog Lamps Malfunction

1. Ignition OFF, disconnect the X2 harness connector at the X50A underhood fuse block.
2. Connect a test lamp between the control circuit terminal 19 and B+.
3. Command the Front Fog 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 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. Ignition OFF, connect the X2 harness connector at the X50A underhood fuse block. Disconnect the harness connector at the appropriate E29 Fog Lamp - Front.
5. Test for less than 5 ohms between the ground circuit terminal A 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.
   - If greater than the specified range, test the ground circuit for an open/high resistance.
7. Command the Front Fog 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 E29 Fog Lamp - Front.
   - If the test lamp is always OFF and the circuit fuse is good, test the control circuit for an open/high

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resistance. If the circuit tests normal, test or replace the E29 Fog Lamp - Front.

- 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 X50A underhood fuse block.

Repair Procedures

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

- **Front Fog Lamp Replacement (Base/SS)**
- **Accessory Wiring Junction Block Retainer Replacement**
- **Headlamp, Instrument Panel Lamp Dimmer, and Fog Lamp Switch Replacement**
- **Control Module References** for BCM and instrument 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	1	1	B3596 00	-
Hazard Switch Ground	-	1	-	-
1. Hazard Lamps Malfunction				

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 BCM supplies battery voltage to all four 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

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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 Lamp Switch parameter while turning the hazard lamp switch ON and OFF. 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 turning the hazard lamp switch ON and OFF. 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 cluster.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the A20 radio/HVAC controls.
2. Ignition OFF, test for less than 5 ohms 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 Lamps 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 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

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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.

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

HIGH INTENSITY DISCHARGE LAMP MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Lamp Switch ON Signal	2	B257A 00	2	-
Headlamp Switch Headlamps ON Signal	B257A 00	1	1	-
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	-
Headlamp Low Beam Relay Control (T4F)	B258A 02	B258A 04	B258A 01	-
Left Headlamp Ground	-	B2575 01, B2575 04	-	-
Right Headlamp Ground	-	B2575 01, B2575 04	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
1. Headlamp Switch Malfunction 2. Park Lamp Switch Malfunction				

Circuit/System Description

With the headlamp switch in the ON position, the headlamp switch headlamp ON signal circuit is grounded through the headlamp and panel dimmer switch. In response to this input, the body control module (BCM) provides ground to either the High Intensity Discharge (HID) headlamp relay control circuit or the headlamp high beam relay control circuit. The position of the headlamp dimmer switch determines which relay coil is supplied with ground. The underhood fuse block supplies battery voltage to the relay coil and switch circuits.

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The HID headlamps operate when the BCM grounds the HID headlamps relay control circuit to the HID headlamp relay coil. This energizes the HID relay coil causing the switch contacts to close. With the switch contacts closed, battery voltage is applied to the left and right HID fuses through to the left and right HID headlamps.

Diagnostic Aids

The following symptoms are noticeable signs of bulb failure:

- Flickering light, caused in the early stages of bulb failure.
- Lights go out, caused when the ballast detects excessive, repetitive bulb re-strike.
- Color change-The lamp may change to a dim pink glow.

Reference Information

Schematic Reference

Headlights 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

WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns:

- **Never open the high intensity discharge system ballast or the arc tube assembly starter.**
- **Never probe between the high intensity discharge system ballast**

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output connector and the arc tube assembly.

1. Ignition OFF, disconnect the KR49 low beam headlamp relay.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuit terminal 87 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 30 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 86 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 T7 headlamp.
6. Ignition OFF, scan tool OFF, exterior lamps 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.
7. Connect the harness connector at the appropriate T7 headlamp.
8. Connect a 20 A fused jumper wire between the B+ circuit terminal 30 and the control circuit terminal 87. Verify the high intensity discharge headlamps are activated.
    - If the high intensity discharge headlamps do 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 T7 headlamp.
    - If the high intensity discharge headlamps do 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 T7 headlamp.
9. Connect a test lamp between the B+ circuit terminal 86 and the control circuit terminal 85.
10. Command the Headlamp Low 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, replace the KR49 low beam headlamp relay.

Repair Procedures

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

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

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HEADLAMPS MALFUNCTION (T4A)

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
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	-	3	-	-
Park Lamp Switch ON Signal	4	B257A 00	4	-
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	2	2	2	-
Right Headlamp High Beam Control	2	2	2	-
Left Headlamp Low Beam Control (T4A)	B2575 02	B2575 01, B2575 04	B2575 01	-
Right Headlamp Low Beam Control (T4A)	B2699 02	B2699 01, B2699 04	B2699 01	-
Left Headlamp Ground	-	B2575 01, B2575 04	-	-
Right Headlamp Ground	-	B2575 01, B2575 04	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
1. Headlamp Switch Malfunction 2. Headlamps Malfunction - High Beam 3. Turn Signal/Multifunction Switch Malfunction 4. Park Lamp Switch Malfunction				

Circuit/System Description

With the headlamp switch in the ON position, the headlamp switch headlamp ON signal circuit is grounded through the headlamp and panel dimmer switch. For low beam headlamp operation, the body control module (BCM) responds by applying a pulse width modulated (PWM) voltage to the left and right low beam headlamp

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control circuits illuminating the low beam headlamps. For high beam headlamp operation, with the turn signal/multifunction switch in the high beam position, the high beam signal circuit is supplied with ground. The BCM responds to this input by applying ground to the high beam relay control circuit. The underhood fuse block supplies battery voltage to the relay coil and switch circuits of the high beam relay. With the high beam relay coil energized, the relay switch contacts close allowing voltage to flow through the left and right HIGH BEAM fuses to the high beam headlamps. With the high beams active, the BCM sends a serial data message to the instrument cluster requesting to illuminate the high beam indicator.

Reference Information

Schematic Reference

Headlights 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

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Switch Malfunction.

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.
5. Command the Headlamp Low Beam 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.
6. Command the High Beam Headlamps 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.
7. Command the All Indicators Test ON and OFF with a scan tool. The lights on indicator and high beam indicator should turn ON and OFF when changing between the commanded states.
    - If the lights on indicator and high beam indicator illuminate during the test, replace the K9 BCM.
    - If the lights on indicator and high beam indicator do not illuminate during the test or remain illuminated at all times, replace the P16 instrument cluster.

Circuit/System Testing

WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns:

- **Never open the high intensity discharge system ballast or the arc tube assembly starter.**
- **Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.**

Headlamp Switch Malfunction

1. Ignition OFF, disconnect the harness connectors at the S30 headlamp 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 4 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 5 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 4 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

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the circuit tests normal, replace the K9 BCM.

6. Install a 3 A fused jumper wire between the signal circuit terminal 5 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 S30 headlamp switch.

Turn Signal/Multifunction 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 3 and ground.
    - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Verify the scan tool Headlamps Flash Switch parameter is Inactive.
    - If not the specified value, test the signal circuit terminal 4 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 2 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 4 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.
6. Install a 3 A fused jumper wire between the signal circuit terminal 2 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 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.

Headlamps Malfunction - Low Beam

1. Ignition OFF, disconnect the harness connector at the appropriate E13 headlamp.
2. Ignition OFF, scan tool OFF, exterior lamps OFF, test for less than 5.0 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 Headlamp Low 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 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 E13 headlamp.

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Headlamps Malfunction - High Beam

1. Ignition OFF, disconnect the X2 harness connector at the X50A underhood fuse block.
2. Connect a test lamp between the control circuit terminal 31 and B+.
3. Command the High Beam Headlamps 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.
4. Ignition OFF, connect the X2 harness connector at the X50A underhood fuse block. Disconnect the harness connector at the appropriate E13 Headlamp.
5. 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.
6. Connect a test lamp between the control circuit terminal 3 and ground.
7. Command the High Beam Headlamps 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 X50A underhood fuse block.
    - 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 underhood fuse block.
    - 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 E13 Headlamp.
8. If all circuits test normal, test or replace the E13 Headlamp.

Repair Procedures

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

- **Accessory Wiring Junction Block Retainer Replacement**
- **Headlamp, Instrument Panel Lamp Dimmer, and Fog Lamp Switch Replacement**
- **Headlamp Replacement**
- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for BCM or instrument cluster replacement, setup, and programming

HEADLAMPS MALFUNCTION (T4F)

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.

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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	-	3	-	-
Park Lamp Switch ON Signal	4	B257A 00	4	-
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	-
Headlamp Low Beam Relay Control (T4F)	B258A 02	B258A 04	B258A 01	-
Left Headlamp High Beam Control	2	2	2	-
Right Headlamp High Beam Control	2	2	2	-
Left Headlamp Ground	-	B2575 01, B2575 04	-	-
Right Headlamp Ground	-	B2575 01, B2575 04	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
1. Headlamp Switch Malfunction 2. Headlamps Malfunction - High Beam 3. Turn Signal/Multifunction Switch Malfunction 4. Park Lamp Switch Malfunction				

Circuit/System Description

With the headlamp switch in the ON position, the headlamp switch headlamp ON signal circuit is grounded through the headlamp and panel dimmer switch. In response to this input, the body control module (BCM) provides ground to either the high intensity discharge (HID) headlamp control circuit or the headlamp high beam relay control circuit. The position of the headlamp dimmer switch determines which relay coil is supplied with ground. The underhood fuse block supplies battery voltage to the relay coil and switch circuits. The HID headlamps operate when the BCM grounds the HID headlamp relay control circuit to the HID headlamp relay coil. This energizes the HID headlamp relay coil causing the switch contacts to close. With the switch contacts closed, battery voltage is applied to the left and right HID fuses through to the left and right HID headlamps. When the headlamp high beam relay coil is energized, current flows through the left and right HIGH BEAM fuses to the high beam headlamps. With the headlamp dimmer switch in the high beam position the BCM sends a serial data message to the instrument cluster requesting to illuminate the high beam indicator.

Reference Information

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Schematic Reference

Headlights 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.
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.
5. Command the Headlamp Low Beam 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

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Malfunction - Low Beams.

6. Command the Dedicated Daytime Running Lamp ON and OFF with a scan tool. The daytime running lamp should turn ON and OFF when commanded.
   - If the daytime running lamp does not turn ON and OFF when commanded, refer to Headlamps Malfunction - Daytime Running Lamps.
7. Command the High Beam Headlamps 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.
8. Command the All Indicators Test ON and OFF with a scan tool. The lights on indicator and high beam indicator should turn ON and OFF when changing between the commanded states.
   - If the lights on indicator and high beam indicator illuminate during the test, replace the K9 BCM.
   - If the lights on indicator and high beam indicator do not illuminate during the test or remain illuminated at all times, replace the P16 instrument cluster.

Circuit/System Testing

WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns:

- **Never open the high intensity discharge system ballast or the arc tube assembly starter.**
- **Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.**

Headlamp Switch Malfunction

1. Ignition OFF, disconnect the harness connectors at the S30 headlamp 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 4 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 5 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 4 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 5 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

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the circuit tests normal, replace the K9 BCM.

7. If all circuits test normal, test or replace the S30 headlamp switch.

Turn Signal/Multifunction 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 3 and ground.
   - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Verify the scan tool Headlamps Flash Switch parameter is Inactive.
   - If not the specified value, test the signal circuit terminal 4 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 2 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 4 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.
6. Install a 3 A fused jumper wire between the signal circuit terminal 2 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 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.

Headlamps Malfunction - Low Beam

1. Ignition OFF, disconnect the KR49 low beam headlamp relay.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuit terminal 87 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 30 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 86 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 T7 headlamp.
6. Ignition OFF, scan tool OFF, exterior lamps 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.
7. Connect the harness connector at the T7 headlamp.
8. Connect a 20 A fused jumper wire between the B+ circuit terminal 30 and the control circuit terminal 87. Verify the T7 headlamps are activated.

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- If the T7 headlamps do not activate and the circuit fuse is good, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the T7 headlamp.
- If the T7 headlamp 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 T7 headlamp.

9. Connect a test lamp between the B+ circuit terminal 86 and the control circuit terminal 85.
10. Command the Headlamp Low 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 KR49 low beam headlamp relay.

Headlamps Malfunction - Daytime Running Lamps

1. Ignition OFF, disconnect the harness connector at the appropriate E4 daytime running lamp.
2. Ignition OFF, scan tool OFF, exterior lamps OFF, test for less than 5.0 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 signal circuit terminal 1 and ground.
4. Command the Dedicated Daytime Running 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 open/high resistance. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, replace the E4 daytime running lamp.

Headlamps Malfunction - High Beam

1. Ignition OFF, disconnect the X2 harness connector at X50A underhood fuse block.
2. Connect a test lamp between the control circuit terminal 31 and B+.
3. Command the High Beam Headlamps 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.
4. Ignition OFF, connect the X2 harness connector at the X50A underhood fuse block. Disconnect the harness connector at the appropriate M28 High Beam Solenoid Actuator.
5. Test for less than 5 ohms between the ground circuit terminal A and ground.
    - If greater than the specified range, test the ground circuit for an open/high resistance.

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6. Connect a test lamp between the control circuit terminal C and ground.
7. Command the High Beam Headlamps 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 X50A underhood fuse block.
    - 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, replace the X50A underhood fuse block.
    - 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 of replace the M28 High Beam Solenoid Actuator.
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 Retainer Replacement**
- **Daytime Running Lamp Replacement (RS)**
- **Daytime Running Lamp Bulb Replacement (RS)** or **Daytime Running Lamp Bulb Replacement (SS)**
- **Headlamp Replacement**
- **Headlamp Ballast Replacement (HID)**
- **Headlamp Bulb Replacement (SS HID)** or **Headlamp Bulb Replacement (RS)**
- **Headlamp, Instrument Panel Lamp Dimmer, and Fog Lamp Switch Replacement**
- **Relay Replacement (Attached to Wire Harness)** or **Relay Replacement (Within an Electrical Center)**
- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for BCM or instrument cluster 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
LED Backlight Dimming Control Terminal 8 X2	B2610 02	1	1	-
LED Backlight Dimming Control				

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Terminal 9 X7	B2610 02	1	1	-
Automatic Transmission Shift Lever Position Indicator Ground	-	1	-	-
Headlamp and Panel Dimmer Switch Ground	-	1	-	-
Steering Wheel Control Switch - Left Ground	-	1	-	-
Steering Wheel Control Switch - Right Ground	-	1	-	-
Sunroof Switch Ground	-	1	-	-
Traction Control Switch Ground	-	1	-	-
Window Switch Driver Ground	-	1	-	-
Window Switch Passenger Ground	-	1	-	-
1. Interior Backlighting Inoperative				

Circuit/System Description

The up/down dimmer controls located on the headlamp and panel dimmer switch is used to increase and decrease the brightness of the interior backlighting components. Each dimmer control 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) supplies each dimmer control switch with a signal circuit. When either the up or down dimmer control switch is placed in the desired position, the dimmed voltage setting is applied from the appropriate dimmer control switch through the dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies the dimmed voltage to the LED and incandescent backlight dimming control circuits and the interior backlighting components dim to the requested level.

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**

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- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, command the Parking Lamps ON and OFF with a scan tool. The park lamps should turn ON and OFF when changing between the commanded states.
    - If the park lamps do not turn ON and OFF when commanded, refer to **Park, License, and/or Tail Lamps Malfunction**.
2. Observe the scan tool LED Backlight Dimming Command parameter while operating the dimmer switch from high to low. The parameters should change from a high percent to a low percent as the switch is activated.
    - If the parameters do not change, refer to Panel Dimmer Switch Malfunction.
3. Observe the function for the backlights while commanding the LED Dimming Duty Cycle Command ON and OFF with a scan tool. All backlights should turn ON and OFF while changing between the commanded states.
    - If a backlight does not turn ON or OFF, refer to Interior Backlighting Malfunction.

Circuit/System Testing

Panel Dimmer Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S30 headlamp switch.
2. Ignition OFF, RAP OFF, scan tool disconnected, test for less than 5 ohms between the low reference circuit terminal 12 and ground.
    - If greater than the specified value, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the K9 BCM.
3. Ignition ON, park lamps ON, test for greater than 10 V between the B+ circuit terminal 1 and ground.
    - 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. Install a 3 A fused jumper wire between the B+ circuit terminal 1 and the low reference circuit terminal 12. Verify the scan tool Dimming Control Signal parameter is a high %.
    - 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 S30 headlamp switch.

Interior Backlighting Malfunction

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

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- **Backlighting components the vehicle is equipped with.**
- **Component locations on the backlighting 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 LED Dimming 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, test or replace the component with inoperative backlighting.

Repair Procedures

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

- **Headlamp, Instrument Panel Lamp Dimmer, and Fog Lamp Switch Replacement**
- Refer to the appropriate replacement procedure for the component causing the condition.
- **Control Module References** for BCM replacement, setup and programming

PARK, LICENSE, AND/OR TAIL LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Lamp Switch ON Signal	-	B257A 00	2	-
Left Front Park Lamps Control	B2585 02	B2585 04	B2585 01	-
Left Front Park Lamps Ground	-	1	-	-
Right Front Park Lamps Control	B3867 02	B3867 04	B3867 01	-
Right Front Park Lamps Ground	-	1	-	-

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Left Rear Park Lamps Control	B3881 02	B3881 04	B3881 01	-
Right Rear Park Lamps Control	B3882 02	B3882 04	B3882 01	-
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	B3883 04	B3883 01	-
License Lamp Ground	-	3	-	-
Headlamp Switch Ground	-	2	-	-
1. Park, License, and/or Tail Lamps Malfunction 2. Park Lamp Switch Malfunction 3. License Lamps Malfunction				

Circuit/System Description

When the headlamp and panel dimmer 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.

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**

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, observe the scan tool Parking Lamp Switch parameter while cycling the park lamp between the OFF and Park positions. The parameter should toggle between Active and Inactive.
    - If the readings do not change between the commanded states, refer to Park Lamp Switch Malfunction.
2. Command the Parking Lamps ON and OFF with a scan tool. The park lamps should turn ON and OFF when changing between the commanded states.
    - If the park lamps do not turn ON and OFF when commanded, refer to Park, License, and/or Tail Lamps Malfunction.
3. Command the Parking Lamps ON and OFF with a scan tool. The license plate lamps should turn ON and OFF when changing between the commanded states.
    - If the license plate lamps do not turn ON and OFF when commanded, refer to License Plate Lamps Malfunction.

Circuit/System Testing

Park Lamp Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S30 headlamp 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 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.
4. Install a 3 A fused jumper wire between the signal circuit terminal 3 and ground. Verify the scan tool Park Lamp 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 S30 headlamp switch.

Park, Marker, and/or Tail Lamps Malfunction

1. Ignition OFF, Disconnect the harness connector at the appropriate park lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5 ohms between the ground circuit terminal listed below and ground.
    - E4 Park/Turn Signal Lamp - terminal 1
    - E4 Front Park Lamp - terminal A
    - E5 Tail/Stop and Turn Signal Lamp - terminal 1

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- E2 Side Marker Lamp - terminal 2
  - 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.
   - E4 Park/Turn Signal Lamp - terminal 2
   - E4 Front Park Lamp - terminal D
   - E5 Tail/Stop and Turn Signal Lamp - terminal 2
   - E2 Side Marker Lamp - terminal 1
4. Command the appropriate 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 park lamp.

License Plate Lamps Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate E7 license plate lamp.
2. Ignition OFF, exterior lamps OFF, 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. Turn the license plate lamps ON and OFF with the parklamp 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 E7 license plate lamp.

Repair Procedures

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

- **Rear License Plate Lamp Replacement**
- **Front Side Marker Lamp Replacement**
- **Rear Side Marker Lamp Replacement**
- **Tail Lamp Replacement - Inboard**
- **Tail Lamp Replacement - Outboard**
- **Headlamp, Instrument Panel Lamp Dimmer, and Fog Lamp Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

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STOP LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Brake Pedal Position Sensor 5 V Reference	C0161 00, C0277 06, C0890 03, U0418 00	C0161 00, C0277 06, U0418 00	C0161 00, C0890 07, U0418 00	-
Brake Pedal Position Sensor Signal	C0161 00, C0277 06, U0418 00	C0161 00, C0277 06, U0418 00	C0161 00, C0277 07, U0418 00	C0277 09
Brake Pedal Position Sensor Low Reference	-	1	1	-
Left Rear Tail/Stop and Turn Signal Lamp Control	B3950 02	B3950 04	B3950 01	-
Left Rear Tail/Stop and Turn Signal Lamp Ground	-	1	-	-
Right Rear Tail/Stop and Turn Signal Lamp Control	B3951 02	B3951 04	B3951 01	-
Right Rear Tail/Stop and Turn Signal Lamp Ground	-	1	-	-
Center High Mounted Stop Lamp Control	B3884 02	B3884 02	B3884 01	-
Center High Mounted Stop Lamp Ground	-	2	-	-
1. Stop Lamps Malfunction 2. Center High Mounted Stop Lamp 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 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 BPP sensor. When the variable signal reaches a voltage threshold indicating the brakes have been applied, the BCM will apply battery voltage to the right and left tail/stop and turn signal lamp control circuits and the center high mounted stop lamp control circuit illuminating the stop lamps.

Reference Information

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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 Applied Output Signal parameter as you apply and unapply the brake pedal. The reading should cycle between OFF and ON as the brake pedal is applied and released.
    - If the reading does not change as the brake pedal is applied and released, refer to Brake Pedal Position (BPP) Sensor Malfunction.
2. Command the Brake Lamp Command ON and OFF with a scan tool. The stop lamps should turn ON and OFF when changing between the commanded states.
    - If the stop lamps do not illuminate when commanded, refer to Stop Lamps Malfunction.
3. Command the Center Brake Lamp Command Test ON and OFF with a scan tool. The center high mounted stop lamp should turn ON and OFF when changing between the commanded states.
    - If the center high mounted stop lamp does not illuminate when commanded, refer to Center High Mounted Stop Lamp Malfunction.

Circuit/System Testing

Brake Pedal Position (BPP) Sensor Malfunction

1. Ignition OFF, disconnect the harness connector at the B22 BPP sensor.
2. Ignition OFF, test for less than 5 ohms between the ground circuit terminal C 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 B+ and the low reference circuit terminal C.

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- If the test lamp does not illuminate, test the low reference circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K9 BCM.

4. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal A 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.
5. Verify the scan tool BPP Sensor parameter is less than 1 V.
   - If greater than the specified range, test the signal circuit terminal B for a short to voltage. If the circuit tests normal, replace the K9 BCM.
6. Install a 3 A fused jumper wire between the signal circuit terminal B and the 5 V reference circuit terminal A. Verify the scan tool BPP Sensor parameter is greater than 4 V.
   - 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.
7. If all circuits test normal, test or replace the B22 BPP sensor.

Stop Lamps Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate E5 stop lamp.
2. Ignition OFF, exterior 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. Connect a test lamp between the control circuit terminal 3 and ground.
4. Command the Brake 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 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 stop lamp.

Center High Mounted Stop Lamp Malfunction

1. Ignition OFF, disconnect the harness connector at the E6 center high mounted stop lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5.0 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 the ground circuit terminal 2.
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.

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- 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**
- **Brake Pedal Position Sensor Replacement**
- **Tail Lamp Replacement - Inboard**
- **Tail Lamp Replacement - Outboard**
- **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 Turn Signal Switch Signal	1	1	2	-
Right Turn Signal Switch Signal	1	1	2	-
Turn Signal/Multifunction Switch Ground	-	1	-	-
Left Front Turn Signal Lamp Control	B3948 02	B3948 04	B3948 01	-
Left Front Turn Signal Lamp Ground	-	1	-	-
Right Front Turn Signal Lamp Control	B3949 02	B3949 04	B3949 01	-
Right Front Turn Signal Lamp Ground	-	1	-	-
Left Rear Stop/Turn Signal Lamp Control	B3950 02	B3950 04	B3950 01	-
Left Rear Stop/Tail/Turn Signal Lamp Ground	-	1	-	-
Right Rear Stop/Turn Signal Lamp Control	B3951 02	B3951 04	B3951 01	-
Right Rear Stop/Tail/Turn Signal Lamp Ground	-	1	-	-

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1. Turn Signal Lamps and/or Indicators Malfunction
2. Turn Signal Switch Malfunction

Circuit/System Description

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 body control module (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 control circuits.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, 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

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Malfunction.

3. Command the All Indicator 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/multifunction switch.
2. Ignition OFF, test for less than 5 ohms between the ground circuit terminal 3 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 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.
6. 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.
7. If all circuits test normal, test or replace the S78 turn signal/multifunction switch.

Turn Signal Lamps Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate turn signal lamp.
2. Ignition OFF, exterior lamps OFF, test for less than 5 ohms between ground circuit terminal listed below and ground:
    - E4 Turn Signal Lamp - Terminal 1
    - E5 Tail/Stop and Turn Signal Lamp - Terminal 1
    - E2 Side Marker Lamp - Terminal 2
    - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between control circuit terminal listed below and ground:
    - E4 Turn Signal Lamp - Terminal 3
    - E5 Tail/Stop and Turn Signal Lamp - Terminal 2

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- E2 Side Marker Lamp - Terminal 1

4. Command the 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 turn signal lamp.

Repair Procedures

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

- **Parking and Turn Signal Lamp Bulb Replacement**
- **Turn Signal Multifunction Switch Replacement**
- **Tail Lamp Replacement - Inboard**
- **Tail Lamp Replacement - Outboard**
- **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.

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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.

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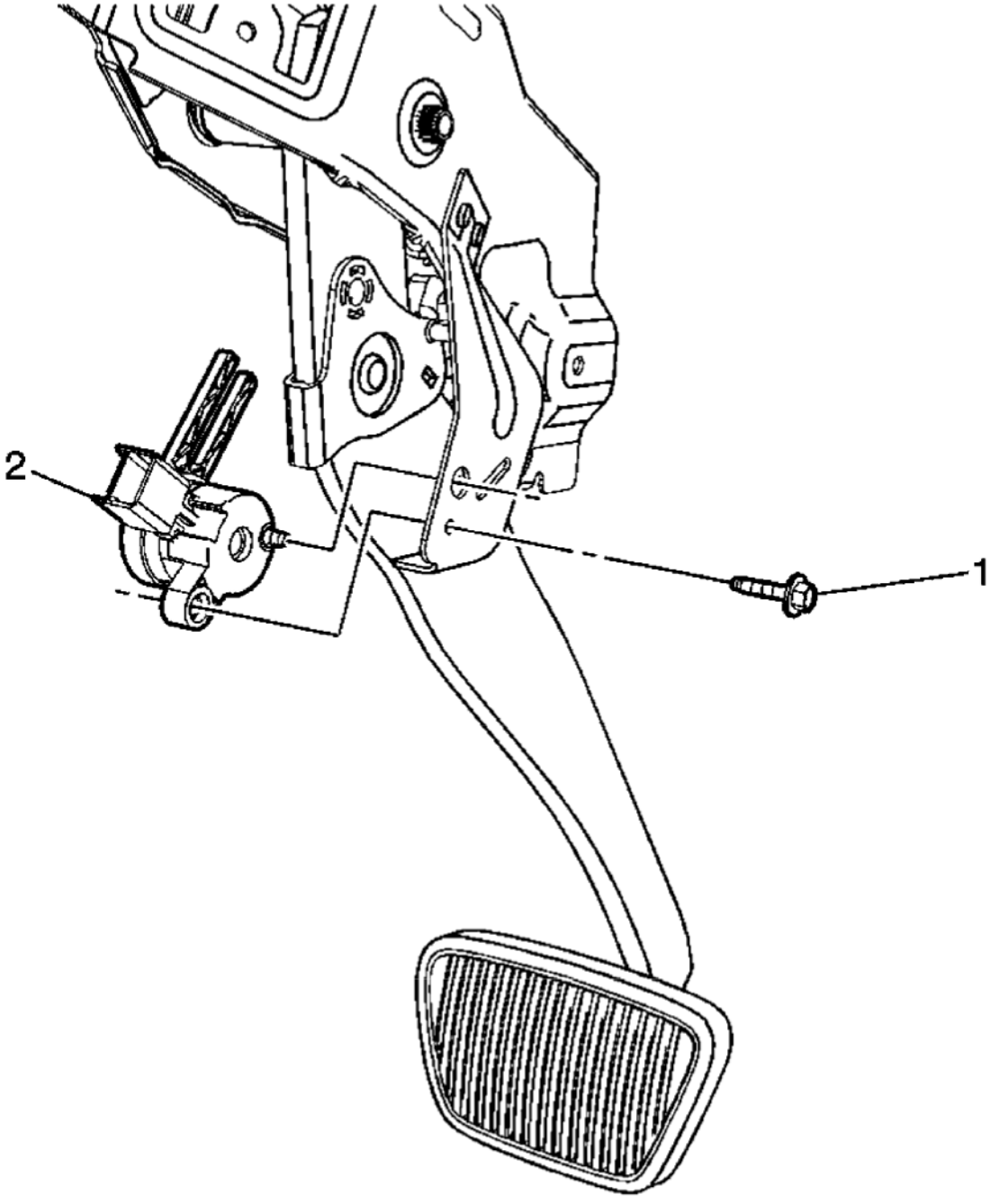


Fig. 11: Brake Pedal Position Sensor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
	Brake Pedal Position Sensor Bolt **CAUTION:**

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	Refer to Fastener Caution .
1	**Procedure:** Remove the sensor bolt. **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 **Brake Pedal Position Sensor Calibration**.

HEADLAMP, INSTRUMENT PANEL LAMP DIMMER, AND FOG LAMP SWITCH REPLACEMENT

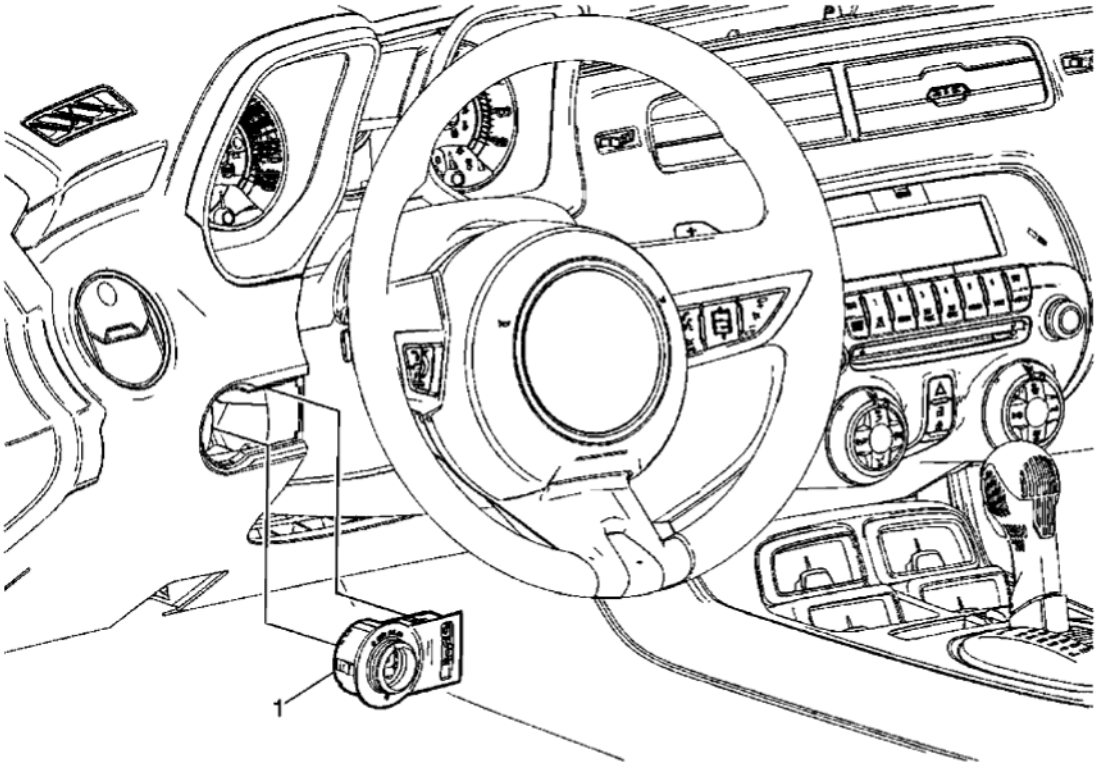


Fig. 12: Headlamp, Instrument Panel Lamp Dimmer & Fog Lamp Switch
Courtesy of GENERAL MOTORS CORP.

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Callout	Component Name
1	Headlamp and Instrument Panel Dimmer and Fog Lamp Switch **Procedure** 1. Use flat bladed tool to release switch from trim panel. 2. Disconnect electrical connector.

HEADLAMP AUTOMATIC CONTROL AMBIENT LIGHT SENSOR REPLACEMENT

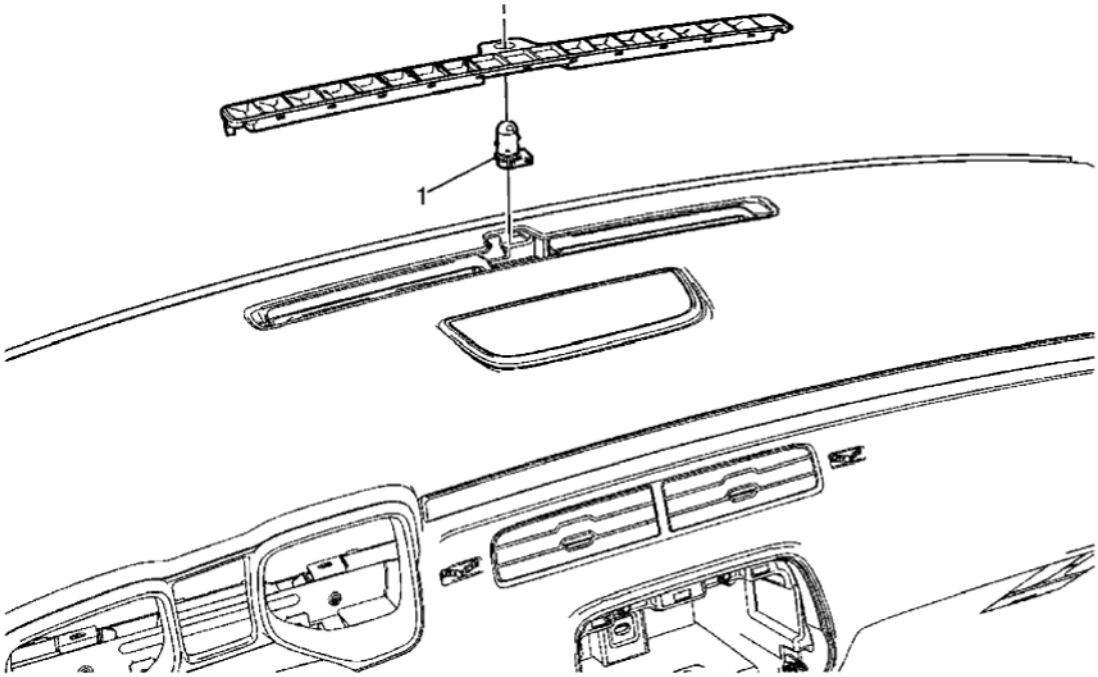


Fig. 13: Headlamp Automatic Control Ambient Light Sensor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the instrument panel center air outlet grille. Refer to **Instrument Panel Center Air Outlet Grille Replacement** .	
1	Headlamp Auto Control Ambient Light Sensor **Procedure** 1. Disconnect the electrical connector. 2. Twist the sensor counterclockwise.

DOME AND READING LAMP LENS REPLACEMENT

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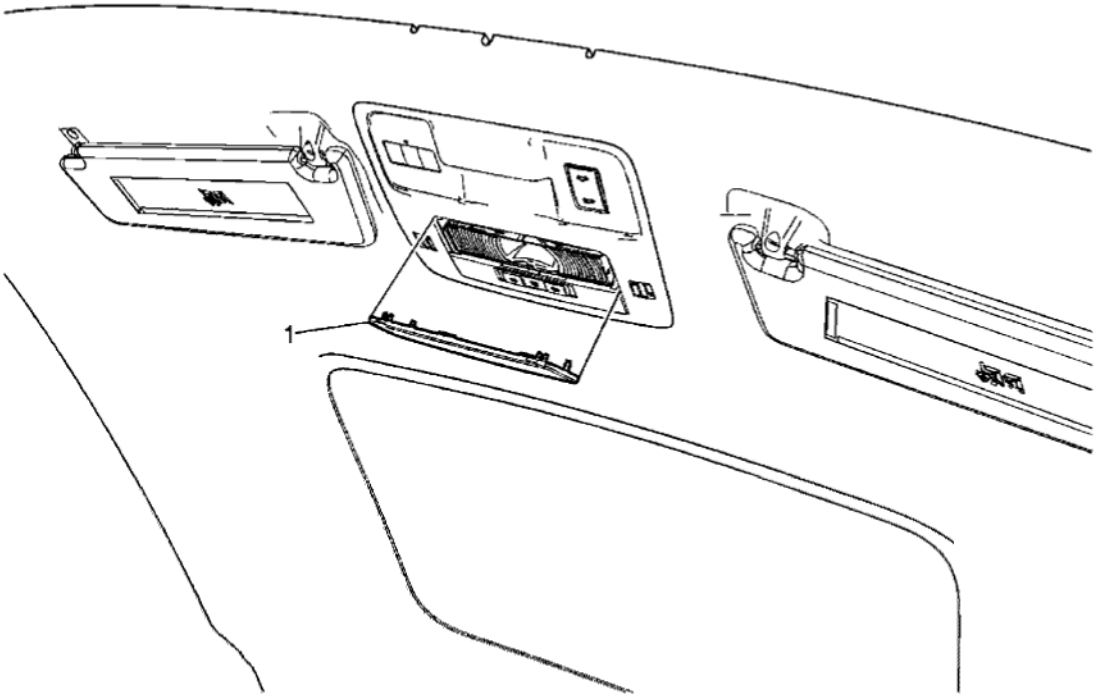


Fig. 14: Dome & Reading Lamp Lens
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Dome and Reading Lamp Lens **Procedure:** Use appropriate tool to release the lens.

COURTESY LAMP REPLACEMENT

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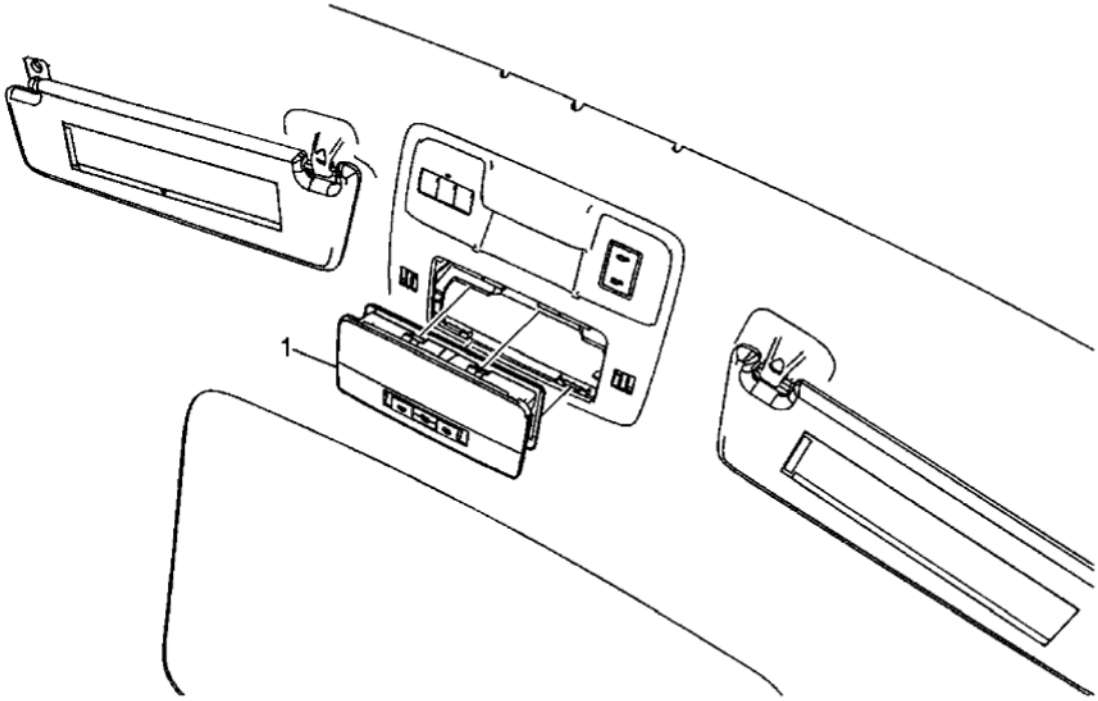


Fig. 15: Courtesy Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the dome and reading lamp lens. Refer to **Dome and Reading Lamp Lens Replacement**	
1	Courtesy Lamp **Procedure** 1. Insert a flat bladed plastic tool into slot. Depress the integral 2 tabs to remove the courtesy lamp from the roof console. 2. Disconnect the electrical connector.

DOME LAMP BULB REPLACEMENT

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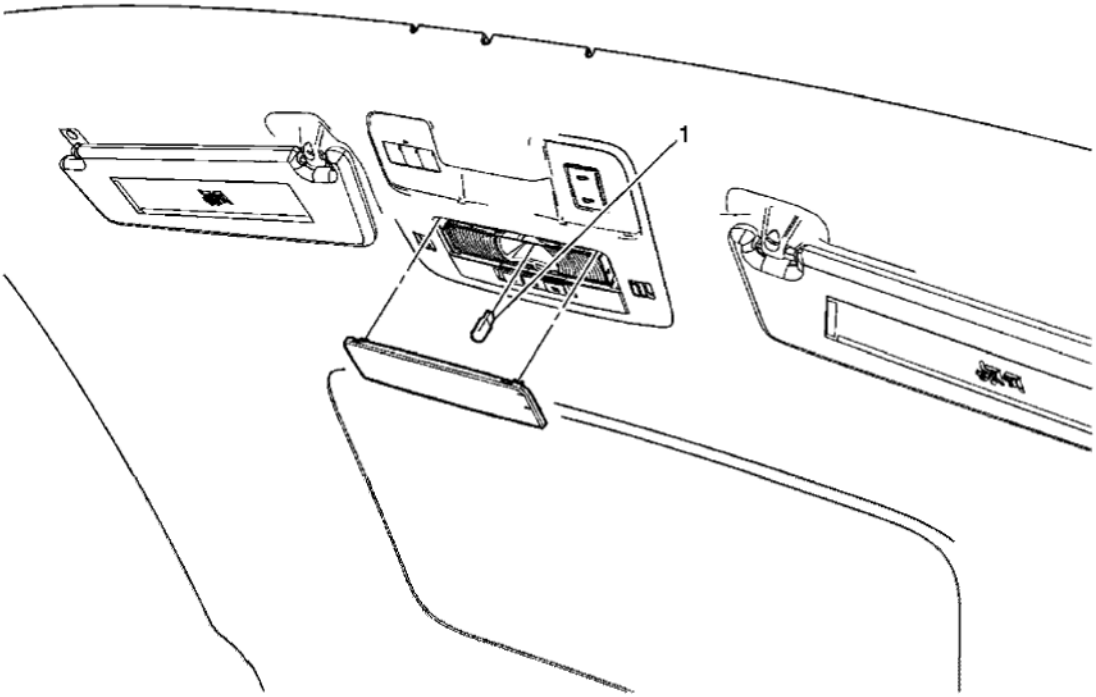


Fig. 16: Dome Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the dome and reading lamp lens. Refer to **Dome and Reading Lamp Lens Replacement**	
1	Dome Lamp Bulb

FRONT SIDE DOOR MAP POCKET ILLUMINATION LAMP REPLACEMENT

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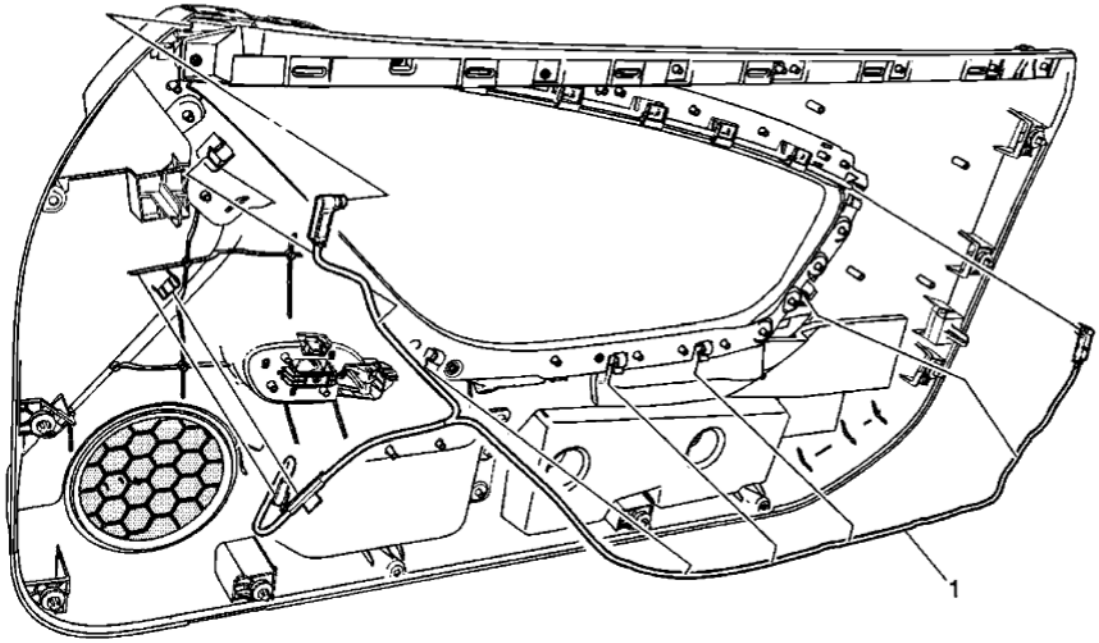


Fig. 17: Front Side Door Map Pocket Illumination Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front side door trim panel. Refer to **Front Side Door Trim Panel Replacement** .	
1	Front Side Door Map Pocket Illumination Lamp **Procedure** 1. Disconnect both ends of lamp from the light pipe. 2. Disconnect wire from eight integral clips.

HEADLAMP REPLACEMENT

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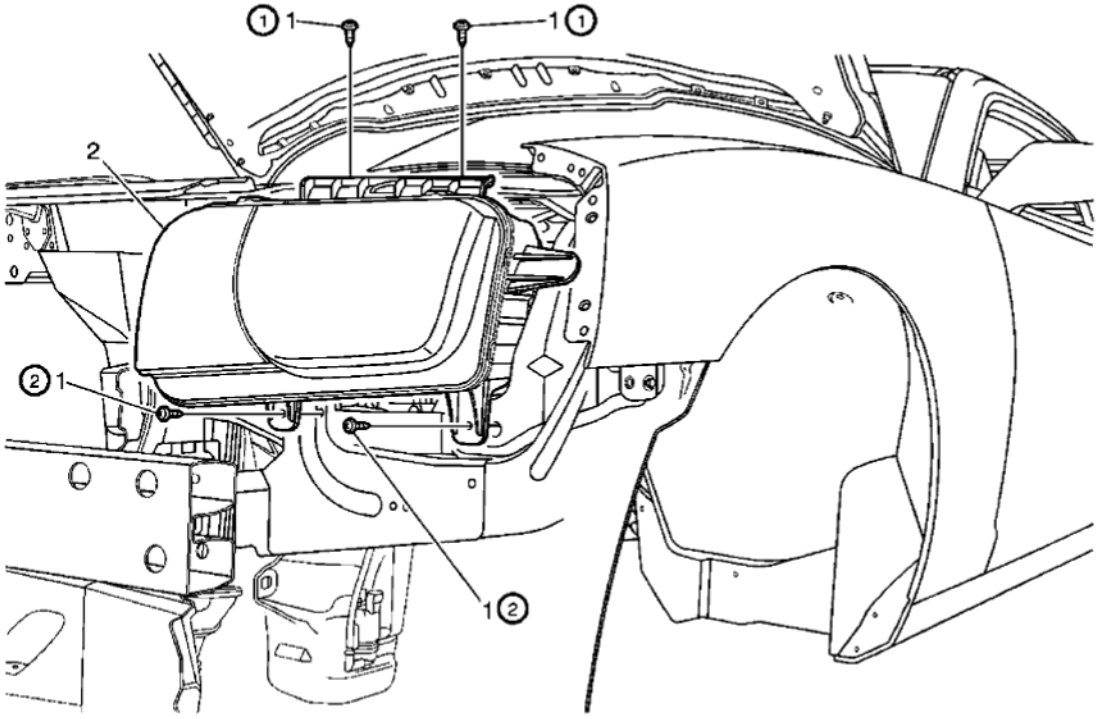


Fig. 18: Headlamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: **WARNING:** **Refer to Halogen Bulb Warning .** Remove the front bumper fascia. Refer to **Front Bumper Fascia Replacement** .	
1	Headlamp Screw (Qty: 4) **CAUTION:** **Refer to Fastener Caution .** **Tip:** Tighten the headlamp screws in the mandatory sequence as shown. **Tighten:** 2.5 N.m (22 lb in)
	Headlamp Assembly **Procedure**

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2	1. Pull the lamp assembly forward and disconnect the forward lamp electrical harness connector from the headlamp. 2. Transfer the headlamp bulbs, sockets and electrical harness into the new headlamp housing assembly. 3. Upon assembly, aim both the headlamps. Refer to **Headlamp Aiming**.

HEADLAMP BALLAST REPLACEMENT (HID)

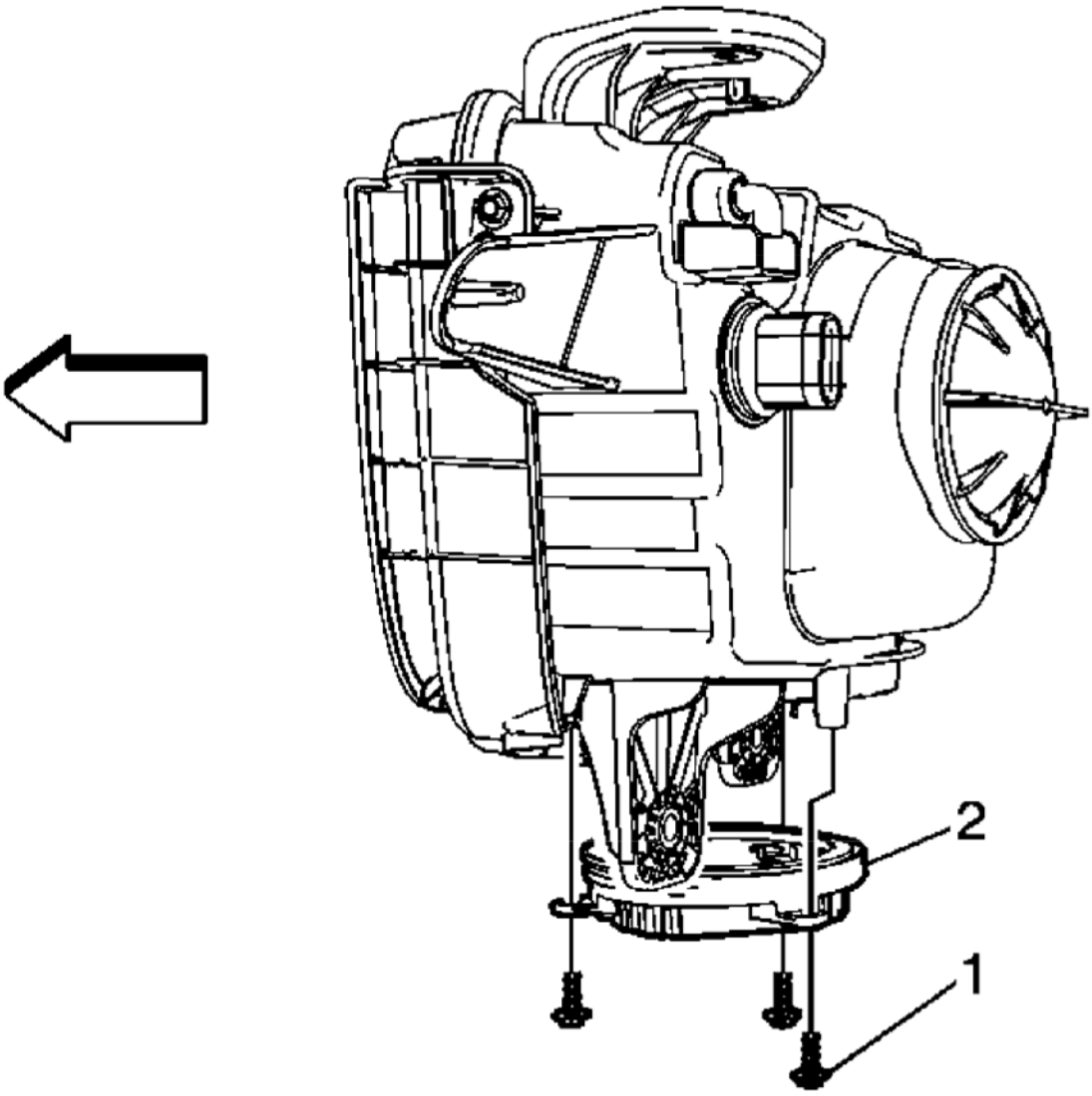


Fig. 19: Headlamp Ballast (HID)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING:	

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The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system.

WARNING:

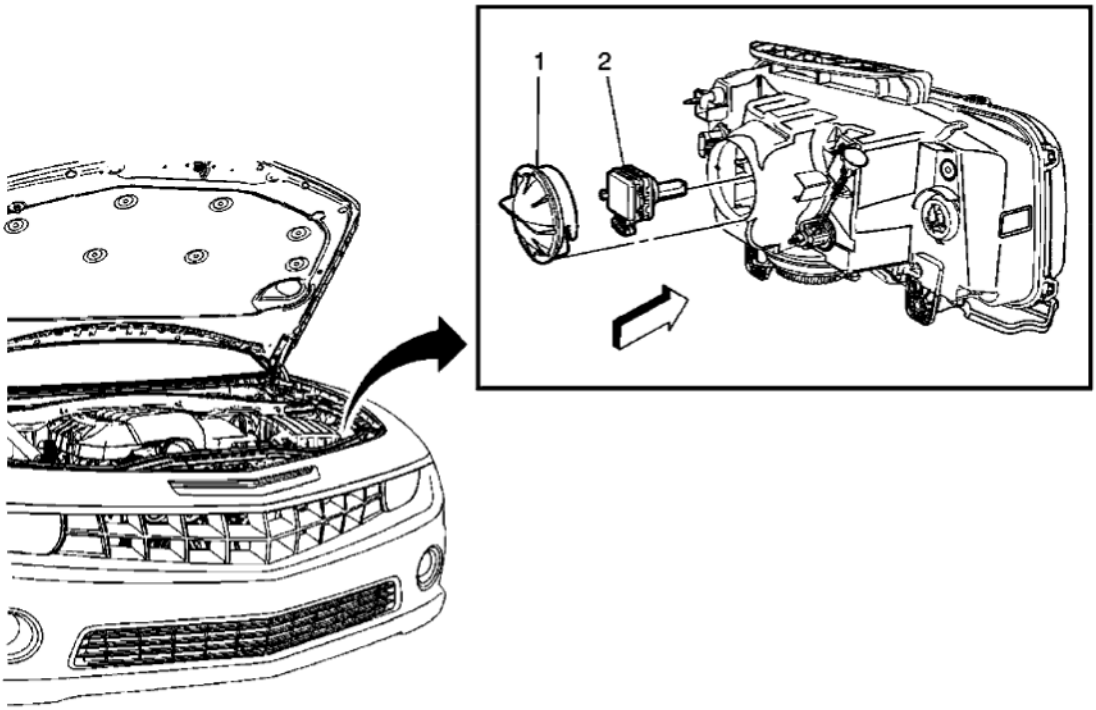
The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns:

- **Never open the high intensity discharge system ballast or the arc tube assembly starter.**
- **Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.**

Preliminary Procedure: Remove the headlamp assembly. Refer to **Headlamp Replacement**.

1	Headlamp Ballast Screw (Qty: 3) **CAUTION:** **Refer to Fastener Caution .** **Tighten:** Hand tighten the screws.
2	Headlamp Ballast **Tip:** Ensure the headlamp ballast seal is in place prior to installing the ballast onto the headlamp assembly.

HEADLAMP BULB REPLACEMENT (SS HID)



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Fig. 20: Headlamp Bulb (SS HID)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING: **The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns:** • **Never open the high intensity discharge system ballast or the arc tube assembly starter.** • **Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.** **WARNING:** **The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system.** **Preliminary Procedure:** Open and support the hood in order to access the headlamp bulb accessory covers and bulb sockets.	
1	Headlamp Bulb Accessory Cover **Tip:** Rotate the cover counter-clockwise and remove.
2	Headlamp Bulb **Procedure** 1. Disconnect the headlamp bulb electrical connector. 2. Rotate the lock ring 1/4 turn counter-clockwise. 3. Pull the HID lamp from the headlamp assembly.

HEADLAMP BULB REPLACEMENT (RS)

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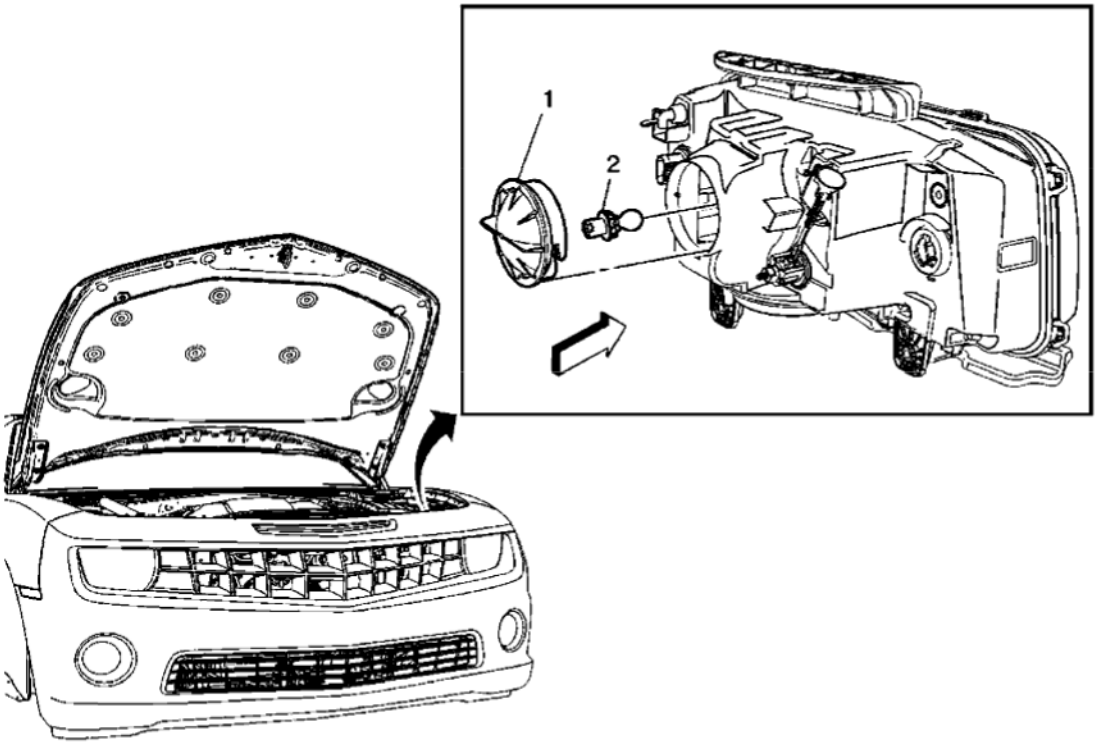


Fig. 21: Headlamp Bulb (RS)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Open and support the hood assembly in order to reach and remove the headlamp bulb accessory covers and bulb sockets.	
1	Headlamp Bulb Accessory Cover **Tip:** Rotate the cover a quarter turn counter-clockwise and remove from the headlamp assembly.
2	Headlamp Bulb Assembly **WARNING:** **Refer to Halogen Bulb Warning .** **Procedure** 1. Disconnect the electrical connector from the bulb socket. 2. Rotate the bulb socket counterclockwise and remove from the headlamp assembly.

HEADLAMP AIMING

Aiming Headlamps (Visual Aim)

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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 capsule is installed.
- If service or repairs to the front end area have (or may have) disturbed the headlamps or their mounting.
- Suspension components have been replaced or repaired.

- The area will consist of a level surface large enough to allow for a vehicle and an additional 7.62 m (25 ft) measured from face of lamps to the front of the aiming screen.
- The screen will be 1.52 m (5 ft) high x 3.66 m (12 ft) wide with a matte white surface well shaded from extraneous light, and properly adjusted to the floor on which the vehicle stands. Provisions 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, 2 laterally adjustable vertical tapes, and 1 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.

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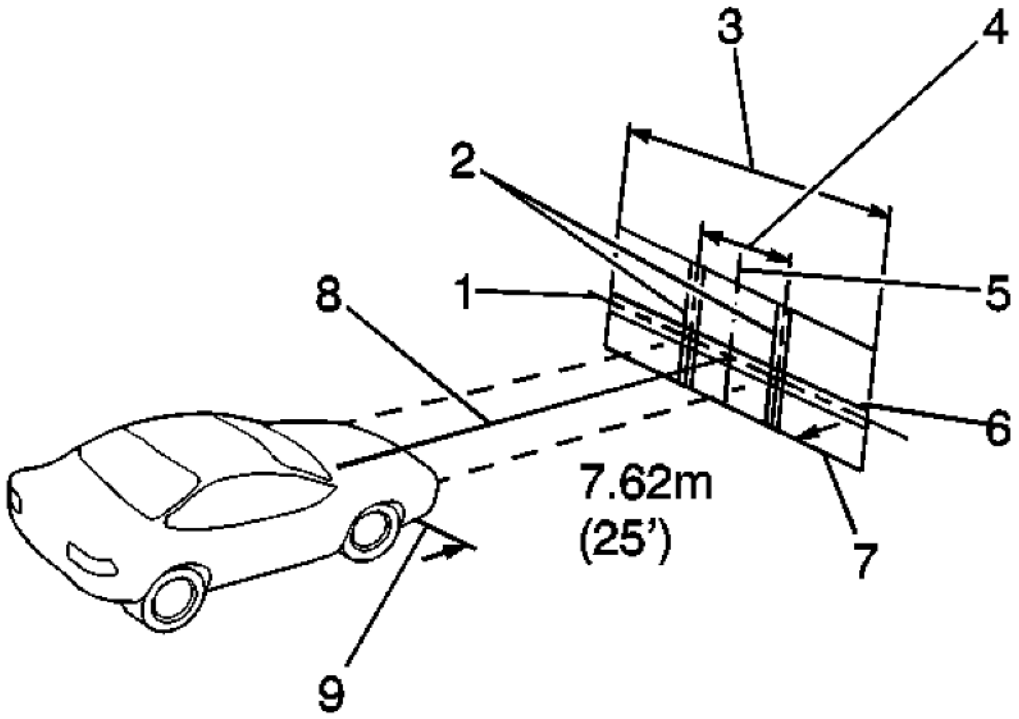


Fig. 22: Aiming Screen
Courtesy of GENERAL MOTORS CORP.

- 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 (1)
  - Center line of screen (2)
  - Adjustable vertical pointer (3)
  - Adjustable horizontal tape (4)
  - Diagram of light screen (5)
  - Vertical center line ahead of right headlamp pointer position (6)
  - 7.62 m (25 ft) (7)
  - Car centerline axis (8)

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

1. Remove any snow, ice or mud from the vehicle.

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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.

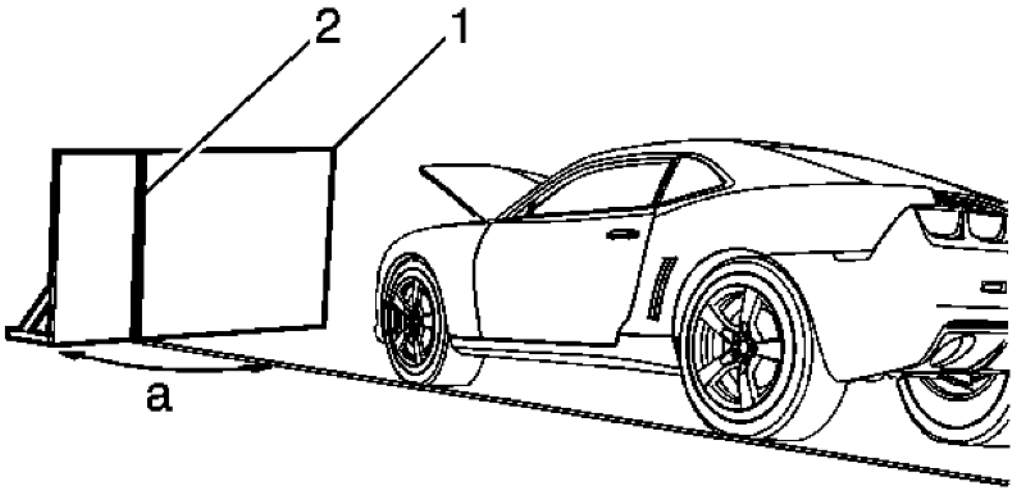


Fig. 23: Vertical Reference Line
Courtesy of GENERAL MOTORS CORP.

6. The vehicle left tires must be aligned with the reference line 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 1 person or 72.56 kg (160 lb) on the driver's 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.

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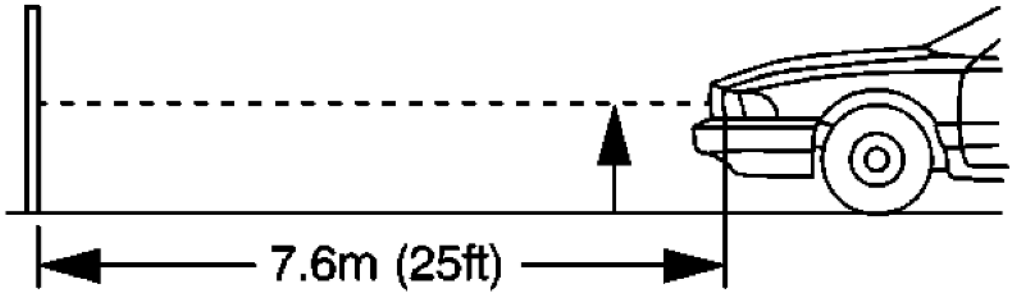


Fig. 24: Measuring Distance Between Headlamp Face & Aiming Screen
Courtesy of GENERAL MOTORS CORP.

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.

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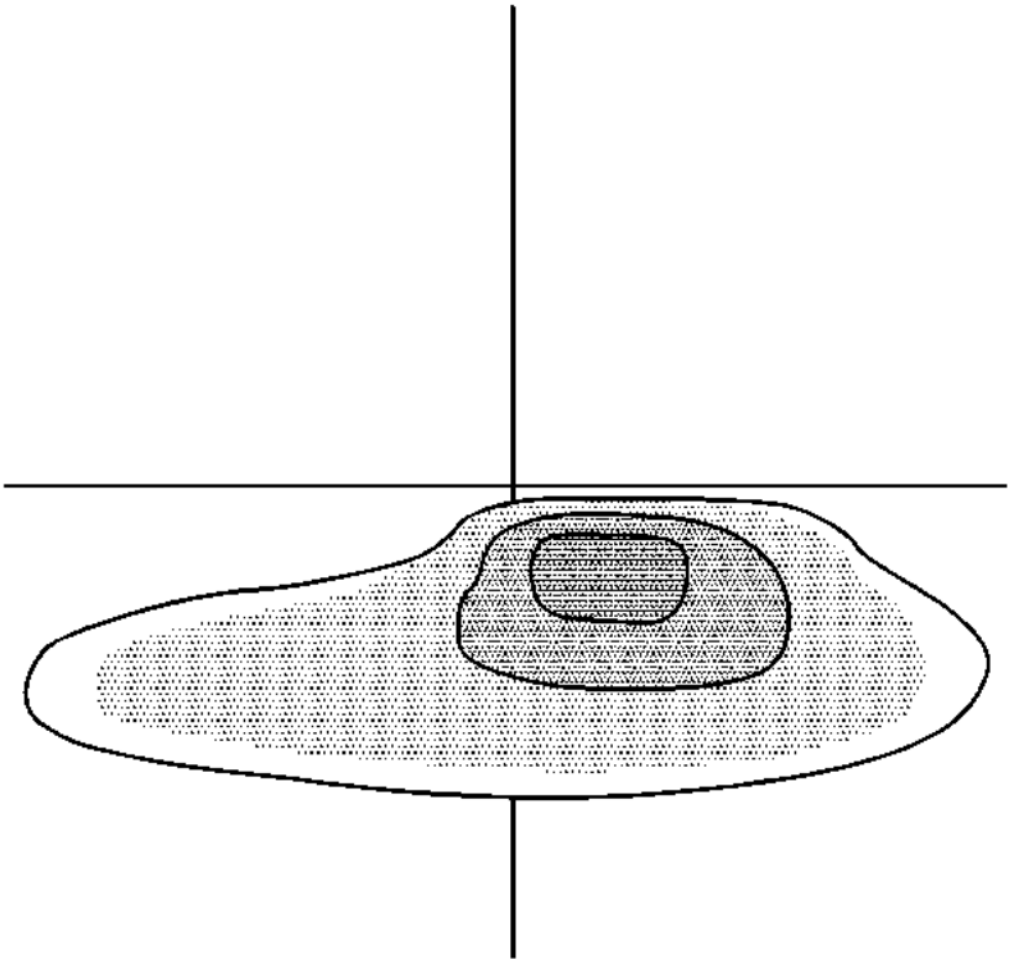


Fig. 25: Projection On Screen
Courtesy of GENERAL MOTORS CORP.

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.

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.

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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 (BASE/SS)

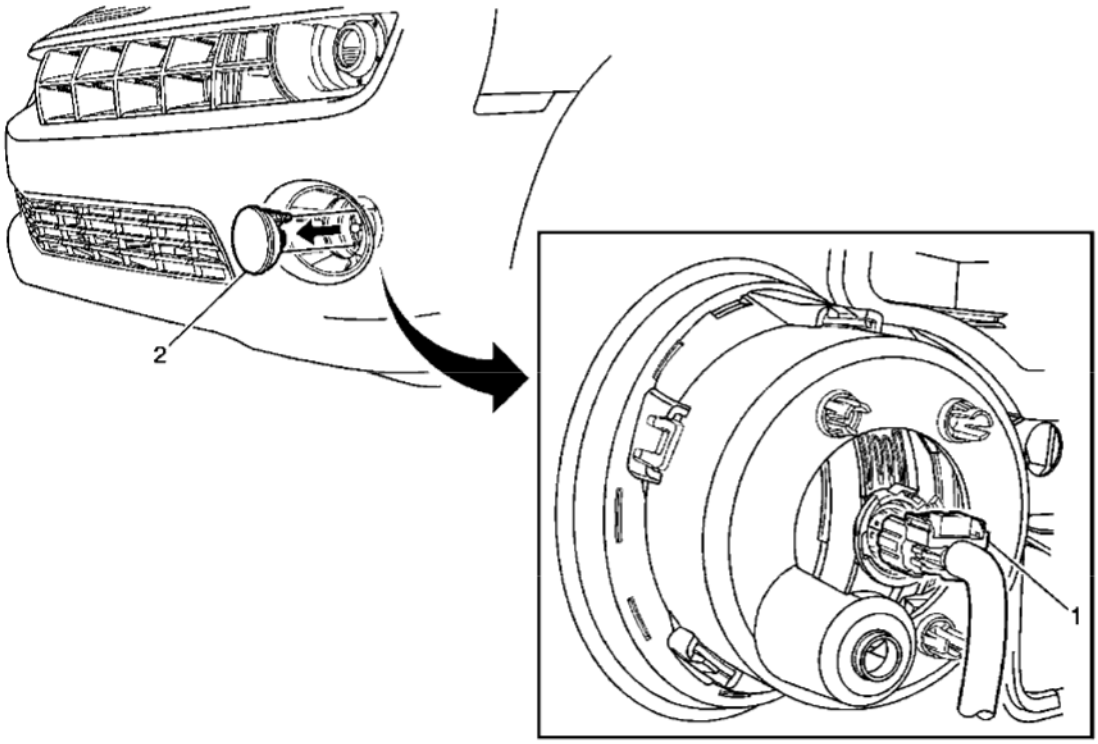


Fig. 26: Front Fog Lamp (Base/SS)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Remove the front wheel liner. Refer to **Front Wheelhouse Liner Replacement** . 2. Remove the fog lamp bezel. Refer to **Front Fog Lamp Bezel Replacement** . 3. Using a blunt tool, push outward and release the fog lamp from the three ball retainers securing the fog lamp to the front bumper fascia.	
1	Forward Lamp Harness Electrical Connector **WARNING:** **Refer to Halogen Bulb Warning .**
2	Front Fog Lamp Assembly **Tip:** Reset the ball retainers into the front bumper fascia prior to installing the fog lamp.

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FRONT FOG LAMP BULB REPLACEMENT (BASE/SS)

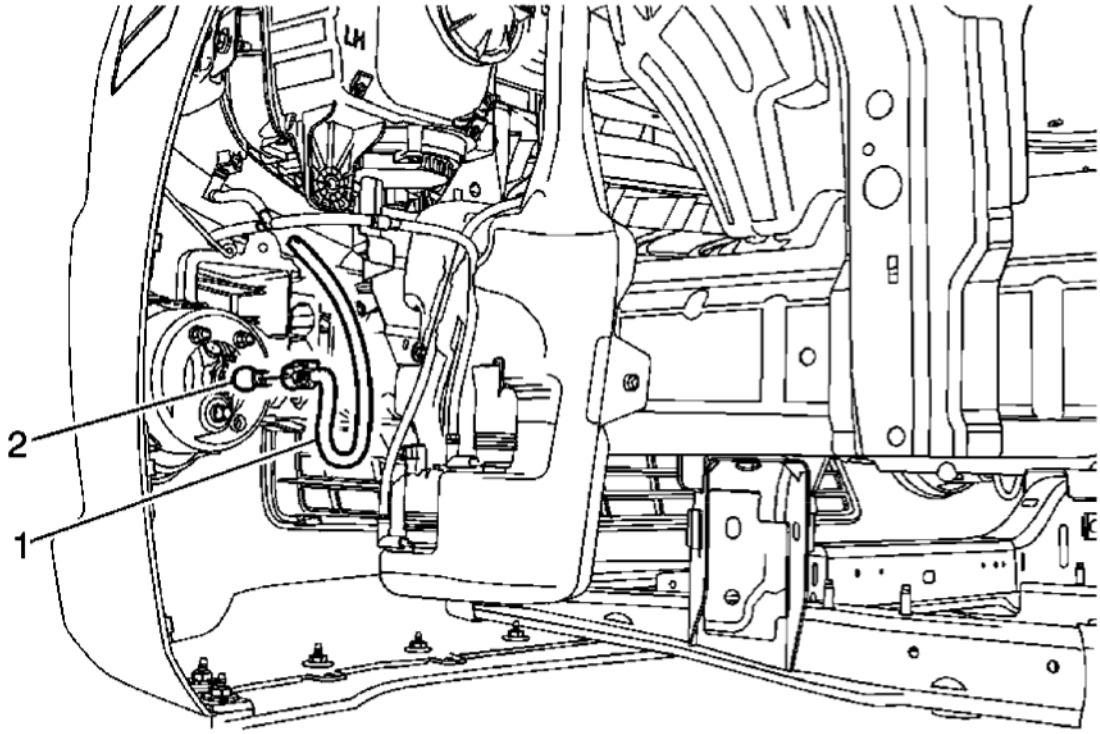


Fig. 27: Front Fog Lamp Bulb (Base/SS)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front wheelhouse liner. Refer to **Front Wheelhouse Liner Replacement** .	
1	Front Fog Lamp Electrical Connector **Tip:** Disconnect the fog lamp electrical connector from the fog lamp projector.
2	Front Fog Lamp Bulb **WARNING:** **Refer to Halogen Bulb Warning .** **Tip:** Release the fog lamp bulb from the electrical harness connector.

FOG LAMP AIMING (BASE/SS)

Adjustment Procedure

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

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vehicle which disturb the front fog lamp mounting or the vehicle ride height.

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

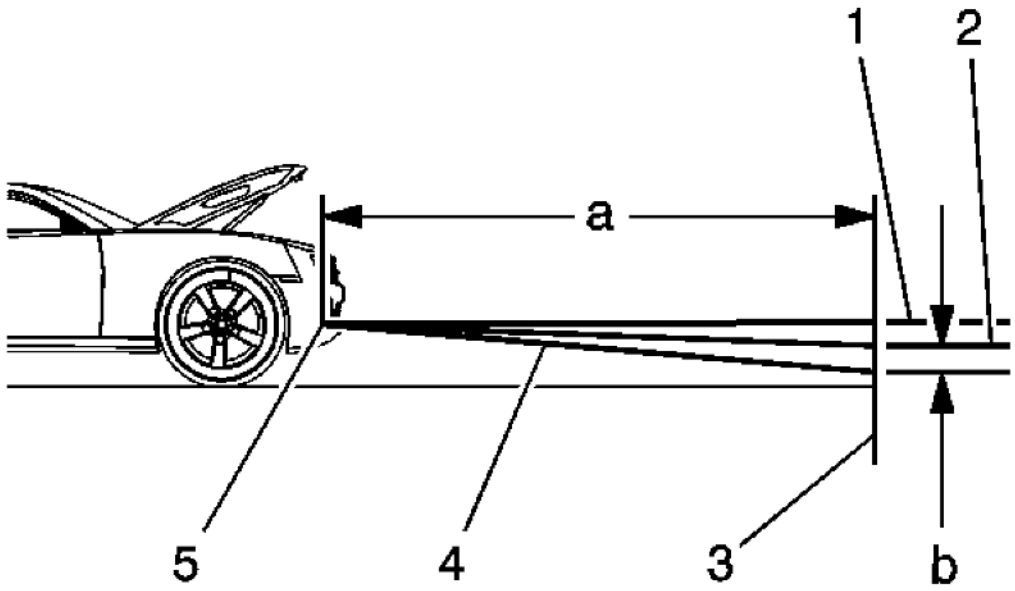


Fig. 28: Fog Lamp Aiming
Courtesy of GENERAL MOTORS CORP.

1. To ensure accurate vertical front fog lamp aiming, first perform the following steps to prepare the vehicle.
   - Make sure that all the components are in place on the vehicle, the tires are properly inflated, and there is not any mud or snow clinging to the vehicle.
   - Stop all other operations of work on the vehicle.
   - Make sure the fuel level is 1/2 full or more.
   - Jounce the vehicle to settle the suspension.
   - Place the vehicle on a level surface 7.6 m (25 ft) from the target screen.
   - Measure the distance from the floor to the center of the fog lamp (5).
   - Using this measurement, mark the horizontal centerline of the fog lamp (1) on the target screen directly in front of the vehicle.
   - Start the vehicle in order to level the electronic suspension.
   - Turn off the vehicle.
2. Turn the front fog lamps ON.
3. Loosen the lower portion of the front wheelhouse liner in order to access and adjust the fog lamp

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projector aim beam.

4. Adjust the fog lamp up or down until the top edge of the high intensity zone on the screen is 102 mm (4 in) below the horizontal centerline.
5. Turn OFF the front fog lamps.
6. Secure the lower front portion of the front wheelhouse liner.

DAYTIME RUNNING LAMP BULB REPLACEMENT (RS)

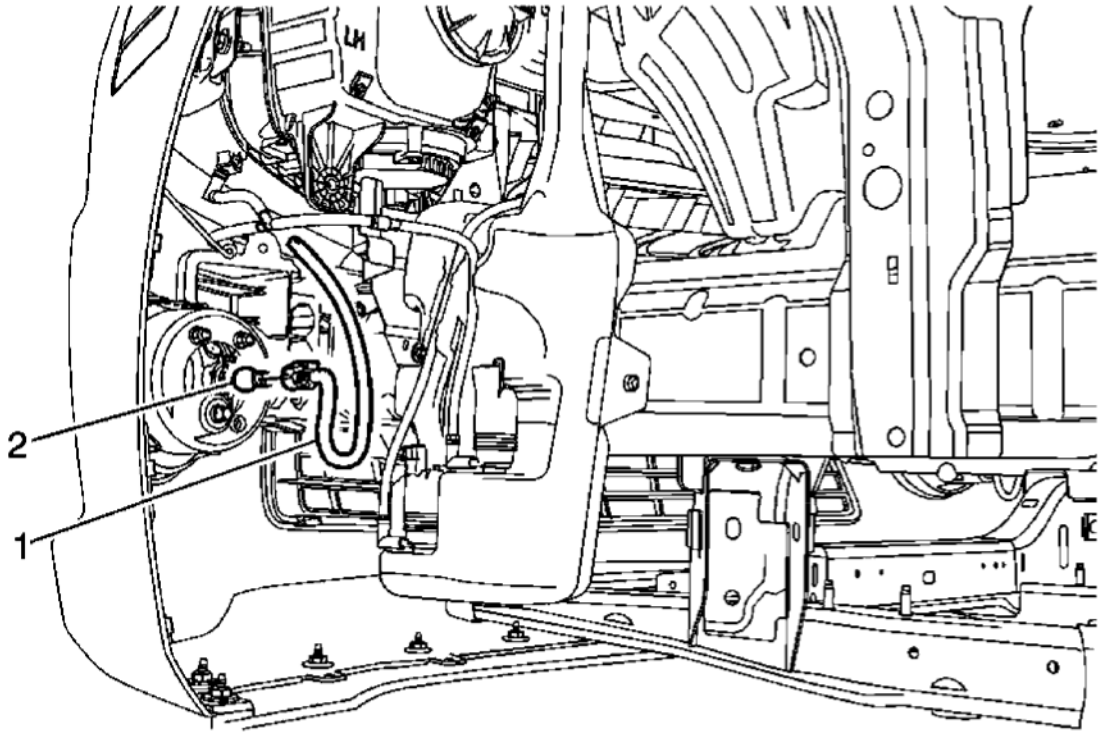


Fig. 29: Daytime Running Lamp Bulb (RS)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front wheelhouse liner. Refer to **Front Wheelhouse Liner Replacement** .	
1	Forward Lamp Harness Connector **Tip:** Disconnect the forward lamp harness connector from the daytime running lamp bulb socket.
2	Daytime Running Lamp Bulb **WARNING:** **Refer to Halogen Bulb Warning .**

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	Tip: Rotate the bulb socket counterclockwise and remove from the (DRL) lamp projector.

DAYTIME RUNNING LAMP BULB REPLACEMENT (SS)

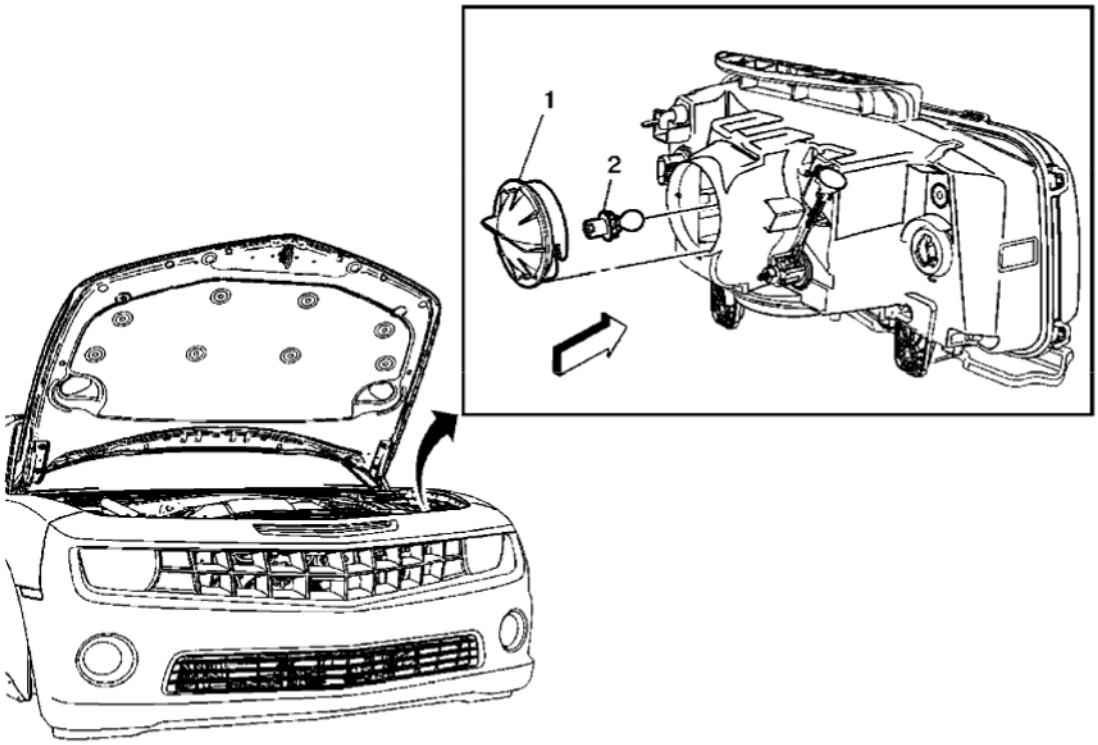


Fig. 30: Daytime Running Lamp Bulb (SS)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Open and support the hood assembly in order to reach and remove the headlamp bulb accessory covers and bulb sockets.	
1	Headlamp Bulb Accessory Cover **Tip:** Rotate the cover a quarter turn counter-clockwise and remove from the headlamp assembly.
2	Daytime Running Lamp Bulb **WARNING:** **Refer to Halogen Bulb Warning .** **Procedure** 1. Disconnect the electrical connector from the bulb socket. 2. Rotate the bulb socket counterclockwise and remove from the headlamp assembly.

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DAYTIME RUNNING LAMP REPLACEMENT (RS)

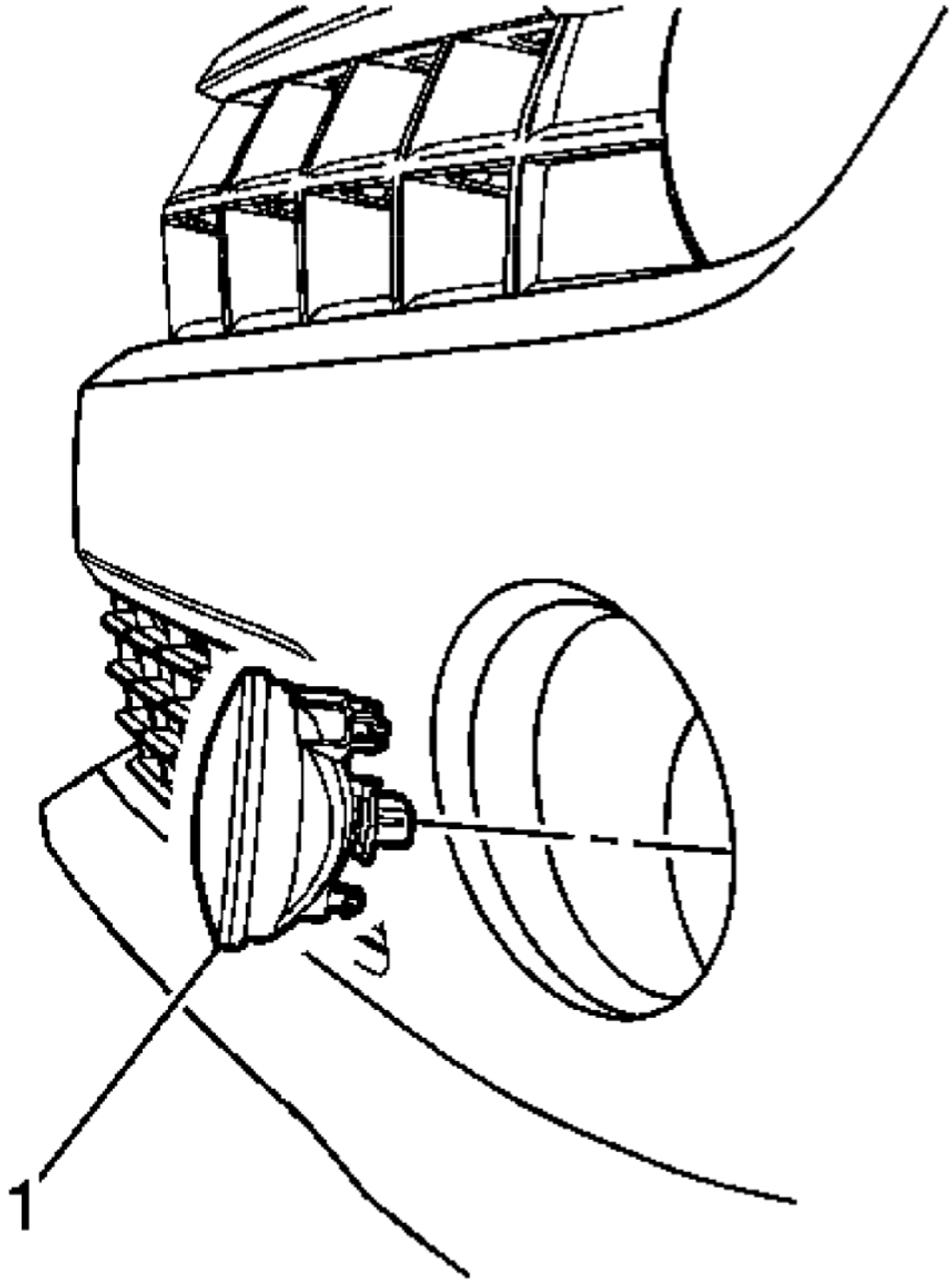


Fig. 31: Daytime Running Lamp (RS)
Courtesy of GENERAL MOTORS CORP.

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Callout	Component Name
Preliminary Procedures 1. Remove the front wheel liner. Refer to **Front Wheelhouse Liner Replacement** . 2. Disconnect the electrical connector from the daytime running lamp bulb socket. 3. Remove the fog lamp bezel. Refer to **Front Fog Lamp Bezel Replacement** .	
1	Daytime Running Lamp Assembly **Procedure** 1. Using a 10 mm, six point socket, push outward and release each of the daytime running lamp tabs from the front bumper fascia opening. 2. Position and press the lamp assembly back into the front bumper fascia opening until all three lamp assembly tabs are secure to the front bumper fascia.

FRONT SIDE MARKER LAMP REPLACEMENT

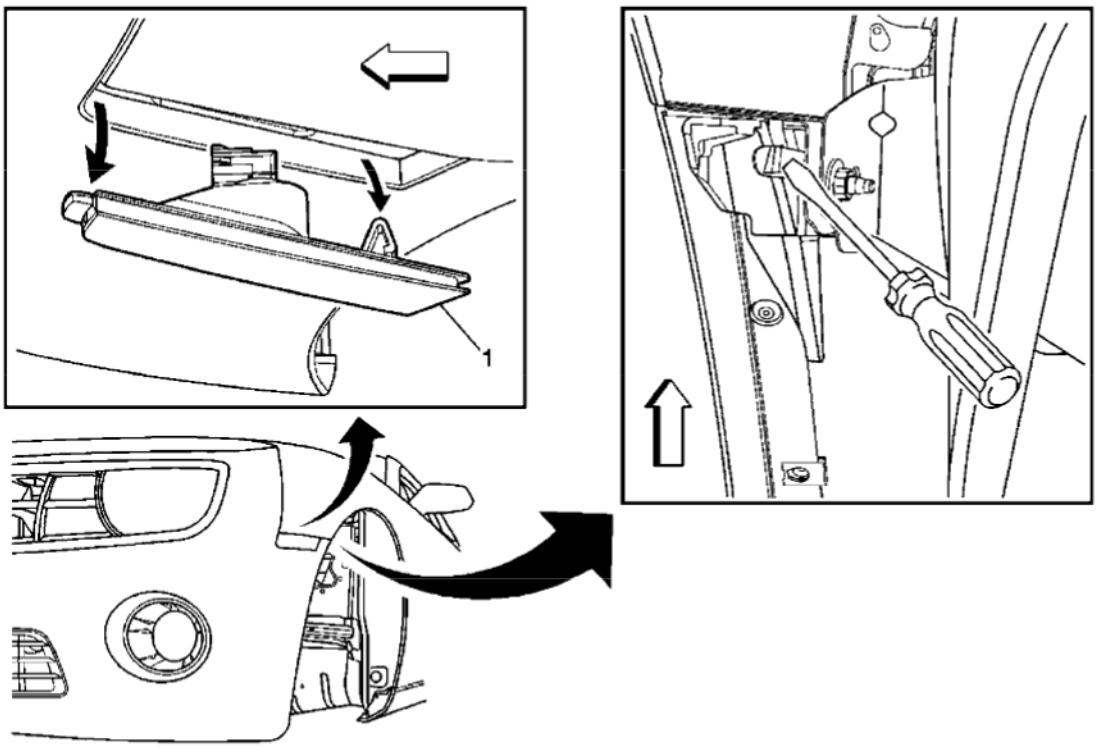


Fig. 32: Front Side Marker Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	

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1. Remove the front wheelhouse front liner. Refer to **Front Wheelhouse Liner Replacement** .
2. Insert a small flat-bladed tool into the front bumper fascia lower reinforcement in order to access the locking tab on the front marker lamp.
3. Gently push the locking tab inward in order to release lamp from the bumper fascia assembly.
4. Pull the front marker lamp outward from the front bumper fascia.

1	Front Side Marker Lamp Assembly **Tip:** Disconnect the electrical connector socket after the lamp has been removed from the front bumper fascia.

FRONT SIDE MARKER LAMP BULB REPLACEMENT

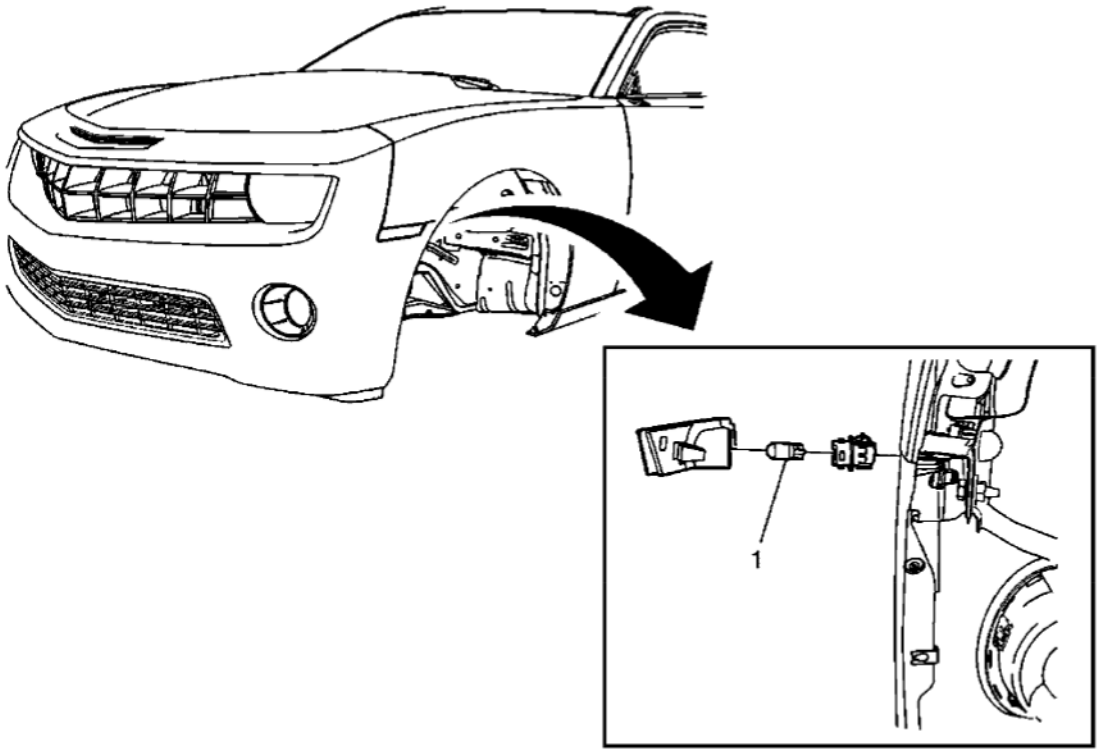


Fig. 33: Front Side Marker Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front side marker lamp assembly. Refer to **Front Side Marker Lamp Replacement**.	
1	Front Side Marker Lamp Bulb **Tip:** Pull the marker lamp bulb straight out of the lamp socket.

REAR SIDE MARKER LAMP REPLACEMENT

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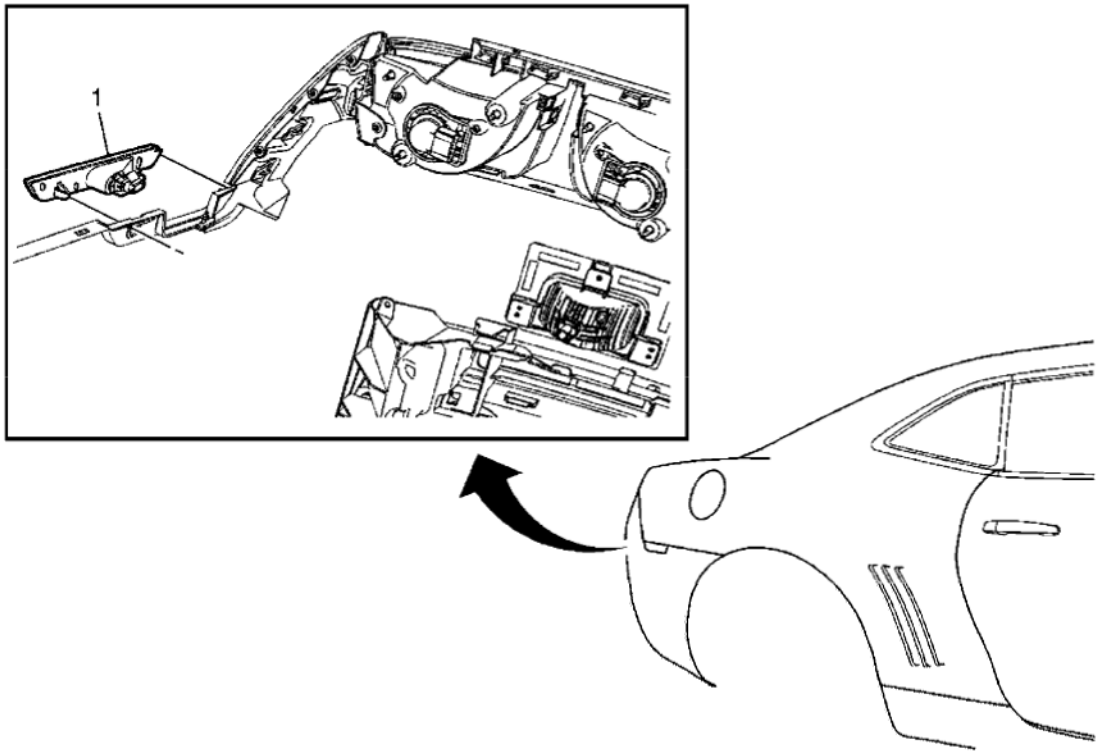


Fig. 34: Rear Side Marker Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear wheelhouse liner. Refer to **Rear Wheelhouse Panel Liner Replacement** .	
1	Rear Side Marker Lamp **Procedure** 1. Depress the forward locking tab rearward on the lamp assembly. 2. Rotate the forward edge outward from the rear bumper fascia. 3. Pull the lamp slightly forward to release the tab. 4. Disconnect the rear side marker lamp socket from the rear side marker lamp assembly.

REAR SIDE MARKER LAMP BULB REPLACEMENT

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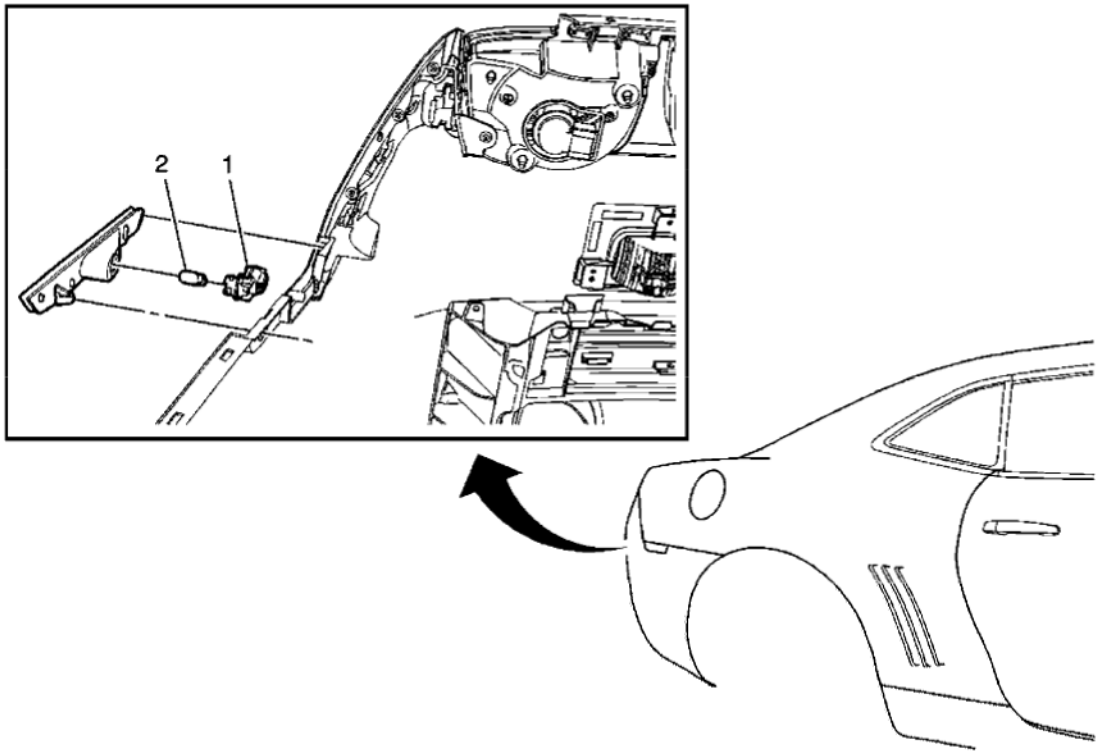


Fig. 35: Rear Side Marker Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear side marker lamp. Refer to **Rear Side Marker Lamp Replacement**.	
1	Rear Side Marker Lamp Socket **Tip:** Rotate and remove the lamp bulb socket from the lamp assembly.
2	Rear Side Marker Lamp Bulb **Tip:** Pull the bulb straight out of the lamp socket.

PARKING AND TURN SIGNAL LAMP BULB REPLACEMENT

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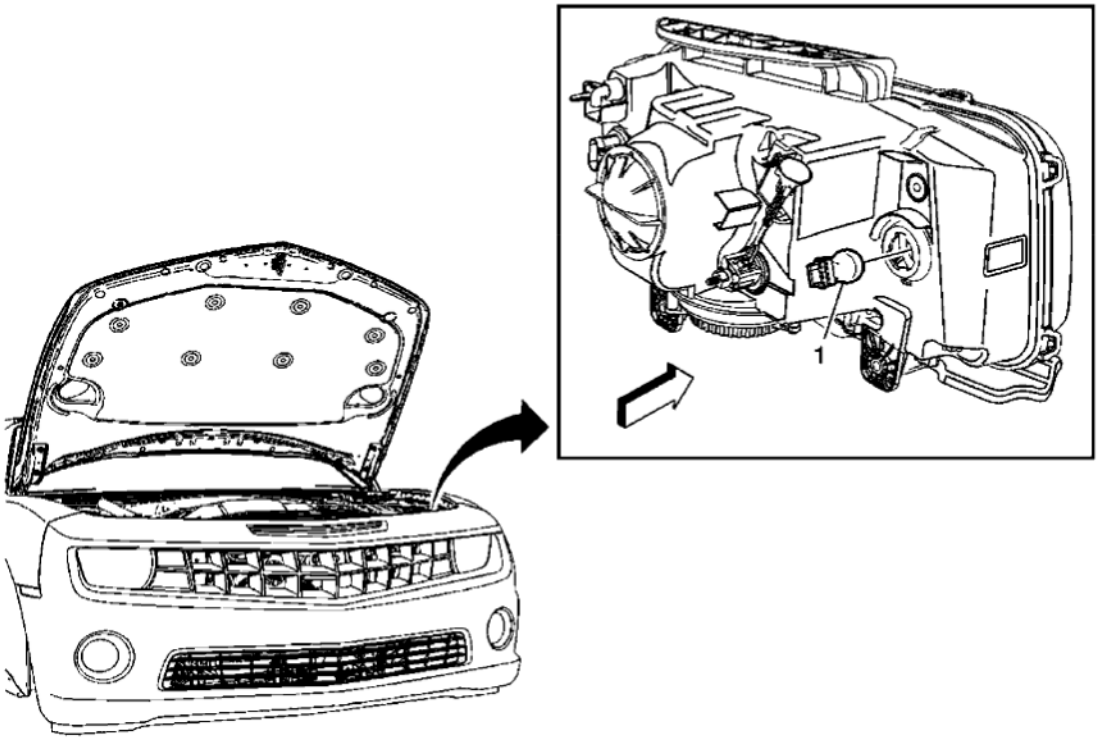


Fig. 36: Parking & Turn Signal Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the air cleaner assembly if removing the driver side park and turn signal lamp bulb. Refer to **Air Cleaner Assembly Replacement** .	
1	Park and Turn Signal Lamp Bulb **Procedure** 1. Rotate the bulb socket counter-clockwise and remove from the headlamp assembly. 2. Pull the bulb straight from the bulb socket.

HIGH MOUNT STOP LAMP REPLACEMENT

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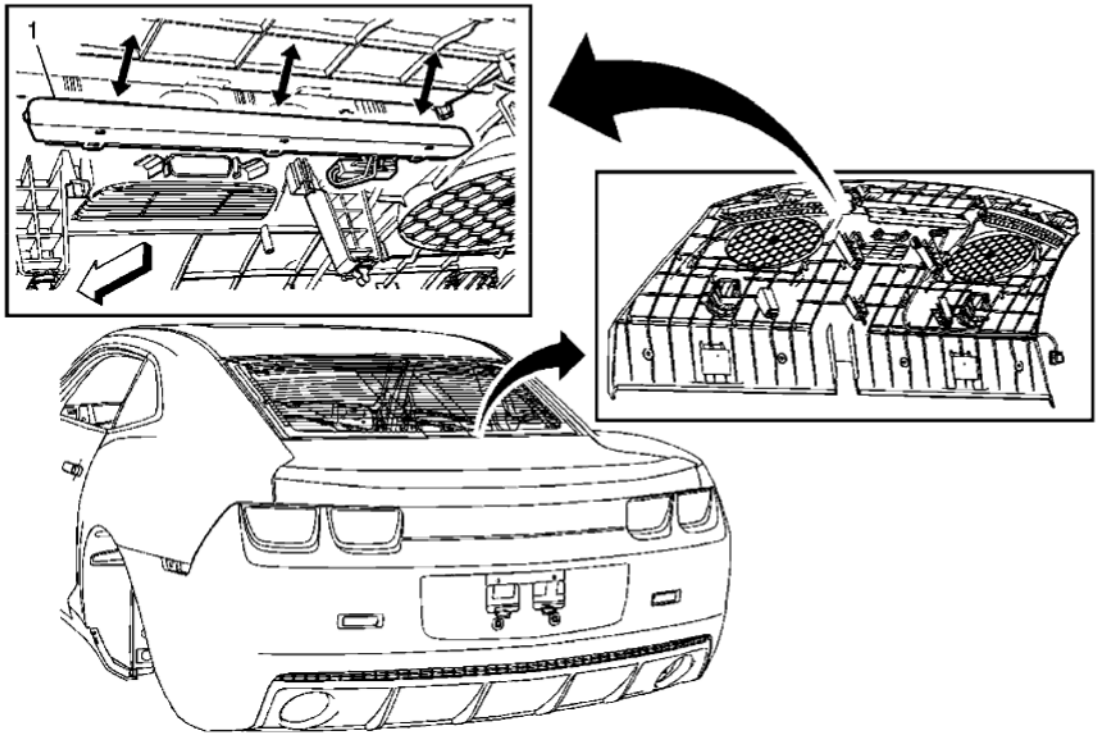


Fig. 37: High Mount Stop Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Remove the rear window panel trim. Refer to **Rear Window Panel Trim Replacement** . 2. Pull back the window panel acoustic trim filler in order to access the high mount stop lamp. 3. Disengage the high mount stop lamp electrical connector from the rear window trim panel. 4. Pull the high mount stop lamp from the rear window panel trim.	
1	High Mount Stop Lamp **Tip:** The high mount stop lamp is serviced as one part.

CARGO LAMP BULB REPLACEMENT

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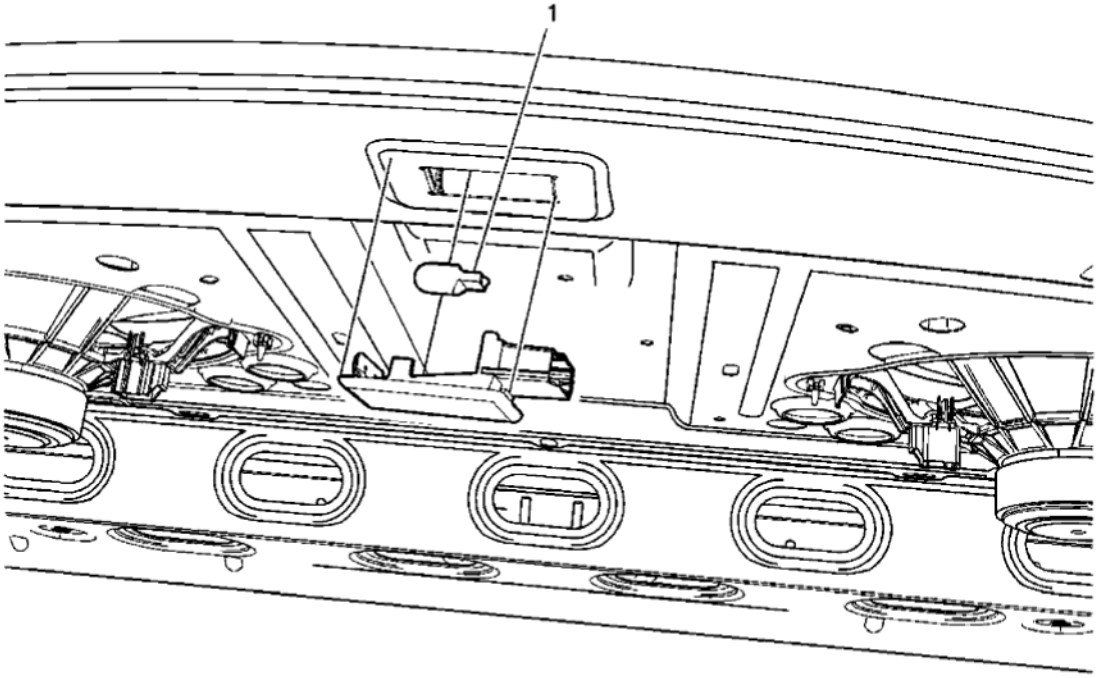


Fig. 38: Cargo Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear compartment courtesy lamp. Refer to **Rear Compartment Courtesy Lamp Replacement**.	
1	Cargo Lamp Bulb **Procedure:** Pull the bulb straight out.

BACKUP LAMP REPLACEMENT

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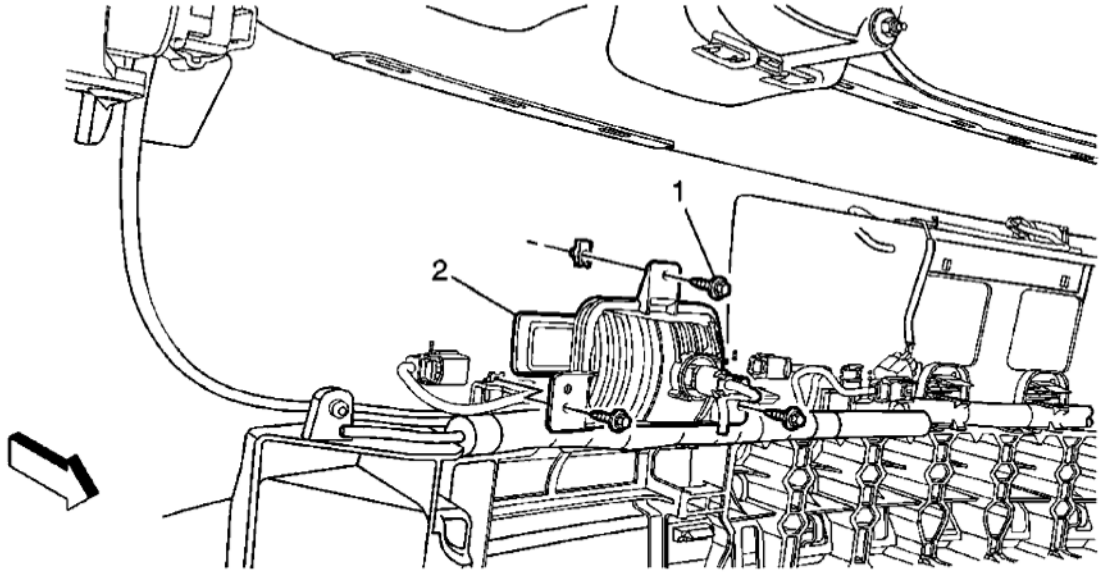


Fig. 39: Backup Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Remove the rear bumper fascia. Refer to **Rear Bumper Fascia Replacement** . 2. Disconnect the electrical connector bulb socket from the back up lamp.	
1	Back Up Lamp Screw (Qty: 3) **CAUTION:** **Refer to Fastener Caution .** **Tip:** Flex the top of the rear bumper energy absorber in order to access the lower back up lamp screws. **Tighten:** 2.5 N.m (22 lb in)
2	Back Up Lamp

BACKUP LAMP BULB REPLACEMENT

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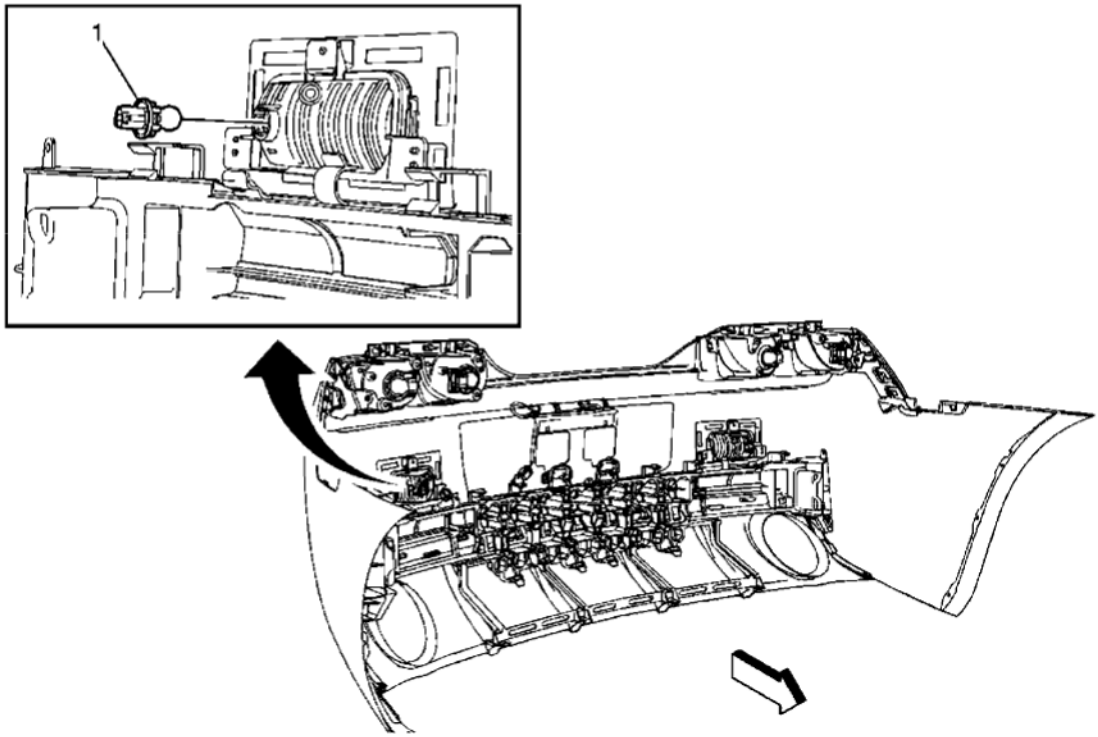


Fig. 40: Backup Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear bumper fascia. Refer to **Rear Bumper Fascia Replacement** .	
1	Back Up Lamp Bulb **WARNING:** **Refer to Halogen Bulb Warning .** **Procedure** 1. Disconnect the electrical harness connector to the bulb socket. 2. Rotate the bulb socket counter-clockwise. 3. Remove and discard the bulb socket.

REAR LICENSE PLATE LAMP REPLACEMENT

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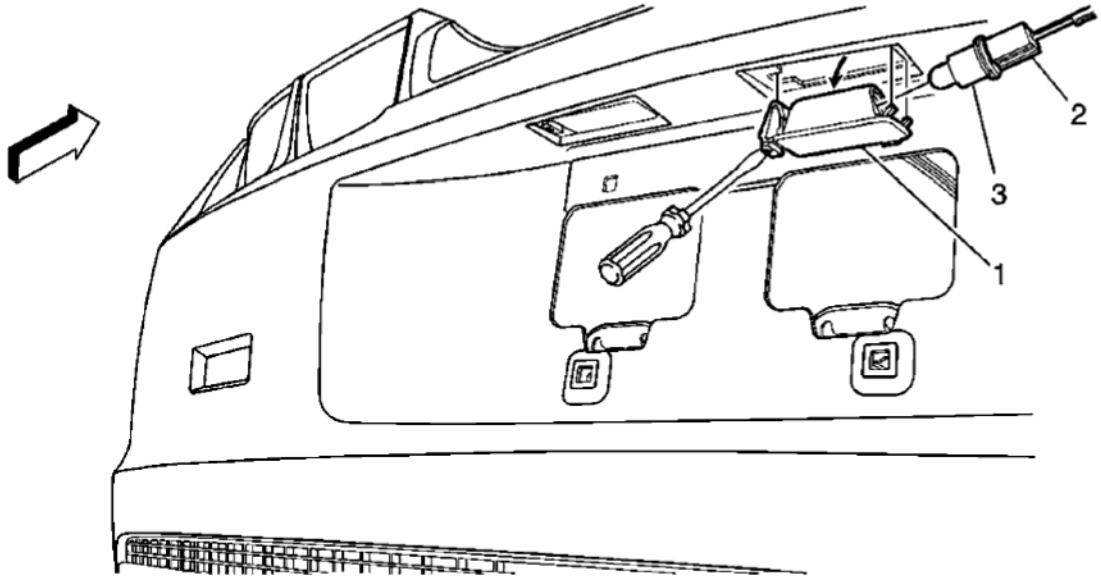


Fig. 41: Rear License Plate Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Using a small flat-bladed tool, depress the inner license plate lamp tab and rotate downward in order to remove the lamp from the rear bumper fascia.	
1	License Plate Lamp
2	License Plate Lamp Electrical Socket Connector
3	License Plate Lamp Bulb **Tip:** Replace the bulb as needed.

TAIL LAMP REPLACEMENT - INBOARD

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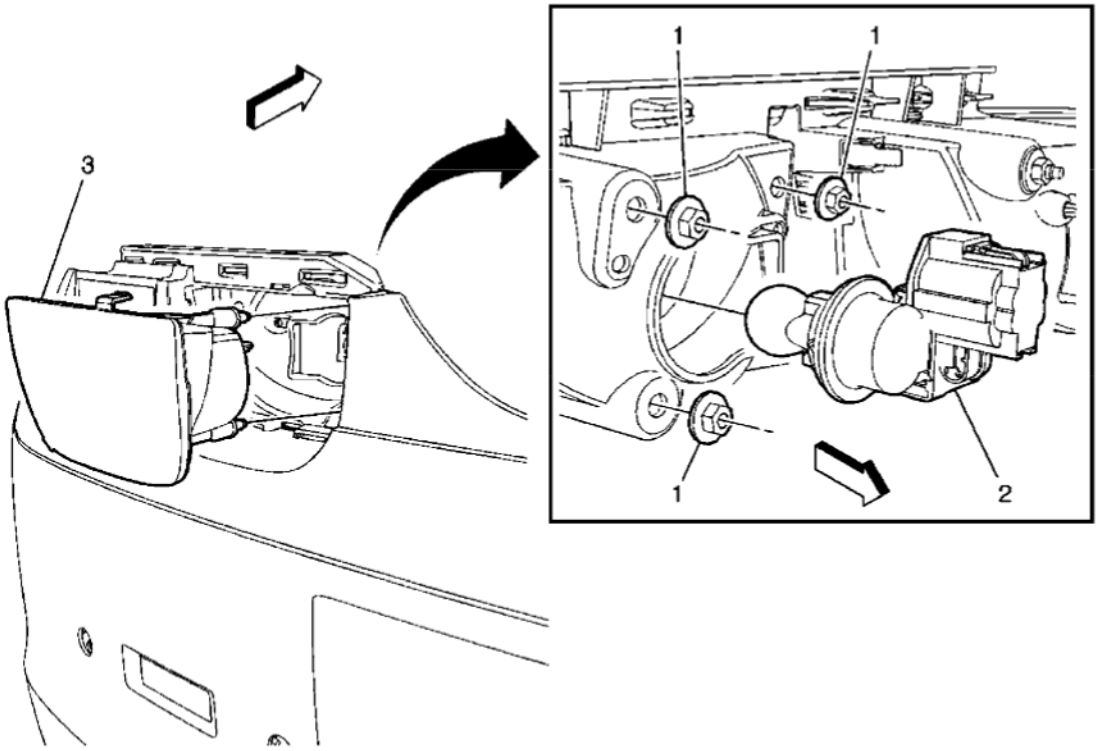


Fig. 42: Tail Lamp - Inboard
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Remove the tail lamp filler closeout panel. Refer to **Tail Lamp Closeout Filler Replacement** . 2. Remove the tail lamp bezel. Refer to **Tail Lamp Bezel Replacement** . 3. Disconnect the bulb socket from the tail lamp. 4. Remove the three tail lamp nuts. 5. Release the three locating tabs securing the tail lamp to the rear bumper fascia pocket. 6. Push the tail lamp assembly outward from the rear bumper fascia.	
1	Tail Lamp Inboard Nut (Qty: 3) **CAUTION:** **Refer to Fastener Caution .** **Tighten:** 2.5 N.m (22 lb in)
2	Tail Lamp Bulb Socket **WARNING:** **Refer to Halogen Bulb Warning .**

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3	Tail Lamp Assembly Inboard

TAIL LAMP REPLACEMENT - OUTBOARD

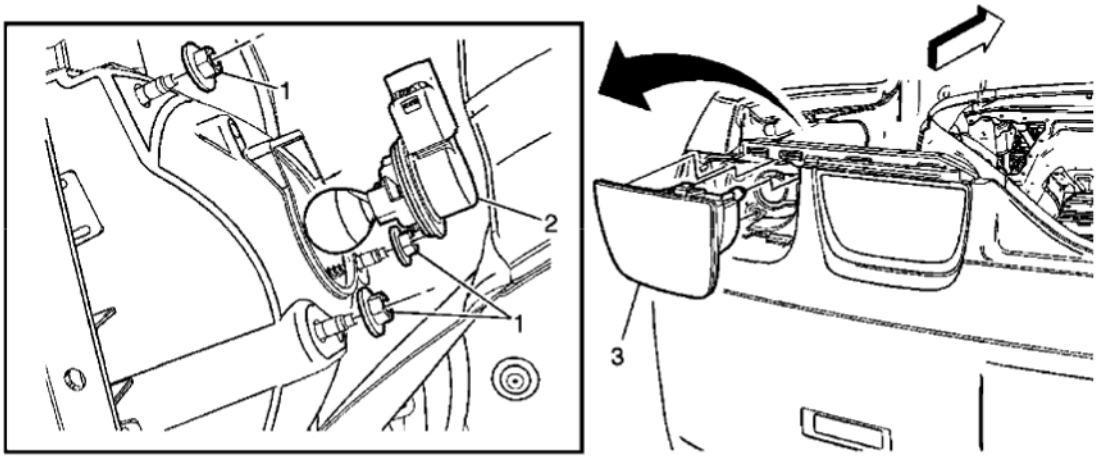


Fig. 43: Tail Lamp - Outboard
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Remove the tail lamp filler closeout panel. Refer to **Tail Lamp Closeout Filler Replacement** . 2. Remove the tail lamp bezel. Refer to **Tail Lamp Bezel Replacement** . 3. Disconnect the bulb socket from the tail lamp. 4. Remove the three tail lamp nuts. 5. Release the three locating tabs securing the tail lamp to the rear bumper fascia pocket. 6. Push the tail lamp assembly outward from the rear bumper fascia.	
1	Tail Lamp Outboard Nut (Qty: 3) **CAUTION:** **Refer to Fastener Caution .** **Tighten:** Tighten the nuts to 2.5 N.m (22 lb in)
2	Tail Lamp Bulb Socket **WARNING:** **Refer to Halogen Bulb Warning .**
3	Tail Lamp Assembly Outboard

TAIL LAMP BULB REPLACEMENT

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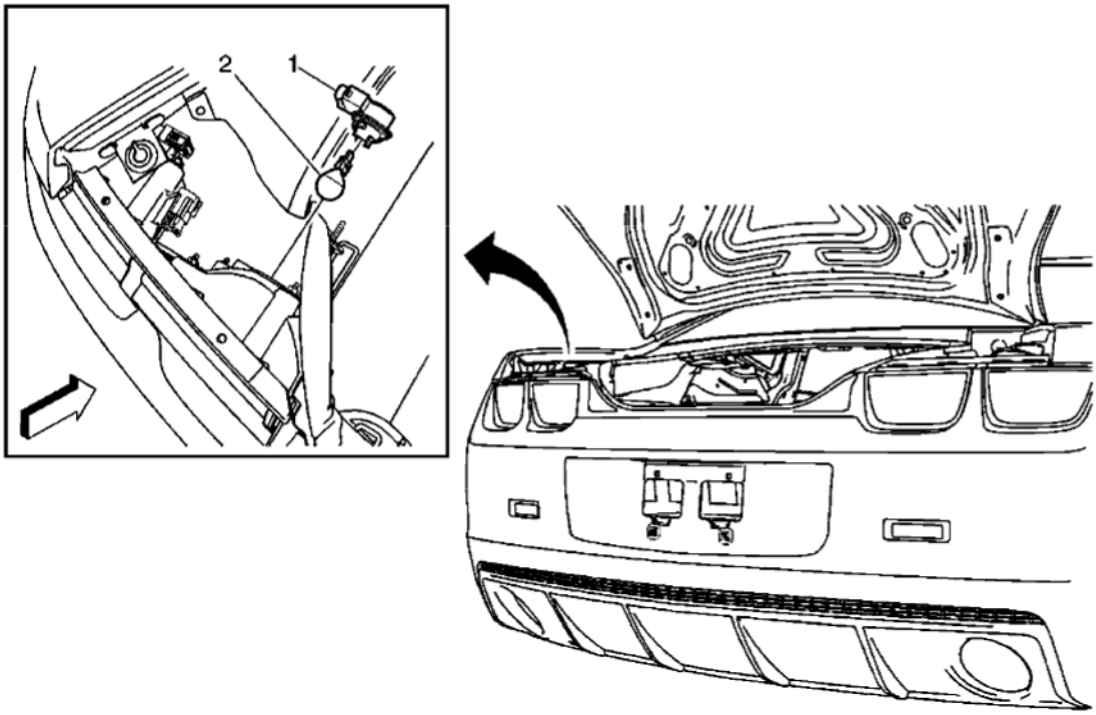


Fig. 44: Tail Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the tail lamp closeout filler panel. Refer to **Tail Lamp Closeout Filler Replacement** .	
1	Tail Lamp Bulb Socket **WARNING:** **Refer to Halogen Bulb Warning .** **Procedure** 1. Disconnect the electrical connector from the bulb socket prior to removing the socket. 2. Rotate the bulb socket counter-clockwise and remove from the tail lamp assembly.
2	Tail Lamp Bulb **Tip:** Pull the tail lamp bulb out of the tail lamp bulb electrical socket.

REAR COMPARTMENT COURTESY LAMP REPLACEMENT

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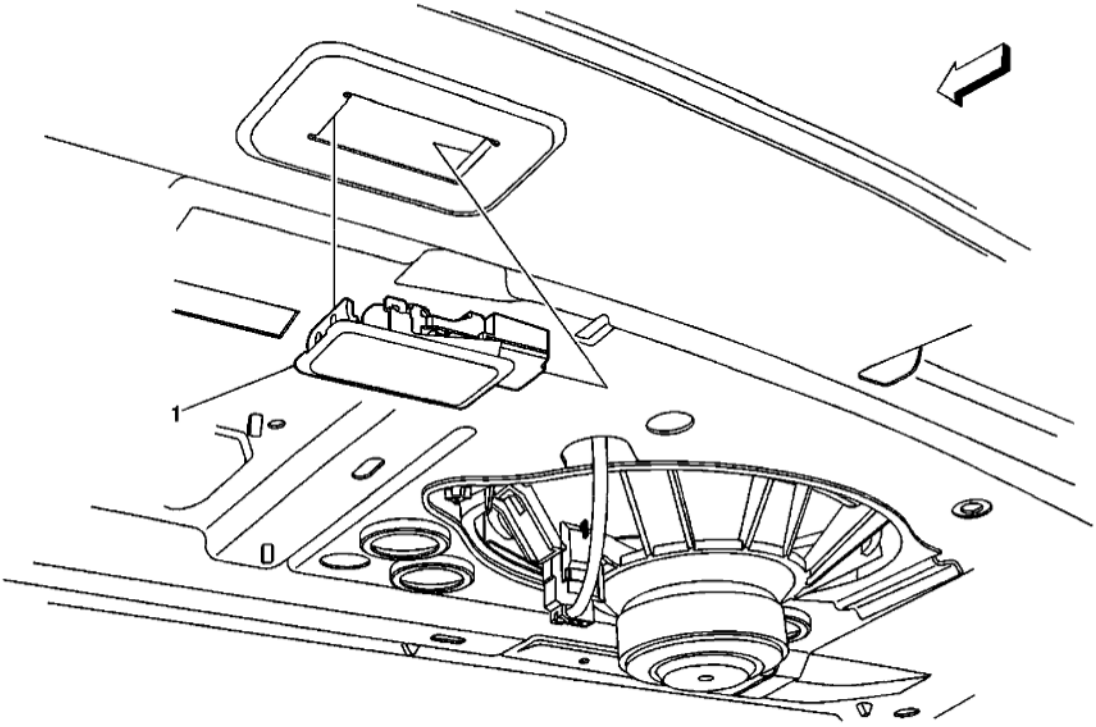


Fig. 45: Rear Compartment Courtesy Lamp
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Rear Compartment Courtesy Lamp **Procedure** 1. Open the rear compartment. 2. Remove the rear compartment lamp using a small fat bladed tool to release the retaining tabs. 3. Disconnect the electrical connector.

DESCRIPTION AND OPERATION

EXTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

Exterior Lamps

The exterior lighting system consists of the following lamps:

- The headlamps
- The front fog lamps

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- The park, tail and marker lamps
- The turn signal/hazard lamps
- The stop lamps
- The backup lamps
- The cargo lamps

Headlamps

The headlamps may be turned ON in 2 different ways. First, when the driver places the headlamp switch in the HEADLAMP position, for normal operation. Second, with the headlamp switch placed in the AUTO position, for automatic lamp control (ALC).

Headlamp ON/OFF control is determined by the body control module (BCM) by a signal on the headlamp switch on input circuit when the headlamp switch is in the HEAD position. When the headlamp switch is in the AUTO position, the BCM determines headlamps ON/OFF by the voltage from the ambient light sensor.

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

The high beam indicator is illuminated when the instrument cluster receives a GMLAN serial data message from the BCM that the high beams are illuminated.

High Beams

The high beam headlamps receive voltage from the headlamp high relay located in the underhood fuse block. The BCM controls the relay on the headlamp high beam relay control circuit. High beam control is determined by a signal on the headlamp dimmer switch high beam signal circuit from the turn signal multifunction switch. When the headlamp dimmer switch signal circuit is grounded, the BCM grounds the headlamp high beam relay control circuit, illuminating the high beam headlamps. The right and left high beam circuits are independent and are fused independently in the underhood fuse block.

Low Beams - Standard

The low beam headlamps receive voltage from the headlamp low beam relay located in the underhood fuse block. The BCM controls the relay on the headlamp low beam relay control circuit. Low beam control is activated when the headlamp switch is placed in the headlamp ON position grounding the headlamp switch headlamps on signal circuit to the BCM. The right and left low beam circuits are independent are fused independently in the underhood fuse block.

Fog Lamps

With both the ignition switch in the RUN position, and the park lamps ON, the fog lights will illuminate when the driver depresses the fog lamp switch. The BCM receives the park lamp ON signal from the interior park lamps supply voltage signal circuit. With the headlamp switch in either the park or headlamp position, and the fog lamp switch is in the ON position, the BCM will ground the fog lamp relay control circuit causing the relay

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to energize. The current flows from the fog lamp relay to both front fog lamps. The state of the fog lamps will remain the same until the fog lamp switch position is changed, or the ignition switch is cycled OFF and ON. Fog lamp operation will be cancelled whenever the park lamps are turned OFF or the high beam headlights have been selected.

Park, Tail and Marker Lamps

The park, tail and marker lamps, including the license lamps, are turned ON when the headlamp switch is placed in the PARK or HEAD position or anytime the headlights are requested. The underhood fuse block supplies battery positive voltage to both the park lamp relay switch contacts and the park lamp coil circuit. The BCM provides a ground or control circuit to the park lamp relay coil circuit. When the park lamps are turned ON, the BCM energizes the park lamp relay. If the headlight switch is left in the ON position, the inadvertent power control feature will turn OFF the park, tail and marker lamps approximately 10 seconds after the ignition switch is turned to the OFF position. If the driver places the headlight switch in the ON position after the ignition switch has been turned OFF, or if the ignition switch is in the ACCY position, the park, tail and marker lamps will remain ON until turned OFF or the battery runs flat.

Turn Signal/Hazard Lamps

When the turn signal multifunction switch is placed in either the left or right position, a ground signal is completed from the turn signal switch to the BCM. The BCM then sends an ON-OFF voltage signal through the fuses to the appropriate turn signal and side repeater lamps or to all of the turn signal fuses for hazard operation. An audio chime is also activated when the turn signals are ON. The instrument panel cluster (IPC) receives the signals to activate the turn signal indicators over the GMLAN serial data system. 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 panel cluster requesting both turn signal indicators to be cycled ON and OFF.

Stop Lamps

When the driver presses the brake pedal, the a variable voltage signal from the brake pedal position sensor (BPPS) is supplied to the BCM. The BCM then supplies voltage to stop lamp supply voltage circuit applying power to the stop lamps and center high mount stop lamp (CHMSL). The BCM also supplies voltage to the transmission control module (TCM), and powertrain control module (ECM) through a dedicated circuit.

Backup Lamps

The backup lamp request signal is sent from the ECM to the BCM on the GMLAN serial data system. This signal is based on the park neutral position (PNP) switch signal. The BCM supplies voltage to the backup relay and to the automatic day/night mirror when the vehicle is in reverse. The backup relay supplies a voltage on the backup lamp supply voltage circuit to the backup lamps.

Cargo Lamps

The cargo lamp is controlled by the trunk ajar control circuit. There is not a separate switch to turn the cargo lamps ON and OFF.

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Electrical Connections

Overloading the vehicles electrical system may damage the vehicles accessories. Do not overload the vehicles system by having unnecessary accessories at the same time.

High Intensity Discharge (HID) Low Beam Headlamps (Uplevel)

WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns:

- **Never open the high intensity discharge system ballast or the arc tube assembly starter.**
- **Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.**

Battery voltage is applied at all times to the coil and switched side of the low beam relay. Ground is applied at all times to the headlamp switch. When the headlamp switch is placed in the HEAD position, ground is applied from the headlamp switch through the headlamps ON signal circuit to the body control module (BCM). The BCM applies ground to the headlamp low beam relay control circuit. This energizes the low beam relay coil, closing the switch side contacts, and applies battery voltage to the LEFT and RIGHT LOW BEAM fuses. Battery voltage is then applied from the fuses, through the low beam voltage supply circuits to the left and right headlamp ballast located in each headlamp assembly. When battery voltage is applied to the headlamp ballast through the low beam voltage supply circuits, the ballast charge the starter to start the lamp. High intensity discharge (HID) headlamps do not have filaments like traditional bulbs, instead the starter uses a high voltage transformer to convert the input voltage into a higher voltage. This increased voltage is used in order to create an arc between the electrodes in the bulb.

Run Up Of The Lamp

Each ballast requires higher amperage in order to ensure normal startup and run up of the lamp. Run up is the term used to describe the extra power level given to the bulb. The input current during the steady state operation is lower that the start up amperage. After the lamp receives the strike from the starter and the arc is established, the ballast uses its operating voltage in order to provide the run up power needed in order to keep the lamp on. The lamp rapidly increases in intensity from a dim glow to a very high-intensity, bright light called a steady state. Within a few seconds of the arc being established in the bulb, the majority of steady state is complete. 100 percent of the steady state is completed shortly there after. A high watt power level is necessary in order to bring the lamp to a steady state in such a short period of time. The high watt power level allows the lamp to meet the SAE light vs. time specification.

When To Change The HID Bulb

Bulb failure, end of life occurs when the bulb gets old and becomes unstable. The bulb may begin shutting itself off sporadically and unpredictably at first, perhaps only once during a 24-hour period. When the bulb begins shutting itself off occasionally, the ballast will automatically turn the bulb back on again within 0.5 seconds. The ballast will re-strike the bulb so quickly that the bulb may not appear to have shut off. As the bulb ages, the bulb may begin to shut off more frequently, eventually over 30 times per minute. When the bulb begins to shut off more frequently, the ballast receives excessive, repetitive current input. Repetitive and excessive restarts or re-strikes, without time for the ballast to cool down, will permanently damage the ballast. As a safeguard, when

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repetitive re-strikes are detected, the ballast will not attempt to re-strike the lamp. The ballast then shuts down and the bulb goes out.

The following symptoms are noticeable signs of bulb failure:

- Flickering light, caused in the early stages of bulb failure.
- Lights go out, caused when the ballast detects excessive, repetitive bulb re-strike.
- Color change-The lamp may change to a dim pink glow.

Input power to the ballast must be terminated in order to reset the ballast's fault circuitry. In order to terminate the input power to the ballast, turn the lights off and back on again. Turning the lights off and back on again resets all of the fault circuitry within the ballast until the next occurrence of excessive, repetitive bulb re-strikes. When excessive, repetitive bulb re-strikes occur, replace the starter/arc tube assembly. The ballast will begin the start-up process when the starter/arc tube assembly is replaced. Repeatedly resetting the input power can overheat the internal components and cause permanent damage to the ballast. Allow a few minutes of cool-down time in between reset attempts.

Bulb failures are often sporadic at first, and difficult to repeat. Technicians can identify bulb failure by observing if the problem gets progressively worse over the next 100 hours of operation.

Light Color

White light has a different color rating than regular headlamps. The range of white light that is acceptable is broad when compared to halogens. Therefore, some variation in headlight coloring between the right and left headlamp will be normal. One high intensity discharge (HID) at the end of the normal range may appear considerably different in color from one at the other end of the range. Difference in color is normal. Replace the arc tube only if the arc tube is determined to be at the bulb failure stage.

Daytime Running Lamps (DRL) without HID

The daytime running lamps (DRL) will illuminate the right and left low beam headlamps continuously. The DRLs will operate when the following conditions are met:

1. The ignition is in the RUN or CRANK position.
2. The shift lever is out of the PARK position.
3. The high and low beam headlamps are OFF.

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 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lights (DRL) or automatic lamp control (ALC) when the headlamp switch is in the AUTO position. In daylight conditions, the BCM will command the DRLs 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 through the left and right DRL fuses to the left and right DRL lamps or low beam headlamps depending on the vehicles option content. Any function or condition

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that turns on the headlamps will cancel DRL operation.

Daytime Running Lamps (DRL) with HID

The daytime running lamps (DRL) will illuminate continuously when the following conditions are met:

1. The ignition is in the RUN or CRANK position.
2. The shift lever is out of the PARK position.
3. The high and low beam headlamps are OFF.

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 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lights (DRL) or automatic lamp control (ALC) when the headlamp switch is in the AUTO position. In daylight conditions, the BCM will command the DRLs 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 through the left and right DRL fuses to the left and right DRL lamps. Any function or condition that turns on the headlamps will cancel DRL operation.

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 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lights (DRL) or automatic lamp control (ALC) when the headlamp switch is in the AUTO position. In daylight conditions, the BCM will command the DRLs 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 through the left and right DRL fuses to the left and right DRL lamps. Any function or condition that turns on the headlamps will cancel DRL operation.

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INTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

Interior Lamps

The interior lighting consists of 3 groups. The first group includes lamps that may not be dimmed.

- Courtesy/illuminated entry lamps
- Accent lamps
- Dome lamps

Courtesy/Illuminated Entry Lamps

The courtesy/illuminated entry lamps, may be manually turned ON or OFF by placing the interior lamp switch in the ON or OFF position. If an outside door handle is lifted and a door is opened, the courtesy/illuminated entry lamps illuminate. After all the doors have been closed the courtesy/illuminated entry lamps will remain

illuminated approximately 15 seconds. The body control module (BCM) will then turn them OFF through the theater dimming feature. The courtesy/illuminated entry lamps will also turn ON prior to any door being opened, and remain illuminated approximately 40 seconds when the driver removes the ignition key. When the driver places the dome lamp defeat switch in the OFF position, the courtesy/illuminated entry lamps will be disabled.

The BCM, the door switches communicate through the GMLAN serial data circuit for the lamp illumination commands of the doors and luggage compartment open/ajar switch signals. For all vehicles, the left and right rear door latch switches are both on one circuit that is also an input to the BCM.

The left and right front door courtesy lamps receive voltage and ground from the driver door switch and the passenger door switch respectively. The remaining courtesy lamps are controlled and receive voltage from the BCM. Voltage for the courtesy lamp supply voltage circuit is from the INT LTS fuse in the instrument panel fuse block.

Accent Lamps - Driver Door, Passenger Door and Instrument Panel

The accent lamps operate very similarly to the courtesy/illuminated entry lamps. They may be manually turned ON or OFF by placing the interior lamp switch in the ON or OFF position. If an outside door handle is lifted and a door is opened, the accent lamps will illuminate. After all the doors have been closed the accent lamps will remain illuminated approximately 15 seconds. The body control module (BCM) will then turn them OFF through the theater dimming feature. The accent lamps will also turn ON prior to any door being opened, and remain illuminated approximately 40 seconds when the driver removes the ignition key.

Unlike the courtesy/illuminated entry lamps, the intensity of the accent lighting can be controlled through use of the instrument panel dimmer switch. The accent lamps will have the same lighting intensity as the other dimmable lighting.

The driver door and passenger door courtesy lamps receive voltage and ground from the driver door switch and the passenger door switch respectively.

Keyless Entry Interior Illumination

When the driver uses the door key in order to unlock the doors, the body control module (BCM) receives a door unlock signal. The BCM must have inputs or serial data messages that indicate that the ignition switch is OFF, the courtesy lamp switch is OFF and all the doors are closed. The BCM will then activate the interior lamps. The courtesy lamps will remain ON, approximately 15 seconds after the door is closed. The BCM will then turn them OFF through the theater dimming feature. If the door locks are activated to the LOCK position, or if the ignition switch is turned to either the RUN or CRANK position the courtesy lamps will turn OFF immediately.

When the driver uses the remote function actuator transmitter to unlock the doors, trunk or presses the panic button, the BCM will keep the courtesy lamps ON approximately 40 seconds. When the driver uses the remote function actuator transmitter to lock the doors, the BCM will keep the courtesy lamps on approximately 2 seconds. If the ignition switch is turned to either the RUN or CRANK position the courtesy lamps will turn OFF immediately.

Battery Rundown Protection/Inadvertent Power

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The body control module (BCM) inadvertent power supply voltage circuit provides battery positive voltage to all of the courtesy lamps and cargo lamps if equipped. In the event that any of these lamps were to remain illuminated for a period of more than 10 seconds with the ignition switch in the OFF position, the BCM will deactivate the inadvertent power supply voltage circuit to prevent a total battery discharge condition.

Interior Lamps Dimming

The second interior lighting group includes lamps which may be dimmed. This group may use a combination of LED illumination and incandescent lamps.

When the ignition switch is turned to the RUN position, the radio VF display turns ON at maximum brightness. When the park lamps are ON, all incandescent and LED back lighting turn ON at the dimming level indicated by the instrument panel (I/P) dimmer switch. At the same time all VF displays dim to match the indicated dimming level. The panel dimmer switch potentiometer is an input to the body control module (BCM). When the driver selects a dimming setting by moving the I/P dimming switch potentiometer, all incandescent back lighting lamps are provided with a specific voltage. When the I/P dimmer switch is moved from MIN to MAX, all VF displays, as well as all incandescent back lighting respond from minimum intensity to maximum brightness in response to the I/P dimmer switch.

The following switches and components have back lighting when the park lamps are ON:

- The instrument panel cluster (IPC)
- Window and heated seat switches
- Sunroof switch
- Accessory switches
- Fog lamp switches
- Rear parking assist (RPA) disable switches
- PRNDL lamps
- Traction control switch
- Steering wheel control switches

The left and right front door switch illumination is controlled, receives voltage and ground from the driver door switch and passenger switch respectively. The radio is also a GMLAN module and has full control of its illumination. The BCM, door switches, and radio communicate through GMLAN serial data for the lamp illumination commands.

The various switches, HVAC control assembly, and the PRNDL lamps receive voltage and are controlled by the BCM on the I/P lamps dimming control circuit.

The following indicators receive voltage from the BCM and are controlled by ground from a switch or from various modules:

- Radio
- HVAC control assembly
- Instrument panel cluster (IPC)

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- Driver information center (DIC)
- Headlamp and panel dimmer switch

The indicators receive voltage from the BCM on the LED dimming circuit. Control for the indicators is from the various modules or switches. Voltage for the LED dimming supply circuit, instrument panel lamps dimming control circuit and the instrument panel lamps dimming supply circuit is from the BCM.

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GENERAL INFORMATION

Chevrolet - Cars - 1980-11

FUEL FILTER LIFE

NOTE: To determine the appropriate reset procedure, refer to Fuel Filter Life Reset Index. Only vehicles listed in this index have a fuel filter life reset.

FUEL FILTER LIFE RESET INDEX

Application	Reset Procedure
Some Models	Fuel Filter Life Reset - Procedure 1

NOTE: ALWAYS reset the FUEL FILTER LIFE system (if equipped) after a fuel filter change.

"FUEL FILTER LIFE" message will appear when a reset is performed either by using the steering wheel controls or performing manual reset procedure.

FUEL FILTER LIFE RESET - PROCEDURE 1

1. On vehicles with steering wheel controls, press and hold the select button for 5 seconds while the FUEL FILTER LIFE message is displayed. This message will appear on the Driver Information Center (DIC) for 10 seconds.
2. On vehicles without steering wheel controls, go to next step.
3. Without pressing the pedals, turn the ignition key to the ON position, engine off. Wait 5 seconds.
4. Completely depress the brake and accelerator pedals simultaneously and hold for 10 seconds. The system is now reset. Turn ignition key OFF.
5. On all vehicles, the next time engine is started, the message will no longer be displayed.

OIL CHANGE REMINDER

NOTE: Most 1981-88 General Motors vehicles do not use a Service Reminder Indicator (SRI).

NOTE: To determine the appropriate reset procedure, refer to Oil Change Reminders Reset Index. Only vehicles listed in this index have an oil change reminder reset.

OIL CHANGE REMINDERS RESET INDEX

Model & Year	Reset Procedure
Aveo	
2009-11	Oil Change Reminder Reset - Procedure 3

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Camaro	
1998-02	**Oil Change Reminder Reset - Procedure 1**
2010-11	**Oil Change Reminder Reset - Procedure 18**
Caprice	
1994	**Oil Change Reminder Reset - Procedure 2**
1995-96	**Oil Change Reminder Reset - Procedure 3**
2011	**Oil Change Reminder Reset - Procedure 6**
Classic	
2005	**Oil Change Reminder Reset - Procedure 4**
Cobalt & G5 Pursuit (Canadian)	
2005-09	**Oil Change Reminder Reset - Procedure 4**
Corvette	
1990-96	**Oil Change Reminder Reset - Procedure 5**
1997-04	**Oil Change Reminder Reset - Procedure 6**
2005-11	**Oil Change Reminder Reset - Procedure 7**
Cruze	
2011	**Oil Change Reminder Reset - Procedure 20**
Impala	
2000-01	**Oil Change Reminder Reset - Procedure 8**
2002-04	**Oil Change Reminder Reset - Procedure 9**
2005-06	**Oil Change Reminder Reset - Procedure 10**
2007-11	**Oil Change Reminder Reset - Procedure 11**
Lumina	
1997-01	**Oil Change Reminder Reset - Procedure 12**
Malibu	
2004-07	**Oil Change Reminder Reset - Procedure 13**
2008-11	**Oil Change Reminder Reset - Procedure 19**
Monte Carlo	
1997-99	**Oil Change Reminder Reset - Procedure 12**
2000-01	**Oil Change Reminder Reset - Procedure 14**
2002-04	**Oil Change Reminder Reset - Procedure 15**
2005-06	**Oil Change Reminder Reset - Procedure 16**
2007-08	**Oil Change Reminder Reset - Procedure 17**
Volt	
2011	**Oil Change Reminder Reset - Procedure 21**

OIL CHANGE REMINDER RESET - PROCEDURE 1

1. The CHANGE OIL (or CHANGE ENGINE OIL) message is displayed when its time to change engine oil, usually between 3000 and 7500 miles since last oil change.
2. To reset the oil life monitor, turn the ignition switch to RUN position, with engine off. Press the TRIP/OIL RESET button on the instrument panel for 12 seconds. The OIL CHANGE light will start to

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flash to confirm that system is reset. Reset is complete when OIL CHANGE light goes out.

OIL CHANGE REMINDER RESET - PROCEDURE 2

1. Engine oil life monitor calculates engine oil temperature and RPM. It indicates when the engine oil is nearly worn out. A CHANGE OIL light on the instrument cluster is illuminated when it is time to change the engine oil.
2. To reset CHANGE OIL light, press reset switch located behind fuse block access door.

OIL CHANGE REMINDER RESET - PROCEDURE 3

Engine oil life monitor calculates engine oil temperature and RPM. It indicates when the engine oil is nearly worn out. A CHANGE OIL light on the instrument cluster is illuminated when it is time to change the engine oil.

1. To reset oil life monitor and turn off CHANGE OIL light, turn ignition switch to ON position with engine off.
2. Depress accelerator pedal to wide open throttle 3 times within 5 seconds. This throttle signal will inform the PCM to reset the oil life monitor and turn off the light. If light does not turn off, turn ignition off and repeat procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 4

When the system has calculated that oil life has been diminished, it will indicate that an oil change is necessary. A CHANGE ENGINE OIL SOON message will come on. Change the engine oil as soon as possible within the next 600 miles (1 000 km). It is possible that, if driving under the best conditions, the oil life system may not indicate that an oil change is necessary for over a year. However, the engine oil and filter must be changed at least once a year and at this time the system must be reset.

1. Turn the ignition to RUN with the engine OFF.
2. Press the information (INFO) and RESET buttons on the Driver Information Center (DIC) at the same time to enter the personalization menu.
3. Press the INFO button to scroll through the available personalization menu modes until the DIC display shows OIL-LIFE RESET.
4. Press and hold the reset button until the DIC display shows ACKNOWLEDGED. This will tell you the system has been reset.
5. Turn the key to LOCK.

OIL CHANGE REMINDER RESET - PROCEDURE 5

Engine oil life monitor calculates engine oil temperature and RPM. It indicates when the oil is nearly worn out. A CHANGE OIL light on left side of instrument cluster is illuminated when it is time to change oil. To reset oil life monitor:

1. Turn ignition on.
2. Depress ENG MET button on trip monitor and release.

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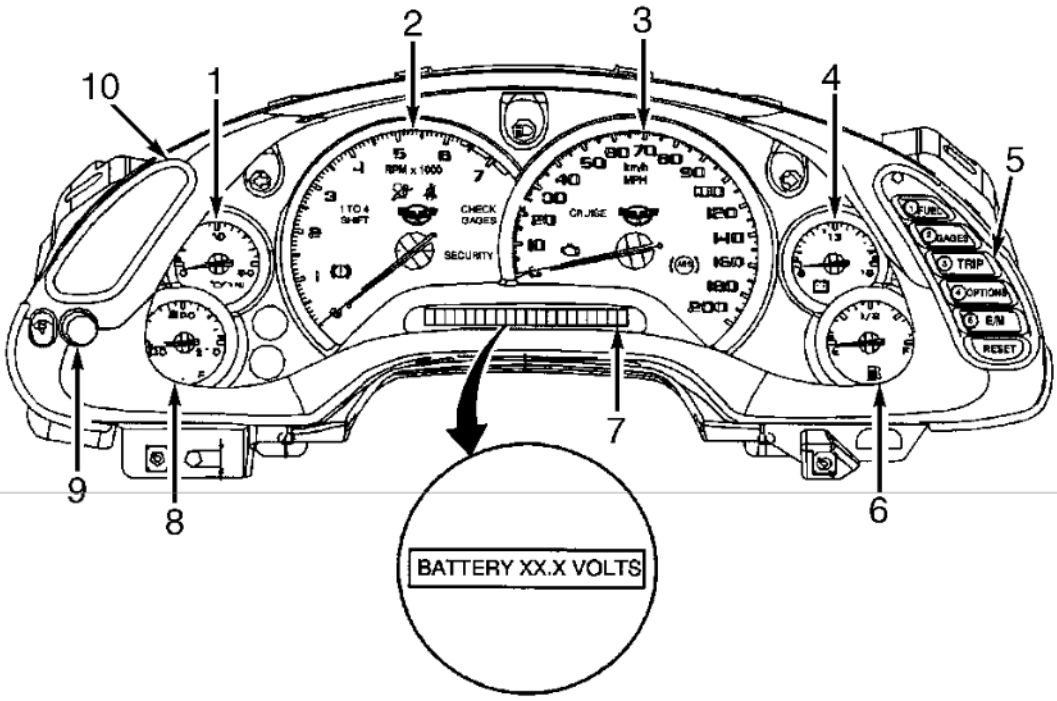
3. Within 5 seconds, depress and release ENG MET button again.
4. Within 5 seconds, depress and hold the ENG MET or GAUGES button again. The CHANGE OIL light should flash.
5. Depress and hold the RANGE or GAUGES button until the CHANGE OIL light stops flashing and goes out. When the light goes out, the engine oil life monitor is reset. This should take about 10 seconds.

NOTE: If the light does not reset, turn ignition off and repeat the procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 6

1. The CHANGE OIL light is illuminated when its time to change engine oil, usually between 3000 and 10,000 miles since last oil change. The Driver Information Center (DIC) will display CHANGE OIL NOW when an oil change is due.
2. To reset oil life monitor, turn ignition switch to RUN position, with engine off. Press TRIP button, located on DIC switch to display OIL LIFE. Message will display percentage of oil life remaining.
3. Press and hold RESET button on DIC for at least 2 seconds. The message will change to indicate that the Oil Life has been reset.
4. Turn ignition off.

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1. Oil Pressure Gauge
2. Tachometer
3. Speedometer
4. Battery Voltage Gauge
5. Driver's Information Center (DIC) Buttons
6. Fuel Gauge
7. Driver's Information Center (DIC)
8. Coolant Temperature Gauge
9. Dimmer Knob
10. Heads-Up Display (HUD) Controls

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Fig. 1: Identifying Instrument Cluster (2002-04 Corvette)
Courtesy of GENERAL MOTORS CORP.

OIL CHANGE REMINDER RESET - PROCEDURE 7

To reset the CHANGE ENGINE OIL message after an oil change, do the following:

1. Turn the ignition to ON with the engine off.
2. Press the TRIP button so the OIL LIFE percentage is displayed.
3. Press RESET and hold for two seconds. OIL LIFE REMAINING 100% will appear.

NOTE: If the CHANGE ENGINE OIL message comes back on when you start your vehicle, the engine oil life system has not reset. Repeat the procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 8

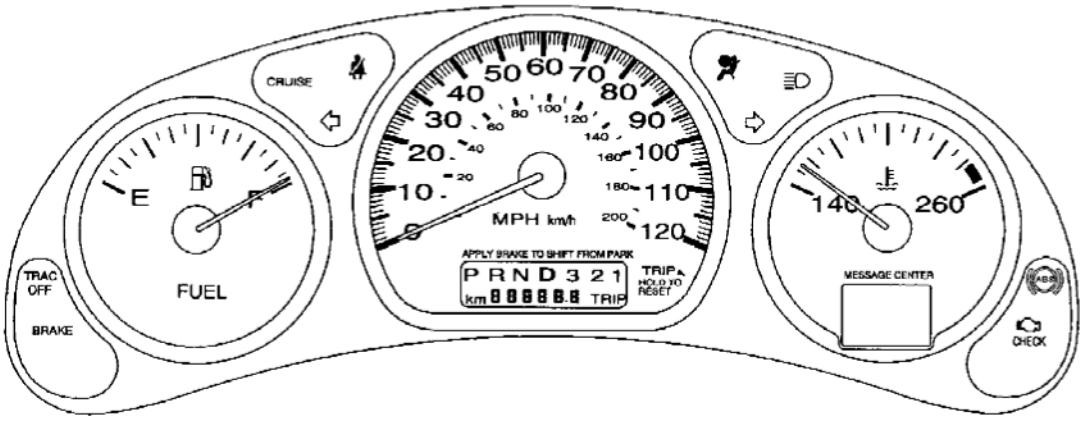
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1. The CHANGE ENGINE OIL message is displayed when its time to change engine oil, usually between 3000 and 7500 miles since last oil change. The oil change interval is not based on mileage, but on engine revolutions and engine operating temperature.
2. There are 2 ways to reset the engine oil life monitor. To reset the engine oil life monitor using the accelerator pedal, go to step 5. To reset the engine oil life monitor using the radio, turn the radio off. Turn ignition to ACC or ON, with the engine off. Press and hold the DISP button on the radio for at least 5 seconds until SETTINGS is displayed.
3. Press the SEEK up or down arrow to scroll through the main menu. Scroll until OIL LIFE appears on the display. Press the PREV or NEXT button to enter the sub-menu. RESET will be displayed.
4. Press the DISP button to reset. A chime will sound to verify the new setting and DONE will be displayed for one second. Once the message indicator has been reset, scroll through the menu until EXIT appears on the display. Press the DISP button to exit the program. A chime will sound to verify the exit.
5. To reset the engine oil life monitor using the accelerator pedal, turn ignition on with engine off. Fully depress and release the accelerator pedal slowly 3 times within 5 seconds. If CHANGE ENGINE OIL light flashes, oil life monitor is reset. If the CHANGE ENGINE OIL light comes back on and stays on, oil life monitor has not reset. Repeat reset procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 9

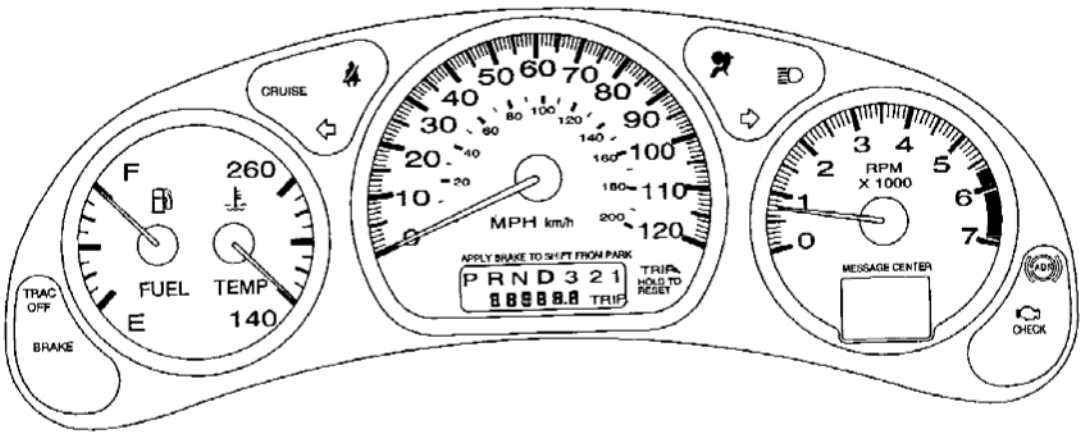
1. The CHANGE ENGINE OIL message is displayed when its time to change engine oil, usually between 3000 and 7500 miles since last oil change. The oil change interval is not based on mileage, but on engine revolutions and engine operating temperature. See **Fig. 2**-**Fig. 5** .
2. There are 2 ways to reset the engine oil life monitor. To reset the engine oil life monitor using the accelerator pedal, go to step 5. To reset the engine oil life monitor using the radio, turn the radio off. Turn ignition to ACC or ON, with the engine off. Press and hold the TUNE DISP button on the radio for at least 5 seconds until SETTINGS is displayed.
3. Press the SEEK PTYPE up or down arrow to scroll through the main menu. Scroll until OIL LIFE appears on the display. Press the 1 PREV or 2 NEXT button to enter the sub-menu. RESET will be displayed.
4. Press the TUNE DISP button to reset. A chime will sound to verify the new setting and DONE will be displayed for one second. Once the message indicator has been reset, scroll through the menu until EXIT appears on the display. Press the TUNE DISP button to exit the program. A chime will sound to verify the exit.
5. To reset the engine oil life monitor using the accelerator pedal, turn ignition on with engine off. Fully depress and release the accelerator pedal slowly 3 times within 5 seconds. If CHANGE ENGINE OIL light flashes, oil life monitor is reset. If the CHANGE ENGINE OIL light comes back on and stays on, oil life monitor has not reset. Repeat reset procedure.

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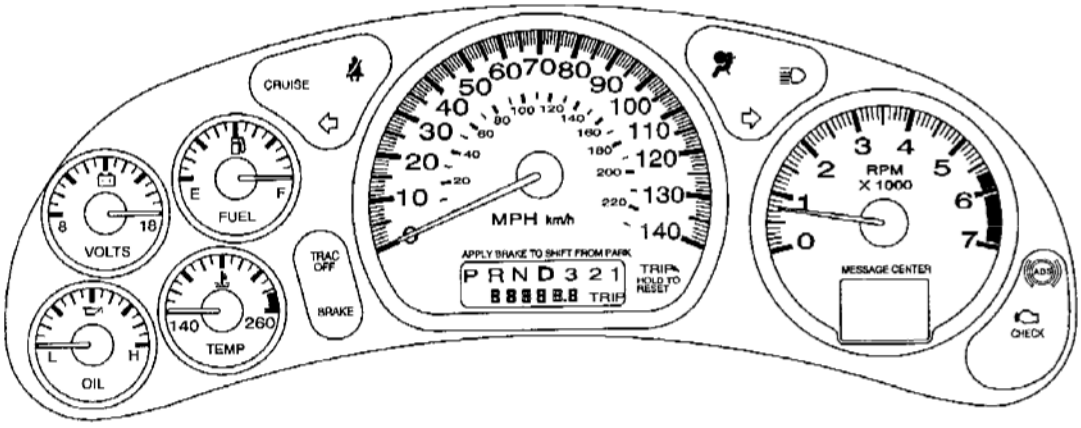
Fig. 2: Identifying Instrument Cluster (Impala & Monte Carlo V6)
Courtesy of GENERAL MOTORS CORP.



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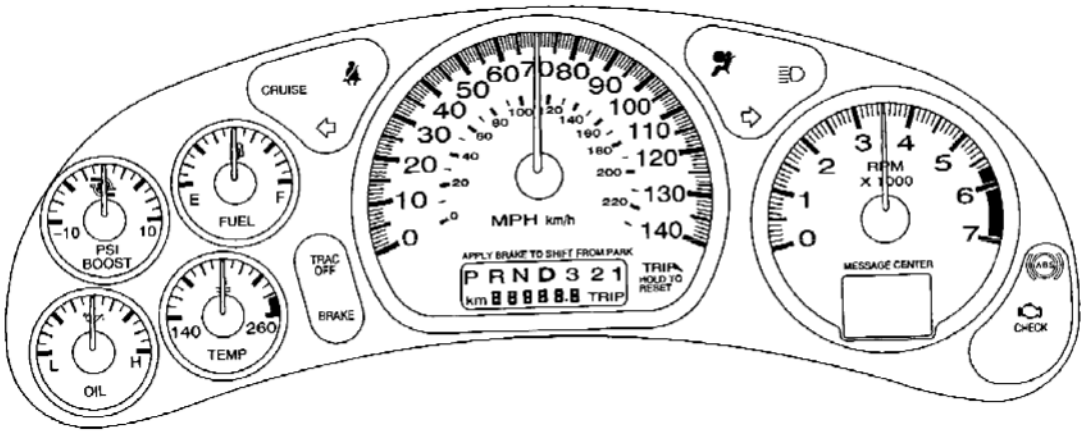
Fig. 3: Identifying Instrument Cluster With Tachometer (Impala V6)
Courtesy of GENERAL MOTORS CORP.

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Fig. 4: Identifying Instrument Cluster (Monte Carlo V6)
Courtesy of GENERAL MOTORS CORP.



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Fig. 5: Identifying Instrument Cluster (Impala & Monte Carlo Supercharged V6)
Courtesy of GENERAL MOTORS CORP.

OIL CHANGE REMINDER RESET - PROCEDURE 10

Using The Radio

1. Turn the ignition to ACC or ON, with the radio off.
2. Press and hold the TUNE DISP knob on the radio for at least five seconds until SETTINGS is displayed.
3. Press the SEEK PSCAN up or down arrow to scroll through the main menu.
4. Scroll until OIL LIFE appears on the display.
5. Press the 1 PREV or 2 NEXT buttons to enter the sub-menu. RESET will be displayed.

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6. Press the TUNE DISP knob to reset. A chime will be heard to verify the new setting and DONE will be displayed for one second.
7. Once the indicator has been reset, scroll until EXIT appears on the display.
8. Press the TUNE DISP knob to exit programming. A chime will be heard to verify the exit.
9. Turn the key to OFF.

If the CHANGE ENGINE OIL message comes back on when you start your vehicle, the engine oil life system has not reset. Repeat the procedure.

Using The Accelerator Pedal

1. Turn the ignition to ON, with the engine off.
2. Fully press and release the accelerator pedal slowly 3 times within five seconds. If the CHANGE ENGINE OIL message flashes, the system is reset.
3. However, if it stays on, it did not reset. Repeat the procedure.
4. Turn the key to OFF.

If the CHANGE ENGINE OIL message comes back on when you start your vehicle, the engine oil life system has not reset. Repeat the procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 11

After changing the engine oil, reset the system by performing the following steps:

1. Press the option button on the DIC until OIL LIFE REMAINING appears on the DIC screen.
2. Press the SET/RESET button on DIC for more than 5 seconds. The oil life will change to 100%.
3. Turn the key to OFF. If the light or message comes back on when you start your vehicle, the oil life system has not reset. Repeat the procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 12

1. Engine oil life monitor calculates engine oil temperature and engine revolutions. It indicates when the engine oil is nearly worn out. CHANGE OIL or CHANGE OIL SOON light on the instrument cluster is illuminated when it is time to change the engine oil.
2. To reset oil life monitor on a vehicle with a Driver Information Center, go to step 4. To reset the oil life monitor on a vehicle NOT equipped with a Driver Information Center, turn ignition switch to ON or RUN position with engine off. Depress accelerator pedal slowly to wide open throttle 3 times within 5 seconds.
3. If the CHANGE OIL or CHANGE OIL SOON light flashes 2 times, the system is reset. However, if light comes on for 5 seconds, system did not reset. Repeat reset procedure. Turn ignition off. Start engine. If oil light comes back on and stays on, the oil life monitor has not reset. Repeat reset procedure.
4. If vehicle is equipped with a Driver Information Center (DIC), reset the oil life monitor by pressing the Driver Information Center RESET button for 5 seconds while viewing the oil life display.

OIL CHANGE REMINDER RESET - PROCEDURE 13

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GM Oil Life System calculates when to change your engine oil and filter based on vehicle use. See **Fig. 6**. Anytime your oil is changed, reset the system so it can calculate when the next oil change is required. If a situation occurs where you change your oil prior to a Change Oil Soon message being turned on, reset the system. After changing the engine oil, reset the system.

1. Display OIL LIFE RESET on the DIC.
2. Press and hold ENTER button for at least one second. An ACKNOWLEDGED display message will appear for 3 seconds or until the next button is pressed. This will tell you the system has been reset.
3. Turn key to OFF.
4. If Change Oil Soon message comes back on when you start your vehicle, engine oil life system has not reset. Repeat the procedure.

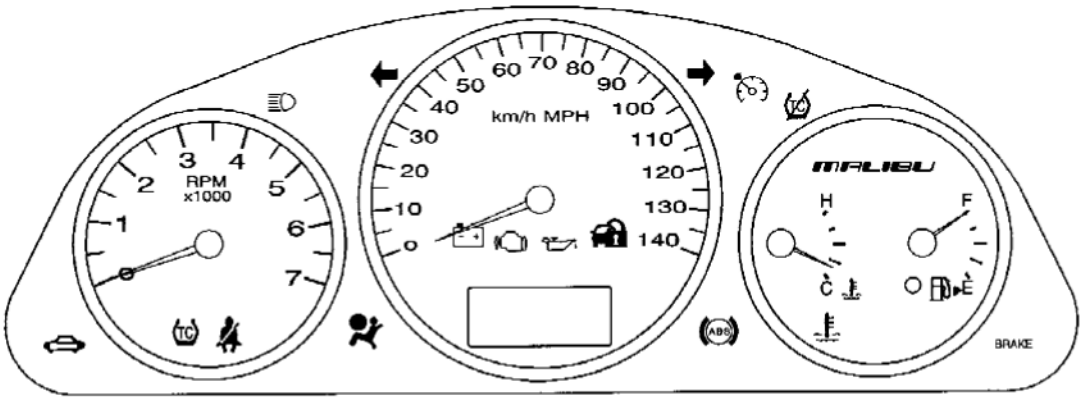


Fig. 6: Identifying Instrument Cluster (2004 Malibu)
Courtesy of GENERAL MOTORS CORP.

OIL CHANGE REMINDER RESET - PROCEDURE 14

1. The CHANGE ENGINE OIL message is displayed when its time to change engine oil, usually between 3000 and 7500 miles since last oil change. The oil change interval is not based on mileage, but on engine revolutions and engine operating temperature.
2. There are 2 ways to reset the engine oil life monitor. To reset the engine oil life monitor using the accelerator pedal, go to step 5. To reset the engine oil life monitor using the radio, turn the radio off. Turn ignition to ACC or ON, with the engine off. Press and hold the DISP button on the radio for at least 5 seconds until SETTINGS is displayed.
3. Press the SEEK up or down arrow to scroll through the main menu. Scroll until OIL LIFE appears on the display. Press the PREV or NEXT button to enter the sub-menu. RESET will be displayed.
4. Press the DISP button to reset. A chime will sound to verify the new setting and DONE will be displayed for one second. Once the message indicator has been reset, scroll through the menu until EXIT appears on the display. Press the DISP button to exit the program. A chime will sound to verify the exit.
5. To reset the engine oil life monitor using the accelerator pedal, turn ignition on with engine off. Fully depress and release the accelerator pedal slowly 3 times within 5 seconds. If CHANGE ENGINE OIL

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light flashes, oil life monitor is reset. If the CHANGE ENGINE OIL light comes back on and stays on, oil life monitor has not reset. Repeat reset procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 15

1. The CHANGE ENGINE OIL message is displayed when its time to change engine oil, usually between 3000 and 7500 miles since last oil change. The oil change interval is not based on mileage, but on engine revolutions and engine operating temperature. See **Fig. 2**-**Fig. 5** .
2. There are 2 ways to reset the engine oil life monitor. To reset the engine oil life monitor using the accelerator pedal, go to step 5. To reset the engine oil life monitor using the radio, turn the radio off. Turn ignition to ACC or ON, with the engine off. Press and hold the TUNE DISP button on the radio for at least 5 seconds until SETTINGS is displayed.
3. Press the SEEK PSCAN up or down arrow to scroll through the main menu. Press the 1 PREV or 2 NEXT button to enter the sub-menu. RESET will be displayed.
4. Press the TUNE DISP button to reset. A chime will sound to verify the new setting and DONE will be displayed for one second. Once the message indicator has been reset, scroll through the menu until EXIT appears on the display. Press the TUNE DISP button to exit the program. A chime will sound to verify the exit.
5. To reset the engine oil life monitor using the accelerator pedal, turn ignition on with engine off. Fully depress and release the accelerator pedal slowly 3 times within 5 seconds. If CHANGE ENGINE OIL light flashes, oil life monitor is reset. If the CHANGE ENGINE OIL light comes back on and stays on, oil life monitor has not reset. Repeat reset procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 16

To reset the CHANGE ENGINE OIL message, use one of the following procedures:

Using The Radio

1. Turn the ignition to ACC or ON, with the radio off.
2. Press and hold the TUNE DISP knob on the radio for at least five seconds until SETTINGS is displayed.
3. Press the SEEK PSCAN up or down arrow to scroll through the main menu.
4. Scroll until OIL LIFE appears on the display.
5. Press the 1 PREV or 2 NEXT buttons to enter the sub-menu. RESET will be displayed.
6. Press the TUNE DISP knob to reset. A chime will be heard to verify the new setting and DONE will be displayed for one second.
7. Once the indicator has been reset, scroll until EXIT appears on the display.
8. Press the TUNE DISP knob to exit programming. A chime will be heard to verify the exit.
9. Turn the key to OFF.

If the CHANGE ENGINE OIL message comes back on when you start your vehicle, the engine oil life system has not reset. Repeat the procedure.

Using The Accelerator Pedal

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1. Turn the ignition to ON, with the engine off.
2. Fully press and release the accelerator pedal slowly 3 times within five seconds. If the CHANGE ENGINE OIL message flashes, the system is reset.
3. However, if message stays on, it did not reset. Repeat the procedure.
4. Turn the key to OFF.

If the CHANGE ENGINE OIL message comes back on when engine is started, the engine oil life system has not reset. Repeat the procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 17

After changing the engine oil, reset the system by performing the following steps:

1. Press the option button on the DIC until OIL LIFE REMAINING appears on the DIC screen.
2. Press the SET/RESET button on DIC for more than 5 seconds. The oil life will change to 100%.
3. Turn the key to OFF. If the light or message comes back on when you start your vehicle, the oil life system has not reset. Repeat the procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 18

When the system has calculated that oil life has been diminished, it will indicate that an oil change is necessary. A CHANGE ENGINE OIL message or light will come on. Change the engine oil as soon as possible within the next 600 miles (1 000 km). It is possible that, if driving under the best conditions, the oil life system may not indicate that an oil change is necessary for over a year. However, the engine oil and filter must be changed at least once a year and at this time the system must be reset.

Vehicles with Driver Information Center (DIC)

1. Press the option button on the DIC until ENGINE OIL MONITOR appears on the DIC screen.
2. Press the set/reset button to reset the system. The next screen indicates that the CHANGE OIL SOON message has been reset. If the vehicle has the uplevel DIC, when the gauges button is pressed and the OIL LIFE REMAINING mode appears, it should read 100 percent OIL LIFE REMAINING.
3. Turn the key to OFF.

Vehicles without DIC

1. With the engine OFF, turn the ignition key to RUN.
2. Fully press and release the accelerator pedal slowly three times within five seconds.
3. Turn the key to OFF, than start the vehicle.

OIL CHANGE REMINDER RESET - PROCEDURE 19

When the system has calculated that oil life has been diminished, it will indicate that an oil change is necessary. A CHANGE ENGINE OIL SOON message will come on. Change the engine oil as soon as possible within the next 600 miles (1 000 km). It is possible that, if driving under the best conditions, the oil life system may not

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indicate that an oil change is necessary for over a year. However, the engine oil and filter must be changed at least once a year and at this time the system must be reset.

Reset Procedure

1. Turn the ignition key to RUN with the engine OFF.
2. Press the INFO and RESET buttons on the Driver Information Center (DIC) at the same time to enter the personalization menu.
3. Press the INFO button to scroll through the available personalization menu modes until the DIC display shows OIL-LIFE RESET.
4. Press the INFO and RESET buttons at the same time for one second and release.
5. Press and hold the reset button until the DIC display shows ACKNOWLEDGED. This will tell you the system has been reset.
6. Turn the key to LOCK/OFF.

Alternate Method

1. Turn the ignition key to RUN with the engine off.
2. Fully press the release the accelerator pedal 3 times within 5 seconds. Several beeps sound. This confirms the oil life system has been reset.
3. If the CHANGE/OIL message comes back on when you start the engine, the engine oil life system has not been reset. Repeat the procedure.

OIL CHANGE REMINDER RESET - PROCEDURE 20

Manual Oil Life System Reset

1. Turn on ignition.
2. Push Menu button on the turn signal switch.
3. Use adjustment wheel and select menu - Vehicle Information System.
4. Use adjustment wheel and select menu - Oil Life System.
5. Push SET/CLR button on the turn signal switch and push brake pedal at same time.

Automatic Oil Life System Reset

1. Turn on ignition.
2. Connect scan tool.
3. Select Module Diagnosis.
4. Select Engine Control Module.
5. Select Configuration/Reset function.
6. Select Engine Oil System Reset.
7. Push Enter button to run function.
8. Confirm Executed successfully.

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9. Turn ignition of and confirm.
10. Turn ignition on and confirm.

OIL CHANGE REMINDER RESET - PROCEDURE 21

1. Use the SELECT knob to select OIL LIFE on the DIC menu.
2. Press SELECT to start the OIL LIFE reset procedure.
3. The DIC menu will display "Are you sure that you want to reset?" Use SELECT to choose YES to reset oil life or NO to exit and return to the previous menu.
4. If YES is selected, the DIC menu will display RESET OIL LIFE for a short time and then 100% OIL LIFE will be display when OIL LIFE is successfully reset.

OXYGEN SENSOR REMINDER FLAG

NOTE: To determine the appropriate reset procedure, refer to OXYGEN SENSOR REMINDER FLAG RESET. Only vehicles listed in this index have an oxygen sensor reminder flag reset.

OXYGEN SENSOR REMINDER FLAG RESET INDEX

Model & Year	Reset Procedure
Some Models	
1980	Oxygen Sensor Reminder Flag - Procedure 1

OXYGEN SENSOR REMINDER FLAG - PROCEDURE 1

1. Every 30,000 miles, a reminder flag appears in speedometer face, indicating service of oxygen sensor is necessary. See **Fig. 7**. Inspect and service oxygen sensor as necessary and reset flag.
2. To reset flag, remove instrument panel trim plate. Remove instrument cluster lens. Using pointed tool, apply light downward pressure on notches of flag until it is reset. An alignment mark will appear in left center of odometer window when flag is fully reset.

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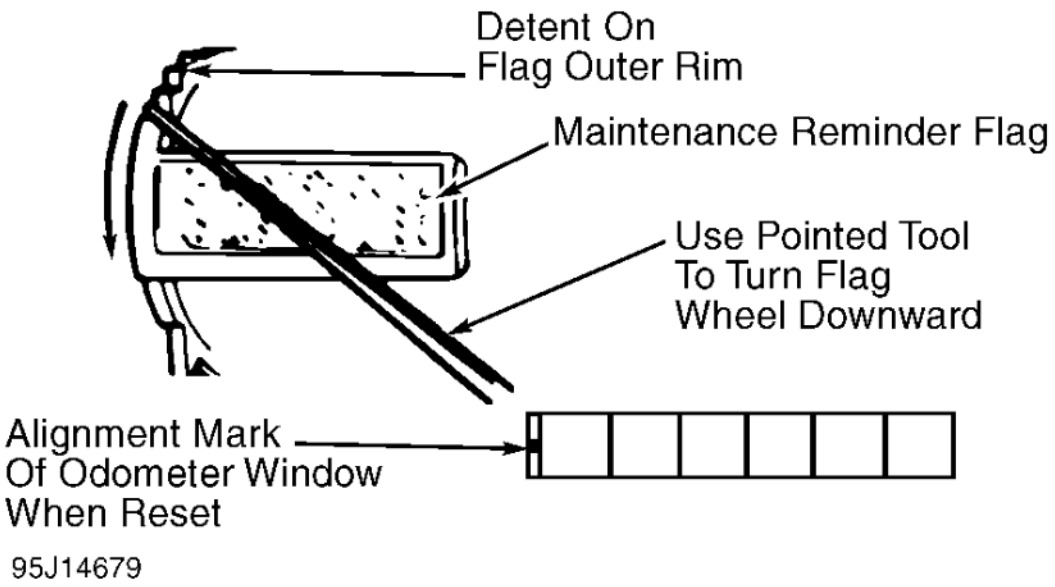


Fig. 7: Resetting Reminder Flag
Courtesy of GENERAL MOTORS CORP.

OXYGEN SENSOR WARNING LIGHT

NOTE: To determine the appropriate reset procedure, refer to OXYGEN SENSOR WARNING LIGHT RESET INDEX. Only vehicles listed in this index have an oxygen sensor warning light reset.

OXYGEN SENSOR WARNING LIGHT RESET INDEX

Model & Year	Reset Procedure
Sprint	
1985-86	Oxygen Sensor Warning Light Reset - Procedure 1

OXYGEN SENSOR WARNING LIGHT RESET - PROCEDURE 1

At 30,000 mile intervals, a SENSOR light in dash will start flashing, indicating oxygen sensor needs replacement. To reset mileage counter (after sensor replacement), locate SENSOR light cancel switch on right side of fuse box. Return cancel switch to OFF position. Start engine to ensure light remains off.

SERVICE REMINDER DISPLAY

NOTE: To determine the appropriate reset procedure, refer to Service Reminder Reset Index. Only vehicles listed in this index have a Service Reminder reset.

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SERVICE REMINDER RESET INDEX

Model & Year	Reset Procedure
Caprice	
2011	Service Reminder Reset - Procedure 1

SERVICE REMINDER RESET - PROCEDURE 1

The displayed service reminder is reset using a scan tool or by the following procedure:

1. Turn the ignition to the OFF position.
2. Press and hold the TRIP button.
3. Turn the ignition to the ON position.
4. Release the TRIP button.
5. Once in the Service Reset screen, press and hold the ENTER switch for 3-5 seconds. A confirmation beep will sound upon reset.
6. Turn the ignition to the OFF position.

NOTE: If the service reminder comes back on when you start the vehicle, the Service Reminder Display has not reset. Repeat the procedure.

TIRE PRESSURE MONITOR SYSTEM (TPMS)

NOTE: To determine the appropriate reset procedure, refer to TPMS Reset Index. Only vehicles listed in this index have a TPMS reset.

TPMS RESET INDEX

Model & Year	Reset Procedure
Aveo	
2008-11	TPMS Reset - Procedure 7
Camaro	
2011	TPMS Reset - Procedure 8
Caprice	
2011	TPMS Reset - Procedure 9
Cobalt	
2008-10	TPMS Reset - Procedure 9
Corvette	
1987-96	TPMS Reset - Procedure 1
1997-04	TPMS Reset - Procedure 2
2005-06	TPMS Reset - Procedure 3
2007-11	TPMS Reset - Procedure 10
Cruze	
2011	TPMS Reset - Procedure 8

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Impala & Monte Carlo	
2000-02	**TPMS Reset - Procedure 4**
2003-05	**TPMS Reset - Procedure 5**
2006	**TPMS Reset - Procedure 6**
2007-11	**TPMS Reset - Procedure 9**
Malibu	
2008-11	**TPMS Reset - Procedure 9**
Volt	
2011	**TPMS Reset - Procedure 11**

TPMS RESET - PROCEDURE 1

NOTE: The LOW TIRE PRESSURE warning light may come on if the vehicle is close to another vehicle that has a similar warning system and a low tire.

When the LOW TIRE PRESSURE warning light illuminates, immediately check air pressure of all tires and adjust to the specified pressure. This warning light will remain illuminated until ignition is turned off, even if tires are inflated while vehicle is running. If SERVICE LTPWS warning light illuminates, there is a problem in the TPM system. See appropriate service information.

TPMS RESET - PROCEDURE 2

1. Turn ON ignition, with engine OFF. Press DIC RESET button in order to clear any warning messages.
2. Press and release OPTIONS button until display is blank.
3. Press and hold RESET button for 3 seconds.

NOTE: If the DIC does not display TIRE TRAINING message, ensure TPM option is enabled in the RCDLR. Check TPM option and Set Options/TPM. The scan tool can be used to enable, or disable TPM option in the RCDLR. Check TPM DTC display and Set Options/TPM DTC. The scan tool can be used to enable or disable TPM DTC displaying option on the DIC.

4. Press and release OPTIONS button until TIRE TRAINING is displayed.
5. Press and release RESET button and LEARN L FRONT TIRE is displayed, verifying learn mode has been enabled.

NOTE: If a horn chirp does not sound after 15 seconds, remove then reinstall sensor activating tool.

6. Starting at left front sensor, hold Tire Pressure Sensor Activating Tool (J-41760) over valve stem until a horn chirp sounds.
7. After horn chirp sounds, proceed as in step 6 for the next 3 sensors in the following order of right front, right rear and left rear.
8. Turn ignition OFF to exit learn mode.

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TPMS RESET - PROCEDURE 3

NOTE: In the following procedure, a TPM Sensor Activation Tool (J-46079) must be used.

NOTE: If the tire pressure sensor or RCDLR is replaced, the TPM system needs to relearn tire pressure sensor IDs.

The TPM system will cancel the learn mode if more then 2 minutes have passed and no sensors have been learned, or if the RCDLR has been in learn mode for more than 5 minutes. If the learn mode is canceled before any IDs are learned, the RCDLR will remember all previously stored IDs and their locations. As soon as the first sensor ID is learned, all other IDs are erased from the RCDLR's memory.

1. Turn ignition switch to ACC position. Apply parking brake.
2. Simultaneously press the keyless entry transmitter's lock and unlock buttons until a horn chirp sounds, indicating the learn mode has been enabled.
3. Starting with left front tire, hold antenna of TPM Sensor Activation Tool (J-46079) against the tire sidewall close to the wheel rim at the valve stem location, then press and release the ACTIVATE button and wait for a horn chirp.
4. After horn chirp has sounded, proceed as in step 3 for the next 3 sensors in the following order: right front, right rear and left rear.
5. After left rear sensor has been learned, a double horn chirp will sound, indicating all 4 sensor IDs have been learned. Turn ignition switch to OFF position.

TPMS RESET - PROCEDURE 4

LOW TIRE PRESSURE light comes on if air pressure in one tire drops to 12 psi (kPa) less than the other 3 tires, if tires are rotated, if tire(s) are repaired or replaced, if air pressure is adjusted or when vehicle battery is disconnected. Light will stay on until ignition is turned off or RESET button is pressed. Check and adjust air pressure in all 4 tires before resetting system.

1. There are 2 ways to reset the tire inflation monitor. To reset the tire inflation monitor using the exterior or interior lamp controls, go to step 4. To reset tire inflation monitor using the radio, turn the radio off. Turn ignition to ACC or ON, with the engine off. Press and hold the TUNE DISP button on the radio for at least 5 seconds until settings is displayed.
2. On Impala, press the SEEK PTYPE up or down arrow to scroll through the main menu. On Monte Carlo, press the SEEK PSCAN up or down arrow to scroll through the main menu. On all models, scroll until TIRE MON appears on the display. Press the 1 PREV or 2 NEXT button to enter the sub-menu. RESET will be displayed.
3. Press the TUNE DISP button to reset. A chime will sound to verify the new setting and DONE will be displayed for one second. Once the message has been reset, scroll through the menu until EXIT appears on the display. Press the TUNE DISP button to exit the program. A chime will sound to verify the exit.
4. On Impala, to reset the tire inflation monitor using the interior lamp controls, turn the interior lamp controls from OFF to ON position 3 times with ignition switch in ON position. On Monte Carlo, to reset the tire inflation monitor using the exterior lamp controls, turn exterior lamp controls from OFF to

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parking lamps 3 times with ignition switch in ON position.

TPMS RESET - PROCEDURE 5

NOTE: There are 3 different ways to reset the Tire Pressure Monitor (TPM) system. After resetting, the TPM system requires up to 30 minutes of straight line driving in each of the 3 speed ranges to complete the calibration process.

Using Exterior Lamp Switch

1. Adjust all tire pressures to the recommended kPa/psi.
2. Turn ON the ignition, with the engine OFF.
3. Cycle the exterior lamp switch from OFF to parking lamps 3 times within 5 seconds.
4. Use the scan tool in order to clear the TPM DTC.

Using RDS Radio, If Equipped

1. Adjust all tire pressures to the recommended kPa/psi.
2. Turn the ignition to ACC or ON, with the engine OFF.
3. Turn the radio OFF.
4. Press and hold the DISP button until SETTINGS is displayed.
5. Press the SEEK up or down arrows until TIRE MON is displayed.
6. Press the PREV or NEXT button to enter the sub-menu. RESET will be displayed.
7. Press the DISP button, A chime will sound and DONE will be displayed.
8. Scroll until EXIT is displayed.
9. Press the DISP button to exit the TPM reset mode. A chime will sound to verify exit.
10. Use the scan tool in order to clear the TPM DTC.

Using Scan Tool

1. Adjust all tire pressures to the recommended kPa/psi.
2. Install the scan tool.
3. Turn ON the ignition, with the engine OFF.
4. With the scan tool select Special Functions.
5. Select TIM Reset.
6. Press the Reset soft key.
7. Use the scan tool in order to clear the TPM DTC.

TPMS RESET - PROCEDURE 6

NOTE: If a tire pressure sensor or the RCDLR is replaced, or if wheels have been rotated, tire pressure sensor must be retrained.

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The TPM system will cancel the learn mode if more then 2 minutes have passed and no sensors have been learned, or if the RCDLR has been in learn mode for more than 5 minutes. If the learn mode is canceled before any IDs are learned, the RCDLR will remember all previously stored IDs and their locations. As soon as the first sensor ID is learned, all other IDs are erased from the RCDLR's memory.

NOTE: Before proceeding with the steps below, ensure that no other sensor learn procedure is being performed simultaneously, or that no tire pressures are being adjusted on another TPM equipped vehicle within close proximity.

NOTE: In the following procedures, a TPM Sensor Activation Tool (J-46079) may be used in place of increasing/decreasing pressures to enable sensor. To use, place activator antenna against the tire sidewall close to the wheel rim at the valve stem location, then press and release the ACTIVATE button.

NOTE: If TPM Sensor Activation Tool (J-46079) is used, and vehicle is having trouble entering relearn mode, check batteries in activation tool. Low batteries may allow some functions to work, but not allow vehicle to perform learn function. When the internal battery is fresh (fully charged), the indicator is "full" or is all dark. When the battery is depleted, the indicator shows "empty" or is all light.

Using Keyless Entry System

1. Turn ignition switch to ACC position. Apply parking brake.
2. Simultaneously press the keyless entry transmitter's lock and unlock buttons until a horn chirp sounds, indicating the learn mode has been enabled.

WARNING: Overinflating tires may cause personal injury or damage to the tires and wheels. When increasing tire pressure, DO NOT exceed the maximum inflation pressure as noted on the tire sidewall.

3. Starting with left front tire, increase or decrease the pressure for 5-8 seconds, or until a horn chirp sounds. The horn chirp may occur before the 5-8 second pressure increase/decrease time period has been reached, or up to 30 seconds after the 5-8 second pressure increase/decrease time period has been reached.
4. After horn chirp has sounded, proceed as in step 3 for the next 3 sensors in the following order: right front, right rear and left rear.
5. After left rear sensor has been learned, a double horn chirp will sound, indicating all 4 sensor IDs have been learned. Turn ignition switch to OFF position. Adjust all tire pressures to specification.

Using Scan Tool

NOTE: Before proceeding with the steps below, ensure that no other sensor learn procedure is being performed simultaneously, or that no tire pressures are being adjusted on another TPM equipped vehicle within close proximity.

1. Connect scan tool. Turn ignition switch to ACC position. Apply parking brake.

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2. Using scan tool, select "SPECIAL FUNCTIONS".
3. Select "SENSOR LEARN MODE ENABLE", and press ENTER key.
4. Press ON soft key. A horn chirp will sound, indicating the learn mode has been enabled.

WARNING: Overinflating tires may cause personal injury or damage to the tires and wheels. When increasing tire pressure, DO NOT exceed the maximum inflation pressure as noted on the tire sidewall.

5. Starting with left front tire, increase or decrease pressure for 5-8 seconds, or until a horn chirp sounds. The horn chirp may occur before the 5-8 second pressure increase/decrease time period has been reached, or up to 30 seconds after the 5-8 second pressure increase/decrease time period has been reached.
6. After horn chirp has sounded, proceed as in step 5 for the next 3 sensors in the following order: right front, right rear and left rear.
7. After left rear sensor has been learned, a double horn chirp will sound, indicating all 4 sensor IDs have been learned. Turn ignition switch to OFF position. Adjust all tire pressures to specification.

TPMS RESET - PROCEDURE 7

NOTE: The J-46079 or Pressure Increase/Decrease Method may be used to perform this procedure. Before proceeding with this process, ensure that no other learn procedure is being performed simultaneously or that tire pressures are not being adjusted on another TPM equipped vehicle within close proximity. Stray signals from other TPM equipped vehicles just driving by can be inadvertently learned. If any random horn chirps are heard from the vehicle while performing the learn procedure, most likely a stray sensor has been learned and the procedure will need to be cancelled and repeated. Under these circumstances, performing the TPM Learn Procedure away from other vehicles would be highly recommended. In the event a particular sensor activation does not cause the horn to chirp, it may be necessary to rotate the wheel valve stem to a different position due to the sensor signal is being blocked by another component.

1. Ignition ON, engine OFF, apply the parking brake.
2. Using a scan tool, initiate the TPM Learn Mode.
3. Perform the procedure by following the menu selections. A double horn chirp will sound and the IPC tire pressure monitor indicator warning lamp icon will flash indicating Learn Mode is enabled.
4. Starting with the left front tire, active the sensors by one of the following methods:
   - Hold the antenna of the J-46079 aimed upward against the tire sidewall close to the wheel rim at the valve stem location. Press and release the activate button and wait for a horn chirp. Once the horn chirp has sounded, the sensor information is learned.
   - Increase/decrease the tire pressure for 8-10 seconds then wait for a horn chirp. The horn chirp may occur before or up to 30 seconds after the 8-10 second pressure increase/decrease time period has been reached. Once the horn chirp has sounded, the sensor information has been learned.

WARNING: Over inflating tires may cause personal injury or damage to the

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tires and wheels. When increasing tire pressure do not exceed the maximum inflation pressure as noted on the tire sidewall.

5. After the horn chirp has sounded, repeat step 4 for the remaining 3 sensors in the following order:
   a. Right front
   b. Right rear
   c. Left rear
6. After the left rear sensor is learned, a double horn chirp will sound indicating all sensor IDs have been learned and the tire pressure module will exit the Learn mode turning OFF the IPC tire pressure monitor warning indicator lamp icon.
7. Ignition OFF, adjust all tires to the recommended pressures. Refer to the tire placard label.

TPMS RESET - PROCEDURE 8

NOTE: If using the scan tool to enable the relearn mode, the TPM tool must be used to activate the sensors. When this preferred method is used, any stray sensor signals will not affect the relearn procedure. In the event a particular sensor's information is displayed on the special tool upon activation but the horn does not chirp, it may be necessary to rotate the wheel valve stem to a different position due to the sensor signal is being blocked by another component.

NOTE: If using the DIC buttons to enable the relearn mode, the TPM tool or Pressure Increase/Decrease Method may be used. Before proceeding with this method, ensure that no other learn procedure is being performed simultaneously or that tire pressures are not being adjusted on another TPM equipped vehicle within close proximity. Stray signals from other TPM equipped vehicles just driving by can be inadvertently learned. If any random horn chirps are heard from the vehicle while performing the learn procedure, most likely a stray sensor has been learned and the procedure will need to be cancelled and repeated. Under these circumstances, performing the TPM Relearn Procedure away from other vehicles would be highly recommended. In the event a particular sensor activation does not cause the horn to chirp, it may be necessary to rotate the wheel valve stem to a different position due to the sensor signal is being blocked by another component.

Preferred Scan Tool Relearn Enable Method

1. Apply park brake (manual transmission only).
2. Ignition ON, using a scan tool, initiate the Tire Pressure Sensors Learn mode. A double horn chirp will sound indicating the Relearn mode has been enabled. The left front turn signal will also be illuminated.
3. Starting with the left front tire, active the sensor by holding the antenna of the TPM tool aimed upward against the tire sidewall close to the wheel rim at the valve stem location. Press and release the Activate button and wait for a horn chirp. Once the horn chirp has sounded, the sensor information is learned and the turn signal in the next location to be learned will illuminate.
4. After the horn chirp has sounded and the right front turn signal is illuminated, repeat step 2 for the

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remaining 3 sensors in the following order:

a. Right front
b. Right rear
c. Left rear

5. When the left rear sensor has been learned and a double horn chirp has sounded, the learn process is complete and the BCM exits the Relearn mode.
6. Ignition OFF, adjust all tires to the recommended pressures.

Alternate DIC Relearn Enable Method

1. Apply park brake (manual transmission only).
2. Ignition ON, activate the Relearn mode with the driver information center (DIC) display controls. A double horn chirp sounds indicating the Relearn mode has been enabled and the left front turn signal will also be illuminated.
3. Starting with the left front tire, activate the tire pressure sensor by using one of the following methods:
   - Hold the antenna of the TPM tool aimed upward against the tire sidewall close to the wheel rim at the valve stem location. Press and release the activate button and wait for a horn chirp. Once the horn chirp has sounded, the sensor information is learned and the turn signal in the next location to be learned will illuminate.
   - Increase/decrease the tire pressure for 8-10 seconds then wait for a horn chirp. The horn chirp may occur before or up to 30 seconds after the 8-10 second pressure increase/decrease time period has been reached. Once the horn chirp has sounded, the sensor information is learned and the turn signal in the next location to be learned will illuminate.

WARNING: Over inflating tires may cause personal injury or damage to the tires and wheels. When increasing tire pressure do not exceed the maximum inflation pressure as noted on the tire sidewall.

4. After the horn chirp has sounded and the right front turn signal is illuminated, repeat step 2 for the remaining 3 sensors in the following order:
   a. Right front
   b. Right rear
   c. Left rear
5. When the left rear sensor has been learned and a double horn chirp has sounded, the learn process is complete and the BCM exits the Relearn mode.
6. Ignition OFF, adjust all tires to the recommended pressures.

TPMS RESET - PROCEDURE 9

NOTE: If using the scan tool to enable the learn mode, the J-46079 must be used to activate the sensors. When this preferred method is used, any stray sensor signals will not affect the learn procedure. In the event a particular sensor's information is displayed on the special tool upon activation but the horn does

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not chirp, it may be necessary to rotate the wheel valve stem to a different position due to the sensor signal is being blocked by another component.

NOTE: If using the keyless entry transmitter or DIC buttons to enable the learn mode, the J-46079 or Pressure Increase/Decrease Method may be used. Before proceeding with this method, ensure that no other learn procedure is being performed simultaneously or that tire pressures are not being adjusted on another TPM equipped vehicle within close proximity. Stray signals from other TPM equipped vehicles just driving by can be inadvertently learned. If any random horn chirps are heard from the vehicle while performing the learn procedure, most likely a stray sensor has been learned and the procedure will need to be cancelled and repeated. Under these circumstances, performing the TPM Learn Procedure away from other vehicles would be highly recommended. In the event a particular sensor activation does not cause the horn to chirp, it may be necessary to rotate the wheel valve stem to a different position due to the sensor signal is being blocked by another component.

Preferred Scan Tool Learn Enable Method

1. Using a scan tool, initiate the TPM Learn Mode. A double horn chirp will sound indicating the Learn Mode has been enabled. The left front turn signal will also be illuminated.
2. Starting with the left front tire, active the sensor by holding the antenna of the J-46079 aimed upward against the tire sidewall close to the wheel rim at the valve stem location. Press and release the Activate button and wait for a horn chirp. Once the horn chirp has sounded, the sensor information is learned and the turn signal in the next location to be learned will illuminate.
3. After the horn chirp has sounded and the right front turn signal is illuminated, repeat step 2 for the remaining 3 sensors in the following order:
    a. Right front
    b. Right rear
    c. Left rear
4. When the left rear sensor has been learned and a double horn chirp has sounded, the learn process is complete and the RCDLR exits the learn mode.
5. Ignition OFF, adjust all tires to the recommended pressures.

Alternate Keyless Entry Transmitter or DIC Learn Enable Method

1. Ignition ON, initiate the TPM Learn Mode using one of the following procedures:
    - On vehicles equipped with keyless entry, simultaneously press the keyless entry transmitters lock and unlock buttons until a double horn chirp sounds indicating the Learn Mode has been enabled. The left front turn signal will also be illuminated.
    - On vehicles not equipped with keyless entry, press and release the driver information center (DIC) INFO button until the TIRE LEARN message appears on the DIC display. Press and hold the SET/RESET button until a double horn chirp sounds indicating the Learn Mode has been enabled. The left front turn signal will also be illuminated.
2. Starting with the left front tire, learn the tire pressure using one of the following methods:

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- Hold the antenna of the J-46079 aimed upward against the tire sidewall close to the wheel rim at the valve stem location. Press and release the activate button and wait for a horn chirp. Once the horn chirp has sounded, the sensor information is learned and the turn signal in the next location to be learned will illuminate.
- Increase/decrease the tire pressure for 8-10 seconds then wait for a horn chirp. The horn chirp may occur before or up to 30 seconds after the 8-10 second pressure increase/decrease time period has been reached. Once the horn chirp has sounded, the sensor information is learned and the turn signal in the next location to be learned will illuminate.

WARNING: Over inflating tires may cause personal injury or damage to the tires and wheels. When increasing tire pressure do not exceed the maximum inflation pressure as noted on the tire sidewall.

3. After the horn chirp has sounded and the right front turn signal is illuminated, repeat step 2 for the remaining 3 sensors in the following order:
   a. Right front
   b. Right rear
   c. Left rear
4. When the left rear sensor has been learned and a double horn chirp has sounded, the learn process is complete and the RCDLR exits the learn mode.
5. Ignition OFF, adjust all tires to the recommended pressures.

TPMS RESET - PROCEDURE 10

NOTE: Before proceeding, ensure that no other learn procedure is being performed simultaneously or that tire pressures are not being adjusted on another TPM equipped vehicle within close proximity. Stray signals from other TPM equipped vehicles just driving by can be inadvertently learned. If any random horn chirps are heard from the vehicle while performing the learn procedure, most likely a stray sensor has been learned and the procedure will need to be cancelled and repeated. Under these circumstances, performing the TPM Learn Procedure away from other vehicles would be highly recommended. In the event a particular sensor activation does not cause the horn to chirp, it may be necessary to rotate the wheel valve stem to a different position due to the sensor signal is being blocked by another component.

1. Place the electronic keyless ignition in the ACCY position.
2. Using a scan tool, initiate the TPM Learn Mode. A horn chirp will sound indicating the Learn Mode has been enabled.
3. Starting with the left front tire, hold the antenna of the J-46079 aimed upward against the tire sidewall close to the wheel rim at the valve stem location. Press and release the activate button and wait for a horn chirp.
4. After the horn chirp has sounded, repeat step 3 for the remaining 3 sensors in the following order:
   a. Right front

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b. Right rear
c. Left rear

5. After the LR sensor has been learned, a double horn chirp will sound indicating all sensors have been learned.
6. Place the electronic keyless ignition in the OFF position to exit the learn mode.
7. After the learn mode has been exited, adjust all tires to the recommended pressures.

TPMS RESET - PROCEDURE 11

NOTE: In the event that during a particular sensor's activation the horn does not chirp, it may be necessary to rotate the wheel valve stem to a different position due to the sensor signal is being blocked by another component.

1. Apply park brake.
2. Vehicle in Service Mode, using a scan tool or driver information center buttons, initiate the Tire Pressure Sensors Learn mode. A double horn chirp will sound indicating the Learn mode has been enabled. The left front turn signal will also be illuminated.
3. Starting with the left front tire, active the sensor by holding the antenna of the tire pressure monitor special tool aimed upward against the tire sidewall close to the wheel rim at the valve stem location. Press and release the Activate button and wait for a horn chirp. Once the horn chirp has sounded, the sensor information is learned and the turn signal in the next location to be learned will illuminate.
4. After the horn chirp has sounded and the Right Front turn signal is illuminated, repeat step 3 for the remaining 3 sensors in the following order: Right Front, Right Rear, Left Rear.
5. When the left rear sensor has been learned and a double horn chirp has sounded, the learn process is complete and the BCM exits the Learn mode

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2010 MAINTENANCE

Maintenance and Lubrication - Camaro

SPECIFICATIONS

APPROXIMATE FLUID CAPACITIES

The following approximate capacities are given in US English and metric conversions. See **Fluid and Lubricant Recommendations (USA and Canada)**, for more information. All capacities are approximate. When adding, be sure to fill to the approximate level, as recommended in this manual. Re-check fluid level after filling.

Application	Specification	
	Metric	US English
Cooling System		
V6 Engine		
• Automatic Transmission	10.25 liters	10.83 quarts
• Manual Transmission	10.7 liters	11.3 quarts
V8 Engine		
• Automatic Transmission	10.85 liters	11.5 quarts
• Manual Transmission	11.05 liters	11.7 quarts
Engine Oil with Filter		
• V6 Engine	5.7 liters	6.0 quarts
• V8 Engine	7.6 liters	8.0 quarts
Fuel Tank	71.0 liters	18.8 gallons
Automatic Transmission		
• 6L80E 6-Speed - Pan Removal and Filter Replacement	6.3 liters	6.7 quarts
• 6L80E 6-Speed - Complete Overhaul	9.9 liters	10.5 quarts
• 6L80E 6-Speed - Dry	10.6 liters	11.2 quarts
Manual Transmission		
• Aisin AV6	1.8 liters	1.9 quarts
• Tremec 6-Speed	3.9 liters	4.2 quarts
Differential		
• Rear Axle - V6 Automatic Transmission	0.9 liters	0.95 quarts
• Rear Axle - V6 Manual Transmission V8 All	0.925 liter base lubricant 0.075 liter friction modifier	0.975 quart base lubricant 0.079 quart friction modifier

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FLUID AND LUBRICANT RECOMMENDATIONS (USA AND CANADA)

The Recommended Fluids and Lubricants information will be found in the Owner's Manual. Refer to the Maintenance Schedule subsection of the Owner's Manual.

You may be able to use the Search information function using the words Fluids or Lubricants.

Most transmission, transfer case, front and rear axle lubricant recommendations will be found in those service categories (subsections).

MAINTENANCE ITEMS

The Normal Maintenance Replacement Parts information will only be found in the Owner's Manual. Refer to the Maintenance Schedule subsection of the Owner's Manual.

You may be able to use the Search information function using the words Replacement Parts.

MAINTENANCE

MAINTENANCE SCHEDULE (NORTH AMERICAN EMISSIONS)

The Maintenance Schedule information will only be found in the Owner's Manual.

Refer to the Maintenance Schedule subsection of the Owner's Manual, or you may be able to use the Search information function using the words Scheduled Maintenance.

GM OIL LIFE SYSTEM RESETTING

When the system has calculated that oil life has been diminished, it will indicate that an oil change is necessary. A CHANGE ENGINE OIL message or light will come on. Change the engine oil as soon as possible within the next 600 miles (1 000 km). It is possible that, if driving under the best conditions, the oil life system may not indicate that an oil change is necessary for over a year. However, the engine oil and filter must be changed at least once a year and at this time the system must be reset.

If the system is ever reset accidentally, change the engine oil at 3,000 miles (5 000 km) since last oil change.

How to Reset the Engine Oil Life System

Vehicles with Driver Information Center (DIC)

1. Press the option button on the DIC until ENGINE OIL MONITOR appears on the DIC screen.
2. Press the set/reset button to reset the system. The next screen indicates that the CHANGE OIL SOON message has been reset. If the vehicle has the uplevel DIC, when the gauges button is pressed and the OIL LIFE REMAINING mode appears, it should read 100 percent OIL LIFE REMAINING.
3. Turn the key to OFF.

Vehicles without DIC

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1. With the engine OFF, turn the ignition key to RUN.
2. Fully press and release the accelerator pedal slowly three times within five seconds.
3. Turn the key to OFF, than start the vehicle.

If the light or message comes back on when you start the vehicle, the OIL LIFE SYSTEM has not reset. Repeat the procedure.

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