Lighting

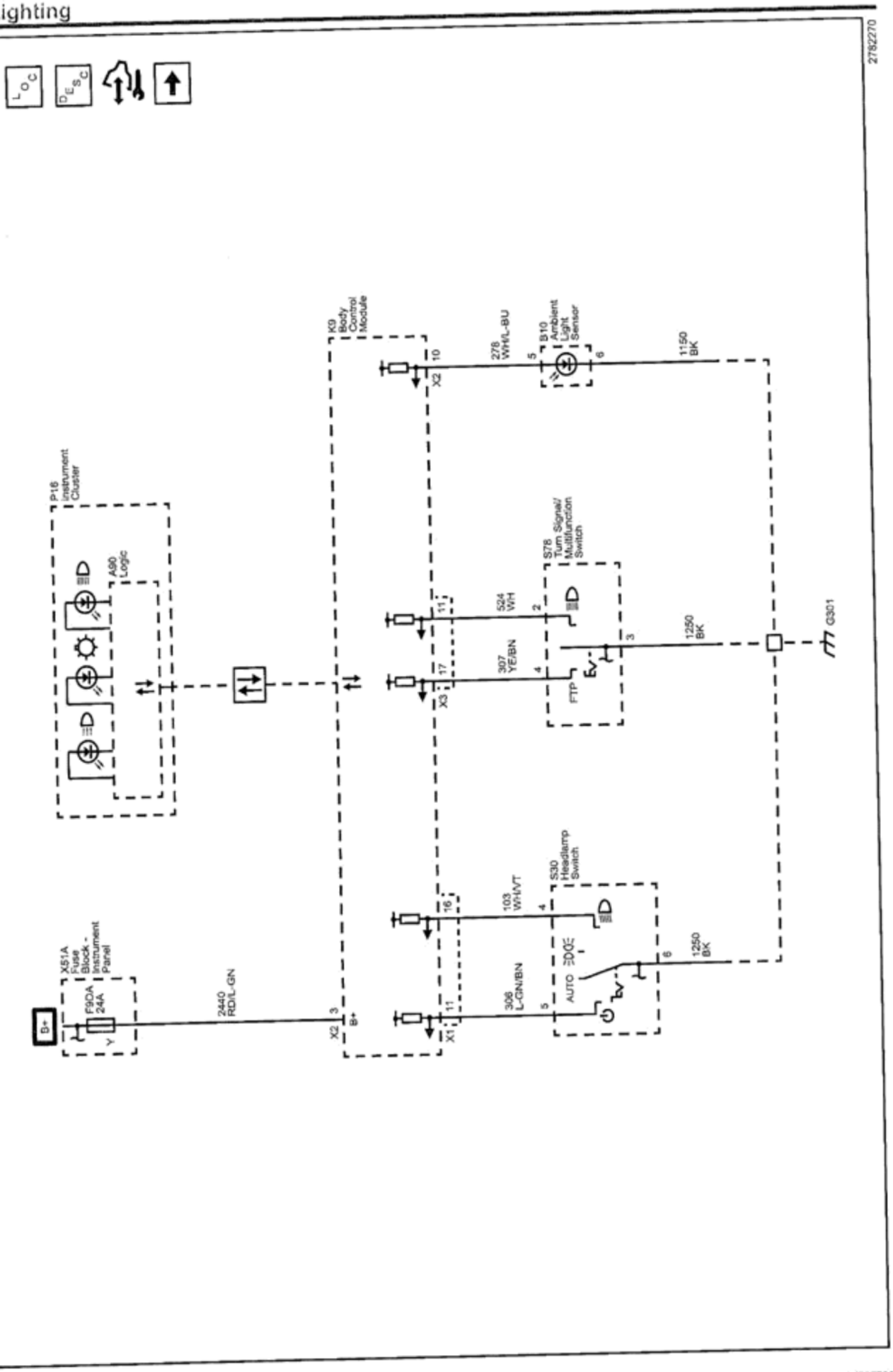
Specifications

Fastener Tightening Specifications

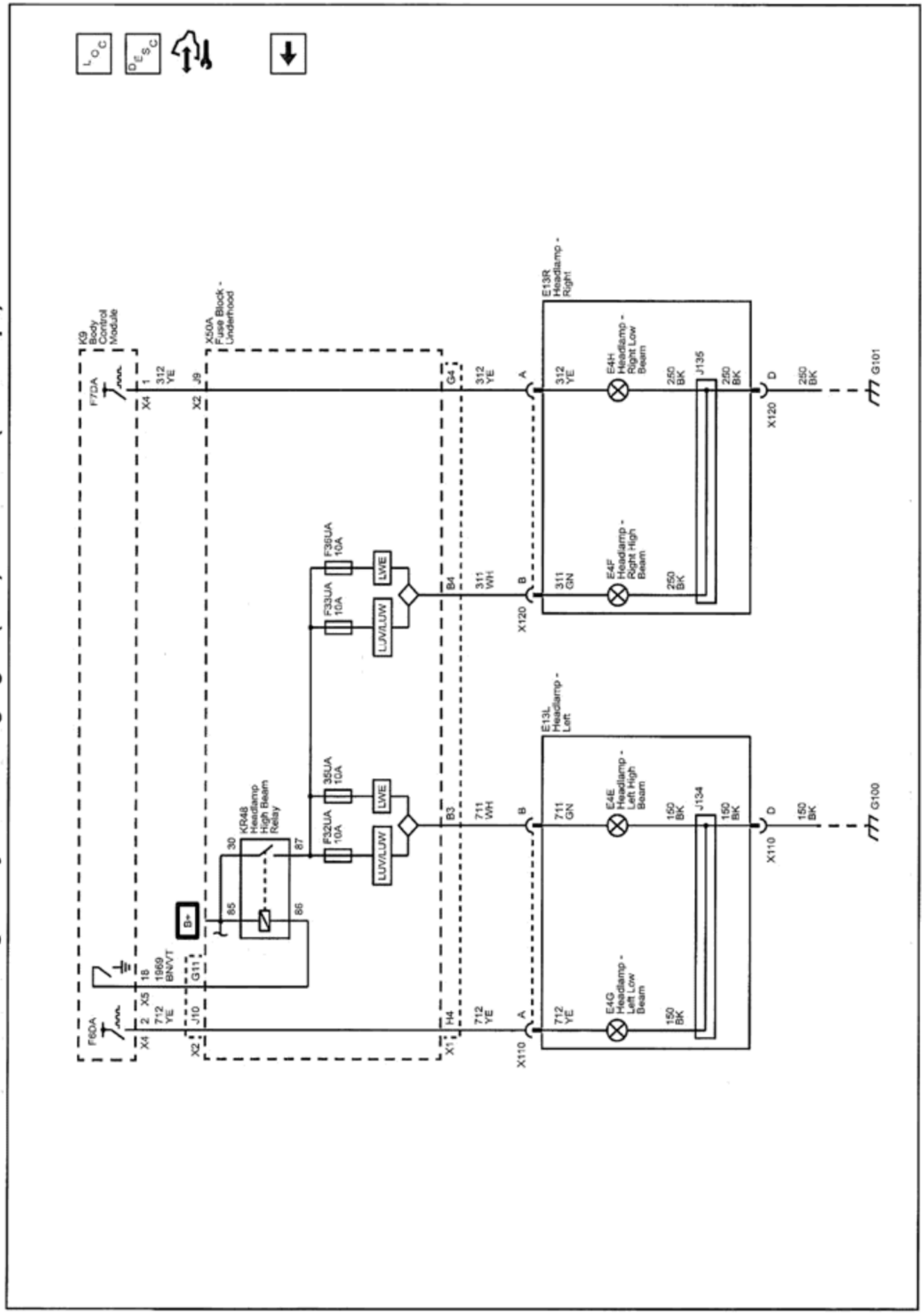
Application	Specification	
	Metric	English
Front Fog Lamp Bolt	1.5 N•m	13 lb in
Headlamp Bolt	2.5 N•m	22 lb in
High Mount Stop Lamp Bolt	2.5 N•m	22 lb in
Rear License Plate Lamp Bolt	1.0 N•m	9 lb in
Tail Lamp Bolt	2.5 N•m	22 lb in

Schematic and Routing Diagrams

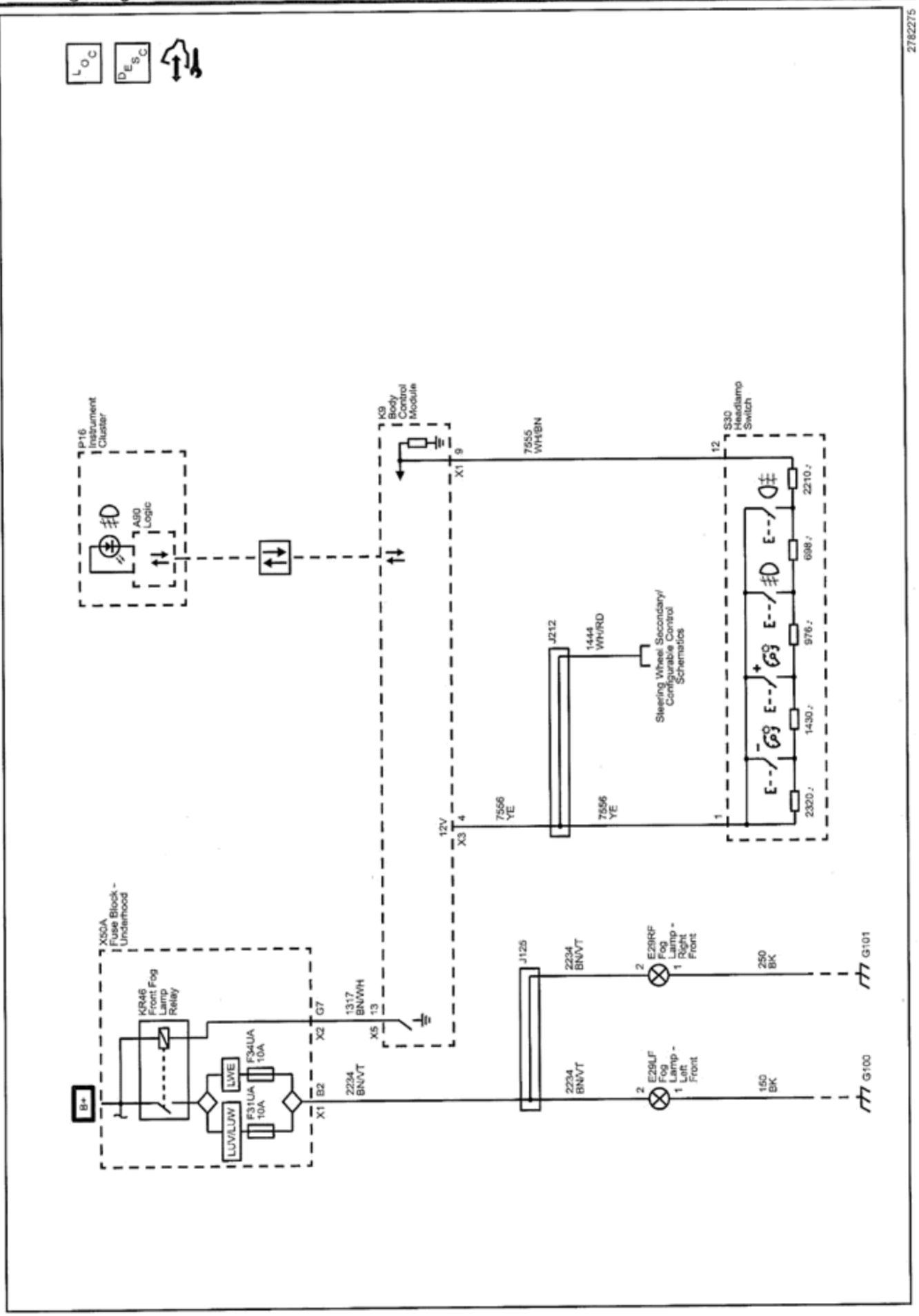
Headlights/Daytime Running Lights (DRL) Schematics (Headlamp Controls and Indicators)



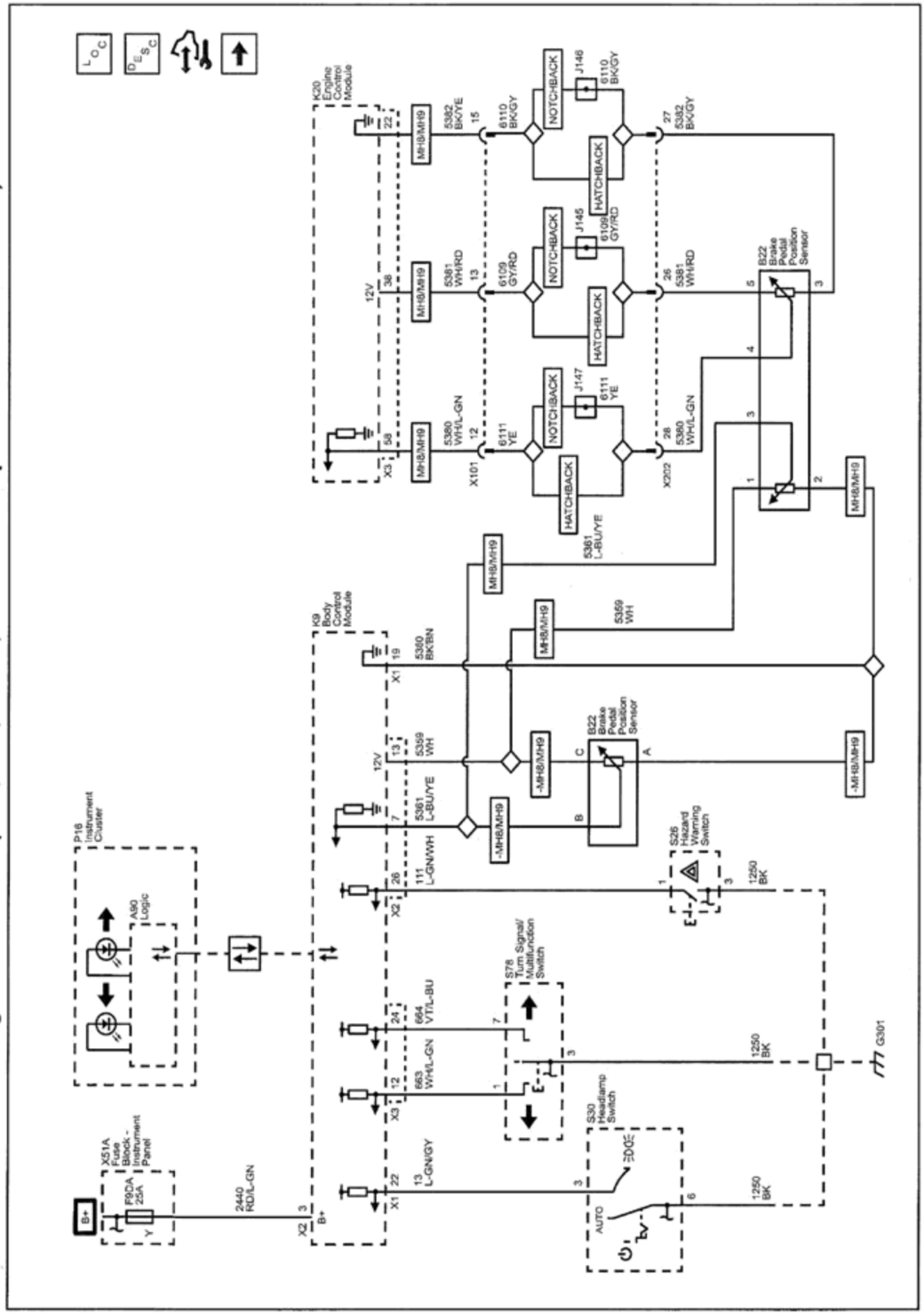
Headlights/Daytime Running Lights (DRL) Schematics (Headlamps)



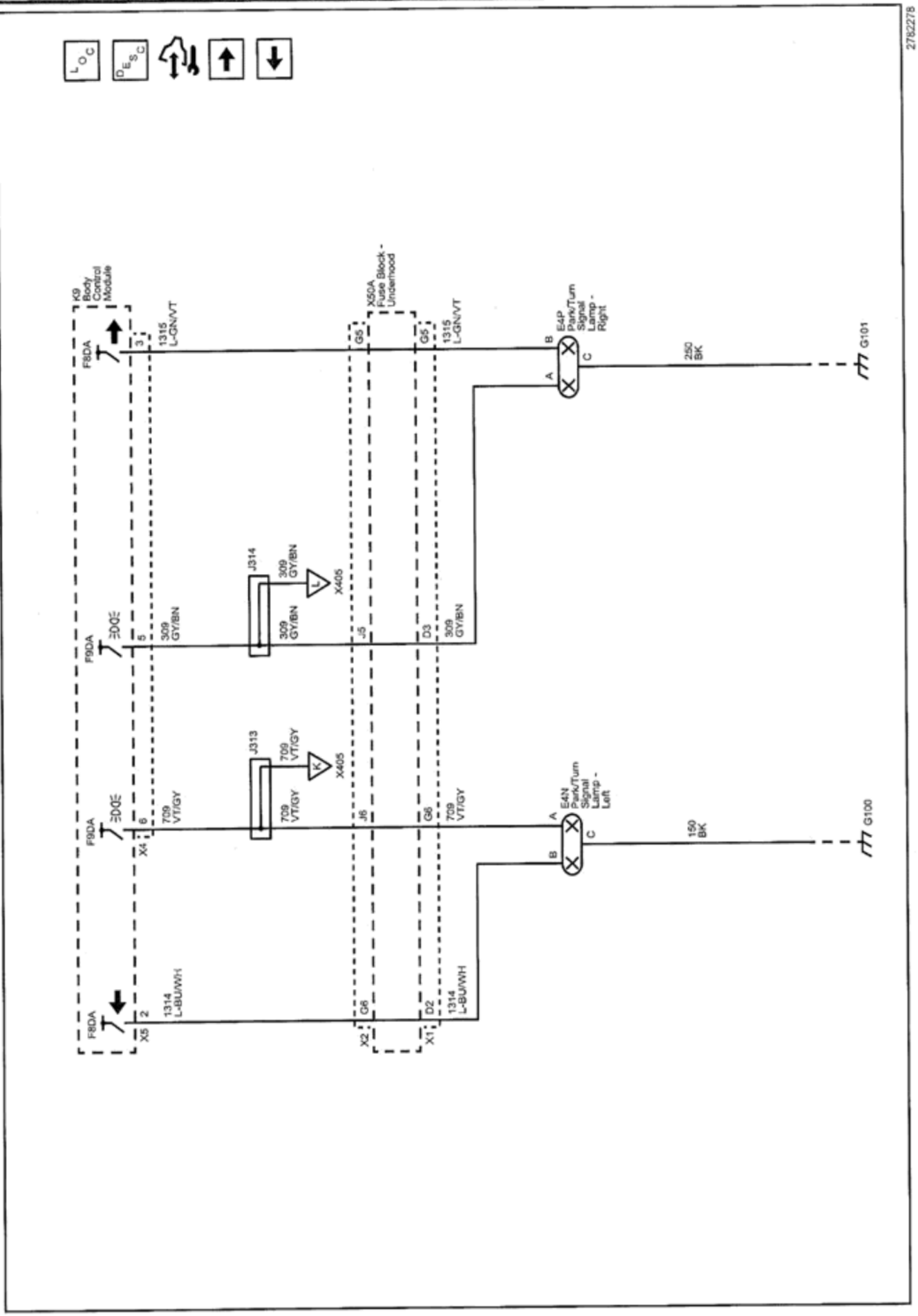
Fog Lights Schematics (Fog Lamps)



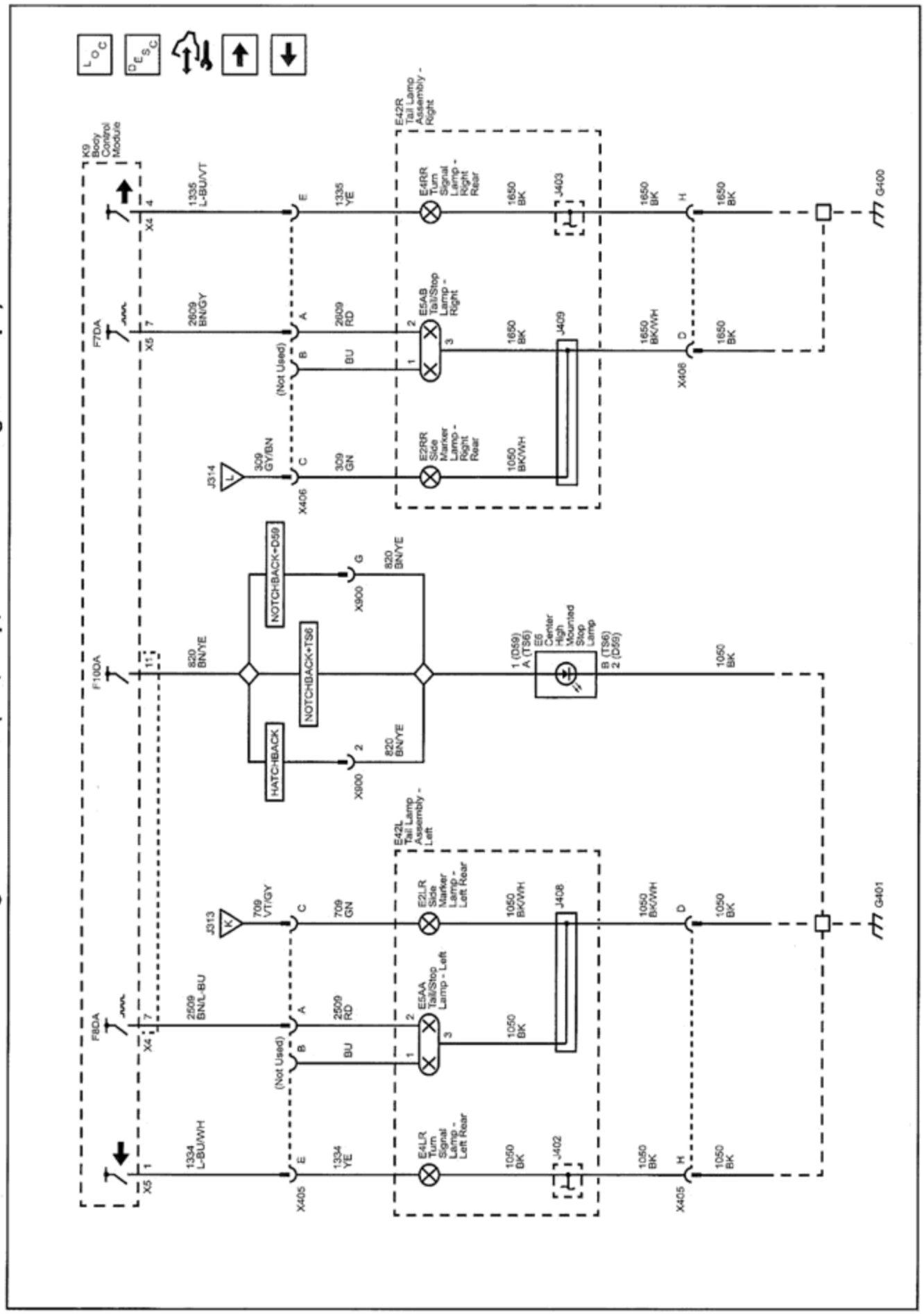
Exterior Lights Schematics (Park, Turn, Hazard, and Brake Lamps Controls and Indicators)



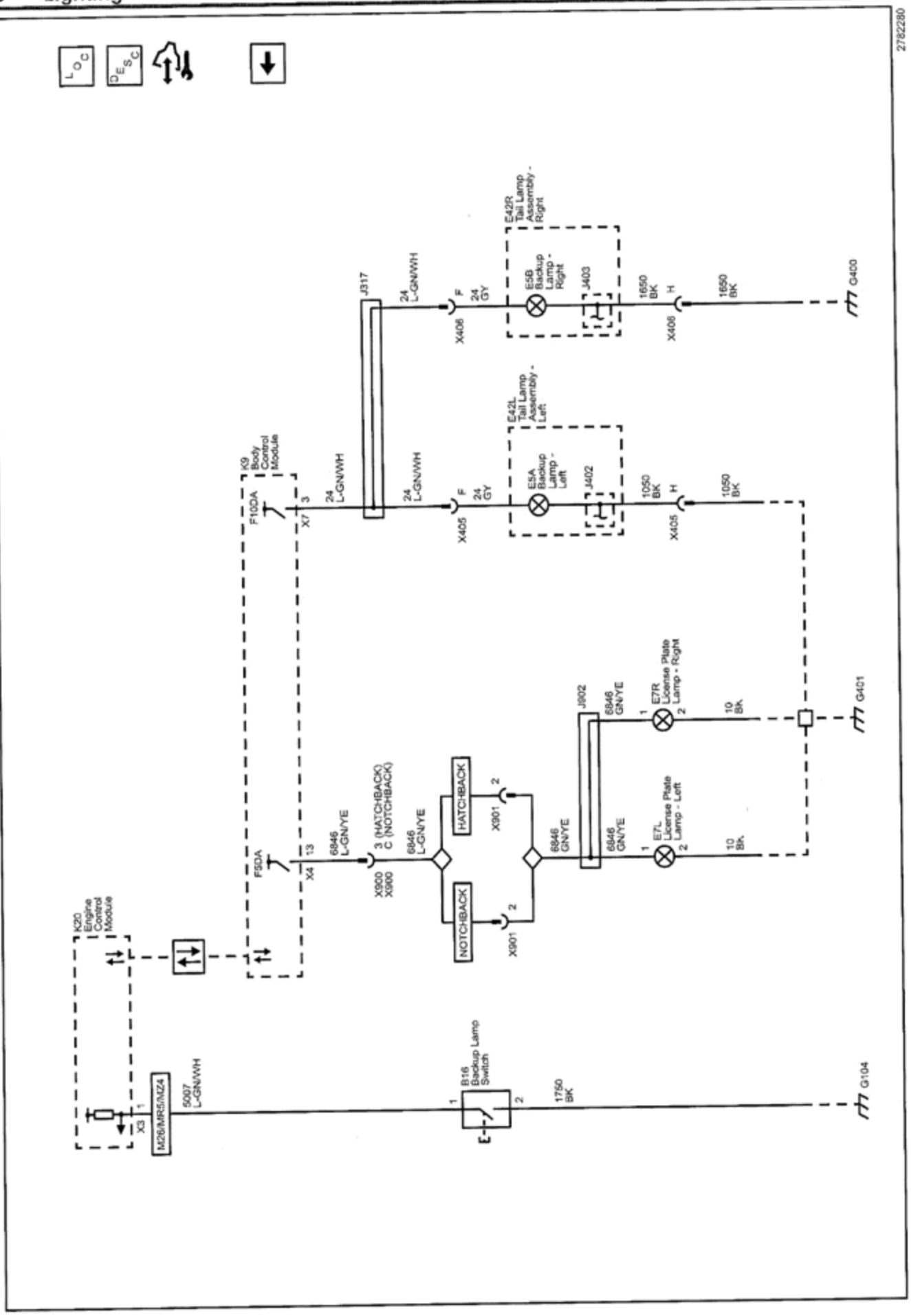
Exterior Lights Schematics (Park and Front Turn Lamps)



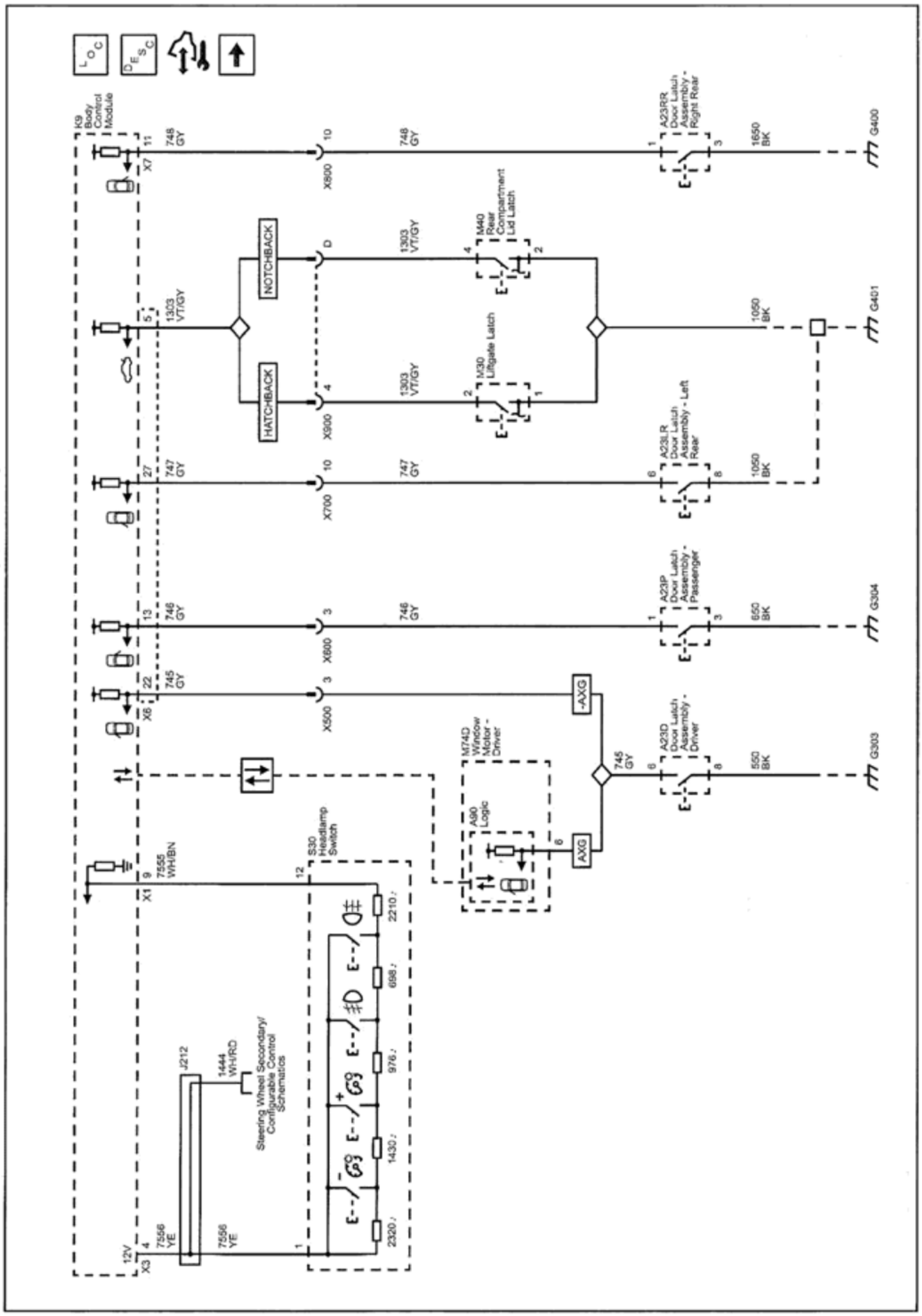
Exterior Lights Schematics (Tail, Stop, and Rear Turn Signal Lamps)



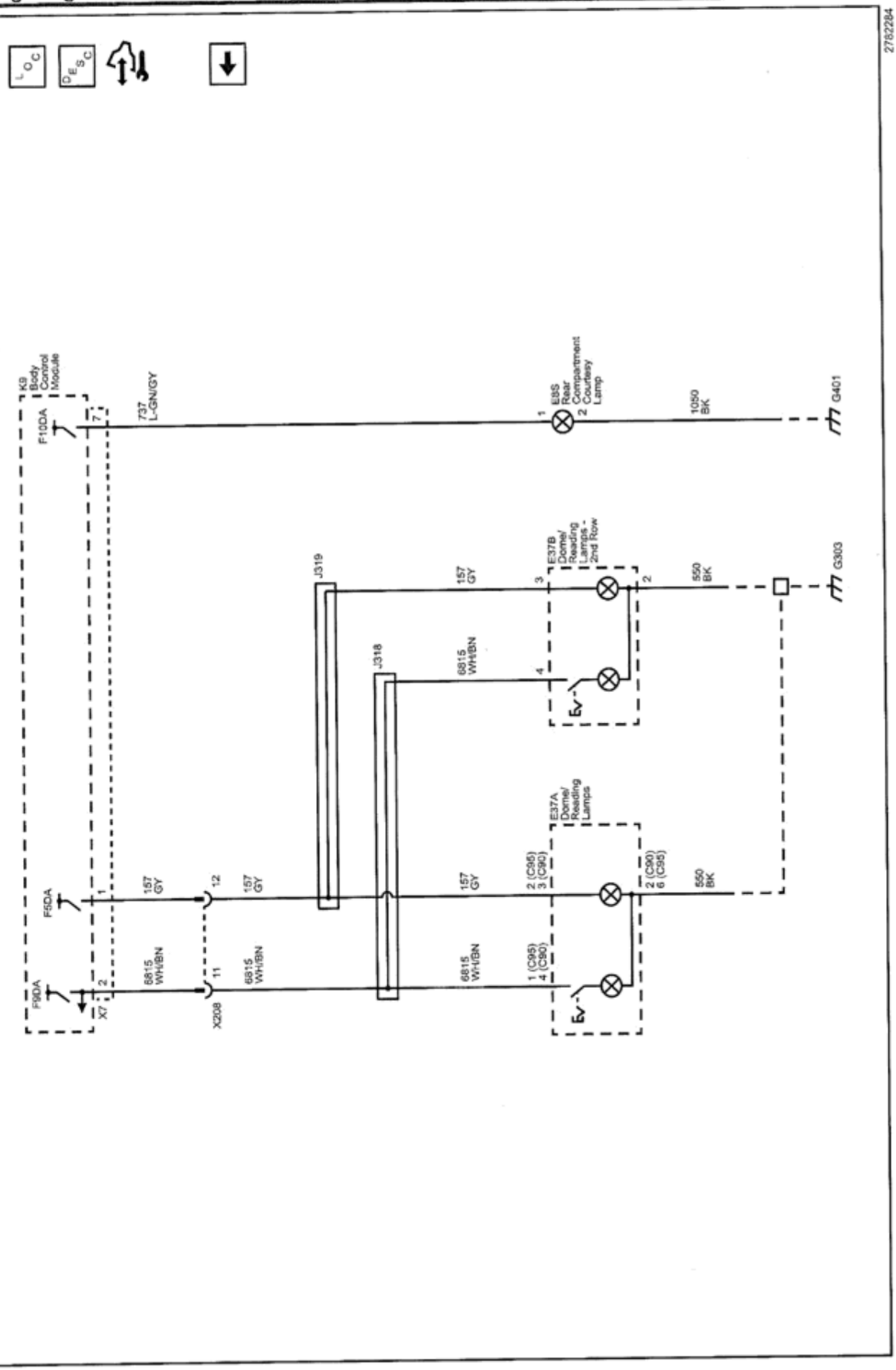
Exterior Lights Schematics (License Plate and Backup Lamps)



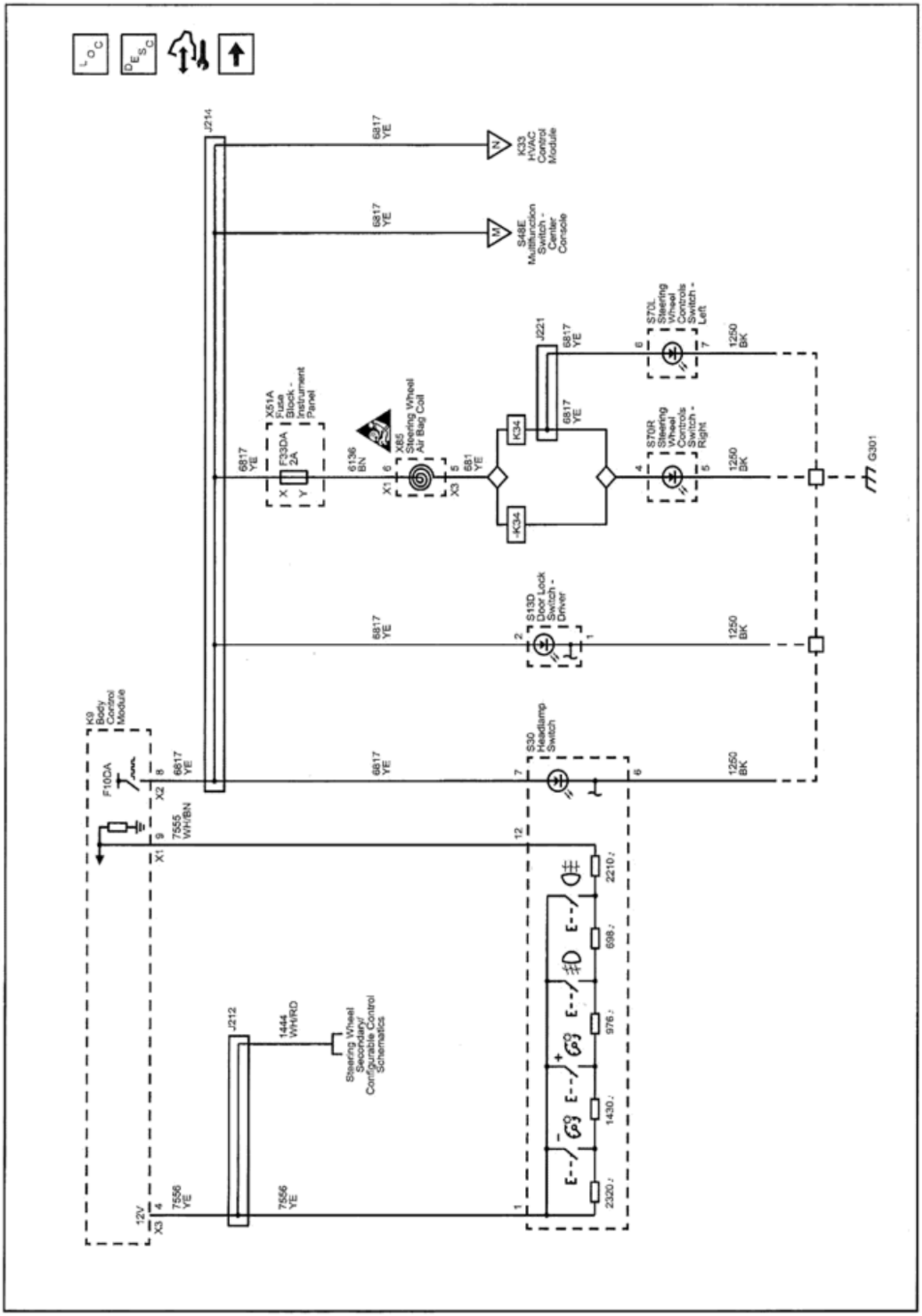
Interior Lights Schematics (Controls)



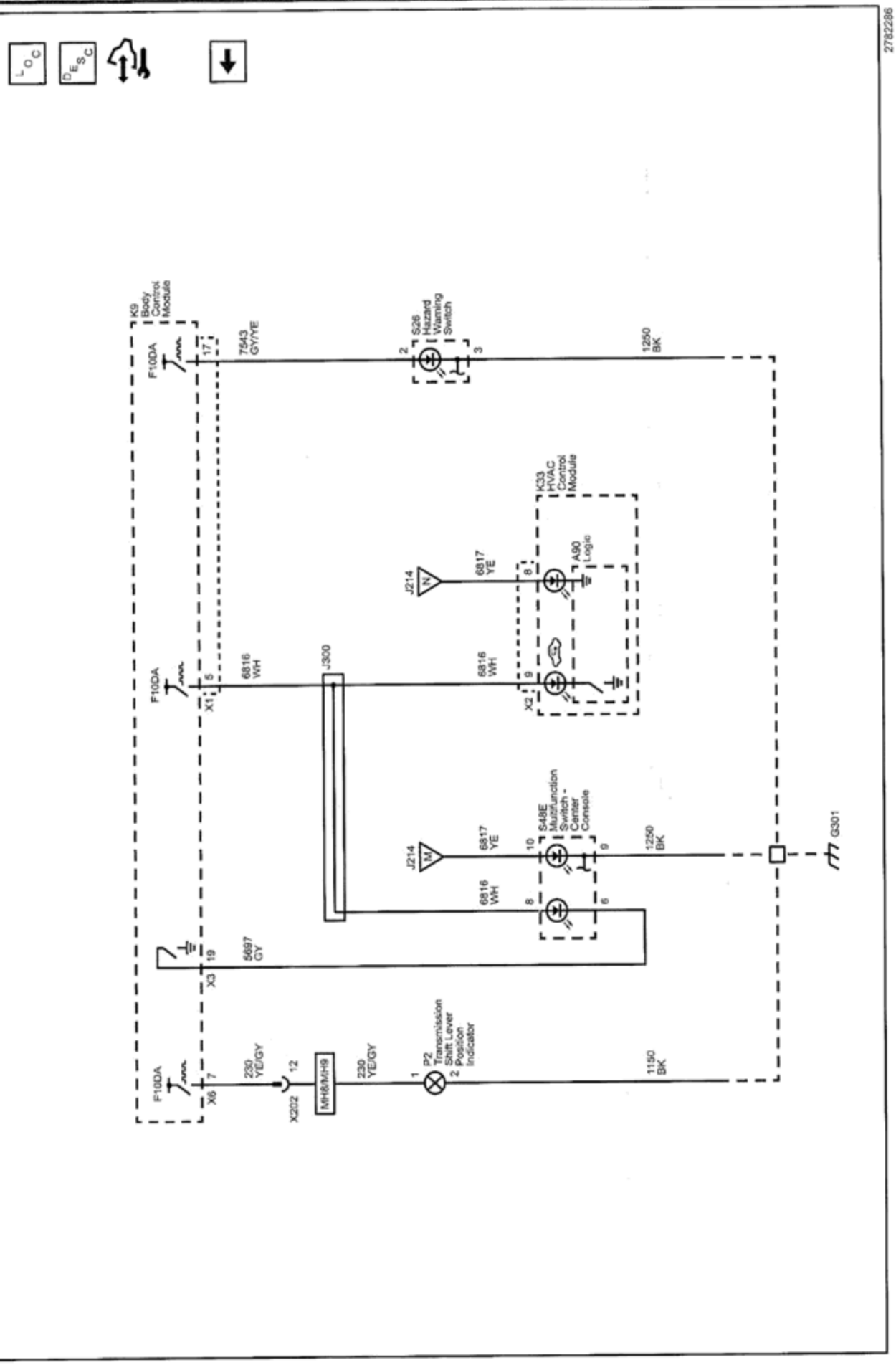
Interior Lights Schematics (Dome and Rear Compartment Lamps)



Interior Lights Dimming Schematics (Controls, and Headlamp, Door Lock and Steering Wheel Switches)



Interior Lights Dimming Schematics (Center Console, HVAC Module, and Hazard Lamp Switch)



Diagnostic Information and Procedures

DTC B1480

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptor

DTC B1480 02: Battery Rundown Protection Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F11DA (BCM 7) Fuse B+	1, 2	1, 2	—	—
Dome Lamps Control	B2615 02	2	2	—
Reading Lamps Control	B1480 02	1	1	—
Dome/Reading Lamps - Front Ground	—	1, 2	—	—
Dome/Reading Lamps - Rear Ground	—	1, 2	—	—
1. Courtesy Lamps Malfunction 2. Dome Lamps Malfunction				

Circuit/System Description

The body control module (BCM) supplies battery voltage to the reading lamps via the courtesy lamp control circuit. The front reading lamps controlled by an individual switch that is activated by the operator when additional cabin lighting is required. In the event that the reading lamp were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position and no doors opened, the BCM will deactivate the reading lamp control circuit to prevent total battery discharge.

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 reading lamp control circuit.

Actions Taken When the DTC Sets

The BCM will disable the circuit and the reading 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.

Reference Information

Schematic Reference

- *Interior Lights Schematics on page 4-89*
- *Body Control System Schematics on page 11-8*

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connectors at the E37F dome/reading lamps-front and E37B dome/reading lamps-2nd row.
2. Connect a test lamp between the appropriate control circuit terminal listed below and ground.
   - E37F dome/reading lamps – front terminal 1 with C95
   - E37F dome/reading lamps – front terminal 4 with C90/C91
   - E37B dome/reading lamps – 2nd row terminal 4 with C90/C95
3. Verify the test lamp turns ON and OFF when commanding the Inadvertent Load ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

3.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module.

3.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

3.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

3.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module, ignition ON.

3.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

4. Test or replace the appropriate E37 dome/reading lamps.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Dome Lamp Bulb Replacement on page 4-192*
- *Reading Lamp Replacement on page 4-189*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B2530

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* 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

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamp and Instrument Panel Dimmer Switch B+	B257B 03, B1405 03	B257B 03	—	—
Front Fog Lamp and Instrument Panel Dimmer Switch Signal	B257B 03	B257B 03	1	—
Front Fog Lamp Relay Control	B2530 02, B2530 04	B2530 02, B2530 04	B2530 01	—
Front Fog Lamp Control	1	1	1	—
Front Fog Lamp Ground – Left	—	1	—	—
Front Fog Lamp Ground – Right	—	1	—	—
1. Front Fog Lamps Malfunction				

Circuit/System Description

The front fog lamp switch is an input to the body control module (BCM) and is contained in the headlamp switch assembly. The BCM supplies voltage to the front fog lamp switch via the front fog lamp and instrument panel dimmer switch B+ circuit. When the front fog lamp switch is pressed, voltage from the B+ circuit is pulled down through the front fog lamp switch resistor. The front fog lamp resistor is part of the resistor ladder that also provides the dimming signals for the instrument panel dimmer switches. The BCM receives the voltage signal through the front fog lamp and instrument panel dimmer switch signal circuit.

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 control circuit which illuminates the front fog lamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2530 01

The BCM detects a short to voltage in the front fog lamp relay control circuit for 5 seconds or greater.

DTC B2530 02

The BCM detects a short to ground in the front fog lamp relay control circuit.

DTC B2530 04

The BCM detects an open in the front fog lamp relay control circuit.

Actions Taken When the DTC Sets

DTC B2530 01 and B2530 04

The front fog lamps will not operate when the park lamps are ON and the front fog lamp switch is active.

DTC B2530 02

The front fog lamps always ON.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Fog Lights Schematics on page 4-84

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the control circuit terminal 13 and ground.

⇒ **If the test lamp does not illuminate**

2.1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block – Underhood.

2.2. Test for infinite resistance between the control circuit terminal and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

2.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the X50A Fuse Block – Underhood.

⇓ **If the test lamp illuminates**

3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 13 and ground.
4. Remove the front fog lamp fuse at the X50A Fuse Block – Underhood, ignition ON.
5. Verify a test lamp illuminates between the front fog lamp fuse B+ switch control terminal and ground.

⇒ **If the test lamp does not illuminate**

5.1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block – Underhood, ignition ON.

5.2. Test for less than 1 V between the control circuit terminal 13 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the X50A Fuse Block – Underhood.

⇓ **If the test lamp illuminates**

6. Test or replace the K9 Body Control Module.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Front Compartment Fuse Block Replacement on page 11-609*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B2545

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptors

DTC B2545 01: Backup Lamps Circuit Short to Battery
DTC B2545 02: Backup Lamps Circuit Short to Ground
DTC B2545 04: Backup Lamps Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F10DA (BCM 6) Fuse B+	1	1	—	—
Backup Lamp Switch Signal (Manual Transmission)	P0812	P0812	1	—
Backup Lamps Control	B2545 02	B2545 04	B2545 01	—
Backup Lamp Switch Ground (Manual Transmission)	—	P0812	—	—
Backup Lamp Ground – Left	—	1	—	—
Backup Lamp Ground – Right	—	1	—	—
1. Backup Lamps Malfunction				

Circuit/System Description

Automatic Transmission

With the engine running and the transmission 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 control circuit illuminating the backup lamps. 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. The engine must be running for the backup lamps to operate.

Manual Transmission

The engine control module (ECM) provides a signal circuit to the backup lamp switch which is permanently grounded. With the engine running and the transmission 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 control circuit illuminating the backup lamps. Once the driver moves the gear selector out of the reverse position, a message is sent by the ECM via serial data requesting the BCM to remove battery voltage from the backup lamps control circuit. The engine must be running for the backup lamps to operate.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Engine RUNNING.
- Transmission placed in REVERSE gear.

Conditions for Setting the DTC

DTC B2545 01

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

DTC B2545 02

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

DTC B2545 04

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

Actions Taken When the DTC Sets

DTC B2545 02 and B2545 04

The backup lamps will not operate.

DTC B2545 01

The backup lamps are always ON.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85
Body Control System Schematics on page 11-8

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

2.1. Ignition OFF.
2.2. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

2.1. Ignition OFF.
2.2. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If the test lamp illuminates**

3. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
4. Ignition OFF, exterior lamps OFF, trunk latch latched, remove the appropriate E5 Backup Lamp bulb at the appropriate E42 Tail Lamp Assembly.
5. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.

⇒ **If 5 Ω or greater**

5.1. Ignition OFF.
5.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

6. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Backup Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

7.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
7.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

7.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

7.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
7.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

8. Test or replace the appropriate E5 Backup Lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Backup Lamp Bulb Replacement (Sedan) on page 4-208*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B256A

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptor

DTC B256A 02: Liftgate Lamp Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F8DA (BCM 4) Fuse B+	1	1	—	—
Rear Compartment Courtesy Lamp Control	B256A 02	1	1	—
Rear Compartment Courtesy Lamp Ground	—	1	—	—
1. Rear Compartment Lamp Malfunction				

Circuit/System Description

The body control module (BCM) applies battery voltage to the rear compartment courtesy lamp through the rear compartment lamp control circuit. When the BCM receives a rear compartment lid open input from the rear compartment lid latch, the BCM applies battery voltage to the rear compartment lamp control circuit illuminating the rear compartment courtesy lamp. In the event that the rear compartment lamp were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position and no doors opened, the BCM will deactivate the rear compartment lamp control circuit to prevent total battery discharge.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Rear compartment OPEN.

Conditions for Setting the DTC

The BCM detects a short to ground on the rear compartment courtesy lamp control circuit.

Actions Taken When the DTC Sets

The rear compartment lamp is 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.

Reference Information

Schematic Reference

Interior Lights Schematics on page 4-89

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the E8S Rear Compartment Courtesy Lamp.
2. Test for less than 5 Ω between the ground circuit terminal 2 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.

4. Verify the test lamp turns ON and OFF when commanding the Trunk Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E8S Rear Compartment Courtesy Lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Rear Compartment Courtesy Lamp Replacement (Hatchback) on page 4-216* or *Rear Compartment Courtesy Lamp Replacement (Sedan) on page 4-217*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B2570

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptor

DTC B2570 02: Trunk Lamp Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F8DA (BCM 4) Fuse B+	1	1	—	—
Rear Compartment Courtesy Lamp Control	B2570 02	1	1	—
Rear Compartment Courtesy Lamp Ground	—	1	—	—
1. Rear Compartment Lamp Malfunction				

Circuit/System Description

The body control module (BCM) applies battery voltage to the rear compartment courtesy lamp through the rear compartment lamp control circuit. When the BCM receives a rear compartment lid open input from the rear compartment lid latch, the BCM applies battery voltage to the rear compartment lamp control circuit illuminating the rear compartment courtesy lamp. In the event that the rear compartment lamp were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position and no doors opened, the BCM will deactivate the rear compartment lamp control circuit to prevent total battery discharge.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Rear compartment OPEN.

Conditions for Setting the DTC

The BCM detects a short to ground on the rear compartment courtesy lamp control circuit.

Actions Taken When the DTC Sets

The rear compartment lamp is 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.

Reference Information

Schematic Reference

Interior Lights Schematics on page 4-89

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the E8S Rear Compartment Courtesy Lamp.
2. Test for less than 5 Ω between the ground circuit terminal 2 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇩ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.

4. Verify the test lamp turns ON and OFF when commanding the Trunk Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E8S Rear Compartment Courtesy Lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Rear Compartment Courtesy Lamp Replacement (Hatchback) on page 4-216* or *Rear Compartment Courtesy Lamp Replacement (Sedan) on page 4-217*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B2575 or B2699

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* 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
F7DA (BCM 3) Fuse B+	1	1	—	—
F8DA (BCM 4) Fuse B+	1	1	—	—
Low Beam Headlamp Control – Left	B2575 02	B2575 04	B2575 01, B2575 04	—
Low Beam Headlamp Control – Right	B2699 02	B2699 04	B2699 01, B2699 04	—
Headlamp Ground – Left	—	B2575 04	—	—
Headlamp Ground – Right	—	B2699 04	—	—
1. Headlamps Malfunction				

Circuit/System Description

With the headlamp switch in the ON position, the headlamp switch headlamp ON signal circuit is grounded through the headlamp switch. The body control module (BCM) responds by applying battery positive 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

DTC B2575 01 and B2575 04

The BCM detects a short to voltage or an open/high resistance in the left low beam headlamp control circuit.

DTC B2575 02

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

DTC B2699 01 and B2699 04

The BCM detects a short to voltage or an open/high resistance in the right low beam headlamp control circuit.

DTC B2699 02

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

Actions Taken When the DTC Sets

- When DTC B2575 sets, the left low beam headlamp will be inoperative.
- When DTC B2699 sets, the right low beam headlamp 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.

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics on page 4-82

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

DTC B2575

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E13L headlamp - left.
2. Test for less than 5 Ω between the ground circuit terminal D and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal A and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Left Low Beam/Daytime Running Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E13L headlamp bulb – left.

DTC B2699

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E13R headlamp - right.
2. Test for less than 5 Ω between the ground circuit terminal D and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal A and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Right Low Beam/Daytime Running Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E13R headlamp bulb – right.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Headlamp Bulb Replacement on page 4-194*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B257A

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptor

DTC B257A 00: Headlamp Switch Input Signals Correlation Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	—
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	—
Headlamp Switch Headlamps ON Signal	B257A 00	1	1	—
Headlamp Switch Ground	—	1	—	—
1. Headlamps Malfunction 2. Park, License, and/or Tail Lamps Malfunction				

Circuit/System Description

For headlamp operation, the body control module (BCM) monitors three signal circuits from the headlamp switch. When the headlamp switch is in the AUTO position, the three signal circuits are unaffected and the BCM relies on the ambient light sensor input to turn the headlamps and daytime running lamps (DRLs) ON and OFF. When the headlamp switch is placed in the OFF position, the headlamp switch headlamps OFF signal circuit is grounded, indicating to the BCM that the exterior lamps should be turned OFF. With the headlamp switch in the PARK LAMPS position, the headlamp switch park lamps ON signal circuit is grounded, indicating that the park lamps have been requested. When the headlamp switch is in the HEADLAMP position, both the headlamp switch park lamps ON signal circuit and the headlamp switch headlamps ON signal circuit are grounded. The BCM responds by commanding the park lamps and headlamps ON.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

- The BCM detects an open/high resistance in the headlamp switch park lamps ON signal circuit.
- The BCM detects a short to ground in the headlamp switch headlamps ON signal circuit.
- The BCM detects a short to ground in the headlamp switch headlamps OFF signal circuit.

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics on page 4-82

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 6 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool Automatic Headlamps Disable Switch parameter is Inactive.

⇒ **If not Inactive**

4.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the signal circuit terminal 5 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the ground circuit terminal 6.
6. Verify the scan tool Automatic Headlamps Disable Switch parameter is Active.

⇒ **If not Active**

6.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 5 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If Active**

7. Verify the scan tool Park Lamps Switch parameter is Inactive.

⇒ **If not Inactive**

7.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.

7.2. Test for infinite resistance between the signal circuit terminal 3 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If Inactive**

8. Install a 3 A fused jumper wire between the signal circuit terminal 3 and the ground circuit terminal 6.
9. Verify the scan tool Park Lamps Switch parameter is Active.

⇒ **If not Active**

9.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.

9.2. Test for less than 1 V between the signal circuit terminal 3 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

9.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If Active**

10. Verify the scan tool Headlamps On Switch parameter is Inactive.

⇒ **If not Inactive**

10.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.

10.2. Test for infinite resistance between the signal circuit terminal 4 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If Inactive**

11. Install a 3 A fused jumper wire between the signal circuit terminal 4 and the ground circuit terminal 6.

12. Verify the scan tool Headlamps On Switch parameter is Active.

⇒ **If not Active**

12.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.

12.2. Test for less than 1 V between the signal circuit terminal 4 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

12.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If Active**

13. Test or replace the S30 Headlamp Switch.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Headlamp Switch Replacement on page 4-187*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B257B

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptors

DTC B257B 03: Lighting Control Switch Signal Low Voltage
DTC B257B 07: Lighting Control Switch Signal High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Instrument Panel Dimmer Switch B+ Reference	B257B 03, B1405 03	B257B 03	—	—
Instrument Panel Dimmer Switch Signal	B257B 03	B257B 03	B257B 07	—
LED Backlight Dimming Control Terminal 8 X2	B2610 02	B2610 04	B2610 01	—
LED Backlight Dimming Control Terminal 5 X1	B252E 02	B252E 02	1	—
Hazard Warning Switch LED Backlight Dimming Control	1	1	1	
Transmission Shift Lever Position Indicator Backlight Control	B2652 02	1	1	—
1. Interior Backlighting Malfunction				

Circuit/System Description

The instrument panel dimmer switch is used to increase and decrease the brightness of the interior backlighting components. The instrument panel dimmer switch provides a voltage signal to the body control module (BCM) that will increase as the brightness of the lights are increased and decrease as the brightness of the lights are decreased. The BCM provides a low reference signal and a B+ voltage reference to the instrument panel dimmer switch. When the instrument panel dimmer switch is placed in the desired position, the dimmed voltage setting is applied from the instrument panel dimmer switch through the instrument panel dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies a pulse width modulated (PWM) voltage through the light emitting diode (LED) dimming control circuits illuminating the interior backlighting to the requested level of brightness.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B257B 03

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

DTC B257B 07

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

Actions Taken When the DTC Sets

The BCM will not dim any interior backlighting. All interior backlighting will default to the level selected prior to the fault being present.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Interior Lights Dimming Schematics on page 4-91

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S30 Headlamp Switch, ignition ON.
2. Test for B+ between the B+ circuit terminal 1 and ground.

⇒ **If less than B+**

2.1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.

2.2. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

2.3. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If B+**

3. Verify a test lamp does not illuminate between the B+ circuit terminal 1 and the signal circuit terminal 12.

⇒ **If the test lamp illuminates**

3.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.

3.2. Test for infinite resistance between the signal circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If the test lamp does not illuminate**

4. Test for B+ between the B+ circuit terminal 1 and the signal circuit terminal 12.

⇒ **If less than B+**

4.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the signal circuit terminal 12 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

4.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If B+**

5. Test or replace the S30 Headlamp Switch.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Headlamp Switch Replacement on page 4-187*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B2580

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* 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
F7DA (BCM 3) Fuse B+	1	1	—	—
F8DA (BCM 4) Fuse B+	1	1	—	—
Headlamp High Beam Relay Control	B2580 02, B2580 04	B2580 02, B2580 04	B2580 01	—
High Beam Headlamp Control – Left	1	1	1	—
High Beam Headlamp Control – Right	1	1	1	—
Headlamp Ground – Left	—	B2575 04	—	—
Headlamp Ground – Right	—	B2699 04	—	—
1. Headlamps Malfunction				

Circuit/System Description

The high beam and flash to pass functions are contained within the turn signal/multifunction switch. The BCM provides the turn signal/multifunction switch with two signal circuits, the high beam signal circuit and the flash to pass signal circuit. When the low beam headlamps are ON and the turn signal/multifunction switch is placed in the high beam position, ground is applied to the BCM through the high beam signal circuit. The BCM responds to the high beam request by applying ground to the 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 control circuits illuminating 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

DTC B2580 01

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

DTC B2580 02

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

DTC B2580 04

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics on page 4-82

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, remove the KR48 Headlamp High Beam Relay.
2. Connect a test lamp between the control circuit terminal 86 and B+, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the High Beams ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

3.1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.

3.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

3.3. Ignition OFF.

3.4. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

3.1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.

3.2. Test for infinite resistance between the control circuit terminal and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

4. Test or replace the KR48 Headlamp High Beam Relay.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Relay Replacement (Within an Electrical Center) on page 11-607* or *Relay Replacement (Attached to Wire Harness) on page 11-607*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B2585 or B3867

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* 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
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	—
License Plate Lamp Control	B3883 02	B3883 01, B3883 04	B3883 01	—
Front Park and Rear Side Marker Lamps Control - Left	B2585 02	B2585 04	B2585 01, B2585 04	—
Front Park and Rear Side Marker Lamps Control - Right	B3867 02	B3867 04	B3867 01, B3867 04	—
Rear Tail/Stop Lamps Control - Left	B3881 02	B3881 04	B3881 01	—
Rear Tail/Stop Lamps Control - Right	B3882 02	B3882 04	B3882 01	—
Headlamp Switch Ground	—	2	—	—
License Plate Lamp Ground - Left	—	B3883 01, B3883 04	—	—
License Plate Lamp Ground - Right	—	B3883 01, B3883 04	—	—
Park Lamp Ground - Left Front	—	1	—	—
Park Lamp Ground - Right Front	—	1	—	—
Rear Tail/Stop Lamps Ground - Left	—	1	—	—
Rear Tail/Stop Lamps Ground - Right	—	1	—	—
Side Marker Lamp Ground - Left Rear	—	1	—	—
Side Marker Lamp Ground - Right Rear	—	1	—	—
1. Park, License, and/or Tail Lamps Malfunction 2. Park Lamp Switch Malfunction				

Circuit/System Description

When the headlamp switch is placed in the HEAD or PARK position, ground is applied to the park lamp switch ON 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, and license lamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2585 01 and B2585 04

The BCM detects a short to voltage or an open/high resistance in the left front park lamps control circuit.

DTC B2585 02

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

DTC B3867 01 and B3867 04

The BCM detects a short to voltage or an open/high resistance in the right front park lamps control circuit.

DTC B3867 02

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

Actions Taken When the DTC Sets

DTC B2585 01

The left park lamps are always ON.

DTC B2585 02 and B2585 04

The left park lamps are always OFF.

DTC B3867 01

The right park lamps are always ON.

DTC B3867 02 and B3867 04

The right park lamps are always OFF.

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 on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

DTC B2585

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the appropriate left front park lamp or left rear side marker lamp.
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
   - E4N park/turn signal lamp – left terminal C
   - E2LR side marker lamp – left rear socket terminal

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
   - E4N park/turn signal lamp – left terminal A
   - E2LR side marker lamp – left rear socket terminal
4. Verify the test lamp turns ON and OFF when commanding the Left Park Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the appropriate left park/ marker lamp.

DTC B3867

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the appropriate right front park lamp or right rear side marker lamp.
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
   - E4P park/turn signal lamp – right terminal C
   - E2RR side marker lamp – right rear socket terminal

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
   - E4P park/turn signal lamp – right terminal A
   - E2RR side marker lamp – right rear socket terminal
4. Verify the test lamp turns ON and OFF when commanding the Right Park Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the appropriate right park/ marker lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Tail Lamp Replacement (Hatchback) on page 4-214* or *Tail Lamp Replacement (Sedan) on page 4-213*
- *Parking and Turn Signal Lamp Bulb Replacement on page 4-203*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B2610

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptors

DTC B2610 01: Passenger Compartment Dimming 1 Circuit Short to Battery
DTC B2610 02: Passenger Compartment Dimming 1 Circuit Short to Ground
DTC B2610 04: Passenger Compartment Dimming 1 Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
LED Backlight Dimming Control Terminal 8 X2	B2610 02	B2610 04, 1	B2610 01, 1	—
1. Interior Backlighting Malfunction				

Circuit/System Description

The instrument panel dimmer switch is used to increase and decrease the brightness of the interior backlighting components. The instrument panel dimmer switch provides a voltage signal to the body control module (BCM) that will increase as the brightness of the lights are increased and decrease as the brightness of the lights are decreased. The BCM provides a low reference, signal, and B+ voltage reference circuits to the instrument panel dimmer switch. When the instrument panel dimmer switch is placed in the desired position, the dimmed voltage setting is applied from the instrument panel dimmer switch through the instrument panel dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies a pulse width modulated (PWM) voltage through the light emitting diode (LED) dimming control circuits illuminating the interior backlighting to the requested level of brightness.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2610 01

The BCM detects a short to battery in the LED backlight dimming control circuit terminal 8 X2.

DTC B2610 02

The BCM detects a short to ground in the LED backlight dimming control circuit terminal 8 X2.

DTC B2610 04

The BCM detects an open/high resistance in the LED backlight dimming control circuit terminal 8 X2.

Actions Taken When the DTC Sets

The BCM will disable the LED 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–free ignition cycles have occurred.

Reference Information

Schematic Reference

Interior Lights Dimming Schematics on page 4-91

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

Note: Each component with backlighting may need to be disconnected to isolate a short to voltage or short to ground. Use the schematics to identify the following:

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

1. Ignition OFF, all doors closed, all accessories OFF, disconnect the harness connector at the component with inoperative backlighting. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
   - S13D door lock switch – driver – terminal 1
   - S30 headlamp switch – terminal 6
   - S48E multifunction switch – center console – terminal 9
   - S70R steering wheel controls switch – right – terminal 5
   - S70L steering wheel controls switch – left – terminal 7

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground.
   - K33 HVAC control module – terminal 8
   - S13D door lock switch – driver – terminal 2
   - S30 headlamp switch – terminal 7
   - S48E multifunction switch – center console – terminal 10
   - S70R steering wheel controls switch – right – terminal 4
   - S70L steering wheel controls switch – left – terminal 6
4. Verify the test lamp turns ON and OFF when commanding the LED Backlight Dimming ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the component with inoperative backlighting.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Headlamp Switch Replacement on page 4-187*
- *Door Lock Switch Replacement on page 4-321*
- *Radio and Telephone Control Switch Replacement on page 8-63*
- *Control Module References on page 6-3* for BCM or HVAC control module replacement, programming, and setup

DTC B2615

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* 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
F11DA (BCM 7) Fuse B+	1, 2	1, 2	—	—
Dome Lamps Control	B2615 02	2	2	—
Reading Lamps Control	B1480 02	1	1	—
Dome/Reading Lamps - Front Ground	—	1, 2	—	—
Dome/Reading Lamps - Rear Ground	—	1, 2	—	—
1. Courtesy Lamps Malfunction 2. Dome 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 any of these courtesy lamps were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position and no doors opened, the BCM will deactivate the courtesy lamp control circuit to prevent total battery discharge.

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 lamps control circuit.

Actions Taken When the DTC Sets

The BCM will disable the dome lamps 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

Interior Lights Schematics on page 4-89

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, all doors closed, all accessories OFF, disconnect the harness connector at the E37F dome/reading lamps – front and E37 B dome/reading lamps – 2nd row. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
   - E37F dome reading lamps – front terminal 2 with C90/C91
   - E37F dome reading lamps – front terminal 6 with C95
   - E37B dome reading lamps – 2nd row terminal 2 with C90/C95

⇒ **If 10 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 10 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground.
   - E37F dome reading lamps – front terminal 3 with C90/C91
   - E37F dome reading lamps – front terminal 2 with C95
   - E37B dome reading lamps – 2nd row terminal 3 with C90/C95
4. Verify the test lamp turns ON and OFF when commanding the Courtesy Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the inoperative E37 dome/reading lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Dome Lamp Bulb Replacement on page 4-192*
- *Reading Lamp Replacement on page 4-189*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B2625

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptors

DTC B2625 01: Display Dimming Pulse Width Modulation Output Circuit Short to Battery
DTC B2625 02: Display Dimming Pulse Width Modulation Output Circuit Short to Ground
DTC B2625 04: Display Dimming Pulse Width Modulation Output Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
LED Backlight Dimming Control Terminal 5 X1	B2625 02	B2625 04	B2625 01	—

Circuit/System Description

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

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 circuit terminal 5 X1.

Actions Taken When the DTC Sets

The LED backlight dimming control circuit driver is shut down.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Interior Lights Dimming Schematics on page 4-91

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the K33 HVAC control module.
2. Connect a test lamp between the control circuit terminal 9 and ground.

3. Verify the test lamp turns ON and OFF when commanding the LED Backlight Dimming ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

3.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module.

3.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

3.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

3.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module, ignition ON.

3.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

4. Test or replace the K33 HVAC control module.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

Control Module References on page 6-3 for BCM or HVAC control module replacement, programming, and setup

DTC B2645

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptors

DTC B2645 03: Ambient Light Sensor Circuit Low Voltage
DTC B2645 07: Ambient Light Sensor Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ambient Light Sensor Signal	B2645 03	B2645 07	B2645 07	—
Low Beam Headlamp Control – Left	B2575 02	B2575 04	B2575 01, B2575 04	—
Low Beam Headlamp Control – Right	B2699 02	B2699 04	B2699 01, B2699 04	—
Ambient Light Sensor Ground	—	B2645 07	—	—
Headlamp Ground – Left	—	1	—	—
Headlamp Ground – Right	—	1	—	—
1. Headlamps Malfunction				

Circuit/System Description

The ambient light sensor is used to monitor outside lighting conditions. The body control module (BCM) provides a 5-volt reference signal to the ambient light sensor. Depending on outside lighting conditions, the ambient light sensor provides a voltage signal to the BCM that will vary between 0.2 and 4.9 volts. 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 headlamp system control when the headlamp switch is in the AUTO position. In daylight conditions, the BCM will command the low beam headlamps (DRLs) ON by applying low voltage to the low beam headlamp control circuits illuminating the low beam headlamps at reduced intensity. 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

DTC B2645 03

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

DTC B2645 07

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

Actions Taken When the DTC Sets

- Automatic headlamp system and daytime running lamps are 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

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics on page 4-82

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the B10 Ambient Light Sensor. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 6 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool Ambient Light Sensor parameter is greater than 4.65 V.

⇒ **If 4.65 V or less**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the signal circuit terminal 5 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If greater than 4.65 V**

5. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the ground circuit terminal 6.
6. Verify the scan tool Ambient Light Sensor parameter is less than 0.196 V.

⇒ **If 0.196 V or greater**

6.1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 5 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If less than 0.196 V**

7. Test or replace the B10 Ambient Light Sensor.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Sun Load Temperature Sensor Replacement on page 10-83*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B2652

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* 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
Transmission Shift Lever Position Indicator Backlighting Control	B2652 02	1	1	—
Transmission Shift Lever Position Indicator Ground	—	1	—	—
1. Interior Backlighting Malfunction				

Circuit/System Description

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

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 transmission shift lever position indicator backlighting control circuit.

Actions Taken When the DTC Sets

The BCM will disable the transmission shift lever position indicator backlighting 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

Interior Lights Dimming Schematics on page 4-91

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the P2 transmission shift lever position indicator. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 2 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇩ **If less than 15 Ω**

3. Connect a test lamp between the control circuit terminal 1 and ground.
4. Verify the test lamp turns ON and OFF while turning the headlamp switch ON and OFF.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X6 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇩ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X6 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇩ **If the test lamp turns ON and OFF**

5. Test or replace the P2 transmission shift lever position indicator.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Transmission Control Replacement on page 17-193*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B3596

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptor

DTC B3596 00: Hazard Lamps Request Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hazard Warning Switch Signal	1	1	1	B3596 00
Hazard Warning Switch LED Backlighting Control	2	2	2	—
Hazard Warning Switch Ground	—	1	—	—
1. Hazard Lamps Malfunction 2. Hazard Warning Switch Backlighting Malfunction				

Circuit/System Description

The hazard flashers may be activated in any power mode. The hazard warning switch signal circuit is momentarily grounded when the hazard warning switch is pressed. The body control module (BCM) responds to the hazard warning switch signal input by supplying battery voltage to all four turn signal lamps in an ON and OFF duty cycle. When the hazard warning 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.
- Hazard lamps ON.

Conditions for Setting the DTC

The hazard warning switch input is Active for longer than 60 seconds.

Actions Taken When the DTC Sets

The hazard lamps are 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.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S26 Hazard Warning Switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 3 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Ignition ON.

4. Verify the scan tool Hazard Lamps Switch parameter is Inactive.

⇒ **If not Inactive**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the signal circuit terminal 1 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground.
6. Verify the scan tool Hazard Lamps Switch parameter is Active.

⇒ **If not Active**

6.1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 1 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If Active**

7. Test or replace the S26 Hazard Warning Switch.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Hazard Warning Switch Replacement on page 4-188*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B3650

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptor

DTC B3650 08: High Beam Request Signal Circuit Performance – Signal Invalid

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	—
Headlamp Switch Headlamps ON Signal	B257A 00	1	1	—
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	—
Turn Signal/Multifunction Switch Flash To Pass Signal	B3806 00	1	1	—
Turn Signal/Multifunction Switch High Beam Signal	B3650 08	1	1	—
Headlamp Switch Ground	—	1	—	—
Turn Signal/Multifunction Switch Ground	—	1	—	—
1. Headlamps Malfunction 2. Park, License, and/or Tail Lamps Malfunction				

Circuit/System Description

When the low beam headlamps are on and the turn signal/multifunction switch is placed in the high beam position, ground is applied to the body control module (BCM) through the high beam signal circuit. The BCM responds to the high beam request by applying ground to the 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 control circuits illuminating the high beam headlamps.

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 turn signal/ multifunction switch 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

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics on page 4-82

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S78 Turn Signal/ Multifunction Switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 3 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool High Beam Select Switch parameter is Inactive.

⇒ **If not Inactive**

4.1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the signal circuit terminal 2 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 2 and the ground circuit terminal 3.
6. Verify the scan tool High Beam Select Switch parameter is Active.

⇒ **If not Active**

6.1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 2 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If Active**

7. Test or replace the S78 Turn Signal/Multifunction Switch.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Turn Signal Multifunction Switch Replacement on page 15-31*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B3806

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptor

DTC B3806 00: High Beam and Headlamp Flash Select Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	—
Headlamp Switch Headlamps ON Signal	B257A 00	1	1	—
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	—
Turn Signal/Multifunction Switch Flash To Pass Signal	B3806 00	1	1	—
Turn Signal/Multifunction Switch High Beam Signal	B3650 08	1	1	—
Headlamp Switch Ground	—	1	—	—
Turn Signal/Multifunction Switch Ground	—	1	—	—
1. Headlamps Malfunction 2. Park, License, and/or Tail Lamps Malfunction				

Circuit/System Description

When the turn signal/multifunction switch is momentarily placed in the flash to pass position, ground is applied to the body control module (BCM) through the flash to pass signal circuit. The BCM responds to the flash to pass request by applying ground to the 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 control circuits illuminating the high beam headlamps. The high beam headlamps will only illuminate for as long at the flash to pass switch is activated.

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 turn signal/ multifunction switch flash to pass signal circuit.

Actions Taken When the DTC Sets

The high beam lamps and the high beam indicator on the instrument cluster are always ON.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics on page 4-82

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S78 Turn Signal/ Multifunction Switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 3 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇩ **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool Headlamps Flash Switch parameter is Inactive.

⇒ **If not Inactive**

4.1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the signal circuit terminal 4 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇩ **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 4 and the ground circuit terminal 3.
6. Verify the scan tool Headlamps Flash Switch parameter is Active.

⇒ **If not Active**

6.1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 4 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇩ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇩ **If Active**

7. Test or replace the S78 Turn Signal/Multifunction Switch.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Turn Signal Multifunction Switch Replacement on page 15-31*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B3881 or B3882

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptors

DTC B3881 01: Tail Lamp Circuit Short to Battery
DTC B3881 02: Tail Lamp Circuit Short to Ground
DTC B3881 04: Tail Lamp Circuit Open
DTC B3882 01: Right Tail Lamp Circuit Short to Battery
DTC B3882 02: Right Tail Lamp Circuit Short to Ground
DTC B3882 04: Right Tail Lamp Circuit Open

Diagnostic Fault Information

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

Circuit/System Description

When the headlamp switch is placed in the HEAD or PARK position, ground is applied to the park lamp switch ON 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, and license lamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3881 01

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

DTC B3881 02

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

DTC B3881 04

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

DTC B3882 01

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

DTC B3882 02

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

DTC B3882 04

The BCM detects an open/high resistance 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.

Diagnostic Aids

Note: When testing at the rear turn signal lamp bulb socket, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

DTC B3881

1. Ignition OFF, exterior lamps OFF, trunk latch latched, remove the E5AA tail/stop lamp bulb – left.
2. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Left Park Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E5AA tail/stop lamp – left.

DTC B3882

1. Ignition OFF, exterior lamps OFF, trunk latch latched, remove the E5AB tail/stop lamp bulb – right.
2. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.

4. Verify the test lamp turns ON and OFF when commanding the Right Park Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E5AB tail/stop lamp – right.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Tail Lamp Replacement (Hatchback) on page 4-214* or *Tail Lamp Replacement (Sedan) on page 4-213*
- *Stop and Turn Signal Lamp Bulb Replacement (Sedan) on page 4-215*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B3883

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* 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
F5DA (BCM 1) Fuse B+	B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	—	—
License Plate Lamp Control	B3883 02	B3883 01, B3883 04	B3883 01	—
License Plate Lamp Ground – Right	—	B3883 01, B3883 04	—	—
License Plate Lamp Ground – Left	—	B3883 01, B3883 04	—	—

Circuit/System Description

When the headlamp switch is placed in the HEAD or PARK position, ground is applied to the park lamp switch ON 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, and license lamps.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

DTC B3883 01

Headlamp switch in OFF position.

DTC B3883 02 or B3883 04

Headlamp switch in PARK or ON positions.

Conditions for Setting the DTC

DTC B3883 01

- The BCM detects a short to voltage in the license lamps control circuit.
- The BCM detects an open/high resistance in the license lamps ground circuit.
- The BCM detects a short to ground or an open/high resistance in the F5DA (BCM 1) fuse B+ circuit.

DTC B3883 02

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

DTC B3883 04

- The BCM detects an open/high resistance in the license lamps control circuit.
- The BCM detects an open/high resistance in the license lamps ground circuit.
- The BCM detects a short to ground or an open/high resistance in the F5DA (BCM 1) fuse B+ circuit.

Actions Taken When the DTC Sets

DTC B3883 01

License lamps always ON.

DTC B3883 02 or B3883 04

License lamps 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.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 1 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

2.1. Ignition OFF.

2.2. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If the test lamp illuminates**

3. Ignition OFF, connect the X2 harness connector at the K9 Body Control Module.
4. Ignition OFF, exterior lamps OFF, rear hatch latch latched, remove both E7 License Plate Lamp bulbs.
5. Test for less than 5 Ω between each ground circuit terminal 2 and ground.

⇒ **If 5 Ω or greater**

5.1. Ignition OFF.

5.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

6. Connect a test lamp between the E7L License Plate Lamp – Left control circuit terminal 1 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

7.1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.

7.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

7.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

7.1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.

7.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

8. Ignition OFF.
9. Connect a test lamp between the E7R License Plate Lamp – Right control circuit terminal 1 and ground, ignition ON.

10. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

10.1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.

10.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

10.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇓ **If the test lamp turns ON and OFF**

11. Test or replace the appropriate E7 License Plate Lamp bulb.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Rear License Plate Lamp Bulb Replacement (Sedan) on page 4-211* or *Rear License Plate Lamp Bulb Replacement (Hatchback) on page 4-212*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B3884

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptors

DTC B3884 01: Center High Mounted Brake Lamp Circuit Short to Battery
DTC B3884 02: Center High Mounted Brake Lamp Circuit Short to Ground
DTC B3884 04: Center High Mounted Brake Lamp Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Center High Mounted Stop Lamp Control	B3884 02	B3884 04	B3884 01	—
Center High Mounted Stop Lamp Ground	—	1	—	—
1. Stop Lamps 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, 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

DTC B3884 01

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

DTC B3884 02

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

DTC B3884 04

The BCM detects an open/high resistance 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

Schematic Reference

Exterior Lights Schematics on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the E6 Center High Mounted Stop Lamp.
2. Test for less than 5 Ω between the ground circuit terminal B and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal A and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Center Brake Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E6 Center High Mounted Stop Lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *High Mount Stop Lamp Replacement (Hatchback) on page 4-205* or *High Mount Stop Lamp Replacement (Sedan) on page 4-204*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B3948 or B3949

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* 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
F7DA (BCM 3) Fuse B+	1	1	—	—
F8DA (BCM 4) Fuse B+	1	1	—	—
F10DA (BCM 6) Fuse B+	1	1	—	—
F11DA (BCM 7) Fuse B+	1	1	—	—
Turn Signal Switch Signal – Left	1	1	1	—
Turn Signal Switch Signal – Right	1	1	1	—
Turn Signal Control – Left Front	B3948 02	B3948 04	B3948 01, B3948 04	—
Turn Signal Control – Left Rear	B3950 02	B3950 04	B3950 01, B3950 04	—
Turn Signal Control – Right Front	B3949 02	B3949 04	B3949 01, B3949 04	—
Turn Signal Control – Right Rear	B3951 02	B3951 04	B3951 01, B3951 04	—
Turn Signal Lamp Ground – Left Front	—	B3948 01, B3948 04	—	—
Turn Signal Lamp Ground – Right Front	—	B3949 01, B3949 04	—	—
Turn Signal Lamp Ground – Left Rear	—	B3950 01, B3950 04	—	—
Turn Signal Lamp Ground – Right Rear	—	B3951 01, B3951 04	—	—
Turn Signal/Multifunction Switch Ground	—	1	—	—
1. Turn Signal Lamps and/or Indicators 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 positions. 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 responds to the turn signal switch input by applying a pulsating voltage to the front and rear turn signal lamps through there respective control circuits. When a turn signal request is received by the BCM, a serial data message is sent to the instrument cluster requesting the respective turn signal indicator be pulsed ON and OFF.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

DTC B3948 01 and B3948 04

- The BCM detects an open/high resistance in the left front turn signal control circuit.
- The BCM detects an open/high resistance in the left front turn signal ground circuit.

DTC B3948 02

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

DTC B3949 01 and B3949 04

- The BCM detects an open/high resistance in the right front turn signal control circuit.
- The BCM detects an open/high resistance in the right front turn signal ground circuit.

DTC B3949 02

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

Actions Taken When the DTC Sets

DTC B3948

- The left front turn signal is inoperative.
- The left turn signal indicator on the instrument cluster flashes rapidly.

DTC B3949

- The right front turn signal is inoperative.
- The right turn signal indicator on the instrument cluster flashes rapidly.

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 on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

DTC B3948

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E4N turn signal lamp – left front.
2. Test for less than 5 Ω between the ground circuit terminal C and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal B and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Left Front Turn Signal Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E4N turn signal lamp bulb – left front.

DTC B3949

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E4P turn signal lamp – right front.
2. Test for less than 5 Ω between the ground circuit terminal C and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal B and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Right Front Turn Signal Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E4P turn signal lamp bulb – right front.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Parking and Turn Signal Lamp Bulb Replacement on page 4-203*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC B3950 or B3951

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

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
F7DA (BCM 3) Fuse B+	1	1	—	—
F8DA (BCM 4) Fuse B+	1	1	—	—
F10DA (BCM 6) Fuse B+	1	1	—	—
F11DA (BCM 7) Fuse B+	1	1	—	—
Turn Signal Switch Signal – Left	1	1	1	—
Turn Signal Switch Signal – Right	1	1	1	—
Turn Signal Control – Left Front	B3948 02	B3948 04	B3948 01, B3948 04	—
Turn Signal Control – Left Rear	B3950 02	B3950 04	B3950 01, B3950 04	—
Turn Signal Control – Right Front	B3949 02	B3949 04	B3949 01, B3949 04	—
Turn Signal Control – Right Rear	B3951 02	B3951 04	B3951 01, B3951 04	—
Turn Signal Lamp Ground – Left Front	—	B3948 01, B3948 04	—	—
Turn Signal Lamp Ground – Right Front	—	B3949 01, B3949 04	—	—
Turn Signal Lamp Ground – Left Rear	—	B3950 01, B3950 04	—	—
Turn Signal Lamp Ground – Right Rear	—	B3951 01, B3951 04	—	—
Turn Signal/Multifunction Switch Ground	—	1	—	—
1. Turn Signal Lamps and/or Indicators 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 positions. 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 responds to the turn signal switch input by applying a pulsating voltage to the front and rear turn signal lamps through there respective control circuits. When a turn signal request is received by the BCM, a serial data message is sent to the instrument cluster requesting the respective turn signal indicator be pulsed ON and OFF.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

DTC B3950 01 and B3950 04

- The BCM detects an open/high resistance in the left rear turn signal control circuit.
- The BCM detects an open/high resistance in the left rear turn signal ground circuit.

DTC B3950 02

The BCM detects a short to ground in the left rear turn signal control circuit.

DTC B3951 01 and B3951 04

- The BCM detects an open/high resistance in the right rear turn signal control circuit.
- The BCM detects an open/high resistance in the right rear turn signal ground circuit.

DTC B3951 02

The BCM detects a short to ground in the right rear turn signal control circuit.

Actions Taken When the DTC Sets

DTC B3950

- The left rear turn signal is inoperative.
- The left turn signal indicator on the instrument cluster flashes rapidly.

DTC B3951

- The right rear turn signal is inoperative.
- The right turn signal indicator on the instrument cluster flashes rapidly.

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

Note: When testing at the rear turn signal lamp bulb socket, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

DTC B3950

1. Ignition OFF, exterior lamps OFF, trunk latch latched, remove the E4LR turn signal lamp bulb – left rear.
2. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Left Rear Turn Signal Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E4LR turn signal lamp bulb – left rear.

DTC B3951

1. Ignition OFF, exterior lamps OFF, trunk latch latched, remove the E4RR turn signal lamp bulb – right rear.
2. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Right Rear Turn Signal Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E4RR turn signal lamp bulb – right rear.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Stop and Turn Signal Lamp Bulb Replacement (Sedan) on page 4-215*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC C0277 or C0890

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

DTC Descriptors

DTC C0277 06: 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 Circuit Calibration Not Learned
DTC C0890 03: Control Module Voltage Reference Output 3 Circuit Low Voltage
DTC C0890 07: Control Module Voltage Reference Output 3 Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Brake Pedal Position Sensor 5 V Reference	C0277 06, C0890 03, C0161 71	C0277 06, C0161 71, C0161 5A	C0277 07, C0890 07, C0161 71	—
Brake Pedal Position Sensor Signal	C0277 06, U0140 71	C0277 06, C0161 71, C0161 5A	C0277 07, C0890 07, C0161 71	C0277 09
Center High Mounted Stop Lamp Control	B3884 02	2	2	—
Rear Tail/Stop Lamp Control – Left	B3881 02	B3881 04	B3881 01	—
Rear Tail/Stop Lamp Control – Right	B3882 02	B3882 04	B3882 01	—
Brake Pedal Position Sensor Low Reference	—	C0277 07, C0161 71	U0151 00, U0184 00	—
Center High Mounted Stop Lamp Ground	—	2	—	—
Rear Tail/Stop Lamp Ground – Left	—	1	—	—
Rear Tail/Stop Lamp Ground – Right	—	1	—	—
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 left and right stop lamp control circuits as well as the center high mounted stop lamp (CHMSL) control circuit illuminating the left and right stop lamps and the CHMSL.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC C0277 06

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

DTC C0277 07

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

DTC C0277 09

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

DTC C0277 4B

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

DTC C0890 03

The BCM detects a short to ground in the BPP sensor 5 V reference circuit.

DTC C0890 07

- The BCM detects a short to voltage in the BPP sensor 5 V reference circuit.
- The BCM detects a short to voltage in the BPP sensor low reference circuit.

Actions Taken When the DTC Sets

- The Traction Control indicator is commanded ON.
- For DTC C0277 4B, the stop lamps may not activate at the expected brake pedal positions.

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 brake pedal position 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 on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

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

1. Ignition OFF, disconnect the harness connector at the B22 brake pedal position sensor, ignition ON.
2. Verify a test lamp illuminates between the appropriate low reference circuit terminal listed below and B+.
   - Terminal 2 – with MH8/MH9
   - Terminal A – with M26/MZ4

⇒ **If the test lamp does not illuminate**

2.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module.

2.2. Test for less than 2 Ω in the low reference circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If the test lamp illuminates**

3. Ignition ON.
4. Test for 4.8–5.2 V between the appropriate 5 V reference circuit terminal listed below and ground.
   - Terminal 1 – with MH8/MH9
   - Terminal C – with M26/MZ4

⇒ **If less than 4.8 V**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the 5 V reference circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the 5 V reference circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If greater than 5.2 V**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the 5 V reference circuit and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If between 4.8–5.2 V**

5. Verify the scan tool Brake Pedal Applied parameter is Inactive.

⇒ **If not Inactive**

5.1. Ignition OFF, disconnect the X2 harness connector at the K9 body control module, ignition ON.

5.2. Test for less than 1 V between the appropriate signal circuit terminal listed below and ground.

- Terminal 3 – with MH8/MH9
- Terminal B– with M26/MZ4

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If Active**

6. Install a 3 A fused jumper wire between the appropriate 5-volt reference and signal circuit terminals listed below.
   - 5 V reference terminal 1 and signal terminal 3 – with MH8/MH9
   - 5 V reference terminal C and signal terminal B – with M26/MZ4
7. Verify the scan tool Brake Pedal Applied parameter is Active.

⇒ **If not Active**

7.1. Ignition OFF, disconnect the X2 harness connector at the K9 body control module.

7.2. Test for infinite resistance between the signal circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

7.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If Active**

8. Test or replace the B22 brake pedal position sensor.

DTC C0277 4B

1. Verify DTC C0277 4B is not set.

⇒ **If DTC C0277 4B is set**

1.1. Ignition ON

1.2. Perform the BPP sensor recalibration procedure for the K9 body control module. Refer to *Brake Pedal Position Sensor Calibration on page 4-185*.

1.3. Verify the DTC does not reset while operating the vehicle under the conditions for running the DTC.

⇒ If the DTC resets, replace the B22 brake pedal position sensor.

⇓ If the DTC does not reset

1.4. All OK.

⇓ **If DTC C0277 4B is not set**

2. All OK.

DTC C0277 09

1. Verify DTC C0277 09 is not set.

⇒ **If DTC C0277 09 is set**

1.1. Replace the B22 brake pedal position sensor.

1.2. Perform the BPP sensor recalibration procedure for the K9 body control module. Refer to *Brake Pedal Position Sensor Calibration on page 4-185*.

1.3. Verify the DTC does not reset while operating the vehicle under the conditions for running the DTC.

⇒ If the DTC resets, replace the K9 body control module.

⇓ If the DTC does not reset

1.4. All OK.

⇓ **If DTC C0277 09 is not set**

2. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Brake Pedal Position Sensor Calibration on page 4-185*
- *Brake Pedal Position Sensor Replacement on page 4-186*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

DTC C0297

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* 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	C0297 02	1	—
1. Cruise Control 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, 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 or an open/high resistance on the brake applied signal circuit.

Actions Taken When the DTC Sets

The cruise control system is disabled.

Conditions for Clearing the DTC

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

Diagnostic Aids

Verify that the brake pedal position sensor is properly calibrated.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the K20 engine control module.
2. Connect a test lamp between the appropriate signal circuit terminal listed below and ground, ignition ON.
   - Terminal 25 – with LUW
   - Terminal 33 – with LUV

3. Verify the test lamp turns ON and OFF while pressing and releasing the brake pedal.

⇒ **If the test lamp is always OFF**

3.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module.

3.2. Test for infinite resistance between the signal circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

3.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

3.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module, ignition ON.

3.2. Test for less than 1 V between the signal circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

4. Replace the K20 engine control module.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Brake Pedal Position Sensor Calibration on page 4-185*
- *Control Module References on page 6-3* for BCM or ECM replacement, programming, and setup

Symptoms - Lighting

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

- Perform the *Diagnostic System Check - Vehicle on page 6-66* 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 on page 4-217*
  - *Interior Lighting Systems Description and Operation on page 4-219*

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the lighting system. Refer to *Checking Aftermarket Accessories on page 11-525*.
- 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 on page 11-531*.

Symptom List

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

- *Backup Lamps Malfunction (Automatic Transmission) on page 4-150* or *Backup Lamps Malfunction (Manual Transmission) on page 4-151*
- *Courtesy Lamps Malfunction on page 4-154*
- *Daytime Running Lamps Malfunction on page 4-155*
- *Dome Lamps Malfunction on page 4-157*
- *Front Fog Lamps Malfunction on page 4-159*
- *Hazard Lamps Malfunction on page 4-161*
- *Headlamps Malfunction on page 4-163*
- *Interior Backlighting Malfunction on page 4-169*
- *Park, License, and/or Tail Lamps Malfunction on page 4-174*
- *Rear Compartment Lamp Malfunction on page 4-177*
- *Stop Lamps Malfunction on page 4-178*
- *Turn Signal Lamps and/or Indicators Malfunction on page 4-181*

Backup Lamps Malfunction (Automatic Transmission)

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F10DA (BCM 6) Fuse B+	1	1	—	—
Backup Lamps Control	B2545 02	B2545 04	B2545 01	—
Backup Lamp Ground – Left	—	1	—	—
Backup Lamp Ground – Right	—	1	—	—
1. Backup Lamps Malfunction				

Circuit/System Description

With the engine running and the transmission 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 control circuit illuminating the backup lamps. 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. The engine must be running for the backup lamps to operate.

Diagnostic Aids

When testing at the backup lamp bulb socket, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Body Control System Schematics on page 11-8

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

2.1. Ignition OFF.

2.2. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If the test lamp illuminates**

3. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
4. Ignition OFF, exterior lamps OFF, rear hatch latch latched, remove the appropriate E5 Backup Lamp bulb at the appropriate E42 Tail Lamp Assembly.

5. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.

⇒ **If 5 Ω or greater**

5.1. Ignition OFF.

5.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

6. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Backup Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

7.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.

7.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

7.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

7.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.

7.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

8. Test or replace the appropriate E5 Backup Lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Backup Lamp Bulb Replacement (Sedan) on page 4-208*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

Backup Lamps Malfunction (Manual Transmission)

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F10DA (BCM 6) Fuse B+	1	1	—	—
Backup Lamp Switch Signal	P0812	P0812	1	—
Backup Lamps Control	B2545 02	B2545 04	B2545 01	—
Backup Lamp Switch Ground	—	P0812	—	—
Backup Lamp Ground – Left	—	1	—	—
Backup Lamp Ground – Right	—	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. With the engine running and the transmission 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 control circuit illuminating the backup lamps. Once the driver moves the gear selector out of the reverse position, a message is sent by the ECM via serial data requesting the BCM to remove battery voltage from the backup lamps control circuit. The engine must be running for the backup lamps to operate.

Diagnostic Aids

Note: When testing at the backup lamp bulb socket, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Body Control System Schematics on page 11-8

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Engine ON.
2. Verify the scan tool Reverse Position Switch parameter changes between ON and OFF while shifting the vehicle between the neutral and reverse gears.

⇒ **If the parameter does not change**

Refer to Backup Lamp Switch Malfunction.

⇓ **If the parameter changes**

3. Verify the backup lamps turn ON and OFF when commanding the Backup Lamps ON and OFF with a scan tool.

⇒ **If the backup lamps do not turn ON and OFF**

Refer to Backup Lamps Malfunction.

⇓ **If the backup lamps turn ON and OFF**

4. All OK.

Circuit/System Testing

Backup Lamp Switch Malfunction

1. Ignition OFF, exterior lamps OFF, all doors closed, disconnect the harness connector at the B16 backup lamp switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 2 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Ignition ON.
4. Verify the scan tool Reverse Position Switch parameter is Off.

⇒ **If not Off**

4.1. Ignition OFF, disconnect the appropriate harness connector listed below at the K20 engine control module.

- X1 – with LDE/LUW
- X3 – with LUV

4.2. Test for infinite resistance between the signal circuit terminal 1 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K20 engine control module.

⇓ **If Off**

5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and the ground circuit terminal 2.
6. Verify the scan tool Reverse Position Switch parameter is On.

⇒ **If not On**

6.1. Ignition OFF, disconnect the appropriate harness connector listed below at the K20 engine control module, ignition ON.

- X1 – with LDE/LUW
- X3 – with LUV

6.2. Test for less than 1 V between the signal circuit terminal 1 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K20 engine control module.

⇓ **If On**

7. Test or replace the B16 backup lamp switch.

Backup Lamps Malfunction

1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

2.1. Ignition OFF.

2.2. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If the test lamp illuminates**

3. Ignition OFF, connect the X5 harness connector at the K9 body control module.
4. Ignition OFF, exterior lamps OFF, trunk latch latched, remove the appropriate E5 backup lamp bulb at the appropriate E42 tail lamp assembly.
5. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.

⇒ **If 5 Ω or greater**

5.1. Ignition OFF.

5.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

6. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Backup Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

7.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module.

7.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

7.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

7.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module, ignition ON.

7.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

8. Test or replace the appropriate E5 backup lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Backup Lamp Bulb Replacement (Sedan) on page 4-208*
- *Backup Lamp Switch Replacement on page 17-463*
- *Backup Lamp Switch Replacement on page 17-576*
- *Control Module References on page 6-3* for BCM or ECM replacement, programming, and setup

Courtesy Lamps Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F11DA (BCM 7) Fuse B+	1, 2	1, 2	—	—
Dome Lamps Control	B2615 02	2	2	—
Reading Lamps Control	B1480 02	1	1	—
Dome/Reading Lamps - Front Ground	—	1, 2	—	—
Dome/Reading Lamps - Rear Ground	—	1, 2	—	—
1. Courtesy Lamps Malfunction 2. Dome Lamps Malfunction				

Circuit/System Description

The body control module (BCM) supplies battery voltage to the reading lamp via the courtesy lamp control circuit. The reading lamp is controlled by an individual switch that is activated by the operator when additional cabin lighting is required. In the event that the courtesy reading lamp were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position and no doors opened, the BCM will deactivate the courtesy lamp control circuit to prevent total battery discharge.

Reference Information

Schematic Reference

Interior Lights Schematics on page 4-89

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, all doors closed, all accessories OFF, disconnect the harness connector at the E37F dome/reading lamps – front and E37 B dome/reading lamps – 2nd row. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
   - E37F dome reading lamps – front terminal 2 with C90/C91
   - E37F dome reading lamps – front terminal 6 with C95
   - E37B dome reading lamps – 2nd row terminal 2 with C90/C95

⇒ **If 10 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 10 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground.
   - E37F dome reading lamps – front terminal 4 with C90/C91
   - E37F dome reading lamps – front terminal 1 with C95
   - E37B dome reading lamps – 2nd row terminal 4 with C90/C95

4. Verify the test lamp turns ON and OFF when commanding the Inadvertent Load ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the inoperative E37 dome/ reading lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Dome Lamp Bulb Replacement on page 4-192*
- *Reading Lamp Replacement on page 4-189*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

Daytime Running Lamps Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F7DA (BCM 3) Fuse B+	1	1	—	—
F8DA (BCM 4) Fuse B+	1	1	—	—
Ambient Light Sensor Signal	B2645 03	B2645 07	B2645 07	—
Low Beam Headlamp Control – Left	B2575 02	B2575 04	B2575 01, B2575 04	—
Low Beam Headlamp Control – Right	B2699 02	B2699 04	B2699 01, B2699 04	—
Ambient Light Sensor Ground	—	B2645 07	—	—
Headlamp Ground – Left	—	1	—	—
Headlamp Ground – Right	—	1	—	—
1. Headlamps Malfunction				

Circuit/System Description

The ambient light sensor is used to monitor outside lighting conditions. The body control module (BCM) provides a low reference ground and 5-volt reference signal to the ambient light sensor. Depending on outside lighting conditions, the ambient light sensor provides a voltage signal to the BCM that will vary between 0.2 and 4.9 volts. 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 headlamp system control when the headlamp switch is in the AUTO position. In daylight conditions, the BCM will command the low beam headlamps (DRLs) ON by applying low voltage to the low beam headlamp control circuits illuminating the low beam headlamps at reduced intensity. Any function or condition that turns on the headlamps will cancel DRL operation.

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics on page 4-82

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the low beam headlamps turn on & off when commanding the Low Beam Headlamps ON and OFF with a scan tool.

⇒ **If the low beam headlamps do not turn ON and OFF**

Refer to *Headlamps Malfunction on page 4-163.*

⇓ **If the low beam headlamps turn ON and OFF**

3. Ignition ON, park brake released.
4. Verify the scan tool BCM Park Brake Status parameter displays released.

⇒ **If the park brake status parameter does not display released**

Refer to *Brake Warning Indicator Malfunction on page 5-114.*

⇓ **If the parameter displays released**

5. Refer to Circuit/System Testing.

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the B10 ambient light sensor. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 6 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool Ambient Light Sensor parameter is greater than 4.65 V.

⇒ **If 4.65 V or less**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the signal circuit terminal 5 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If greater than 4.65 V**

5. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the ground circuit terminal 6.
6. Verify the scan tool Ambient Light Sensor parameter is less than 0.196 V.

⇒ **If 0.196 V or greater**

6.1. Ignition OFF, disconnect the X2 harness connector at the K9 body control module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 5 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If less than 0.196 V**

7. Test or replace the B10 ambient light sensor.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Sun Load Temperature Sensor Replacement on page 10-83*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

Dome Lamps Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F11DA (BCM 7) Fuse B+	1, 2	1, 2	—	—
Dome Lamps Control	B261502	1	1	—
Dome/Reading Lamps Ground – Front	1	1	1	—
Dome/Reading Lamps Ground – Rear	1	1	1	—
1. Dome Lamps Malfunction 2. Turn Signal Lamps and/or Indicators Malfunction				

Circuit/System Description

When any door is opened, the door ajar switch contacts close and the body control module (BCM) receives a door-open input. The BCM illuminates the dome lamp when any door is opened or a door lock/unlock request is activated with the key fob. After all doors have been closed, the dome lamp will remain illuminated approximately 3 seconds after the last door closes. In the event that the dome lamp were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position and no doors opened, the BCM will deactivate the dome lamp control circuit to prevent total battery discharge.

Reference Information

Schematic Reference

Interior Lights Schematics on page 4-89

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Door Ajar Sw. parameter changes between Active and Inactive while opening and closing each vehicle door.

⇒ **If the parameter does not change**

Refer to *Door Ajar Indicator Malfunction on page 4-268*.

⇓ **If the parameter changes**

3. Verify the dome lamps turn ON and OFF while commanding the Courtesy Lamps ON and OFF with a scan tool.

⇒ **If the dome lamps do not turn ON and OFF**

Refer to Circuit/System Testing.

⇓ **If the dome lamps turn ON and OFF**

4. All OK.

Circuit/System Testing

1. Ignition OFF, all doors closed, all accessories OFF, disconnect the harness connector at the E37F dome/reading lamps – front and E37 B dome/reading lamps – 2nd row. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
   - E37F dome reading lamps – front – terminal 2 with C90/C91
   - E37F dome reading lamps – front – terminal 6 with C95
   - E37B dome reading lamps – 2nd row – terminal 2 with C90/C95

⇒ **If 10 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 10 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground.
   - E37F dome reading lamps – front – terminal 3 with C90/C91
   - E37F dome reading lamps – front – terminal 2 with C95
   - E37B dome reading lamps – 2nd row – terminal 3 with C90/C95
4. Verify the test lamp turns ON and OFF when commanding the Courtesy Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the inoperative E37 dome/reading lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Dome Lamp Bulb Replacement on page 4-192*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

Front Fog Lamps Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F19UA (FRT FOG) Fuse B+	1	1	—	—
Front Fog Lamp and I/P Dimmer Switch B+	B257B 03, B1405 03	B257B 03	—	—
Front Fog Lamp and I/P Dimmer Switch Signal	B257B 03	B257B 03	1	—
Front Fog Lamp Relay Control	B2530 02, B2530 04	B2530 02, B2530 04	B2530 01	—
Front Fog Lamp Control	1	1	1	—
Front Fog Lamp Ground – Left	—	1	—	—
Front Fog Lamp Ground – Right	—	1	—	—
1. Front Fog Lamps Malfunction				

Circuit/System Description

The front fog lamp switch is an input to the body control module (BCM) and is contained in the headlamp switch assembly. The BCM supplies voltage to the front fog lamp switch via the front fog lamp and I/P dimmer switch B+ circuit. When the front fog lamp switch is pressed, voltage from the B+ circuit is pulled down through the front fog lamp switch resistor. The front fog lamp resistor is part of the resistor ladder that also provides the dimming signals for the I/P dimmer switches. The BCM receives the voltage signal through the front fog lamp and I/P dimmer switch signal circuit.

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

Reference Information

Schematic Reference

Fog Lights Schematics on page 4-84

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON, headlamps ON.
2. Verify the scan tool Front Fog Lamps Switch parameter changes between Active and Inactive while commanding the front fog lamps ON and OFF with the front fog lamp switch.

⇒ **If the parameter does not change**

Refer to Front Fog Lamp Switch Malfunction.

⇓ **If the parameter changes**

3. Verify the front fog lamps turn ON and OFF when commanding the Front Fog Lamps ON and OFF with a scan tool.

⇒ **If the front fog lamps do not turn ON and OFF**

Refer to Front Fog Lamps Malfunction.

⇓ **If the front fog lamps turn ON and OFF**

4. Verify the front fog lamp indicator on the instrument cluster turns ON and OFF while commanding the front fog lamps ON and OFF with the front fog lamp switch.

⇒ **If the front fog lamp indicator does not turn ON and OFF**

Refer to Front Fog Lamp Indicator Malfunction.

⇓ **If the front fog lamp indicator turns ON and OFF**

5. All OK.

Circuit/System Testing

Front Fog Lamp Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S30 Headlamp Switch, ignition ON.
2. Test for B+ between the B+ circuit terminal 1 and ground.

⇒ **If less than B+**

2.1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.

2.2. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

2.3. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If B+**

3. Verify the scan tool LED Backlight Dimming Command parameter is greater than 40%.

⇒ **If 40% or less**

3.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.

3.2. Test for less than 1 V between the signal circuit terminal 12 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If greater than 40%**

4. Install a 3 A fused jumper wire between the signal circuit terminal 12 and the B+ circuit terminal 1.
5. Verify the scan tool LED Backlight Dimming Command parameter is less than 30%.

⇒ **If 30% or greater**

5.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.

5.2. Test for infinite resistance between the signal circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

5.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If less than 30%**

6. Test or replace the S30 Headlamp Switch.

Front Fog Lamps Malfunction

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the control circuit terminal 13 and ground.

⇒ **If the test lamp does not illuminate**

2.1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block – Underhood.

2.2. Test for infinite resistance between the control circuit terminal and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

2.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the X50A Fuse Block – Underhood.

⇓ **If the test lamp illuminates**

3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 13 and ground.
4. Remove the F19UA fuse at the X50A Fuse Block – Underhood, ignition ON.
5. Verify a test lamp illuminates between the F19UA fuse B+ switch control terminal and ground.

⇒ **If the test lamp does not illuminate**

5.1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block – Underhood, ignition ON.

5.2. Test for less than 1 V between the control circuit terminal 13 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the X50A Fuse Block – Underhood.

⇓ **If the test lamp illuminates**

6. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
7. Install the F19UA fuse at the X50A Fuse Block – Underhood.

8. Disconnect the harness connector at the appropriate E29 Fog Lamp, ignition OFF, exterior lamps OFF.
9. Test for less than 5 Ω between the ground circuit terminal 1 and ground.

⇒ **If 5 Ω or greater**

9.1. Ignition OFF.

9.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

10. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
11. Verify the test lamp turns ON and OFF when commanding the Front Fog Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

11.1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block – Underhood.

11.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

11.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the X50A Fuse Block – Underhood.

⇒ **If the test lamp is always ON**

11.1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block – Underhood, ignition ON.

11.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the X50A Fuse Block – Underhood.

⇓ **If the test lamp turns ON and OFF**

12. Test or replace the appropriate E29 Fog Lamp.

Front Fog Lamp Indicator Malfunction

1. Ignition ON.
2. Verify the front fog lamp indicator turns ON and OFF when commanding the Instrument Cluster All Indicators Test ON and OFF with a scan tool.

⇒ **If the front fog lamp indicator is always OFF or remains ON**

Replace the P16 Instrument Cluster.

⇓ **If the front fog lamp indicator turns ON and OFF**

3. Replace the K9 Body Control Module.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Headlamp Switch Replacement on page 4-187*
- *Front Fog Lamp Bulb Replacement on page 4-200*
- *Front Compartment Fuse Block Replacement on page 11-609*
- *Control Module References on page 6-3* for BCM or Instrument Cluster replacement, programming, and setup

Hazard Lamps Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hazard Warning Switch Signal	1	1	1	B3596 00
Hazard Warning Switch LED Backlighting Control	2	2	2	—
Hazard Warning Switch Ground	—	1	—	—
1. Hazard Lamps Malfunction 2. Hazard Warning Switch Backlighting Malfunction				

Circuit/System Description

The hazard flashers may be activated in any power mode. The hazard warning switch signal circuit is momentarily grounded when the hazard warning switch is pressed. The body control module (BCM) responds to the hazard warning switch signal input by supplying battery voltage to all four turn signal lamps in an ON and OFF duty cycle. When the hazard warning 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.

The instrument panel dimmer switch controls are located on the headlamp switch assembly and are used to increase and decrease the brightness of the interior backlighting components. When the instrument panel dimmer switch is placed in a desired brightness position, the body control module (BCM) receives a signal from the instrument panel dimmer switch and responds by applying a pulse width modulated (PWM) voltage to the hazard switch LED backlighting control circuit illuminating the LED to the desired level of brightness.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Hazard Lamps Switch parameter changes between Active and Inactive while commanding the hazard lamps ON and OFF with the hazard warning switch.

⇒ **If the parameter does not change**

Refer to Hazard Warning Switch Malfunction.

⇓ **If the parameter changes**

3. Verify all left and right turn signal lamps turn ON and OFF while commanding the hazard lamps ON and OFF with the hazard warning switch.

⇒ **If all turn signal lamps do not turn ON and OFF**

Refer to *Turn Signal Lamps and/or Indicators Malfunction on page 4-181*

⇓ **If all turn signal lamps turn ON and OFF**

4. Verify the hazard warning switch backlighting turns ON and OFF while commanding the Hazard Lamps Switch Backlight ON and OFF with a scan tool.

⇒ **If the hazard warning switch backlighting does not turn ON and OFF**

Refer to Hazard Warning Switch Backlighting Malfunction.

⇓ **If the hazard warning switch backlighting turns ON and OFF**

5. All OK.

Circuit/System Testing

Hazard Warning Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S26 Hazard Warning Switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 3 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Ignition ON.
4. Verify the scan tool Hazard Lamps Switch parameter is Inactive.

⇒ **If not Inactive**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the signal circuit terminal 1 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground.
6. Verify the scan tool Hazard Lamps Switch parameter is Active.

⇒ **If not Active**

6.1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 1 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If Active**

7. Test or replace the S26 Hazard Warning Switch.

Hazard Warning Switch Backlighting Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S26 Hazard Warning Switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 3 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Hazard Lamps Switch Backlight ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the S26 Hazard Warning Switch.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Hazard Warning Switch Replacement on page 4-188*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

Headlamps Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F7DA (BCM 3) Fuse B+	1	1	—	—
F8DA (BCM 4) Fuse B+	1	1	—	—
Low Beam Headlamp Control – Left	B2575 02	B2575 04	B2575 01, B2575 04	—

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp High Beam Relay Control	B2580 02, B2580 04	B2580 02, B2580 04	B2580 01	—
Low Beam Headlamp Control – Right	B2699 02	B2699 04	B2699 01, B2699 04	—
High Beam Headlamp Control – Left	2	2	2	—
High Beam Headlamp Control – Right	2	2	2	—
Headlamp Switch Headlamps OFF Signal	B257A 00	3	3	—
Headlamp Switch Headlamps ON Signal	B257A 00	3	3	—
Turn Signal/Multifunction Switch Flash To Pass Signal	B3806 00	4	4	—
Turn Signal/Multifunction Switch High Beam Signal	B3650 08	4	4	—
Headlamp Ground – Left	—	B2575 04	—	—
Headlamp Ground – Right	—	B2699 04	—	—
Headlamp Switch Ground	—	3	—	—
Turn Signal/Multifunction Switch Ground	—	4	—	—

1. Headlamps Malfunction – Low Beam
2. Headlamps Malfunction – High Beam
3. Headlamp Switch Malfunction
4. Turn Signal/Multifunction Switch Malfunction

Circuit/System Description

The body control module (BCM) monitors three signal circuits from the headlamp switch. When the headlamp switch is in the AUTO position, all three signal circuits are open. When placed in the AUTO position, the BCM monitors inputs from the ambient light sensor to determine if headlamps are required or if daytime running lamps will be activated based on outside lighting conditions. When the headlamp switch is placed in the OFF position, the headlamp switch headlamps OFF signal circuit is grounded, indicating to the BCM that the exterior lamps should be turned OFF. With the headlamp switch in the PARK position, the headlamp switch park lamps ON signal circuit is grounded, indicating that the park lamps have been requested. When the headlamp switch is placed in the HEADLAMP position, both the headlamp switch park lamps ON signal circuit and the headlamp switch headlamps ON signal circuit are grounded. The BCM responds to the inputs by illuminating the park lamps and headlamps. When the low beam headlamps are requested, the BCM applies B+ to both low beam headlamp control circuits illuminating the low beam headlamps.

The high beam and flash to pass functions are contained within the turn signal/multifunction switch. The BCM provides the turn signal/multifunction switch with two signal circuits, the high beam signal circuit and the flash to pass signal circuit. When the low beam headlamps are ON and the turn signal/multifunction switch is placed in the high beam position, ground is applied to the BCM through the high beam signal circuit. The BCM responds to the high beam request by applying ground to the 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 control circuits illuminating the high beam headlamps.

When the turn signal/multifunction switch is momentarily placed in the flash to pass position, ground is applied to the BCM through the flash to pass signal circuit. The BCM responds by applying ground to the high beam relay control circuit which energizes the high beam relay illuminating the high beams for a brief moment or until the flash to pass switch is released.

Reference Information

Schematic Reference

- *Headlights/Daytime Running Lights (DRL) Schematics on page 4-82*
- *Body Control System Schematics on page 11-8*

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Headlamps On Switch parameter changes between Active and Inactive while commanding the headlamp ON and OFF with the headlamp switch.

⇒ **If the parameter does not change**

Refer to Headlamp Switch Malfunction.

⇓ **If the parameter changes**

3. Verify the scan tool Automatic Headlamps Disable Switch parameter changes between Active and Inactive while commanding the automatic lamp control ON and OFF with the headlamp switch.

⇒ **If the parameter does not change**

Refer to Headlamp Switch Malfunction.

⇓ **If the parameter changes**

4. Verify the scan tool Headlamps Flash Switch parameter changes between Active and Inactive while commanding the flash to pass ON and OFF with the turn signal/multifunction switch.

⇒ **If the parameter does not change**

Refer to Turn Signal/Multifunction Switch Malfunction.

⇓ **If the parameter changes**

5. Verify the scan tool High Beam Select Switch parameter changes between Active and Inactive while commanding the high beams ON and OFF with the turn signal/multifunction switch.

⇒ **If the parameter does not change**

Refer to Turn Signal/Multifunction Switch Malfunction.

⇓ **If the parameter changes**

6. Verify the left low beam/daytime running lamp turn ON and OFF when commanding the Left Low Beam/Daytime Running Lamp ON and OFF with a scan tool.

⇒ **If the left low beam/daytime running lamp does not turn ON and OFF**

Refer to Headlamps Malfunction – Low Beam.

⇓ **If the left low beam/daytime running lamp turns ON and OFF**

7. Verify the right low beam/daytime running lamp turn ON and OFF when commanding the Right Low Beam/Daytime Running Lamp ON and OFF with a scan tool.

⇒ **If the right low beam/daytime running lamp does not turn ON and OFF**

Refer to Headlamps Malfunction – Low Beam.

⇓ **If the right low beam/daytime running lamp turns ON and OFF**

8. Verify the high beams turn ON and OFF when commanding the High Beams ON and OFF with a scan tool.

⇒ **If the high beams do not turn ON and OFF**

Refer to Headlamps Malfunction – High Beam.

⇓ **If the high beams turn ON and OFF**

9. Verify the high beam indicator on the instrument cluster turns ON and OFF while commanding the All Indicators Test ON and OFF with a scan tool.

⇒ **If the high beam indicator does not turn ON and OFF**

Refer to High Beam Indicator Malfunction.

⇓ **If the high beam indicator turns ON and OFF**

10. All OK.

Circuit/System Testing

Headlamp Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S30 headlamp switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 6 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool Automatic Headlamps Disable Switch parameter is Inactive.

⇒ **If not Inactive**

4.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the signal circuit terminal 5 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the ground circuit terminal 6.
6. Verify the scan tool Automatic Headlamps Disable Switch parameter is Active.

⇒ **If not Active**

6.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 5 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If Active**

7. Verify the scan tool Park Lamps Switch parameter is Inactive.

⇒ **If not Inactive**

7.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module.

7.2. Test for infinite resistance between the signal circuit terminal 3 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If Inactive**

8. Install a 3 A fused jumper wire between the signal circuit terminal 3 and the ground circuit terminal 6.
9. Verify the scan tool Park Lamps Switch parameter is Active.

⇒ **If not Active**

9.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module, ignition ON.

9.2. Test for less than 1 V between the signal circuit terminal 3 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

9.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If Active**

10. Verify the scan tool Headlamps On Switch parameter is Inactive.

⇒ **If not Inactive**

10.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module.

10.2. Test for infinite resistance between the signal circuit terminal 4 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If Inactive**

11. Install a 3 A fused jumper wire between the signal circuit terminal 4 and the ground circuit terminal 6.
12. Verify the scan tool Headlamps On Switch parameter is Active.

⇒ **If not Active**

12.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module, ignition ON.

12.2. Test for less than 1 V between the signal circuit terminal 4 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

12.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If Active**

13. Test or replace the S30 headlamp switch.

Turn Signal/Multifunction Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S78 turn signal/ multifunction switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 3 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool High Beam Select Switch parameter is Inactive.

⇒ **If not Inactive**

4.1. Ignition OFF, disconnect the X3 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the signal circuit terminal 2 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 2 and the ground circuit terminal 3.

6. Verify the scan tool High Beam Select Switch parameter is Active.

⇒ **If not Active**

6.1. Ignition OFF, disconnect the X3 harness connector at the K9 body control module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 2 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If Active**

7. Verify the scan tool Headlamps Flash Switch parameter is Inactive.

⇒ **If not Inactive**

7.1. Ignition OFF, disconnect the X3 harness connector at the K9 body control module.

7.2. Test for infinite resistance between the signal circuit terminal 4 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If Inactive**

8. Install a 3 A fused jumper wire between the signal circuit terminal 4 and the ground circuit terminal 3.
9. Verify the scan tool Headlamps Flash Switch parameter is Active.

⇒ **If not Active**

9.1. Ignition OFF, disconnect the X3 harness connector at the K9 body control module, ignition ON.

9.2. Test for less than 1 V between the signal circuit terminal 4 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

9.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If Active**

10. Test or replace the S78 turn signal/multifunction switch.

Headlamps Malfunction – Low Beam

1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

2.1. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

2.1. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If the test lamp illuminates**

3. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

3.1. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

3.1. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If the test lamp illuminates**

4. Ignition OFF, connect the X1 harness connector at the K9 body control module.
5. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 headlamp.
6. Test for less than 5 Ω between the ground circuit terminal D and ground.

⇒ **If 5 Ω or greater**

6.1. Ignition OFF.

6.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

7. Connect a test lamp between the control circuit terminal A and ground, ignition ON.
8. Verify the test lamp turns ON and OFF when commanding the appropriate Low Beam/Daytime Running Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

8.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

8.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

8.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

8.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

8.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

9. Test or replace the appropriate E4 headlamp – low beam.

Headlamps Malfunction – High Beam

1. Ignition OFF, remove the KR48 headlamp high beam relay.
2. Connect a test lamp between the control circuit terminal 86 and B+, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the High Beams ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

3.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module, ignition ON.

3.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

3.3. Ignition OFF.

3.4. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

3.1. Ignition OFF, disconnect the X5 harness connector at the K9 body control module.

3.2. Test for infinite resistance between the control circuit terminal and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

4. Ignition OFF, exterior lamps OFF, connect the KR48 headlamp high beam relay.
5. Disconnect the harness connector at the appropriate E13 headlamp.
6. Test for less than 5 Ω between the ground circuit terminal D and ground.

⇒ **If 5 Ω or greater**

6.1. Ignition OFF.

6.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

7. Connect a test lamp between the control circuit terminal B and ground, ignition ON.
8. Verify the test lamp turns ON and OFF when commanding the High Beams ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

8.1. Ignition OFF, disconnect the X1 harness connector at the X50A fuse block – underhood.

8.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

8.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the KR48 headlamp high beam relay.

⇒ **If the test lamp is always ON**

8.1. Ignition OFF, disconnect the X1 harness connector at the X50A fuse block – underhood, ignition ON.

8.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the KR48 headlamp high beam relay.

⇓ **If the test lamp turns ON and OFF**

9. Test or replace the appropriate E4 headlamp – high beam.

High Beam Indicator Malfunction

1. Ignition ON.
2. Verify the high beam indicator turns ON and OFF when commanding the Instrument Cluster All Indicators Test ON and OFF with a scan tool.

⇒ **If the high beam indicator is always OFF or remains ON**

Replace the P16 instrument cluster.

⇓ **If the high beam indicator turns ON and OFF**

3. Replace the K9 body control module.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Headlamp Switch Replacement on page 4-187*
- *Headlamp Bulb Replacement on page 4-194*
- *Relay Replacement (Within an Electrical Center) on page 11-607* or *Relay Replacement (Attached to Wire Harness) on page 11-607*
- *Turn Signal Multifunction Switch Replacement on page 15-31*
- *Control Module References on page 6-3* for BCM or Instrument Cluster replacement, programming, and setup

Interior Backlighting Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F10DA (BCM 6) Fuse B+	1	1	—	—
Instrument Panel Dimmer Switch B+ Reference	B257B 03, B1405 03	B257B 03	—	—
Instrument Panel Dimmer Switch Signal	B257B 03	B257B 03	B257B 07	—
Passenger Air Bag Disable Indicator Backlighting Control	3	3	3	—
LED Backlight Dimming Control Terminal 8 X2	B2610 02	B2610 04	B2610 01	—
Hazard Warning Switch LED Backlight Dimming Control	1	1	1	
Transmission Shift Lever Position Indicator Backlight Control	B2652 02	1	1	—
LED Backlight Dimming Control Terminal 5 X1	B252E 02	B252E 02	1	—
Passenger Air Bag Disable Indicator Ground	—	3	—	—
Multifunction Switch – Center Console Ground	—	1	—	—
Door Lock Switch – Driver Ground	—	1	—	—
Hazard Lamps Switch – Ground	—	1	—	—
Headlamp Switch Ground	2	2	—	—
Steering Wheel Controls Switch – Left Ground	—	1	—	—

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Steering Wheel Controls Switch – Right Ground	—	1	—	—
Transmission Shift Lever Position Indicator Ground	—	1	—	—
1. Interior Backlighting Malfunction 2. Dimmer Switch Malfunction 3. Passenger Air Bag Disable Indicator Backlighting Malfunction				

Circuit/System Description

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

Reference Information

Schematic Reference

Interior Lights Dimming Schematics on page 4-91

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool LED Backlight Dimming Command parameter changes between a high percentage to a low percentage while operating the dimmer switch from high to low.

⇒ **If the parameter does not change**

Refer to Dimmer Switch Malfunction.

⇓ **If the parameter changes**

3. Verify the backlighting components turn ON and OFF while commanding the LED Backlight Dimming ON and OFF with a scan tool.

⇒ **If the backlighting components do not turn ON and OFF**

Refer to Interior Backlighting Malfunction.

⇓ **If the backlighting components turn ON and OFF**

4. Verify the hazard lamps switch backlighting turns ON and OFF while commanding the Hazard Lamps Switch Backlight ON and OFF with a scan tool.

⇒ **If the hazard lamps switch backlighting does not turn ON and OFF**

Refer to Hazard Lamps Switch Backlighting Malfunction.

⇓ **If the hazard lamps switch backlighting turns ON and OFF**

5. Verify the transmission shift lever position indicator backlighting turns ON and OFF while turning the park lamps ON and OFF with the headlamp switch.

⇒ **If the transmission shift lever position indicator backlighting does not turn ON and OFF**

Refer to Transmission Shift Lever Position Indicator Backlighting Malfunction.

⇓ **If the transmission shift lever position indicator backlighting turns ON and OFF**

6. Verify the phrase PASSENGER AIR BAG is illuminated on the Passenger Air Bag Disable Indicator.

⇒ **If the phrase PASSENGER AIR BAG is not illuminated**

Refer to Passenger Air Bag Disable Indicator Backlighting Malfunction.

⇓ **If the phrase PASSENGER AIR BAG is illuminated**

7. All OK.

Circuit/System Testing

Dimmer Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S30 Headlamp Switch, ignition ON.
2. Test for B+ between the B+ circuit terminal 1 and ground.

⇒ **If less than B+**

2.1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.

2.2. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

2.3. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If B+**

3. Verify a test lamp does not illuminate between the B+ circuit terminal 1 and the signal circuit terminal 12.

⇒ **If the test lamp illuminates**

3.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.

3.2. Test for infinite resistance between the signal circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 Body Control Module.

⇓ **If the test lamp does not illuminate**

4. Test for B+ between the B+ circuit terminal 1 and the signal circuit terminal 12.

⇒ **If less than B+**

4.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the signal circuit terminal 12 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

4.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇓ **If B+**

5. Test or replace the S30 Headlamp Switch.

Interior Backlighting Malfunction

Note: Each component with backlighting may need to be disconnected to isolate a short to voltage or short to ground. Use the schematics to identify the following:

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

1. Ignition OFF, all doors closed, all accessories OFF, disconnect the harness connector at the component with inoperative backlighting. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
   - S13D Door Lock Switch – Driver terminal 1
   - S30 Headlamp Switch – terminal 6
   - S48E Multifunction Switch – Center Console terminal 9
   - S70R Steering Wheel Controls Switch – right terminal 5
   - S70L Steering Wheel Controls Switch – left terminal 7

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground.
   - K33 HVAC Control Module – terminal 8
   - S13D Door Lock Switch – Driver terminal 2
   - S30 Headlamp Switch – terminal 7
   - S48E Multifunction Switch – Center Console terminal 10
   - S70R Steering Wheel Controls Switch – Right terminal 4
   - S70L Steering Wheel Controls Switch – Left terminal 6

4. Verify the test lamp turns ON and OFF when commanding the LED Backlight Dimming ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the component with inoperative backlighting.

Hazard Lamps Switch Backlighting Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S26 Hazard Warning Switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 3 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Hazard Lamps Switch Backlight ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the S26 Hazard Warning Switch.

Transmission Shift Lever Position Indicator Backlighting Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the P2 Transmission Shift Lever Position Indicator. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 2 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Connect a test lamp between the control circuit terminal 1 and ground.

4. Verify the test lamp turns ON and OFF while turning the headlamp switch ON and OFF.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X6 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X6 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the P2 Transmission Shift Lever Position Indicator.

Passenger Air Bag Disable Indicator Backlighting Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the P14 Passenger Air Bag Disable Indicator. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 3 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal 1 and ground.
4. Verify the test lamp turns ON and OFF while turning the ignition switch ON and OFF.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, remove the F28DA at the X51A Fuse Block – Instrument Panel, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the X51A Fuse Block – Instrument Panel.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the P14 Passenger Air Bag Disable Indicator.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Door Lock Switch Replacement on page 4-321*
- *Hazard Warning Switch Replacement on page 4-188*
- *Headlamp Switch Replacement on page 4-187*
- *Transmission Control Replacement on page 17-193*
- *Radio and Telephone Control Switch Replacement on page 8-63*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

Park, License, and/or Tail Lamps Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F5DA (BCM 1) Fuse B+	B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	—	—
F7DA (BCM 3) Fuse B+	1, 3	1, 3	—	—
F8DA (BCM 4) Fuse B+	1, 3	1, 3	—	—
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	—
License Plate Lamp Control	B3883 02	B3883 01, B3883 04	B3883 01	—
Front Park and Rear Side Marker Lamps Control - Left	B2585 02	B2585 04	B2585 01, B2585 04	—
Front Park and Rear Side Marker Lamps Control - Right	B3867 02	B3867 04	B3867 01, B3867 04	—
Rear Tail/Stop Lamps Control - Left	B3881 02	B3881 04	B3881 01	—
Rear Tail/Stop Lamps Control - Right	B3882 02	B3882 04	B3882 01	—
Headlamp Switch Ground	—	2	—	—
License Plate Lamp Ground - Left	—	B3883 01, B3883 04	—	—
License Plate Lamp Ground - Right	—	B3883 01, B3883 04	—	—
Park Lamp Ground - Left Front	—	1	—	—
Park Lamp Ground - Right Front	—	1	—	—
Rear Tail/Stop Lamps Ground - Left	—	1	—	—
Rear Tail/Stop Lamps Ground - Right	—	1	—	—
Side Marker Lamp Ground - Left Rear	—	1	—	—
Side Marker Lamp Ground - Right Rear	—	1	—	—

1. Park, License, and/or Tail Lamps Malfunction
2. Park Lamp Switch Malfunction
3. Turn Signal Lamps and/or Indicators Malfunction

Circuit/System Description

When the headlamp switch is placed in the HEAD or PARK position, ground is applied to the park lamp switch ON 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, and license lamps.

Diagnostic Aids

When testing at the park lamp bulb socket, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Park Lamp Switch parameter changes between Active and Inactive while commanding the park lamps ON and OFF with the headlamp switch.

⇒ **If the parameter does not change**

Refer to Park Lamp Switch Malfunction.

⇓ **If the parameter changes**

3. Verify the left park lamps turn ON and OFF when commanding the Left Park Lamps ON and OFF with a scan tool.

⇒ **If the left park lamps do not turn ON and OFF**

Refer to Park Lamps Malfunction.

⇓ **If the left park lamps turn ON and OFF**

4. Verify the right park lamps turn ON and OFF when commanding the Right Park Lamps ON and OFF with a scan tool.

⇒ **If the right park lamps do not turn ON and OFF**

Refer to Park Lamps Malfunction.

⇓ **If the right park lamps turn ON and OFF**

5. Verify the license plate lamps turn ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.

⇒ **If the license plate lamps do not turn ON and OFF**

Refer to License Plate Lamps Malfunction.

⇓ **If the license plate lamps turn ON and OFF**

6. All OK.

Circuit/System Testing

Park Lamp Switch Malfunction

1. Ignition OFF, all doors closed, all accessories OFF, disconnect the harness connector at the S30 headlamp switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 6 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool Park Lamps Switch parameter is Inactive.

⇒ **If not Inactive**

4.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the signal circuit terminal 3 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 3 and the ground circuit terminal 6.
6. Verify the scan tool Park Lamps Switch parameter is Active.

⇒ **If not Active**

6.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 3 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If Active**

7. Test or replace the S30 headlamp switch.

Park Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the appropriate park lamp.
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
   - E4N park/turn signal lamp - left terminal C
   - E4P park/turn signal lamp - right terminal C
   - E5AA tail/stop lamp - left terminal 3
   - E5AB tail/stop lamp - right terminal 3

- E2LR side marker lamp - left rear socket terminal
- E2RR side marker lamp - right rear socket terminal

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
   - E4N park/turn signal lamp - left terminal A
   - E4P park/turn signal lamp - right terminal A
   - E5AA tail/stop lamp - left terminal 2
   - E5AB tail/stop lamp - right terminal 2
   - E2LR side marker lamp - left rear socket terminal
   - E2RR side marker lamp - right rear socket terminal
4. Verify the test lamp turns ON and OFF when commanding the appropriate Park Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 body control module.
- X4
- X5

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 body control module, ignition ON.
- X4
- X5

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the appropriate park lamp.

License Plate Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, trunk latch latched, remove both E7 license plate lamp bulbs.
2. Test for less than 5 Ω between each ground circuit terminal 1 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the license plate lamp – left control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Connect a test lamp between the license plate lamp – right control circuit terminal 2 and ground, ignition ON.

6. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

6.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

6.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

6.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

7. Test or replace the appropriate E7 license plate lamp bulb.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Headlamp Switch Replacement on page 4-187*
- *Tail Lamp Replacement (Hatchback) on page 4-214* or *Tail Lamp Replacement (Sedan) on page 4-213*
- *Parking and Turn Signal Lamp Bulb Replacement on page 4-203*
- *Rear License Plate Lamp Bulb Replacement (Sedan) on page 4-211* or *Rear License Plate Lamp Bulb Replacement (Hatchback) on page 4-212*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

Rear Compartment Lamp Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F8DA (BCM 4) Fuse B+	1	1	—	—
Rear Compartment Courtesy Lamp Control	B257002	1	1	—
Rear Compartment Courtesy Lamp Ground	—	1	—	—
1. Rear Compartment Lamp Malfunction				

Circuit/System Description

The body control module (BCM) applies battery voltage to the rear compartment courtesy lamp through the rear compartment lamp control circuit. When the BCM receives a rear compartment lid open input from the rear compartment lid latch, the BCM applies battery voltage to the rear compartment lamp control circuit illuminating the rear compartment courtesy lamp. In the event that the rear compartment lamp were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position and no doors opened, the BCM will deactivate the rear compartment lamp control circuit to prevent total battery discharge.

Reference Information

Schematic Reference

Interior Lights Schematics on page 4-89

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Interior Lighting Systems Description and Operation on page 4-219

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the E8S Rear Compartment Courtesy Lamp.
2. Test for less than 5 Ω between the ground circuit terminal 2 and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Trunk Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 Body Control Module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 Body Control Module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E8S Rear Compartment Courtesy Lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Rear Compartment Courtesy Lamp Replacement (Hatchback) on page 4-216* or *Rear Compartment Courtesy Lamp Replacement (Sedan) on page 4-217*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

---

Stop Lamps Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F5DA (BCM 1) Fuse B+	B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	—	—
F7DA (BCM 3) Fuse B+	1, 3	1, 3	—	—

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F8DA (BCM 4) Fuse B+	1, 3	1, 3	—	—
Brake Pedal Position Sensor 5 V Reference	C0277 06, C0890 03, C0161 71	C0277 06, C0161 71, C0161 5A	C0277 07, C0890 07, C0161 71	—
Brake Pedal Position Sensor Signal	C0277 06, U0140 71	C0277 06, C0161 71, C0161 5A	C0277 07, C0890 07, C0161 71	C0277 09
Center High Mounted Stop Lamp Control	B3884 02	2	2	—
Rear Tail/Stop Lamp Control – Left	B3881 02	B3881 04	B3881 01	—
Rear Tail/Stop Lamp Control – Right	B3882 02	B3882 04	B3882 01	—
Brake Pedal Position Sensor Low Reference	—	C0277 07, C0161 71	U0151 00, U0184 00	—
Center High Mounted Stop Lamp Ground	—	2	—	—
Rear Tail/Stop Lamp Ground – Left	—	1	—	—
Rear Tail/Stop Lamp Ground – Right	—	1	—	—

1. Stop Lamps Malfunction
2. Center High Mounted Stop Lamp Malfunction
3. Turn Signal Lamps and/or Indicators 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 left and right stop lamp control circuits as well as the center high mounted stop lamp (CHMSL) control circuit illuminating the left and right stop lamps and the CHMSL.

Diagnostic Aids

When testing at the stop lamp bulb socket, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Exterior Lights Schematics on page 4-85

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Brake Lamps Command parameter changes between Active and Inactive while pressing and releasing the brake pedal.

⇒ **If the parameter does not change**

Refer to Brake Pedal Position Sensor Malfunction.

⇓ **If the parameter changes**

3. Verify the left brake lamp turns ON and OFF when commanding the Left Rear Brake/Park Lamp ON and OFF with a scan tool.

⇒ **If the left brake lamp does not turn ON and OFF**

Refer to Stop Lamps Malfunction.

⇓ **If the left brake lamp turns ON and OFF**

4. Verify the right brake lamp turns ON and OFF when commanding the Right Rear Brake/Park Lamp ON and OFF with a scan tool.

⇒ **If the right brake lamp does not turn ON and OFF**

Refer to Stop Lamps Malfunction.

⇓ **If the right brake lamp turns ON and OFF**

5. Verify the center high mounted stop lamp turns ON and OFF when commanding the Center Brake Lamp ON and OFF with a scan tool.

⇒ **If the center high mounted stop does not turn ON and OFF**

Refer to Center High Mount Stop Lamp Malfunction.

⇓ **If the center high mounted stop turns ON and OFF**

6. All OK.

Circuit/System Testing

Brake Pedal Position Sensor Malfunction

1. Ignition OFF, disconnect the harness connector at the B22 brake pedal position sensor, ignition ON.
2. Test for less than 1 V between the appropriate low reference circuit terminal listed below and ground.
   - Terminal 2 – with MH9
   - Terminal A – without MH9

⇒ **If 1 V or greater**

2.1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module, ignition ON.

2.2. Test for less than 1 V between the low reference circuit and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If less than 1 V**

3. Test or replace the B22 brake pedal position sensor.

Stop Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, trunk latch latched, remove the appropriate E5A tail/stop lamp bulb.
2. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the appropriate Rear Brake/Park Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 body control module.
   - X4 left stop lamp
   - X5 right stop lamp

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 body control module, ignition ON.
   - X4 left stop lamp
   - X5 right stop lamp

4.1. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the appropriate E5A tail/stop lamp.

Center High Mount Stop Lamp Malfunction

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the E6 center high mounted stop lamp.
2. Test for less than 5 Ω between the ground circuit terminal B and ground.

⇒ **If 5 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

3. Connect a test lamp between the control circuit terminal A and ground, ignition ON.

4. Verify the test lamp turns ON and OFF when commanding the Center Brake Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

4.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

4.1. Ignition OFF, disconnect the X4 harness connector at the K9 body control module, ignition ON.

4.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

5. Test or replace the E6 center high mounted stop lamp.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *High Mount Stop Lamp Replacement (Hatchback) on page 4-205* or *High Mount Stop Lamp Replacement (Sedan) on page 4-204*
- *Brake Pedal Position Sensor Calibration on page 4-185*
- *Brake Pedal Position Sensor Replacement on page 4-186*
- *Stop and Turn Signal Lamp Bulb Replacement (Sedan) on page 4-215*
- *Control Module References on page 6-3* for BCM replacement, programming, and setup

Turn Signal Lamps and/or Indicators Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle on page 6-66* prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis on page 6-58* for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions on page 6-59* provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F7DA (BCM 3) Fuse B+	1	1	—	—
F8DA (BCM 4) Fuse B+	1	1	—	—
F10DA (BCM 6) Fuse B+	1	1	—	—
F11DA (BCM 7) Fuse B+	1	1	—	—
Turn Signal Switch Signal – Left	2	2	2	—
Turn Signal Switch Signal – Right	2	2	2	—
Turn Signal Control – Left Front	B3948 02	B3948 04	B3948 01, B3948 04	—
Turn Signal Control – Left Rear	B3950 02	B3950 04	B3950 01, B3950 04	—
Turn Signal Control – Right Front	B3949 02	B3949 04	B3949 01, B3949 04	—
Turn Signal Control – Right Rear	B3951 02	B3951 04	B3951 01, B3951 04	—

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Turn Signal Lamp Ground – Left Front	—	B3948 01, B3948 04	—	—
Turn Signal Lamp Ground – Right Front	—	B3949 01, B3949 04	—	—
Turn Signal Lamp Ground – Left Rear	—	B3950 01, B3950 04	—	—
Turn Signal Lamp Ground – Right Rear	—	B3951 01, B3951 04	—	—
Turn Signal/Multifunction Switch Ground	—	2	—	—
1. Turn Signal Lamps and/or Indicators Malfunction 2. Turn Signal/Multifunction 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 positions. 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 responds to the turn signal switch input by applying a pulsating voltage to the front and rear turn signal lamps through there respective control circuits. When a turn signal request is received by the BCM, a serial data message is sent to the instrument cluster requesting the respective turn signal indicator be pulsed ON and OFF.

Diagnostic Aids

When testing at the turn signal lamp bulb socket, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

- *Exterior Lights Schematics on page 4-85*
- *Body Control System Schematics on page 11-8*

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Exterior Lighting Systems Description and Operation on page 4-217

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Right Turn Signal Switch and Left Turn Signal Switch parameters change between Active and Inactive while cycling the turn signal switch between the right and left positions.

⇒ **If the parameters do not change**

Refer to Turn Signal/Multifunction Switch Malfunction.

⇓ **If the parameters change**

3. Verify the left front turn signal lamps turn ON and OFF while commanding the Left Front Turn Signal Lamp ON and OFF with a scan tool.

⇒ **If the left front turn signal lamps do not turn ON and OFF**

Refer to Turn Signal Lamps Malfunction.

⇓ **If the left front turn signal lamps turn ON and OFF**

4. Verify the right front turn signal lamps turn ON and OFF while commanding the Right Front Turn Signal Lamp ON and OFF with a scan tool.

⇒ **If the right front turn signal lamps do not turn ON and OFF**

Refer to Turn Signal Lamps Malfunction.

⇓ **If the right front turn signal lamps turn ON and OFF**

5. Verify the left rear turn signal lamps turn ON and OFF while commanding the Left Rear Turn Signal Lamp ON and OFF with a scan tool.

⇒ **If the left rear turn signal lamps do not turn ON and OFF**

Refer to Turn Signal Lamps Malfunction.

⇓ **If the left rear turn signal lamps turn ON and OFF**

6. Verify the right rear turn signal lamps turn ON and OFF while commanding the Right Rear Turn Signal Lamp ON and OFF with a scan tool.

⇒ **If the right rear turn signal lamps do not turn ON and OFF**

Refer to Turn Signal Lamps Malfunction.

⇓ **If the right rear turn signal lamps turn ON and OFF**

7. Verify the left and right turn signal indicators turn ON and OFF while commanding the All Indicators Test ON and OFF with a scan tool.

⇒ **If the left or right turn signal indictors do not turn ON and OFF**

Refer to Turn Signal Indicators Malfunction.

⇓ **If the left and right turn signal indictors turn ON and OFF**

8. All OK.

Circuit/System Testing

Turn Signal/Multifunction Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S78 turn signal/ multifunction switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 3 and ground.

⇒ **If 15 Ω or greater**

2.1. Ignition OFF.

2.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool Left Turn Signal Switch parameter is Inactive.

⇒ **If not Inactive**

4.1. Ignition OFF, disconnect the X3 harness connector at the K9 body control module.

4.2. Test for infinite resistance between the signal circuit terminal 1 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and the ground circuit terminal 3.
6. Verify the scan tool Left Turn Signal Switch parameter is Active.

⇒ **If not Active**

6.1. Ignition OFF, disconnect the X3 harness connector at the K9 body control module, ignition ON.

6.2. Test for less than 1 V between the signal circuit terminal 1 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

6.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If Active**

7. Verify the scan tool Right Turn Signal Switch parameter is Inactive.

⇒ **If not Inactive**

7.1. Ignition OFF, disconnect the X3 harness connector at the K9 body control module.

7.2. Test for infinite resistance between the signal circuit terminal 7 and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If Inactive**

8. Install a 3 A fused jumper wire between the signal circuit terminal 7 and the ground circuit terminal 3.
9. Verify the scan tool Right Turn Signal Switch parameter is Active.

⇒ **If not Active**

9.1. Ignition OFF, disconnect the X3 harness connector at the K9 body control module, ignition ON.

9.2. Test for less than 1 V between the signal circuit terminal 7 and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇓ If less than 1 V

9.3. Test for less than 2 Ω in the signal circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇓ **If Active**

10. Test or replace the S78 turn signal/multifunction switch.

Turn Signal Lamps Malfunction

1. Ignition OFF, disconnect the X1 harness connector at the K9 body control module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

2.1. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

2.1. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If the test lamp illuminates**

3. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

3.1. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

3.1. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If the test lamp illuminates**

4. Ignition OFF, connect the X1 harness connector at the K9 body control module.
5. Disconnect the X5 harness connector at the K9 body control module, ignition ON.
6. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

6.1. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

6.1. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If the test lamp illuminates**

7. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.

⇒ **If the test lamp does not illuminate and the circuit fuse is good**

7.1. Test for less than 2 Ω in the B+ circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

⇒ **If the test lamp does not illuminate and the circuit fuse is open**

7.1. Test for infinite resistance between the B+ circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, replace the K9 body control module.

⇓ **If the test lamp illuminates**

8. Ignition OFF, connect the X5 harness connector at the K9 body control module.
9. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the appropriate E4 turn signal lamp.
10. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
    - E4N park/turn signal lamp – left terminal C
    - E4P park/turn signal lamp – right terminal C
    - E4LR turn signal lamp – left rear socket terminal
    - E4RR turn signal lamp – right rear socket terminal

⇒ **If 5 Ω or greater**

10.1. Ignition OFF.

10.2. Test for less than 2 Ω in the ground circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, repair the open/high resistance in the ground connection.

⇓ **If less than 5 Ω**

11. Connect a test lamp between the appropriate control circuit terminal listed below and ground.
    - E4N park/turn signal lamp – left terminal B
    - E4P park/turn signal lamp – right terminal B
    - E4LR turn signal lamp – left rear socket terminal
    - E4RR turn signal lamp – right rear socket terminal
12. Verify the test lamp turns ON and OFF when commanding the appropriate Turn Signal Lamp ON and OFF with a scan tool.

⇒ **If the test lamp is always OFF**

12.1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 body control module.
    - X5 left turn signals
    - X4 right turn signals

12.2. Test for infinite resistance between the control circuit and ground.

⇒ If less than infinite resistance, repair the short to ground on the circuit.

⇓ If infinite resistance

12.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, replace the K9 body control module.

⇒ **If the test lamp is always ON**

12.1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 body control module, ignition ON.

- X5 left turn signals
- X4 right turn signals

12.2. Test for less than 1 V between the control circuit terminal and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

⇒ If less than 1 V, replace the K9 body control module.

⇓ **If the test lamp turns ON and OFF**

13. Test or replace the appropriate E4 turn signal lamp.

Turn Signal Indicators Malfunction

1. Ignition ON.
2. Verify the left and right turn signal indicators turn ON and OFF while commanding the All Indicators Test ON and OFF with a scan tool.

⇒ **If the left or right turn signal indictors are always OFF or remain ON**

Replace the P16 instrument cluster.

⇓ **If the left and right turn signal indictors turn ON and OFF**

3. Replace the K9 body control module.

Repair Instructions

Perform the *Diagnostic Repair Verification on page 6-92* after completing the repair.

- *Parking and Turn Signal Lamp Bulb Replacement on page 4-203*
- *Turn Signal Multifunction Switch Replacement on page 15-31*
- *Stop and Turn Signal Lamp Bulb Replacement (Sedan) on page 4-215*
- *Control Module References on page 6-3* for BCM or Instrument Cluster replacement, programming, and setup

Repair Instructions

Brake Pedal Position Sensor Calibration

Calibration Criteria

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

Brake pedal position sensor calibration must be performed after the brake pedal position sensor or body control module (BCM) have been serviced. The calibration procedure will set the brake pedal position sensor home value. This value is used by the BCM to determine the action of the driver applying the brake system and to provide this information to the vehicle subsystems via serial data.

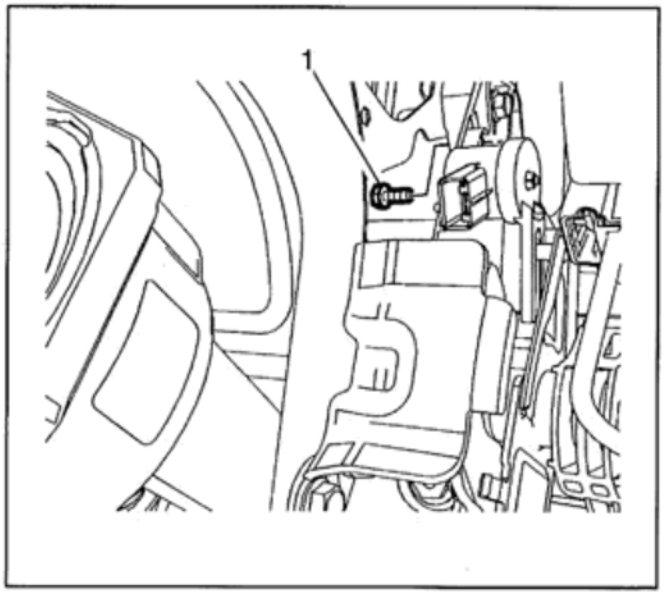
Calibration Procedure

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

Brake Pedal Position Sensor Replacement

Removal Procedure

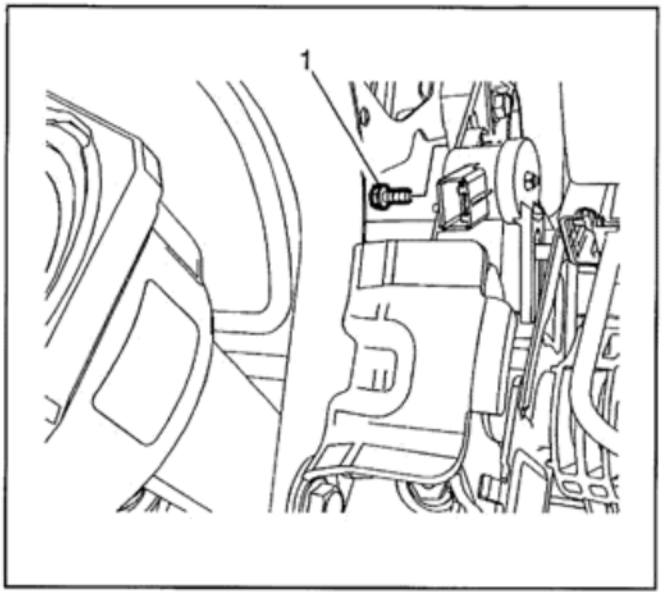
1. Remove the instrument panel lower trim pad cover. Refer to *Instrument Panel Lower Trim Pad Cover Replacement (Without AAL) on page 2-40* or *Instrument Panel Lower Trim Pad Cover Replacement (With AAL) on page 2-41*.



2511817

2. Disconnect the brake pedal position sensor electrical connector.
3. Remove the brake pedal position sensor bolt (1).
4. Remove the brake pedal position sensor.

Installation Procedure



2511817

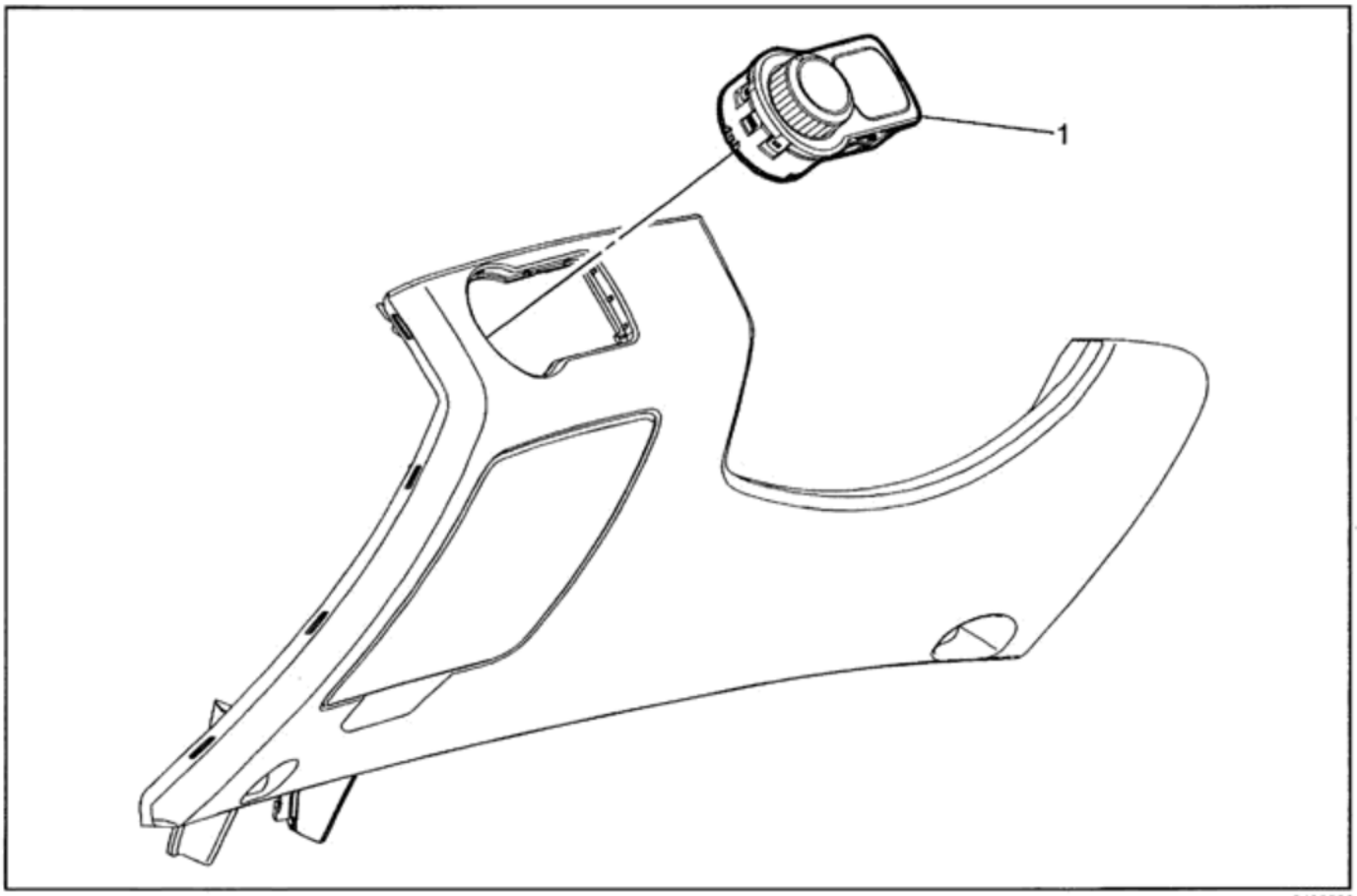
Note: Ensure the fork of the brake pedal position sensor is positioned over the brake pedal post.

1. Install the brake pedal position sensor to the brake pedal bracket.

Caution: Refer to *Fastener Caution on page 0-8*.

2. Install the brake pedal position sensor bolt (1) and tighten to **3 N·m (27 lb in)**.
3. Connect the brake pedal position sensor electrical connector.
4. Calibrate the brake pedal position sensor. Refer to *Brake Pedal Position Sensor Calibration on page 4-185*.
5. Install the instrument panel lower trim pad cover. Refer to *Instrument Panel Lower Trim Pad Cover Replacement (Without AAL) on page 2-40* or *Instrument Panel Lower Trim Pad Cover Replacement (With AAL) on page 2-41*.

Headlamp Switch Replacement

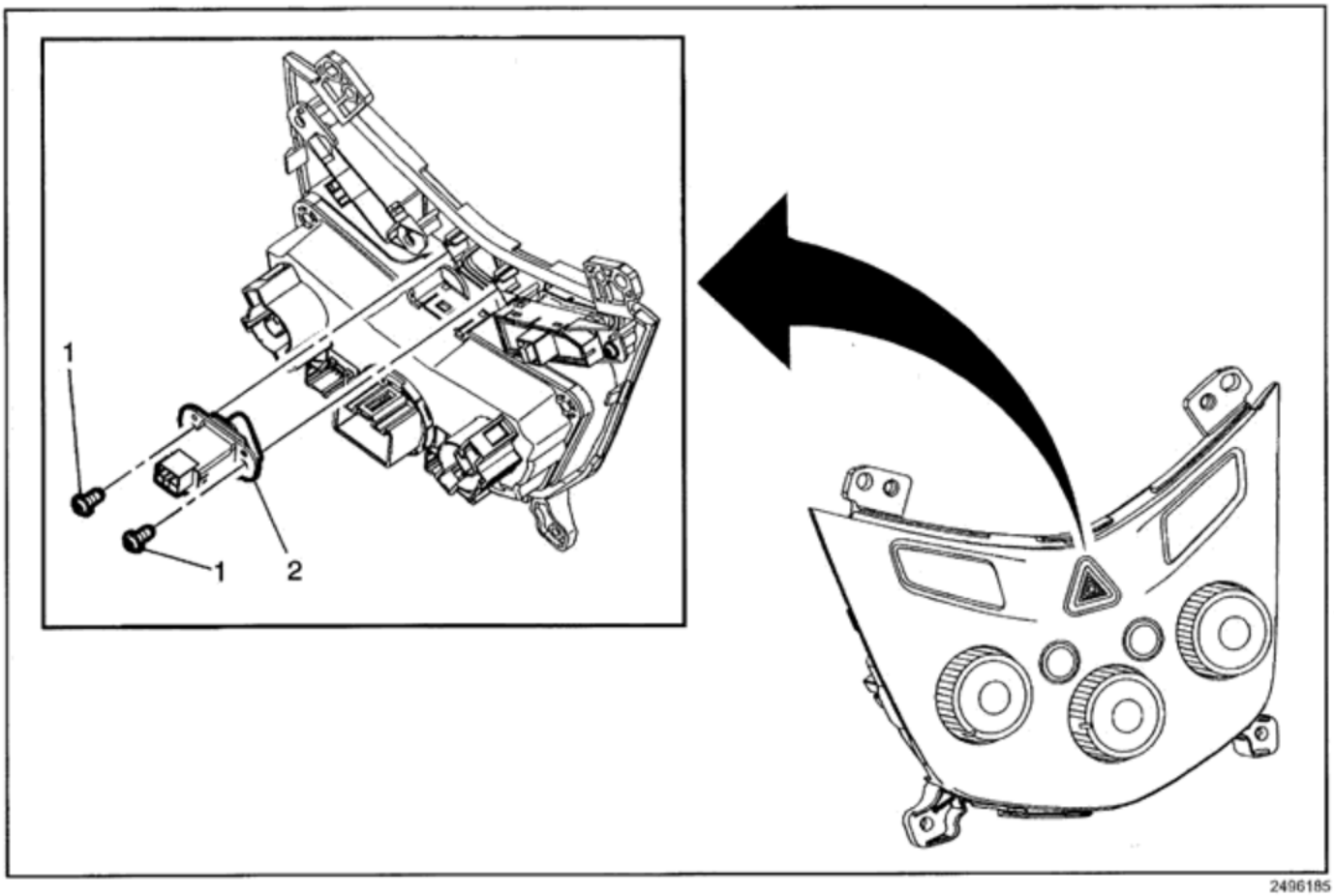


2496206

Headlamp Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the instrument panel lower trim pad cover. Refer to *Instrument Panel Lower Trim Pad Cover Replacement (Without AAL) on page 2-40* or *Instrument Panel Lower Trim Pad Cover Replacement (With AAL) on page 2-41*	
1	Headlamp Switch **Procedure** 1. Gently depress tabs to remove the switch assembly from the instrument panel lower cover. 2. Disconnect the electrical connector.

Hazard Warning Switch Replacement

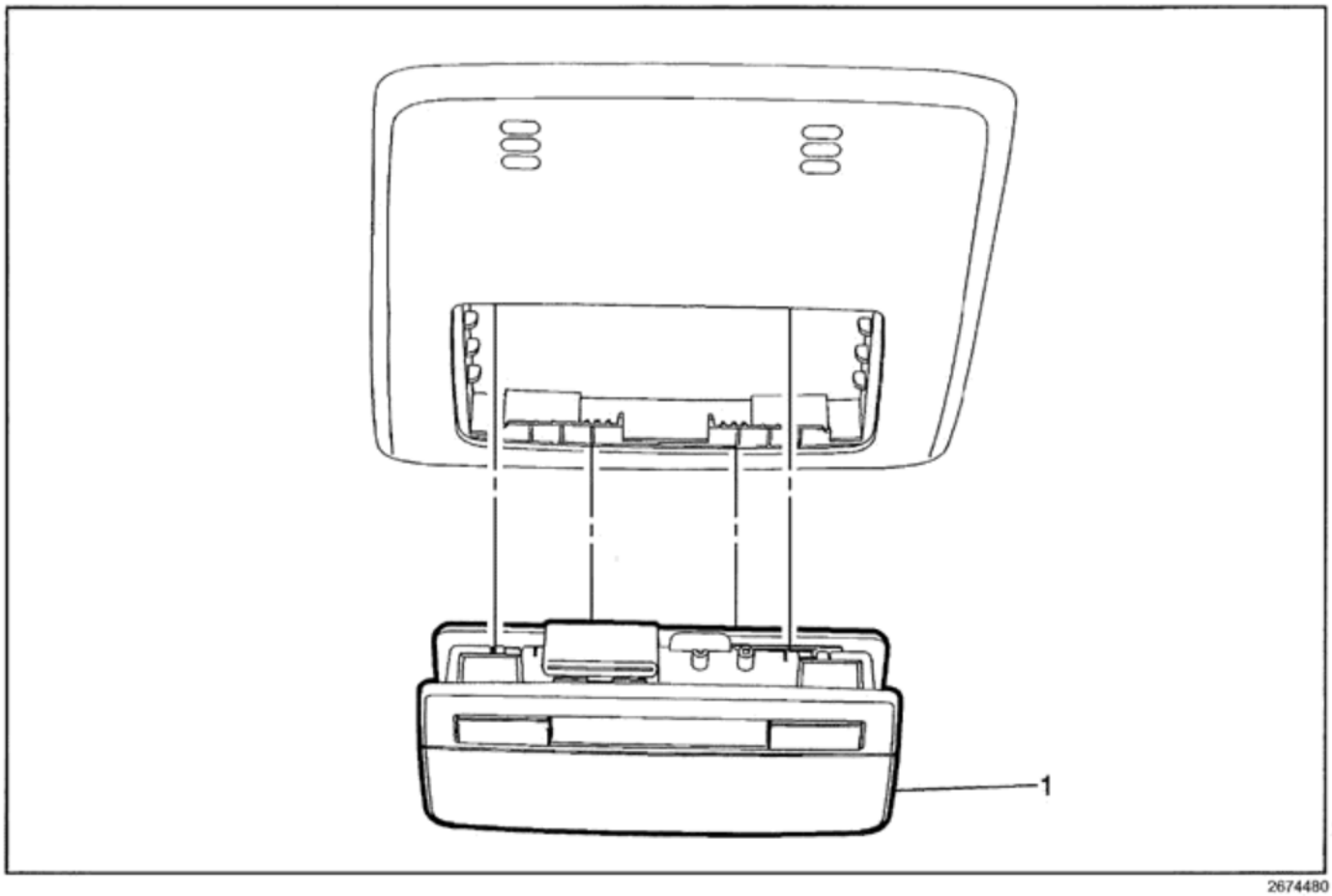


2496185

Hazard Warning Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the heater and air conditioning control. Refer to *Heater and Air Conditioning Control Replacement on page 10-79*.	
1	Hazard Warning Switch Bolts (Qty: 2) **Caution:** Refer to *Fastener Caution on page 0-8*.
2	Hazard Warning Switch **Procedure** Disconnect the electrical connector.

Reading Lamp Replacement

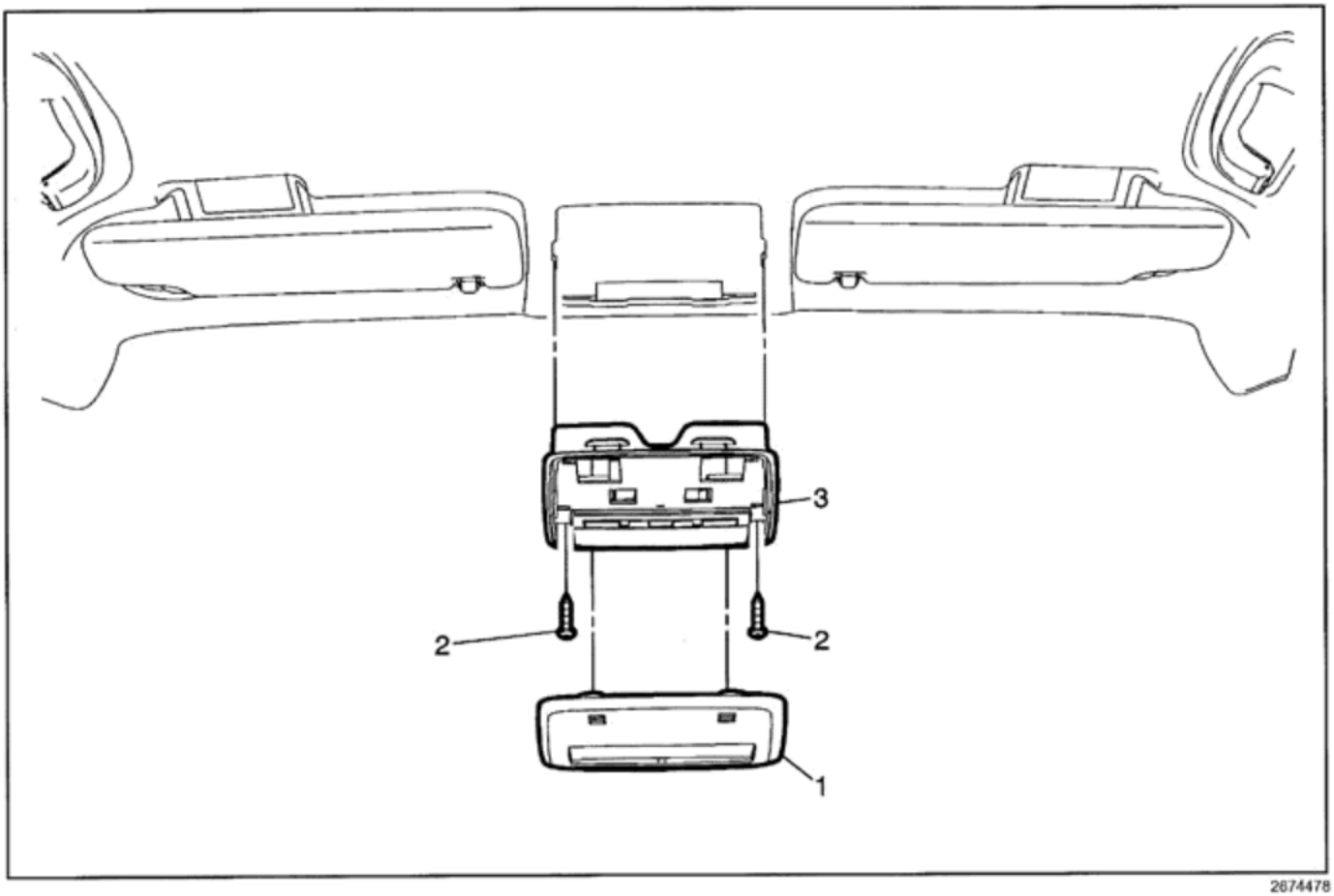


2674480

Reading Lamp Replacement

Callout	Component Name
Preliminary Procedure Remove the dome lamp bezel. Refer to *Dome Lamp Bezel Replacement on page 4-190*.	
1	Reading lamp **Procedures** 1. Release the clips retaining the reading lamp assembly to the bezel. 2. Disconnect the electrical connections.

Dome Lamp Bezel Replacement

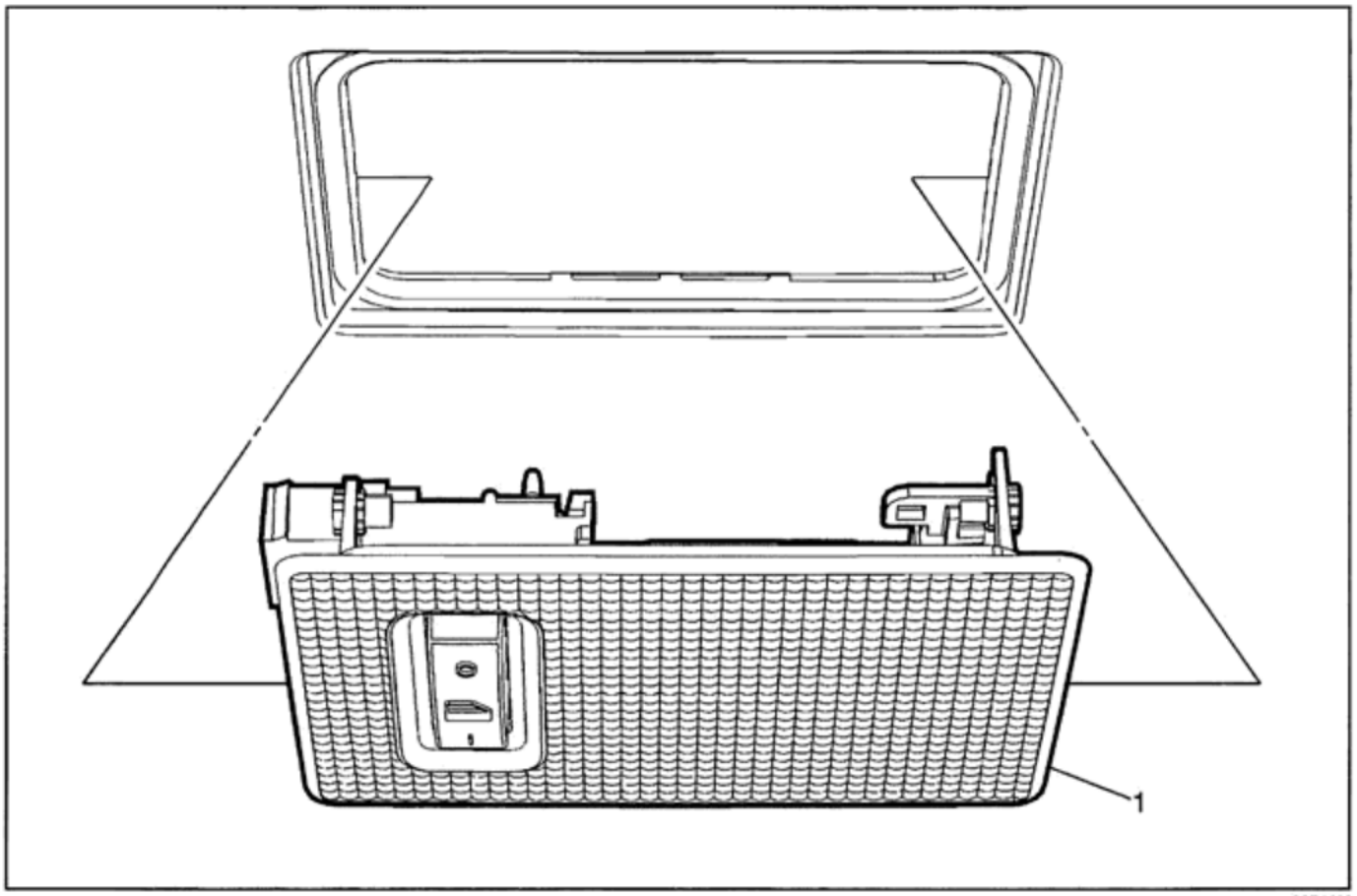


2674478

Dome Lamp Bezel Replacement

Callout	Component Name
1	Dome Lamp Bezel Cover **Procedures** 1. Grasp the bezel cover and pull downward to remove from the lamp assembly. 2. Disconnect the electrical connections, as necessary.
2	Dome Lamp Bezel Fasteners (Qty: 2) **Caution:** Refer to *Fastener Caution on page 0-8*.
3	Dome Lamp Bezel **Procedures** 1. Pull assembly downward to remove. 2. Disconnect the electrical connections.

Windshield Header Courtesy Lamp Replacement

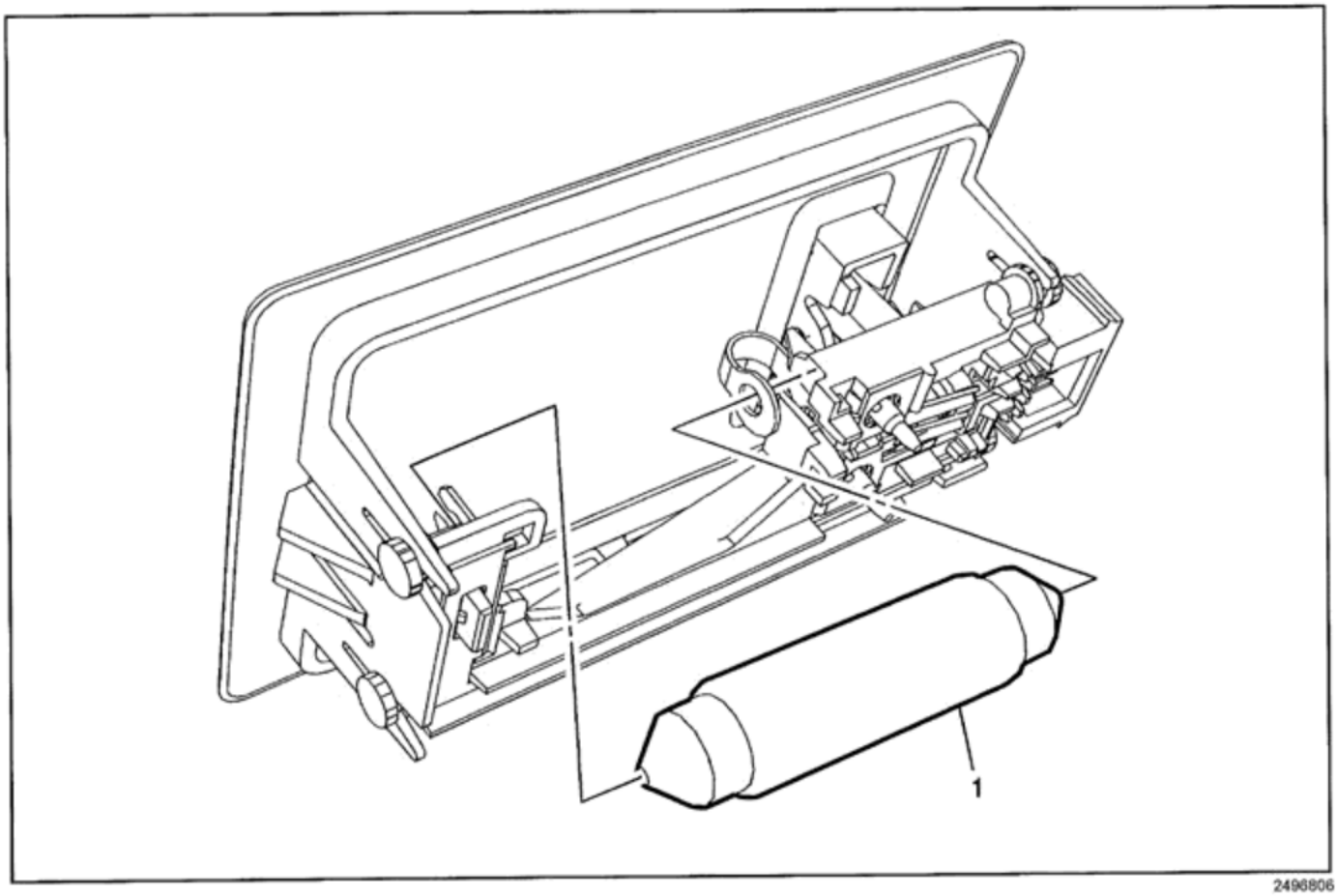


2674482

Windshield Header Courtesy Lamp Replacement

Callout	Component Name
1	Windshield Header Courtesy Lamp **Procedures** 1. Grasp the courtesy lamp assembly and pull downward to release the retainer clips securing the courtesy lamp assembly to the headliner. 2. Disconnect the electrical connections.

Dome Lamp Bulb Replacement

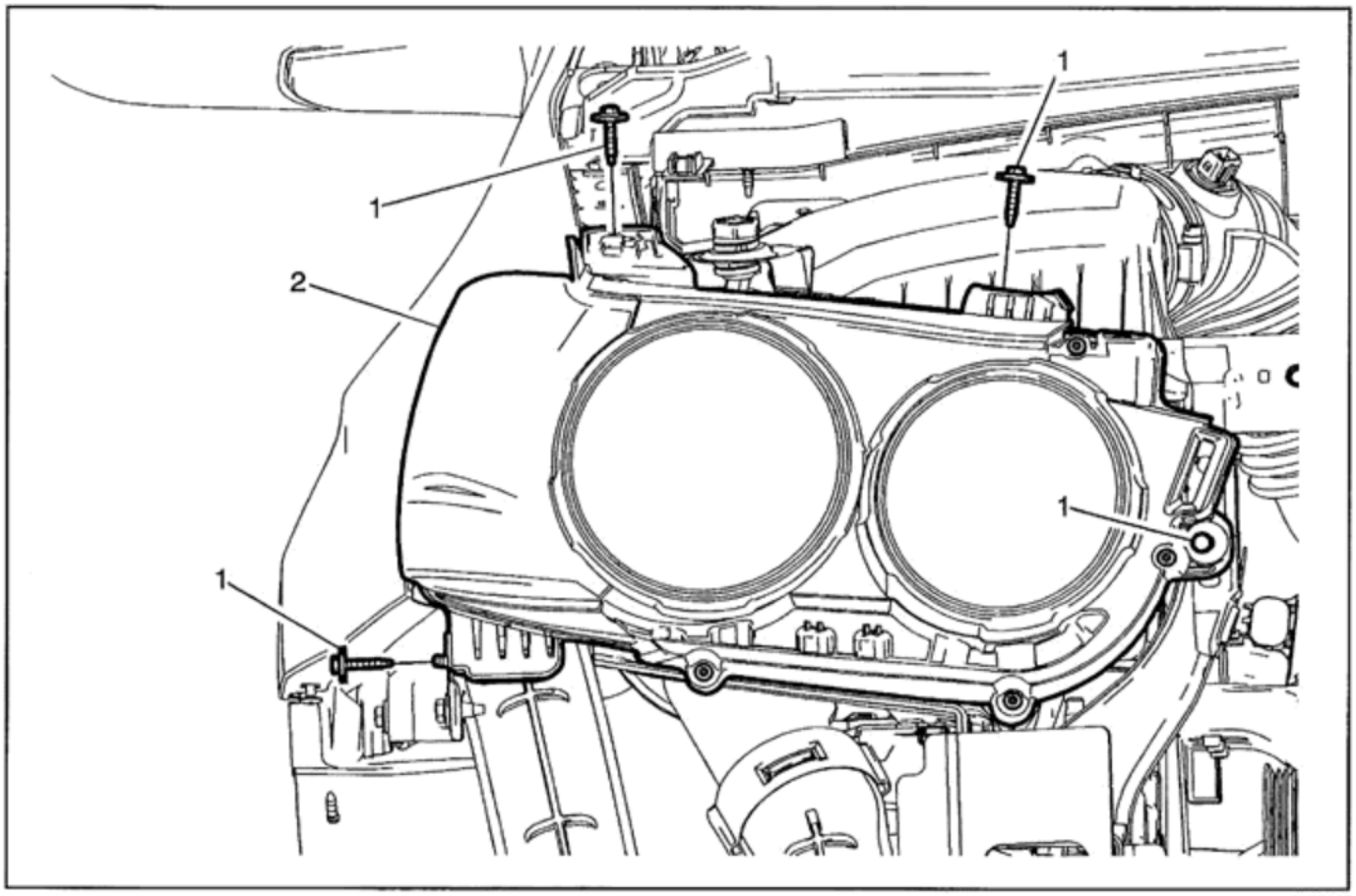


2496806

Dome Lamp Bulb Replacement

Callout	Component Name
Preliminary Procedure Remove the windshield header courtesy lamp. Refer to *Windshield Header Courtesy Lamp Replacement on page 4-191*	
1	Dome Lamp Bulb

Headlamp Replacement

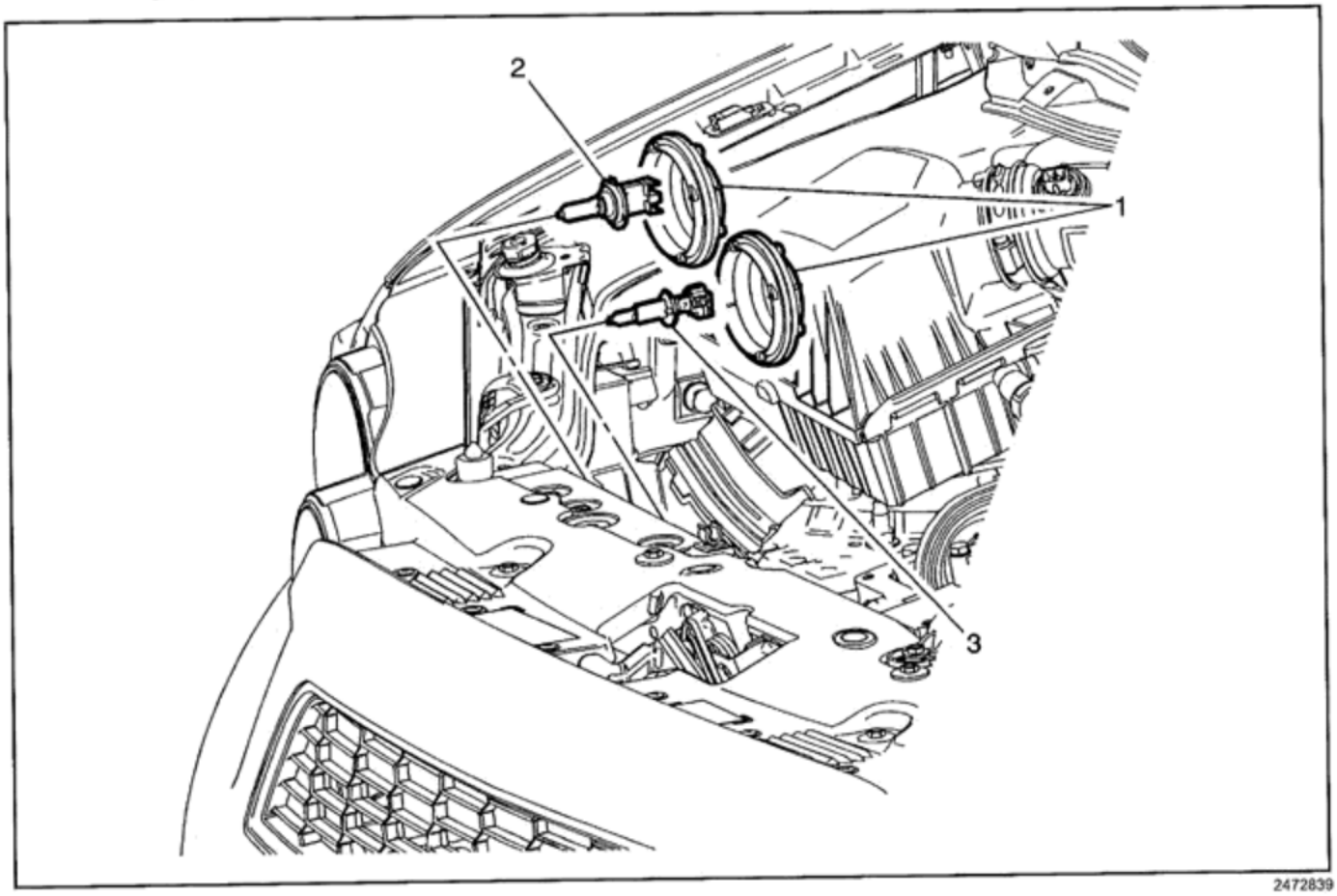


2472837

Headlamp Replacement

Callout	Component Name
Preliminary Procedure Remove the front bumper fascia. Refer to *Front Bumper Fascia Replacement on page 3-55*.	
1	Headlamp Assembly Screw (Qty: 4) **Caution:** Refer to *Fastener Caution on page 0-8*. **Tighten** 2.5 N•m (22 lb in)
2	Headlamp Assembly **Procedure** 1. Disconnect the electrical connector bulb harness and remove the headlamp assembly. 2. Aim the headlamps after replacement. Refer to *Headlamp Aiming on page 4-196*.

Headlamp Bulb Replacement

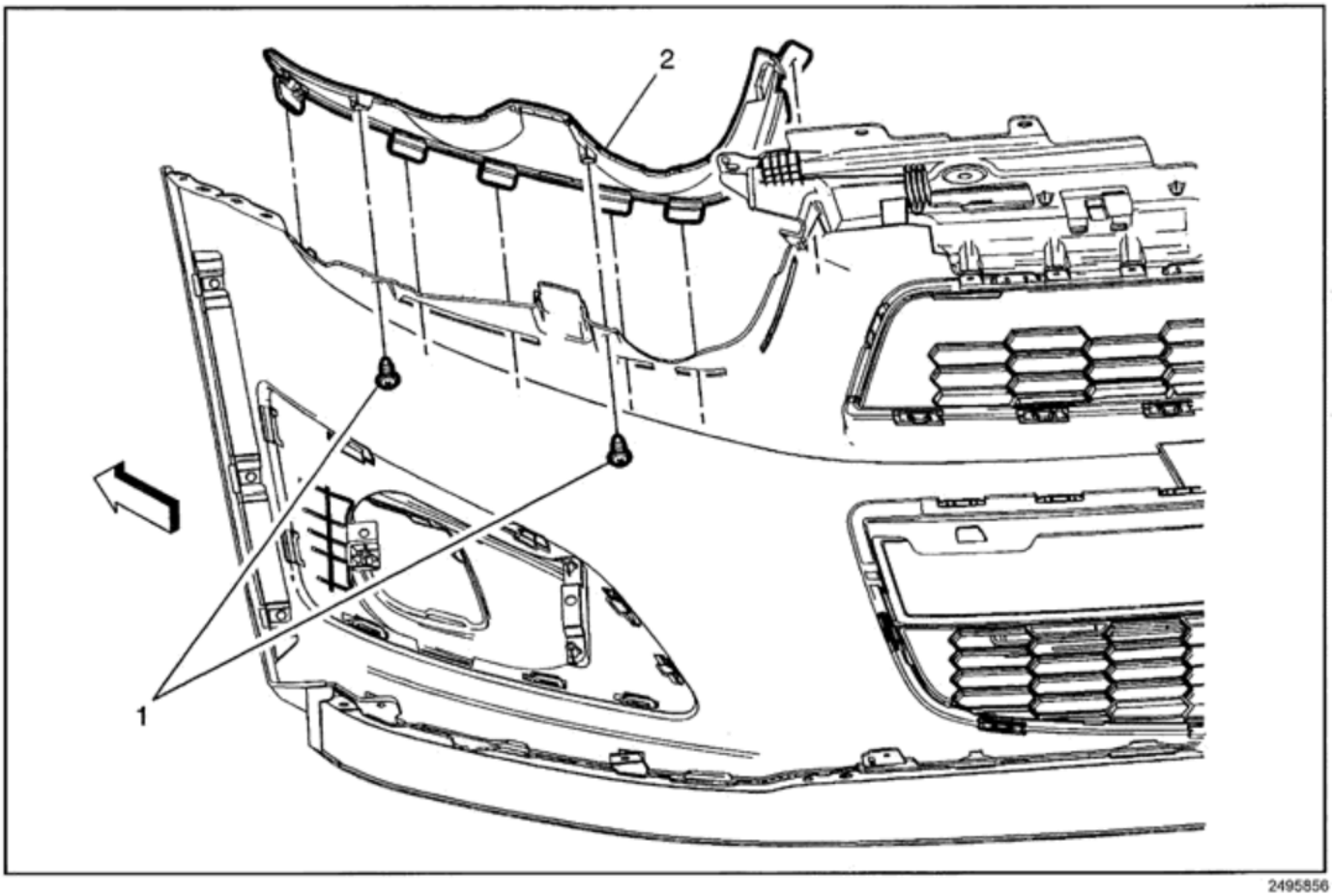


2472839

Headlamp Bulb Replacement

Callout	Component Name
Preliminary Procedure Open and support the hood assembly.	
1	Accessory Bulb Cover (Qty: 2)
2	***Warning: Refer to Halogen Bulb Warning on page 0-5.*** Headlamp Bulb (Low Beam) **Procedure** 1. Disconnect the electrical connector from the bulb socket. 2. Rotate the bulb socket and remove from the headlamp housing.
3	Headlamp Bulb (High Beam) **Procedure** 1. Disconnect the electrical connector from the bulb socket. 2. Rotate the bulb socket a quarter turn and remove from the headlamp housing.

Headlamp Housing Bracket Replacement

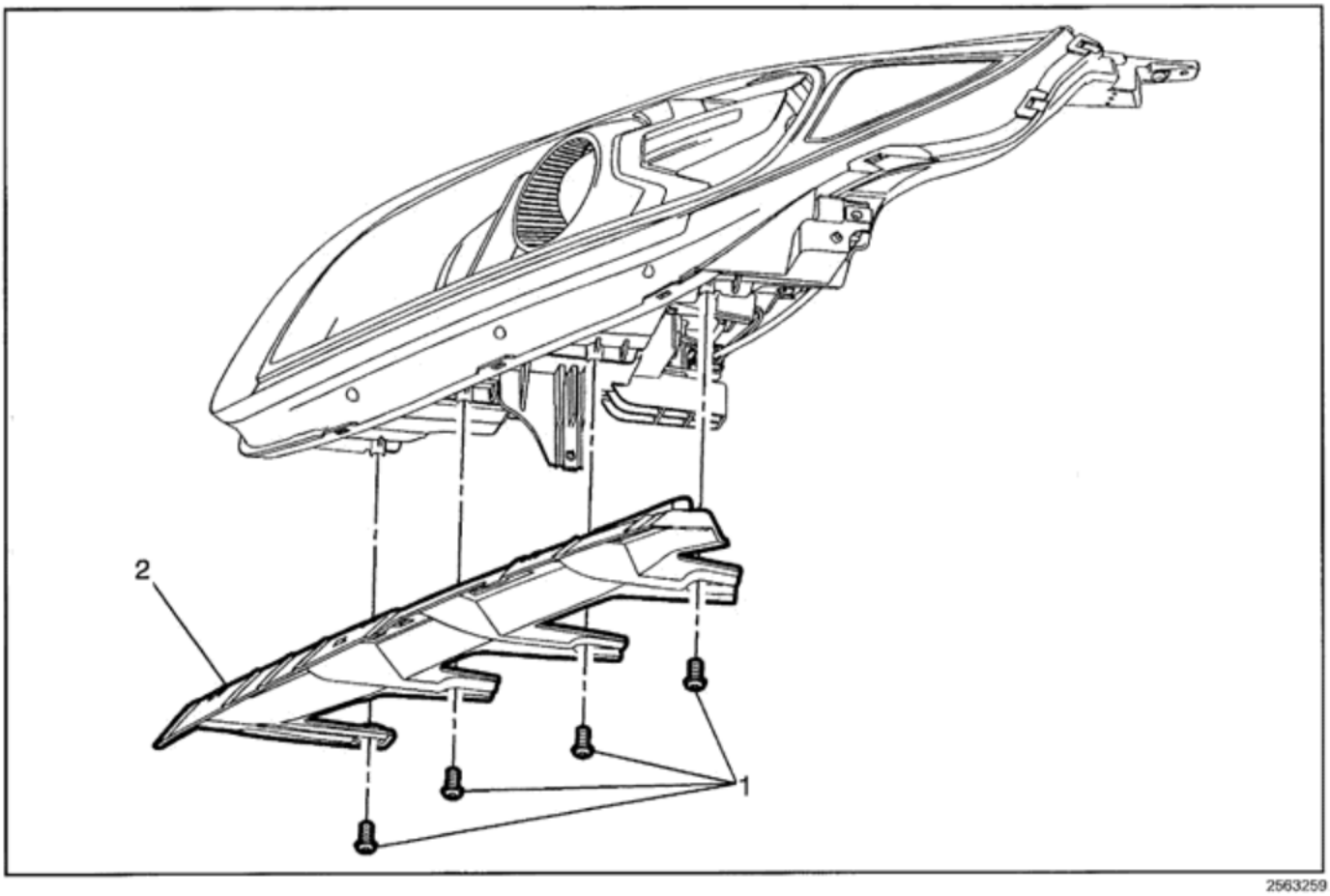


2495856

Headlamp Housing Bracket Replacement

Callout	Component Name
Preliminary Procedure Remove the front bumper fascia. Refer to *Front Bumper Fascia Replacement on page 3-55*.	
1	Headlamp Housing Bracket Screw (Qty: 2) **Caution:** Refer to *Fastener Caution on page 0-8*. **Tighten** 2.5 N•m (22 lb in)
2	Headlamp Housing Bracket **Procedure** Release the tabs on the housing bracket from the front bumper fascia and remove.

Headlamp Bracket Replacement



2563259

Headlamp Bracket Replacement

Callout	Component Name
Preliminary Procedure Remove the front bumper fascia. Refer to *Front Bumper Fascia Replacement on page 3-55.*	
1	Headlamp Bracket Screw (Qty: 4) **Caution:** Refer to *Fastener Caution on page 0-8.* **Tighten** 2.5 N•m (22 lb in)
2	Headlamp Bracket

Headlamp Aiming

Visual Aiming Preparation Procedure

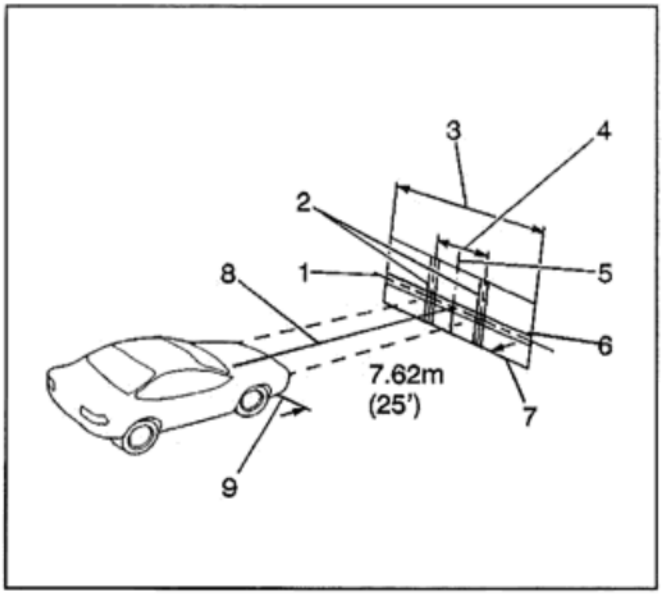
Note: Some state and local laws specify requirements for headlamp aim. Comply with all of these laws when performing any headlamp aiming operations.

Headlamp aim should be checked:

- When a new headlamp capsule is installed.
- If service or repairs to the front end area have, or may have, disturbed the headlamps or their mounting.

The aiming screen should meet the following criteria:

- The area will consist of a level surface large enough to allow for a vehicle and an additional 7.62 m (25 ft) measured from face of lamps to the front of the aiming screen.
- The screen will be 1.52 m (5 ft) high x 3.66 m (12 ft) wide with a matte white surface well shaded from extraneous light, and properly adjusted to the floor on which the vehicle stands. Provisions should be made to align the aiming screen parallel with the vehicle.
- The screen shall be provided with a fixed vertical centerline, two laterally adjustable vertical tapes, and one vertically adjustable horizontal tape.
- If a regular commercial aiming screen is not available, the screen may consist of a vertical wall having a clear uninterrupted area approximately 1.83 m (6 ft) high and 3.66 m (12 ft) wide. The surface should be finished with a washable non-gloss white paint.

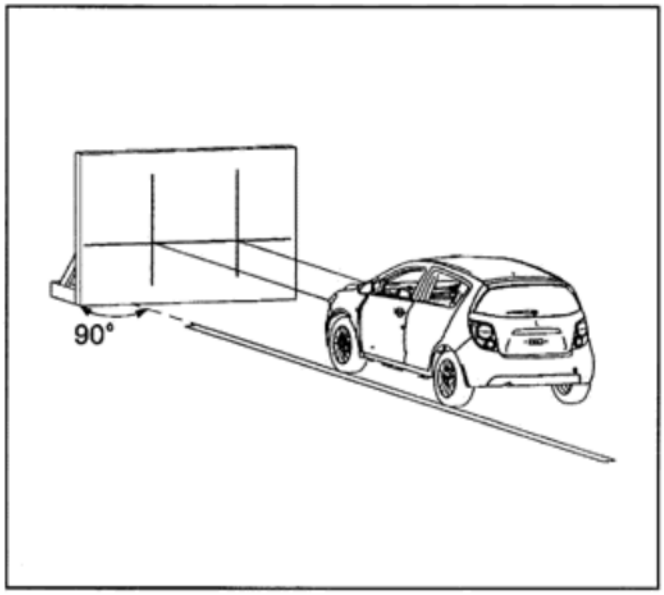


280087

- After the aiming screen has been set up in a permanent location, paint a reference line on the floor directly under the lens of the lamps to indicate the proper location of the headlamps when they are being aimed:
  - Distance between headlamps (1)
  - Center line of screen (2)
  - Adjustable vertical pointer (3)
  - Adjustable horizontal tape (4)
  - Diagram of light screen (5)
  - Vertical center line ahead of right headlamp pointer position (6)
  - 7.62 m (25 ft) (7)
  - Car axis (8)
  - Adjustable vertical pointer
  - Horizontal center line of lamps
  - Vertical center line ahead of left headlamp

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

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

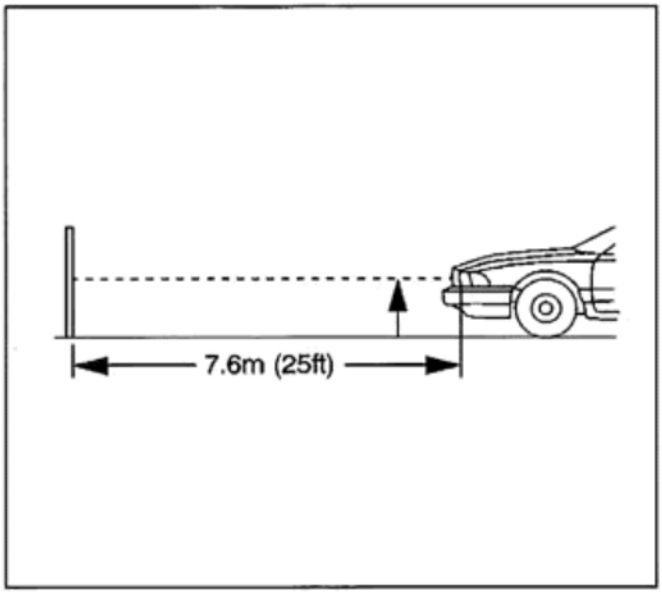


2505631

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

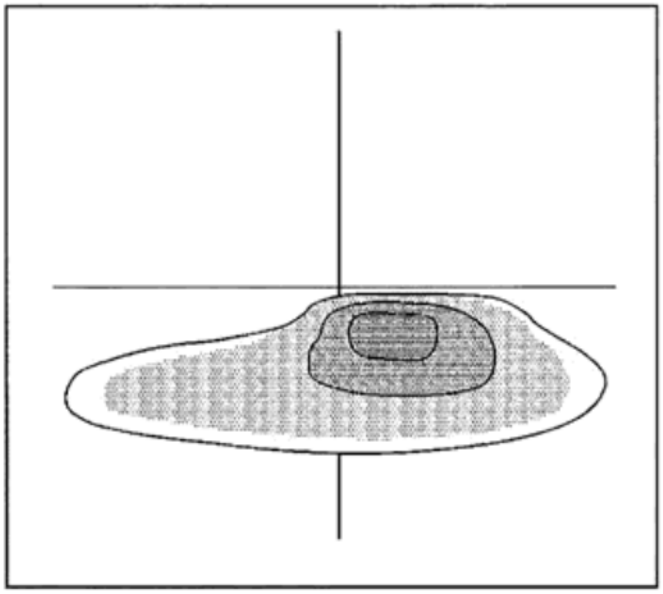
Headlamp Aiming Procedure

1. Open the hood.



418400

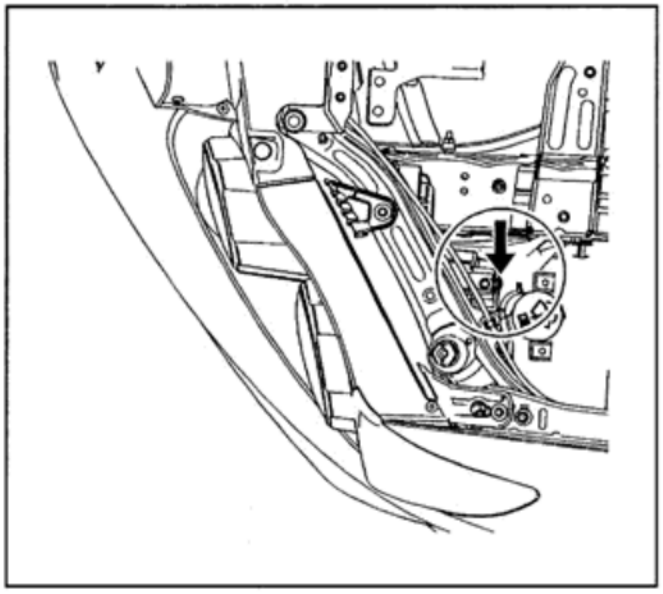
2. Measure from the floor to the center of the headlamp bulb. Some headlamps have an aim dot marked on the headlamp lens.
3. At the screen, measure from the floor and place the horizontal tape at the measured distance.
4. Measure from the reference line on the floor to the left headlamp bulb centerline.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



476831

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

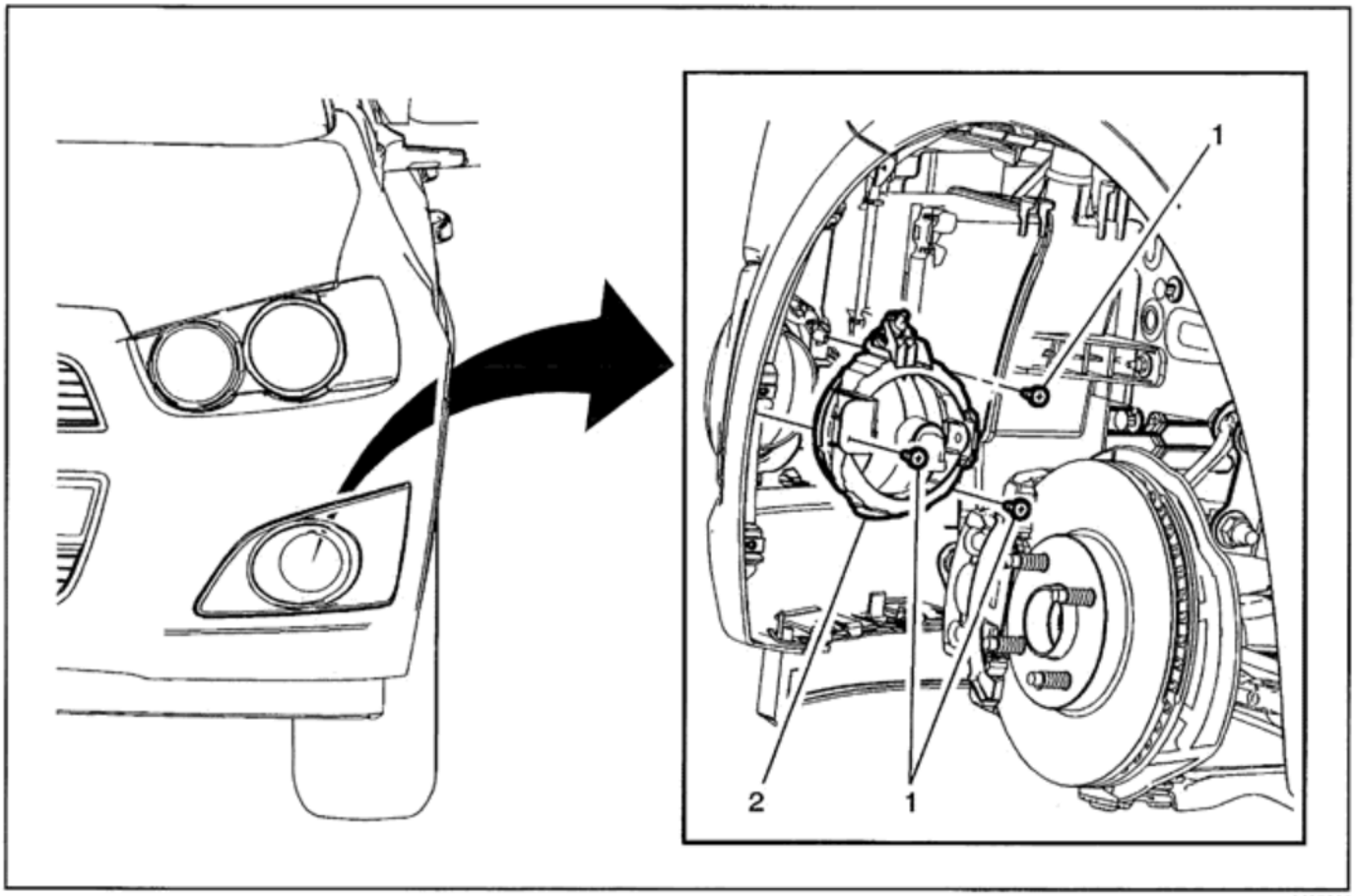
8. Turn ON the low beam headlamps. Block the light from projecting onto the screen from the passenger side headlamp.



2506058

9. Adjust the vertical aim screw (as shown by the arrow) of the headlamps to the specifications required by the state and the local authorities, or as shown in step number 8.
10. Repeat the aiming procedure for the passenger side headlamp while blocking the light from projecting onto the screen from the driver side headlamp.
11. Turn the headlamps OFF.
12. Close the hood.

Front Fog Lamp Replacement

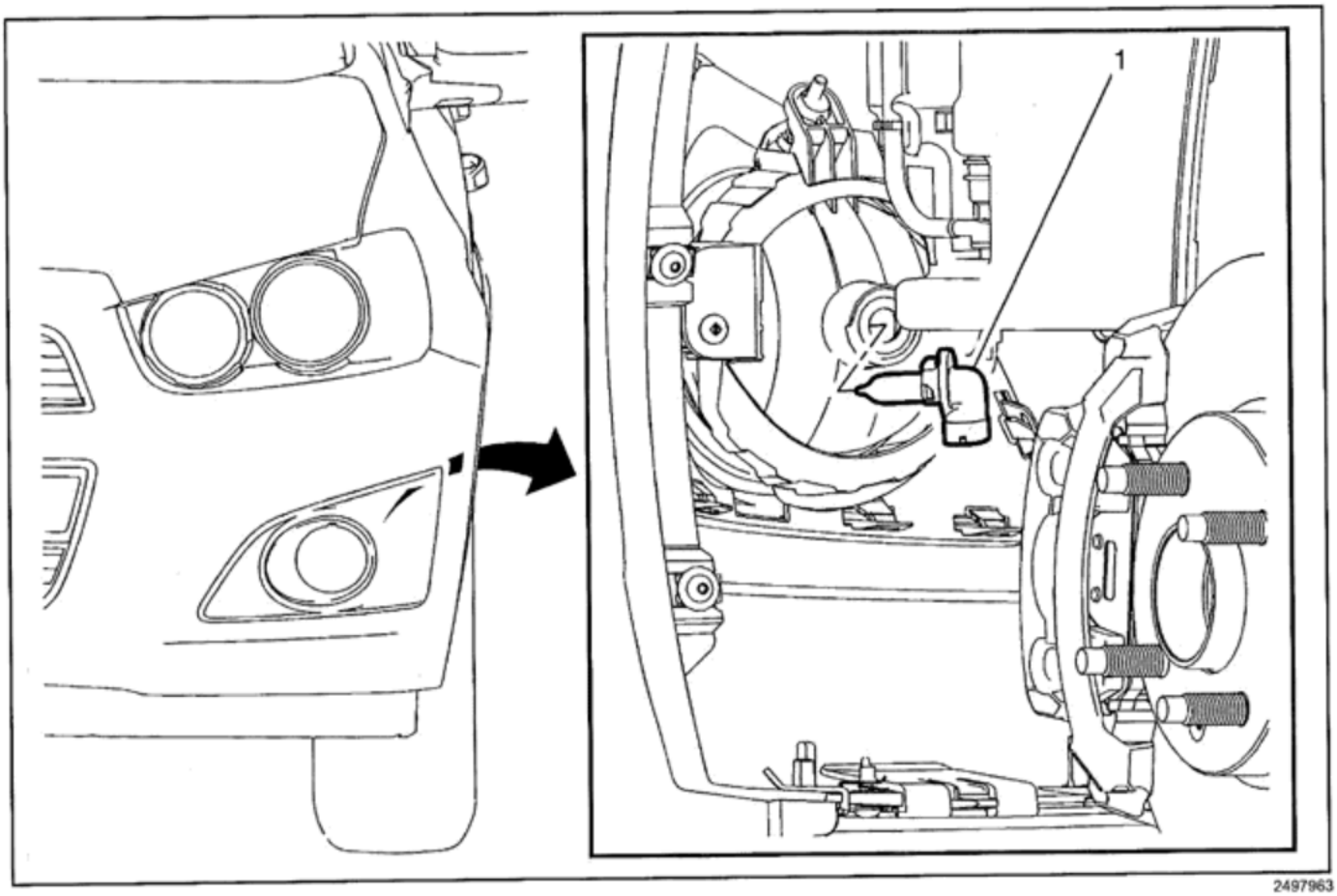


2497962

Front Fog Lamp Replacement

Callout	Component Name
Preliminary Procedure 1. Remove either the right front or left front wheelhouse liner. Refer to *Front Wheelhouse Liner Replacement (Rear) on page 3-151* or *Front Wheelhouse Liner Replacement (Front) on page 3-150*. 2. Disconnect the electrical connector from the fog lamp bulb socket.	
1	Front Fog Lamp Screw (Qty: 3) **Caution:** Refer to *Fastener Caution on page 0-8*. Remove the three fog lamp mounting screws from the front bumper fascia.
2	Front Fog Lamp **Procedure** Aim the front fog lamps after replacement. Refer to *Fog Lamp Aiming on page 4-202*.

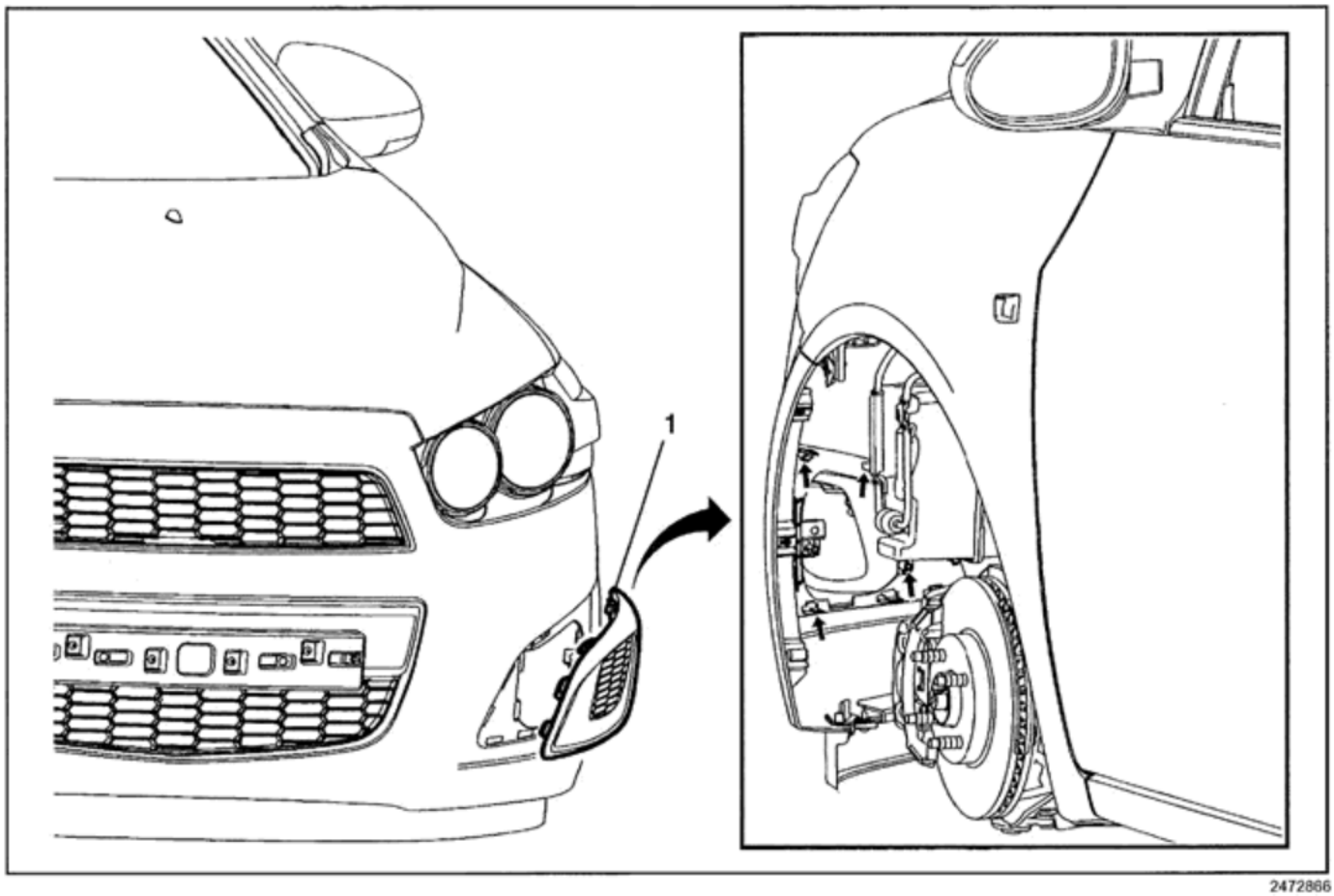
Front Fog Lamp Bulb Replacement



Front Fog Lamp Bulb Replacement

Callout	Component Name
Preliminary Procedure 1. Remove either the left front or right front wheelhouse liner. Refer to *Front Wheelhouse Liner Replacement (Rear) on page 3-151* or *Front Wheelhouse Liner Replacement (Front) on page 3-150*. 2. Disconnect the electrical connector to the fog lamp bulb.	
1	Front Fog Lamp Bulb ***Warning: Refer to Halogen Bulb Warning on page 0-5.*** **Procedure** Turn the fog lamp bulb socket counter-clockwise and remove from the fog lamp housing.

Front Fog Lamp Cover Replacement (Without T3U)



2472866

Front Fog Lamp Cover Replacement (Without T3U)

Callout	Component Name
Preliminary Procedure Remove the front wheelhouse liner. Refer to *Front Wheelhouse Liner Replacement (Rear) on page 3-151* or *Front Wheelhouse Liner Replacement (Front) on page 3-150*.	
1	Front Fog Lamp Front Cover **Procedure** Release the tabs securing the front fog lamp front cover to the front bumper fascia and remove.

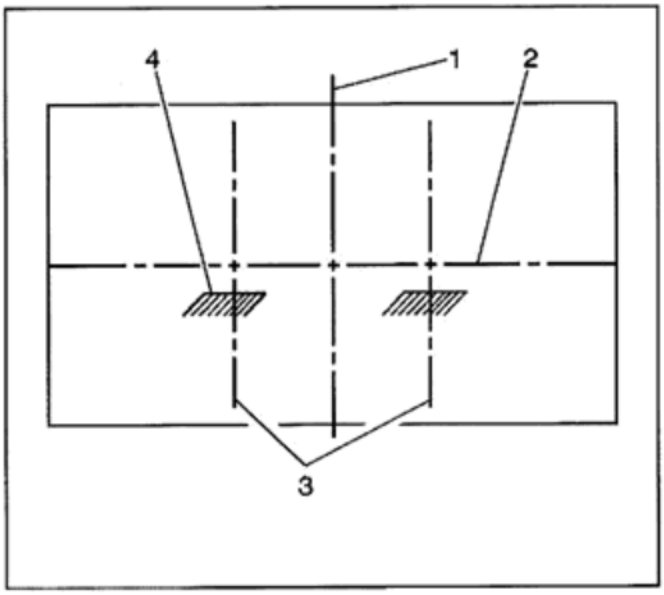
Fog Lamp Aiming

Preparation Procedure

Note: Horizontal aim is not adjustable on this vehicle. Vertical aim is done by an adjusting nut located on the rear of the fog lamp. Prior to aiming the fog lamps, perform the following steps:

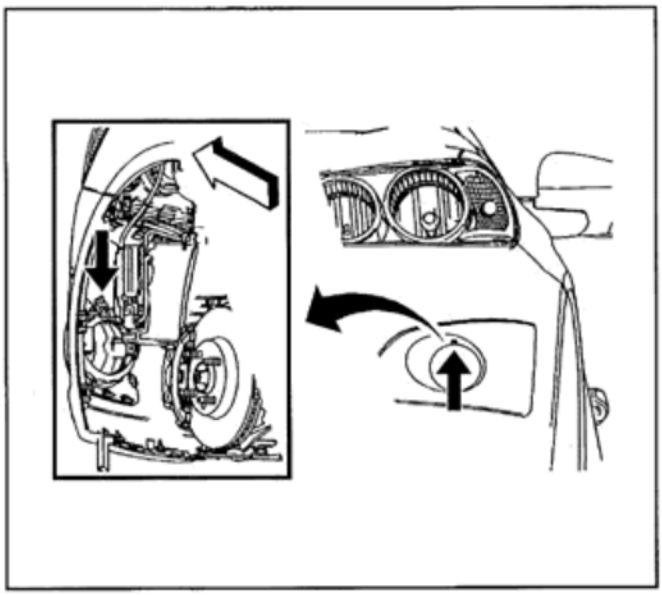
1. Completely assemble all of the components on the vehicle.
2. Place the vehicle on a level surface.
3. Stop all unnecessary operations or work that could affect the ride height of the vehicle.
4. Close the doors and verify that the luggage compartment is empty.
5. Stabilize the suspension by rocking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

Aiming Procedure



276650

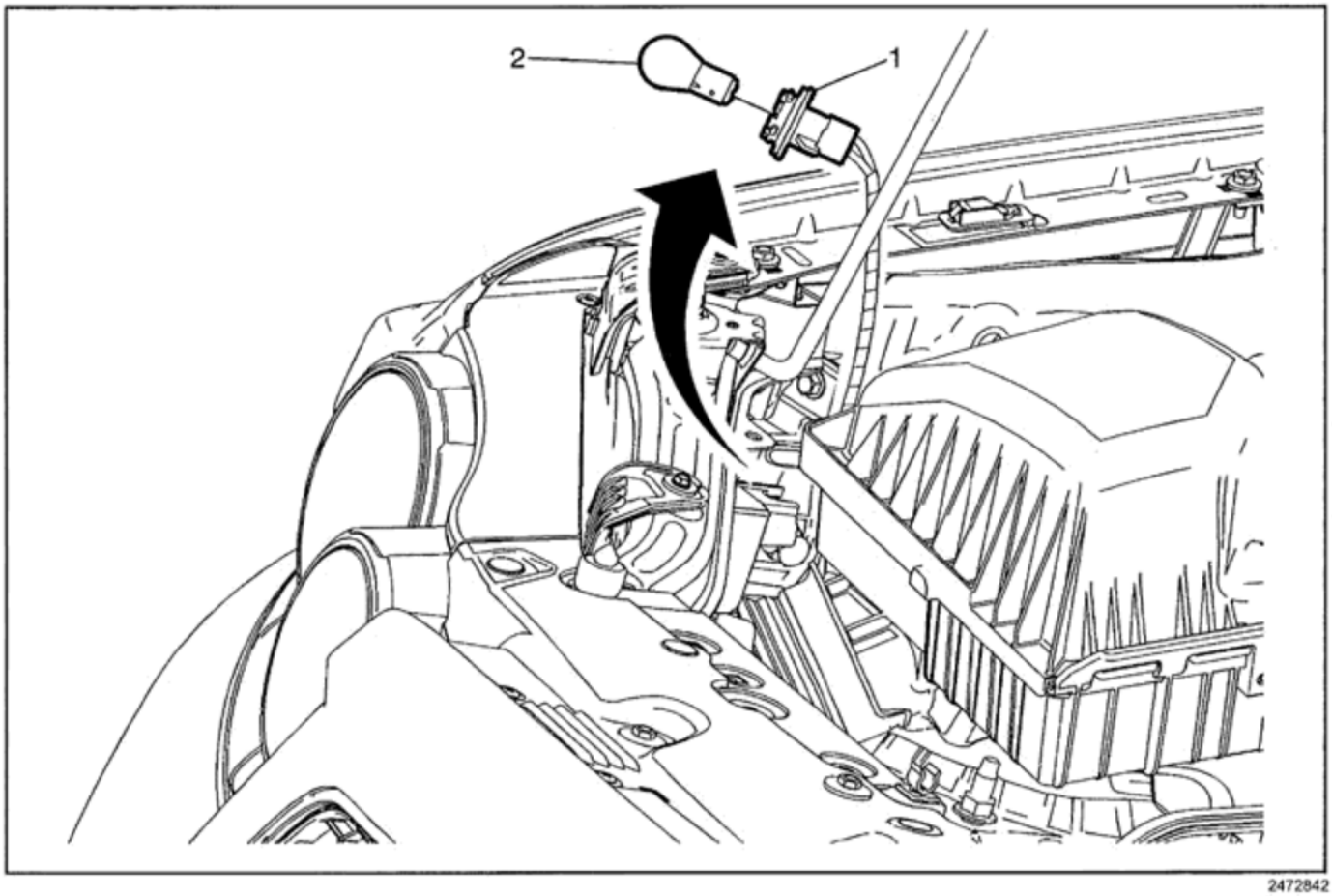
1. Park the vehicle 7.6 m (25 ft) away from the target screen.
2. Measure from the center of the fog lamp to the ground line. Using this measurement, mark the horizontal centerline (2) of the fog lamp on the target screen directly in front of the vehicle.
3. Turn ON the fog lamps. The top of the fog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



2502532

4. Adjust the fog lamp as required using the adjusting screw above the projector lens on the outside of the front bumper fascia.
5. Turn OFF the fog lamps.

Parking and Turn Signal Lamp Bulb Replacement

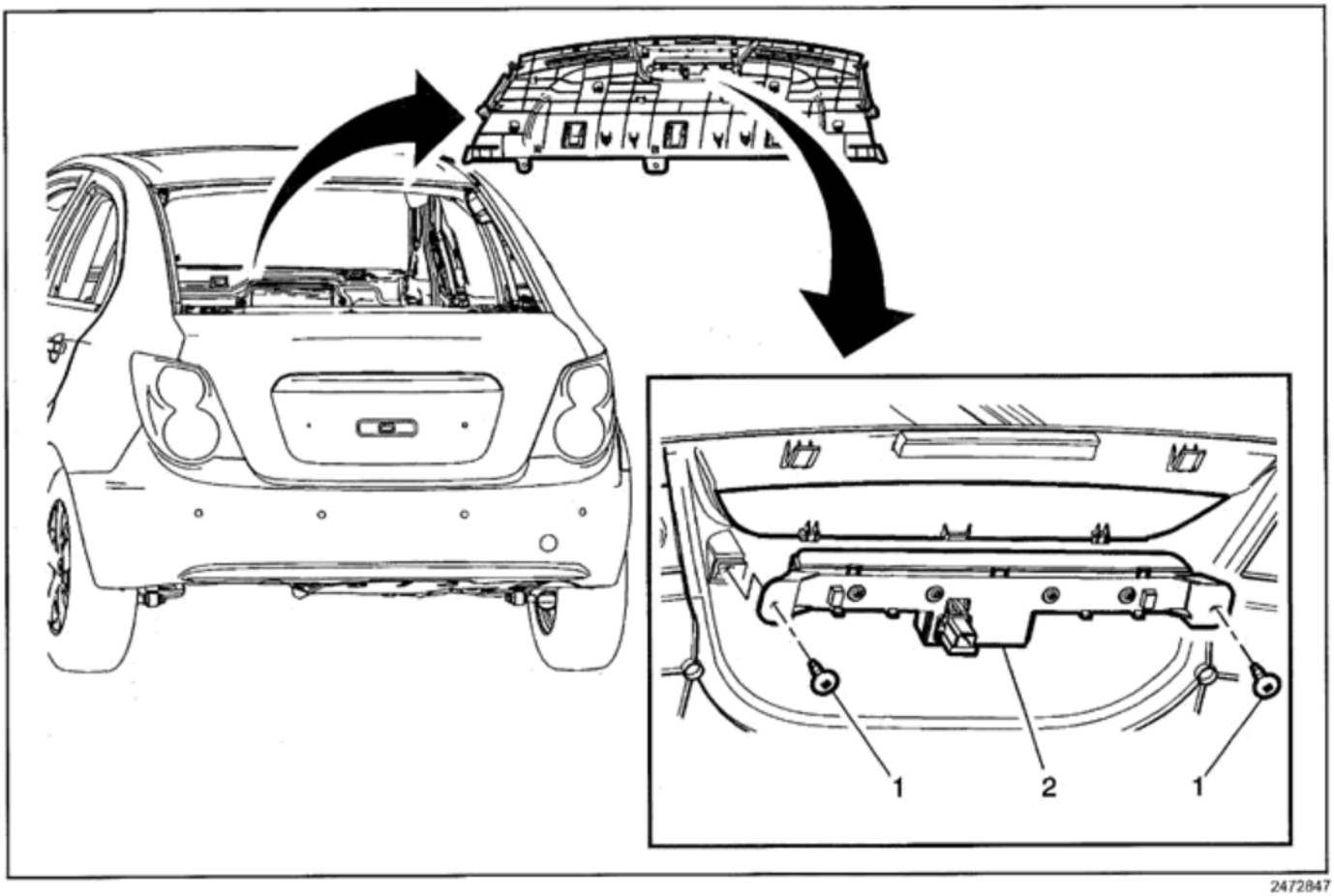


2472842

Parking and Turn Signal Lamp Bulb Replacement

Callout	Component Name
Preliminary Procedures 1. Open and support the hood assembly. 2. Reposition the air cleaner inlet duct on the passenger side of the engine compartment. 3. Remove the low beam accessory bulb cover in order to access the front parking and turn signal lamp bulb socket.	
1	Parking and Turn Signal Lamp Bulb Socket **Procedure** Rotate the bulb socket counter-clockwise and remove from the headlamp housing.
2	Parking and Turn Signal Lamp Bulb **Procedure** Push inward and rotate the parking and turn signal bulb counter-clockwise in order to remove.

High Mount Stop Lamp Replacement (Sedan)

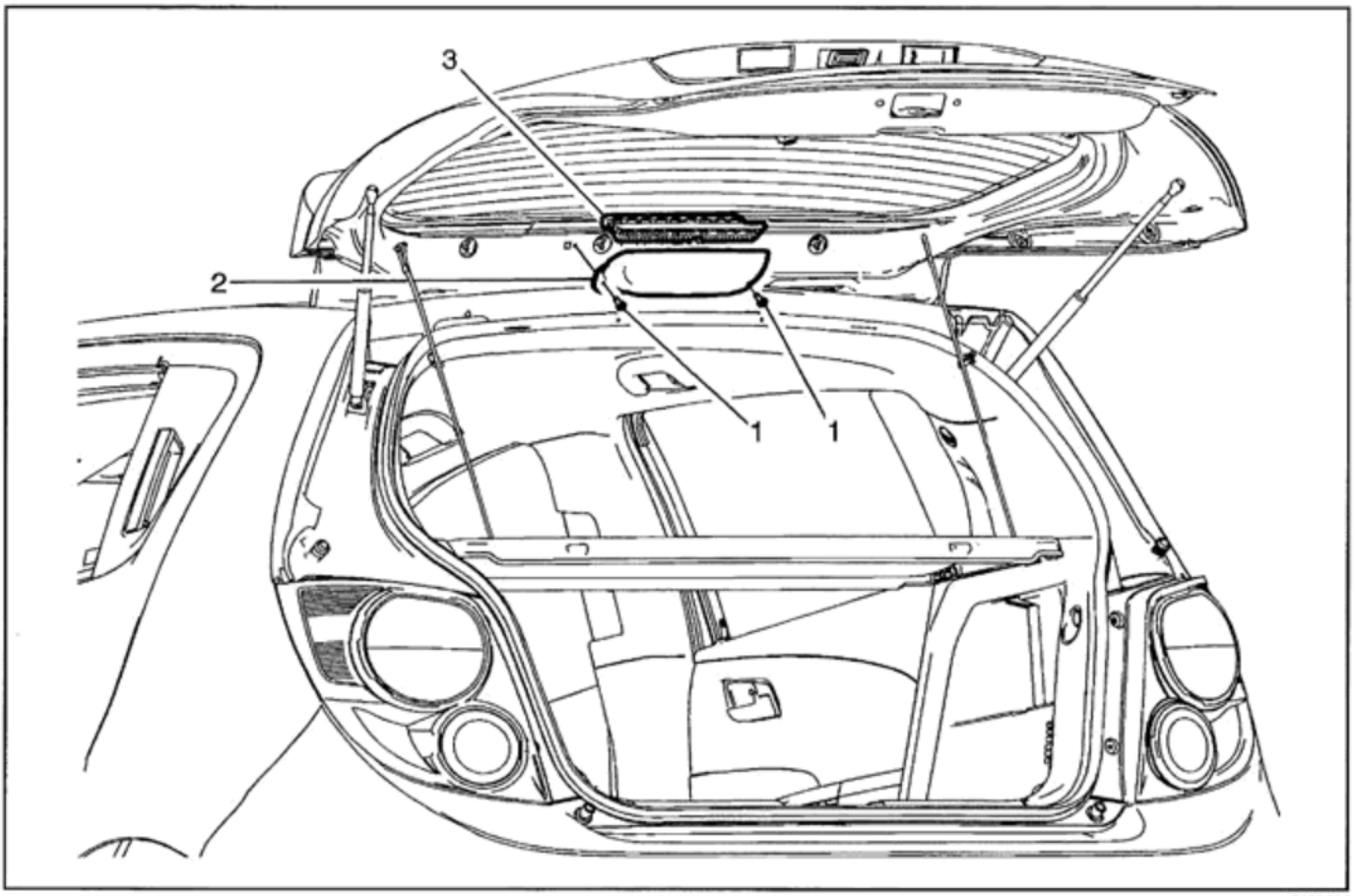


2472847

High Mount Stop Lamp Replacement (Sedan)

Callout	Component Name
Preliminary Procedure 1. Remove the rear window panel trim. Refer to *Rear Window Panel Trim Replacement on page 2-81*. 2. Place the rear window panel trim face down on a clean protected surface to access and remove the high mount stop lamp screws.	
1	High Mount Stop Lamp Screw (Qty: 2) **Caution:** Refer to *Fastener Caution on page 0-8*.
2	High Mount Stop Lamp **Tip:** The high mount stop lamp is (LED) Light Emitting Diode and is serviced as an assembly.

High Mount Stop Lamp Replacement (Hatchback)

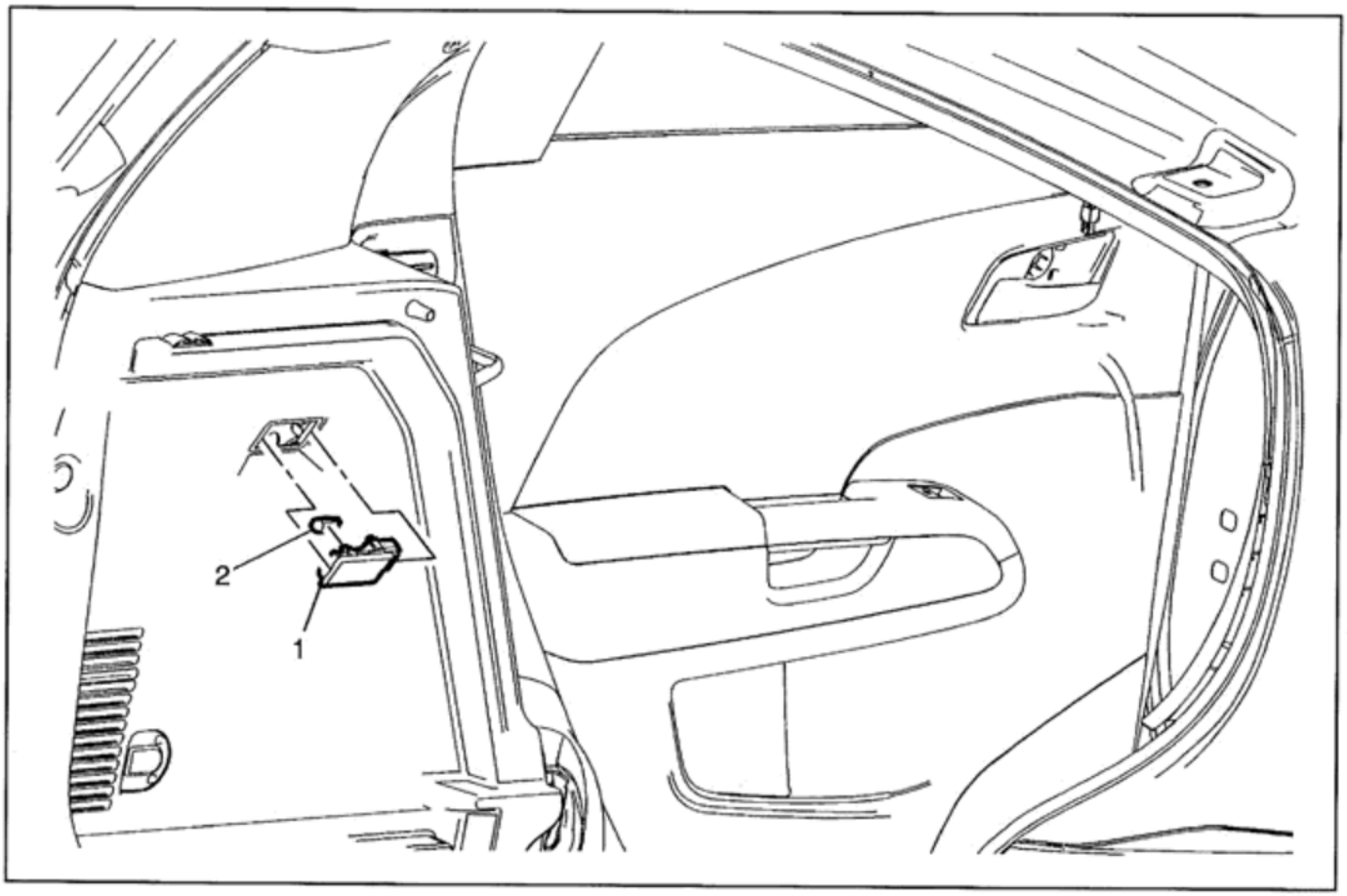


2498830

High Mount Stop Lamp Replacement (Hatchback)

Callout	Component Name
Preliminary Procedure Open and support the liftgate assembly.	
1	High Mount Stop Lamp Bolt (Qty: 2) **Caution:** Refer to *Fastener Caution on page 0-8*. **Tighten** 2.5 N•m (22 lb in)
2	High Mount Stop Lamp Cover **Procedure** Remove the cover and the four screws from the high mount stop lamp.
3	High Mount Stop Lamp Assembly **Procedure** Release the electrical connector and (LED) Light Emitted Diode lamp from the cover.

Cargo Center Courtesy Lamp Bulb Replacement (Hatchback)

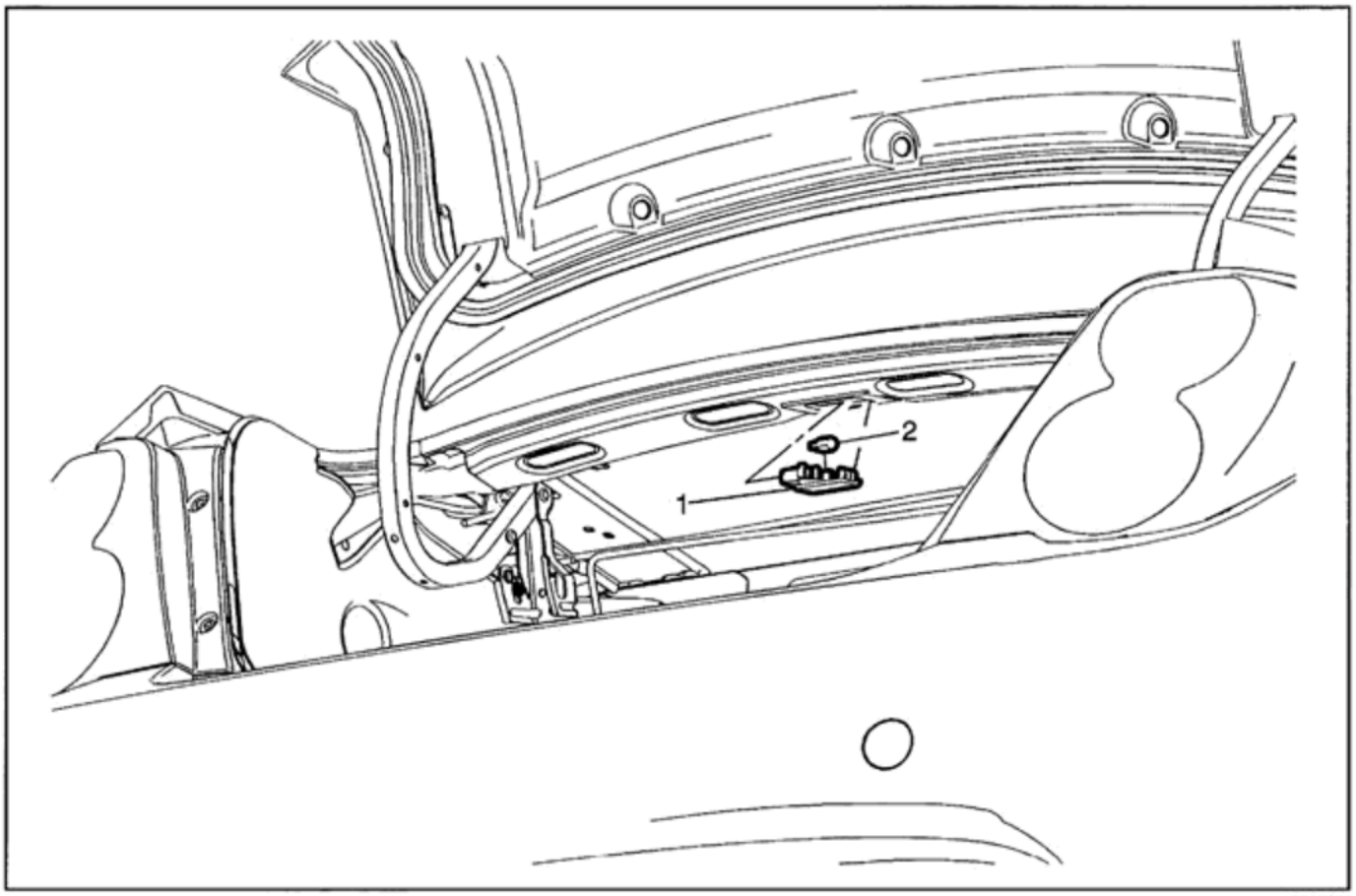


2496812

Cargo Center Courtesy Lamp Bulb Replacement (Hatchback)

Callout	Component Name
1	Rear Compartment Courtesy Lamp Refer to *Rear Compartment Courtesy Lamp Replacement (Hatchback) on page 4-216* or *Rear Compartment Courtesy Lamp Replacement (Sedan) on page 4-217*
2	Cargo Lamp Bulb

Cargo Center Courtesy Lamp Bulb Replacement (Sedan)

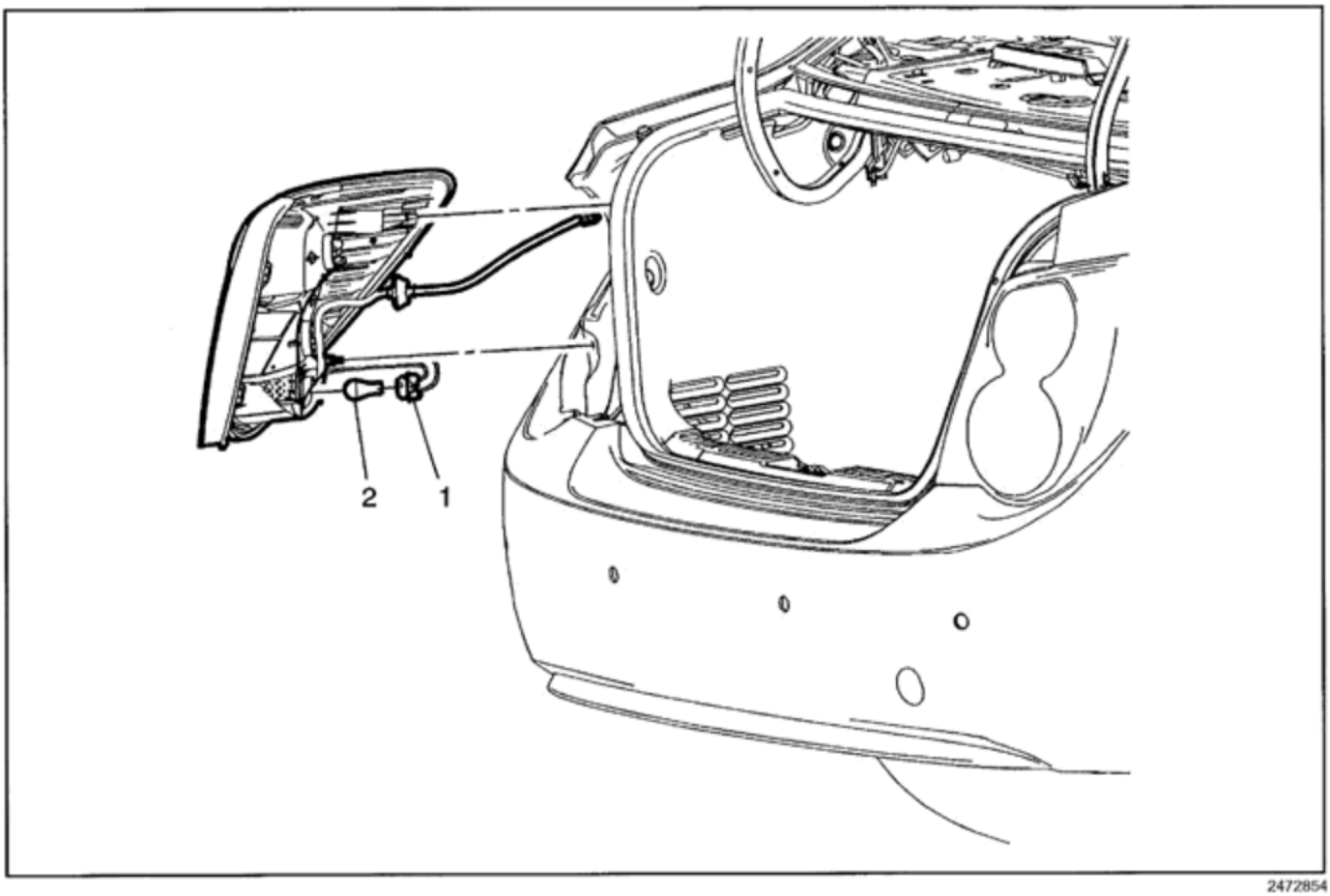


2507472

Cargo Center Courtesy Lamp Bulb Replacement (Sedan)

Callout	Component Name
1	Rear Compartment Courtesy Lamp Refer to *Rear Compartment Courtesy Lamp Replacement (Hatchback) on page 4-216* or *Rear Compartment Courtesy Lamp Replacement (Sedan) on page 4-217*
2	Cargo Lamp Bulb

Backup Lamp Bulb Replacement (Sedan)

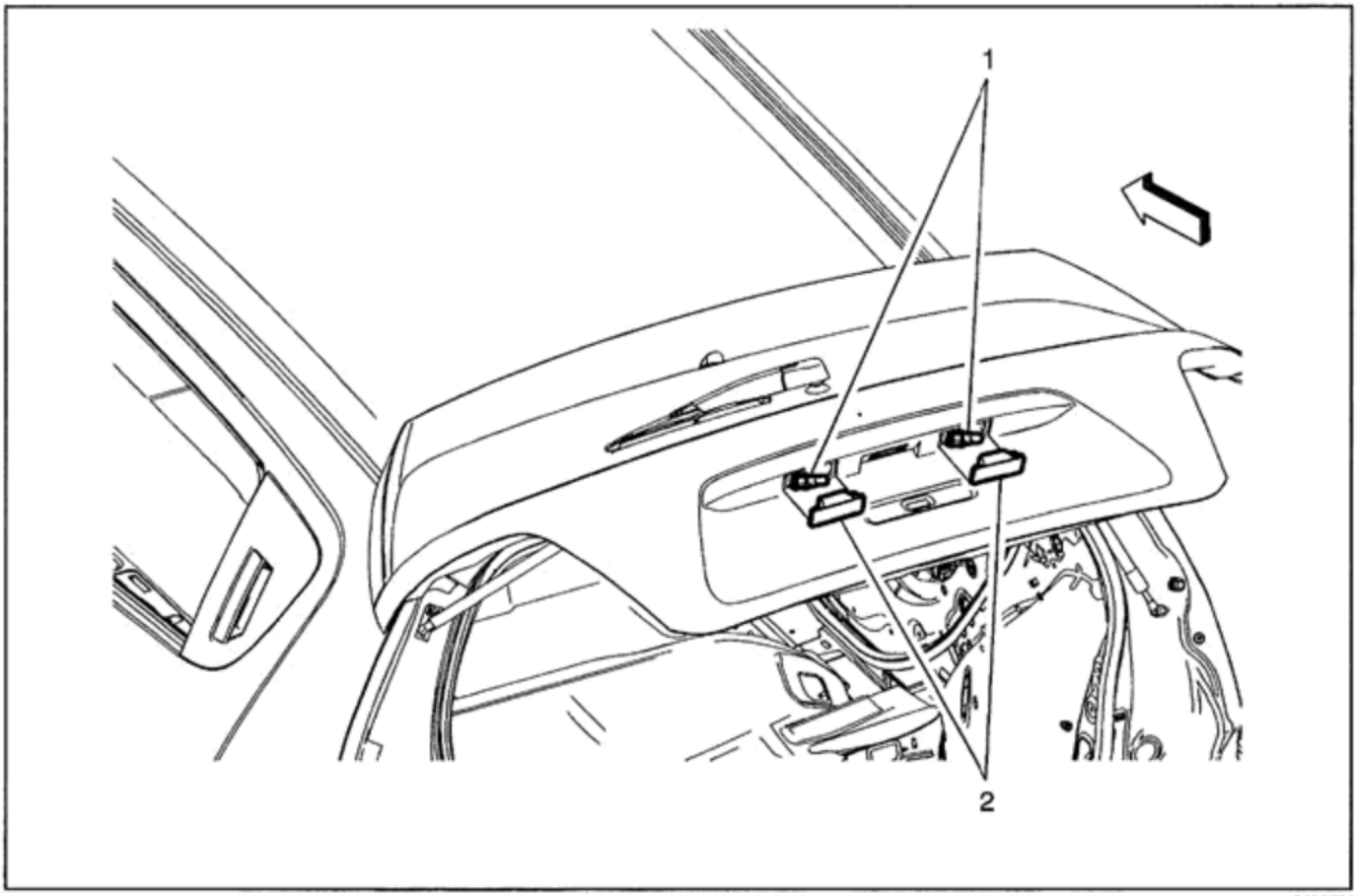


2472854

Backup Lamp Bulb Replacement (Sedan)

Callout	Component Name
Preliminary Procedure Remove the tail lamp assembly. Refer to *Tail Lamp Replacement (Hatchback) on page 4-214* or *Tail Lamp Replacement (Sedan) on page 4-213*.	
1	Back Up Lamp Bulb Socket **Procedure** Rotate the back up lamp bulb socket counter-clockwise and remove from the tail lamp housing.
2	Back Up Lamp Bulb **Procedure** Push inward while rotating counter-clockwise on the bulb and remove from the lamp socket.

Rear License Plate Lamp Replacement (Hatchback)

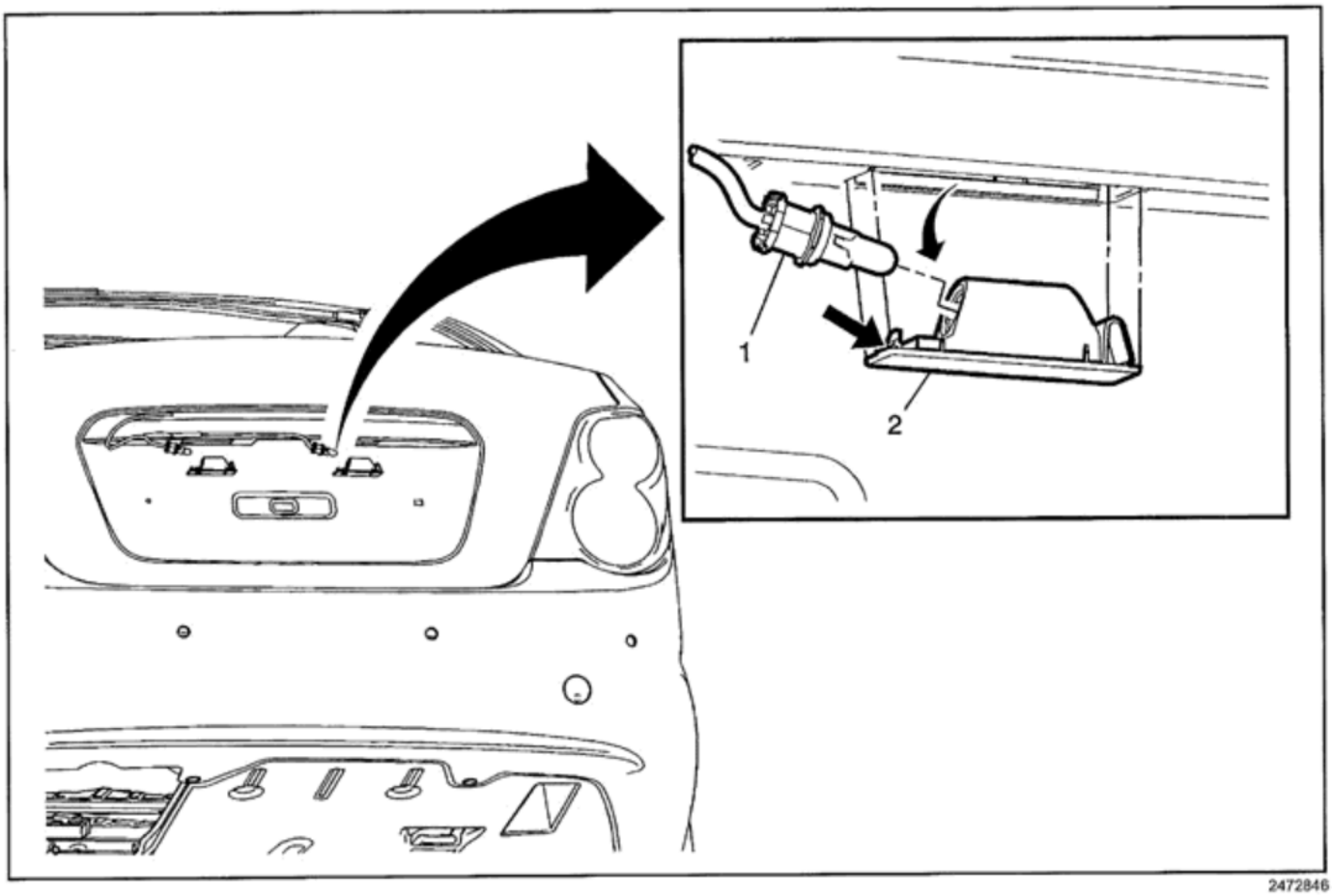


2489521

Rear License Plate Lamp Replacement (Hatchback)

Callout	Component Name
Preliminary Procedure 1. Open and support the lift gate assembly. 2. At the left side of the lamp, insert a small flat-blade into the lamp housing edge and push slightly sideways to disengage the lamp housing from the rear applique. 3. Pull and rotate the housing downward far enough to remove and access the lamp socket and electrical harness.	
1	Rear License Plate Lamp Socket **Procedure** Rotate the lamp socket counter-clockwise and remove from the lamp housing.
2	Rear License Plate Lamp

Rear License Plate Lamp Replacement (Sedan)

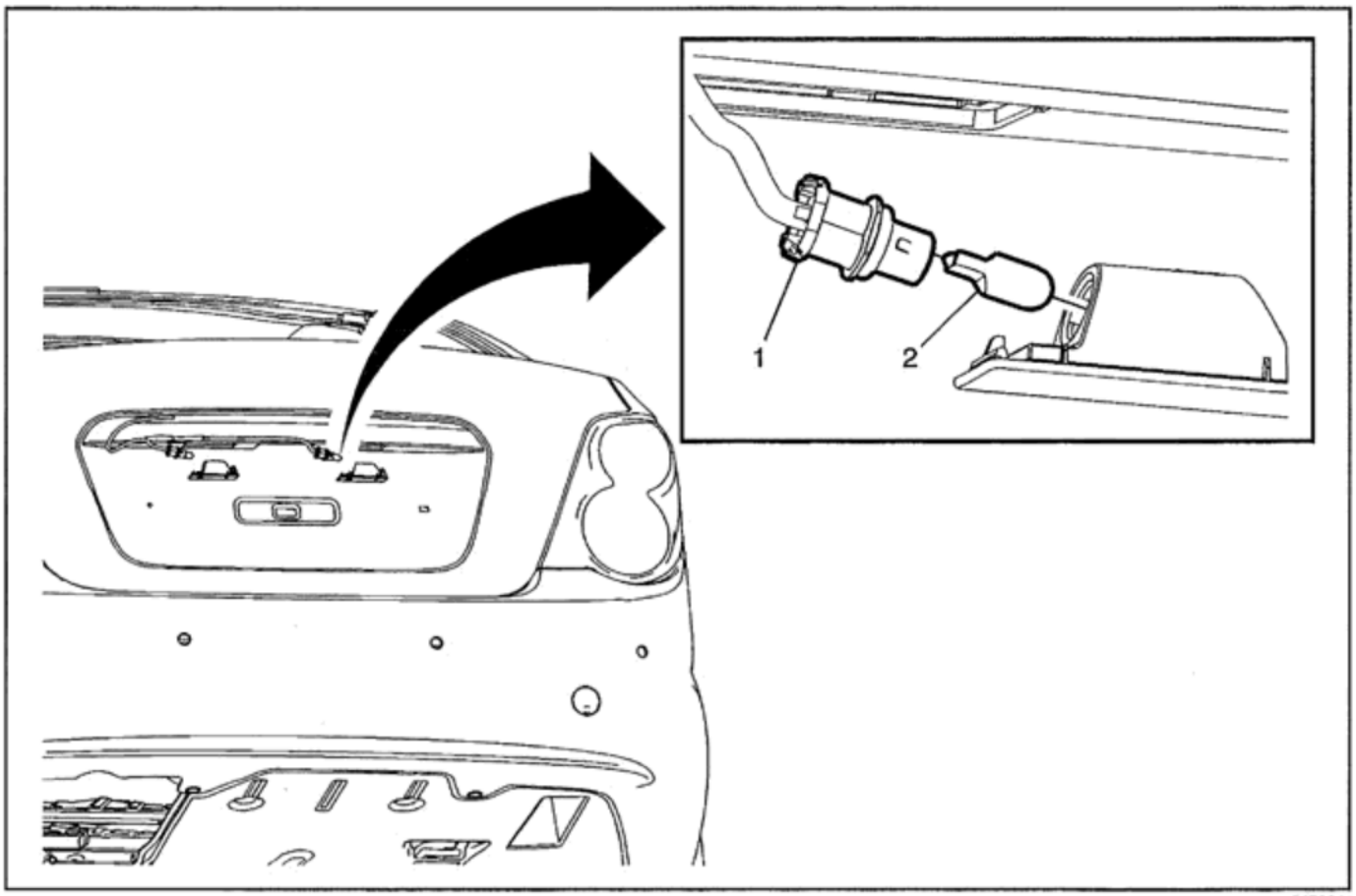


2472846

Rear License Plate Lamp Replacement (Sedan)

Callout	Component Name
Preliminary Procedure 1. Insert a small flat-blade at the arrow location at the lamp housing edge. 2. Push inward slightly and rotate downward. 3. Pull the housing down far enough to access the lamp socket and electrical harness.	
1	Rear License Plate Lamp Socket **Procedure** Rotate the lamp socket a quarter turn and remove.
2	Rear License Plate Lamp

Rear License Plate Lamp Bulb Replacement (Sedan)

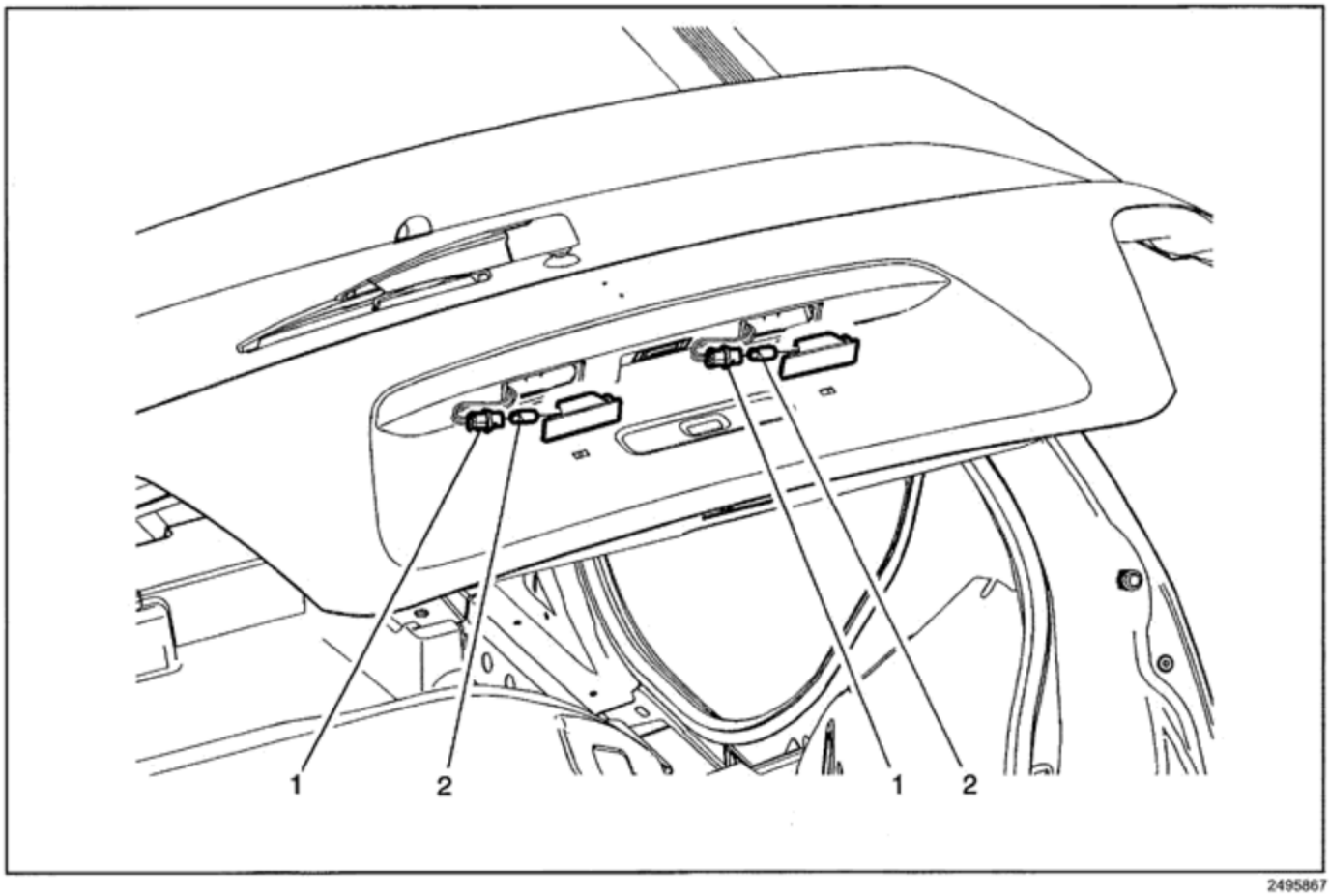


2472844

Rear License Plate Lamp Bulb Replacement (Sedan)

Callout	Component Name
Preliminary Procedure Remove the rear license plate lamp housing. Refer to *Rear License Plate Lamp Replacement (Sedan) on page 4-210* or *Rear License Plate Lamp Replacement (Hatchback) on page 4-209*.	
1	License Plate Lamp Socket
2	License Plate Lamp Bulb **Tip:** Pull the bulb straight out of the lamp socket.

Rear License Plate Lamp Bulb Replacement (Hatchback)

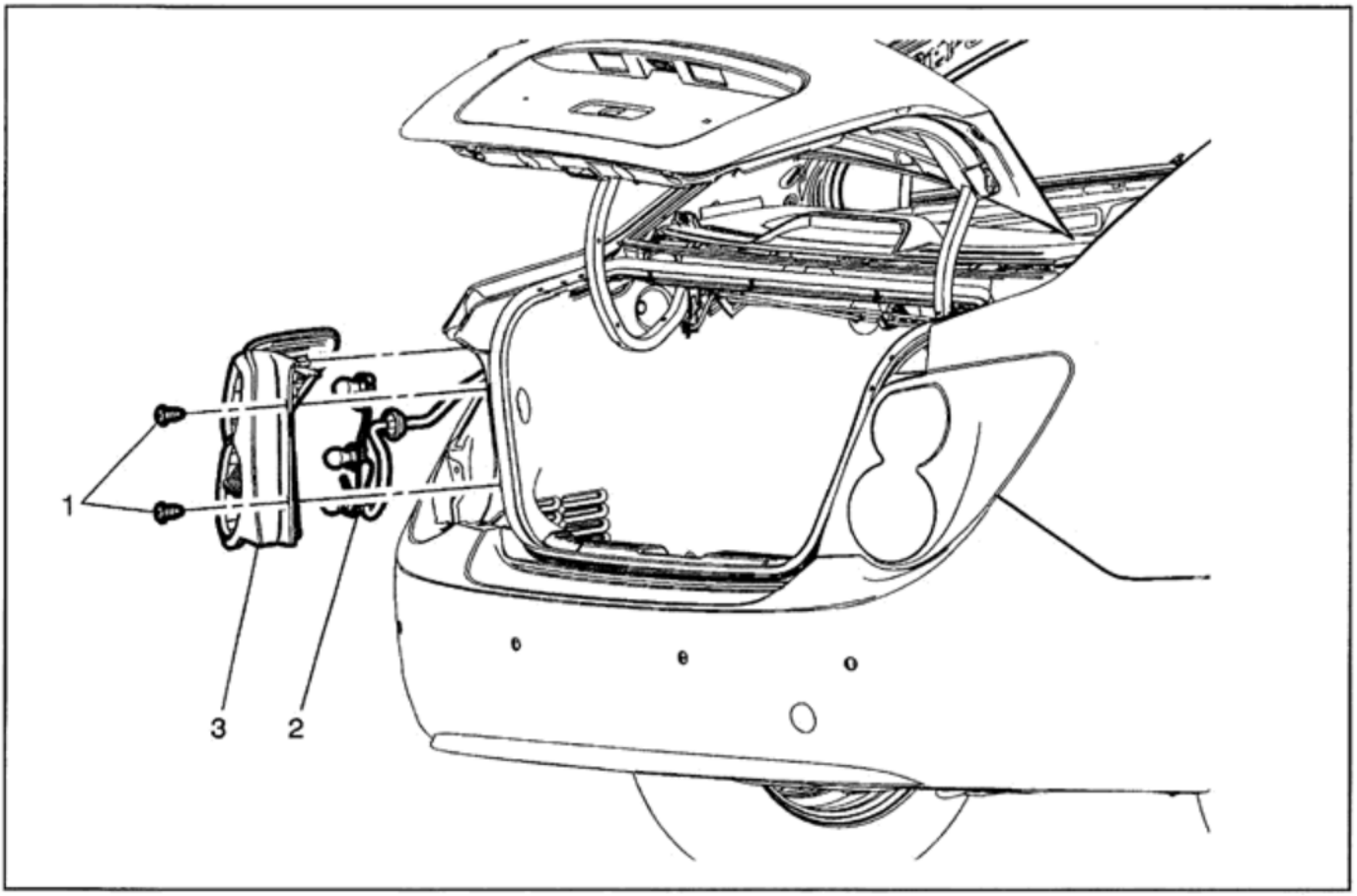


2495867

Rear License Plate Lamp Bulb Replacement (Hatchback)

Callout	Component Name
Preliminary Procedure Remove the rear license plate lamp housing. Refer to *Rear License Plate Lamp Replacement (Sedan) on page 4-210* or *Rear License Plate Lamp Replacement (Hatchback) on page 4-209*.	
1	License Plate Lamp Socket **Procedure** Rotate the electrical lamp socket a quarter turn counter-clockwise and remove from the lamp housing.
2	License Plate Lamp Bulb **Procedure** Pull the bulb straight out of the electrical lamp socket.

Tail Lamp Replacement (Sedan)

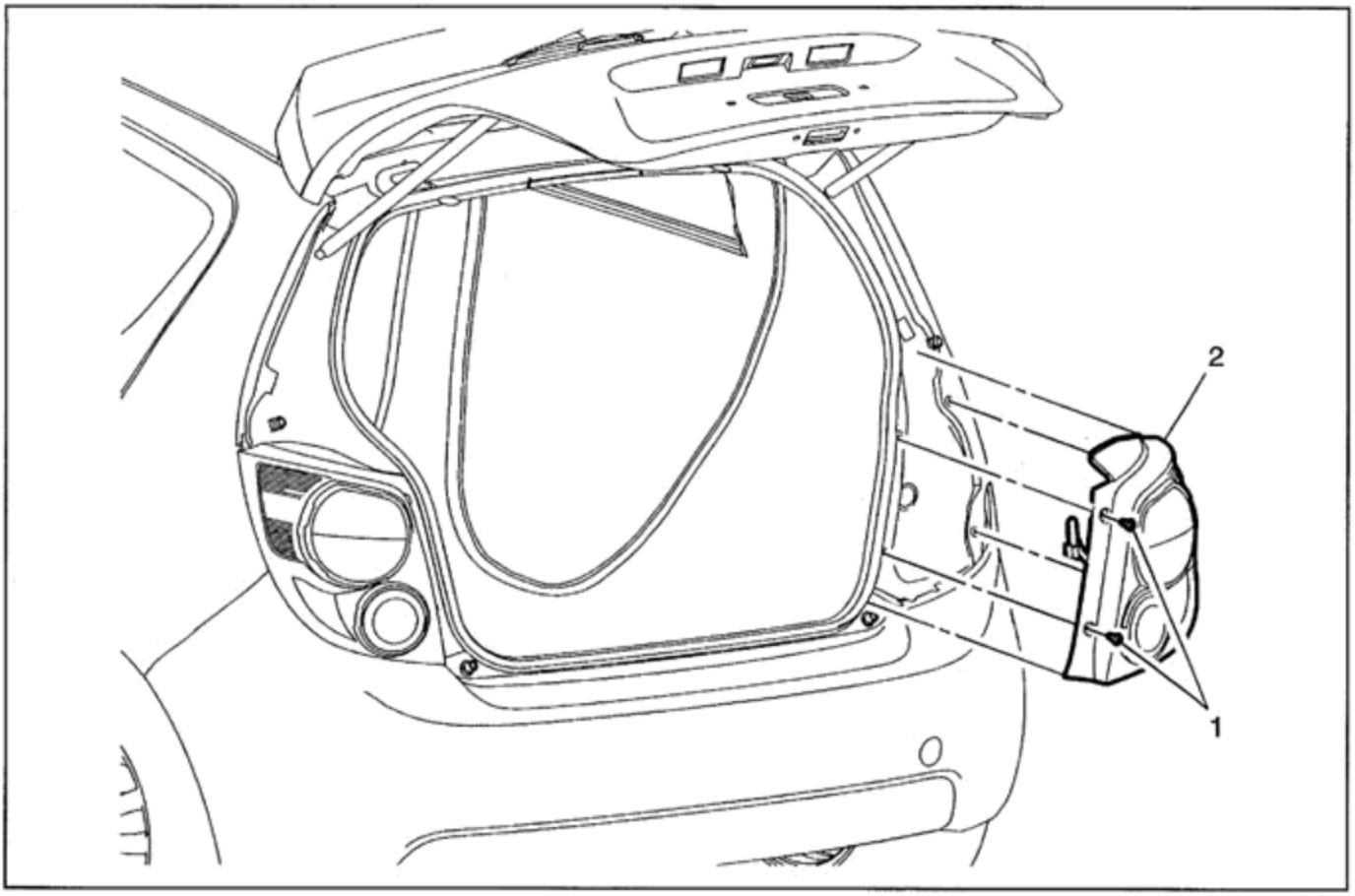


2486673

Tail Lamp Replacement (Sedan)

Callout	Component Name
Preliminary Procedure Open and secure the rear compartment lid.	
1	Tail Lamp Bolt/Screw (Qty: 2) **Caution:** Refer to *Fastener Caution on page 0-8.* **Tighten** 2.5N•m (22 lb in)
2	Tail Lamp Electrical Harness **Procedure** Remove all three tail lamp bulb sockets with bulbs.
3	Tail Lamp

Tail Lamp Replacement (Hatchback)

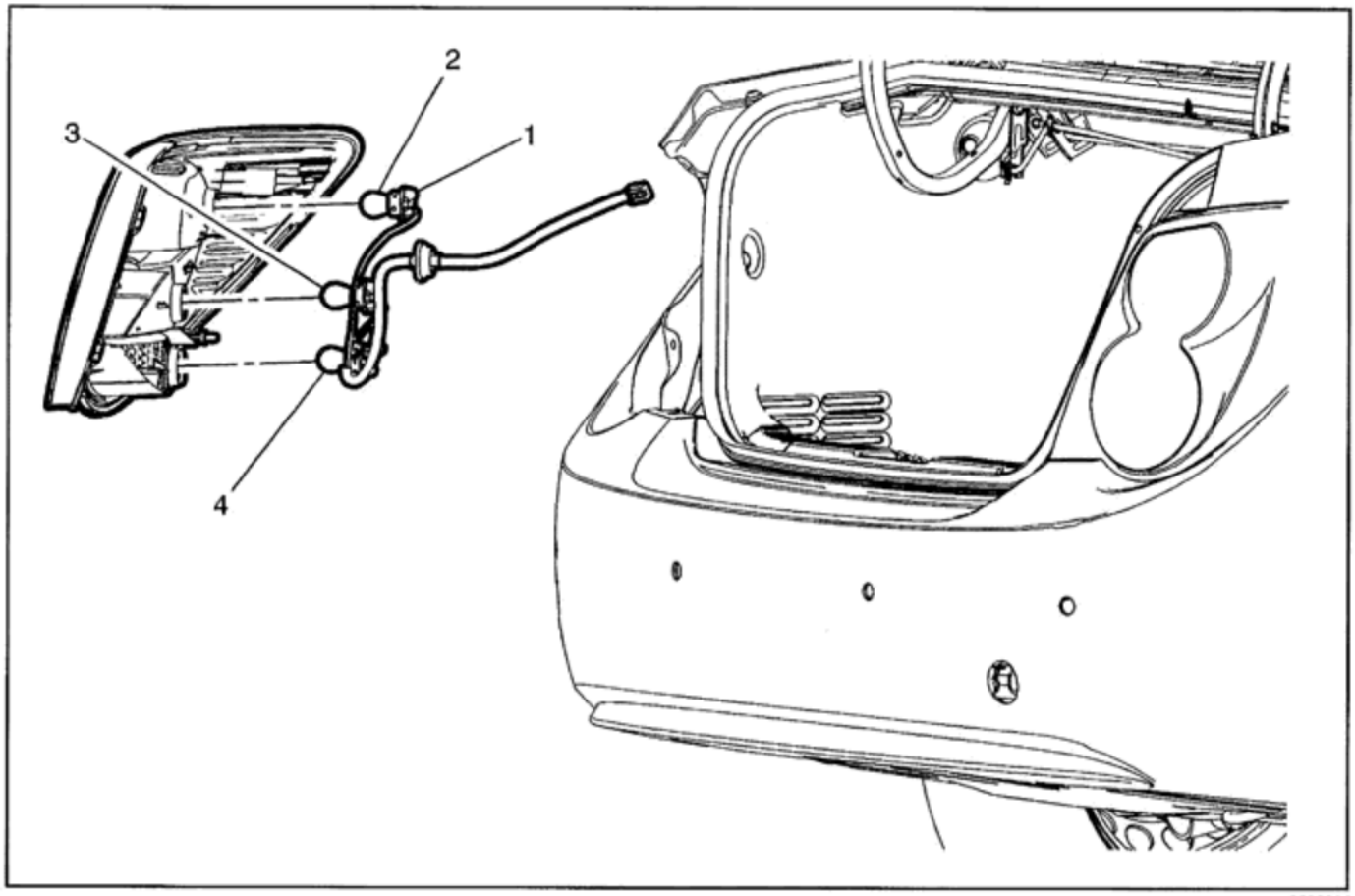


2489525

Tail Lamp Replacement (Hatchback)

Callout	Component Name
Preliminary Procedure Open and support the liftgate assembly.	
1	Tail Lamp Bolt/Screw (Qty: 2) **Caution:** Refer to *Fastener Caution on page 0-8*. **Tighten** 2.5N•m (22 lb in)
2	Tail Lamp Assembly **Procedure** 1. Hold both sides of the tail lamp assembly and give a quick pull rearward in order to disengage the two locator pins from the bodyside outer panel. 2. Rotate all three bulb sockets and remove from the tail lamp housing, being careful not to damage the exposed bulbs. 3. Disengage the tail lamp bulb electrical harness from the retainer clips on the tail lamp housing.

Stop and Turn Signal Lamp Bulb Replacement (Sedan)

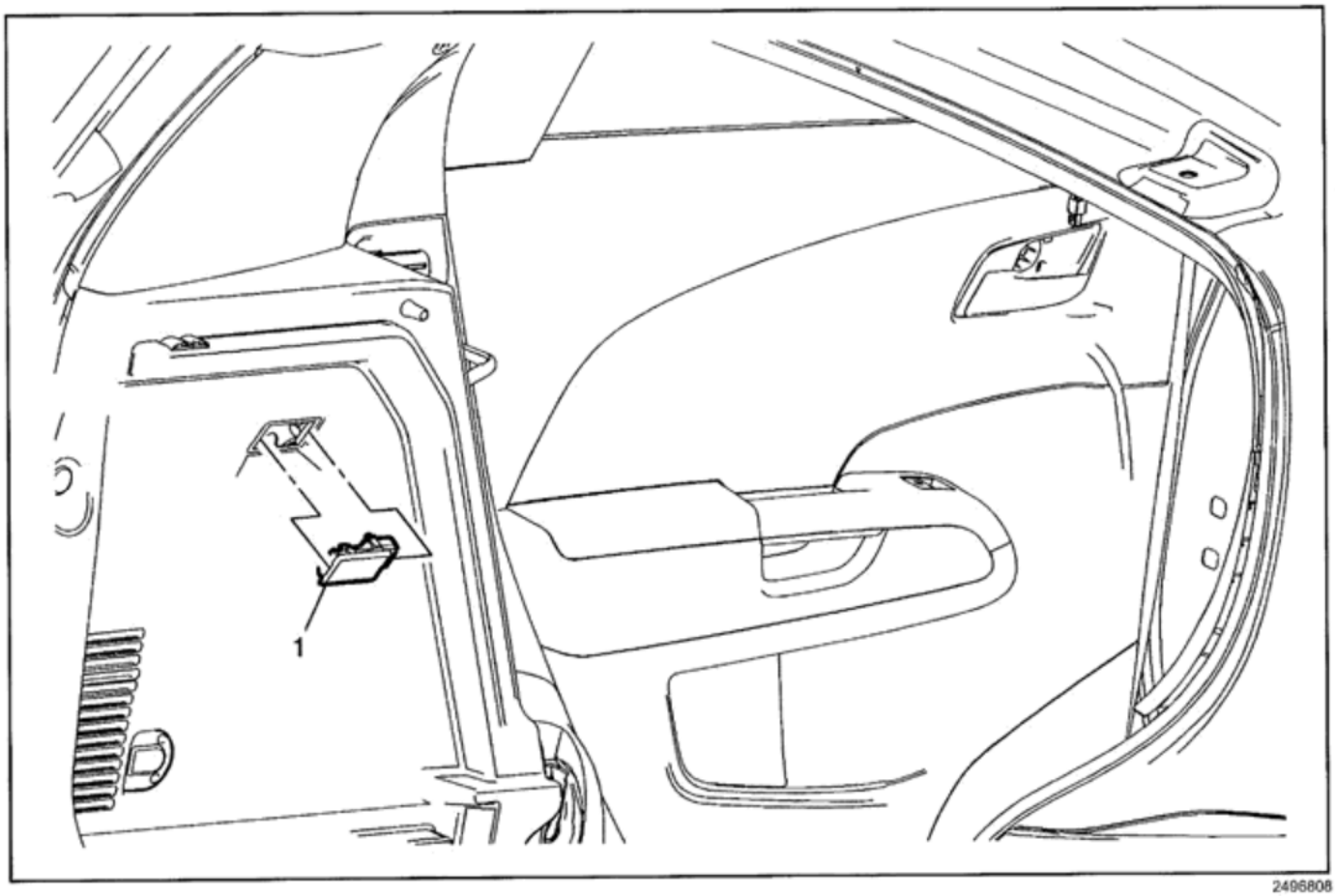


2538914

Stop and Turn Signal Lamp Bulb Replacement (Sedan)

Callout	Component Name
Preliminary Procedure Remove the tail lamp assembly. Refer to *Tail Lamp Replacement (Hatchback) on page 4-214* or *Tail Lamp Replacement (Sedan) on page 4-213*.	
1	Tail Lamp Socket **Procedure** Rotate the lamp socket counter-clockwise and remove the socket from the lamp housing.
2	Park and Stop Lamp Bulb **Procedure** Push the bulb inward while rotating counter-clockwise to remove.
3	Turn Signal Bulb
4	Back Up Bulb

Rear Compartment Courtesy Lamp Replacement (Hatchback)

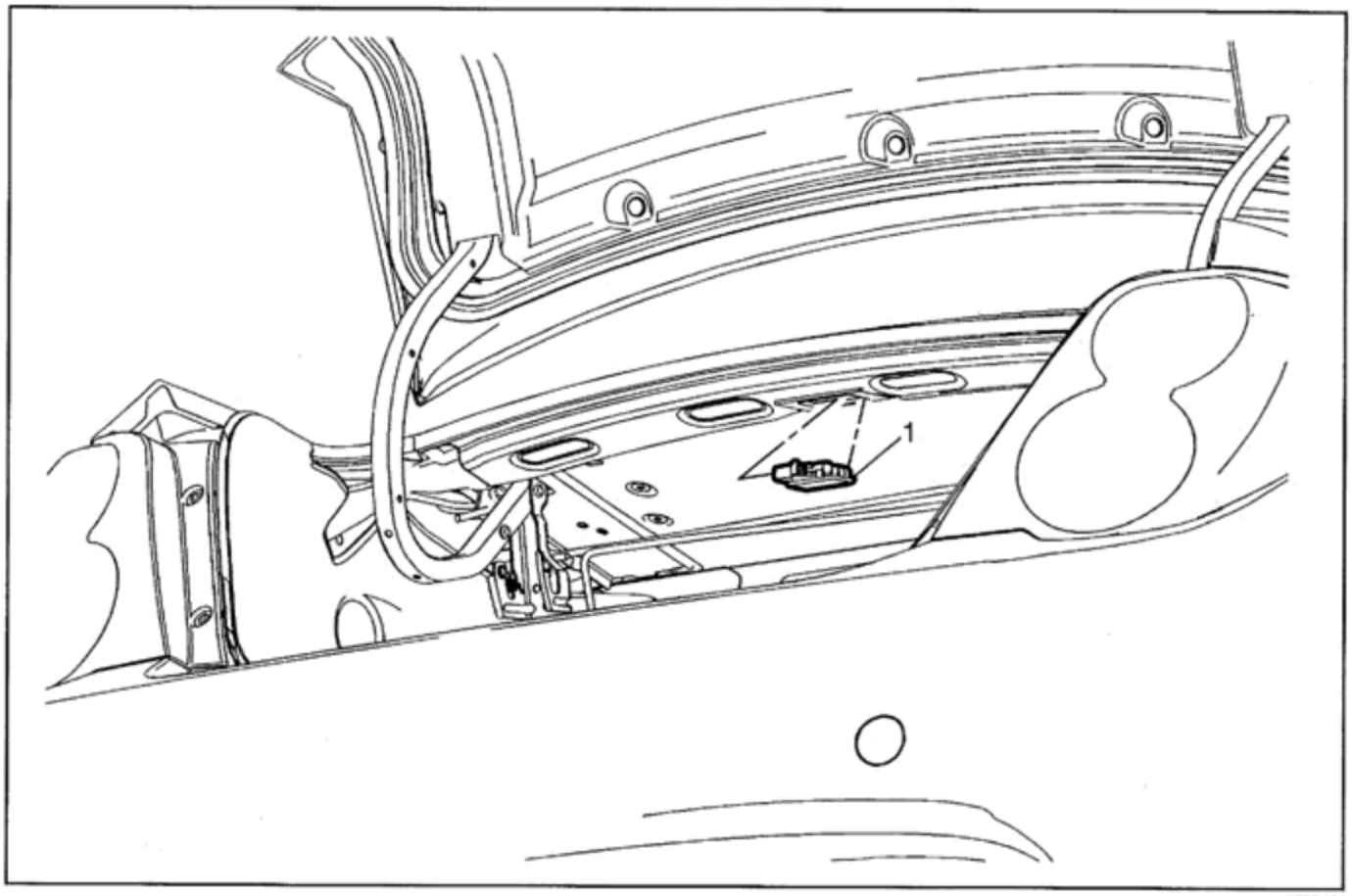


2496808

Rear Compartment Courtesy Lamp Replacement (Hatchback)

Callout	Component Name
1	Rear Compartment Courtesy Lamp Assembly **Procedure** 1. Use the appropriate trim tool in order to release the lamp assembly from the rear quarter trim panel. 2. Disconnect the electrical connection.

Rear Compartment Courtesy Lamp Replacement (Sedan)



2507468

Rear Compartment Courtesy Lamp Replacement (Sedan)

Callout	Component Name
1	Rear Compartment Courtesy Lamp Assembly **Procedure** 1. Use the appropriate trim tool in order to release the lamp assembly from the rear quarter trim panel. 2. Disconnect the electrical connection.

Description and Operation

Exterior Lighting Systems Description and Operation

Exterior Lamps

The exterior lighting system consist of the following lamps if equipped:

- Backup lamps
- Front fog lamps
- Hazard warning lamps
- Headlamps
- Park, tail and license lamps
- Stop lamps
- Turn signal lamps

Low Beam Headlamps

The body control module (BCM) monitors three signal circuits from the headlamp switch. When the headlamp switch is in the AUTO position, all three signal circuits are open. When placed in the AUTO position, the BCM monitors inputs from the ambient light sensor to determine if headlamps are required or if daytime running lamps will be activated based on outside lighting conditions. When the headlamp switch is placed in the OFF position, the headlamp switch headlamps OFF signal circuit is grounded, indicating to the BCM that the exterior lamps should be turned OFF. With the headlamp switch in the PARK position, the headlamp switch park lamps ON signal circuit is grounded, indicating that the park lamps have been requested. When the headlamp switch is placed in the HEADLAMP position, both the headlamp switch park lamps ON signal circuit and the headlamp switch headlamps ON signal circuit are grounded. The BCM responds to the inputs by illuminating the park lamps and headlamps. When the low beam headlamps are

requested, the BCM applies B+ to both low beam headlamp control circuits illuminating the low beam headlamps.

The BCM will also command the low beam headlamps ON during daylight conditions when the following conditions are met:

- Headlamp switch in the AUTO position
- Windshield wipers ON
- Vehicle in any gear but PARK – automatic transmission
- Vehicle in motion – manual transmission

When the BCM commands the low beam headlamps ON, the operator will notice the interior backlighting for the instrument cluster and the various other switches dim to the level of brightness selected by the instrument panel dimmer switch.

High Beam Headlamps

When the low beam headlamps are ON and the turn signal/multifunction switch is placed in the high beam position, ground is applied to the BCM through the high beam signal circuit. The BCM responds to the high beam request by applying ground to the 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 control circuits illuminating the left and right high beam headlamps.

Daytime Running Lamps (DRL)

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:

- The ignition is in the RUN or CRANK position
- The shift lever is out of the PARK position for vehicles equipped with automatic transmissions or the parking brake is released for vehicles with manual transmissions
- The low and high 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 volts depending on outside lighting conditions. The body control module (BCM) provides a 5-volt 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 headlamp system control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the low beam headlamps ON. The low beam headlamps are the designated DRL's. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel DRL operation.

Flash to Pass (FTP)

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

Front Fog Lamps

The front fog lamp switch is an input to the body control module (BCM) and is contained in the headlamp switch assembly. The BCM supplies voltage to the front fog lamp switch via the front fog lamp and instrument panel dimmer switch B+ circuit. When the front fog lamp switch is pressed, voltage from the B+ circuit is pulled down through the front fog lamp switch resistor. The front fog lamp resistor is part of the resistor ladder that also provides the dimming signals for the instrument panel dimmer switches. The BCM receives the voltage signal through the front fog lamp and instrument panel dimmer switch signal circuit.

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 control circuit which illuminates the front fog lamps.

Hazard Lamps

The hazard flashers may be activated in any power mode. The hazard warning switch signal circuit is momentarily grounded when the hazard warning switch is pressed. The body control module (BCM) responds to the hazard warning switch signal input by supplying battery voltage to all four turn signal lamps in an ON and OFF duty cycle. When the hazard warning 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.

The instrument panel dimmer switch controls are located on the headlamp switch assembly and are used to increase and decrease the brightness of the interior backlighting components. When the instrument panel dimmer switch is placed in a desired brightness position, the body control module (BCM) receives a signal from the instrument panel dimmer switch and responds by applying a pulse width modulated (PWM) voltage to the hazard switch LED backlighting control circuit illuminating the LED to the desired level of brightness.

Park, Tail, and License Lamps

When the headlamp switch is placed in the HEAD or PARK position, ground is applied to the park lamp switch ON 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, and license lamps.

Stop Lamps

The brake pedal position (BPP) sensor is used to sense the action of the driver application of the brake pedal. The BPP sensor provides an analog voltage signal that will increase as the brake pedal is applied. The 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 left and right stop lamp control circuits as well as the center high mounted stop lamp (CHMSL) control circuit illuminating the left and right stop lamps and the CHMSL.

Turn Signal Lamps

Ground is applied at all times to the turn signal/ multifunction switch. The turn signal lamps may only be activated with the ignition switch in the ON or START positions. 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 responds to the turn signal switch input by applying a pulsating voltage to the front and rear turn signal lamps through there respective control circuits. When a turn signal request is received by the BCM, a serial data message is sent to the instrument cluster requesting the respective turn signal indicator be pulsed ON and OFF.

Backup Lamps

Automatic Transmission

With the engine ON and the transmission 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 control circuit illuminating the backup lamps. 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. The engine must be running for the backup lamps to operate.

Manual Transmission

The engine control module (ECM) provides a signal circuit to the backup lamp switch which is permanently grounded. With the engine ON and the transmission 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 control circuit illuminating the backup lamps. Once the driver moves the gear selector out of the reverse position, a message is sent by the ECM via serial data requesting the BCM to remove battery voltage from the backup lamps control circuit. The engine must be running for the backup lamps to operate.

Battery Run Down Protection/ Inadvertent Power

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

Interior Lighting Systems Description and Operation

Interior Lamps

The interior lighting consist of two groups. This first group includes lamps that may not be dimmed.

- Dome/reading lamps
- Rear compartment courtesy lamp

Dome Lamps

When any door is opened, the associated door jamb switch closes providing a door open input to the body control module (BCM). The BCM responds by applying battery positive voltage to the dome lamp control circuit illuminating the dome lamp. The dome lamp will turn OFF immediately if the ignition switch is turned to the ON position or approximately 20 seconds after all doors are closed. The dome lamp will normally turn OFF using the theater dimming feature when controlled by the BCM. If the operator inadvertently leaves any interior lamp ON, the BCM will turn all interior lamps OFF after 10 minutes has passed since any switch activation has been detected by the BCM.

Keyless Entry Interior Illumination

When the operator uses the keyless entry transmitter in order to unlock the doors, the BCM receives a door-unlock signal. The BCM must receive inputs from various systems that indicate that the ignition switch is OFF, the courtesy lamp switch is OFF, and all doors are closed before the BCM will activate the interior lamps. The courtesy lamps will remain ON for 20 seconds after the door is closed. The BCM will turn off the courtesy lamps 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.

Rear Compartment Courtesy Lamp

The BCM provides battery positive voltage to the rear compartment courtesy lamp. When the rear compartment is opened, the rear compartment latch opens providing a rear compartment open input to the BCM. The BCM responds by applying battery positive voltage to the rear compartment lamp control circuit illuminating the rear compartment lamp.

Reading Lamps

The inadvertent power supply voltage circuit from the BCM provides battery positive voltage the reading lamp. When the reading lamp switch is activated, the switch contacts close providing a path to ground and the reading lamp illuminates. If the operator inadvertently leaves a reading lamp ON, the BCM will turn all interior lamps OFF after 10 minutes has passed since any switch activation has been detected by the BCM.

Interior Lamps Dimming

The second group includes lamps which may be dimmed.

- Door lock switch – driver
- Hazard warning switch
- Headlamp switch
- HVAC control head assembly
- Instrument cluster
- Multifunction switch - center console
- Radio
- Steering wheel control switch – left
- Steering wheel control switch – right
- Transmission shift lever position indicator

When the headlamp switch is placed in the PARK or HEAD position, the park lamp switch signal circuit provides an input to the body control module (BCM). The BCM responds by applying voltage to the park lamps as well as the dimming control circuits illuminating all components with interior backlighting. All LED and incandescent backlighting turns ON at the dimming level indicated by the instrument panel dimmer switch. The instrument panel dimmer switch is a momentary type switch and utilizes a resistor ladder to accomplish dimming controls. The instrument panel dimmer switch contains a battery positive voltage reference circuit and a signal circuit from the BCM. When the instrument panel dimmer switch is held in the decrease brightness position, the BCM receives a low voltage signal via the instrument panel dimmer switch signal circuit. The BCM responds by decreasing the brightness of all interior backlighting by decreasing the voltage supplied to the backlighting components via the dimming control circuits. When the instrument panel dimmer switch is held in the increase brightness position, the BCM receives a high voltage signal via the instrument panel dimmer switch signal circuit. The BCM responds by increasing the brightness of all interior backlighting by increasing the voltage supplied to the backlighting components via the dimming control circuits.

Battery Rundown Protection/ Inadvertent Power

The BCM inadvertent power supply voltage circuit provides battery positive voltage to all of the interior lamps. In the event that any of these lamps were to remain illuminated for a period of more than 10 minutes with the ignition switch in the OFF position, the BCM will deactivate the inadvertent power supply voltage circuit to prevent total battery discharge.