

## 2018 ACCESSORIES & EQUIPMENT

### Lighting - Diagnostic Information And Procedures - Equinox & Terrain

## DIAGNOSTIC INFORMATION AND PROCEDURES

### DTC B1395: CONTROL MODULE VOLTAGE REFERENCE OUTPUT 1 CIRCUIT LOW/HIGH VOLTAGE

#### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

#### DTC Descriptors

##### DTC B1395 03

Control Module Voltage Reference Output 1 Circuit Low Voltage

##### DTC B1395 07

Control Module Voltage Reference Output 1 Circuit High Voltage

#### Diagnostic Fault Information

| Circuit                                      | Short to Ground    | Open/High Resistance | Short to Voltage   | Signal Performance |
|----------------------------------------------|--------------------|----------------------|--------------------|--------------------|
| Instrument Panel Dimmer Switch B+ Reference  | B1395 03, B3600 03 | B3600 03             | B1395 07, B3600 07 | -                  |
| Instrument Panel Dimmer Switch Signal        | B1395 03, B3600 03 | B3600 03             | B1395 07, B3600 07 | -                  |
| Instrument Panel Dimmer Switch Low Reference | 1                  | 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 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 voltage through the LED dimming 1 and dimming 2 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 B1395 03

- The BCM detects a short to ground in the instrument panel dimmer switch B+ reference circuit.

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

## DTC B1395 07

- The BCM detects a short to voltage in the instrument panel dimmer switch B+ reference circuit.
- 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 FULL bright.

### 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 Wiring Schematics

Connector End View Reference

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Scan Tool Reference

### Control Module References 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 12 and ground.
  - **If less than B+**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    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
    3. Test for less than 2  $\Omega$  in the B+ circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If B+**
3. Verify a test lamp illuminates between B+ and the low reference circuit terminal 7.
  - **If the test lamp does not illuminate**

1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the low reference circuit terminal 7 and ground.
  - If 1 V or greater, repair the short to voltage on the circuit.
  - If less than 1 V
3. Test for less than 2  $\Omega$  in the low reference circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If the test lamp illuminates**
4. Verify a test lamp does not illuminate between B+ and the signal circuit terminal 11.
  - **If the test lamp illuminates**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
    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.
    - **Go to next step: If the test lamp does not illuminate**
5. Test for B+ between the B+ circuit terminal 12 and the signal circuit terminal 11.
  - **If less than B+**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
    2. Test for less than 1 V between the signal circuit terminal 11 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **Go to next step: If B+**
      1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
      2. Test for less than 1 V between the B+ circuit terminal 12 and ground.
        - If 1 V or greater, repair the short to voltage on the circuit.
        - If less than 1 V
6. Test or replace the S30 Headlamp Switch.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\)](#) [Headlamp Switch Replacement \(Terrain Base\)](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B1480: BATTERY RUNDOWN PROTECTION CIRCUIT SHORT TO GROUND

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptor

### DTC B1480 02

## Diagnostic Fault Information

| Circuit                                | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|----------------------------------------|-----------------|----------------------|------------------|--------------------|
| Courtesy Lamps Control Terminal 3 X7   | B1480 02        | 1                    | 1                | -                  |
| Center Console Compartment Lamp Ground | -               | 1                    | -                | -                  |
| Dome/Reading Lamps - Left Rear Ground  | -               | 1                    | -                | -                  |
| Dome/Reading Lamps - Right Rear Ground | -               | 1                    | -                | -                  |
| Front Overhead Console Assembly Ground | -               | 1                    | -                | -                  |
| Sunshade - Left Ground                 | -               | 1                    | -                | -                  |
| Sunshade - Right Ground                | -               | 1                    | -                | -                  |
| 1. Courtesy Lamps Malfunction          |                 |                      |                  |                    |

## Circuit/System Description

The body control module (BCM) supplies battery voltage to the front and rear reading lamps, left and right sunshade lamps, and center console compartment lamp via the courtesy lamp control circuit. When the center console compartment or a sunshade mirror is opened, the switch contact close allowing battery voltage to flow illuminating the respective lamps. The front and rear reading lamps are controlled by individual switches that are activated by the operator when additional cabin lighting is required. In the event that any of these courtesy lamps were to remain illuminated for more than 10 min with the ignition switch in the OFF position, 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 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 Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connectors at the components listed below.
  - A3L Sunshade - Left
  - A3R Sunshade - Right
  - A98 Front Overhead Console Assembly
  - E28 Center Console Compartment Lamp
  - E37LR Dome/Reading Lamps - Left Rear
  - E37RR Dome/Reading Lamps - Right Rear
2. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - A3L Sunshade - Left terminal A
  - A3R Sunshade - Right terminal A
  - A98 Front Overhead Console Assembly terminal 7
  - E28 Center Console Compartment Lamp terminal 2
  - E37LR Dome/Reading Lamps - Left Rear terminal 1
  - E37RR Dome/Reading Lamps - Right Rear terminal 1
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**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
4. Test or replace the courtesy lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Sunshade Replacement](#)
- Refer to [Roof Rail Rear Seat Position Reading and Courtesy Lamp Replacement](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B2530: FRONT FOG LAMPS CONTROL CIRCUIT

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 Relay Control   | 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 relay is supplied with battery voltage at all times. The front fog lamp switch signal circuit is grounded through a resistor momentarily when the front fog lamp switch is pressed. 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 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 s 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

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

### Conditions for Clearing the DTC

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

### Reference Information

Schematic Reference

### Fog Lights Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) 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 10 and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block - Underhood.
    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
    3. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X50A Fuse Block - Underhood.
  - **Go to next step: If the test lamp illuminates**
3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 10 and ground.
4. Remove the front fog lamp fuse (F39UA) at the X50A Fuse Block - Underhood, ignition ON.
5. Verify a test lamp illuminates between the front fog lamp fuse (F39UA) B+ switch control terminal and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block - Underhood, ignition ON.
    2. Test for less than 1 V between the control circuit terminal 10 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.
  - **Go to next step: If the test lamp illuminates**

6. Test or replace the K9 Body Control Module.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Engine Wiring Harness Junction Block Replacement](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B2545: BACKUP LAMPS CIRCUIT

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptors

#### DTC B2545 01

Backup Lamps Circuit Short to Battery

#### DTC B2545 02

Backup Lamps Circuit Short to Ground

#### DTC B2545 04

Backup Lamps Circuit Open

### Diagnostic Fault Information

| Circuit                     | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|-----------------------------|-----------------|----------------------|------------------|--------------------|
| Backup Lamps Control        | B2545 02        | B2545 01, B2545 04   | 1                | -                  |
| 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.

### 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 and B2545 04

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

#### DTC B2545 02

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

### **Actions Taken When the DTC Sets**

The backup lamps will not operate.

### **Conditions for Clearing the DTC**

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

### **Reference Information**

Schematic Reference

- [Exterior Lights Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### **Circuit/System Testing**

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E5 Backup Lamp.
2. Test for less than 5  $\Omega$  between the ground circuit at the socket terminal and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
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 Backup Lamps ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$
    2. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module and all other components associated with the control circuit.
    3. 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, replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the appropriate E5 Backup Lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Backup Bulb Replacement \(Chevrolet\)](#), [Backup Bulb Replacement \(GMC\)](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B255F: INTERIOR DOOR HANDLE BACKLIGHT CIRCUIT

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptors

#### DTC B255F 02

Interior Door Handle Backlight Circuit Short to Ground

#### DTC B255F 04

Interior Door Handle Backlight Circuit Open

### Diagnostic Fault Information

| Circuit                                       | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|-----------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Accent Lamps Control - Terminal 22 X7         | B255F 02        | 1                    | 1                | -                  |
| Accent Lamp - Center Console Cupholder Ground | -               | 1                    | -                | -                  |
| Accent Lamp - Driver Door Handle Ground       | -               | 1                    | -                | -                  |
| Accent Lamp - Passenger Door Handle Ground    | -               | 1                    | -                | -                  |
| Accent Lamp - Right Instrument Panel Ground   | -               | 1                    | -                | -                  |
| Flood Lamp - Driver Door Handle Ground        | -               | 1                    | -                | -                  |
| Flood Lamp - Passenger Door Handle Ground     | -               | 1                    | -                | -                  |
| 1. Interior Accent Lighting Malfunction       |                 |                      |                  |                    |

### Circuit/System Description

The body control module (BCM) supplies battery voltage to accent lighting lamps via the accent lamp control circuit. When a door is opened the BCM applies battery voltage to the accent lamp control

circuit illuminating all of the accent lighting. The accent lighting will remain illuminated until all doors are closed and the ignition is OFF. The accent lighting remains illuminated with the ignition ON.

### Conditions for Running the DTC

Battery voltage must be between 9 - 16 V.

### Conditions for Setting the DTC

#### DTC B255F 02

The BCM detects a short to ground in the accent lamp control circuit terminal 22 X7

#### DTC B255F 04

The BCM detects an open/high resistance in the accent lamp control circuit terminal 22 X7

### Actions Taken When the DTC Sets

The BCM will disable the accent lamp control circuit.

### Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- Turn ignition OFF, open and close drivers door, wait 1 min.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

### Reference Information

Schematic Reference

### Interior Lights Wiring Schematics

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Testing

**NOTE:** Each component may need to be disconnected to isolate a short to voltage, short to ground, or an open/high resistance. Use the wiring schematics to identify the following:

- Courtesy lamps the vehicle is equipped with
- Each component's control and ground circuit terminals
- Component locations on the exterior courtesy lamps control circuit

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the inoperative accent/flood lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - E1C Accent Lamp - Driver Door Handle terminal 1
  - E1AC Accent Lamp - Center Console Cupholder terminal 1
  - E1H Accent Lamp - Right Instrument Panel terminal 1
  - E1M Accent Lamp - Passenger Door Handle terminal 1
  - E63D Flood Lamp - Driver Door Handle terminal 2
  - E63P Flood Lamp - Passenger Door Handle terminal 2
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
    - **Go to next step: If less than 10  $\Omega$**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - E1C Accent Lamp - Driver Door Handle terminal 2
  - E1AC Accent Lamp - Center Console Cupholder terminal 2
  - E1H Accent Lamp - Right Instrument Panel terminal 2
  - E1M Accent Lamp - Passenger Door Handle terminal 2
  - E63D Flood Lamp - Driver Door Handle terminal 1
  - E63P Flood Lamp - Passenger Door Handle terminal 1
4. Verify the test lamp turns ON and OFF when commanding the Accent Lighting 1 ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the accent/flood lamp.

## Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Front Side Door Inside Handle Illumination Lamp Replacement \(Equinox\)](#), [Front Side Door Inside Handle Illumination Lamp Replacement \(Denali\)](#).
- Refer to [Front Floor Console Compartment Lamp Replacement](#)
- Refer to [Instrument Panel Light Conductor Lamp Replacement \(Equinox\)](#), [Instrument Panel Light Conductor Lamp Replacement \(GMC\)](#).

- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## **DTC B256A: LIFTGATE LAMP CONTROL CIRCUIT SHORT TO GROUND**

### **Diagnostic Instructions**

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 |
|----------------------------------------|-----------------|----------------------|------------------|--------------------|
| 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 min with the ignition switch in the OFF position, 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 Wiring Schematics**

Connector End View Reference

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[Control Module References](#) 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  $\Omega$  between the ground circuit terminal 3 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
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**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: 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](#) after completing the repair.

- Refer to [Cargo Center Courtesy Lamp Replacement](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## **DTC B2575 OR B2699: HEADLAMPS CONTROL CIRCUIT (T4A/T4L)**

### [Diagnostic Instructions](#)

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.

- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 |
|-----------------------------------|-----------------------|-----------------------|------------------|--------------------|
| F21DA (BCM 4) Fuse B+             | B2575 01,<br>B2575 04 | B2575 01,<br>B2575 04 | -                | -                  |
| F8DA (BCM 3) Fuse B+              | B2699 01,<br>B2699 04 | B2699 01,<br>B2699 04 | -                | -                  |
| Low Beam Headlamp - Left Control  | B2575 02              | B2575 01,<br>B2575 04 | 1                | -                  |
| Low Beam Headlamp - Right Control | B2699 02              | B2699 01,<br>B2699 04 | 1                | -                  |
| Headlamp Assembly - Left Ground   | -                     | 1                     | -                | -                  |
| Headlamp Assembly - Right Ground  | -                     | 1                     | -                | -                  |
| 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 an open/high resistance in the left low beam headlamp control circuit.
- The BCM detects a short to ground or an open/high resistance in the F21DA (BCM 4) fuse B+ 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 an open/high resistance in the right low beam headlamp control circuit.
- The BCM detects a short to ground or an open/high resistance in the F8DA (BCM 3) fuse B+ 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.

### **Diagnostic Aids**

When testing at the headlamp 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

- [Headlights/Daytime Running Lights \(DRL\) Wiring Schematics](#)
- [Body Control System Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### **Circuit/System Testing**

## **DTC B2575**

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**
    1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
    2. Test for less than 2  $\Omega$  in the B+ circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , 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**
    1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
    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.
  - **Go to next step: If the test lamp illuminates**
3. Ignition OFF, connect the X1 harness connector at the K9 Body Control Module.
4. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E13LA Headlamp Assembly - Left.
5. Test for less than 10  $\Omega$  between the ground circuit terminal 1 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
6. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Left Headlamp Low Beam ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
8. Test or replace the headlamp - left low beam.

## DTC B2699

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 3 and ground.
  - **If the test lamp does not illuminate and the circuit fuse is good**
    1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
    2. Test for less than 2  $\Omega$  in the B+ circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , 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**
  1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
  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.
- **Go to next step: If the test lamp illuminates**
- 3. Ignition OFF, connect the X1 harness connector at the K9 Body Control Module.
- 4. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E13RA Headlamp Assembly - Right.
- 5. Test for less than 10  $\Omega$  between the ground circuit terminal 1 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
- 6. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
- 7. Verify the test lamp turns ON and OFF when commanding the Right Headlamp Low Beam ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
- 8. Test or replace the headlamp - right low beam.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Bulb Replacement - Left Side \(Chevrolet with T4A\)](#).
- Refer to [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4A and LYX\)](#), [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4A and LH7\)](#), [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4A and LTG\)](#).
- Refer to [Headlamp Replacement \(Chevrolet\)](#), [Headlamp Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B2575 OR B2699: HEADLAMPS CONTROL CIRCUIT (T4F)

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 |
|-----------------------------------|-----------------------|-----------------------|------------------|--------------------|
| F21DA (BCM 4) Fuse B+             | B2575 01,<br>B2575 04 | B2575 01,<br>B2575 04 | -                | -                  |
| F8DA (BCM 3) Fuse B+              | B2699 01,<br>B2699 04 | B2699 01,<br>B2699 04 | -                | -                  |
| Low Beam Headlamp - Left Control  | B2575 02              | B2575 01,<br>B2575 04 | 1                | -                  |
| Low Beam Headlamp - Right Control | B2699 02              | B2699 01,<br>B2699 04 | 1                | -                  |
| Headlamp Assembly - Left Ground   | -                     | 1                     | -                | -                  |
| Headlamp Assembly - Right Ground  | -                     | 1                     | -                | -                  |
| 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 an open/high resistance in the left low beam headlamp control circuit.
- The BCM detects a short to ground or an open/high resistance in the F21DA (BCM 4) fuse B+ 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 an open/high resistance in the right low beam headlamp control circuit.
- The BCM detects a short to ground or an open/high resistance in the F8DA (BCM 3) fuse B+ 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.

### **Diagnostic Aids**

When testing at the headlamp 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

- [Headlights/Daytime Running Lights \(DRL\) Wiring Schematics](#)
- [Body Control System Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Testing](#)

1. Ignition OFF, disconnect the X1 harness connector at the 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**
    1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
    2. Test for less than 2  $\Omega$  in the B+ circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , 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**
    1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
    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.
  - **Go to next step: If the test lamp illuminates**
3. Ignition OFF, connect the X1 harness connector at the K9 Body Control Module.
4. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the X110 harness connector. It may take up to 2 min for all vehicle systems to power down.
5. Test for less than 10  $\Omega$  between the ground circuit terminal 1 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
6. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Left Headlamp Low Beam ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
8. Ignition OFF, Replace the E4G Headlamp - Left Low Beam bulb.
9. Ignition ON, verify the left low beam headlamp illuminates when commanded ON with the headlamp switch.
  - **If the left low beam headlamp does not illuminate**
    1. Replace the left Headlamp assembly.
  - **Go to next step: If the left low beam headlamp illuminates**
10. All OK.

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 3 and ground.

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

1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
2. Test for less than 2  $\Omega$  in the B+ circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , 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**

1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
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.

- **Go to next step: If the test lamp illuminates**

3. Ignition OFF, connect the X1 harness connector at the K9 Body Control Module.
4. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the X120 harness connector. It may take up to 2 min for all vehicle systems to power down.
5. Test for less than 10  $\Omega$  between the ground circuit terminal 1 and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.
2. Test for less than 2  $\Omega$  in the ground circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

6. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Right Headlamp Low Beam ON and OFF with a scan tool.

- **If the test lamp is always OFF**

1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
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. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If the test lamp is always ON**

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

- **Go to next step: If the test lamp turns ON and OFF**

8. Ignition OFF, Replace the E4H Headlamp - Right Low Beam bulb.
9. Ignition ON, verify the right low beam headlamp illuminates when commanded ON with the headlamp switch.

- **If the right low beam headlamp does not illuminate**

1. Replace the right Headlamp assembly.

- **Go to next step: If the right low beam headlamp illuminates**

10. All OK.

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Bulb Replacement - Left Side \(GMC with T4F\)](#), [Headlamp Bulb Replacement - Left Side \(Chevrolet with T4F\)](#).
- Refer to [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4F and LYX\)](#), [Headlamp Bulb Replacement - Right Side \(GMC with T4F and LTG\)](#), [Headlamp Bulb Replacement - Right Side \(GMC with T4F and LYX\)](#), [Headlamp Bulb Replacement - Right Side \(GMC with T4F and LH7\)](#), [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4F and LTG\)](#), [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4F and LH7\)](#).
- Refer to [Headlamp Replacement \(Chevrolet\)](#), [Headlamp Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B257A: HEADLAMP SWITCH INPUT SIGNALS CORRELATION MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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<br>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 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) Wiring Schematics**

### **Exterior Lights Wiring Schematics**

Connector End View Reference

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

Scan Tool Reference

### **Control Module References** for scan tool information

### **Circuit/System Testing**

1. Ignition OFF, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 8 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON.
4. Verify the scan tool Automatic Headlamps Disable Switch parameter is Inactive.
  - **If not Inactive**

1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
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.
- **Go to next step: If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 3 and ground.
6. Verify the scan tool Automatic Headlamps Disable Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
7. Verify the scan tool Park Lamps Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If Inactive**
8. Install a 3 A fused jumper wire between the signal circuit terminal 5 and ground.
9. Verify the scan tool Park Lamps Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
10. Verify the scan tool Headlamps On Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If Inactive**
11. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground.
12. Verify the scan tool Headlamps On Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    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
3. Test for less than 2  $\Omega$  in the signal circuit end to end.
- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.
- **Go to next step: If Active**

13. Test or replace the S30 Headlamp Switch.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\) Headlamp Switch Replacement \(Terrain Base\)](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B2580: HIGH BEAM CONTROL CIRCUIT

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptors

#### DTC B2580 01

High Beam Control Circuit Short to Battery

#### DTC B2580 02

High Beam Control Circuit Short to Ground

#### DTC B2580 04

High Beam Control Circuit Open

### Diagnostic Fault Information

| Circuit                            | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|------------------------------------|-----------------|----------------------|------------------|--------------------|
| Headlamp High Beam Relay Control   | B2580 02        | B2580 04             | B2580 01         | -                  |
| Headlamp High Beam Control - Left  | 1               | 1                    | 1                | -                  |
| Headlamp High Beam Control - Right | 1               | 1                    | 1                | -                  |
| Headlamp Ground - Left             | -               | 1                    | -                | -                  |
| Headlamp Ground - Right            | -               | 1                    | -                | -                  |
| 1. Headlamps Malfunction           |                 |                      |                  |                    |

### Circuit/System Description

The headlamp high beam relay is supplied with battery voltage at all times. 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 headlamp 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 solenoid actuators opening the right and left high beam shutters exposing the full headlamps for high beam operation.

### 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/high resistance in the headlamp high beam control circuit.

### Actions Taken When the DTC Sets

- For an open/high resistance fault, the high beam headlamps and flash to pass function are inoperative. The high beam indicator on the instrument cluster operates normally.
- For a short to voltage fault, the high beam headlamps and flash to pass function 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

#### Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

### Circuit/System Testing

1. Ignition OFF, 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**

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
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. Ignition OFF.
4. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.
- **If the test lamp is always ON**
  1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
  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.
- **Go to next step: 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](#) after completing the repair.

- Refer to [Relay Replacement \(Attached to Wire Harness\)](#), [Relay Replacement \(Within an Electrical Center\)](#).
- Refer to [Control Module References](#) for BCM, replacement, programming, and setup

## DTC B25F8: AUXILIARY DAYTIME RUNNING LAMPS RELAY CONTROL CIRCUIT

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptors

#### DTC B25F8 01

Auxiliary Daytime Running Lamps Relay Control Circuit Short to Battery

#### DTC B25F8 02

Auxiliary Daytime Running Lamps Relay Control Circuit Short to Ground

#### DTC B25F8 04

Auxiliary Daytime Running Lamps Relay Control Circuit Open

### Diagnostic Fault Information

| Circuit                              | Short to Ground    | Open/High Resistance | Short to Voltage | Signal Performance |
|--------------------------------------|--------------------|----------------------|------------------|--------------------|
| Headlamp Relay Control               | B25F8 02, B25F8 04 | B25F8 02, B25F8 04   | B25F8 01         | -                  |
| Headlamp Assembly Ground - Left      | -                  | 1                    | -                | -                  |
| Headlamp Assembly Ground - Right     | -                  | 1                    | -                | -                  |
| 1. Daytime Running Lamps Malfunction |                    |                      |                  |                    |

### Daytime Running Lamps With CE1

The rain/ambient light sensor module is used to monitor outside lighting conditions. The rain/ambient light sensor module provides a serial data message to the BCM based on outside lighting conditions to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the designated daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

### Daytime Running Lamps Without CE1

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor and the HVAC control module provides a low reference ground. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

### Conditions for Running the DTC

- Battery voltage must be between 9 - 16 V.
- Engine ON.
- Headlamp switch in AUTO position.
- Ambient light is day.

### Conditions for Setting the DTC

#### DTC B25F8 01

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

#### DTC B25F8 02 and B25F8 04

The BCM detects a short to ground or an open/high resistance in the headlamp relay control circuit.

### Actions Taken When the DTC Sets

- The low beam headlamps will not operate.

### Conditions for Clearing the DTC

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

### Reference Information

Schematic Reference

### Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

#### Scan Tool Reference

[Control Module References](#) for scan tool information

#### Circuit/System Testing

1. Ignition OFF, disconnect the KR50 Headlamp 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 Daytime Running Lamps ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
    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. Ignition OFF.
    4. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
4. Test or replace the KR50 Headlamp Relay.

#### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Relay Replacement \(Attached to Wire Harness\)](#) [Relay Replacement \(Within an Electrical Center\)](#).
- Refer to [Control Module References](#) for Headlamp Control Module replacement, programming, and setup

### **DTC B260D OR B260E: LEFT/RIGHT DAYTIME RUNNING LAMP AND FRONT PARK LAMP CONTROL CIRCUIT SHORT TO GROUND**

#### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

#### DTC Descriptors

#### **DTC B260D 02**

**DTC B260E 02****Right Daytime Running Lamp and Front Park Lamp Control Circuit Short to Ground****Diagnostic Fault Information**

| <b>Circuit</b>                       | <b>Short to Ground</b> | <b>Open/High Resistance</b> | <b>Short to Voltage</b> | <b>Signal Performance</b> |
|--------------------------------------|------------------------|-----------------------------|-------------------------|---------------------------|
| Daytime Running Lamp Control - Left  | B260D 02               | 1                           | 1                       | -                         |
| Daytime Running Lamp Control - Right | B260E 02               | 1                           | 1                       | -                         |
| Daytime Running Lamp Ground - Left   | -                      | 1                           | -                       | -                         |
| Daytime Running Lamp Ground - Right  | -                      | 1                           | -                       | -                         |
| 1. Daytime Running Lamps Malfunction |                        |                             |                         |                           |

**Circuit/System Description****Daytime Running Lamps With CE1**

The rain/ambient light sensor module is used to monitor outside lighting conditions. The rain/ambient light sensor module provides a serial data message to the BCM based on outside lighting conditions to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the designated daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

**Daytime Running Lamps Without CE1**

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor and the HVAC control module provides a low reference ground. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

**Conditions for Running the DTC**

- Battery voltage must be between 9 - 16 V.
- Engine ON.
- Headlamp switch in AUTO position.
- Ambient light is day.

**Conditions for Setting the DTC****DTC B260D 02**

The BCM detects a short to ground in the left daytime running lamp control circuit.

**DTC B260E 02**

The BCM detects a short to ground in the right daytime running lamp control circuit.

**Actions Taken When the DTC Sets**

The appropriate daytime running lamp is inoperative.

### Conditions for Clearing the DTC

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

### Reference Information

Schematic Reference

### Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Testing

#### Without T4L

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
2. Test for less than 5  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - Terminal 4 (Z88+T4F)
  - Terminal 5 (All others without T4L)
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - Terminal 7 (Z88+T4F)
  - Terminal 4 (All others without T4L)
4. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module
- **If the test lamp is always ON**
  1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
  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
  - **Go to next step: If the test lamp turns On and Off**
5. Test or replace the E13 Headlamp Assembly.

#### With T4L

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
2. Test for less than 5  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - Terminal 4 (Z88+T4L)
  - Terminal 5 (X88+T4L)
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
    - **Go to next step: If less than 5  $\Omega$**
3. Ignition on, command the appropriate Front Park Lamp/Daytime Running Lamp ON with a scan tool.
4. Test for 4.8V-5.2V between the appropriate control circuit terminal listed below and ground.
  - Terminal 7 (Z88+T4L)
  - Terminal 4 (X88+T4L)
  - **If less than 4.8V**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module
    - **If more than 5.2V**
      1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
      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
      - **Go to next step: If between 4.8V-5.2V**
5. Test or replace the E13 Headlamp Assembly.

#### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Replacement \(Chevrolet\)](#), [Headlamp Replacement \(GMC\)](#)

- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B2610: PASSENGER COMPARTMENT DIMMING 1 CIRCUIT

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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             | B2610 01         | -                  |
| LED Backlight Dimming Control Terminal 9 X7  | B2610 02        | B2610 04             | B2610 01         | -                  |
| Door Lock Switch - Driver Ground             | -               | 1                    | -                | -                  |
| Door Lock Switch - Passenger Ground          | -               | 1                    | -                | -                  |
| Drive Mode Select Switch Ground              | -               | 1                    | -                | -                  |
| Front Overhead Console Assembly Ground       | -               | 1                    | -                | -                  |
| Garage Door Opener Ground                    | -               | 1                    | -                | -                  |
| Headlamp Switch Ground                       | -               | 1                    | -                | -                  |
| Ignition Mode Switch Ground                  | -               | 1                    | -                | -                  |
| Liftgate Control Switch - Interior Ground    | -               | 1                    | -                | -                  |
| Multifunction Switch - Center Console Ground | -               | 1                    | -                | -                  |
| Parking Assist On/Off Switch Ground          | -               | 1                    | -                | -                  |
| Park Brake Switch Ground                     | -               | 1                    | -                | -                  |
| Seat Memory Switch - Driver Ground           | -               | 1                    | -                | -                  |
| Steering Wheel Control Switch - Left Ground  | -               | 1                    | -                | -                  |
| Steering Wheel Control Switch - Right 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 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 or the LED backlight dimming control circuit terminal 9 X7.

#### DTC B2610 02

The BCM detects a short to ground in the LED backlight dimming control circuit terminal 8 X2 or the LED backlight dimming control circuit terminal 9 X7.

#### DTC B2610 04

The BCM detects an open/high resistance in the LED backlight dimming control circuit terminal 8 X2 or the LED backlight dimming control circuit terminal 9 X7.

### 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 Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

## Circuit/System Testing

**NOTE:** Each component supplied by the LED backlight dimming control circuits may need to be disconnected to isolate the short to ground. Use the wiring schematics to identify the following:

- Each component control and ground circuit terminals
- Component locations on the LED backlight dimming control circuits

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the component with inoperative backlighting. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

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

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**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.

- X2 terminal 8
- X7 terminal 9

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. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If the test lamp is always ON**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.

- X2 terminal 8
- X7 terminal 9

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.

- **Go to next step: If the test lamp turns ON and OFF**

5. Test or replace the component with inoperative backlighting.

## Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\)](#), [Headlamp Switch Replacement \(Terrain Base\)](#).

- Refer to [Cruise Control Switch Replacement \(Equinox\)](#), [Cruise Control Switch Replacement \(Terrain\)](#).
- Refer to [Door Lock Switch Replacement - Driver Side \(Equinox\)](#), [Door Lock Switch Replacement - Driver Side \(Terrain\)](#).
- Refer to [Door Lock Switch Replacement - Passenger Front \(Equinox\)](#), [Door Lock Switch Replacement - Passenger Front \(Terrain\)](#).
- Refer to [Liftgate Close Switch Replacement](#)
- Refer to [Parking Brake Switch Replacement \(Equinox\)](#), [Parking Brake Switch Replacement \(Terrain\)](#).
- Refer to [Radio Control Switch Replacement - Steering Wheel \(Equinox, Right Front\)](#), [Radio Control Switch Replacement - Steering Wheel \(Equinox, Left Rear\)](#), [Radio Control Switch Replacement - Steering Wheel \(Equinox, Right Rear\)](#), [Radio Control Switch Replacement - Steering Wheel \(Terrain, Right Front\)](#), [Radio Control Switch Replacement - Steering Wheel \(Terrain, Left Rear\)](#), [Radio Control Switch Replacement - Steering Wheel \(Terrain, Right Rear\)](#).
- Refer to [Ignition and Start Switch Replacement \(Equinox\)](#), [Ignition and Start Switch Replacement \(Terrain\)](#).
- Refer to [Floor Console Accessory Function Switch Replacement \(Equinox\)](#), [Floor Console Accessory Function Switch Replacement \(Terrain\)](#).
- Refer to [Garage Door Opener Transmitter Pushbutton Replacement](#)
- Refer to [Front Seat Adjuster Memory Switch Replacement \(Equinox\)](#), [Front Seat Adjuster Memory Switch Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## **DTC B2615: PASSENGER COMPARTMENT DIMMING 2 CIRCUIT SHORT TO GROUND**

### **Diagnostic Instructions**

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### **DTC Descriptor**

### **DTC B2615 02**

Passenger Compartment Dimming 2 Circuit Short to Ground

### **Diagnostic Fault Information**

| Circuit                                          | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|--------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Dome/Reading Lamps - Front Control Terminal 1 X7 | B2615 02        | 1                    | 1                | -                  |
| Dome/Reading Lamps - Left Rear Ground            | -               | 1                    | -                | -                  |
| Dome/Reading Lamps - Right Rear Ground           | -               | 1                    | -                | -                  |
| Front Overhead Console Assembly Ground           | -               | 1                    | -                | -                  |
| 1. Dome Lamps Malfunction                        |                 |                      |                  |                    |

### **Circuit/System Description**

The dome lamp switch has 3 positions: DOOR, OFF, and ON. The ON position provides a ground for continuous operation and the dome lamps will remain illuminated until the switch is placed in either the DOOR or OFF position. When in the DOOR position, the dome lamps operation is controlled by the body control module (BCM). When any door is opened, the door ajar switch contacts close and the BCM receives a door-open input. The BCM illuminates the dome lamps 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 lamps will remain illuminated approximately 3 s after the last door closes. When the driver places the dome lamp switch in the OFF position, the dome lamps will be disabled. In the event that the dome lamps were to remain illuminated for more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the dome lamps 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/courtesy lamps control circuit.

### Actions Taken When the DTC Sets

The dome/courtesy 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

- [Interior Lights Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Testing

**NOTE:** Each dome lamp may need to be disconnected to isolate the short to ground. Use the schematic to identify the following:

- Each dome lamps control and ground circuit terminals
- All dome lamps equipped on the vehicle
- Component locations on the dome lamps control circuits

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connectors at the following components. It may take up to 2 min for all vehicle systems to power down.

- A98 Front Overhead Console Assembly
- E37LR Dome/Reading Lamps - Left Rear

- E37RR Dome/Reading Lamps - Right Rear
2. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
    - A98 Front Overhead Console Assembly terminal 5
    - E37LR Dome/Reading Lamps - Left Rear terminal 3
    - E37RR Dome/Reading Lamps - Right Rear terminal 3
    - **If 10  $\Omega$  or greater**
      1. Ignition OFF.
      2. Test for less than 2  $\Omega$  in the ground circuit end to end.
        - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
        - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
      - **Go to next step: If less than 10  $\Omega$**
  3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - A98 Front Overhead Console Assembly terminal 8
    - E37LR Dome/Reading Lamps - Left Rear terminal 4
    - E37RR Dome/Reading Lamps - Right Rear terminal 4
  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**
      1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
      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. Test for less than 2  $\Omega$  in the control circuit end to end.
        - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
        - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **If the test lamp is always ON**
      1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
      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.
    - **Go to next step: If the test lamp turns ON and OFF**
  5. Test or replace the dome/courtesy lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Roof Rail Rear Seat Position Reading and Courtesy Lamp Replacement](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B2625: DISPLAY DIMMING PULSE WIDTH MODULATION OUTPUT CIRCUIT SHORT TO GROUND

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptor

### DTC B2625 02

**Diagnostic Fault Information**

| <b>Circuit</b>                                                                                                                                                                                     | <b>Short to Ground</b> | <b>Open/High Resistance</b> | <b>Short to Voltage</b> | <b>Signal Performance</b> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------|-------------------------|---------------------------|
| Switch Indicator LED Backlight Dimming Control Terminal 5 X1                                                                                                                                       | B2625 02               | 1                           | 1                       | -                         |
| Front Overhead Console Assembly Indicator Control                                                                                                                                                  | 5                      | 5                           | 5                       | -                         |
| Drive Mode Select Switch Indicator Control                                                                                                                                                         | 3, 4                   | 3, 4                        | 3, 4                    | -                         |
| Multifunction Switch - Center Console Indicator Control                                                                                                                                            | 4                      | 4                           | 4                       | -                         |
| Park Assist On/Off Switch Indicator Control                                                                                                                                                        | 2                      | 2                           | 2                       | -                         |
| Door Lock Switch - Driver Ground                                                                                                                                                                   | -                      | 1                           | -                       | -                         |
| Door Lock Switch - Passenger Ground                                                                                                                                                                | -                      | 1                           | -                       | -                         |
| 1. Interior Backlighting Malfunction<br>2. Park Assist System Malfunction<br>3. Lane Departure Warning System Malfunction<br>4. All Wheel Drive Indicator Malfunction<br>5. Dome Lamps 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 voltage through the LED backlight dimming control circuit illuminating the dome lamp switch, all wheel drive switch, lane departure warning switch, park assist switch, and driver and passenger door lock switch amber LED's 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 indicator dimming control circuit terminal 5 X1.

**Actions Taken When the DTC Sets**

The dome lamp switch, all wheel drive switch, lane departure warning switch, park assist switch, and driver and passenger door lock switch amber indicators 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

- [Interior Lights Dimming Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) 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 wiring 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, disconnect the harness connector at the appropriate switch listed below.
  - A98 Front Overhead Console Assembly
  - S48E Multifunction Switch - Center Console (Chevrolet)
  - S126 Drive Mode Select Switch (GMC)
  - S107 Parking Assist On/Off Switch (UFQ)
  - S13D Door Lock Switch - Driver
  - S13P Door Lock Switch - Passenger
2. Ignition ON, place the instrument panel dimmer switch in the HIGH position for high backlighting intensity.
3. Verify a test lamp illuminates between the appropriate control circuit terminal listed below and ground.
  - A98 Front Overhead Console Assembly terminal 18
  - S48E Multifunction Switch - Center Console terminal 5 (Chevrolet)
  - S126 Drive Mode Select Switch terminal 8 (GMC)
  - S107 Parking Assist On/Off Switch terminal 5 (UFQ)
  - S13D Door Lock Switch - Driver terminal 5
  - S13P Door Lock Switch - Passenger terminal 5
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.

- If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If the test lamp illuminates**
- Place the instrument panel dimmer switch in the LOW position for low backlighting intensity.
  - Verify a test lamp does not illuminate at FULL intensity between the appropriate control circuit terminal listed below and ground.
    - A98 Front Overhead Console Assembly terminal 18
    - S48E Multifunction Switch - Center Console terminal 5 (Chevrolet)
    - S126 Drive Mode Select Switch terminal 8 (GMC)
    - S107 Parking Assist On/Off Switch terminal 5 (UFQ)
    - S13D Door Lock Switch - Driver terminal 5
    - S13P Door Lock Switch - Passenger terminal 5
  - If the test lamp illuminates at full intensity**
    - Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    - 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.
  - Go to next step: If the test lamp does not illuminate at full intensity**
- Test or replace the inoperative component.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Door Lock Switch Replacement - Driver Side \(Equinox\)](#), [Door Lock Switch Replacement - Driver Side \(Terrain\)](#).
- Refer to [Door Lock Switch Replacement - Passenger Front \(Equinox\)](#), [Door Lock Switch Replacement - Passenger Front \(Terrain\)](#).
- Refer to [Floor Console Accessory Function Switch Replacement \(Equinox\)](#), [Floor Console Accessory Function Switch Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B2645: AMBIENT LIGHT SENSOR CIRCUIT LOW/HIGH VOLTAGE

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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         | -                  |
|                             |                 |                      |                  |                    |

| Circuit                              | Short to Ground | Open/High Resistance                | Short to Voltage | Signal Performance |
|--------------------------------------|-----------------|-------------------------------------|------------------|--------------------|
| Ambient Light Sensor Low Reference   | 1               | B2645 07,<br>B0163 05,<br>B0183 05, | 1                | -                  |
| 1. Daytime Running Lamps Malfunction |                 |                                     |                  |                    |

### Circuit/System Description

#### Without CE1

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor and the HVAC control module provides a low reference ground. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

#### With CE1

The rain/ambient light sensor module is used to monitor outside lighting conditions. The rain/ambient light sensor module provides a serial data message to the BCM based on outside lighting conditions to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the designated daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps 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 low reference 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) Wiring Schematics

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Scan Tool Reference

[Control Module References](#) 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 B10B Ambient Light/Sunload Sensor. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the low reference circuit terminal 6 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF, disconnect the X2 harness connector at the K33 HVAC Control Module.
    2. Test for less than 2  $\Omega$  in the low reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K33 HVAC Control Module.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON.
4. Verify the scan tool Ambient Light Sensor parameter is greater than 4.65 V.
  - **If 4.65 V or less**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If greater than 4.65 V**
5. Install a 3 A fused jumper wire between the signal circuit terminal 3 and the low reference circuit terminal 6.
6. Verify the scan tool Ambient Light Sensor parameter is less than 0.196 V.
  - **If 0.196 V or greater**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If less than 0.196 V**
7. Test or replace the B10B Ambient Light/Sunload Sensor.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Sun Load Temperature and Headlamp Automatic Control Ambient Light Sensor Replacement \(Equinox\)](#), [Sun Load Temperature and Headlamp Automatic Control Ambient Light Sensor Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM or HVAC Control Module replacement, programming, and setup

## **DTC B2740: FRONT FOG LAMP SWITCH CIRCUIT MALFUNCTION**

### **Diagnostic Instructions**

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### **DTC Descriptor**

#### **DTC B2740 00**

Front Fog Lamp Switch Circuit Malfunction

### **Diagnostic Fault Information**

| Circuit                        | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|--------------------------------|-----------------|----------------------|------------------|--------------------|
| Front Fog Lamp Switch Signal   | B2740 00        | 1                    | 1                | -                  |
| Headlamp Switch Ground         | -               | 1                    | -                | -                  |
| 1. Front Fog Lamps Malfunction |                 |                      |                  |                    |

### **Circuit/System Description**

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

### **Conditions for Running the DTC**

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

### **Conditions for Setting the DTC**

The front fog lamp switch input is Active for longer than 60 seconds.

### **Actions Taken When the DTC Sets**

The front fog 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

[Fog Lights Wiring Schematics](#)

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Scan Tool Reference

[Control Module References](#) 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 S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 8 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON.
4. Verify the scan tool Front Fog Lamps Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    2. Test for infinite resistance between the signal circuit terminal 10 and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance, replace the K9 Body Control Module.
  - **Go to next step: If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 10 and ground.
6. Verify the scan tool Front Fog Lamps Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    2. Test for less than 1 V between the signal circuit terminal 10 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
7. Test or replace the S30 Headlamp Switch.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\)](#) [Headlamp Switch Replacement \(Terrain Base\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## **DTC B3410 OR B3420: HEADLAMP LEVELING CONTROL MODULE FRONT/REAR AXLE SENSOR SIGNAL CIRCUIT**

### **Diagnostic Instructions**

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### **DTC Descriptors**

#### **DTC B3410 02**

Headlamp Leveling Control Module Front Axle Sensor Signal Circuit Short to Ground

#### **DTC B3410 05**

Headlamp Leveling Control Module Front Axle Sensor Signal Circuit High Voltage/Open

#### **DTC B3410 08**

Headlamp Leveling Control Module Front Axle Sensor Signal Circuit Performance - Signal Invalid

#### **DTC B3410 5A**

Headlamp Leveling Control Module Front Axle Sensor Signal Circuit Not Plausible

#### **DTC B3420 02**

Headlamp Leveling Control Module Rear Axle Sensor Signal Circuit Short to Ground

#### **DTC B3420 05**

Headlamp Leveling Control Module Rear Axle Sensor Signal Circuit High Voltage/Open

#### **DTC B3420 08**

Headlamp Leveling Control Module Rear Axle Sensor Signal Circuit Performance - Signal Invalid

#### **DTC B3420 5A**

Headlamp Leveling Control Module Rear Axle Sensor Signal Circuit Not Plausible

### **Diagnostic Fault Information**

| <b>Circuit</b>                                 | <b>Short to Ground</b> | <b>Open/High Resistance</b> | <b>Short to Voltage</b> | <b>Signal Performance</b> |
|------------------------------------------------|------------------------|-----------------------------|-------------------------|---------------------------|
| Suspension Height Sensor 5 V Reference - Front | B3415 02               | 1                           | B3415 01                | -                         |
| Suspension Height Sensor 5 V Reference - Rear  | B3415 02               | 1                           | B3415 01                | -                         |
| Suspension Height Sensor Signal - Front        | B3410 02               | B3410 05                    | B3410 05                | B3410 08, B3410 5A        |
| Suspension Height Sensor Signal - Rear         | B3420 02               | B3420 05                    | B3420 05                | B3420 08, B3420 5A        |

| Circuit                                        | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Suspension Height Sensor Low Reference - Front | -               | 1                    | -                | -                  |
| Suspension Height Sensor Low Reference - Rear  | -               | 1                    | -                | -                  |
| 1. Headlamp Leveling Malfunction               |                 |                      |                  |                    |

### Circuit/System Description

Each headlamp assembly contains a headlamp leveling motor that is controlled by the headlamp control module. The front and rear suspension height sensors provide the headlamp control module with suspension height information. Each sensor receives a 5 V reference, signal, and low reference circuits from the headlamp control module. The sensors are connected to the control arms of the front and rear suspension. As the vehicle travels, the suspension compresses and rebounds moving the suspension height sensor arms. This causes the signal output of the sensor to change. The headlamp control module compares the information from both suspension height sensors and adjusts the headlamp leveling as needed.

### Conditions for Running the DTC

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

### Conditions for Setting the DTC

#### DTC B3410 02

The headlamp control module detects a short to ground or an open/high resistance in the front suspension height sensor signal circuit.

#### DTC B3410 05

The headlamp control module detects a short to voltage or an open/high resistance in the front suspension height sensor signal circuit.

#### DTC B3410 08 or B3410 5A

The headlamp control module receives a signal from the front suspension height sensor signal circuit that is not within the normal operating range.

#### DTC B3420 02

The headlamp control module detects a short to ground or an open/high resistance in the rear suspension height sensor signal circuit.

#### DTC B3420 05

The headlamp control module detects a short to voltage or an open/high resistance in the rear suspension height sensor signal circuit.

#### DTC B3420 08 or B3420 05

The headlamp control module receives a signal from the rear suspension height sensor signal circuit that is not within the normal operating range.

### Actions Taken When the DTC Sets

- The headlamp control module disables the headlamp leveling system.
- The driver information center will display "Adaptive Forward Lighting" and "Headlamp Leveling Malfunction".
- On vehicles equipped with both AFL and headlamp leveling, the AFL system will remain active.

## 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.

## Reference Information

Schematic Reference

## Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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Scan Tool Reference

Control Module References for scan tool information

Special Tools

**J-38522** Variable Signal Generator

For equivalent regional tools, refer to Special Tools

## Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate B51 Suspension Height Sensor, ignition ON.
2. Verify a test lamp illuminates between the low reference circuit terminal 2 and B+.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module.
    2. Test for less than 2  $\Omega$  in the low reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K26 Headlamp Control Module.
  - **Go to next step: If the test lamp illuminates**
3. Ignition ON.
4. Test for 4.8 - 5.2 V between the 5 V reference circuit terminal 1 and ground.
  - **If less than 4.8 V**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module.
    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
    3. Test for less than 2  $\Omega$  in the 5 V reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K26 Headlamp Control Module.
  - **If greater than 5.2 V**

1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module, ignition ON.
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 K26 Headlamp Control Module.
  - **Go to next step: If between 4.8 - 5.2 V**
5. Verify the appropriate scan tool Leveling Position Sensor Signal parameter is less than 1 mm.
  - **If 1 mm or greater**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module, ignition ON.
    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, replace the K26 Headlamp Control Module.
    - **Go to next step: If less than 1 mm**
6. Ignition OFF.
7. Connect the red lead of the **J-38522** Variable Signal Generator to the signal circuit terminal 3 and the black lead of the **J-38522** Variable Signal Generator to the low reference circuit terminal 2.
8. Adjust the **J-38522** Variable Signal Generator to the settings listed below:
  - Signal control to 5 V
  - Frequency control to 250 Hz
  - Duty cycle control to the 60%
9. Ignition ON, verify the appropriate scan tool Leveling Position Sensor parameter is 11 mm.
  - **If not 11 mm**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module.
    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. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K26 Headlamp Control Module.
    - **Go to next step: If 11 mm**
10. Test or replace the B51 Suspension Height Sensor.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Control Module References](#) for Headlamp Control Module replacement, programming, and setup

## DTC B3415: HEADLAMP LEVELING CONTROL MODULE AXLE SENSOR SUPPLY CIRCUIT SHORT

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptors

#### DTC B3415 01

Headlamp Leveling Control Module Axle Sensor Supply Circuit Short to Ground

## DTC B3415 02

### Headlamp Leveling Control Module Axle Sensor Supply Circuit Short to Battery

#### Diagnostic Fault Information

| Circuit                                        | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Suspension Height Sensor 5 V Reference - Front | B3415 02        | 1                    | B3415 01         | -                  |
| Suspension Height Sensor 5 V Reference - Rear  | B3415 02        | 1                    | B3415 01         | -                  |
| Suspension Height Sensor Signal - Front        | B3410 02        | B3410 05             | B3410 05         | B3410 08, B3410 5A |
| Suspension Height Sensor Signal - Rear         | B3420 02        | B3420 05             | B3420 05         | B3420 08, B3420 5A |
| Suspension Height Sensor Low Reference - Front | -               | 1                    | -                | -                  |
| Suspension Height Sensor Low Reference - Rear  | -               | 1                    | -                | -                  |
| 1. Headlamp Leveling Malfunction               |                 |                      |                  |                    |

#### Circuit/System Description

Each headlamp assembly contains a headlamp leveling motor that is controlled by the headlamp control module. The front and rear suspension height sensors provide the headlamp control module with suspension height information. Each sensor receives a 5 V reference, signal, and low reference circuits from the headlamp control module. The sensors are connected to the control arms of the front and rear suspension. As the vehicle travels, the suspension compresses and rebounds moving the suspension height sensor arms. This causes the signal output of the sensor to change. The headlamp control module compares the information from both suspension height sensors and adjusts the headlamp leveling as needed.

#### Conditions for Running the DTC

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

#### Conditions for Setting the DTC

##### DTC B3415 01

The headlamp control module detects no signal and low voltage on the suspension height sensor signal circuit.

##### DTC B3415 02

The headlamp control module detects no signal and high voltage on the suspension height sensor signal circuit.

#### Actions Taken When the DTC Sets

- The headlamp control module disables the headlamp leveling system.
- The driver information center will display "Adaptive Forward Lighting" and "Headlamp Leveling Malfunction".
- On vehicles equipped with both AFL and headlamp leveling, the AFL system will remain active.

#### 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.

## Reference Information

Schematic Reference

## Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

## COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

## Exterior Lighting Systems Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Special Tools

**J-38522** Variable Signal Generator

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

## Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate B51 Suspension Height Sensor, ignition ON.
2. Verify a test lamp illuminates between the low reference circuit terminal 2 and B+.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module.
    2. Test for less than 2  $\Omega$  in the low reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K26 Headlamp Control Module.
  - **Go to next step: If the test lamp illuminates**
3. Ignition ON.
4. Test for 4.8 - 5.2 V between the 5 V reference circuit terminal 1 and ground.
  - **If less than 4.8 V**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module.
    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
    3. Test for less than 2  $\Omega$  in the 5 V reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K26 Headlamp Control Module.
  - **If greater than 5.2 V**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module, ignition ON.

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 K26 Headlamp Control Module.
  - **Go to next step: If between 4.8 - 5.2 V**
5. Verify the appropriate scan tool Leveling Position Sensor Signal parameter is less than 1 mm.
  - **If 1 mm or greater**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module, ignition ON.
    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, replace the K26 Headlamp Control Module.
  - **Go to next step: If less than 1 mm**
6. Ignition OFF.
7. Connect the red lead of the **J-38522** Variable Signal Generator to the signal circuit terminal 3 and the black lead of the **J-38522** Variable Signal Generator to the low reference circuit terminal 2.
8. Adjust the **J-38522** Variable Signal Generator to the settings listed below:
  - Signal control to 5 V
  - Frequency control to 250 Hz
  - Duty cycle control to the 60%
9. Ignition ON, verify the appropriate scan tool Leveling Position Sensor parameter is 11 mm.
  - **If not 11 mm**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module.
    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. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K26 Headlamp Control Module.
  - **Go to next step: If 11 mm**
10. Test or replace the B51 Suspension Height Sensor.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Control Module References](#) for Headlamp Control Module replacement, programming, and setup

## DTC B3435 OR B3440: HEADLAMP LEVELING CONTROL MODULE LEFT/RIGHT SERVO DRIVER 1 OR 2 CIRCUIT MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptors

#### DTC B3435 00

Headlamp Leveling Control Module Left Servo Driver 1 or 2 Circuit Malfunction

#### DTC B3440 00

**Diagnostic Fault Information**

| <b>Circuit</b>                                      | <b>Short to Ground</b>                                                    | <b>Open/High Resistance</b>                                               | <b>Short to Voltage</b>                                      | <b>Signal Performance</b> |
|-----------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------|
| LIN Serial Data - Left Headlamp Leveling Actuator   | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05              | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05              | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05 | -                         |
| LIN Serial Data - Right Headlamp Leveling Actuator  | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05              | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05              | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05 | -                         |
| Headlamp Leveling Actuator - Left B+ (F42 UA)       | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3435 00,<br>B3843 05 | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3435 00,<br>B3843 05 | B3435 00                                                     | -                         |
| Headlamp Leveling Actuator - Right B+ (F42 UA)      | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3440 00,<br>B3843 05 | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3440 00,<br>B3843 05 | B3440 00                                                     | -                         |
| Suspension Height Sensor 5V Reference - Left Front  | B3415 02                                                                  | 1                                                                         | B3415 01                                                     | -                         |
| Suspension Height Sensor 5V Reference - Left Rear   | B3415 02                                                                  | 1                                                                         | B3415 01                                                     | -                         |
| Suspension Height Sensor Signal - Left Front        | B3410 02                                                                  | B3410 05                                                                  | B3410 05                                                     | B3410 08, B3410 5A        |
| Suspension Height Sensor Signal - Left Rear         | B3420 02                                                                  | B3420 05                                                                  | B3420 05                                                     | B3420 08, B3420 5A        |
| Suspension Height Sensor Low Reference - Left Front | -                                                                         | 1                                                                         | -                                                            | -                         |
| Suspension Height Sensor Low Reference - Left Rear  | -                                                                         | 1                                                                         | -                                                            | -                         |
| Headlamp Control Module Ground                      | -                                                                         | 1                                                                         | -                                                            | -                         |
| Headlamp Leveling Actuator - Left Ground            | -                                                                         | 1                                                                         | -                                                            | -                         |
| Headlamp Leveling Actuator - Right Ground           | -                                                                         | 1                                                                         | -                                                            | -                         |
| 1. Headlamp Leveling Malfunction                    |                                                                           |                                                                           |                                                              |                           |

**Circuit/System Description**

Each headlamp assembly contains a headlamp leveling actuator that is controlled by the headlamp control module. The front and rear suspension position sensors provide the headlamp leveling control with suspension position information. Each sensor receives a 5 V reference, signal, and low reference circuits from the headlamp control module. The sensors are connected to the control arms of the front and rear suspension. As the vehicle travels, the suspension compresses and rebounds moving the suspension position sensor arms. This causes the signal output of the sensor to change. The headlamp control module compares the information from both suspension position sensors and adjusts the headlamp leveling as needed. The headlamp control module communicates with the left and right headlamp leveling actuators via the LIN serial data circuit.

### Conditions for Running the DTC

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

### Conditions for Setting the DTC

#### DTC B3435 00

- The headlamp control module detects a short to ground or an open/high resistance in the left headlamp leveling actuator LIN bus circuit.
- The headlamp control module detects an open/high resistance in the left headlamp leveling actuator ground circuit.

#### DTC B3440 00

- The headlamp control module detects a short to ground or an open/high resistance in the right headlamp leveling actuator LIN bus circuit.
- The headlamp control module detects an open/high resistance in the right headlamp leveling actuator ground circuit.

### Action Taken When the DTC Sets

- The headlamp control module disables the headlamp leveling system.
- Service head light leveling indication ON.
- Advanced front lighting system fault indication ON.

### Conditions for Clearing the DTC

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

### Reference Information

#### Schematic Reference

- [Headlights/Daytime Running Lights \(DRL\) Wiring Schematics](#)
- Ground Distribution Wiring Schematics

#### Connector End View Reference

### [COMPONENT CONNECTOR END VIEWS - INDEX](#)

#### Description and Operation

### [Exterior Lighting Systems Description and Operation](#)

#### Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

#### Scan Tool Reference

### [Control Module References](#) for scan tool information

### Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
2. Test for less than 15  $\Omega$  between the ground circuit terminal 8 and ground.
  - **If 15  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 15  $\Omega$**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 6 and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
    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
    3. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X50A Fuse Block - Underhood.
  - **Go to next step: If the test lamp illuminates**
5. Replace the M29 Headlamp Leveling Actuator.
6. Ignition ON.
7. Verify the appropriate headlamp operates to the UP and DOWN positions when commanding the appropriate Headlamp Vertical Motor UP and DOWN with a scan tool.
  - **If the headlamp does not operate UP and DOWN**  
  
Replace the K26 Headlamp Control Module.
  - **Go to next step: If the headlamp operates UP and DOWN**
8. All OK.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Control Module References](#) for headlamp control module replacement, programming, and setup

## DTC B3596: HAZARD LAMPS REQUEST CIRCUIT MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 |
|---------|-----------------|----------------------|------------------|--------------------|
|         |                 |                      |                  |                    |

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

### 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 Wiring Schematics

Connector End View Reference

### COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

### Exterior Lighting Systems Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Testing

1. Ignition OFF, 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 min for all vehicle systems to power down.

2. Test for less than 5  $\Omega$  between the ground circuit terminal 1 and ground.

- **If 5  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 5  $\Omega$**

3. Ignition ON.

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

- **If not Inactive**

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

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.

- **Go to next step: If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 2 and ground.

6. Verify the scan tool Hazard Lamps Switch parameter is Active.

- **If not Active**

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

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

3. Test for less than 2  $\Omega$  in the signal circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If Active**

7. Test or replace the S26 Hazard Warning Switch.

## Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Hazard Warning Switch Replacement \(Equinox\)](#), [Hazard Warning Switch Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B3600: PASSENGER COMPARTMENT DIMMING REQUEST SIGNAL CIRCUIT LOW/HIGH VOLTAGE

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptors

#### DTC B3600 03

Passenger Compartment Dimming Request Signal Circuit Low Voltage

#### DTC B3600 07

Passenger Compartment Dimming Request Signal Circuit High Voltage

## Diagnostic Fault Information

| Circuit                                      | Short to Ground    | Open/High Resistance | Short to Voltage   | Signal Performance |
|----------------------------------------------|--------------------|----------------------|--------------------|--------------------|
| Instrument Panel Dimmer Switch B+ Reference  | B1395 03, B3600 03 | B3600 03             | B1395 07, B3600 07 | -                  |
| Instrument Panel Dimmer Switch Signal        | B1395 03, B3600 03 | B3600 03             | B1395 07, B3600 07 | -                  |
| Instrument Panel Dimmer Switch Low Reference | 1                  | 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 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 voltage through the LED dimming 1 and dimming 2 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 B3600 03

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

#### DTC B3600 07

- The BCM detects a short to voltage in the instrument panel dimmer switch B+ reference circuit.
- 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 FULL bright.

### 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 Wiring Schematics

Connector End View Reference

## COMPONENT CONNECTOR END VIEWS - INDEX

## Interior Lighting Systems Description and Operation

### Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

### Scan Tool Reference

### [Control Module References](#) for scan tool information

### Circuit/System Testing

1. Ignition OFF 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 12 and ground.
  - **If less than B+**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    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
    3. Test for less than 2  $\Omega$  in the B+ circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If B+**
3. Verify a test lamp illuminates between B+ and the low reference circuit terminal 7.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    2. Test for less than 1 V between the low reference circuit terminal 7 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V
    3. Test for less than 2  $\Omega$  in the low reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If the test lamp illuminates**
4. Verify a test lamp does not illuminate between B+ and the signal circuit terminal 11.
  - **If the test lamp illuminates**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If the test lamp does not illuminate**
5. Test for B+ between the B+ circuit terminal 12 and the signal circuit terminal 11.
  - **If less than B+**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
    2. Test for less than 1 V between the signal circuit terminal 11 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.

- If less than 1 V
3. Test for less than 2  $\Omega$  in the signal circuit end to end.
    - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
    - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If B+**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    2. Test for less than 1 V between the B+ circuit terminal 12 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V
  6. Test or replace the S30 Headlamp Switch.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\) Headlamp Switch Replacement \(Terrain Base\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B3650: HIGH BEAM REQUEST SIGNAL CIRCUIT PERFORMANCE - SIGNAL INVALID

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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<br>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) Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) 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 min for all vehicle systems to power down.
2. Test for less than 5  $\Omega$  between the ground circuit terminal 3 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Ignition ON.
4. Verify the scan tool High Beam Select Switch parameter is Inactive.

- **If not Inactive**

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

- **Go to next step: If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 7 and ground.
6. Verify the scan tool High Beam Select Switch parameter is Active.

- **If not Active**

1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module, ignition ON.
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
3. Test for less than 2  $\Omega$  in the signal circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If Active**

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

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Turn Signal Switch Replacement \(Equinox\)](#), [Turn Signal Switch Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B3806: HIGH BEAM AND HEADLAMP FLASH SELECT CIRCUIT MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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                    | -                | -                  |

| Circuit                                                                     | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|-----------------------------------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Turn Signal/Multifunction Switch Ground                                     | -               | 1                    | -                | -                  |
| 1. Headlamps Malfunction<br>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 as 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 panel 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) Wiring Schematics

Connector End View Reference

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

Scan Tool Reference

### Control Module References for scan tool information

### Circuit/System Testing

1. Ignition OFF, 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 min for all vehicle

systems to power down.

2. Test for less than 5  $\Omega$  between the ground circuit terminal 3 and ground.

- **If 5  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 5  $\Omega$**

3. Ignition ON.

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

- **If not Inactive**

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

2. Test for infinite resistance between the signal circuit terminal 6 and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K9 Body Control Module.

- **Go to next step: If Inactive**

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

6. Verify the scan tool Headlamps Flash Switch parameter is Active.

- **If not Active**

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

2. Test for less than 1 V between the signal circuit terminal 6 and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V

3. Test for less than 2  $\Omega$  in the signal circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If Active**

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

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Turn Signal Switch Replacement \(Equinox\)](#), [Turn Signal Switch Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## **DTC B380A OR B380B: PASSENGER COMPARTMENT LAMP ON/OFF SWITCH CIRCUIT SHORT/PASSENGER COMPARTMENT LAMP DEFEAT SWITCH CIRCUIT SHORT**

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptors

#### **DTC B380A 01**

Passenger Compartment Lamp On/Off Switch Circuit Short to Battery

#### **DTC B380B 02**

**Diagnostic Fault Information**

| <b>Circuit</b>                         | <b>Short to Ground</b> | <b>Open/High Resistance</b> | <b>Short to Voltage</b> | <b>Signal Performance</b> |
|----------------------------------------|------------------------|-----------------------------|-------------------------|---------------------------|
| Dome Lamp Switch Cancel Signal         | B380B 02               | 1                           | 1                       | -                         |
| Dome Lamp Switch ON Signal             | 1                      | B380A 01                    | B380A 01                | -                         |
| Front Overhead Console Assembly Ground | -                      | 1                           | -                       | -                         |
| 1. Dome Lamps Malfunction              |                        |                             |                         |                           |

**Circuit/System Description**

The dome lamp switch has 3 positions: DOOR, OFF, and ON. The ON position provides a ground for continuous operation and the dome/courtesy lamps will remain illuminated until the switch is placed in either the DOOR or OFF position. When in the DOOR position, the dome/courtesy lamps operation is controlled by the body control module (BCM). The BCM applies battery voltage to the interior courtesy lamps through the dome/courtesy lamps control circuits at terminal 1 X7 and terminal 3 X7. 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 responds by applying battery voltage to the interior courtesy lamps through the dome/courtesy lamps control circuits at terminal 1 X7 and terminal 3 X7. After all doors have been closed, the dome lamps will remain illuminated approximately 3 s after the last door closes. When the driver places the dome lamp switch in the OFF position, the dome/courtesy lamps will be disabled and an amber indicator will illuminate to inform the driver that the dome lamp switch is in the OFF position. In the event that any of the dome/courtesy lamps were to remain illuminated for more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the dome/courtesy lamp control circuits to prevent total battery discharge.

**Conditions for Running the DTC**

Battery voltage must be between 9-16 V.

**Conditions for Setting the DTC****DTC B380A 01**

The BCM detects a short to voltage in the dome lamp switch On/Off signal circuit.

**DTC B380B 02**

The BCM detects a short to ground in the dome lamp switch Cancel signal circuit.

**Actions Taken When the DTC Sets**

The dome/courtesy 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

**Interior Lights Wiring Schematics**

Connector End View Reference

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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

### Scan Tool Reference

### [Control Module References](#) for scan tool information

### Circuit/System Testing

1. Ignition OFF/Vehicle OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the A98 Front Overhead Console Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 5 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF/Vehicle OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON/vehicle in Service Mode.
4. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Door.
  - **If Cancel**
    1. Ignition OFF/Vehicle OFF, disconnect the X6 harness connector at the K9 Body Control Module.
    2. Test for infinite resistance between the signal circuit terminal 21 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 On**
    1. Ignition OFF/Vehicle OFF, disconnect the X7 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If Door**
5. Install a 3 A fused jumper wire between the signal circuit terminal 21 and ground.
6. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Cancel.
  - **If not Cancel**
    1. Ignition OFF/Vehicle OFF, disconnect the X6 harness connector at the K9 Body Control Module, ignition ON/vehicle in Service Mode.
    2. Test for less than 1 V between the signal circuit terminal 21 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Cancel**
7. Install a 3 A fused jumper wire between the signal circuit terminal 3 and ground.

8. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is On.

- **If not On**

1. Ignition OFF/Vehicle OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON/vehicle in Service Mode.
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
3. Test for less than 2  $\Omega$  in the signal circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If On**

9. Test or replace the A98 Front Overhead Console Assembly.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B3881 OR B3882: TAIL LAMP CIRCUITS

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 |
|---------------------------|-----------------|-----------------------|-----------------------|--------------------|
| Stop Lamp - Left Control  | B3881 02        | B3881 01,<br>B3881 04 | B3881 01,<br>B3881 04 | -                  |
| Stop Lamp - Right Control | B3882 02        | B3882 01,<br>B3882 04 | B3882 01,<br>B3882 04 | -                  |

| Circuit                           | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|-----------------------------------|-----------------|----------------------|------------------|--------------------|
| Tail Lamp Assembly - Left Ground  | -               | 1                    | -                | -                  |
| Tail Lamp Assembly - Right 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 left and right stop lamp control circuits as well as the center high mounted stop lamp control circuit illuminating the left and right stop lamps and the center high mounted stop lamp.

### Conditions for Running the DTC

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

### Conditions for Setting the DTC

#### DTC B3881 01 and B3881 04

The BCM detects a short to voltage or an open/high resistance in the left stop lamp control circuit.

#### DTC B3881 02

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

#### DTC B3882 01 and B3882 04

The BCM detects a short to voltage or an open/high resistance in the right stop lamp control circuit.

#### DTC B3882 02

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

### Actions Taken When the DTC Sets

The appropriate stop lamp will not operate.

### Conditions for Clearing the DTC

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

### Reference Information

Schematic Reference

- [Exterior Lights Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

## Scan Tool Reference

[Control Module References](#) for scan tool information

## Circuit/System Testing

### DTC B3881

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below.
  - E5LE Tail/Stop Lamp - Left Outer (Z88/X88-UGE)
  - E42L Tail Lamp Assembly - Left (X88+UGE)
2. Test for less than 5  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
  - E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
  - E42L Tail Lamp Assembly - Left terminal 1 (X88+UGE)
4. Verify the test lamp turns ON and OFF when commanding the Left Stop Lamp ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **If the test lamp is always ON**
      1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
      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.
    - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the left tail/stop lamp.

### DTC B3882

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below.
  - E5RE Tail/Stop Lamp - Right Outer (Z88/X88-UGE)
  - E42R Tail Lamp Assembly - Right (X88+UGE)
2. Test for less than 5  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
  - E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
    - **Go to next step: If less than 5  $\Omega$**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
  - E42R Tail Lamp Assembly - Right terminal 1 (X88+UGE)
4. Verify the test lamp turns ON and OFF when commanding the Right Stop Lamp ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **If the test lamp is always ON**
      1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
      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.
      - **Go to next step: If the test lamp turns ON and OFF**
  - 5. Test or replace the right tail/stop lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Rear Body Structure Stop Lamp Replacement \(Chevrolet Without UGE\)](#), [Rear Body Structure Stop Lamp Replacement \(Chevrolet With UGE\)](#), [Rear Body Structure Stop Lamp Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B3883: LICENSE PLATE LAMP CIRCUIT

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptors

## DTC B3883 01

License Plate Lamp Circuit Short to Battery

## DTC B3883 02

License Plate Lamp Circuit Short to Ground

## DTC B3883 04

License Plate Lamp Circuit Open

### Diagnostic Fault Information

| Circuit                                         | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|-------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| License Plate Lamp Control                      | B3883 02        | B3883 01, B3883 04   | B3883 01         | -                  |
| License Plate Lamp Ground - Left                | -               | 1                    | -                | -                  |
| License Plate Lamp Ground - Right               | -               | 1                    | -                | -                  |
| 1. Park, License, and/or Tail Lamps 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.

#### DTC B3883 01

Headlamp switch in OFF position.

#### DTC B3883 02 or B3883 04

Headlamp switch in AUTO, 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.

#### 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.

### 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.

### Diagnostic Aids

When testing at the license plate lamp bulb sockets, 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 Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, remove both E7 License Plate Lamp bulbs.
2. Test for less than 5  $\Omega$  between each ground circuit terminal 1 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Connect a test lamp between the E7L 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**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.
- **If the test lamp is always ON**
  1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
  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.
  - **Go to next step: If the test lamp turns ON and OFF**
5. Ignition OFF.
6. Connect a test lamp between the E7R License Plate Lamp - Right control circuit terminal 2 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**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
    - **Go to next step: If the test lamp turns ON and OFF**
8. Test or replace the E7 License Plate Lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Rear License Plate Lamp Replacement \(Chevrolet\)](#), [Rear License Plate Lamp Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B3884: CENTER HIGH MOUNTED BRAKE LAMP CIRCUIT SHORT TO GROUND

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### DTC Descriptor

#### DTC B3884 02

Center High Mounted Brake Lamp Circuit Short to Ground

### Diagnostic Fault Information

| Circuit                               | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|---------------------------------------|-----------------|----------------------|------------------|--------------------|
| Center High Mounted Stop Lamp Control | B3884 02        | 1                    | 1                | -                  |
| 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**

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

## **Actions Taken When the DTC Sets**

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

## **Conditions for Clearing the DTC**

- The condition responsible for setting the DTC no longer exists.
- Turn ignition OFF, open and close driver door, wait 2 min.
- A history DTC will clear once 100 malfunction-free ignition cycles have occurred.

## **Reference Information**

Schematic Reference

## **Exterior Lights Wiring Schematics**

Connector End View Reference

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

Scan Tool Reference

**Control Module References** for scan tool information

## **Circuit/System Testing**

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the E6 Center High Mounted Stop Lamp.
2. Test for less than 10  $\Omega$  between the ground circuit terminal A and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.

- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
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 Center Stop Lamp ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
      1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
      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. Test for less than 2  $\Omega$  in the control circuit end to end.
        - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
        - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **If the test lamp is always ON**
      1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
      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.
    - **Go to next step: 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](#) after completing the repair.

- Refer to [High Mount Stop Lamp Replacement \(Chevrolet\)](#), [High Mount Stop Lamp Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

### DTC B3948 OR B3949: LEFT/RIGHT FRONT TURN SIGNAL CIRCUIT

#### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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

**DTC B3949 04**

## Right Front Turn Signal Circuit Open

**Diagnostic Fault Information**

| <b>Circuit</b>                                     | <b>Short to Ground</b> | <b>Open/High Resistance</b> | <b>Short to Voltage</b> | <b>Signal Performance</b> |
|----------------------------------------------------|------------------------|-----------------------------|-------------------------|---------------------------|
| Turn Signal - Left Front Control                   | B3948 02               | B3948 01,<br>B3948 04       | 1                       | -                         |
| Turn Signal - Right Front Control                  | B3949 02               | B3949 01,<br>B3949 04       | 1                       | -                         |
| Turn Signal Lamp - Left Front Ground               | -                      | 1                           | -                       | -                         |
| Turn Signal Lamp - Right Front Ground              | -                      | 1                           | -                       | -                         |
| Turn Signal Repeater Lamp - Left Ground            | -                      | 1                           | -                       | -                         |
| Turn Signal Repeater Lamp - Right 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 their 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.

### Diagnostic Aids

When testing at the turn signal lamp bulb sockets, 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 Wiring Schematics](#)

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Testing

## DTC B3948

1. Ignition OFF, exterior lamps OFF, remove the appropriate E4 Turn Signal Lamp - Left listed below.
  - E4LF Turn Signal Lamp - Left Front
  - E4Y Turn Signal Repeater Lamp - Left
2. Test for less than 10  $\Omega$  between the appropriate ground circuit at the socket terminal and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**

3. Connect a test lamp between the appropriate control circuit at the socket terminal 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**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the E4 Turn Signal Lamp - Left.

#### DTC B3949

1. Ignition OFF, exterior lamps OFF, remove the appropriate E4 Turn Signal Lamp - Right listed below.
  - E4RF Turn Signal Lamp - Right Front
  - E4Z Turn Signal Repeater Lamp - Right
2. Test for less than 10  $\Omega$  between the appropriate ground circuit at the socket terminal and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Connect a test lamp between the appropriate control circuit at the socket terminal 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**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
    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.

- **Go to next step: If the test lamp turns ON and OFF**

5. Test or replace the appropriate E4 Turn Signal Lamp - Right.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Outside Rearview Mirror Turn Signal Lamp Replacement](#)
- Refer to [Turn Signal Bulb Replacement - Left Side \(Chevrolet\)](#), [Turn Signal Bulb Replacement - Left Side \(GMC\)](#)
- Refer to [Turn Signal Bulb Replacement - Right Side \(Chevrolet\)](#), [Turn Signal Bulb Replacement - Right Side \(GMC\)](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC B3950 OR B3951: LEFT/RIGHT REAR TURN SIGNAL CIRCUIT

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 |
|----------------------------------------------------|-----------------|-----------------------|------------------|--------------------|
| Turn Signal - Left Rear Control                    | B3950 02        | B3950 01,<br>B3950 04 | 1                | -                  |
| Turn Signal - Right Rear Control                   | B3951 02        | B3951 01,<br>B3951 04 | 1                | -                  |
| Tail Lamp Assembly - Left Ground                   | -               | 1                     | -                | -                  |
| Tail Lamp Assembly - Right 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 their 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 "Check Left Rear Turn Signal Lamp" message is displayed on the driver information center display.
- The left turn signal indicator on the instrument cluster flashes rapidly.

### DTC B3951

- The right rear turn signal is inoperative.
- The "Check Right Rear Turn Signal Lamp" message is displayed on the driver information center display.
- 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

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

- [Exterior Lights Wiring Schematics](#)

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

## [Circuit/System Testing](#)

### **DTC B3950**

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below.
  - E5LE Tail/Stop Lamp - Left Outer (Z88/X88-UGE)
  - E42L Tail Lamp Assembly - Left (X88+UGE)
2. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
  - E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
  - E42L Tail Lamp Assembly - Left terminal 1 (X88+UGE)
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**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**

1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
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.
- **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the E5LE Tail/Stop Lamp - Left Outer.

## DTC B3951

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below.
  - E5RE Tail/Stop Lamp - Right Outer (Z88/X88-UGE)
  - E42R Tail Lamp Assembly - Right (X88+UGE)
2. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
  - E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
  - E42R Tail Lamp Assembly - Right terminal 1 (X88+UGE)
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**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the E5RE Tail/Stop Lamp - Right Outer.

## Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Rear Combination Lamp Replacement \(Chevrolet\) Rear Combination Lamp Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC C0277 OR C0890: BRAKE PEDAL POSITION SENSOR CIRCUIT/CONTROL MODULE VOLTAGE REFERENCE OUTPUT 3 CIRCUIT VOLTAGE

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 12

Brake Pedal Position Sensor Circuit Malfunction

#### 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 |
|-------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|------------------------------------|--------------------|
| F23DA (BCM 1) Fuse B+                     | C0890 03,<br>B101E 43,<br>B1405 03,<br>B1529 03,<br>U0121 00 | C0890 03,<br>B101E 43,<br>B1405 03,<br>B1529 03,<br>U0121 00 | -                                  | -                  |
| Brake Pedal Position Sensor 5 V Reference | C0277 06,<br>C0890 03,<br>U0140 71                           | C0277 06,<br>U0140 71                                        | C0277 07,<br>C0890 07,<br>U0140 71 | -                  |
| Brake Pedal Position Sensor Signal        | C0277 06,<br>U0140 71                                        | C0277 06,<br>U0140 71                                        | C0277 07,<br>C0890 07,<br>U0140 71 | C0277 09, C0277 12 |
| Center High Mounted Stop Lamp Control     | B3884 02                                                     | 2                                                            | 2                                  | -                  |
| Stop Lamp - Left Control                  | 1                                                            | 1                                                            | 1                                  | -                  |
| Stop Lamp - Right Control                 | 1                                                            | 1                                                            | 1                                  | -                  |
| Brake Pedal Position Sensor Low Reference | -                                                            | C0277 07,<br>U0140 71                                        | 1                                  | -                  |
| Center High Mounted Stop Lamp Ground      | -                                                            | 2                                                            | -                                  | -                  |

| Circuit                                                                   | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|---------------------------------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Tail Lamp Assembly - Left Ground                                          | -               | 1                    | -                | -                  |
| Tail Lamp Assembly - Right Ground                                         | -               | 1                    | -                | -                  |
| 1. Stop Lamps Malfunction<br>2. Center High Mounted Stop Lamp Malfunction |                 |                      |                  |                    |

### Circuit/System Description

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

### Conditions for Running the DTC

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

### Conditions for Setting the DTC

#### DTC C0277 06

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

#### DTC C0277 07

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

#### DTC C0277 09

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

#### DTC C0277 4B

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

#### DTC C0890 03

- The BCM detects a short to ground in the brake pedal position sensor 5 V reference circuit.
- The BCM detects a short to ground or an open/high resistance in the F23DA (BCM 1) fuse B+ circuit.

#### DTC C0890 07

- The BCM detects a short to voltage in the brake pedal position sensor 5 V reference circuit.
- The BCM detects a short to voltage in the brake pedal position 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 Wiring Schematics

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) 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 low reference circuit terminal 2 and B+.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    2. Test for less than 2  $\Omega$  in the low reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If the test lamp illuminates**
3. Ignition ON.
4. Test for 4.8 - 5.2 V between the 5 V reference circuit terminal 1 and ground.
  - **If less than 4.8 V**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
    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
    3. Test for less than 2  $\Omega$  in the 5 V reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If greater than 5.2 V**

1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
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.
- **Go to next step: If between 4.8 - 5.2 V**
5. Verify the scan tool Brake Pedal Applied parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
    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, replace the K9 Body Control Module.
  - **Go to next step: If Inactive**
6. Install a 3 A fused jumper wire between the 5 V reference circuit terminal 1 and signal circuit terminal 3.
7. Verify the scan tool Brake Pedal Applied parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
8. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [\*\*Brake Pedal Position Sensor Calibration\*\*](#).
9. 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
10. All OK.

#### **DTC C0277 4B**

1. Verify DTC C0277 4B is not set.
  - **If DTC C0277 4B is set**
    1. Ignition ON
    2. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [\*\*Brake Pedal Position Sensor Calibration\*\*](#).
    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
  - 4. All OK.
  - **Go to next step: If DTC C0277 4B is not set**
2. All OK.

#### **DTC C0277 09 and DTC C0277 12**

1. Verify DTC C0277 09 and C0277 12 are not set.

- **If DTC C0277 09 or C0277 12 is set**

1. Replace the B22 Brake Pedal Position sensor.
2. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [Brake Pedal Position Sensor Calibration](#).
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
4. All OK.
  - **Go to next step: If DTC C0277 09 or C0277 12 is not set**

2. All OK.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Brake Pedal Position Sensor Replacement](#)
- Refer to [Brake Pedal Position Sensor Calibration](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DTC C0297: BRAKE APPLIED OUTPUT CIRCUIT SHORT TO GROUND

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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

### Cruise Control Wiring Schematics

Connector End View Reference

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

Scan Tool Reference

Control Module References for scan tool information

### Circuit/System Testing

1. Ignition OFF, disconnect the 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 50 (LTG/LYX)
  - Terminal 29 (LH7)
3. Verify the test lamp turns ON and OFF while pressing and releasing the brake pedal.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
    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.

- **Go to next step: If the test lamp turns ON and OFF**

4. Replace the K20 Engine Control Module.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Brake Pedal Position Sensor Calibration](#)
- Refer to [Control Module References](#) 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](#) before using a symptom table in order to verify that all of the following conditions are true:
  - There are no DTCs set.
  - The control modules can communicate via the serial data link.
- Review the system description and operation in order to familiarize yourself with the system functions. Refer to the following:
  - [Exterior Lighting Systems Description and Operation](#)
  - [Interior Lighting Systems Description and Operation](#)

### Visual/Physical Inspection

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

### Intermittent

Thoroughly inspect the wiring and connectors. An incomplete inspection of the wiring and connectors may result in misdiagnosis causing part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, refer to [Testing for Intermittent Conditions and Poor Connections](#).

### Symptom List

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

- [Adaptive Forward Lighting Malfunction](#)
- [Backup Lamps Malfunction \(Automatic Transmission\)Backup Lamps Malfunction \(Manual Transmission\)](#)
- [Courtesy Lamps Malfunction](#)
- [Daytime Running Lamps Malfunction](#)
- [Dome Lamps Malfunction](#)
- [Front Fog Lamps Malfunction](#)
- [Hazard Lamps Malfunction](#)
- [Headlamps Malfunction](#)
- [Headlamp Leveling Malfunction \(Automatic Headlamp Leveling\)Headlamp Leveling Malfunction \(Manual Headlamp Leveling\)](#)
- [Interior Accent Lighting Malfunction](#)
- [Interior Backlighting Malfunction](#)
- [Park, License, and/or Tail Lamps Malfunction](#)
- [Rear Compartment Lamp Malfunction](#)
- [Stop Lamps Malfunction](#)
- [Trailer Lamps Malfunction](#)

- [Turn Signal Lamps and/or Indicators Malfunction](#)

## ADAPTIVE FORWARD LIGHTING MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                                        | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Headlamp Control Module B+ (F38 UA)            | 1               | 1                    | -                | -                  |
| Headlamp Leveling Actuator - Left B+ (F42 UA)  | 1               | 1                    | -                | -                  |
| Headlamp Leveling Actuator - Right B+ (F42 UA) | 1               | 1                    | -                | -                  |
| Headlamp Control Module Ground                 | -               | 1                    | -                | -                  |
| Headlamp Actuator - Left Ground                | -               | 1                    | -                | -                  |
| Headlamp Actuator - Right Ground               | -               | 1                    | -                | -                  |
| 1. Adaptive Forward Lighting Malfunction       |                 |                      |                  |                    |

### Circuit/System Description

Battery positive voltage is applied to the headlamp leveling control module at all times. The headlamp leveling control module has a normal operational voltage range of about 12.5 - 16 V and is only fully functional with the ignition switch is in the RUN position and the headlamp switch in the AUTOMATIC LIGHT position. The communications enable signal from the body control module (BCM) wakes the headlamp control module microprocessor. The headlamp leveling control module receives serial data messages from the engine control module (ECM), transmission control module (TCM), electronic brake control module (EBCM), and BCM with information regarding power mode, speed, steering angle, transmission gear selection, and headlamp switch status. The headlamp leveling control module calculates the headlamp angle and sends commands to the left and right adaptive forward lighting system headlamp actuators. The headlamp actuators drive the headlamps to the position commanded by the headlamp leveling control module.

### Reference Information

Schematic Reference

### [Headlights/Daytime Running Lights \(DRL\) Wiring Schematics](#)

Connector End View Reference

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- [Testing for Intermittent Conditions and Poor Connections](#)

- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 8 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 6 and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
    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
    3. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X50A Fuse Block - Underhood.
  - **Go to next step: If the test lamp illuminates**
5. Replace the E13 Headlamp Assembly.
6. Ignition ON.
7. Verify the appropriate headlamp operates to the LEFT and RIGHT positions when commanding the appropriate Headlamp Horizontal Motor control LEFT and RIGHT with a scan tool.
  - **If the headlamp does not operate LEFT and RIGHT**

Replace the K26 Headlamp Control Module.
  - **Go to next step: If the headlamp operates LEFT and RIGHT**
8. All OK.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Replacement \(Chevrolet\)](#), [Headlamp Replacement \(GMC\)](#)
- Refer to [Engine Wiring Harness Junction Block Replacement](#)
- Refer to [Control Module References](#) for headlamp leveling control module replacement, programming, and setup

## BACKUP LAMPS MALFUNCTION (AUTOMATIC TRANSMISSION)

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

## Diagnostic Fault Information

| Circuit                     | Short to Ground | Open/High Resistance  | Short to Voltage | Signal Performance |
|-----------------------------|-----------------|-----------------------|------------------|--------------------|
| Backup Lamps Control        | B2545 02        | B2545 01,<br>B2545 04 | 1                | -                  |
| 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 Wiring Schematics](#)

Connector End View Reference

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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

## Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, remove the appropriate E5 Backup Lamp bulb.
2. Test for less than 5  $\Omega$  between the ground circuit at the socket terminal and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
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 Backup Lamps ON and OFF with a scan tool.

- **If the test lamp is always OFF**

1. Ignition OFF, test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$
2. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module and all other components associated with the control circuit.
3. 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, replace the K9 Body Control Module.

- **If the test lamp is always ON**

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

- **Go to next step: If the test lamp turns ON and OFF**

5. Test or replace the E5 Backup Lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## BACKUP LAMPS MALFUNCTION (MANUAL TRANSMISSION)

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                     | Short to Ground | Open/High Resistance  | Short to Voltage | Signal Performance |
|-----------------------------|-----------------|-----------------------|------------------|--------------------|
| Backup Lamp Switch Signal   | P0812           | P0812                 | 1                | -                  |
| Backup Lamps Control        | B2545 02        | B2545 01,<br>B2545 04 | 1                | -                  |
| Backup Lamp Switch Ground   | -               | P0812                 | -                | -                  |
| Backup Lamp - Left Ground   | -               | 1                     | -                | -                  |
| Backup Lamp - Right Ground  | -               | 1                     | -                | -                  |
| 1. Backup Lamps Malfunction |                 |                       |                  |                    |

### Circuit/System Description

The engine control module (ECM) provides a signal circuit to the backup lamp switch which is permanently grounded. 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.

### Reference Information

## Exterior Lights Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) 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.
  - **Go to next step: 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.
  - **Go to next step: 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 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 2 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON.
4. Verify the scan tool Reverse Position Switch parameter is Off.
  - **If not Off**
    1. Ignition OFF, disconnect the X3 harness connector at the K20 Engine Control Module.

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.
- **Go to next step: If Off**
5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground circuit terminal 2.
6. Verify the scan tool Reverse Position Switch parameter is On.
  - **If not On**
    1. Ignition OFF, disconnect the X3 harness connector at the K20 Engine Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K20 Engine Control Module.
  - **Go to next step: If On**
7. Test or replace the B16 Backup Lamp Switch.

### Backup Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E5 Backup Lamp.
2. Test for less than 5  $\Omega$  between the ground circuit at the socket terminal and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
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 Backup Lamps ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the appropriate E5 Backup Lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Backup Bulb Replacement \(Chevrolet\)](#) [Backup Bulb Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM or ECM replacement, programming, and setup

## COURTESY LAMPS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                                | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|----------------------------------------|-----------------|----------------------|------------------|--------------------|
| Courtesy Lamps Control Terminal 3 X7   | B1480 02        | 1                    | 1                | -                  |
| Center Console Compartment Lamp Ground | -               | 1                    | -                | -                  |
| Dome/Reading Lamps - Left Rear Ground  | -               | 1                    | -                | -                  |
| Dome/Reading Lamps - Right Rear Ground | -               | 1                    | -                | -                  |
| Front Overhead Console Assembly Ground | -               | 1                    | -                | -                  |
| Sunshade - Left Ground                 | -               | 1                    | -                | -                  |
| Sunshade - Right Ground                | -               | 1                    | -                | -                  |
| 1. Courtesy Lamps Malfunction          |                 |                      |                  |                    |

### Circuit/System Description

The body control module (BCM) supplies battery voltage to the front and rear reading lamps, left and right sunshade lamps, and center console compartment lamp via the courtesy lamp control circuit. When the center console compartment or a sunshade mirror is opened, the switch contact close allowing battery voltage to flow illuminating the respective lamps. The front and rear reading lamps are controlled by individual switches that are activated by the operator when additional cabin lighting is required. In the event that any of these courtesy lamps were to remain illuminated for more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the courtesy lamp control circuit to prevent total battery discharge.

### Reference Information

Schematic Reference

### [Interior Lights Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

## Control Module References for scan tool information

### Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connectors at the components listed below.
  - A3L Sunshade - Left
  - A3R Sunshade - Right
  - A98 Front Overhead Console Assembly
  - E28 Center Console Compartment Lamp
  - E37LR Dome/Reading Lamps - Left Rear
  - E37RR Dome/Reading Lamps - Right Rear
2. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - A3L Sunshade - Left terminal B
  - A3R Sunshade - Right terminal B
  - A98 Front Overhead Console Assembly terminal 5
  - E28 Center Console Compartment Lamp terminal 1
  - E37LR Dome/Reading Lamps - Left Rear terminal 3
  - E37RR Dome/Reading Lamps - Right Rear terminal 3
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
    - **Go to next step: If less than 10  $\Omega$**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - A3L Sunshade - Left terminal A
  - A3R Sunshade - Right terminal A
  - A98 Front Overhead Console Assembly terminal 7
  - E28 Center Console Compartment Lamp terminal 2
  - E37LR Dome/Reading Lamps - Left Rear terminal 1
  - E37RR Dome/Reading Lamps - Right Rear terminal 1
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**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
    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.

- Go to next step: If the test lamp turns ON and OFF

5. Test or replace the courtesy lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Sunshade Replacement](#)
- Refer to [Roof Rail Rear Seat Position Reading and Courtesy Lamp Replacement](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DAYTIME RUNNING LAMPS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                                                                                 | Short to Ground | Open/High Resistance               | Short to Voltage | Signal Performance |
|-----------------------------------------------------------------------------------------|-----------------|------------------------------------|------------------|--------------------|
| Ambient Light/Sunload Sensor Signal                                                     | B2645 03        | B2645 07                           | B2645 07         | -                  |
| Daytime Running Lamp - Left Control                                                     | B260D 02        | 1                                  | 1                | -                  |
| Daytime Running Lamp - Right Control                                                    | B260E 02        | 1                                  | 1                | -                  |
| Multifunction LED Control Module Relay Control                                          | 2               | 2                                  | 2                | -                  |
| Ambient Light/Sunload Sensor Low Reference                                              | -               | B2645 07,<br>B0163 05,<br>B0183 05 | -                | -                  |
| Headlamp Assembly - Left Ground                                                         | -               | 1                                  | -                | -                  |
| Headlamp Assembly - Right Ground                                                        | -               | 1                                  | -                | -                  |
| 1. Daytime Running Lamps Malfunction<br>2. Multifunction LED Control Module Malfunction |                 |                                    |                  |                    |

### Circuit/System Description

#### Daytime Running Lamps With CE1

The rain/ambient light sensor module is used to monitor outside lighting conditions. The rain/ambient light sensor module provides a serial data message to the BCM based on outside lighting conditions to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the designated daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

#### Daytime Running Lamps Without CE1

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor and the HVAC control module provides a low reference ground. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the

BCM will command the daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

### **Diagnostic Aids**

When testing at the park/daytime running 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

### **Headlights/Daytime Running Lights (DRL) Wiring Schematics**

Connector End View Reference

### **COMPONENT CONNECTOR END VIEWS - INDEX**

Description and Operation

### **Exterior Lighting Systems Description and Operation**

Electrical Information Reference

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

Scan Tool Reference

**Control Module References** for scan tool information

### **Circuit/System Verification**

1. Ignition ON.
2. Verify the left daytime running lamp turns ON and OFF while commanding the Left Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
  - **If the left daytime running lamp does not turn ON and OFF**  
  
Refer to Daytime Running Lamps Malfunction.
  - **Go to next step: If the left daytime running lamp turns ON and OFF**
3. Verify the right daytime running lamp turns ON and OFF while commanding the Right Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
  - **If the right daytime running lamp does not turn ON and OFF**  
  
Refer to Daytime Running Lamps Malfunction.
  - **Go to next step: If the right daytime running lamp turns ON and OFF**

### **NOTE:**

- **Vehicles equipped with RPO CE1 use the B200 Rain Sensor Module for ambient light status. Vehicles without RPO CE1 use the B10B Ambient Light/Sunload Sensor for ambient light status.**
- **Placing a towel over the ambient light sensor can simulate a dim light condition and shining an incandescent light at the ambient light sensor can simulate a bright light condition.**

4. Verify the scan tool Ambient Light Status parameter changes while switching from dim to bright ambient light conditions

- **If the parameter does not change and the vehicle is equipped with RPO CE1**

Refer to Rain Sensing Module Malfunction.

- **If the parameter does not change and the vehicle is not equipped with RPO CE1**

Refer to Ambient Light Sensor Malfunction.

- **Go to next step: If the parameter changes and the automatic headlamps turn ON and OFF**

5. All OK.

### Circuit/System Testing

#### Daytime Running Lamps Malfunction (Without T4L)

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.

2. Test for less than 5  $\Omega$  between the appropriate ground circuit terminal listed below and ground.

- Terminal 4 (Z88+T4F)
- Terminal 5 (All others without T4L)
- **If 5  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 5  $\Omega$**

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

- Terminal 7 (Z88+T4F)
- Terminal 4 (All others without T4L)

4. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.

- **If the test lamp is always OFF**

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

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. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module

- **If the test lamp is always ON**

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

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

- **Go to next step: If the test lamp turns On and Off**

5. Test or replace the E13 Headlamp Assembly.

#### Daytime Running Lamps Malfunction (With T4L)

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
2. Test for less than 5  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - Terminal 4 (Z88+T4L)
  - Terminal 5 (X88+T4L)
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Ignition on, command the appropriate Front Park Lamp/Daytime Running Lamp ON with a scan tool.
4. Test for 4.8V-5.2V between the appropriate control circuit terminal listed below and ground.
  - Terminal 7 (Z88+T4L)
  - Terminal 4 (X88+T4L)
  - **If less than 4.8V**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module
  - **If more than 5.2V**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
    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
  - **Go to next step: If between 4.8V-5.2V**
5. Test or replace the E13 Headlamp Assembly.

### Ambient Light Sensor Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the B10B Ambient Light/Sunload Sensor. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 5  $\Omega$  between the low reference circuit terminal 6 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF, disconnect the X2 harness connector at the K33 HVAC Control Module.
    2. Test for less than 2  $\Omega$  in the low reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K33 HVAC Control Module.
  - **Go to next step: If less than 5  $\Omega$**
3. Ignition ON.
4. Verify the scan tool Ambient Light Sensor parameter is greater than 4.65 V.
  - **If 4.65 V or less**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If greater than 4.65 V**
5. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the low reference circuit terminal 6.
  6. Verify the scan tool Ambient Light Sensor parameter is less than 0.196 V.
    - **If 0.196 V or greater**
      1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
      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
      3. Test for less than 2  $\Omega$  in the signal circuit end to end.
        - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
        - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **Go to next step: If less than 0.196 V**
  7. Test or replace the B10B Ambient Light/Sunload Sensor.

### Rain Sensing Module Malfunction

1. Verify the B200 Rain Sensor Module is properly installed and there is no windshield damage or tinted window film than may obstruct or obscure the sensor.
  - **If incorrectly installed or the sensor is obstructed**  
Repair as necessary.
  - **Go to next step: If installed properly with no obstructions**
2. Ignition OFF, all vehicle systems OFF, disconnect the harness connector at the B200 Rain Sensor Module. It may take up to 2 min for all vehicle systems to power down.
3. Test for less than 10  $\Omega$  between the ground circuit terminal 3 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
4. Ignition ON.
5. 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**
    1. Ignition OFF, remove the test lamp.
    2. Test for less than 2  $\Omega$  in the B+ circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , 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**
    1. Ignition OFF, remove the test lamp.
    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 B200 Rain Sensor Module.
  - **Go to next step: If the test lamp illuminates**
6. Test for 5.0 - 10.0 V between the serial data circuit terminal 2 and ground.
  - **If less than 5.0 V**
    1. Ignition OFF, disconnect the X6 harness connector at the K9 Body Control Module.

2. Test for infinite resistance between the serial data circuit and ground.

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

3. Test for less than 2  $\Omega$  in the serial data circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

• **If greater than 10.0 V**

1. Ignition OFF, disconnect the X6 harness connector at the K9 Body Control Module, ignition ON.

2. Test for less than 1 V between the serial data 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.

• **Go to next step: If between 5.0 - 10.0 V**

7. Test or replace the B200 Rain Sensor Module.

### **Multifunction LED Control Module Malfunction**

1. Ignition OFF, disconnect the KR50 Headlamp Relay.

2. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

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

Replace the X50A Fuse Block - Underhood.

• **Go to next step: If the test lamp illuminates**

3. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.

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

Replace the X50A Fuse Block - Underhood.

• **Go to next step: If the test lamp illuminates**

4. Connect a test lamp between the control circuit terminal 1 and B+, ignition ON.

5. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.

• **If the test lamp is always OFF**

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

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

3. Ignition OFF.

4. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

• **If the test lamp is always ON**

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

2. Test for infinite resistance between the control circuit terminal 13 and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K9 Body Control Module.

• **Go to next step: If the test lamp turns ON and OFF**

6. Ignition OFF, connect the KR50 Headlamp Relay.

7. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.

8. Test for less than 10  $\Omega$  between the ground circuit terminal 4 and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.
2. Test for less than 2  $\Omega$  in the ground circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

9. Connect a test lamp between the control circuit terminal 5 and ground, ignition ON.
10. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
    2. Test for infinite resistance between the control circuit terminal 5 and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance
    3. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the KR50 Headlamp Relay.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood, ignition ON.
    2. Test for less than 1 V between the control circuit terminal 5 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V, replace the KR50 Headlamp Relay.
  - **Go to next step: If the test lamp turns ON and OFF**
11. Test or replace the appropriate E13 Headlamp Assembly.

## Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Replacement \(Chevrolet\)](#), [Headlamp Replacement \(GMC\)](#)
- Refer to [Relay Replacement \(Attached to Wire Harness\)](#), [Relay Replacement \(Within an Electrical Center\)](#).
- Refer to [Sun Load Temperature and Headlamp Automatic Control Ambient Light Sensor Replacement \(Equinox\)](#), [Sun Load Temperature and Headlamp Automatic Control Ambient Light Sensor Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## DOMELAMPS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                                          | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|--------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Dome Lamp Switch Cancel Signal                   | B380B 02        | 1                    | 1                | -                  |
| Dome Lamp Switch ON Signal                       | 1               | B380A 01             | B380A 01         | -                  |
| Dome/Reading Lamps - Front Control Terminal 1 X7 | B2615 02        | 1                    | 1                | -                  |

| Circuit                                | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|----------------------------------------|-----------------|----------------------|------------------|--------------------|
| Dome/Reading Lamps - Left Rear Ground  | -               | 1                    | -                | -                  |
| Dome/Reading Lamps - Right Rear Ground | -               | 1                    | -                | -                  |
| Front Overhead Console Assembly Ground | -               | 1                    | -                | -                  |
| 1. Dome Lamps Malfunction              |                 |                      |                  |                    |

### Circuit/System Description

The dome lamp switch has 3 positions: DOOR, OFF, and ON. The ON position provides a ground for continuous operation and the dome lamp will remain illuminated until the switch is placed in either the DOOR or OFF position. When in the DOOR position, the dome lamp operation is controlled by the body control module (BCM). When any door is opened, the door ajar switch contacts close and the 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 s after the last door closes. When the driver places the dome lamp switch in the OFF position, the dome lamp will be disabled. In the event that the dome lamp were to remain illuminated for more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the dome lamp control circuit to prevent total battery discharge.

### Reference Information

Schematic Reference

### Interior Lights Wiring Schematics

Connector End View Reference

### COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

### Interior Lighting Systems Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Verification

1. Ignition ON.
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](#).
  - **Go to next step: If the parameter changes**
3. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter changes between Door, On, and Cancel while placing the dome lamp switch in the Door, On, and Cancel positions.
  - **If the parameter does not change**

Refer to Dome Lamp Switch Malfunction.

- **Go to next step: If the parameter changes**

4. 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 Dome Lamps Malfunction.

- **Go to next step: If the dome lamps turn ON and OFF**

5. All OK.

## Circuit/System Testing

### Dome Lamp Switch Malfunction

1. Ignition OFF/Vehicle OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the A98 Front Overhead Console Assembly. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10  $\Omega$  between the ground circuit terminal 5 and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF/Vehicle OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

3. Ignition ON/vehicle in Service Mode.

4. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Door.

- **If Cancel**

1. Ignition OFF/Vehicle OFF, disconnect the X6 harness connector at the K9 Body Control Module.

2. Test for infinite resistance between the signal circuit terminal 21 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 On**

1. Ignition OFF/Vehicle OFF, disconnect the X7 harness connector at the K9 Body Control Module.

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.

- **Go to next step: If Door**

5. Install a 3 A fused jumper wire between the signal circuit terminal 21 and ground.

6. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Cancel.

- **If not Cancel**

1. Ignition OFF/Vehicle OFF, disconnect the X6 harness connector at the K9 Body Control Module, ignition ON/vehicle in Service Mode.

2. Test for less than 1 V between the signal circuit terminal 21 and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V

3. Test for less than 2  $\Omega$  in the signal circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If Cancel**

7. Install a 3 A fused jumper wire between the signal circuit terminal 3 and ground.
8. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is On.
  - **If not On**
    1. Ignition OFF/Vehicle OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON/vehicle in Service Mode.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If On**
9. Test or replace the A98 Front Overhead Console Assembly.

## Dome Lamps Malfunction

**NOTE:** Each dome lamp may need to be disconnected to isolate the short to ground. Use the schematic to identify the following:

- Each dome lamps control and ground circuit terminals
  - All dome lamps equipped on the vehicle
  - Component locations on the dome lamps control circuits
1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connectors at the following components. It may take up to 2 min for all vehicle systems to power down.
    - A98 Front Overhead Console Assembly
    - E37LR Dome/Reading Lamps - Left Rear
    - E37RR Dome/Reading Lamps - Right Rear
  2. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
    - A98 Front Overhead Console Assembly terminal 5
    - E37LR Dome/Reading Lamps - Left Rear terminal 3
    - E37RR Dome/Reading Lamps - Right Rear terminal 3
    - **If 10  $\Omega$  or greater**
      1. Ignition OFF.
      2. Test for less than 2  $\Omega$  in the ground circuit end to end.
        - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
        - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
    - **Go to next step: If less than 10  $\Omega$**
  3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - A98 Front Overhead Console Assembly terminal 8
    - E37LR Dome/Reading Lamps - Left Rear terminal 4
    - E37RR Dome/Reading Lamps - Right Rear terminal 4
  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**
      1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
      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. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

• **If the test lamp is always ON**

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

• **Go to next step: If the test lamp turns ON and OFF**

5. Test or replace the dome/courtesy lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Roof Rail Rear Seat Position Reading and Courtesy Lamp Replacement](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## FRONT FOG LAMPS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                        | Short to Ground       | Open/High Resistance  | Short to Voltage | Signal Performance |
|--------------------------------|-----------------------|-----------------------|------------------|--------------------|
| Front Fog Lamp Fuse B+         | 1                     | 1                     | -                | -                  |
| Front Fog Lamp Switch Signal   | B2740 00              | 1                     | 1                | -                  |
| Front Fog Lamp Relay Control   | B2530 02,<br>B2530 04 | B2530 02,<br>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 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.

### Reference Information

Schematic Reference

### Fog Lights Wiring Schematics

Connector End View Reference

## [COMPONENT CONNECTOR END VIEWS - INDEX](#)

## Exterior Lighting Systems Description and Operation

### Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

### Scan Tool Reference

### [Control Module References](#) for scan tool information

### Circuit/System Verification

1. Ignition ON, headlamps 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.
  - **Go to next step: 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.
  - **Go to next step: 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.
  - **Go to next step: If the front fog lamp indicator turns ON and OFF**
5. All OK.

### Circuit/System Testing

#### Front Fog Lamp 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 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 8 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON.
4. Verify the scan tool Front Fog Lamps Switch parameter is Inactive.
  - **If not Inactive**

1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the signal circuit terminal 10 and ground.
  - If less than infinite resistance, repair the short to ground on the circuit.
  - If infinite resistance, replace the K9 Body Control Module.
- **Go to next step: If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 10 and ground.
6. Verify the scan tool Front Fog Lamps Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    2. Test for less than 1 V between the signal circuit terminal 10 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
7. 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 10 and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block - Underhood.
    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
    3. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X50A Fuse Block - Underhood.
  - **Go to next step: If the test lamp illuminates**
3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 10 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**
    1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block - Underhood, ignition ON.
    2. Test for less than 1 V between the control circuit terminal 10 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.
  - **Go to next step: If the test lamp illuminates**
6. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
7. Install the front fog lamp fuse at the X50A Fuse Block - Underhood.
8. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E29 Fog Lamp.
9. Test for less than 5  $\Omega$  between the ground circuit terminal 2 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

• **Go to next step: If less than 5  $\Omega$**

10. Connect a test lamp between the control circuit terminal 1 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**

1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.

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. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

• **If the test lamp is always ON**

1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood, ignition ON.

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.

• **Go to next step: 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.

• **Go to next step: If the front fog lamp indicator turns ON and OFF**

3. Replace the K9 Body Control Module.

## Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\)](#), [Headlamp Switch Replacement \(Terrain Base\)](#).
- Refer to [Front Fog Lamp Bulb Replacement \(Chevrolet - Left Side\)](#), [Front Fog Lamp Bulb Replacement \(Chevrolet - Right Side\)](#), [Front Fog Lamp Bulb Replacement \(GMC - Left\)](#), [Front Fog Lamp Bulb Replacement \(GMC - Right\)](#).
- Refer to [Control Module References](#) for BCM or Instrument Cluster replacement, programming, and setup

## HAZARD LAMPS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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                   | B3596 00        | 1                    | 1                | -                  |
| Hazard Warning Switch LED Backlighting Control | 1               | 1                    | 1                | -                  |
| Hazard Warning Switch Ground                   | -               | 1                    | -                | -                  |
| 1. Hazard Lamps 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 voltage to the hazard switch LED backlighting control circuit illuminating the LED to the desired level of brightness.

### Reference Information

Schematic Reference

### Exterior Lights Wiring Schematics

Connector End View Reference

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### Exterior Lighting Systems Description and Operation

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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Verification

1. Ignition ON.
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.
  - **Go to next step: 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](#)

- **Go to next step: 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.

- **Go to next step: 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 min for all vehicle systems to power down.

2. Test for less than 5  $\Omega$  between the ground circuit terminal 1 and ground.

- **If 5  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 5  $\Omega$**

3. Ignition ON.

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

- **If not Inactive**

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

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.

- **Go to next step: If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 2 and ground.

6. Verify the scan tool Hazard Lamps Switch parameter is Active.

- **If not Active**

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

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

3. Test for less than 2  $\Omega$  in the signal circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: 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 min for all vehicle systems to power down.
2. Test for less than 5  $\Omega$  between the ground circuit terminal 1 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Connect a test lamp between the control circuit terminal 4 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**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the S26 Hazard Warning Switch.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Hazard Warning Switch Replacement \(Equinox\)](#), [Hazard Warning Switch Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## HEADLAMPS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit               | Short to Ground       | Open/High Resistance  | Short to Voltage | Signal Performance |
|-----------------------|-----------------------|-----------------------|------------------|--------------------|
| F21DA (BCM 4) Fuse B+ | B2575 01,<br>B2575 04 | B2575 01,<br>B2575 04 | -                | -                  |
| F8DA (BCM 3) Fuse B+  | B2699 01,<br>B2699 04 | B2699 01,<br>B2699 04 | -                | -                  |
|                       |                       |                       |                  |                    |

| Circuit                                                                                                                                                                                                              | Short to Ground | Open/High Resistance  | Short to Voltage | Signal Performance |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------|------------------|--------------------|
| Headlamp High Beam Relay Control                                                                                                                                                                                     | B2580 02        | B2580 04              | B2580 01         | -                  |
| Low Beam Headlamp - Left Control                                                                                                                                                                                     | B2575 02        | B2575 01,<br>B2575 04 | 1                | -                  |
| Low Beam Headlamp - Right Control                                                                                                                                                                                    | B2699 02        | B2699 01,<br>B2699 04 | 1                | -                  |
| High Beam Headlamp - Left Control                                                                                                                                                                                    | 2               | 2                     | 2                | -                  |
| High Beam Headlamp - Right Control                                                                                                                                                                                   | 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 Auto High Beam Select Signal (TQ5)                                                                                                                                                  | 5               | 5                     | 5                | -                  |
| Turn Signal/Multifunction Switch Flash To Pass Signal                                                                                                                                                                | B3806 00        | 4                     | 4                | -                  |
| Turn Signal/Multifunction Switch High Beam Signal                                                                                                                                                                    | B3650 08        | 4                     | 4                | -                  |
| Headlamp Assembly - Left Ground                                                                                                                                                                                      | -               | 1                     | -                | -                  |
| Headlamp Assembly - Right Ground                                                                                                                                                                                     | -               | 1                     | -                | -                  |
| Headlamp Switch Ground                                                                                                                                                                                               | -               | 3                     | -                | -                  |
| Turn Signal/Multifunction Switch Ground                                                                                                                                                                              | -               | 4                     | -                | -                  |
| 1. Headlamps Malfunction - Low Beam<br>2. Headlamps Malfunction - High Beam<br>3. Headlamp Switch Malfunction<br>4. Turn Signal/Multifunction Switch Malfunction<br>5. Automatic High Beam Select Switch Malfunction |                 |                       |                  |                    |

### Circuit/System Description

#### Low Beams

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.

#### High Beams

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 fuse's to the high beam control circuits actuating the left and right high beam solenoid actuators opening the right and left high beam shutters exposing the full headlamps for high beam operation.

## **Flash to Pass**

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.

## **With CE1**

The rain/ambient light sensor module is used to monitor outside lighting conditions. The rain/ambient light sensor module provides a serial data message to the BCM based on outside lighting conditions to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the designated daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

## **Without CE1**

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor and the HVAC control module provides a low reference ground. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lamps or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the daytime running lamps ON. During low light conditions the BCM will command the low beam headlamps ON. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

## **Diagnostic Aids**

When testing at the headlamp bulb sockets, 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

### **Headlights/Daytime Running Lights (DRL) Wiring Schematics**

Connector End View Reference

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Scan Tool Reference

**Control Module References** for scan tool information

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.
  - **Go to next step: 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.
  - **Go to next step: 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.
  - **Go to next step: 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.
  - **Go to next step: If the parameter changes**
6. Verify the left low beam headlamp turns ON and OFF when commanding the Left Headlamp Low Beam ON and OFF with a scan tool.
  - **If the left low beam headlamp does not turn ON and OFF**  
Refer to Headlamps Malfunction - Low Beam.
  - **Go to next step: If the left low beam headlamp turns ON and OFF**
7. Verify the right low beam headlamp turns ON and OFF when commanding the Right Headlamp Low Beam ON and OFF with a scan tool.
  - **If the right low beam headlamp does not turn ON and OFF**  
Refer to Headlamps Malfunction - Low Beam.
  - **Go to next step: If the right low beam headlamp 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.
  - **Go to next step: 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.
  - **Go to next step: If the high beam indicator turns ON and OFF**

10. (TQ5 only), verify the automatic high beam control indicator on the instrument cluster turns ON and OFF while commanding the automatic high beam control ON and OFF with the automatic high beam control switch located on the Turn Signal/Multifunction switch.

- **If the automatic high beam control indicator does not turn ON and OFF.**

Refer to Automatic High Beam Select Switch Malfunction.

- **Go to next step: If the automatic high beam control indicator turns ON and OFF.**

#### **NOTE:**

- **Vehicles equipped with RPO CE1 use the B200 Rain Sensor Module for ambient light status. Vehicles without RPO CE1 use the B10B Ambient Light/Sunload Sensor for ambient light status.**
- **Placing a towel over the ambient light sensor can simulate a dim light condition and shining an incandescent light at the ambient light sensor can simulate a bright light condition.**

11. Verify the scan tool Ambient Light Status parameter changes while switching from dim to bright ambient light conditions

- **If the parameter does not change and the vehicle is equipped with RPO CE1**

Refer to Rain Sensing Module Malfunction.

- **If the parameter does not change and the vehicle is not equipped with RPO CE1**

Refer to Ambient Light Sensor Malfunction.

- **Go to next step: If the parameter changes and the automatic headlamps turn ON and OFF**

12. All OK.

### **Circuit/System Testing**

#### **Headlamp 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 min for all vehicle systems to power down.

2. Test for less than 10  $\Omega$  between the ground circuit terminal 8 and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

3. Ignition ON.

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

- **If not Inactive**

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

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.

- **Go to next step: If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 3 and ground.

6. Verify the scan tool Automatic Headlamps Disable Switch parameter is Active.

- **If not Active**

1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
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
3. Test for less than 2  $\Omega$  in the signal circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
7. Verify the scan tool Park Lamps Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    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.
    - **Go to next step: If Inactive**
8. Install a 3 A fused jumper wire between the signal circuit terminal 5 and ground.
9. Verify the scan tool Park Lamps Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **Go to next step: If Active**
10. Verify the scan tool Headlamps On Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    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.
    - **Go to next step: If Inactive**
11. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground.
12. Verify the scan tool Headlamps On Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **Go to next step: If Active**
13. Test or replace the S30 Headlamp Switch.

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 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 3 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON.
4. Verify the scan tool High Beam Select Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 7 and ground.
6. Verify the scan tool High Beam Select Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
7. Verify the scan tool Headlamps Flash Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.
    2. Test for infinite resistance between the signal circuit terminal 6 and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance, replace the K9 Body Control Module.
  - **Go to next step: If Inactive**
8. Install a 3 A fused jumper wire between the signal circuit terminal 6 and ground.
9. Verify the scan tool Headlamps Flash Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module, ignition ON.
    2. Test for less than 1 V between the signal circuit terminal 6 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**

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

### **Automatic High Beam Select Switch Malfunction (with TQ5)**

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 min for all vehicle systems to power down.
2. Test for less than 5  $\Omega$  between the ground circuit terminal 3 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Ignition ON, Headlamp Switch ON
4. Verify the automatic high beam control indicator on the instrument cluster is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 4 and ground.
6. Verify the automatic high beam control indicator on the instrument cluster is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
7. Test or replace the S78 Turn Signal/Multifunction Switch.

### **Headlamps Malfunction - Low Beam (T4A)**

1. Ignition OFF, scan tool disconnected, all doors closed, exterior lamps OFF, remove the appropriate E4 Headlamp - Low Beam. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit at the socket terminal and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
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 Headlamp Low Beam ON and OFF with a scan tool.
  - **If the test lamp is always OFF**

1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
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. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.
- **If the test lamp is always ON**
  1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
  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.
- **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the E4 Headlamp - Low Beam.

### **Headlamps Malfunction - Low Beam (T4F)**

1. Ignition OFF, scan tool disconnected, all doors closed, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 1 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
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 appropriate Headlamp Low Beam ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
5. Ignition OFF, replace the appropriate E4 Headlamp - Low Beam bulb.
6. Ignition ON, verify the appropriate low beam headlamp illuminates when commanded ON with the headlamp switch.
  - **If the low beam headlamp does not illuminate**
    1. Test or replace the appropriate E13 Headlamp Assembly.

- **Go to next step: If the low beam headlamp illuminates**

7. All OK.

### **Headlamps Malfunction - Low Beam (T4L)**

1. Ignition OFF, scan tool disconnected, all doors closed, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 1 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
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 appropriate Headlamp Low Beam ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the E13 Headlamp Assembly.

### **Headlamps Malfunction - High Beam (T4A/T4F)**

1. Ignition OFF, disconnect the KR48 Headlamp High Beam Relay, ignition ON
2. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
  - **If the test lamp does not illuminate**

Replace the X50A Fuse Block - Underhood.
  - **Go to next step: 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**

Replace the X50A Fuse Block - Underhood.
  - **Go to next step: If the test lamp illuminates**
4. Connect a test lamp between the control circuit terminal 1 and B+, ignition ON.
5. 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**

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the control circuit terminal 18 and ground.
  - If 1 V or greater, repair the short to voltage on the circuit.
  - If less than 1 V
3. Ignition OFF.
4. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.
- **If the test lamp is always ON**
  1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
  2. Test for infinite resistance between the control circuit terminal 18 and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance, replace the K9 Body Control Module.
- **Go to next step: If the test lamp turns ON and OFF**
6. Ignition OFF, exterior lamps OFF, connect the KR48 Headlamp High Beam Relay.
7. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
8. Test for less than 10  $\Omega$  between the ground circuit terminal 1 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
9. Connect a test lamp between the control circuit terminal 3 and ground, ignition ON, low beams ON.
10. 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**
    1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood, ignition ON.
    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.
  - **Go to next step: If the test lamp turns ON and OFF**
11. Test or replace the appropriate M28 High Beam Solenoid Actuator.

### Headlamps Malfunction - High Beam (T4L)

1. Ignition OFF, disconnect the KR48 Headlamp High Beam Relay, ignition ON
2. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
  - **If the test lamp does not illuminate**

Replace the X50A Fuse Block - Underhood.

- **Go to next step: 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**

Replace the X50A Fuse Block - Underhood.

- **Go to next step: If the test lamp illuminates**

4. Connect a test lamp between the control circuit terminal 1 and B+, ignition ON.

5. 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**

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

2. Test for less than 1 V between the control circuit terminal 18 and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V

3. Ignition OFF.

4. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If the test lamp is always ON**

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

2. Test for infinite resistance between the control circuit terminal 18 and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K9 Body Control Module.

- **Go to next step: If the test lamp turns ON and OFF**

6. Ignition OFF, exterior lamps OFF, connect the KR48 Headlamp High Beam Relay.

7. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.

8. Test for less than 10  $\Omega$  between the ground circuit terminal 1 and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

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

10. 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**

1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.

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. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If the test lamp is always ON**

1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood, ignition ON.
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.
- **Go to next step: If the test lamp turns ON and OFF**
11. Test or replace the appropriate E13 Headlamp Assembly.

### 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.
  - **Go to next step: If the high beam indicator turns ON and OFF**
3. Replace the K9 Body Control Module.

### Ambient Light Sensor Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the B10B Ambient Light/Sunload Sensor. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 5  $\Omega$  between the low reference circuit terminal 6 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF, disconnect the X2 harness connector at the K33 HVAC Control Module.
    2. Test for less than 2  $\Omega$  in the low reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K33 HVAC Control Module.
  - **Go to next step: If less than 5  $\Omega$**
3. Ignition ON.
4. Verify the scan tool Ambient Light Sensor parameter is greater than 4.65 V.
  - **If 4.65 V or less**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If greater than 4.65 V**
5. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the low reference circuit terminal 6.
6. Verify the scan tool Ambient Light Sensor parameter is less than 0.196 V.
  - **If 0.196 V or greater**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If less than 0.196 V**

7. Test or replace the B10B Ambient Light/Sunload Sensor.

## Rain Sensing Module Malfunction

1. Verify the B200 Rain Sensor Module is properly installed and there is no windshield damage or tinted window film than may obstruct or obscure the sensor.

- **If incorrectly installed or the sensor is obstructed**

Repair as necessary.

- **Go to next step: If installed properly with no obstructions**

2. Ignition OFF, all vehicle systems OFF, disconnect the harness connector at the B200 Rain Sensor Module. It may take up to 2 min for all vehicle systems to power down.

3. Test for less than 10  $\Omega$  between the ground circuit terminal 3 and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.

- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

4. Ignition ON.

5. 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**

1. Ignition OFF, remove the test lamp.

2. Test for less than 2  $\Omega$  in the B+ circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.

- If less than 2  $\Omega$ , 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**

1. Ignition OFF, remove the test lamp.

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 B200 Rain Sensor Module.

- **Go to next step: If the test lamp illuminates**

6. Test for 5.0 - 10.0 V between the serial data circuit terminal 2 and ground.

- **If less than 5.0 V**

1. Ignition OFF, disconnect the X6 harness connector at the K9 Body Control Module.

2. Test for infinite resistance between the serial data circuit and ground.

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

- If infinite resistance

3. Test for less than 2  $\Omega$  in the serial data circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.

- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If greater than 10.0 V**

1. Ignition OFF, disconnect the X6 harness connector at the K9 Body Control Module, ignition ON.

2. Test for less than 1 V between the serial data 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.

- **Go to next step: If between 5.0 - 10.0 V**

7. Test or replace the B200 Rain Sensor Module.

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\)](#), [Headlamp Switch Replacement \(Terrain Base\)](#).
- Refer to [Headlamp Replacement \(Chevrolet\)](#), [Headlamp Replacement \(GMC\)](#).
- Refer to [Headlamp Bulb Replacement - Left Side \(Chevrolet with T4A\)](#), [Headlamp Bulb Replacement - Left Side \(GMC with T4F\)](#), [Headlamp Bulb Replacement - Left Side \(Chevrolet with T4F\)](#).
- Refer to [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4A and LYX\)](#), [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4F and LYX\)](#), [Headlamp Bulb Replacement - Right Side \(GMC with T4F and LTG\)](#), [Headlamp Bulb Replacement - Right Side \(GMC with T4F and LYX\)](#), [Headlamp Bulb Replacement - Right Side \(GMC with T4F and LH7\)](#), [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4F and LTG\)](#), [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4F and LH7\)](#), [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4A and LH7\)](#), [Headlamp Bulb Replacement - Right Side \(Chevrolet with T4A and LTG\)](#).
- Refer to [Relay Replacement \(Attached to Wire Harness\)](#), [Relay Replacement \(Within an Electrical Center\)](#).
- Refer to [Turn Signal Switch Replacement \(Equinox\)](#), [Turn Signal Switch Replacement \(Terrain\)](#).
- Refer to [Engine Wiring Harness Junction Block Replacement](#).
- Refer to [Windshield Multifunction Sensor Mount Bracket Cover Replacement](#).
- Refer to [Control Module References](#) for BCM or instrument cluster replacement, programming, and setup.

## HEADLAMP LEVELING MALFUNCTION (AUTOMATIC HEADLAMP LEVELING)

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic Refer to category.

### Diagnostic Fault Information

| Circuit                                            | Short to Ground                                                           | Open/High Resistance                                                      | Short to Voltage                                             | Signal Performance |
|----------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------|--------------------|
| LIN Serial Data - Left Headlamp Leveling Actuator  | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05              | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05              | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05 | -                  |
| LIN Serial Data - Right Headlamp Leveling Actuator | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05              | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05              | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3843 05 | -                  |
| Headlamp Control Module B+ (F38 UA)                | U0181 00                                                                  | U0181 00                                                                  | -                                                            | -                  |
| Headlamp Leveling Actuator - Left B+ (F42 UA)      | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3435 00,<br>B3843 05 | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3435 00,<br>B3843 05 | B3435 00                                                     | -                  |

| Circuit                                        | Short to Ground                                                           | Open/High Resistance                                                      | Short to Voltage | Signal Performance |
|------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------|--------------------|
| Headlamp Leveling Actuator - Right B+ (F42 UA) | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3440 00,<br>B3843 05 | U1513 00,<br>U1514 00,<br>U1523 00,<br>U1524 00,<br>B3440 00,<br>B3843 05 | B3440 00         | -                  |
| Suspension Height Sensor 5V Reference - Front  | B3415 02                                                                  | 1                                                                         | B3415 01         | -                  |
| Suspension Height Sensor 5V Reference - Rear   | B3415 02                                                                  | 1                                                                         | B3415 01         | -                  |
| Suspension Height Sensor Signal - Front        | B3410 02                                                                  | B3410 05                                                                  | B3410 05         | B3410 08, B3410 5A |
| Suspension Height Sensor Signal - Rear         | B3420 02                                                                  | B3420 05                                                                  | B3420 05         | B3420 08, B3420 5A |
| Suspension Height Sensor Low Reference - Front | -                                                                         | 1                                                                         | -                | -                  |
| Suspension Height Sensor Low Reference - Rear  | -                                                                         | 1                                                                         | -                | -                  |
| Headlamp Control Module Ground                 | -                                                                         | 1                                                                         | -                | -                  |
| Headlamp Leveling Actuator - Left Ground       | -                                                                         | 1                                                                         | -                | -                  |
| Headlamp Leveling Actuator - Right Ground      | -                                                                         | 1                                                                         | -                | -                  |
| 1. Headlamp Leveling Malfunction               |                                                                           |                                                                           |                  |                    |

### Circuit/System Description

Each headlamp assembly contains a headlamp leveling actuator that is controlled by the headlamp control module. The front and rear suspension position sensors provide the headlamp control module with suspension position information. Each sensor receives a 5 V reference, signal, and low reference circuits from the headlamp control module. The sensors are connected to the control arms of the front and rear suspension. As the vehicle travels, the suspension compresses and rebounds moving the suspension position sensor arms. This causes the signal output of the sensor to change. The headlamp control module compares the information from both suspension position sensors and adjusts the headlamp leveling as needed. The headlamp control module communicates with the left and right headlamp leveling actuators via the LIN serial data circuit.

### Reference Information

Schematic Reference

### Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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### Exterior Lighting Systems Description and Operation

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- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

[Control Module References](#) for scan tool information

## Special Tools

### J-38522 Variable Signal Generator

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

## Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Front Leveling Position Sensor Signal parameter is between 5% and 90%.
  - **If the parameter is not between 5% and 90%**  
  
Refer to Headlamp Leveling Sensor Malfunction.
  - **Go to next step: If the parameter is between 5% and 90%**
3. Verify the scan tool Rear Leveling Position Sensor Signal parameter is between 5% and 90%.
  - **If the parameter is not between 5% and 90%**  
  
Refer to Headlamp Leveling Sensor Malfunction.
  - **Go to next step: If the parameter is between 5% and 90%**
4. Verify the left and right headlamps operate to the UP and DOWN positions when commanding the Right and Left Headlamp Vertical Motor controls UP and DOWN with a scan tool.
  - **If the left and right headlamps do not operate UP and DOWN**  
  
Refer to Headlamp Leveling Actuator Malfunction
  - **Go to next step: If the left and right headlamps operate UP and DOWN**
5. All OK.

## Circuit/System Testing

### Headlamp Leveling Actuator Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 8 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 6 and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
    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
    3. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X50A Fuse Block - Underhood.

- **Go to next step: If the test lamp illuminates**
5. Replace the E13 Headlamp Assembly.
  6. Ignition ON.
  7. Verify the appropriate headlamp operates to the UP and DOWN positions when commanding the appropriate Headlamp Vertical Motor control UP and DOWN with a scan tool.
    - **If the headlamp does not operate UP and DOWN**  
 Replace the K26 Headlamp Control Module.
    - **Go to next step: If the headlamp operates UP and DOWN**
  8. All OK.

## Headlamp Leveling Sensor Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate B51 Suspension Height Sensor, ignition ON.
2. Verify a test lamp illuminates between the low reference circuit terminal 2 and B+.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module.
    2. Test for less than 2  $\Omega$  in the low reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K26 Headlamp Control Module.
  - **Go to next step: If the test lamp illuminates**
3. Ignition ON.
4. Test for 4.8 - 5.2 V between the 5 V reference circuit terminal 1 and ground.
  - **If less than 4.8 V**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module.
    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
    3. Test for less than 2  $\Omega$  in the 5 V reference circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K26 Headlamp Control Module.
  - **If greater than 5.2 V**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module, ignition ON.
    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 K26 Headlamp Control Module.
  - **Go to next step: If between 4.8 - 5.2 V**
5. Verify the appropriate scan tool Leveling Position Sensor Signal parameter is less than 1 mm.
  - **If 1 mm or greater**
    1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module, ignition ON.
    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, replace the K26 Headlamp Control Module.
  - **Go to next step: If less than 1 mm**
6. Ignition OFF.
7. Connect the red lead of the **J-38522** Variable Signal Generator to the signal circuit terminal 3 and the black lead of the **J-38522** Variable Signal Generator to the low reference circuit terminal 2.
8. Adjust the **J-38522** Variable Signal Generator to the settings listed below:

- Signal control to 5 V
- Frequency control to 250 Hz
- Duty cycle control to the 60%

9. Ignition ON, verify the appropriate scan tool Leveling Position Sensor parameter is 11 mm.

• **If not 11 mm**

1. Ignition OFF, disconnect the harness connector at the K26 Headlamp Control Module.

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. Test for less than 2  $\Omega$  in the signal circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K26 Headlamp Control Module.

• **Go to next step: If 11 mm**

10. Test or replace the B51 Suspension Height Sensor.

### Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- Refer to **Headlamp Replacement (Chevrolet)**, **Headlamp Replacement (GMC)**
- Refer to **Control Module References** for headlamp control module replacement, programming, and setup

## HEADLAMP LEVELING MALFUNCTION (MANUAL HEADLAMP LEVELING)

### Diagnostic Instructions

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

### Diagnostic Fault Information

| Circuit                                   | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|-------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Headlamp Leveling Actuator - Left B+      | 1               | 1                    | -                | -                  |
| Headlamp Leveling Actuator - Right B+     | 1               | 1                    | -                | -                  |
| Headlamp Leveling Switch B+               | 1               | 1                    | -                | -                  |
| Headlamp Leveling Control                 | 1               | 1                    | 1                | -                  |
| Headlamp Leveling Actuator - Left Ground  | -               | 1                    | -                | -                  |
| Headlamp Leveling Actuator - Right Ground | -               | 1                    | -                | -                  |
| Headlamp Switch Ground                    | -               | 1                    | -                | -                  |
| 1. Headlamp Leveling Malfunction          |                 |                      |                  |                    |

### Circuit/System Description

Each headlamp assembly contains a headlamp leveling actuator that is controlled by the headlamp leveling switch. The headlamp leveling switch is supplied with ignition voltage and ground and contains a resistor ladder with 4 positions for adjusting the headlamps up or down. When the headlamp leveling switch is activated to the desired position, voltage from the B+ ignition circuit is pulled down through the resistor ladder and the voltage is applied to the left and right headlamp leveling actuators via the headlamp leveling control circuits. The headlamp leveling actuators are supplied with B+ and ground.

When the headlamp leveling switch is activated, the left and right headlamp leveling actuators respond by moving the headlamps to the desired position.

### Diagnostic Aids

For testing purposes, the vehicle battery must be fully charged.

### Reference Information

Schematic Reference

### Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

### Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5  $\Omega$  between the ground circuit terminal 8 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 6 and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
    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
    3. Test for less than 2  $\Omega$  in the B+ circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X50A Fuse Block - Underhood.
  - **Go to next step: If the test lamp illuminates**
5. 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 min for all vehicle systems to power down.

6. Test for less than 15  $\Omega$  between the ground circuit terminal 8 and ground.
  - **If 15  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 15  $\Omega$**
7. Ignition ON.
8. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block - Underhood.
    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
    3. Test for less than 2  $\Omega$  in the B+ circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X50A Fuse Block - Underhood.
  - **Go to next step: If the test lamp illuminates**
9. Ignition OFF, connect the harness connector at the S30 Headlamp Switch.
10. Ignition ON, exterior lights OFF.
11. Test the voltage between the control circuit terminal 7 at the E13 Headlamp Assembly harness connector and ground for each headlamp leveling switch position listed below.
  - Headlamp leveling switch position 0 - 10 V - 11 V
  - Headlamp leveling switch position 1 - 8.5 V - 9.9 V
  - Headlamp leveling switch position 2 - 8 V - 9 V
  - Headlamp leveling switch position 3 - 6 V - 7 V
  - **If less than the specified voltage range for each headlamp leveling switch position**
    1. Ignition OFF, disconnect the harness connector at the S30 Headlamp Switch.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the S30 Headlamp Switch.
  - **If greater than the specified voltage range for each headlamp leveling switch position**
    1. Ignition OFF, disconnect the harness connector at the S30 Headlamp Switch, ignition ON.
    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 S30 Headlamp Switch.
  - **Go to next step: If within the specified voltage range for each headlamp leveling switch position**
12. Test or replace the E13 Headlamp Assembly.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\)](#), [Headlamp Switch Replacement \(Terrain Base\)](#).
- Refer to [Headlamp Replacement \(Chevrolet\)](#), [Headlamp Replacement \(GMC\)](#).

# INTERIOR ACCENT LIGHTING MALFUNCTION

## Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

## Diagnostic Fault Information

| Circuit                                       | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|-----------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Accent Lamps Control - Terminal 22 X7         | B255F 02        | 1                    | 1                | -                  |
| Accent Lamp - Center Console Cupholder Ground | -               | 1                    | -                | -                  |
| Accent Lamp - Driver Door Handle Ground       | -               | 1                    | -                | -                  |
| Accent Lamp - Passenger Door Handle Ground    | -               | 1                    | -                | -                  |
| Accent Lamp - Right Instrument Panel Ground   | -               | 1                    | -                | -                  |
| Flood Lamp - Driver Door Handle Ground        | -               | 1                    | -                | -                  |
| Flood Lamp - Passenger Door Handle Ground     | -               | 1                    | -                | -                  |
| 1. Interior Accent Lighting Malfunction       |                 |                      |                  |                    |

## Circuit/System Description

The body control module (BCM) supplies battery voltage to accent lighting lamps via the accent lamp control circuit. When a door is opened the BCM applies battery voltage to the accent lamp control circuit illuminating all of the accent lighting. The accent lighting will remain illuminated until all doors are closed and the ignition is OFF. The accent lighting remains illuminated with the ignition ON.

## Reference Information

Schematic Reference

## [Interior Lights Wiring Schematics](#)

Connector End View Reference

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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

## Circuit/System Testing

**NOTE:**

Each component may need to be disconnected to isolate a short to voltage, short to ground, or an open/high resistance. Use the wiring schematics to identify the following:

- **Courtesy lamps the vehicle is equipped with**
  - **Each component's control and ground circuit terminals**
  - **Component locations on the exterior courtesy lamps control circuit**
1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the inoperative accent/flood lamp. It may take up to 2 min for all vehicle systems to power down.
  2. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal and ground.
    - **If 10  $\Omega$  or greater**
      1. Ignition OFF.
      2. Test for less than 2  $\Omega$  in the ground circuit end to end.
        - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
        - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
    - **Go to next step: If less than 10  $\Omega$**
  3. Connect a test lamp between the appropriate control circuit terminal and ground, ignition ON.
  4. Verify the test lamp turns ON and OFF when commanding the Accent Lighting 1 ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
      1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
      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. Test for less than 2  $\Omega$  in the control circuit end to end.
        - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
        - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **If the test lamp is always ON**
      1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
      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.
    - **Go to next step: If the test lamp turns ON and OFF**
  5. Test or replace the accent/flood lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Front Side Door Inside Handle Illumination Lamp Replacement \(Equinox\)](#), [Front Side Door Inside Handle Illumination Lamp Replacement \(Denali\)](#).
- Refer to [Front Floor Console Compartment Lamp Replacement](#)
- Refer to [Instrument Panel Light Conductor Lamp Replacement \(Equinox\)](#), [Instrument Panel Light Conductor Lamp Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## INTERIOR BACKLIGHTING MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.

- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                                                      | Short to Ground    | Open/High Resistance | Short to Voltage   | Signal Performance |
|--------------------------------------------------------------|--------------------|----------------------|--------------------|--------------------|
| Instrument Panel Dimmer Switch B+ Reference                  | B1395 03, B3600 03 | B3600 03             | B1395 07, B3600 07 | -                  |
| Instrument Panel Dimmer Switch Signal                        | B1395 03, B3600 03 | B3600 03             | B1395 07, B3600 07 | -                  |
| LED Backlight Dimming Control Terminal 8 X2                  | B2610 02           | B2610 04             | B2610 01           | -                  |
| LED Backlight Dimming Control Terminal 9 X7                  | B2610 02           | B2610 04             | B2610 01           | -                  |
| Switch Indicator LED Backlight Dimming Control Terminal 5 X1 | B2625 02           | 2                    | 2                  | -                  |
| Front Overhead Console Assembly Indicator Control            | 4                  | 4                    | 4                  | -                  |
| Drive Mode Select Switch Indicator Control                   | 5, 6               | 5, 6                 | 5, 6               | -                  |
| Multifunction Switch - Center Console Indicator Control      | 6                  | 6                    | 6                  | -                  |
| Park Assist On/Off Switch Indicator Control                  | 7                  | 7                    | 7                  | -                  |
| Instrument Panel Dimmer Switch Low Reference                 | 3                  | 3                    | 3                  | -                  |
| Door Lock Switch - Driver Ground                             | -                  | 1, 2                 | -                  | -                  |
| Door Lock Switch - Passenger Ground                          | -                  | 1, 2                 | -                  | -                  |
| Drive Mode Select Switch Ground                              | -                  | 1                    | -                  | -                  |
| Front Overhead Console Assembly Ground                       | -                  | 1                    | -                  | -                  |
| Garage Door Opener Ground                                    | -                  | 1                    | -                  | -                  |
| Headlamp Switch Ground                                       | -                  | 1                    | -                  | -                  |
| Ignition Mode Switch Ground                                  | -                  | 1                    | -                  | -                  |
| Liftgate Control Switch - Interior Ground                    | -                  | 1                    | -                  | -                  |
| Multifunction Switch - Center Console Ground                 | -                  | 1                    | -                  | -                  |
| Park Assist On/Off Switch Ground                             | -                  | 1                    | -                  | -                  |
| Park Brake Control Switch Ground                             | -                  | 1                    | -                  | -                  |
| Seat Memory Switch - Driver Ground                           | -                  | 1                    | -                  | -                  |
| Steering Wheel Control Switch - Left Ground                  | -                  | 1                    | -                  | -                  |
| Steering Wheel Control Switch - Right Ground                 | -                  | 1                    | -                  | -                  |

| Circuit                                                                                                                                                                                                                                                                      | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| 1. Interior Backlighting Malfunction<br>2. Switch Indicator LED Backlighting Malfunction<br>3. Dimmer Switch Malfunction<br>4. Dome Lamps Malfunction<br>5. Lane Departure Warning System Malfunction<br>6. All Wheel Drive Malfunction<br>7. Park Assist System 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 modulate voltage through the light emitting diode (LED) dimming control circuits illuminating the interior backlighting to the requested level of brightness.

### Reference Information

Schematic Reference

- [Interior Lights Dimming Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) 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.
  - **Go to next step: If the parameter changes**
3. Verify the switch indicator amber LED's for the components listed below turn ON and OFF while turning the associated switches ON and OFF.
  - A98 Front Overhead Console Assembly
  - S48E Multifunction Switch - Center Console

- S126 Drive Mode Select Switch (All Wheel Drive Switch)
- S126 Drive Mode Select Switch (Lane Departure Warning Switch)
- S107 Parking Assist On/Off Switch
- S13D Door Lock Switch - Driver
- S13P Door Lock Switch - Passenger
- **If any of the switch indicator amber LED's do not turn ON and OFF**

Refer to Switch Indicator LED Backlighting Malfunction.

- **Go to next step: If all switch indicator amber LED's turn ON and OFF**

4. 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.

- **Go to next step: If the backlighting components turn ON and OFF**

5. 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 12 and ground.

- **If less than B+**

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

3. Test for less than 2  $\Omega$  in the B+ circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If B+**

3. Verify a test lamp illuminates between B+ and the low reference circuit terminal 7.

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

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

2. Test for less than 1 V between the low reference circuit terminal 7 and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V

3. Test for less than 2  $\Omega$  in the low reference circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

4. Verify a test lamp does not illuminate between B+ and the signal circuit terminal 11.

- **If the test lamp illuminates**

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

- **Go to next step: If the test lamp does not illuminate**

5. Test for B+ between the B+ circuit terminal 12 and the signal circuit terminal 11.

- **If less than B+**

1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the signal circuit terminal 11 and ground.
  - If 1 V or greater, repair the short to voltage on the circuit.
  - If less than 1 V
3. Test for less than 2  $\Omega$  in the signal circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If B+**

1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the B+ circuit terminal 12 and ground.
  - If 1 V or greater, repair the short to voltage on the circuit.
  - If less than 1 V

6. Test or replace the S30 Headlamp Switch.

## Interior Backlighting Malfunction

**NOTE:** Each component supplied by the LED backlight dimming control circuits may need to be disconnected to isolate the short to ground. Use the wiring schematics to identify the following:

- Each component control and ground circuit terminals
- Component locations on the LED backlight dimming control circuits

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the component with inoperative backlighting. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 5  $\Omega$  between the appropriate ground circuit terminal and ground.

- **If 5  $\Omega$  or greater**

1. Ignition OFF.
2. Test for less than 2  $\Omega$  in the ground circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 5  $\Omega$**

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

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**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
  - X2 terminal 8
  - X7 terminal 9
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. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If the test lamp is always ON**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.

- X2 terminal 8
- X7 terminal 9

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.

- **Go to next step: If the test lamp turns ON and OFF**

5. Test or replace the component with inoperative backlighting.

## Switch Indicator LED Backlighting Malfunction

**NOTE:** Each component with backlighting may need to be disconnected to isolate a short to voltage or short to ground. Use the wiring 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, disconnect the harness connector at the appropriate switch listed below.

- A98 Front Overhead Console Assembly
- S48E Multifunction Switch - Center Console
- S126 Drive Mode Select Switch
- S107 Parking Assist On/Off Switch
- S13D Door Lock Switch - Driver
- S13P Door Lock Switch - Passenger

2. Ignition ON, place the instrument panel dimmer switch in the HIGH position for high backlighting intensity.

3. Verify a test lamp illuminates between the appropriate control circuit terminal listed below and ground.

- A98 Front Overhead Console Assembly terminal 18
- S48E Multifunction Switch - Center Console terminal 5 (Chevrolet)
- S126 Drive Mode Select Switch terminal 8 (GMC)
- S107 Parking Assist On/Off Switch terminal 5 (UFQ)
- S13D Door Lock Switch - Driver terminal 5
- S13P Door Lock Switch - Passenger terminal 5
- **If the test lamp does not illuminate**

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

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. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

4. Place the instrument panel dimmer switch in the LOW position for low backlighting intensity.

5. Verify a test lamp does not illuminate at FULL intensity between the appropriate control circuit terminal listed below and ground.

- A98 Front Overhead Console Assembly terminal 18

- S48E Multifunction Switch - Center Console terminal 5 (Chevrolet)
- S126 Drive Mode Select Switch terminal 8 (GMC)
- S107 Parking Assist On/Off Switch terminal 5 (UFQ)
- S13D Door Lock Switch - Driver terminal 5
- S13P Door Lock Switch - Passenger terminal 5
- **If the test lamp illuminates at full intensity**
  1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
  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.
  - **Go to next step: If the test lamp does not illuminate at full intensity**
- 6. Test or replace the inoperative component.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\)](#) [Headlamp Switch Replacement \(Terrain Base\)](#)
- Refer to [Ignition and Start Switch Replacement \(Equinox\)](#) [Ignition and Start Switch Replacement \(Terrain\)](#)
- Refer to [Cruise Control Switch Replacement \(Equinox\)](#) [Cruise Control Switch Replacement \(Terrain\)](#)
- Refer to [Door Lock Switch Replacement - Driver Side \(Equinox\)](#) [Door Lock Switch Replacement - Driver Side \(Terrain\)](#)
- Refer to [Door Lock Switch Replacement - Passenger Front \(Equinox\)](#) [Door Lock Switch Replacement - Passenger Front \(Terrain\)](#)
- Refer to [Liftgate Close Switch Replacement](#)
- Refer to [Parking Brake Switch Replacement \(Equinox\)](#) [Parking Brake Switch Replacement \(Terrain\)](#)
- Refer to [Radio Control Switch Replacement - Steering Wheel \(Equinox, Right Front\)](#) [Radio Control Switch Replacement - Steering Wheel \(Equinox, Left Rear\)](#) [Radio Control Switch Replacement - Steering Wheel \(Equinox, Right Rear\)](#) [Radio Control Switch Replacement - Steering Wheel \(Terrain, Right Front\)](#) [Radio Control Switch Replacement - Steering Wheel \(Terrain, Left Rear\)](#) [Radio Control Switch Replacement - Steering Wheel \(Terrain, Right Rear\)](#)
- Refer to [Front Seat Adjuster Memory Switch Replacement \(Equinox\)](#) [Front Seat Adjuster Memory Switch Replacement \(Terrain\)](#)
- Refer to [Garage Door Opener Transmitter Pushbutton Replacement](#)
- Refer to [Floor Console Accessory Function Switch Replacement \(Equinox\)](#) [Floor Console Accessory Function Switch Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## PARK, LICENSE, AND/OR TAIL LAMPS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|---------|-----------------|----------------------|------------------|--------------------|
|         |                 |                      |                  |                    |

| 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,<br>B3883 04 | B3883 01         | -                  |
| Multifunction LED Control Module Relay Control                                                                                        | 3               | 3                     | 3                | -                  |
| Park/Daytime Running Lamp - Left Control                                                                                              | B260D 02        | 1                     | 1                | -                  |
| Park/Daytime Running Lamp - Right Control                                                                                             | B260E 02        | 1                     | 1                | -                  |
| Park/Tail Lamps Control - Rear                                                                                                        | 1               | 1                     | 1                | -                  |
| Headlamp Switch Ground                                                                                                                | -               | 2                     | -                | -                  |
| Headlamp Assembly - Left Ground                                                                                                       | -               | 1                     | -                | -                  |
| Headlamp Assembly - Right Ground                                                                                                      | -               | 1                     | -                | -                  |
| License Plate Lamp - Left Ground                                                                                                      | -               | 1                     | -                | -                  |
| License Plate Lamp - Right Ground                                                                                                     | -               | 1                     | -                | -                  |
| Liftgate Tail Lamp Assembly - Left Ground                                                                                             | -               | 1                     | -                | -                  |
| Liftgate Tail Lamp Assembly - Right Ground                                                                                            | -               | 1                     | -                | -                  |
| Tail Lamp Assembly - Left Ground                                                                                                      | -               | 1                     | -                | -                  |
| Tail Lamp Assembly - Right Ground                                                                                                     | -               | 1                     | -                | -                  |
| 1. Park, License, and/or Tail Lamps Malfunction<br>2. Park Lamp Switch Malfunction<br>3. Multifunction LED Control Module 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/license lamp bulb sockets, 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 Wiring Schematics

Connector End View Reference

### COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

### Exterior Lighting Systems Description and Operation

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

## Scan Tool Reference

[Control Module References](#) for scan tool information

## Circuit/System Verification

1. Ignition ON.
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.
  - **Go to next step: If the parameter changes**
3. Verify the left front park lamp turns ON and OFF while commanding the Left Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
  - **If the left front park lamp does not turn ON and OFF**  
Refer to Park Lamps Malfunction - Front.
  - **Go to next step: If the left front park lamp turns ON and OFF**
4. Verify the right front park lamp turns ON and OFF while commanding the Right Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
  - **If the right front park lamp does not turn ON and OFF**  
Refer to Park Lamps Malfunction - Front.
  - **Go to next step: If the right front park lamp turns ON and OFF**
5. Verify the left front side marker lamp and left rear park lamps turn ON and OFF when commanding the Park Lamps ON and OFF with a scan tool.
  - **If the left front side marker lamp and left rear park lamps do not turn ON and OFF**  
Refer to Park Lamps Malfunction - Rear.
  - **Go to next step: If the left front side marker lamp and left rear park lamps turn ON and OFF**
6. Verify the right front side marker lamp and right rear park lamps turn ON and OFF when commanding the Right Park Lamps ON and OFF with a scan tool.
  - **If the right front side marker lamp and right rear park lamps do not turn ON and OFF**  
Refer to Park Lamps Malfunction - Rear.
  - **Go to next step: If the right front side marker lamp and right rear park lamps turn ON and OFF**
7. 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.
  - **Go to next step: If the license plate lamps turn ON and OFF**

8. All OK.

## Circuit/System Testing

### Park Lamp 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 min for all vehicle systems to power down.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 8 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Ignition ON.
4. Verify the scan tool Park Lamps Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 5 and ground.
6. Verify the scan tool Park Lamps Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
7. Test or replace the S30 Headlamp Switch.

### Park Lamps Malfunction - Front

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - E13LA Headlamp Assembly - Left terminal 5 (X88)
  - E13RA Headlamp Assembly - Right terminal 5 (X88)
  - E13LA Headlamp Assembly - Left terminal 4 (Z88)
  - E13RA Headlamp Assembly - Right terminal 4 (Z88)
  - **If 15  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 15  $\Omega$**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E13LA Headlamp Assembly - Left terminal 4 (X88)
    - E13RA Headlamp Assembly - Right terminal 4 (X88)
    - E13LA Headlamp Assembly - Left terminal 7 (Z88)
    - E13RA Headlamp Assembly - Right terminal 7 (Z88)
  4. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
      1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
      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. Test for less than 2  $\Omega$  in the control circuit end to end.
        - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
        - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **If the test lamp is always ON**
      1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
      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.
    - **Go to next step: If the test lamp turns ON and OFF**
  5. Test or replace the appropriate E4A Park/Daytime Running Lamp.

### **Park Lamps Malfunction - Rear**

1. Ignition OFF, disconnect the KR53 Park Lamps Relay, ignition ON
2. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
  - **If the test lamp does not illuminate**  
Replace the X53A Fuse Block - Rear Body.
  - **Go to next step: 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**  
Replace the X53A Fuse Block - Rear Body.
  - **Go to next step: If the test lamp illuminates**
4. Connect a test lamp between the control circuit terminal 1 and B+, ignition ON.
5. Verify the test lamp turns ON and OFF when commanding the Rear Park Lamps ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
    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. Ignition OFF.
    4. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.

- If less than 2  $\Omega$ , replace the K9 Body Control Module.
- **If the test lamp is always ON**
  1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
  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.
  - **Go to next step: If the test lamp turns ON and OFF**
- 6. Ignition OFF, exterior lamps OFF, connect the KR53 Park Lamps Relay.
- 7. Disconnect the harness connector at the appropriate component listed below.
  - E42L Tail Lamp Assembly - Left
  - E42R Tail Lamp Assembly - Right
  - E43L Liftgate Tail Lamp Assembly - Left
  - E43R Liftgate Tail Lamp Assembly - Right
  - E13LA Headlamp Assembly - Left
  - E13RA Headlamp Assembly - Right
- 8. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - E42L Tail Lamp Assembly - Left terminal 1
  - E42R Tail Lamp Assembly - Right terminal 1
  - E43L Liftgate Tail Lamp Assembly - Left terminal 1
  - E43R Liftgate Tail Lamp Assembly - Right terminal 1
  - E13LA Headlamp Assembly - Left terminal 5 (X88)
  - E13LA Headlamp Assembly - Left terminal 4 (Z88)
  - E13RA Headlamp Assembly - Right terminal 5 (X88)
  - E13RA Headlamp Assembly - Right terminal 4 (Z88)
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
    - **Go to next step: If less than 10  $\Omega$**
- 9. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - E42L Tail Lamp Assembly - Left terminal 2
  - E42R Tail Lamp Assembly - Right terminal 2
  - E43L Liftgate Tail Lamp Assembly - Left terminal 2
  - E43R Liftgate Tail Lamp Assembly - Right terminal 2
  - E13LA Headlamp Assembly - Left terminal 6 (X88)
  - E13LA Headlamp Assembly - Left terminal 12 (Z88)
  - E13RA Headlamp Assembly - Right terminal 6 (X88)
  - E13RA Headlamp Assembly - Right terminal 12 (Z88)
- 10. Verify the test lamp turns ON and OFF when commanding the Rear Park Lamps ON and OFF with a scan tool.
  - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the harness connector at the X53A Fuse Block - Rear Body.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.

- If less than 2  $\Omega$ , replace the KR53 Park Lamps Relay.

- **If the test lamp is always ON**

1. Ignition OFF, disconnect the harness connector at the X53A Fuse Block - Rear Body, ignition ON.
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 KR53 Park Lamps Relay.

- **Go to next step: If the test lamp turns ON and OFF**

11. Test or replace the inoperative park lamp.

## Multifunction LED Control Module Malfunction

1. Ignition OFF, disconnect the KR50 Headlamp Relay.
2. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

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

Replace the X50A Fuse Block - Underhood.

- **Go to next step: If the test lamp illuminates**

3. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.

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

Replace the X50A Fuse Block - Underhood.

- **Go to next step: If the test lamp illuminates**

4. Connect a test lamp between the control circuit terminal 1 and B+, ignition ON.
5. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.

- **If the test lamp is always OFF**

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
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
3. Ignition OFF.
4. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If the test lamp is always ON**

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the control circuit terminal 13 and ground.
  - If less than infinite resistance, repair the short to ground on the circuit.
  - If infinite resistance, replace the K9 Body Control Module.

- **Go to next step: If the test lamp turns ON and OFF**

6. Ignition OFF, connect the KR50 Headlamp Relay.
7. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
8. Test for less than 10  $\Omega$  between the ground circuit terminal 4 and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.
2. Test for less than 2  $\Omega$  in the ground circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

9. Connect a test lamp between the control circuit terminal 5 and ground, ignition ON.
10. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.

- **If the test lamp is always OFF**

1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
2. Test for infinite resistance between the control circuit terminal 5 and ground.
  - If less than infinite resistance, repair the short to ground on the circuit.
  - If infinite resistance
3. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the KR50 Headlamp Relay.

- **If the test lamp is always ON**

1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood, ignition ON.
2. Test for less than 1 V between the control circuit terminal 5 and ground.
  - If 1 V or greater, repair the short to voltage on the circuit.
  - If less than 1 V, replace the KR50 Headlamp Relay.

- **Go to next step: If the test lamp turns ON and OFF**

11. Test or replace the appropriate E13 Headlamp Assembly.

## **License Plate Lamps Malfunction**

1. Ignition OFF, exterior lamps OFF, remove both E7 License Plate Lamp bulbs.
2. Test for less than 10  $\Omega$  between each ground circuit terminal 1 and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.
2. Test for less than 2  $\Omega$  in the ground circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

3. Connect a test lamp between the E7L 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**

1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
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. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If the test lamp is always ON**

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

- **Go to next step: If the test lamp turns ON and OFF**

5. Ignition OFF.

6. Connect a test lamp between the E7R License Plate Lamp - Right control circuit terminal 2 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**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - **Go to next step: If the test lamp turns ON and OFF**
8. Test or replace the E7 License Plate Lamp.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\)](#) [Headlamp Switch Replacement \(Terrain Base\)](#).
- Refer to [Headlamp Replacement \(Chevrolet\)](#) [Headlamp Replacement \(GMC\)](#).
- Refer to [Side Marker Bulb Replacement \(Without UGE\)](#).
- Refer to [Rear Body Structure Stop Lamp Replacement \(Chevrolet Without UGE\)](#) [Rear Body Structure Stop Lamp Replacement \(Chevrolet With UGE\)](#) [Rear Body Structure Stop Lamp Replacement \(GMC\)](#).
- Refer to [Rear Combination Lamp Replacement \(Chevrolet\)](#) [Rear Combination Lamp Replacement \(GMC\)](#).
- Refer to [Rear License Plate Lamp Replacement \(Chevrolet\)](#) [Rear License Plate Lamp Replacement \(GMC\)](#).
- Refer to [Relay Replacement \(Attached to Wire Harness\)](#) [Relay Replacement \(Within an Electrical Center\)](#).
- Refer to [Rear Body Fuse Block Replacement \(Equinox\)](#) [Rear Body Fuse Block Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## REAR COMPARTMENT LAMP MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                                | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|----------------------------------------|-----------------|----------------------|------------------|--------------------|
| 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 min with the ignition switch in the OFF position, the BCM will deactivate the rear compartment lamp control circuit to prevent total battery discharge.

## Reference Information

Schematic Reference

## Interior Lights Wiring Schematics

Connector End View Reference

## COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

## Interior Lighting Systems Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

## Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the E8S Rear Compartment Courtesy Lamp.
2. Test for less than 5  $\Omega$  between the ground circuit terminal 3 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
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**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
    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.

- **Go to next step: 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](#) after completing the repair.

- Refer to [Cargo Center Courtesy Lamp Replacement](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## STOP LAMPS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                                                                                                                     | Short to Ground              | Open/High Resistance | Short to Voltage             | Signal Performance |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|------------------------------|--------------------|
| Brake Pedal Position Sensor 5 V Reference                                                                                   | C0277 06, C0890 03, U0140 71 | C0277 06, U0140 71   | C0277 07, C0890 07, U0140 71 | -                  |
| Brake Pedal Position Sensor Signal                                                                                          | C0277 06, U0140 71           | C0277 06, U0140 71   | C0277 07, C0890 07, U0140 71 | C0277 09, C0277 12 |
| Tail/Stop Lamp Outage Detection Signal - Left Outer                                                                         | 3                            | 3                    | 3                            | -                  |
| Tail/Stop Lamp Outage Detection Signal - Right Outer                                                                        | 3                            | 3                    | 3                            | -                  |
| Center High Mounted Stop Lamp Control                                                                                       | B3884 02                     | 2                    | 2                            | -                  |
| Stop Lamp - Left Control                                                                                                    | B3881 02                     | B3881 01, B3881 04   | B3881 01, B3881 04           | -                  |
| Stop Lamp - Right Control                                                                                                   | B3882 02                     | B3882 01, B3882 04   | B3882 01, B3882 04           | -                  |
| Brake Pedal Position Sensor Low Reference                                                                                   | -                            | C0277 07, U0140 71   | 1                            | -                  |
| Center High Mounted Stop Lamp Ground                                                                                        | -                            | 2                    | -                            | -                  |
| Tail Lamp Assembly - Left Ground                                                                                            | -                            | 1                    | -                            | -                  |
| Tail Lamp Assembly - Right Ground                                                                                           | -                            | 1                    | -                            | -                  |
| 1. Stop Lamps Malfunction<br>2. Center High Mounted Stop Lamp Malfunction<br>3. Tail/Stop Lamp Outage Detection 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 left and right stop lamp control circuits as well as the center high mounted stop lamp control circuit illuminating the left and right stop lamps and the center high mounted stop lamp.

Schematic Reference

- [Exterior Lights Wiring Schematics](#)
- [Body Control System Wiring Schematics](#)

Connector End View Reference

**COMPONENT CONNECTOR END VIEWS - INDEX**

Description and Operation

**Exterior Lighting Systems Description and Operation**

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

**Control Module References** for scan tool information

**Circuit/System Verification**

1. Ignition ON.
2. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [Brake Pedal Position Sensor Calibration](#).
3. Verify the scan tool Brake Pedal Applied 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.
  - **Go to next step: If the parameter changes**
4. Verify the center high mounted stop lamp turns ON and OFF when commanding the Center Stop 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.
  - **Go to next step: If the center high mounted stop turns ON and OFF**
5. Verify the left stop lamp turns ON and OFF when commanding the Left Stop Lamp ON and OFF with a scan tool.
  - **If the left stop lamp does not turn ON and OFF**  
Refer to Stop Lamps Malfunction
  - **Go to next step: If the left stop lamp turns ON and OFF**
6. Verify the right stop lamp turns ON and OFF when commanding the Right Stop Lamp ON and OFF with a scan tool.
  - **If the right stop lamp does not turn ON and OFF**  
Refer to Stop Lamps Malfunction.
  - **Go to next step: If the right stop lamp turns ON and OFF**

7. Observe the left and right outer tail/stop lamps while activating the stop lamps. The left and right outer tail/stop lamps should illuminate when turned ON.

- **If the left or right outer tail/stop lamp does not illuminate**

Refer to Tail/Stop Lamp Outage Detection Malfunction.

- **Go to next step: If the left and right outer tail/stop lamps illuminate**

8. 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. Verify a test lamp illuminates between the low reference circuit terminal 2 and B+.

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

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

2. Test for less than 2  $\Omega$  in the low reference circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

3. Test for less than 1 V between the low reference circuit terminal 2 and B+.

- **If 1 V or greater**

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

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.

- **Go to next step: If less than 1 V**

4. Test for 4.8 - 5.2 V between the 5 V reference circuit terminal 1 and ground.

- **If less than 4.8 V**

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

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

3. Test for less than 2  $\Omega$  in the 5 V reference circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If greater than 5.2 V**

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

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.

- **Go to next step: If between 4.8 - 5.2 V**

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

- **If not Inactive**

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

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, replace the K9 Body Control Module.
  - **Go to next step: If Inactive**
6. Install a 3 A fused jumper wire between the 5 V reference circuit terminal 1 and signal circuit terminal 3.
  7. Verify the scan tool Brake Pedal Applied parameter is Active.
    - **If not Active**
      1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
      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. Test for less than 2  $\Omega$  in the signal circuit end to end.
        - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
        - If less than 2  $\Omega$ , replace the K9 Body Control Module.
    - **Go to next step: If Active**
  8. Connect the harness connector at the B22 Brake Pedal Position Sensor.
  9. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [\*\*Brake Pedal Position Sensor Calibration\*\*](#).
  10. Verify the scan tool Brake Pedal Applied parameter changes between Active and Inactive while pressing and releasing the brake pedal.
    - **If the parameter does not change**

Test or replace the B22 Brake Pedal Position Sensor.
    - **Go to next step: If the parameter changes**

All OK

## Stop Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below.
  - E5LE Tail/Stop Lamp - Left Outer (Z88/X88-UGE)
  - E5RE Tail/Stop Lamp - Right Outer (Z88/X88-UGE)
  - E42L Tail Lamp Assembly - Left (X88+UGE)
  - E42R Tail Lamp Assembly - Right (X88+UGE)
2. Test for less than 5  $\Omega$  between the appropriate ground circuit terminal listed below and ground.
  - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
  - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
  - E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
  - E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
  - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
  - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
  - E42L Tail Lamp Assembly - Left terminal 1 (X88+UGE)
  - E42R Tail Lamp Assembly - Right terminal 1 (X88+UGE)

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

- **If the test lamp is always OFF**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.

- X4 - left stop lamps
- X5 - right stop lamps

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. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If the test lamp is always ON**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.

- X4 - left stop lamps
- X5 - right stop lamps

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.

- **Go to next step: If the test lamp turns ON and OFF**

5. Test or replace the appropriate E5 Tail/Stop Lamp - Outer.

### **Tail/Stop Lamp Outage Detection Malfunction**

1. Ignition OFF, disconnect the harness connector at the appropriate E42 Tail Lamp Assembly, ignition ON.

2. Test for B+ between the signal circuit terminal 3 and ground.

- **If not B+**

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

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. Test for less than 2  $\Omega$  in the signal circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **Go to next step: If B+**

3. Verify a test lamp does not illuminate between the signal circuit terminal 3 and ground.

- **If the test lamp illuminates**

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

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.

- **Go to next step: If the test lamp does not illuminate**

4. Test or replace the E5 Tail/Stop Lamp - Outer.

### **Center High Mount Stop Lamp Malfunction**

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E6 Center High Mounted Stop Lamp.

2. Test for less than 10  $\Omega$  between the ground circuit terminal A and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

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 Center Stop Lamp ON and OFF with a scan tool.

- **If the test lamp is always OFF**

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

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. Test for less than 2  $\Omega$  in the control circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

- **If the test lamp is always ON**

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

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.

- **Go to next step: 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](#) after completing the repair.

- Refer to [High Mount Stop Lamp Replacement \(Chevrolet\)](#), [High Mount Stop Lamp Replacement \(GMC\)](#).
- Refer to [Brake Pedal Position Sensor Replacement](#)
- Refer to [Brake Pedal Position Sensor Calibration](#)
- Refer to [Rear Body Structure Stop Lamp Replacement \(Chevrolet Without UGE\)](#), [Rear Body Structure Stop Lamp Replacement \(Chevrolet With UGE\)](#), [Rear Body Structure Stop Lamp Replacement \(GMC\)](#).
- Refer to [Stop Bulb Replacement \(Chevrolet Without UGE\)](#).
- Refer to [Rear Combination Lamp Replacement \(Chevrolet\)](#), [Rear Combination Lamp Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## TRAILER LAMPS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

|  |
|--|
|  |
|--|

| <b>Circuit</b>                                      | <b>Short to Ground</b> | <b>Open/High Resistance</b> | <b>Short to Voltage</b> | <b>Signal Performance</b> |
|-----------------------------------------------------|------------------------|-----------------------------|-------------------------|---------------------------|
| Park Lamps Relay Control                            | 1                      | 1                           | 1                       | -                         |
| Trailer Backup Lamps Relay Control                  | 1                      | 1                           | 1                       | -                         |
| Trailer Stop/Turn Signal Lamp Relay - Left Control  | 1                      | 1                           | 1                       | -                         |
| Trailer Stop/Turn Signal Lamp Relay - Right Control | 1                      | 1                           | 1                       | -                         |
| Park Lamps Control                                  | 1                      | 1                           | 1                       | -                         |
| Trailer Backup Lamps Control                        | 1                      | 1                           | 1                       | -                         |
| Trailer Stop/Turn Signal Lamp Control - Left        | 1                      | 1                           | 1                       | -                         |
| Trailer Stop/Turn Signal Lamp Control - Right       | 1                      | 1                           | 1                       | -                         |
| Trailer Connector Ground                            | -                      | 1                           | -                       | -                         |
| 1. Trailer Lamps Malfunction                        |                        |                             |                         |                           |

### Circuit/System Description

#### Park 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, license lamps, and trailer park lamps control circuits illuminating the park, tail, license, and trailer park lamps.

#### Stop Lamps

For stop lamp operation, the left and right trailer stop/turn signal lamp relay's are supplied with battery voltage at all times. 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 energizes the left and right trailer stop/turn signal lamp relay's by applying voltage to the left and right stop lamp relay control circuits. With the left and right trailer stop/turn signal lamp relay's energized, the relay switch contacts close and battery voltage is applied through the left and right trailer stop/turn signal fuse's to the trailer stop lamp control circuits which illuminates the trailer stop lamps.

#### Turn Signal Lamps

For turn signal lamp operation, the left and right trailer stop/turn signal lamp relay's are supplied with battery voltage at all times. 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 left and right trailer stop/turn signal lamp relay control circuits energizing the relay's in an ON and OFF cycle. With the left and right trailer stop/turn signal lamp relay's energized, the relay switch contacts cycle ON and OFF applying battery voltage through the left and right trailer stop/turn signal fuse's to the trailer turn signal lamp control circuits which illuminates the trailer turn signal lamps in an ON and OFF cycle.

### Diagnostic Aids

For testing purposes, the vehicle must be diagnosed with the trailer/trailer lighting connector disconnected.

### Reference Information

- Trailer Connector/Provision Wiring Schematics

Connector End View Reference

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## **Exterior Lighting Systems Description and Operation**

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

Scan Tool Reference

**Control Module References** for scan tool information

## **Circuit/System Verification**

1. Ignition ON.
2. Verify the vehicles park lamps turn ON and OFF when commanding the Park Lamps ON and OFF with a scan tool.
  - **If the vehicles park lamps do not turn ON and OFF**  
Refer to **Park, License, and/or Tail Lamps Malfunction**.
  - **Go to next step: If the vehicles park lamps turn ON and OFF**
3. Verify the vehicles backup lamps turn ON and OFF when commanding the Backup Lamps ON and OFF with a scan tool.
  - **If the vehicles backup lamps do not turn ON and OFF**  
Refer to **Backup Lamps Malfunction (Automatic Transmission)Backup Lamps Malfunction (Manual Transmission)**.
  - **Go to next step: If the vehicles backup lamps turn ON and OFF**
4. Verify the vehicles left stop lamp turns ON and OFF when commanding the Left Stop Lamp ON and OFF with a scan tool.
  - **If the vehicles left stop lamp does not turn ON and OFF**  
Refer to **Stop Lamps Malfunction**.
  - **Go to next step: If the vehicles left stop lamp turns ON and OFF**
5. Verify the vehicles right stop lamp turns ON and OFF when commanding the Right Stop Lamp ON and OFF with a scan tool.
  - **If the vehicles right stop lamp does not turn ON and OFF**  
Refer to **Stop Lamps Malfunction**.
  - **Go to next step: If the vehicles right stop lamp turns ON and OFF**
6. Verify the vehicles left and right turn signal lamps turn ON and OFF when commanding the left and right turn signal lamps ON and OFF with the turn signal/multifunction switch.
  - **If the vehicles left or right turn signal lamps do not turn ON and OFF**  
Refer to **Turn Signal Lamps and/or Indicators Malfunction**.

- **Go to next step: If the vehicles left and right turn signal lamps turn ON and OFF**

7. Refer to Circuit/System Testing.

## Circuit/System Testing

### Trailer Park Lamps Malfunction (6-pin trailer connector)

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 10  $\Omega$  between the ground circuit terminal 2 at the X88 Trailer Connector and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
3. Remove the KR53 Park Lamps Relay from the X53A Fuse Block - Rear Body, ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
  - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.
  - **Go to next step: If the test lamp illuminates**
5. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.
  - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.
  - **Go to next step: If the test lamp illuminates**
6. Verify a test lamp does not illuminate between the control circuit terminal 1 and ground.
  - **If the test lamp illuminates**
    1. Ignition ON.
    2. Test for less than 1 V between the control circuit terminal 1 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V, replace the X88 Trailer Connector.
  - **Go to next step: If the test lamp does not illuminate**
7. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 1 and B+, ignition ON.
8. Verify a test lamp illuminates between the control circuit terminal 1 at the X88 Trailer Connector and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, remove the 3 A fused jumper wire.
    2. Test for infinite resistance between the control circuit terminal 1 and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance
    3. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X88 Trailer Connector.
  - **Go to next step: If the test lamp illuminates**
9. Ignition OFF, install the KR53 Park Lamps Relay.
10. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
11. Verify a test lamp illuminates between the control circuit terminal 22 and ground.
  - **If the test lamp does not illuminate**

1. Ignition OFF, remove the KR53 Park Lamps Relay.
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. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the X53A Fuse Block - Rear Body.
  - **Go to next step: If the test lamp illuminates**
12. Connect a 3 A fused jumper between the control circuit terminal 22 and ground, ignition ON.
13. Verify a test lamp illuminates between the control circuit terminal 1 at the X88 Trailer Connector and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, remove the KR53 Park Lamps Relay, ignition ON.
    2. Test for less than 1 V between the control circuit terminal 22 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V, replace the X53A Fuse Block - Rear Body.
    - **Go to next step: If the test lamp illuminates**
14. Test or replace the K9 Body Control Module.

### Trailer Park Lamps Malfunction (7-pin trailer connector)

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 10  $\Omega$  between the ground circuit terminal B at the X88 Trailer Connector and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
    - **Go to next step: If less than 10  $\Omega$**
3. Remove the KR53 Park Lamps Relay from the X53A Fuse Block - Rear Body, ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
  - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.

    - **Go to next step: If the test lamp illuminates**
5. Verify a test lamp illuminates between the B+ circuit terminal 5 and ground.
  - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.

    - **Go to next step: If the test lamp illuminates**
6. Verify a test lamp does not illuminate between the control circuit terminal 1 and ground.
  - **If the test lamp illuminates**
    1. Ignition ON.
    2. Test for less than 1 V between the control circuit terminal 1 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V, replace the X88 Trailer Connector.
    - **Go to next step: If the test lamp does not illuminate**
7. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 1 and B+, ignition ON.

8. Verify a test lamp illuminates between the control circuit terminal F at the X88 Trailer Connector and ground.

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

1. Ignition OFF, remove the 3 A fused jumper wire.
2. Test for infinite resistance between the control circuit terminal 1 and ground.
  - If less than infinite resistance, repair the short to ground on the circuit.
  - If infinite resistance
3. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the X88 Trailer Connector.

- **Go to next step: If the test lamp illuminates**

9. Ignition OFF, install the KR53 Park Lamps Relay.

10. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.

11. Verify a test lamp illuminates between the control circuit terminal 22 and ground.

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

1. Ignition OFF, remove the KR53 Park Lamps Relay.
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. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the X53A Fuse Block - Rear Body.

- **Go to next step: If the test lamp illuminates**

12. Connect a 3 A fused jumper between the control circuit terminal 22 and ground, ignition ON.

13. Verify a test lamp illuminates between the control circuit terminal F at the X88 Trailer Connector and ground.

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

1. Ignition OFF, remove the KR53 Park Lamps Relay, ignition ON.
2. Test for less than 1 V between the control circuit terminal 22 and ground.
  - If 1 V or greater, repair the short to voltage on the circuit.
  - If less than 1 V, replace the X53A Fuse Block - Rear Body.

- **Go to next step: If the test lamp illuminates**

14. Test or replace the K9 Body Control Module.

### **Trailer Backup Lamps Malfunction (7 - pin trailer connector)**

1. Ignition OFF, exterior lamps OFF, remove the KR61 Trailer Backup Lamps Relay from the X53A Fuse Block - Rear Body.

2. Test for less than 10  $\Omega$  between the ground circuit terminal 2 and ground.

- **If 10  $\Omega$  or greater**

1. Ignition OFF.
2. Test for less than 2  $\Omega$  in the ground circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10  $\Omega$**

3. Ignition ON, verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

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

Replace the X53A Fuse Block - Rear Body.

- **Go to next step: If the test lamp illuminates**

4. Verify a test lamp does not illuminate between the control circuit terminal 1 and ground.
  - **If the test lamp illuminates**
    1. Ignition ON.
    2. Test for less than 1 V between the control circuit terminal 1 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V, replace the X88 Trailer Connector.
  - **Go to next step: If the test lamp does not illuminate**
5. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 1 and B+, ignition ON.
6. Verify a test lamp illuminates between the control circuit terminal A at the X88 Trailer Connector and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, remove the 3 A fused jumper wire.
    2. Test for infinite resistance between the control circuit terminal 1 and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance
    3. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X88 Trailer Connector.
  - **Go to next step: If the test lamp illuminates**
7. Ignition OFF, install the KR61 Trailer Backup Lamps Relay.
8. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
9. Verify a test lamp illuminates between the control circuit terminal 11 and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, remove the KR61 Trailer Backup Lamps Relay.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X53A Fuse Block - Rear Body.
  - **Go to next step: If the test lamp illuminates**
10. Connect a 3 A fused jumper between the control circuit terminal 11 and ground, ignition ON.
11. Verify a test lamp illuminates between the control circuit terminal A at the X88 Trailer Connector and ground.
  - **If the test lamp does not illuminate**
    1. Ignition OFF, remove the KR61 Trailer Backup Lamps Relay, ignition ON.
    2. Test for less than 1 V between the control circuit terminal 11 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V, replace the X53A Fuse Block - Rear Body.
  - **Go to next step: If the test lamp illuminates**
12. Test or replace the K9 Body Control Module.

### Trailer Stop/Turn Signal Lamps Malfunction

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 10  $\Omega$  between the ground circuit terminal B at the X88 Trailer Connector and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
- **Go to next step: If less than 10  $\Omega$**
3. Ignition OFF, disconnect the appropriate KR63 Trailer Stop/Turn Signal Lamp Relay.
4. Test for less than 10  $\Omega$  between the ground circuit terminal 2 and ground.
  - **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
5. Ignition ON, verify a test lamp illuminates between the B+ circuit terminal 3 and ground.
  - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.
  - **Go to next step: If the test lamp illuminates**
6. Verify a test lamp does not illuminate between the control circuit terminal 1 and ground.
  - **If the test lamp illuminates**
    1. Ignition ON.
    2. Test for less than 1 V between the control circuit terminal 1 and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V, replace the X88 Trailer Connector.
  - **Go to next step: If the test lamp does not illuminate**
7. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 1 and B+, ignition ON.
8. Verify a test lamp illuminates between the appropriate control circuit terminal listed below at the X88 Trailer Connector and ground.
  - Terminal G - left stop/turn signal
  - Terminal D - right stop/turn signal
  - **If the test lamp does not illuminate**
    1. Ignition OFF, remove the 3 A fused jumper wire.
    2. Test for infinite resistance between the control circuit terminal 1 and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance
    3. Test for less than 2  $\Omega$  in the control circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the X88 Trailer Connector.
  - **Go to next step: If the test lamp illuminates**
9. Ignition OFF, install the KR63 Trailer Stop/Turn Signal Lamp Relay.
10. Disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
11. Verify a test lamp illuminates between the appropriate control circuit terminal listed below and ground.
  - Terminal 5 - left stop/turn signal
  - Terminal 8 - right stop/turn signal
  - **If the test lamp does not illuminate**
    1. Ignition OFF, remove the appropriate KR63 Trailer Stop/Turn Signal Lamp Relay.
    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. Test for less than 2  $\Omega$  in the control circuit end to end.
    - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
    - If less than 2  $\Omega$ , replace the X53A Fuse Block - Rear Body.
  - **Go to next step: If the test lamp illuminates**
  12. Connect a 3 A fused jumper between the appropriate control circuit terminal listed below and ground, ignition ON.
    - Terminal 5 - left stop/turn signal
    - Terminal 8 - right stop/turn signal
  13. Verify a test lamp illuminates between the appropriate control circuit terminal listed below at the X88 Trailer Connector and ground.
    - Terminal G - left stop/turn signal
    - Terminal D - right stop/turn signal
    - **If the test lamp does not illuminate**
      1. Ignition OFF, remove the appropriate KR63 Trailer Stop/Turn Signal Lamp Relay, ignition ON.
      2. Test for less than 1 V between the appropriate control circuit terminal listed below and ground.
        - Terminal 5 - left stop/turn signal
        - Terminal 8 - right stop/turn signal
        - If 1 V or greater, repair the short to voltage on the circuit.
        - If less than 1 V, replace the X53A Fuse Block - Rear Body.
    - **Go to next step: If the test lamp illuminates**
  14. Test or replace the K9 Body Control Module.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Relay Replacement \(Attached to Wire Harness\)](#) [Relay Replacement \(Within an Electrical Center\)](#).
- Refer to [Rear Body Fuse Block Replacement \(Equinox\)](#) [Rear Body Fuse Block Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

## TURN SIGNAL LAMPS AND/OR INDICATORS MALFUNCTION

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

### Diagnostic Fault Information

| Circuit                                              | Short to Ground | Open/High Resistance  | Short to Voltage | Signal Performance |
|------------------------------------------------------|-----------------|-----------------------|------------------|--------------------|
| Tail/Stop Lamp Outage Detection Signal - Left Outer  | 3               | 3                     | 3                | -                  |
| Tail/Stop Lamp Outage Detection Signal - Right Outer | 3               | 3                     | 3                | -                  |
| Turn Signal Switch - Left Signal                     | 2               | 2                     | 2                | -                  |
| Turn Signal Switch - Right Signal                    | 2               | 2                     | 2                | -                  |
| Turn Signal - Left Front Control                     | B3948 02        | B3948 01,<br>B3948 04 | 1                | -                  |

| Circuit                                                                                                                                                 | Short to Ground | Open/High Resistance  | Short to Voltage | Signal Performance |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------|------------------|--------------------|
| Turn Signal - Left Rear Control                                                                                                                         | B3950 02        | B3950 01,<br>B3950 04 | 1                | -                  |
| Turn Signal - Right Front Control                                                                                                                       | B3949 02        | B3949 01,<br>B3949 04 | 1                | -                  |
| Turn Signal - Right Rear Control                                                                                                                        | B3951 02        | B3951 01,<br>B3951 04 | 1                | -                  |
| Turn Signal Lamp - Left Front Ground                                                                                                                    | -               | 1                     | -                | -                  |
| Turn Signal Lamp - Right Front Ground                                                                                                                   | -               | 1                     | -                | -                  |
| Turn Signal Repeater Lamp - Left Ground                                                                                                                 | -               | 1                     | -                | -                  |
| Turn Signal Repeater Lamp - Right Ground                                                                                                                | -               | 1                     | -                | -                  |
| Tail Lamp Assembly - Left Ground                                                                                                                        | -               | 1                     | -                | -                  |
| Tail Lamp Assembly - Right Ground                                                                                                                       | -               | 1                     | -                | -                  |
| Turn Signal/Multifunction Switch Ground                                                                                                                 | -               | 2                     | -                | -                  |
| 1. Turn Signal Lamps and/or Indicators Malfunction<br>2. Turn Signal/Multifunction Switch Malfunction<br>3. Tail/Stop Lamp Outage Detection 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 their 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 sockets, 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 Wiring Schematics](#)
- [Body Control System Wiring Schematics](#)

Connector End View Reference

### COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

### Exterior Lighting Systems Description and Operation

Electrical Information Reference

- [Circuit Testing](#)

- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### Circuit/System Verification

1. Ignition ON.
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.
  - **Go to next step: 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.
  - **Go to next step: 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.
  - **Go to next step: 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.
  - **Go to next step: 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.
  - **Go to next step: 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 indicators do not turn ON and OFF**  
Refer to Turn Signal Indicators Malfunction.
  - **Go to next step: If the left and right turn signal indicators turn ON and OFF**
8. Observe the left and right outer tail/stop lamps and turn signal indicators on the instrument cluster while activating the left and right turn signals. The left and right outer tail/stop lamps and indicators should illuminate and flash at a normal rate when turned ON.
  - **If the left and right outer tail/stop lamps and indicators illuminate but flash in a rapid manner**

- **Go to next step: If the left and right outer tail/stop lamps and indicators operate normally**

9. 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 min for all vehicle systems to power down.
2. Test for less than 5  $\Omega$  between the ground circuit terminal 3 and ground.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 5  $\Omega$**
3. Ignition ON.
4. Verify the scan tool Left Turn Signal Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground.
6. Verify the scan tool Left Turn Signal Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module, ignition ON.
    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
    3. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If Active**
7. Verify the scan tool Right Turn Signal Switch parameter is Inactive.
  - **If not Inactive**
    1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.
    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.
  - **Go to next step: If Inactive**
8. Install a 3 A fused jumper wire between the signal circuit terminal 2 and ground.
9. Verify the scan tool Right Turn Signal Switch parameter is Active.
  - **If not Active**
    1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module, ignition ON.

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

3. Test for less than 2  $\Omega$  in the signal circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , replace the K9 Body Control Module.

• **Go to next step: If Active**

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

### Turn Signal Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E4 Turn Signal Lamp listed below.

- E4LF Turn Signal Lamp - Left Front
- E4Y Turn Signal Repeater Lamp - Left
- E5LE Tail/Stop Lamp - Left Outer (Z88/X88-UGE)
- E42L Tail Lamp Assembly - Left (X88+UGE)
- E4RF Turn Signal Lamp - Right Front
- E4Z Turn Signal Repeater Lamp - Right
- E5RE Tail/Stop Lamp - Right Outer (Z88/X88-UGE)
- E42R Tail Lamp Assembly - Right (X88+UGE)

2. Test for less than 10  $\Omega$  between the appropriate ground circuit terminal listed below and ground.

- E4LF Turn Signal Lamp - Left Front socket terminal
- E4Y Turn Signal Repeater Lamp - Left socket terminal
- E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
- E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
- E4RF Turn Signal Lamp - Right Front socket terminal
- E4Z Turn Signal Repeater Lamp - Right socket terminal
- E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
- E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)

• **If 10  $\Omega$  or greater**

1. Ignition OFF.

2. Test for less than 2  $\Omega$  in the ground circuit end to end.

- If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
- If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.

• **Go to next step: If less than 10  $\Omega$**

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

- E4LF Turn Signal Lamp - Left Front socket terminal
- E4Y Turn Signal Repeater Lamp - Left socket terminal
- E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
- E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
- E4RF Turn Signal Lamp - Right Front socket terminal
- E4Z Turn Signal Repeater Lamp - Right socket terminal
- E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
- E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)

4. 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**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
  - X5 left front and right rear turn signals
  - X4 right front and left rear turn signals
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. Test for less than 2  $\Omega$  in the control circuit end to end.
  - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
  - If less than 2  $\Omega$ , replace the K9 Body Control Module.
- **If the test lamp is always ON**
  1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
    - X5 left front and right rear turn signals
    - X4 right front and left rear turn signals
  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.
- **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the appropriate turn signal lamp.

### **Tail/Stop Lamp Outage Detection Malfunction**

1. Ignition OFF, disconnect the harness connector at the appropriate E42 Tail Lamp Assembly, ignition ON.
2. Test for B+ between the signal circuit terminal 3 and ground.
  - **If not B+**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
    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. Test for less than 2  $\Omega$  in the signal circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the K9 Body Control Module.
  - **Go to next step: If B+**
3. Verify a test lamp does not illuminate between the signal circuit terminal 3 and ground.
  - **If the test lamp illuminates**
    1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
    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.
  - **Go to next step: If the test lamp does not illuminate**
4. Test or replace the E5 Tail/Stop Lamp - Outer.

### **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 indicators are always OFF or remain ON**

Replace the P16 Instrument Cluster.

- **Go to next step: If the left and right turn signal indicators turn ON and OFF**

3. Replace the K9 Body Control Module.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Turn Signal Switch Replacement \(Equinox\)](#), [Turn Signal Switch Replacement \(Terrain\)](#).
  - Refer to [Turn Signal Bulb Replacement - Left Side \(Chevrolet\)](#), [Turn Signal Bulb Replacement - Left Side \(GMC\)](#).
  - Refer to [Turn Signal Bulb Replacement - Right Side \(Chevrolet\)](#), [Turn Signal Bulb Replacement - Right Side \(GMC\)](#).
  - Refer to [Outside Rearview Mirror Turn Signal Lamp Replacement](#).
  - Refer to [Rear Combination Lamp Replacement \(Chevrolet\)](#), [Rear Combination Lamp Replacement \(GMC\)](#).
  - Refer to [Rear Fascia Signal Lamp Replacement \(Chevrolet\)](#), [Rear Fascia Signal Lamp Replacement \(GMC\)](#).
  - Refer to [Control Module References](#) for BCM or instrument cluster replacement, programming, and setup
-