

2018 ACCESSORIES & EQUIPMENT

Lighting - Diagnostic Information And Procedures - Traverse

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B1395

Diagnostic Instructions

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

DTC Descriptors

DTC B1395 03

Control Module Voltage Reference Output 1 Circuit Low Voltage

DTC B1395 07

Control Module Voltage Reference Output 1 Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Instrument Panel 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. 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

COMPONENT CONNECTOR END VIEWS - INDEX

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Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

Repair Instructions

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

- [Headlamp Switch Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B1480

Diagnostic Instructions

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

DTC Descriptor

DTC B1480 02

Battery Rundown Protection Circuit Short to Ground

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	-
Dome/Reading Lamps - Middle Ground	-	1	-	-
Dome/Reading Lamps - Rear Ground	-	1	-	-
Instrument Panel Compartment Lamp Ground	-	1	-	-
Front Overhead Console Assembly Ground	-	1	-	-
Sunshade Mirror Lamp - Left Ground	-	1	-	-
Sunshade Mirror Lamp - 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, center console compartment lamp, and instrument panel compartment lamp via the courtesy lamp control circuit. When the instrument panel compartment, center console armrest, or a sunshade mirror is opened, the switch contacts 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 occupants when additional cabin lighting is required. In the event that any of these courtesy lamps were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position, 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 courtesy lamps control circuit terminal 3 X7.

Actions Taken When the DTC Sets

- The BCM will disable the control circuit and all lamps controlled by the courtesy lamps control circuit terminal 3 X7 will be inoperative.
- Dome lamps inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

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, disconnect the harness connectors at the components listed below.
 - A3L Sunshade - Left
 - A3R Sunshade - Right
 - A98 Front Overhead Console Assembly
 - E27 Instrument Panel Compartment Lamp
 - E37M Dome/Reading Lamps - Middle
 - E37R Dome/Reading Lamps - 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
 - E27 Instrument Panel Compartment Lamp terminal 1
 - E37M Dome/Reading Lamps - Middle terminal 4
 - E37R Dome/Reading Lamps - Right Rear terminal 4
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 appropriate courtesy lamp.

Repair Instructions

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

- [Instrument Panel Compartment Lamp Replacement](#)

- [Sunshade Replacement](#)
- [Roof Console Replacement](#)
- [3rd Row Seat Position Center Reading and Courtesy Lamp Replacement](#)
- [Rear Seat Position Center Reading Lamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B2530

Diagnostic Instructions

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

DTC Descriptor

DTC B2530 02

Front Fog Lamps Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamp Relay Control	B2530 02	1	1	-
Front Fog Lamp Control	1	1	1	-
Front Fog Lamp Relay Ground	-	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 battery voltage 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 F33UA 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

The BCM detects a short to ground 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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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.

NOTE: **The test lamp in the following step will illuminate at LOW intensity. This is normal circuit operation and does not indicate a circuit malfunction.**

2. Verify a test lamp illuminates between the control circuit terminal 9 and B+.
 - **If the test lamp does not illuminate**
 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 9 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the X50A Fuse Block - Underhood.
 - **Go to next step: If the test lamp illuminates**
 - 3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 9 and B+, ignition ON.
 - 4. Verify the front fog lamps illuminate.
 - **If the front fog lamps do not illuminate**
 1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
 2. Test for infinite resistance between the control circuit terminal 9 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the X50A Fuse Block - Underhood.
 - **Go to next step: If the front fog lamps illuminate**
 - 5. Test or replace the K9 Body Control Module.

Repair Instructions

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

- [Fuse Block Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B2540

Diagnostic Instructions

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

DTC Descriptors

DTC B2540 02

Rear Fog Lamps Control Circuit Short to Ground

DTC B2540 04

Rear Fog Lamps Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Rear Fog Lamp Control	B2540 02	B2540 04	1	-
Rear Fog Lamp Ground	-	1	-	-
1. Rear Fog Lamp Malfunction				

Circuit/System Description

The rear fog lamp switch signal circuit is grounded momentarily by pressing the rear fog lamp switch. The body control module (BCM) responds to the rear fog lamp request by applying voltage to the rear fog lamp control circuit which illuminates the rear fog lamp.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Rear fog lamp ON.

Conditions for Setting the DTC

DTC B2540 02

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

DTC B2540 04

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

Actions Taken When the DTC Sets

The rear fog lamp will not operate when the park lamps are ON and the rear 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

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 E29R Fog Lamp - Rear.
It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 1 and ground.
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Rear Fog 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 E29R Fog Lamp - Rear.

Repair Instructions

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

DTC B2545

Diagnostic Instructions

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

DTC Descriptors

DTC B2545 01

Backup Lamps Circuit Short to Battery

DTC B2545 02

Backup Lamps Circuit Short to Ground

DTC B2545 04

Backup Lamps Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Backup Lamps Control	B2545 02	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.

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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- 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 10 Ω between the ground circuit at the socket terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**

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.

- [Backup Bulb Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B255F

Diagnostic Instructions

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

DTC Descriptor

DTC B255F 02

Interior Door Handle Backlight Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Accent Lamps Control - Terminal 7 X6	B255F 02	1	1	-
Accent Lamp - Left Middle Instrument Panel Ground	-	1	-	-
Accent Lamp - Driver Door Ground	-	1	-	-
Accent Lamp - Passenger Door Ground	-	1	-	-
Center Console Compartment Lamp Ground	-	1	-	-
Flood Lamp - Driver Door Pull Handle Ground	-	1	-	-
Flood Lamp - Passenger Door Pull Handle Ground	-	1	-	-
Front Overhead Console Assembly Ground	-	1	-	-
1. Interior Accent Lighting Malfunction				

Circuit/System Description

The body control module (BCM) supplies battery voltage to accent 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

The BCM detects a short to ground in the accent lamp control circuit terminal 7 X6

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.
- 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 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 Ω between the appropriate ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**

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 X6 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.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

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

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 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.

- [Front Side Door Inside Handle Illumination Lamp Replacement](#)
- [Front Side Door Map Pocket Illumination Lamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B256A

Diagnostic Instructions

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

DTC Descriptor

DTC 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	-
Cargo Lamp Ground	-	1	-	-
1. Rear Compartment Lamp Malfunction				

Circuit/System Description

The body control module (BCM) applies battery voltage to the cargo lamp through the rear compartment lamp control circuit. When the BCM receives a rear liftgate open input from the rear liftgate latch, the BCM applies battery voltage to the rear compartment lamp control circuit illuminating the cargo lamp. In the event that the cargo 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 liftgate 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 cargo/liftgate 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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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 E33 Cargo Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 2 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Cargo 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.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
- **If the test lamp is always ON**
 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 E33 Cargo Lamp.

Repair Instructions

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

- [Cargo Center Courtesy Lamp Bulb Replacement \(Liftgate Lower Trim Finish Panel\)](#), [Cargo Center Courtesy Lamp Bulb Replacement \(Front Side Door Trim\)](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B2575 OR B2699

Diagnostic Instructions

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

DTC Descriptors

DTC B2575 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
Low Beam Headlamp - Left Control	B2575 02	B2575 04	B2575 01, B2575 04	-
Low Beam Headlamp - Right Control	B2699 02	B2699 04	B2699 01, B2699 04	-
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 a short to voltage or an open/high resistance in the left low beam headlamp control circuit.

DTC B2575 02

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

DTC B2699 01 and B2699 04

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

DTC B2699 02

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) 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, exterior lamps OFF, disconnect the harness connector at the E13LA Headlamp Assembly - Left. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - Terminal 4 (T4F)
 - Terminal 1 (T4L)
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 E13LA Headlamp Assembly - Left.

DTC B2699

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E13RA Headlamp Assembly - Right. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.

- Terminal 4 (T4F)
- Terminal 1 (T4L)
- **If 10 Ω or greater**

1. Ignition OFF.

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

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

• **Go to next step: If less than 10 Ω**

3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.

4. Verify the test lamp turns ON and OFF when commanding the 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.
- Go to next step: If infinite resistance

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

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

• **If the test lamp is always ON**

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 E13RA Headlamp Assembly - Right.

Repair Instructions

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

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

DTC B257A

Diagnostic Instructions

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

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 Ground	-	1	-	-
1. Headlamps Malfunction 2. Park, License, and/or Tail Lamps Malfunction				

Circuit/System Description

For headlamp operation, the body control module (BCM) monitors three signal circuits from the headlamp switch. When the headlamp switch is in the AUTO position, the three signal circuits are unaffected and the BCM relies on the ambient light sensor input to turn the headlamps and daytime running lamps 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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- [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 Ω between the ground circuit terminal 8 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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.
 - Go to next step: If less than 1 V
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **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.
 - Go to next step: If less than 1 V
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **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.

- [Headlamp Switch Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B2580

Diagnostic Instructions

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

DTC Descriptors

DTC B2580 01

High Beam Control Circuit Short to Battery

DTC B2580 02

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 Control	B2580 02, B2580 04	B2580 02, B2580 04	B2580 01	-
Headlamp Assembly - Left Ground	-	1	-	-
Headlamp Assembly - Right Ground	-	1	-	-
1. Headlamps Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC**DTC B2580 01**

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

DTC B2580 02 and B2580 04

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) 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 E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
 - E13LA Headlamp Assembly - Left terminal 4 (T4F)
 - E13LA Headlamp Assembly - Left terminal 1 (T4L)
 - E13RA Headlamp Assembly - Right terminal 4 (T4F)
 - E13RA Headlamp Assembly - Right terminal 1 (T4L)
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the control circuit terminal 3 and ground, ignition ON.
4. 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 X3 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 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 E13 Headlamp Assembly.

Repair Instructions

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

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

DTC B2585 OR B3867

Diagnostic Instructions

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

DTC Descriptors

DTC B2585 02

Left Park Lamps Control Circuit Short to Ground

DTC B3867 02

Right Park Lamps Control Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Lamps Control - Left	B2585 02	1	1	-
Park Lamps Control - Right	B3867 02	1	1	-
Headlamp Assembly - Left Ground	-	1	-	-
Headlamp Assembly - Right Ground	-	1	-	-
Side Marker Lamp - Left Front Ground	-	1	-	-
Side Marker Lamp - Right Front Ground	-	1	-	-
Tail Lamp - Left Inner Ground	-	1	-	-
Tail Lamp - Left Outer Ground	-	1	-	-
Tail Lamp - Right Inner Ground	-	1	-	-
Tail Lamp - Right Outer Ground	-	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, side marker lamps, tail lamps, and license lamps control circuits illuminating the park, side marker, tail, and license lamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2585 02

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

DTC B3867 02

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

Actions Taken When the DTC Sets

The appropriate park/side marker lamps 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

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 B2585

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
 - E13LA Headlamp Assembly - Left
 - E2LF Side Marker Lamp - Left Front
 - E5G Tail Lamp - Left Inner
 - E5AK Tail Lamp - Left Outer
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - E13LA Headlamp Assembly - Left terminal 1
 - E2LF Side Marker Lamp - Left Front terminal 1
 - E5G Tail Lamp - Left Inner terminal 1
 - E5AK Tail Lamp - Left Outer terminal 6
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.

- E13LA Headlamp Assembly - Left terminal 6
 - E2LF Side Marker Lamp - Left Front terminal 2
 - E5G Tail Lamp - Left Inner terminal 2
 - E5AK Tail Lamp - Left Outer terminal 5
4. Verify the test lamp turns ON and OFF when commanding the Left Park Lamps ON and OFF with a scan tool.
- **If the test lamp is always OFF**
 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 left park lamp.

DTC B3867

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
 - E13RA Headlamp Assembly - Right
 - E2RF Side Marker Lamp - Right Front
 - E5H Tail Lamp - Right Inner
 - E5AL Tail Lamp - Right Outer
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - E13RA Headlamp Assembly - Right terminal 1
 - E2RF Side Marker Lamp - Right Front terminal 1
 - E5H Tail Lamp - Right Inner terminal 1
 - E5AL Tail Lamp - Right Outer terminal 6
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E13RA Headlamp Assembly - Right terminal 6
 - E2RF Side Marker Lamp - Right Front terminal 2
 - E5H Tail Lamp - Right Inner terminal 2
 - E5AL Tail Lamp - Right Outer terminal 5
4. Verify the test lamp turns ON and OFF when commanding the Right Park Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**

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.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
- **If the test lamp is always ON**
 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 right park lamp.

Repair Instructions

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

- [Headlamp Replacement](#)
- [Rear Body Structure Stop Lamp Replacement](#)
- [Rear Closure Signal Lamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B2610

Diagnostic Instructions

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

DTC Descriptors

DTC B2610 02

Passenger Compartment Dimming 1 Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
LED Backlight Dimming Control Terminal 8 X2	B2610 02	1	1	-
LED Backlight Dimming Control Terminal 9 X7	B2610 02	1	1	-
Door Lock Switch - Driver Ground	-	1	-	-
Door Lock Switch - Passenger Ground	-	1	-	-
Drive Mode Select Switch Ground	-	1	-	-
Garage Door Opener Ground	-	1	-	-
Front Overhead Console Assembly Ground	-	1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hazard Warning Switch Ground	-	1	-	-
Headlamp Switch Ground	-	1	-	-
Ignition Mode Switch Ground	-	1	-	-
Liftgate Control Switch - Interior Ground	-	1	-	-
Park Brake Switch Ground	-	1	-	-
Seat Memory Switch - Driver Ground	-	1	-	-
Steering Wheel Controls Switch - Left Ground	-	1	-	-
Steering Wheel Controls Switch - Right Ground	-	1	-	-
1. Interior Backlighting Malfunction				

Circuit/System Description

The headlamp switch is used to increase and decrease the brightness of the interior backlighting components. The headlamp 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 headlamp switch. When the headlamp switch is placed in the desired position, the dimmed voltage setting is applied from the headlamp switch through the headlamp 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. The BCM also sends a serial data message to the following components requesting there backlighting be adjusted to the level selected by the instrument panel dimmer switch:

- HVAC Controls - Auxiliary
- Info Display Module
- Instrument Cluster
- Transmission Shift Lever Position Indicator
- Window Switch - Driver
- Window Switch - Passenger
- Window Switch - Left Rear
- Window Switch - Right Rear

Conditions for Running the DTC

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

Conditions for Setting the DTC

The BCM detects a short to ground in the LED backlight dimming control 1 circuit terminal 8 X2 or LED backlight dimming control 2 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

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 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, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, 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 Ω between the appropriate ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , replace the K9 Body Control Module.
- **If the test lamp is always ON**
 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.

- [Headlamp Switch Replacement](#)
- [Door Lock Switch Replacement - Driver Side](#)
- [Door Lock Switch Replacement - Passenger Front](#)
- [Liftgate Release Switch Replacement - Interior](#)
- [Front Seat Adjuster Memory Switch Replacement](#)
- [Ignition and Start Switch Replacement](#)
- [Garage Door Opener Transmitter Pushbutton Replacement](#)
- [Hazard Warning Switch Replacement](#)
- [Radio Control Switch Replacement - Steering Wheel \(Right Rear\) Radio Control Switch Replacement - Steering Wheel \(Left Rear\) Radio Control Switch Replacement - Steering Wheel \(Right Front\)](#)
- [Parking Brake Actuator Switch Replacement](#)
- [Cruise Control Switch Replacement](#)
- [Roof Console Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B2615

Diagnostic Instructions

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

DTC Descriptor

DTC B2615 02

Passenger Compartment Dimming 2 Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F23DA Fuse B+	B2615 02	B2615 02	-	-
Dome Lamps Control Terminal 1 X7	B2615 02	1	1	-
Center Console Compartment Lamp Ground	-	1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Dome/Reading Lamps - Middle Ground	-	1	-	-
Dome/Reading Lamps - Rear Ground	-	1	-	-
Door Courtesy Lamp - Driver Ground	-	1	-	-
Door Courtesy Lamp - Passenger Ground	-	1	-	-
Front Overhead Console Assembly Ground	-	1	-	-
1. Dome Lamps Malfunction				

Circuit/System Description

The body control module (BCM) applies battery voltage to the interior courtesy lamps through the dome lamps control circuit at terminal 1 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 will activate the dome lamps control circuit terminal 1 X7 providing battery voltage to all courtesy lamps supplied by the circuits. 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 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 B2615 02

- The BCM detects a short to ground in the dome/courtesy lamps control circuit terminal 1 X7.
- The BCM detects a short to ground or an open/high resistance in the F23DA fuse B+ circuit.

Actions Taken When the DTC Sets

The BCM will disable the dome lamps control circuits terminal 1 X7.

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

NOTE: Each lighting component may need to be disconnected to isolate a short to ground. Use the schematics to identify the following:

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

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 4 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF, remove the fuse at the X51A Fuse Block - Instrument Panel.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF, remove the fuse 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, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the inoperative component listed below. It may take up to 2 min for all vehicle systems to power down.
 - E8D Door Courtesy Lamp - Driver
 - E8P Door Courtesy Lamp - Passenger
 - A98 Front Overhead Console Assembly
 - E37M Dome/Reading Lamps - Middle
 - E37R Dome/Reading Lamps - Rear
 - E28 Center Console Compartment Lamp
5. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - E8D Door Courtesy Lamp - Driver terminal 2
 - E8P Door Courtesy Lamp - Passenger terminal 2
 - A98 Front Overhead Console Assembly terminal 5
 - E37M Dome/Reading Lamps - Middle terminal 3
 - E37R Dome/Reading Lamps - Rear terminal 3
 - E28 Center Console Compartment Lamp terminal 2
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**

6. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E8D Door Courtesy Lamp - Driver terminal 1
 - E8P Door Courtesy Lamp - Passenger terminal 1
 - A98 Front Overhead Console Assembly terminal 8
 - E37M Dome/Reading Lamps - Middle terminal 2
 - E37R Dome/Reading Lamps - Rear terminal 2
 - E28 Center Console Compartment Lamp terminal 1
7. 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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**
8. Test or replace the inoperative dome lamp.

Repair Instructions

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

- [Roof Console Replacement](#)
- [Rear Seat Position Center Reading Lamp Replacement](#)
- [3rd Row Seat Position Center Reading and Courtesy Lamp Replacement](#)
- [Front Side Door Inside Handle Illumination Lamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B2625

Diagnostic Instructions

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

DTC Descriptor

DTC B2625 02

Display Dimming Pulse Width Modulation Output Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Switch Indicator LED Backlight Dimming Control Terminal 5 X1	B2625 02	1	1	-
Dome Lamp Cancel Switch Indicator Control	1	1	B093F 01	-
Drive Mode Select Switch Ground	-	1	-	-
Hazard Warning Switch 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 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

The BCM detects a short to ground in the switch indicator LED backlight dimming control circuit terminal 5 X1.

Actions Taken When the DTC Sets

The switch indicator LED backlight dimming control circuit driver is shut down.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Interior Lights Dimming 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 harness connector at the appropriate component listed below.
 - A98 Front Overhead Console Assembly
 - S126 Drive Mode Select Switch (X88)
 - S26 Hazard Warning Switch (W49)
 - S86 Vehicle Stability Control Switch (W49)
2. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - A98 Front Overhead Console Assembly terminal 18
 - S126 Drive Mode Select Switch terminal 8 (X88)
 - S26 Hazard Warning Switch terminal 8 (W49)
 - S86 Vehicle Stability Control Switch terminal 8 (W49)
3. Verify the test lamp turns ON and OFF when commanding the Indicator Dimming 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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**
4. Test or replace the inoperative component.

Repair Instructions

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

- [Hazard Warning Switch Replacement](#)
- [Roof Console Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B2645

Diagnostic Instructions

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

DTC Descriptors

DTC B2645 03

Ambient Light Sensor Circuit Low Voltage

DTC B2645 07

Ambient Light Sensor Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ambient Light Sensor Signal	B2645 03	B2645 07	B2645 07	-
Ambient Light Sensor Low Reference	1	B2645 07, B0163 05, B0183 05,	1	-
1. Daytime Running Lamps Malfunction				

Circuit/System Description

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor 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.

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](#)

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, 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 Ω between the low reference circuit terminal 6 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF, disconnect the X2 harness connector at the K33 HVAC Control Module.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K33 HVAC control module.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON.
4. Verify the scan tool Ambient Light Sensor parameter is greater than 4.65 V.
 - **If 4.65 V or less**
 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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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.

- [Sun Load Temperature and Ambient Light and Security Indicator Sensor Replacement](#)
- [Control Module References](#) for BCM or HVAC Control Module replacement, programming, and setup

DTC B2740

Diagnostic Instructions

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

DTC Descriptor

DTC B2740 00

Front Fog Lamp Switch Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog 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](#)

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 S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 8 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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.

- [Headlamp Switch Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B323E

Diagnostic Instructions

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

DTC Descriptors

DTC B323E 01

Hands - Free Liftgate Sensor Lamp Circuit Short to Voltage

DTC B323E 02

Hands - Free Liftgate Sensor Lamp Circuit Short to Ground

DTC B323E 04

Hands - Free Liftgate Sensor Lamp Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hands - Free Liftgate Sensor Lamp Control (with TC2)	B323E 02	B323E 04	B323E 01	-
Hands - Free Liftgate Sensor Lamp Ground (with TC2)	-	1	-	-
1. Exterior Courtesy Lamps Malfunction				

Circuit/System Description

The keyless entry control module supplies battery voltage to the hands - free liftgate sensor lamp located on the lower center section of the rear bumper. The hands - free liftgate sensor lamp illuminates the area where the sensor for the foot activated liftgate actuator is located for hands free liftgate operation. When the keyless entry transmitter is operated to either the lock or unlock functions, the hands - free liftgate sensor lamp is commanded ON by the keyless entry control module. The hands - free liftgate sensor lamp will display the image of the car brand logo on the ground directly under the center of the rear bumper.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

DTC B323E 01

The keyless entry control module detects a short to voltage in the hands - free liftgate sensor lamp control circuit.

DTC B323E 02

The keyless entry control module detects a short to ground in the hands - free liftgate sensor lamp control circuit.

DTC B323E 04

The keyless entry control module detects an open/high resistance in the hands - free liftgate sensor lamp control circuit.

Actions Taken When the DTC Sets

The hands - free liftgate sensor 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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- **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 inoperative E72 Hands - Free Liftgate Sensor Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 2 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Hands-Free Liftgate Sensor Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X2 harness connector at the K84 Keyless Entry 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K84 Keyless Entry Control Module.
 - **If the test lamp is always ON**

1. Ignition OFF, disconnect the X2 harness connector at the K84 Keyless Entry 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 K84 Keyless Entry Control Module.
- **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the E72 Hands - Free Liftgate Sensor Lamp.

Repair Instructions

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

- [Rear Closure Hands Free Lamp Replacement](#)
- [Control Module References](#) for Keyless Entry Control Module replacement, programming, and setup

DTC B3588

Diagnostic Instructions

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

DTC Descriptor

DTC B3588 00

Rear Fog Lamp Switch Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Rear Fog Lamp Switch Signal	B3588 00	1	1	-
Rear Fog Lamp Switch Ground	-	1	-	-
1. Rear Fog Lamp Malfunction				

Circuit/System Description

The rear fog lamp switch signal circuit is grounded momentarily by pressing the rear fog lamp switch. The body control module (BCM) responds to the rear fog lamp request by applying voltage to the rear fog lamps control circuit which illuminates the rear fog lamps.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

The BCM detects a short to ground in the headlamp switch rear fog lamp signal circuit.

Actions Taken When the DTC Sets

The rear fog lamp indicator on the instrument cluster is 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.

Schematic Reference

Fog 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, 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 Ω between the ground circuit terminal 8 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON.
4. Verify the scan tool Rear 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 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 Rear 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 6 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **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.

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

DTC B3596

Diagnostic Instructions

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

DTC Descriptor

DTC B3596 00

Hazard Lamps Request Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hazard 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

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, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, 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 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - Terminal 2 (X88)
 - Terminal 3 (W49)
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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 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 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 1 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.

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

- **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.

- [Hazard Warning Switch Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B3600

Diagnostic Instructions

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

DTC Descriptors

DTC B3600 03

Passenger Compartment Dimming Request Signal Circuit Low Voltage

DTC B3600 07

Passenger Compartment Dimming Request Signal Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Instrument Panel 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. 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 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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- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

Repair Instructions

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

- [Headlamp Switch Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B3650

Diagnostic Instructions

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

DTC Descriptor

High Beam Request Signal Circuit Performance - Signal Invalid**Diagnostic Fault Information**

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Turn Signal/Multifunction Switch High Beam Signal	B3650 08	1	1	-
Turn Signal/Multifunction Switch Ground	-	1	-	-
1. Headlamps 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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- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close the drivers door, 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 Ω between the ground circuit terminal 3 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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.

- [Turn Signal Switch Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B3806

Diagnostic Instructions

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

DTC Descriptor

DTC B3806 00

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Turn Signal/Multifunction Switch Flash To Pass Signal	B3806 00	1	1	-
Turn Signal/Multifunction Switch Ground	-	1	-	-
1. Headlamps 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**With T4A**

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

With T4F

The high beam headlamps 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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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 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 Ω between the ground circuit terminal 3 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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.

- [Turn Signal Switch Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B380A OR B380B

Diagnostic Instructions

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

DTC Descriptors

DTC B380A 01

Passenger Compartment Lamp On/Off Switch Circuit Short to Battery

DTC B380B 02

Passenger Compartment Lamp Defeat Switch Circuit Short to Ground

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	-
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

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/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 Ω between the ground circuit terminal 5 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/vehicle in Service Mode.
4. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Inactive.
 - **If Cancel**
 1. Ignition OFF/Vehicle OFF, disconnect the X1 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 Inactive**
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 X1 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.
 - Go to next step: If less than 1 V
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
- **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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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.

- [Roof Console Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B3881 OR B3882

Diagnostic Instructions

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

DTC Descriptors

DTC B3881 01

Tail Lamp Circuit Open

DTC B3881 02

Tail Lamp Circuit Short to Ground

DTC B3881 04

Tail Lamp Circuit Short to Battery

DTC B3882 01

Right Tail Lamp Circuit Open

DTC B3882 02

Right Tail Lamp Circuit Short to Ground

DTC B3882 04

Right Tail Lamp Circuit Short to Battery

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Stop/Turn Signal Lamp Control - Left Rear	B3881 02	B3881 01, B3881 04	B3881 01, B3881 04	-
Stop/Turn Signal Lamp Control - Right Rear	B3882 02	B3882 01, B3882 04	B3882 01, B3882 04	-
Tail Lamp Assembly - Left Ground	-	1	-	-
Tail Lamp Assembly - Right Ground	-	1	-	-
1. Turn Signal Lamps and/or Indicators 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 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 rear stop/turn signal lamp control circuit.

DTC B3881 02

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

DTC B3882 01 and B3882 04

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

DTC B3882 02

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

Actions Taken When the DTC Sets

The appropriate stop/turn signal lamp will be inoperative.

Conditions for Clearing the DTC

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

Reference Information

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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 E5AM Stop/Turn Signal Lamp - Left. It may take up to 2 min for all vehicle systems to power down
2. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Left Rear Turn Signal/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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 E5AM Stop/Turn Signal Lamp - Left.

DTC B3882

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E5AN Stop/Turn Signal Lamp - Right. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit at the socket terminal and ground.
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Right Rear Turn Signal/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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 E5AN Stop/Turn Signal Lamp - Right.

Repair Instructions

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

- [Rear Body Structure Stop Lamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B3883

Diagnostic Instructions

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

DTC Descriptor

DTC B3883 02

License Plate Lamp Circuit Short to Ground

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
License Plate Lamps Control	B3883 02	1	1	-
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 turn signal/multifunction switch is placed in the HEAD or PARK position, ground is applied to the park lamp switch ON signal circuit to the body control module (BCM). The BCM responds by applying voltage to the park lamps, tail lamps, and license lamps control circuits illuminating the park, tail, and license lamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

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

Actions Taken When the DTC Sets

License plate 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.

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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. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between each ground circuit terminal listed below and ground.
 - E7L License Plate Lamp - Left terminal 1 (-DRZ)
 - E7L License Plate Lamp - Left terminal 2 (DRZ)
 - E7R License Plate Lamp - Right terminal 1 (-DRZ)
 - E7R License Plate Lamp - Right terminal 2 (DRZ)
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the appropriate E7L License Plate Lamp - Left control circuit terminal listed below and ground, ignition ON.
 - Terminal 2 (-DRZ)
 - Terminal 1 (DRZ)
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 appropriate E7R License Plate Lamp - Right control circuit terminal listed below and ground, ignition ON.
 - Terminal 2 (-DRZ)
 - Terminal 1 (DRZ)
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - **Go to next step: If the test lamp turns ON and OFF**
8. Test or replace the E7 License Plate Lamp bulb.

Repair Instructions

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

- [Rear License Plate Lamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B3884

Diagnostic Instructions

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

DTC Descriptor

DTC B3884 02

Center High Mounted Stop 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	-
Radio AM Antenna Signal Filter 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 center high mounted stop lamp control circuit illuminating the center high mounted stop lamp. The R44 Radio Antenna Signal Filter Module eliminates unwanted electrical noise/interference emitted through the radio antenna signal when the Center High Mounted Stop Lamp is illuminated

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

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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 E6 Center Stop Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 1 and ground.
 - **If 10 Ω or greater**
 1. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit. If the circuit tests normal, replace the R44 Radio AM Antenna Signal Filter Module.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit. If the circuit tests normal, replace the R44 Radio AM Antenna Signal Filter Module.
 - If less than 2 Ω , 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.

- [High Mount Stop Lamp Replacement](#)
- [Radio AM Antenna Signal Filter Module Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B3948 OR B3949

Diagnostic Instructions

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

DTC Descriptors

DTC B3948 01

Left Front Turn Signal Circuit Short to Battery

DTC B3948 02

Left Front Turn Signal Circuit Short to Ground

DTC B3948 04

Left Front Turn Signal Circuit Open

DTC B3949 01

Right Front Turn Signal Circuit Short to Battery

DTC B3949 02

Right Front Turn Signal Circuit Short to Ground

DTC B3949 04

Right Front Turn Signal Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Turn Signal Control - Left Front	B3948 02	B3948 01, B3948 04	B3948 01, B3948 04 1	-
Turn Signal Control - Right Front	B3949 02	B3949 01, B3949 04	B3949 01, B3949 04	-
Outside Rearview Mirror - Driver Ground	-	1	-	-
Outside Rearview Mirror - Passenger Ground	-	1	-	-
Turn Signal - Left Front Ground	-	1	-	-
Turn Signal - Right Front 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 a short to voltage or an open/high resistance in the left front turn signal control 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 a short to voltage or an open/high resistance in the right front turn signal control 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.
- The driver information center displays "Left Front Turn Indicator Failure".

DTC B3949

- The right front turn signal is inoperative.
- The right turn signal indicator on the instrument cluster flashes rapidly.
- The driver information center displays "Right Front Turn Indicator Failure".

Conditions for Clearing the DTC

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

Reference Information

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Scan Tool Reference

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

Circuit/System Testing

DTC B3948

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
 - E4LF Turn Signal Lamp - Left Front
 - A9A Outside Rearview Mirror - Driver
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
 - E4LF Turn Signal Lamp - Left Front terminal 1
 - A9A Outside Rearview Mirror - Driver terminal 5
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E4LF Turn Signal Lamp - Left Front terminal 3
 - A9A Outside Rearview Mirror - Driver terminal 6 (X88)
 - A9A Outside Rearview Mirror - Driver terminal 13 (W49)
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 left front turn signal lamp.

DTC B3949

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
 - E4RF Turn Signal Lamp - Right Front
 - A9B Outside Rearview Mirror - Passenger
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
 - E4RF Turn Signal Lamp - Right Front terminal 1
 - A9B Outside Rearview Mirror - Passenger terminal 5
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E4RF Turn Signal Lamp - Right Front terminal 3
 - A9B Outside Rearview Mirror - Passenger terminal 6 (X88)
 - A9B Outside Rearview Mirror - Passenger terminal 13 (W49)
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 right front turn signal lamp.

Repair Instructions

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

- [Front Turn Signal Lamp Bulb Replacement](#)
- [Outside Rearview Mirror Turn Signal Lamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC B3950 OR B3951

Diagnostic Instructions

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

DTC Descriptors

DTC B3950 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 Control - Left Rear	B3950 02	B3950 01, B3950 04	B3950 01	-
Turn Signal Control - Right Rear	B3951 02	B3951 01, B3951 04	B3951 01	-
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 short to voltage or an open/high resistance in the left rear turn signal control 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 short to voltage or an open/high resistance in the right rear turn signal control circuit.

DTC B3951 02

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

Actions Taken When the DTC Sets

DTC B3950

- The left rear turn signal is inoperative.
- The left turn signal indicator on the instrument cluster flashes rapidly.
- The driver information center displays "Left Rear Turn Indicator Failure".

DTC B3951

- The right rear turn signal is inoperative.
- The right turn signal indicator on the instrument cluster flashes rapidly.
- The driver information center displays "Right Rear Turn Indicator Failure".

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.

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- **Wiring Repairs**

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 E5AK Outer Tail Lamp Assembly - Left. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - Terminal 6 (X88)
 - Terminal 4 (W49)

- **If 10 Ω or greater**

1. Ignition OFF.
2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E5AK Outer Tail Lamp Assembly - Left terminal 4 (X88)
 - E5AK Outer Tail Lamp Assembly - Left terminal 1 (W49)
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 E5AK Outer Tail Lamp Assembly - Left.

DTC B3951

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E5AL Outer Tail Lamp Assembly - Right. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - Terminal 6 (X88)
 - Terminal 4 (W49)
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E5AL Outer Tail Lamp Assembly - Right terminal 4 (X88)
 - E5AL Outer Tail Lamp Assembly - Right terminal 1 (W49)
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.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 E5AL Outer Tail Lamp Assembly - Right.

Repair Instructions

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

- [Rear Body Structure Stop Lamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

DTC C0277 OR C0890

Diagnostic Instructions

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

DTC Descriptors

DTC C0277 06

Brake Pedal Position Sensor Circuit 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 Low Input

DTC C0277 4B

Brake Pedal Position Sensor Circuit Calibration Not Learned

DTC C0890 03

Control Module Voltage Reference Output 3 Circuit Low Voltage

DTC C0890 07

Control Module Voltage Reference Output 3 Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Brake Pedal Position Sensor 5 V Reference	C0277 06, C0890 03, U0422 71	C0277 06, U0422 71	C0277 07, C0890 07, U0422 71	C0277 09, C0277 12
Brake Pedal Position Sensor Signal	C0277 06, U0422 71	C0277 06, U0422 71	C0277 07, U0422 71	C0277 09, C0277 12
Brake Pedal Position Sensor Low Reference	-	C0277 07, U0422 71	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 C0277 06 and C0277 12

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

DTC C0890 07

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

Actions Taken When the DTC Sets

- The "Service Stabilitrak" and "Service Driver Assist System" messages are displayed on the driver information center.

- 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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Exterior Lighting Systems Description and Operation

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- Circuit Testing
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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

DTC C0277 06, C0277 07, C0277 12, 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 1 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 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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 2 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the 5 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , replace the K9 Body Control Module.
- **If greater than 5.2 V**
 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. Test for less than 1 V between the signal circuit terminal 3 and ground.
 - **If 1 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, replace the K9 Body Control Module.
 - **Go to next step: If less than 1 V**

NOTE: The scan tool Brake Pedal Applied parameter will change to Active for 3 s as the 3 A fused jumper wire is connected between the 5 V reference circuit and the signal circuit and then default to Inactive. This is normal operation.

6. Install a 3 A fused jumper wire between the 5 V reference circuit terminal 2 and the signal circuit terminal 3.
7. Verify the scan tool Brake Pedal Applied parameter is Active for 3 s before defaulting to Inactive.
 - **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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If Active**
8. Test or replace the B22 Brake Pedal Position Sensor.

DTC C0277 4B

1. Verify DTC C0277 4B is not set.
 - **If DTC C0277 4B is set**
 1. 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.
 - Go to next step: If the DTC does not reset
 - **Go to next step: If DTC C0277 4B is not set**
2. All OK.

DTC C0277 09

1. Verify DTC C0277 09 is not set.

- **If DTC C0277 09 is set**

1. 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.
 - Go to next step: If the DTC does not reset

4. All OK.

- **Go to next step: If DTC C0277 09 is not set**

2. All OK.

Repair Instructions

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

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

DTC C0297

Diagnostic Instructions

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

DTC Descriptor

DTC C0297 02

Brake Applied Output Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Brake Applied Signal	C0297 02	1	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 in 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](#)
- [Body Control System Wiring Schematics](#)

Connector End View Reference

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Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the K20 Engine Control Module.
2. Connect a test lamp between the signal circuit terminal 13 and ground, ignition ON.
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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.

- **Brake Pedal Position Sensor Calibration**
- **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:

- **Backup Lamps Malfunction**
- **Courtesy Lamps Malfunction**
- **Daytime Running Lamps Malfunction**
- **Dome Lamps Malfunction**
- **Exterior Courtesy Lamps Malfunction**
- **Front Fog Lamps Malfunction**
- **Rear Fog Lamps Malfunction**
- **Hazard Lamps Malfunction**
- **Headlamps Malfunction**
- **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**

BACKUP LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F1DA (BCM 6) Fuse B+	1	1	-	-
Backup Lamp Control	B2545 02	1	1	-
Backup Lamp Ground	-	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 lamp control circuit. The engine must be running for the backup lamp to operate.

Reference Information

Schematic Reference

- [Exterior Lights Wiring Schematics](#)
- [Body Control System Wiring Schematics](#)

Connector End View Reference

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Description and Operation

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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 X5 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF, remove the fuse at the X51A Fuse Block - Instrument Panel.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition OFF, remove the fuse 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 X5 harness connector at the K9 Body Control Module.
4. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E5 Backup Lamp. It may take up to 2 min for all vehicle systems to power down.
5. Test for less than 10 Ω between the ground circuit at the socket terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
6. Connect a test lamp between the control circuit at the socket terminal and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Backup Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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**
8. Test or replace the E5 Backup Lamp.

Repair Instructions

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

- [Backup Bulb Replacement](#)
- [Control Module References](#) for BCM 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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Courtesy Lamps Control - Terminal 3 X7	B1480 02	1	1	-
Dome/Reading Lamps - Middle Ground	-	1	-	-
Dome/Reading Lamps - Rear Ground	-	1	-	-
Instrument Panel Compartment Lamp 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, middle, and rear reading lamps, left and right sunshade lamps, and instrument panel compartment lamp via the courtesy lamp control circuit. When the instrument panel compartment or a sunshade mirror is opened, the switch contacts close allowing battery voltage to flow illuminating the respective lamps. The front, middle, and rear reading lamps are controlled by individual switches that are activated by the occupants 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

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

NOTE: Each lighting component may need to be disconnected to isolate a short to ground. Use the schematics to identify the following:

- Lighting components the vehicle is equipped with
- Each component's control and ground circuit terminals
- Component locations on the lighting 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 courtesy lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω 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
 - E27 Instrument Panel Compartment Lamp terminal 2
 - E37M Dome/Reading Lamps - Middle terminal 3
 - E37R Dome/Reading Lamps - Rear terminal 3
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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
 - E27 Instrument Panel Compartment Lamp terminal 1
 - E37M Dome/Reading Lamps - Middle terminal 4
 - E37R Dome/Reading Lamps - Rear terminal 4
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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.

- [Instrument Panel Compartment Lamp Replacement](#)
- [Sunshade Replacement](#)
- [Roof Console Replacement](#)
- [3rd Row Seat Position Center Reading and Courtesy Lamp Replacement](#)

- [Rear Seat Position Center Reading Lamp Replacement](#)
- [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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

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

Circuit/System Description

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2 and 4.9 V depending on outside lighting conditions. The body control module (BCM) provides a 5 V reference signal to the ambient light sensor 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 lights or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will command the designated daytime running lights 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 lights operation.

Reference Information

Schematic Reference

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

1. Ignition ON.
2. Verify the left daytime running lamp turns ON and OFF while commanding the Left Dedicated 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 Dedicated 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**
4. Refer to Circuit/System Testing - Ambient Light Sensor Malfunction.

Circuit/System Testing

Daytime Running Lamps Malfunction (T4L)

1. Ignition OFF, exterior lamps OFF, disconnect the connector at the appropriate harness connector listed below. It may take up to 2 min for all vehicle systems to power down.
 - E13LA Headlamp Assembly - Left
 - E13RA Headlamp Assembly - Right
2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 6 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Park 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

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

1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
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 K166 Multifunction LED Control Module.

Daytime Running Lamps Malfunction (T4F)

1. Ignition OFF, exterior lamps OFF, disconnect the connector at the appropriate harness connector listed below. It may take up to 2 min for all vehicle systems to power down.

- E13LA Headlamp Assembly - Left
- E13RA Headlamp Assembly - Right

2. Test for less than 10 Ω between the ground circuit terminal 1 and ground.

- **If 10 Ω or greater**

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

- **Go to next step: If less than 10 Ω**

3. Connect a test lamp between the control circuit terminal 5 and ground, ignition ON.

4. Verify the test lamp turns ON and OFF when commanding the 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 appropriate harness connector listed below at the K9 Body Control Module.

- X5 - Left Daytime Running Lamps
- X7 - Right Daytime Running 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.
 - Go to next step: If infinite resistance

3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

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

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

- X5 - Left Daytime Running Lamps
- X7 - Right Daytime Running 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 Daytime Running Lamp.

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 10 Ω between the low reference circuit terminal 6 and ground.

- **If 10 Ω or greater**
 1. Ignition OFF, disconnect the X2 harness connector at the K33 HVAC Control Module.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K33 HVAC Control Module.
 - **Go to next step: If less than 10 Ω**
- 3. Ignition ON.
- 4. Verify the scan tool Ambient Light Sensor parameter is greater than 4.65 V.
 - **If 4.65 V or less**
 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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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.

- [Sun Load Temperature and Ambient Light and Security Indicator Sensor Replacement](#)
- [Headlamp Replacement](#)
- [Control Module References](#) for BCM or HVAC control module replacement, programming, and setup

DOME LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F23DA Fuse B+	B2615 02	B2615 02	-	-
Dome Lamps Control Terminal 1 X7	B2615 02	1	1	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Dome Lamp Switch Cancel Signal	B380B 02	2	2	-
Dome Lamp Switch ON Signal	2	B380A 01	B380A 01	-
Center Console Compartment Lamp Ground	-	1	-	-
Dome/Reading Lamps - Middle Ground	-	1	-	-
Dome/Reading Lamps - Rear Ground	-	1	-	-
Door Courtesy Lamp - Driver Ground	-	1	-	-
Front Overhead Console Assembly Ground	-	1, 2	-	-
1. Dome Lamps Malfunction 2. Dome Lamp Switch 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). The BCM applies battery voltage to the interior courtesy lamps through the dome lamps control circuit at terminal 1 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 lamps control circuit at terminal 1 X7. After all doors have been closed, the dome lamps will remain illuminated approximately 3 s after the last door closes. In the event that any of 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 lamp control circuit to prevent total battery discharge.

When the driver places the dome lamp cancel switch in the OFF position, the dome lamps will be disabled when any door is opened and an amber indicator located on the dome lamp cancel switch will illuminate to inform the driver that the dome lamp cancel switch is in the OFF position.

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

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 INACTIVE and ON/OFF while switching the dome lamp switch from the ON/OFF positions.
 - **If the parameter does not change**
Refer to Dome Lamp Switch Malfunction.
 - **Go to next step: If the parameter changes**
4. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter changes between INACTIVE and DOOR while switching the dome lamp cancel switch from the ON/OFF positions.
 - **If the parameter does not change**
Refer to Dome Lamp Switch Malfunction.
 - **Go to next step: If the parameter changes**
5. Verify all dome lamps controlled by the dome/courtesy lamps control circuit at terminal 1 X7 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**
6. All OK.

Circuit/System Testing

Dome Lamp Switch Malfunction

1. Ignition 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 Ω between the ground circuit terminal 5 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON.
4. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is INACTIVE.
 - **If DOOR**
 1. Ignition OFF, disconnect the X1 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/OFF**

1. Ignition 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 INACTIVE**
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 DOOR.
 - **If not DOOR**
 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 21 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If DOOR**
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/OFF.
 - **If not ON/OFF**
 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 signal circuit terminal 3 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If ON/OFF**
9. Test or replace the A98 Front Overhead Console Assembly.

Dome Lamps Malfunction

NOTE: Each lighting component may need to be disconnected to isolate a short to ground. Use the schematics to identify the following:

- Lighting components the vehicle is equipped with
 - Each component's control and ground circuit terminals
 - Component locations on the lighting 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 component listed below. It may take up to 2 min for all vehicle systems to power down.
 - E8D Door Courtesy Lamp - Driver
 - E8P Door Courtesy Lamp - Passenger
 - A98 Front Overhead Console Assembly
 - E37M Dome/Reading Lamps - Middle
 - E37R Dome/Reading Lamps - Rear
 - E28 Center Console Compartment Lamp
 2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - E8D Door Courtesy Lamp - Driver terminal 2

- E8P Door Courtesy Lamp - Passenger terminal 2
- A98 Front Overhead Console Assembly terminal 5
- E37M Dome/Reading Lamps - Middle terminal 3
- E37R Dome/Reading Lamps - Rear terminal 3
- E28 Center Console Compartment Lamp terminal 2
- **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
- 3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E8D Door Courtesy Lamp - Driver terminal 1
 - E8P Door Courtesy Lamp - Passenger terminal 1
 - A98 Front Overhead Console Assembly terminal 8
 - E37M Dome/Reading Lamps - Middle terminal 2
 - E37R Dome/Reading Lamps - Rear terminal 2
 - E28 Center Console Compartment Lamp terminal 1
- 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 inoperative dome lamp.

Repair Instructions

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

- [Roof Console Replacement](#)
- [Rear Seat Position Center Reading Lamp Replacement](#)
- [3rd Row Seat Position Center Reading and Courtesy Lamp Replacement](#)
- [Front Side Door Inside Handle Illumination Lamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

EXTERIOR COURTESY LAMPS MALFUNCTION

Diagnostic Instructions

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

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hands - Free Liftgate Sensor Lamp Control (TC2)	B323E 02	B323E 04	B323E 01	-
Hands - Free Liftgate Sensor Lamp Ground (TC2)	-	1	-	-
1. Hands-Free Liftgate Sensor Lamp Malfunction				

Circuit/System Description

The keyless entry control module supplies battery voltage to the hands - free liftgate sensor lamp located on the lower center section of the rear bumper. The hands - free liftgate sensor lamp illuminates the area where the sensor for the foot activated liftgate actuator is located for hands free liftgate operation. When the keyless entry transmitter is operated to either the lock or unlock functions, the hands - free liftgate sensor lamp is commanded ON by the keyless entry control module. The hands - free liftgate sensor lamp will display the image of the car brand logo on the ground directly under the center of the rear bumper.

Reference Information

Schematic Reference

Exterior 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 hands - free liftgate sensor lamp turns ON and OFF while commanding the Projected Lamp ON and OFF with a scan tool.
 - **If the hands - free liftgate sensor lamp does not turn ON and OFF**
 Refer to Hands - Free Liftgate Sensor Lamp Malfunction.
 - **Go to next step: If the hands - free liftgate sensor lamp turns ON and OFF**
3. All OK.

Circuit/System Testing

Hands-Free Liftgate Sensor Lamp Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the inoperative E72 Hands - Free Liftgate Sensor Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 2 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Projected Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X2 harness connector at the K84 Keyless Entry 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K84 Keyless Entry Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF, disconnect the X2 harness connector at the K84 Keyless Entry 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 K84 Keyless Entry Control Module.
 - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the E72 Hands - Free Liftgate Sensor Lamp.

Repair Instructions

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

- [Rear Closure Hands Free Lamp Replacement](#)
- [Control Module References](#) for Keyless Entry Control Module 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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamp Switch Signal	B2740 00	2	2	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamp Relay Control	B2530 02	1	1	-
Front Fog Lamp Control	1	1	1	-
Front Fog Lamp Relay Ground	-	1	-	Ã,Â
Front Fog Lamp Ground - Left	-	1	-	-
Front Fog Lamp Ground - Right	-	1	-	-
Headlamp Switch Ground	-	2	-	-
1. Front Fog Lamps Malfunction 2. Front Fog Lamp Switch 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 battery voltage 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 F33UA fog lamp fuse to the front fog lamp control circuit which illuminates the front fog lamps. With the front fog lamp switch activated the BCM sends a message via serial data to the instrument cluster requesting the instrument cluster to illuminate the front fog indicator.

Reference Information

Schematic Reference

Fog Lights 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, park lamps 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, open and close drivers door, 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 Ω between the ground circuit terminal 8 and ground.

- **If 10 Ω or greater**

1. Ignition OFF.

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

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

- **Go to next step: If less than 10 Ω**

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.
- Go to next step: If less than 1 V

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

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

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

7. Test or replace the S30 Headlamp Switch.

Front Fog Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E29 Fog Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 2 and ground.
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.
4. Verify the test lamp does not turn ON and OFF when commanding the Front Fog Lamps ON and OFF with a scan tool.
 - **If the test lamp turns ON and OFF**

Test or replace the appropriate E29 Fog Lamp.
 - **Go to next step: If the test lamp does not turn ON and OFF**
5. Ignition OFF, connect the E29 Fog Lamp. Disconnect the X5 harness connector at the X50A Fuse Block - Underhood, ignition ON.
6. Verify the fog lamps do not illuminate.
 - **If the fog lamps illuminate**
 1. Ignition OFF, remove the E29 Fog Lamps, ignition ON.
 2. Test for less than 1 V between the control circuit terminal 15 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the appropriate E29 Fog Lamp.
 - **Go to next step: If the fog lamps do not illuminate**
7. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 15 and B+, ignition ON.
8. Verify the fog lamps illuminate.
 - **If the fog lamps do not illuminate**
 1. Ignition OFF, remove the 3 A fused jumper wire, remove the E29 Fog Lamps.
 2. Test for infinite resistance between the control circuit terminal 15 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , all OK.
 - **Go to next step: If the fog lamps illuminate**
9. Ignition OFF, connect the X5 harness connector at the X50A Fuse Block - Underhood.
10. Ignition OFF, all vehicle systems OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood. It may take up to 2 min for all vehicle systems to power down.
11. Test for less than 10 Ω between the ground circuit terminal 32 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
12. Connect the X1 harness connector at the X50A Fuse Block - Underhood. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
13. Verify a test lamp illuminates between the control circuit terminal 9 and B+.

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

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 9 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - Go to next step: If less than 1 V
3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the X50A Fuse Block - Underhood.
- **Go to next step: If the test lamp illuminates**
14. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 9 and B+, ignition ON.
15. Verify the fog lamps illuminate.
 - **If the fog lamps do not illuminate**
 1. Ignition OFF, disconnect the X1 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, replace the X50A Fuse Block - Underhood.
 - **Go to next step: If the fog lamps illuminate**
16. Test or replace the K9 Body Control Module.

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.

- [Front Fog Lamp Replacement](#)
- [Front Fog Lamp Bulb Replacement](#)
- [Headlamp Switch Replacement](#)
- [Fuse Block Replacement](#)
- [Control Module References](#) for BCM or Instrument Cluster replacement, programming, and setup

REAR FOG LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Rear Fog Lamp Switch Signal	B3588 00	2	2	-
Rear Fog Lamp Control	B2540 02	B2540 04	1	-
Rear Fog Lamp Ground	-	1	-	-
Headlamp Switch Ground	-	2	-	-
1. Rear Fog Lamp Malfunction 2. Rear Fog Lamp Switch Malfunction				

Circuit/System Description

The rear fog lamp switch signal circuit is grounded momentarily by pressing the rear fog lamp switch. The body control module (BCM) responds to the rear fog lamp request by applying voltage to the rear fog lamp control circuit which illuminates the rear fog lamp.

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 Verification

1. Ignition ON, headlamps ON.
2. Verify the scan tool Rear Fog Lamps Switch parameter changes between Active and Inactive while commanding the rear fog lamp ON and OFF with the rear fog lamp switch.
 - **If the parameter does not change**

Refer to Rear Fog Lamp Switch Malfunction.
 - **Go to next step: If the parameter changes**
3. Verify the rear fog lamp turns ON and OFF when commanding the Rear Fog Lamps ON and OFF with a scan tool.
 - **If the rear fog lamp does not turn ON and OFF**

Refer to Rear Fog Lamp Malfunction.
 - **Go to next step: If the rear fog lamp turns ON and OFF**
4. All OK.

Circuit/System Testing

Rear Fog Lamp Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, 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 Ω between the ground circuit terminal 8 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON.
4. Verify the scan tool Rear Fog Lamp 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 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 Rear Fog Lamp 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 6 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If Active**
7. Test or replace the S30 Headlamp Switch.

Rear Fog Lamp Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E29R Fog Lamp - Rear. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 1 and ground.
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Rear Fog 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.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
- **If the test lamp is always ON**
 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 E29R Fog Lamp - Rear.

Repair Instructions

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

- [Headlamp Switch Replacement](#)
- [Control Module References](#) for BCM and 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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

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

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 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 Circuit/System Testing.
 - **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. All OK.

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 S26 Hazard Warning Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - Terminal 2 (X88)
 - Terminal 3 (W49)
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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 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 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 1 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - Go to next step: If less than 1 V
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
- **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.

- [Hazard Warning Switch Replacement](#)
- [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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp High Beam Control	B2580 02, B2580 04	B2580 02, B2580 04	B2580 01	-
Low Beam Headlamp Control - Left	B2575 02	B2575 04	B2575 01, B2575 04	-
Low Beam Headlamp Control - Right	B2699 02	B2699 04	B2699 01, B2699 04	-
Headlamp Switch Park Lamps ON Signal	4	B257A 00	4	-
Headlamp Switch Headlamps OFF Signal	B257A 00	4	4	-
Headlamp Switch Headlamps ON Signal	B257A 00	4	4	-
Turn Signal/Multifunction Switch Flash To Pass Signal	B3806 00	3	3	-
Turn Signal/Multifunction Switch High Beam Signal	B3650 08	3	3	-
Turn Signal/Multifunction Switch Auto High Beam Select Signal (with TQ5)	5	5	5	-
Headlamp Assembly - Left Ground	-	1, 2	-	-
Headlamp Assembly - Right Ground	-	1, 2	-	-
Headlamp Switch Ground	-	4	-	-
Turn Signal/Multifunction Switch Ground	-	3	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
1. Headlamps Malfunction - Low Beam 2. Headlamps Malfunction - High Beam 3. Turn Signal/Multifunction Switch Malfunction 4. Headlamp Switch Malfunction 5. Automatic High Beam Select Switch Malfunction				

Circuit/System Description

Low Beam Headlamps (T4F)

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 (open) 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 energizes the low beam relays by applying ground to the low beam relay control circuits. With the low beam relays energized, the relay switch contacts close and battery voltage flows through the lamp relay control circuits to the headlamp ballasts located within each headlamp assembly. When battery voltage is applied to the headlamp ballast through the low beam control circuits, the ballast charge the starter to start the lamp. High intensity discharge headlamps do not have filaments like traditional bulbs, instead the starter uses a high voltage transformer to convert the input voltage into a higher voltage. This increased voltage is used in order to create an arc between the electrodes in the bulb illuminating the low beam headlamps.

Low Beam Headlamps (T4L)

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 (open) 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 to the low beam request by applying ground to the low beam relay control circuits. With the low beam relays energized, the relay switch contacts close and battery voltage flows through the lamp relay control circuits to the left and right headlamp control modules located in each headlamp assembly illuminating the low beam headlamps.

High Beam Headlamps (T4F)

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 battery positive voltage through the high beam control circuit to the left and right high beam solenoid actuators opening the left and right high beam shutters exposing the full headlamps for high beam operation.

High Beam Headlamps (T4L)

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 from the high

beam headlamp control circuit to the left and right headlamp control modules located in each headlamp assembly illuminating the high beam headlamps.

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 battery positive voltage to the high beam control circuit illuminating the high beams for a brief moment or until the flash to pass switch is released.

Automatic Headlamps

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.

Reference Information

Schematic Reference

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

Connector End View Reference

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Scan Tool Reference

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

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Headlamps On Switch parameter changes between Active and Inactive while commanding the headlamp ON and OFF with the Headlamp switch.
 - **If the parameter does not change**

Refer to Circuit/System Testing - 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 Circuit/System Testing - 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 Circuit/System Testing - 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 Circuit/System Testing - Turn Signal/Multifunction Switch Malfunction.

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

6. Connect a test lamp between the Left Low Beam Fuse (F32UA) test point and ground, ignition ON.

7. Verify the test lamp turns ON and OFF when commanding the Low Beam Headlamps ON and OFF with a scan tool.

- **If the test lamp does not turn ON and OFF**

Refer to Circuit/System Testing - BCM Relay Control Malfunction

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

8. Connect a test lamp between the Right Low Beam Fuse (F37UA) test point and ground, ignition ON.

9. Verify the test lamp turns ON and OFF when commanding the Low Beam Headlamps ON and OFF with a scan tool.

- **If the test lamp does not turn ON and OFF**

Refer to Circuit/System Testing - BCM Relay Control Malfunction

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

10. Remove the test lamp.

11. Verify the low beam headlamps turn ON and OFF when commanding the Low Beam Headlamps ON and OFF with a scan tool.

- **If the low beam headlamps do not turn ON and OFF**

Refer to Circuit/System Testing - Headlamps Malfunction - Low Beam (T4F or T4L).

- **Go to next step: If the low beam headlamps turn ON and OFF**

12. 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 Circuit/System Testing - Headlamps Malfunction - High Beam.

- **Go to next step: If the high beams turn ON and OFF**

13. (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:

- **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.**

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

- **If the parameter does not change**

Refer to Ambient Light Sensor Malfunction.

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

15. 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 Ω between the ground circuit terminal 8 and ground.

- **If 10 Ω or greater**

1. Ignition OFF.

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

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

- **Go to next step: If less than 10 Ω**

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.
- Go to next step: If less than 1 V

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

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

- **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.
- Go to next step: If less than 1 V

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

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

- **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.
- Go to next step: If less than 1 V

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

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

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

13. Test or replace the S30 Headlamp Switch.

Turn Signal/Multifunction Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S78 Turn Signal/Multifunction Switch. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10 Ω between the ground circuit terminal 3 and ground.

- **If 10 Ω or greater**

1. Ignition OFF.

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

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

- **Go to next step: If less than 10 Ω**

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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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, open and close drivers door, 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 Ω between the ground circuit terminal 3 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition 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.
- Go to next step: If less than 1 V

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

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

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

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

BCM Relay Control Malfunction

NOTE: You must perform the Circuit/System Verification before proceeding with Circuit/System Testing.

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

2. Connect a 3 A fused jumper between the appropriate control circuit terminal listed below and ground.

- Left Low Beam - Terminal 22
- Right Low Beam - Terminal 13

3. Ignition ON, verify a test lamp illuminates between the appropriate Low Beam Fuse listed below and ground.

- Left Low Beam - fuse F32UA
- Right Low Beam - fuse F37UA

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

1. Ignition OFF, disconnect the appropriate harness connector listed below at the X50A Fuse Block - Underhood.

- Left Low Beam - X1
- Right Low Beam - X2

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.
- Go to next step: If less than 1 V.

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

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the X50A Fuse Block - Underhood.

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

4. Ignition OFF, remove the fused jumper wire

5. Ignition ON, verify the test lamp does not illuminate between the appropriate Low Beam Fuse listed below and ground

- Left Low Beam - fuse F32UA

- Right Low Beam - fuse F37UA

- **If the test lamp illuminates**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the X50A Fuse Block - Underhood.

- Left Low Beam - X1
- Right Low Beam - X2

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, replace the X50A Fuse Block - Underhood

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

6. Replace the K9 Body Control Module

Headlamps Malfunction - Low Beam (T4L)

NOTE: You must perform the Circuit/System Verification before proceeding with Circuit/System Testing.

1. Ignition OFF, exterior lamps OFF, disconnect the appropriate E13 Headlamp assembly.

2. Test for less than 15 Ω between the ground circuit terminal 1 and ground.

- **If 15 Ω or greater**

1. Ignition OFF, test for less than 2 Ω in the ground circuit end to end.

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

- **Go to next step: If less than 15 Ω**

3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.

4. Verify the test lamp turns ON and OFF when commanding the Low Beam Headlamp ON and OFF with a scan tool.

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

1. Ignition OFF, disconnect the X5 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.
- Go to next step: If infinite resistance

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

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the X50A Fuse Block - Underhood.

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

1. Ignition OFF, disconnect the X5 harness connector at the X50A Fuse Block - Underhood.

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

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the X50A Fuse Block - Underhood.

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

5. Test or replace the E13 Headlamp assembly.

Headlamps Malfunction - Low Beam (T4F)

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E13LA Headlamp Assembly - Left. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.

- **If 10 Ω or greater**

1. Ignition OFF.

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

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

- If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
 4. Verify the test lamp turns ON and OFF when commanding the 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 T7 Headlamp Ballast.
 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. Replace the appropriate E4 Headlamp - Low Beam bulb.
 - **Go to next step: If the low beam headlamp illuminates**
 7. All OK.

Headlamps Malfunction - High Beam

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 Ω between the appropriate ground circuit terminal listed below and ground.
 - E13LA Headlamp Assembly - Left terminal 4 (T4F)
 - E13LA Headlamp Assembly - Left terminal 1 (T4L)
 - E13RA Headlamp Assembly - Right terminal 4 (T4F)
 - E13RA Headlamp Assembly - Right terminal 1 (T4L)
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the control circuit terminal 3 and ground, ignition ON.
4. 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 X3 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.
 - Go to next step: If infinite resistance

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

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

• **If the test lamp is always ON**

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 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 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.

Repair Instructions

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

- [Headlamp Switch Replacement](#)
- [Turn Signal Switch Replacement](#)
- [Headlamp Replacement](#)
- [Control Module References](#) for BCM replacement, programming, and setup

INTERIOR ACCENT LIGHTING MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Accent Lamps Control - Terminal 7 X6	B255F 02	1	1	-
Accent Lamp - Left Middle Instrument Panel Ground	-	1	-	-
Accent Lamp - Driver Door Ground	-	1	-	-
Accent Lamp - Passenger Door Ground	-	1	-	-
Center Console Compartment Lamp Ground	-	1	-	-
Flood Lamp - Driver Door Pull Handle Ground	-	1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Flood Lamp - Passenger Door Pull Handle Ground	-	1	-	-
Front Overhead Console Assembly 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

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

NOTE: Each component may need to be disconnected to isolate a short to voltage, short to ground, or an open/high resistance. Use the 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 Ω between the appropriate ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

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 X6 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.
- Go to next step: If infinite resistance

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

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

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

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 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.

- [Front Side Door Inside Handle Illumination Lamp Replacement](#)
- [Front Side Door Map Pocket Illumination Lamp Replacement](#)
- [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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp Switch B+ Reference	B1395 03, B3600 03	B3600 03	B1395 07, B3600 07	-
Headlamp Switch Signal	B1395 03, B3600 03	B3600 03	B1395 07, B3600 07	-
LED Backlight Dimming Control Terminal 8 X2	B2610 02	2	2	-
LED Backlight Dimming Control Terminal 9 X7	B2610 02	2	2	-
Switch Indicator LED Backlight Dimming Control Terminal 5 X1	B2625 02	3	3	-
Headlamp Switch Low Reference	1	1	1	-
Door Lock Switch - Driver Ground	-	2	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Door Lock Switch - Passenger Ground	-	2	-	-
Drive Mode Select Switch Ground	-	2	-	-
Garage Door Opener Ground	-	2	-	-
Front Overhead Console Assembly Ground	-	2	-	-
Hazard Warning Switch Ground	-	2	-	-
Headlamp Switch Ground	-	2	-	-
Ignition Mode Switch Ground	-	2	-	-
Instrument Panel Dimmer Switch Ground	-	2	-	-
Liftgate Control Switch - Interior Ground	-	2	-	-
Park Brake Switch Ground	-	2	-	-
Seat Memory Switch - Driver Ground	-	2	-	-
Steering Wheel Controls Switch - Left Lower Ground	-	3	-	-
Steering Wheel Controls Switch - Left Upper Ground	-	3	-	-
1. Dimmer Switch Malfunction 2. Interior Backlighting Malfunction 3. Switch Indicator LED Backlighting Malfunction				

Circuit/System Description

The headlamp switch is used to increase and decrease the brightness of the interior backlighting components. The headlamp 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 headlamp switch. When the headlamp switch is placed in the desired position, the dimmed voltage setting is applied from the headlamp switch through the headlamp 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. The BCM also sends a serial data message to the following components requesting there backlighting be adjusted to the level selected by the instrument panel dimmer switch:

- HVAC Controls - Auxiliary
- Info Display Module
- Instrument Cluster
- Transmission Shift Lever Position Indicator
- Window Switch - Driver
- Window Switch - Passenger
- Window Switch - Left Rear
- Window Switch - Right Rear

The backlighting for the switch indicators listed below are controlled by the Switch Indicator LED Backlight Dimming Control Terminal 5 X1.

- Dome Lamp Cancel Switch Amber LED Indicator
- Driver Mode Select Switch Amber LED Indicator
- Hazard Switch Backlighting

Reference Information

Schematic Reference

- [Interior Lights Dimming Wiring Schematics](#)
- [Body Control System 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 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 backlighting/amber indicators for the components listed below dim from LOW to HIGH while operating the dimmer switch from LOW to HIGH.
 - Dome Lamp Cancel Switch Amber LED Indicator
 - Driver Mode Select Switch Amber LED Indicator
 - Hazard Switch Backlighting
 - **If the switch backlighting/amber indicators do not dim from LOW to HIGH**
Refer to the appropriate Switch Indicator LED Backlighting Malfunction.
 - **Go to next step: If the switch backlighting/amber indicators dim from LOW to HIGH**
4. Verify all backlighting components turn ON and OFF while commanding the LED Backlight Dimming ON and OFF with a scan tool.
 - **If all backlighting components do not turn ON and OFF**
Refer to Interior Backlighting Malfunction.
 - **Go to next step: If all backlighting components turn ON and OFF**
5. All OK.

Circuit/System Testing

Dimmer Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S30 Headlamp Switch, ignition ON.

2. Test for B+ between the B+ reference 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+ reference circuit terminal 12 and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- Go to next step: If infinite resistance

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

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

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

3. 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 terminal 11 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**

4. Test for B+ between the B+ reference 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.
- Go to next step: If less than 1 V

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

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

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

5. Test for B+ between the B+ reference circuit terminal 12 and the low reference circuit terminal 7.

- **If less than 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 low reference circuit terminal 7 and ground.

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

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

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

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

6. Verify a test lamp does not illuminate between the B+ reference circuit terminal 12 and ground.

- **If the test lamp illuminates**

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+ reference circuit terminal 12 and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K9 Body Control Module.

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

7. Test or replace the S30 Headlamp Switch.

NOTE:

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

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

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, 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 Ω between the appropriate ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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

1. Ignition OFF, disconnect the harness connectors at the components listed below.
 - S126 Drive Mode Select Switch (X88)
 - S26 Hazard Warning Switch (W49)
2. Test for less than 10 Ω between the ground circuit terminal 3 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 8 and ground, ignition ON.
 4. Verify the test lamp turns ON and OFF when commanding the Indicator Dimming 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 inoperative component.

Dome Lamp Switch Indicator LED Backlighting Malfunction

1. Ignition OFF, disconnect the harness connector at the A98 Front Overhead Console. Ignition ON/Vehicle In Service Mode.
2. Connect a test lamp between the control circuit terminal 18 and ground, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the Indicator Dimming 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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**
4. Ignition OFF, connect the A98 Front Overhead Console Assembly.
5. Disconnect the X6 harness connector at the K9 Body Control Module. Ignition ON/Vehicle In Service Mode
6. Verify the Dome Lamp Switch indicator is not illuminated.
 - **If illuminated**

1. Ignition OFF, disconnect the harness connector at the A98 Front Overhead Console Assembly.
2. Test for infinite resistance between the control circuit terminal 11 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, test or replace the A98 Front Overhead Console Assembly.
- **Go to next step: If not illuminated**
7. Ignition ON/Vehicle In Service Mode, connect a 3 A fused jumper wire between the control circuit terminal 11 and ground.
8. Verify the Dome Lamp Switch indicator is illuminated.
 - **If not illuminated**
 1. Ignition OFF/Vehicle OFF, remove the jumper wire, disconnect the harness connector at the A98 Front Overhead Console, ignition ON / Vehicle In Service Mode.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , test or replace the A98 Front Overhead Console.
 - **Go to next step: If illuminated**
9. Test or replace the K9 Body Control Module.

Repair Instructions

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

- [Headlamp Switch Replacement](#)
- [Door Lock Switch Replacement - Driver Side](#)
- [Door Lock Switch Replacement - Passenger Front](#)
- [Liftgate Release Switch Replacement - Interior](#)
- [Front Seat Adjuster Memory Switch Replacement](#)
- [Ignition and Start Switch Replacement](#)
- [Garage Door Opener Transmitter Pushbutton Replacement](#)
- [Hazard Warning Switch Replacement](#)
- [Radio Control Switch Replacement - Steering Wheel \(Right Rear\)](#) [Radio Control Switch Replacement - Steering Wheel \(Left Rear\)](#) [Radio Control Switch Replacement - Steering Wheel \(Right Front\)](#)
- [Parking Brake Actuator Switch Replacement](#)
- [Cruise Control Switch Replacement](#)
- [Roof Console Replacement](#)
- [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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	-
License Plate Lamps Control	B3883 02	3	3	-
Park Lamps Control - Left	B2585 02	1	1	-
Park Lamps Control - Right	B3867 02	1	1	-
Headlamp Assembly Ground - Left	-	1	-	-
Headlamp Assembly Ground - Right	-	1	-	-
Headlamp Switch Ground	-	2	-	-
License Plate Lamp Ground - Right	-	3	-	-
License Plate Lamp Ground - Left	-	3	-	-
Side Marker Lamp - Left Front Ground	-	1	-	-
Side Marker Lamp - Right Front Ground	-	1	-	-
Tail Lamp - Left Inner Ground	-	1	-	-
Tail Lamp - Left Outer Ground	-	1	-	-
Tail Lamp - Right Inner Ground	-	1	-	-
Tail Lamp - Right Outer Ground	-	1	-	-
1. Park, License, and/or Tail Lamps Malfunction 2. Headlamp Switch Malfunction 3. License Plate 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, side marker lamps, tail lamps, and license lamps control circuits illuminating the park, side marker, tail, and license lamps.

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 Park Lamps 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 Headlamp Switch Malfunction.
 - **Go to next step: If the parameter changes**
3. Verify the left park lamps turn ON and OFF when commanding the Left Park Lamps ON and OFF with a scan tool.
 - **If the left park lamps do not turn ON and OFF**
Refer to Park Lamps Malfunction.
 - **Go to next step: If the left park lamps turn ON and OFF**
4. Verify the right park lamps turn ON and OFF when commanding the Right Park Lamps ON and OFF with a scan tool.
 - **If the right park lamps do not turn ON and OFF**
Refer to Park Lamps Malfunction.
 - **Go to next step: If the right park lamps turn ON and OFF**
5. Verify the license plate lamps turn ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.
 - **If the license plate lamps do not turn ON and OFF**
Refer to License Plate Lamps Malfunction.
 - **Go to next step: If the license plate lamps turn ON and OFF**
6. All OK.

Circuit/System Testing

Headlamp Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, 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 Ω between the ground circuit terminal 8 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If Active**
 7. Test or replace the S30 Headlamp Switch.

Park Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
 - E4AC Park/Daytime Running Lamp - Left (X88)
 - E13LA Headlamp Assembly - Left (W49)
 - E13LA Headlamp Assembly - Left (T4L)
 - E2LF Side Marker Lamp - Left Front
 - E5G Tail Lamp - Left Inner
 - E5AK Tail Lamp - Left Outer
 - E4AD Park/Daytime Running Lamp - Right (X88)
 - E13RA Headlamp Assembly - Right (W49)
 - E13RA Headlamp Assembly - Right (T4L)
 - E2RF Side Marker Lamp - Right Front
 - E5H Tail Lamp - Right Inner
 - E5AL Tail Lamp - Right Outer
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - E4AC Park/Daytime Running Lamp - Left socket terminal (X88)
 - E13LA Headlamp Assembly - Left terminal 6 (W49)
 - E13LA Headlamp Assembly - Left terminal 4 (T4L)
 - E2LF Side Marker Lamp - Left Front terminal 1
 - E5G Tail Lamp - Left Inner terminal 1 (X88)
 - E5G Tail Lamp - Left Inner terminal 3 (W49)
 - E5AK Tail Lamp - Left Outer terminal 6 (X88)
 - E5AK Tail Lamp - Left Outer terminal 4 (W49)
 - E4AD Park/Daytime Running Lamp - Right socket terminal (X88)
 - E13RA Headlamp Assembly - Right terminal 6 (W49)
 - E13RA Headlamp Assembly - Right terminal 4 (T4L)
 - E2RF Side Marker Lamp - Right Front terminal 1
 - E5H Tail Lamp - Right Inner terminal 1 (X88)
 - E5H Tail Lamp - Right Inner terminal 3 (W49)
 - E5AL Tail Lamp - Right Outer terminal 6 (X88)
 - E5AL Tail Lamp - Right Outer terminal 4 (W49)

- **If 10 Ω or greater**
- 1. Ignition OFF.
- 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
- **Go to next step: If less than 10 Ω**
- 3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E4AC Park/Daytime Running Lamp - Left socket terminal (X88)
 - E13LA Headlamp Assembly - Left terminal 4 (W49)
 - E13LA Headlamp Assembly - Left terminal 6 (T4L)
 - E2LF Side Marker Lamp - Left Front terminal 2
 - E5G Tail Lamp - Left Inner terminal 2 (X88)
 - E5G Tail Lamp - Left Inner terminal 1 (W49)
 - E5AK Tail Lamp - Left Outer terminal 5 (X88)
 - E5AK Tail Lamp - Left Outer terminal 2 (W49)
 - E4AD Park/Daytime Running Lamp - Right socket terminal (X88)
 - E13RA Headlamp Assembly - Right terminal 4 (W49)
 - E13RA Headlamp Assembly - Right terminal 6 (T4L)
 - E2RF Side Marker Lamp - Right Front terminal 2
 - E5H Tail Lamp - Right Inner terminal 2 (X88)
 - E5H Tail Lamp - Right Inner terminal 1 (W49)
 - E5AL Tail Lamp - Right Outer terminal 5 (X88)
 - E5AL Tail Lamp - Right Outer terminal 2 (W49)
- 4. Verify the test lamp turns ON and OFF when commanding the appropriate Park Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 inoperative park lamp.

License Plate Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, remove both E7 License Plate Lamp bulbs. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between each ground circuit terminal listed below and ground.
 - E7L License Plate Lamp - Left terminal 1 (-DRZ)
 - E7L License Plate Lamp - Left terminal 2 (DRZ)

- E7R License Plate Lamp - Right terminal 1 (-DRZ)
- E7R License Plate Lamp - Right terminal 2 (DRZ)
- **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
- 3. Connect a test lamp between the appropriate E7L License Plate Lamp - Left control circuit terminal listed below and ground, ignition ON.
 - Terminal 2 (-DRZ)
 - Terminal 1 (DRZ)
- 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 appropriate E7R License Plate Lamp - Right control circuit terminal listed below and ground, ignition ON.
 - Terminal 2 (-DRZ)
 - Terminal 1 (DRZ)
- 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - **Go to next step: If the test lamp turns ON and OFF**
- 8. Test or replace the E7 License Plate Lamp bulb.

Repair Instructions

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

- [Rear License Plate Lamp Replacement](#)

- [Headlamp Switch Replacement](#)
- [Headlamp Replacement](#)
- [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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Rear Compartment Courtesy Lamp Control	B256A 02	1	1	-
Cargo Lamp Ground	-	1	-	-
1. Rear Compartment Lamp Malfunction				

Circuit/System Description

The body control module (BCM) applies battery voltage to the cargo lamp through the rear compartment lamp control circuit. When the BCM receives a rear liftgate open input from the rear liftgate latch, the BCM applies battery voltage to the rear compartment lamp control circuit illuminating the cargo lamp. In the event that the cargo 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, disconnect the harness connector at the E33 Cargo Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 2 and ground.
 - **If 10 Ω or greater**

1. Ignition OFF.
2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
- **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Cargo 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 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 E33 Cargo Lamp.

Repair Instructions

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

- [Cargo Center Courtesy Lamp Bulb Replacement \(Liftgate Lower Trim Finish Panel\)](#), [Cargo Center Courtesy Lamp Bulb Replacement \(Front Side Door Trim\)](#)
- [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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F21DA (BCM 4) Fuse B+	1	1	-	-
F23DA (BCM 2) Fuse B+	B2615 02	B2615 02	-	-
Brake Pedal Position Sensor 5 V Reference	C0277 06, C0890 03, U0422 71	C0277 06, U0422 71	C0277 07, C0890 07, U0422 71	C0277 09, C0277 12
Brake Pedal Position Sensor Signal	C0277 06, U0422 71	C0277 06, U0422 71	C0277 07, U0422 71	C0277 09, C0277 12
Center High Mounted Stop Lamp Control	B3884 02	2	2	-
Stop Lamp Control - Left	1	1	1	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Stop Lamp Control - Right	1	1	1	-
Brake Pedal Position Sensor Low Reference	-	C0277 07, U0422 71	1	-
Center High Mounted Stop Lamp Ground	-	2	-	-
Tail Lamp Assembly - Left Rear Ground	-	1	-	-
Tail Lamp Assembly - Right Rear Ground	-	1	-	-
1. Stop Lamps Malfunction 2. Center High Mounted Stop Lamp Malfunction				

Circuit/System Description

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

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 Verification

1. Ignition ON.
2. 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**
3. Verify the left park lamps turn ON and OFF when commanding the Left Park Lamps ON and OFF with a scan tool.

- **If the left park lamps do not turn ON and OFF**

Refer to [Park, License, and/or Tail Lamps Malfunction](#).

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

4. Verify the right park lamps turn ON and OFF when commanding the Right Park Lamps ON and OFF with a scan tool.

- **If the right park lamps do not turn ON and OFF**

Refer to Refer to [Park, License, and/or Tail Lamps Malfunction](#).

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

5. Verify the left stop lamp turns ON and OFF when commanding the left stop lamp ON and OFF with the brake pedal.

- **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 the brake pedal.

- **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. 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 Mounted Stop Lamp Malfunction.

- **Go to next step: If the center high mounted stop turns ON and OFF**

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 1 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 Ω in the low reference circuit end to end.

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

- **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 2 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.
- Go to next step: If infinite resistance

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

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K9 Body Control Module.
- **If greater than 5.2 V**
 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. Test for less than 1 V between the signal circuit terminal 3 and ground.
 - **If 1 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, replace the K9 Body Control Module.
 - **Go to next step: If less than 1 V**

NOTE: The scan tool Brake Pedal Applied parameter will change to Active for 3 s as the 3 A fused jumper wire is connected between the 5 V reference circuit and the signal circuit and then default to Inactive. This is normal operation.

6. Install a 3 A fused jumper wire between the 5 V reference circuit terminal 2 and the signal circuit terminal 3.
7. Verify the scan tool Brake Pedal Applied parameter is Active for 3 s before defaulting to Inactive.
 - **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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If Active**
8. Test or replace the B22 Brake Pedal Position Sensor.

Stop Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E5 Outer Tail Lamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal listed below and ground.
 - E5 Outer Tail Lamp Assembly - terminal 6 (X88)
 - E5 Outer Tail Lamp Assembly - terminal 4 (W49)
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the control circuit terminal listed below and ground, ignition ON.
 - E5 Outer Tail Lamp Assembly - terminal 4 (X88)

- E5A Outer Tail Lamp Assembly - terminal 1 (W49)
4. Verify the test lamp turns ON and OFF when commanding the stop lamps ON and OFF with the brake pedal.
 - **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 lamp
 - X5 - right stop lamp
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
 - X4 - left stop lamp
 - X5 - right stop lamp
 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 E42 Tail Lamp Assembly.

Center High Mounted Stop Lamp Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E6 Center Stop Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 1 and ground.
 - **If 10 Ω or greater**
 1. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit. If the circuit tests normal, replace the R44 Radio AM Antenna Signal Filter Module.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the 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.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit. If the circuit tests normal, replace the R44 Radio AM Antenna Signal Filter Module.
 - If less than 2 Ω , 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.

- [High Mount Stop Lamp Replacement](#)
- [Rear Body Structure Stop Lamp Replacement](#)
- [Brake Pedal Position Sensor Replacement](#)
- [Brake Pedal Position Sensor Calibration](#)
- [Radio AM Antenna Signal Filter Module Replacement](#)
- [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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Backup Lamps Relay Control	1	1	1	-
Trailer Park 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	-
Trailer Backup Lamps Control	1	1	1	-
Trailer Park 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

Backup Lamps

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.

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

Schematic Reference

Trailer Connector/Provision 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 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](#).
 - **Go to next step: If the vehicles backup lamps turn ON and OFF**
3. 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**
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 brake lamp does not turn ON and OFF**
Refer to [Stop Lamps Malfunction](#).
 - **Go to next step: If the vehicles left brake 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 brake lamp does not turn ON and OFF**
Refer to [Stop Lamps Malfunction](#).
 - **Go to next step: If the vehicles right brake 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 Backup Lamps Malfunction (V92)

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 5 Ω between the ground circuit terminal B at the X88 Trailer Connector and ground.
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Ignition OFF, all vehicle systems OFF, disconnect the X2 harness connector at the X53A Fuse Block - Rear Body.
4. Test for less than 5 Ω between the ground circuit terminal 34 and ground.
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
5. Ignition OFF, all vehicle systems OFF, Connect the X2 harness connector at the X53A Fuse Block - Rear Body.
 6. Disconnect the X1 harness connector at the X53A Fuse Block - Rear Body.
 7. Connect a test lamp between the control circuit terminal 46 and ground, ignition ON
 8. Verify the test lamp illuminates when commanding the Backup Lamps ON and OFF with a scan tool
 - **If the test lamp does not illuminate**
 1. Ignition OFF, test for infinite resistance between the control circuit terminal 46 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 2. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp is always ON**
 1. Ignition OFF, 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**
 9. Test or replace the X53A Fuse Block - Rear Body.

Trailer Park Lamps Malfunction

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below at the X88 Trailer Connector and ground.
 - Terminal A (-V92)
 - Terminal B (V92)
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
4. Verify a test lamp illuminates between the control circuit terminal 22 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 control circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the X50A Fuse Block - Underhood.
 - **Go to next step: If the test lamp illuminates**
 - 5. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 22 and ground.
 - 6. Remove the trailer park lamp fuse (F23UA) at the X50A Fuse Block - Underhood, ignition ON.

7. Verify a test lamp illuminates between the trailer park lamp fuse (F23UA) B+ switch control terminal and ground.

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

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 22 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**

8. 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 5 Ω between the appropriate ground circuit terminal listed below at the X88 Trailer Connector and ground.

- Terminal A (-V92)
- Terminal B (V92)

- **If 5 Ω or greater**

1. Ignition OFF.

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

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

- **Go to next step: If less than 5 Ω**

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

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

- Terminal 8 - left trailer stop/turn signal lamp relay
- Terminal 17 - right trailer stop/turn signal lamp relay

- **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 control circuit terminal and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- Go to next step: If infinite resistance

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

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the X50A Fuse Block - Underhood.

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

5. Ignition OFF, connect a 3 A fused jumper between the appropriate control circuit terminal listed below and ground.

- Terminal 8 - left trailer stop/turn signal lamp relay
- Terminal 17 - right trailer stop/turn signal lamp relay

6. Remove the appropriate trailer stop/turn signal lamp fuse listed below at the X50A Fuse Block - Underhood, ignition ON.

- F27UA - left trailer stop/turn signal lamp
- F24UA - right trailer stop/turn signal lamp

7. Verify a test lamp illuminates between the trailer stop/turn signal lamp fuse B+ switch control terminal and ground.

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

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 X50A Fuse Block - Underhood.

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

8. Test or replace the K9 Body Control Module.

Repair Instructions

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

- [Fuse Block Replacement](#)
- [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.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Turn Signal Switch Signal - Left	2	2	2	-
Turn Signal Switch Signal - Right	2	2	2	-
Turn Signal Lamp Outage Detection Signal - Left Rear	3	3	3	-
Turn Signal Lamp Outage Detection Signal - Right Rear	3	3	3	-
Turn Signal Control - Left Front	B3948 02	B3948 01, B3948 04	B3948 01, B3948 04	-
Turn Signal Control - Left Rear	B3950 02	B3950 01, B3950 04	B3950 01	-
Turn Signal Control - Right Front	B3949 02	B3949 01, B3949 04	B3949 01, B3949 04	-
Turn Signal Control - Right Rear	B3951 02	B3951 01, B3951 04	B3951 01	-
Outside Rearview Mirror - Driver Ground	-	1	-	-
Outside Rearview Mirror - Passenger Ground	-	1	-	-
Tail Lamp Assembly - Left Ground	-	1	-	-
Tail Lamp Assembly - Right Ground	-	1	-	-
Turn Signal Lamp - Left Front Ground	-	1	-	-
Turn Signal Lamp - Right Front Ground	-	1	-	-
Turn Signal/Multifunction Switch Ground	-	2	-	-
1. Turn Signal Lamps and/or Indicators Malfunction 2. Turn Signal/Multifunction Switch Malfunction 3. Turn Signal 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.

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 and turn signal repeater 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 and/or turn signal repeater lamps do not turn ON and OFF**
Refer to Turn Signal Lamps Malfunction.
 - **Go to next step: If the left front turn signal and turn signal repeater lamps turn ON and OFF**
4. Verify the right front turn signal and turn signal repeater 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 and/or turn signal repeater lamps do not turn ON and OFF**
Refer to Turn Signal Lamps Malfunction.

- **Go to next step: If the right front turn signal and turn signal repeater lamps turn ON and OFF**
5. Verify the left rear turn signal lamp turns ON and OFF while commanding the Left Rear Turn Signal/Stop Lamp ON and OFF with a scan tool.
 - **If the left rear turn signal lamp does not turn ON and OFF**
Refer to Turn Signal Lamps Malfunction.
 - **Go to next step: If the left rear turn signal lamp turns ON and OFF**
 6. Verify the right rear turn signal lamp turns ON and OFF while commanding the Right Rear Turn Signal/Stop Lamp ON and OFF with a scan tool.
 - **If the right rear turn signal lamp does not turn ON and OFF**
Refer to Turn Signal Lamps Malfunction.
 - **Go to next step: If the right rear turn signal lamp turns ON and OFF**
 7. Observe the left and right turn signal lamps and turn signal indicators on the instrument cluster while activating the left and right turn signals. The left and right turn signal lamps and indicators should illuminate and flash at a normal rate when turned ON.
 - **If the left and right turn signal lamps and indicators illuminate but flash in a rapid manner**
Refer to Turn Signal Lamp Outage Detection Malfunction.
 - **Go to next step: If the left and right turn signal lamps and indicators operate normally**
 8. All OK.

Circuit/System Testing

Turn Signal/Multifunction Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, 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 Ω between the ground circuit terminal 3 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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.
 - Go to next step: If less than 1 V
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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.
 - Go to next step: If less than 1 V
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **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 turn signal lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
 - A9A Outside Rearview - Driver terminal 5
 - A9B Outside Rearview - Passenger terminal 5
 - E4LF Turn Signal Lamp - Left Front terminal 1
 - E4RF Turn Signal Lamp - Right Front terminal 1
 - E5AK Outer Tail Lamp Assembly - Left terminal 6 (X88)
 - E5AK Outer Tail Lamp Assembly - Left terminal 4 (W49)
 - E5AL Outer Tail Lamp Assembly - Right terminal 6 (X88)
 - E5AL Outer Tail Lamp Assembly - Right terminal 4 (W49)
 - **If 5 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 5 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - A9A Outside Rearview - Driver terminal 6 (X88)
 - A9A Outside Rearview - Driver terminal 13 (W49)

- A9B Outside Rearview - Passenger terminal 13 (W49)
 - E4LF Turn Signal Lamp - Left Front terminal 3
 - E4RF Turn Signal Lamp - Right Front terminal 3
 - E5AK Outer Tail Lamp Assembly - Left terminal 4 (X88)
 - E5AK Outer Tail Lamp Assembly - Left terminal 1 (W49)
 - E5AL Outer Tail Lamp Assembly - Right terminal 4 (X88)
 - E5AL Outer Tail Lamp Assembly - Right terminal 1 (W49)
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.
 - X4 Right front turn signal lamps
 - X4 Left rear turn signal lamps
 - X5 Left front turn signal lamps
 - X5 Right rear turn signal 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.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

• **If the test lamp is always ON**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
 - X4 Right front turn signal lamps
 - X4 Left rear turn signal lamps
 - X5 Left front turn signal lamps
 - X5 Right rear turn signal 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 turn signal lamp.

Turn Signal Lamp Outage Detection Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate E5 Outer Tail Lamp Assembly, ignition ON.
 2. Test for B+ between the signal circuit terminal listed below and ground.
 - E5 Outer Tail Lamp Assembly - terminal 2 (CZ3)
 - E5 Outer Tail Lamp Assembly - terminal 3 (-CZ3)
- **If not B+**
1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
 - X6 left rear turn signal
 - X7 right rear turn signal
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance

3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If B+**
3. Verify a test lamp does not illuminate between the signal circuit terminal 2 and ground.
 - **If the test lamp illuminates**
 1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
 - X6 left rear turn signal
 - X7 right rear turn signal
 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 Outer Tail Lamp Assembly.

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.

- [Front Turn Signal Lamp Bulb Replacement](#)
 - [Outside Rearview Mirror Turn Signal Lamp Replacement](#)
 - [Turn Signal Switch Replacement](#)
 - [Rear Fascia Lower Signal Lamp Replacement](#)
 - [Rear Closure Signal Lamp Replacement](#)
 - [Rear Body Structure Stop Lamp Replacement](#)
 - [Control Module References](#) for BCM replacement, programming, and setup
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