

2018 ACCESSORIES & EQUIPMENT

Lighting - Description And Operation

DESCRIPTION AND OPERATION

EXTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

Exterior Lamps

The exterior lighting system consist of the following lamps:

- Automatic High Beam Assist
- Backup Lamps
- Daytime Running Lamps
- Front Fog Lamps
- Hazard Warning Lamps
- Headlamps
- Park, Tail, License and Side Marker Lamps
- Repeater Lamps
- Stop Lamps
- Turn Signal Lamps

Low Beam Headlamps (T4A)

The headlamps may be turned ON in 3 different ways:

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

The BCM controls the headlamps based on the inputs explained above. When a low beam request is received, the BCM supplies B+ to the low beam headlamps, illuminating the low beam headlamps.

When the BCM commands the low beam headlamps ON, the operator will notice the interior backlighting for the instrument cluster and the various other switches dim to the level of brightness selected by the instrument panel dimmer switch.

Low Beam Headlamps (T4F)

The body control module (BCM) monitors three signal circuits from the turn signal/multifunction switch. When the turn signal/multifunction switch is in the AUTO position, all three signal circuits are open. When placed in the AUTO position, the BCM monitors inputs from the ambient light sensor to determine if headlamps are required or if daytime running lamps will be activated based on outside lighting conditions. When the turn signal/multifunction switch is placed in the OFF position, the turn signal/multifunction switch headlamps OFF signal circuit is grounded, indicating to the BCM that the exterior lamps should be turned OFF. With the turn signal/multifunction switch in the PARK position, the turn signal/multifunction switch park lamps ON signal circuit is grounded, indicating that the park lamps have been requested. When the turn signal/multifunction switch is placed in the HEADLAMP position, both the turn signal/multifunction switch park lamps ON signal circuit and the turn signal/multifunction switch headlamps ON signal circuit are grounded. The BCM responds to the low beam request by applying ground to the low beam control circuits. Battery voltage is then applied through the low beam control circuits to the left and right headlamp ballast located in each headlamp assembly. When battery voltage is applied to the headlamp ballast through the low beam control circuits, the ballast charge the starter to start the lamp. High intensity discharge (HID) headlamps do not have

filaments like traditional bulbs, instead the starter uses a high voltage transformer to convert the input voltage into a higher voltage. This increased voltage is used in order to create an arc between the electrodes in the bulb.

Run Up of the Lamp

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

When to Change the HID Bulb

An inoperative bulb, end of life occurs when the bulb gets old and becomes unstable. The bulb may begin shutting itself OFF sporadically and unpredictably at first, perhaps only once during a 24 h period. When the bulb begins shutting itself off occasionally, the ballast will automatically turn the bulb back ON again within 0.5 s. The ballast will restrike the bulb so quickly that the bulb may not appear to have shut off. As the bulb ages, the bulb may begin to shut off more frequently, eventually over 30 times per minute. When the bulb begins to shut off more frequently, the ballast receives an extreme amount of repetitive current input. Repetitive and extreme amount restarts or restrikes, without time for the ballast to cool down, will permanently damage the ballast. As a safeguard, when repetitive restrikes are detected, the ballast will not attempt to restrike the lamp. The ballast then shuts down and the bulb goes out.

The following symptoms are noticeable signs of an inoperative bulb:

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

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

Inoperative bulbs are often sporadic at first, and difficult to repeat. Inoperative bulbs can be identified by observing if the condition gets progressively worse over the next 100 h of operation.

Light Color

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

Low Beam Headlamps (T4L)

The headlamps may be turned ON in 3 different ways:

- When the headlamp switch is placed in the ON position, for normal operation
- When the headlamp switch is placed in the AUTOMATIC LIGHT position, for automatic lamp control

- When the headlamp switch is placed in the AUTOMATIC LIGHT position, with the windshield wipers ON in daylight conditions, after a 6 s delay

The BCM controls the headlamps based on the inputs explained above. When a low beam request is received, the BCM supplies B+ to the left and right headlamp control modules, which illuminate the low beam LEDs.

When the BCM commands the low beam headlamps ON, the operator will notice the interior backlighting for the instrument cluster and the various other switches dim to the level of brightness selected by the instrument panel dimmer switch.

No parts are serviceable within the headlamp assemblies so complete headlamp assembly replacement is necessary.

High Beam Headlamps (T4A/T4F)

When the low beam headlamps are ON and the turn signal/multifunction switch is placed in the high beam position, ground is applied to the BCM through the high beam signal circuit. The BCM responds to the high beam request by applying ground to the high beam relay control circuit which energizes the high beam relay. With the high beam relay energized, the switch contacts close allowing battery voltage to flow through the left and right high beam fuses to the high beam control circuits and on to the left and right high beam solenoid actuators within the headlamp assemblies. Once the high beam solenoid actuators are active, the solenoid shutters open in each headlamp assembly exposing the remaining portion of the headlamp that was covered by the shutters illuminating the high beams at full intensity.

High Beam Headlamps (T4L)

When the low beam headlamps are ON and the turn signal/multifunction switch is placed in the high beam position, ground is applied to the BCM through the high beam signal circuit. The BCM responds to the high beam request by applying ground to the high beam relay control circuit which energizes the high beam relay. With the high beam relay energized, the switch contacts close allowing battery voltage to flow through the left and right high beam fuses to the high beam control circuits and on to the left and right headlamp control modules within the headlamp assemblies. When supplied with battery voltage, the left and right headlamp control modules will illuminate the high beam LEDs.

No parts are serviceable within the headlamp assemblies so complete headlamp assembly replacement is necessary.

Automatic High Beam Assist (AHBA)

The automatic high beam assist (AHBA) system operates the high beam headlamps ON and OFF automatically when the system is activated and certain conditions are met. The AHBA system consists of a front camera module that detects light and is able to identify approaching vehicles on an even, straight road at a distance of greater than 0.4 km (0.25 mi). The front camera module analyzes light color, intensity, and movement. The AHBA system will turn OFF the high beam headlamps when approaching vehicle headlamps or preceding vehicle taillights are detected by the front camera module. AHBA can be deactivated when the headlamp dimmer switch is moved from the neutral position to the high beam or flash to pass (FTP) positions. AHBA can be reactivated by operating the high beam select switch from the neutral position to the high beam position twice within 2 seconds.

AHBA System Activation

- Vehicle ON
- Headlamp switch placed in the AUTO position
- Press the Auto High Beam ON/OFF switch located on the turn signal/multifunction switch
- Headlamp dimmer switch must be in the neutral position
- Outside lighting conditions must be dark
- Vehicle speed greater than 25 mph (40 km/h)

AHBA System Operation

The following are conditions that the AHBA system will turn the high beam headlamps off during operation:

- The system detects approaching traffic headlamps
- The system detects preceding traffic tail lamps
- Ambient light level too high due to towns or twilight situations
- The vehicle's speed drops below 13 mph (22 km/h)
- Delay

NOTE: AHBA may not operate properly if any of the following conditions exist:

- Approaching and preceding vehicles lamps are undetectable due to dirt, snow, road spray, smoke, fog, or any other airborne conditions.
- The front camera module is covered with ice, dirt, snow, haze, or is obstructed.
- The vehicle is being driven on winding or hilly road conditions which would make any on coming vehicle headlamps undetectable by the AHBA.

AHBA System Deactivation

- Manually operating the headlamp dimmer switch from neutral to high beam position
- Press the Auto High Beam ON/OFF switch located on the turn signal/multifunction switch
- AHBA is deactivated automatically when the front or rear fog lamps are turned ON

AHBA System Indicator

The status of the AHBA system is shown by a green indicator located on the instrument panel cluster. When AHBA is active, the indicator will be illuminated continuously. If the operator deactivates the AHBA system, the indicator will turn off.

Flash to Pass

When the turn signal/multifunction switch is momentarily placed in the flash to pass position, ground is applied to the turn signal/multifunction switch. The turn signal/multifunction switch applies ground to the body control module (BCM) through the flash to pass switch signal circuit. The BCM responds to the flash to pass request by applying ground to the high beam relay control circuit. This energizes the high beam relay, closing the switch side contacts of the high beam relay, applying battery voltage to the left and right high beam fuses. Battery voltage is applied from the high beam fuses through the high beam control circuit to the high beam control circuits and on to the left and right high beam solenoid actuators within the headlamp assemblies. Once the high beam solenoid actuators are active, the solenoid shutters open in each headlamp assembly exposing the remaining portion of the headlamp that was covered by the shutters illuminating the high beams at full intensity.

Daytime Running Lamps

The daytime running lamps are combined with the park lamps. The daytime running lamps will operate when the following conditions are met:

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

Daytime Running Lamps With CE1

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

Daytime Running Lamps Without CE1

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

T4A/X88 with T4F or T4L

In daylight conditions, the BCM will command the daytime running lamps ON by supplying B+ to the daytime running lamps control circuit, illuminating the left and right daytime running lamp LEDs. Any function or condition that turns on the headlamps will cancel daytime running lamps operation.

Z88 with T4F or T4L

In daylight conditions, the BCM will command the daytime running lamps ON by supplying B+ to the left and right multifunction LED control modules, which illuminate the daytime running lamp LEDs.

No parts are serviceable within the headlamp assemblies so complete headlamp assembly replacement is necessary. (T4L)

Front Fog Lamps

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

Park, Tail, License and Side Marker Lamps

The park lamps, tail lamps, and license plate lamps are turned ON when the headlamp switch is placed in the PARK, AUTO, or LOW BEAM position. When the BCM receives a request from the headlamp switch to turn ON the park lamps the BCM applies ground to the park lamps relay control circuit, which energizes the park lamps relay. With the park lamps relay energized, the switch contacts close allowing battery voltage to flow through the left and right park lamp fuses to the park lamp control circuits illuminating left and right park, side marker, and tail lamps.

Turn Signal Lamps

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

Hazard Lamps

The hazard warning lamps may be activated in any power mode. The hazard switch is permanently grounded. When the hazard switch is placed in the ON position, ground is applied through the hazard switch signal circuit to the BCM. The BCM supplies battery voltage to all turn signal lamps in an ON and OFF duty cycle. When the hazard switch is activated, the BCM sends a serial data message to the instrument cluster requesting both turn signal indicators to be cycled ON and OFF.

Stop Lamps

The brake pedal position 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 BCM provides a low reference signal and a 5 V reference voltage to the brake pedal position sensor. When the variable signal reaches a voltage threshold indicating the brakes have been applied, the BCM will apply battery voltage to the stop lamp control circuit and center high mounted stop lamp control circuit. When the control circuit is energized the stop lamps are illuminated.

Backup Lamps

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

Battery Run Down Protection/Inadvertent Power

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

INTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

Interior Lamps

The interior lighting system consist of two groups. This first group includes lamps that may not be dimmed.

- Dome lamps
- Door courtesy lamps
- Center console compartment lamp
- Reading lamps
- Rear compartment courtesy lamp
- Sunshade mirror lamps

Dome Lamps

The dome lamp switch contains 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 lamp operation is controlled by the body control module (BCM). When any door is opened, the door ajar switch contacts close and the BCM receives a door-open input. The BCM illuminates the dome lamp when any door is opened or a door lock/unlock request is activated with the key fob. After all doors have been closed, the dome lamp will remain illuminated approximately 3 s after the last door closes. When the driver places the dome lamp switch in the OFF position, the dome lamps will be disabled. In the event that the dome lamps were to remain illuminated for more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the dome lamp control circuit to prevent total battery discharge. The dome lamps will turn OFF using the theater dimming feature when controlled by the BCM.

Center Console Compartment Lamp

The inadvertent power supply voltage circuit from the BCM provides battery voltage to the center console compartment lamp. When the center console compartment is opened, the center console compartment lamp switch contacts close providing a path to ground and the center console compartment lamp illuminates. If the operator inadvertently leaves the center console compartment door open with the

center console compartment lamp ON, the BCM will turn all interior lamps OFF after 10 min has passed since any switch activation has been detected by the BCM.

Reading Lamps

The inadvertent power supply voltage circuit from the BCM provides battery positive voltage to each reading lamp. When a reading lamp switch is activated, the switch contacts close providing a path to ground and the reading lamp illuminates. If the operator inadvertently leaves a reading lamp ON, the BCM will turn all interior lamps OFF after 10 min has passed since any switch activation has been detected by the BCM.

Rear Compartment Courtesy Lamp

When the rear compartment is opened, the rear compartment lid latch opens providing a rear compartment open input signal to the BCM. The BCM responds by applying battery voltage to the rear compartment courtesy lamp control circuit illuminating the rear compartment courtesy lamp.

Sunshade Mirror Lamps

The inadvertent power supply voltage circuit from the BCM provides battery voltage to each set of sunshade mirror lamps. When the sunshade mirror cover is opened, a switch closes providing ground and the sunshade lamps illuminate. If the operator inadvertently leaves a sunshade mirror cover open with the lamps ON, the BCM will turn all interior lamps OFF after 10 min has passed since any switch activation has been detected by the BCM.

Keyless Entry Interior Illumination

When the operator uses the keyless entry transmitter in order to unlock the doors, the BCM receives a door-unlock signal. The BCM must receive inputs from various systems that indicate that the ignition switch is OFF, the courtesy lamp switch is OFF, and all doors are closed before the BCM will activate the interior lamps. After all doors have been closed, the courtesy lamps will turn OFF immediately if the ignition switch is turned to the ON position, the door locks are LOCKED, or approximately 20 s after the last door closes. The BCM will turn off the courtesy lamps through the theater dimming feature. The BCM keeps the courtesy lamps on for 40 s after an alarm event is completed.

Interior Lamps Dimming

The second group includes lamps which may be dimmed. This group may use a combination of light emitting diodes (LED), incandescent lamps, and pulse width modulation illumination.

- Accent lamp - center console cupholder
- Accent lamp - driver door handle
- Accent lamp - passenger door handle
- Accent lamp - right instrument panel
- Dome lamp switch
- Door lock switch - driver
- Door lock switch - passenger
- Drive mode select switch
- Flood lamp - driver door handle
- Flood lamp - passenger door handle
- Garage door opener
- Hazard warning switch
- Headlamp switch
- Ignition mode switch
- Liftgate control switch - interior
- Multifunction switch - center console
- Parking assist on/off switch
- Park brake switch
- Seat memory switch - driver

- Steering wheel controls switch - left
- Steering wheel controls switch - right

With the headlamp switch in the PARK or HEAD position, the park lamp switch signal circuit provides an input to the body control module (BCM). The BCM responds by applying voltage to the park lamps as well as the backlight dimming control circuits illuminating all components with interior backlighting. All interior backlighting turns ON at the dimming level indicated by the instrument panel dimmer switch. The instrument panel dimmer switch is a momentary type switch and utilizes a resistor ladder to increase and decrease the brightness of the interior backlighting components. The instrument panel dimmer switch provides a voltage signal to the BCM that will increase as the brightness of the lights are increased and decrease as the brightness of the lights are decreased. The BCM provides a low reference signal and a B+ circuit to the instrument panel dimmer switch. When the instrument panel dimmer switch is held 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 backlighting control circuits illuminating the interior backlighting to the requested level of brightness.

The backlighting for the instrument cluster, infotainment controls, window switches, and steering wheel control switches are controlled by the BCM via serial data. When the instrument panel dimmer switch is operated to the desired backlighting setting, the BCM sends a serial data message to the instrument cluster, infotainment controls, window switches, and steering wheel control switches requesting the backlighting be adjusted to the desired level.

Battery Rundown Protection/Inadvertent Power

The BCM inadvertent power supply voltage circuit provides battery voltage to all of the interior courtesy lamps. In the event that any of these lamps were to remain illuminated for a period of more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the inadvertent power supply voltage circuit to prevent total battery discharge. If the ignition switch is turned to any position other than OFF, or if a lamp switch is activated during this 10 min period, the timer resets for another 10 min.

2018 ACCESSORIES & EQUIPMENT

Lighting - Diagnostic Information And Procedures - Equinox & Terrain

DIAGNOSTIC INFORMATION AND PROCEDURES

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

Diagnostic Instructions

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

DTC Descriptors

DTC B1395 03

Control Module Voltage Reference Output 1 Circuit Low Voltage

DTC B1395 07

Control Module Voltage Reference Output 1 Circuit High Voltage

Diagnostic Fault Information

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

Circuit/System Description

The instrument panel dimmer switch is used to increase and decrease the brightness of the interior backlighting components. The instrument panel dimmer switch provides a voltage signal to the body control module (BCM) that will increase as the brightness of the lights are increased and decrease as the brightness of the lights are decreased. The BCM provides a low reference, signal, and B+ voltage reference to the instrument panel dimmer switch. When the instrument panel dimmer switch is placed in the desired position, the dimmed voltage setting is applied from the instrument panel dimmer switch through the instrument panel dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies a pulse width modulated voltage through the LED dimming 1 and dimming 2 control circuits illuminating the interior backlighting to the requested level of brightness.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B1395 03

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

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

DTC B1395 07

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

Actions Taken When the DTC Sets

The BCM will not dim any interior backlighting. All interior backlighting will default to the FULL bright.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Interior Lights Dimming Wiring Schematics

Connector End View Reference

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

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

Repair Instructions

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

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

DTC B1480: BATTERY RUNDOWN PROTECTION CIRCUIT SHORT TO GROUND

Diagnostic Instructions

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

DTC Descriptor

DTC B1480 02

Diagnostic Fault Information

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

Circuit/System Description

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

Conditions for Running the DTC

Battery voltage must be between 9 - 16 V.

Conditions for Setting the DTC

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

Actions Taken When the DTC Sets

The BCM will disable the circuit and the reading lamp will be inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

- [Interior Lights Wiring Schematics](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

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Electrical Information Reference

- [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

1. Ignition OFF, exterior lamps OFF, disconnect the harness connectors at the components listed below.
 - A3L Sunshade - Left
 - A3R Sunshade - Right
 - A98 Front Overhead Console Assembly
 - E28 Center Console Compartment Lamp
 - E37LR Dome/Reading Lamps - Left Rear
 - E37RR Dome/Reading Lamps - Right Rear
2. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - A3L Sunshade - Left terminal A
 - A3R Sunshade - Right terminal A
 - A98 Front Overhead Console Assembly terminal 7
 - E28 Center Console Compartment Lamp terminal 2
 - E37LR Dome/Reading Lamps - Left Rear terminal 1
 - E37RR Dome/Reading Lamps - Right Rear terminal 1
3. Verify the test lamp turns ON and OFF when commanding the Inadvertent Load ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 courtesy lamp.

Repair Instructions

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

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

DTC B2530: FRONT FOG LAMPS CONTROL CIRCUIT

Diagnostic Instructions

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

DTC Descriptors

DTC B2530 01

Front Fog Lamps Control Circuit Short to Battery

DTC B2530 02

Front Fog Lamps Control Circuit Short to Ground

DTC B2530 04

Front Fog Lamps Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamp Relay Control	B2530 02	B2530 04	B2530 01	-
Front Fog Lamp Control	1	1	1	-
Front Fog Lamp Ground - Left	-	1	-	-
Front Fog Lamp Ground - Right	-	1	-	-
1. Front Fog Lamps Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2530 01

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

DTC B2530 02

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

DTC B2530 04

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Fog Lights Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the control circuit terminal 10 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block - Underhood.
 2. Test for infinite resistance between the control circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 10 and ground.
4. Remove the front fog lamp fuse (F39UA) at the X50A Fuse Block - Underhood, ignition ON.
5. Verify a test lamp illuminates between the front fog lamp fuse (F39UA) B+ switch control terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block - Underhood, ignition ON.
 2. Test for less than 1 V between the control circuit terminal 10 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X50A Fuse Block - Underhood.
 - **Go to next step: If the test lamp illuminates**

6. Test or replace the K9 Body Control Module.

Repair Instructions

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

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

DTC B2545: BACKUP LAMPS CIRCUIT

Diagnostic Instructions

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

DTC Descriptors

DTC B2545 01

Backup Lamps Circuit Short to Battery

DTC B2545 02

Backup Lamps Circuit Short to Ground

DTC B2545 04

Backup Lamps Circuit Open

Diagnostic Fault Information

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

Circuit/System Description

With the engine running and the transmission in the reverse position, the transmission control module (TCM) sends a serial data message to the body control module (BCM). The message indicates that the gear selector is in the reverse position. The BCM applies battery voltage to the backup lamps control circuit illuminating the backup lamps. Once the driver moves the gear selector out of the reverse position, a message is sent by the TCM via serial data requesting the BCM to remove battery voltage from the backup lamps control circuit. The engine must be running for the backup lamps to operate.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2545 01 and B2545 04

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

DTC B2545 02

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

Actions Taken When the DTC Sets

The backup lamps will not operate.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

- [Exterior Lights Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E5 Backup Lamp.
2. Test for less than 5 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 Backup Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, 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
 2. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module and all other components associated with the control circuit.
 3. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, replace the K9 Body Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
 2. Test for less than 1 V between the control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the appropriate E5 Backup Lamp.

Repair Instructions

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

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

DTC B255F: INTERIOR DOOR HANDLE BACKLIGHT CIRCUIT

Diagnostic Instructions

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

DTC Descriptors

DTC B255F 02

Interior Door Handle Backlight Circuit Short to Ground

DTC B255F 04

Interior Door Handle Backlight Circuit Open

Diagnostic Fault Information

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

Circuit/System Description

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

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

Conditions for Running the DTC

Battery voltage must be between 9 - 16 V.

Conditions for Setting the DTC

DTC B255F 02

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

DTC B255F 04

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

Actions Taken When the DTC Sets

The BCM will disable the accent lamp control circuit.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Interior Lights Wiring Schematics

Connector End View Reference

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

Scan Tool Reference

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

Circuit/System Testing

NOTE:

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

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

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

Repair Instructions

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

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

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

DTC B256A: LIFTGATE LAMP CONTROL CIRCUIT SHORT TO GROUND

Diagnostic Instructions

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

DTC Descriptor

DTC B256A 02

Liftgate Lamp Control Circuit Short to Ground

Diagnostic Fault Information

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

Circuit/System Description

The body control module (BCM) applies battery voltage to the rear compartment courtesy lamp through the rear compartment lamp control circuit. When the BCM receives a rear compartment lid open input from the rear compartment lid latch, the BCM applies battery voltage to the rear compartment lamp control circuit illuminating the rear compartment courtesy lamp. In the event that the rear compartment lamp were to remain illuminated for more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the rear compartment lamp control circuit to prevent total battery discharge.

Conditions for Running the DTC

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

Conditions for Setting the DTC

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

Actions Taken When the DTC Sets

The rear compartment lamp is inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

[Interior Lights Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

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

[Circuit/System Testing](#)

1. Ignition OFF, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the E8S Rear Compartment Courtesy Lamp.
2. Test for less than 5 Ω between the ground circuit terminal 3 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 turns ON and OFF when commanding the Trunk Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E8S Rear Compartment Courtesy Lamp.

[Repair Instructions](#)

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

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

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

[Diagnostic Instructions](#)

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

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

DTC Descriptors

DTC B2575 01

Headlamps Control Circuit Short to Battery

DTC B2575 02

Headlamps Control Circuit Short to Ground

DTC B2575 04

Headlamps Control Circuit Open

DTC B2699 01

Right Headlamp Control Circuit Short to Battery

DTC B2699 02

Right Headlamp Control Circuit Short to Ground

DTC B2699 04

Right Headlamp Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F21DA (BCM 4) Fuse B+	B2575 01, B2575 04	B2575 01, B2575 04	-	-
F8DA (BCM 3) Fuse B+	B2699 01, B2699 04	B2699 01, B2699 04	-	-
Low Beam Headlamp - Left Control	B2575 02	B2575 01, B2575 04	1	-
Low Beam Headlamp - Right Control	B2699 02	B2699 01, B2699 04	1	-
Headlamp Assembly - Left Ground	-	1	-	-
Headlamp Assembly - Right Ground	-	1	-	-
1. Headlamps Malfunction				

Circuit/System Description

With the headlamp switch in the ON position, the headlamp switch headlamp ON signal circuit is grounded through the headlamp switch. The body control module (BCM) responds by applying battery positive voltage to the left and right low beam headlamp control circuits illuminating the low beam headlamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2575 01 and B2575 04

- The BCM detects an open/high resistance in the left low beam headlamp control circuit.
- The BCM detects a short to ground or an open/high resistance in the F21DA (BCM 4) fuse B+ circuit.

DTC B2575 02

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

DTC B2699 01 and B2699 04

- The BCM detects an open/high resistance in the right low beam headlamp control circuit.
- The BCM detects a short to ground or an open/high resistance in the F8DA (BCM 3) fuse B+ circuit.

DTC B2699 02

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

Schematic Reference

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

Connector End View Reference

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Scan Tool Reference

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

Circuit/System Testing

DTC B2575

1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
 2. Test for less than 2 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, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
3. Ignition OFF, connect the X1 harness connector at the K9 Body Control Module.
4. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E13LA Headlamp Assembly - Left.
5. Test for less than 10 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**
6. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Left Headlamp Low Beam ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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**
8. Test or replace the headlamp - left low beam.

DTC B2699

1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
 2. Test for less than 2 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, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
- **Go to next step: If the test lamp illuminates**
- 3. Ignition OFF, connect the X1 harness connector at the K9 Body Control Module.
- 4. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E13RA Headlamp Assembly - Right.
- 5. Test for less than 10 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**
- 6. Connect a test lamp between the control circuit terminal 2 and ground, ignition ON.
- 7. Verify the test lamp turns ON and OFF when commanding the Right Headlamp Low Beam ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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**
- 8. Test or replace the headlamp - right low beam.

Repair Instructions

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

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

DTC B2575 OR B2699: HEADLAMPS CONTROL CIRCUIT (T4F)

Diagnostic Instructions

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

DTC Descriptors

DTC B2575 01

Headlamps Control Circuit Short to Battery

DTC B2575 02

Headlamps Control Circuit Short to Ground

DTC B2575 04

Headlamps Control Circuit Open

DTC B2699 01

Right Headlamp Control Circuit Short to Battery

DTC B2699 02

Right Headlamp Control Circuit Short to Ground

DTC B2699 04

Right Headlamp Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F21DA (BCM 4) Fuse B+	B2575 01, B2575 04	B2575 01, B2575 04	-	-
F8DA (BCM 3) Fuse B+	B2699 01, B2699 04	B2699 01, B2699 04	-	-
Low Beam Headlamp - Left Control	B2575 02	B2575 01, B2575 04	1	-
Low Beam Headlamp - Right Control	B2699 02	B2699 01, B2699 04	1	-
Headlamp Assembly - Left Ground	-	1	-	-
Headlamp Assembly - Right Ground	-	1	-	-
1. Headlamps Malfunction				

Circuit/System Description

With the headlamp switch in the ON position, the headlamp switch headlamp ON signal circuit is grounded through the headlamp switch. The body control module (BCM) responds by applying battery positive voltage to the left and right low beam headlamp control circuits illuminating the low beam headlamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2575 01 and B2575 04

- The BCM detects an open/high resistance in the left low beam headlamp control circuit.
- The BCM detects a short to ground or an open/high resistance in the F21DA (BCM 4) fuse B+ circuit.

DTC B2575 02

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

DTC B2699 01 and B2699 04

- The BCM detects an open/high resistance in the right low beam headlamp control circuit.
- The BCM detects a short to ground or an open/high resistance in the F8DA (BCM 3) fuse B+ circuit.

DTC B2699 02

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

Schematic Reference

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

Connector End View Reference

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

1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

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

1. Ignition OFF, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
2. Test for less than 2 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, disconnect the harness connector at the X51A Fuse Block - Instrument Panel.
2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.

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

3. Ignition OFF, connect the X1 harness connector at the K9 Body Control Module.
4. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the X120 harness connector. It may take up to 2 min for all vehicle systems to power down.
5. Test for less than 10 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**

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

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

1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance

3. Test for less than 2 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**

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

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

1. Replace the right Headlamp assembly.

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

10. All OK.

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

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

DTC B257A: HEADLAMP SWITCH INPUT SIGNALS CORRELATION MALFUNCTION

Diagnostic Instructions

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

DTC Descriptor

DTC B257A 00

Headlamp Switch Input Signals Correlation Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	-
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	-
Headlamp Switch Headlamps ON Signal	B257A 00	1	1	-
Headlamp Switch Ground	-	1	-	-
1. Headlamps Malfunction 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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- **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, 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.
 - 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.
 - 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.
 - 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.

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

DTC B2580: HIGH BEAM CONTROL CIRCUIT

Diagnostic Instructions

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

DTC Descriptors

DTC B2580 01

High Beam Control Circuit Short to Battery

DTC B2580 02

High Beam Control Circuit Short to Ground

DTC B2580 04

High Beam Control Circuit Open

Diagnostic Fault Information

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

Circuit/System Description

The headlamp high beam relay is supplied with battery voltage at all times. When the low beam headlamps are on and the turn signal/multifunction switch is placed in the high beam position, ground is applied to the body control module (BCM) through the high beam signal circuit. The BCM responds to the high beam request by applying ground to the high beam relay control circuit which energizes the headlamp high beam relay. With the high beam relay energized, the switch contacts close allowing battery voltage to flow through the high beam fuses to the high beam solenoid actuators opening the right and left high beam shutters exposing the full headlamps for high beam operation.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2580 01

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

DTC B2580 02

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

DTC B2580 04

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
3. Ignition OFF.
4. Test for less than 2 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.
 2. Test for infinite resistance between the control circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
- **Go to next step: If the test lamp turns ON and OFF**
4. Test or replace the KR48 Headlamp High Beam Relay.

Repair Instructions

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

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

DTC B25F8: AUXILIARY DAYTIME RUNNING LAMPS RELAY CONTROL CIRCUIT

Diagnostic Instructions

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

DTC Descriptors

DTC B25F8 01

Auxiliary Daytime Running Lamps Relay Control Circuit Short to Battery

DTC B25F8 02

Auxiliary Daytime Running Lamps Relay Control Circuit Short to Ground

DTC B25F8 04

Auxiliary Daytime Running Lamps Relay Control Circuit Open

Diagnostic Fault Information

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

Daytime Running Lamps With CE1

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

Daytime Running Lamps Without CE1

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B25F8 01

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

DTC B25F8 02 and B25F8 04

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

Actions Taken When the DTC Sets

- The low beam headlamps will not operate.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, disconnect the KR50 Headlamp Relay.
2. Connect a test lamp between the control circuit terminal 86 and B+, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the Daytime Running Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
 2. Test for less than 1 V between the control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF.
 4. Test for less than 2 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.
 2. Test for infinite resistance between the control circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp turns ON and OFF**
4. Test or replace the KR50 Headlamp Relay.

Repair Instructions

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

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

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

Diagnostic Instructions

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

DTC Descriptors

DTC B260D 02

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

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

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

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

Daytime Running Lamps Without CE1

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

Conditions for Running the DTC

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

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

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

DTC B260E 02

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

Actions Taken When the DTC Sets

The appropriate daytime running lamp is inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

Without T4L

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
 - Terminal 4 (Z88+T4F)
 - Terminal 5 (All others without 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 appropriate control circuit terminal listed below and ground, ignition ON.
 - Terminal 7 (Z88+T4F)
 - Terminal 4 (All others without T4L)
4. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance

3. Test for less than 2 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 E13 Headlamp Assembly.

With T4L

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

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

- Terminal 4 (Z88+T4L)
- Terminal 5 (X88+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. Ignition on, command the appropriate Front Park Lamp/Daytime Running Lamp ON with a scan tool.

4. Test for 4.8V-5.2V between the appropriate control circuit terminal listed below and ground.

- Terminal 7 (Z88+T4L)
- Terminal 4 (X88+T4L)

• **If less than 4.8V**

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

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

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

3. Test for less than 2 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 more than 5.2V**

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

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

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

• **Go to next step: If between 4.8V-5.2V**

5. Test or replace the E13 Headlamp Assembly.

Repair Instructions

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

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

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

DTC B2610: PASSENGER COMPARTMENT DIMMING 1 CIRCUIT

Diagnostic Instructions

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

DTC Descriptors

DTC B2610 01

Passenger Compartment Dimming 1 Circuit Short to Battery

DTC B2610 02

Passenger Compartment Dimming 1 Circuit Short to Ground

DTC B2610 04

Passenger Compartment Dimming 1 Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
LED Backlight Dimming Control Terminal 8 X2	B2610 02	B2610 04	B2610 01	-
LED Backlight Dimming Control Terminal 9 X7	B2610 02	B2610 04	B2610 01	-
Door Lock Switch - Driver Ground	-	1	-	-
Door Lock Switch - Passenger Ground	-	1	-	-
Drive Mode Select Switch Ground	-	1	-	-
Front Overhead Console Assembly Ground	-	1	-	-
Garage Door Opener Ground	-	1	-	-
Headlamp Switch Ground	-	1	-	-
Ignition Mode Switch Ground	-	1	-	-
Liftgate Control Switch - Interior Ground	-	1	-	-
Multifunction Switch - Center Console Ground	-	1	-	-
Parking Assist On/Off Switch Ground	-	1	-	-
Park Brake Switch Ground	-	1	-	-
Seat Memory Switch - Driver Ground	-	1	-	-
Steering Wheel Control Switch - Left Ground	-	1	-	-
Steering Wheel Control Switch - Right Ground	-	1	-	-
1. Interior Backlighting Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2610 01

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

DTC B2610 02

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

DTC B2610 04

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

Actions Taken When the DTC Sets

The BCM will disable the LED backlight dimming control circuits.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Interior Lights Dimming Wiring Schematics

Connector End View Reference

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

Scan Tool Reference

Circuit/System Testing

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

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

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

2. Test for less than 10 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.
- 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.

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

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

DTC B2615: PASSENGER COMPARTMENT DIMMING 2 CIRCUIT SHORT TO GROUND

Diagnostic Instructions

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

DTC Descriptor

DTC B2615 02

Passenger Compartment Dimming 2 Circuit Short to Ground

Diagnostic Fault Information

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

Circuit/System Description

The dome lamp switch has 3 positions: DOOR, OFF, and ON. The ON position provides a ground for continuous operation and the dome lamps will remain illuminated until the switch is placed in either the DOOR or OFF position. When in the DOOR position, the dome lamps operation is controlled by the body control module (BCM). When any door is opened, the door ajar switch contacts close and the BCM receives a door-open input. The BCM illuminates the dome lamps when any door is opened or a

door lock/unlock request is activated with the key fob. After all doors have been closed, the dome lamps will remain illuminated approximately 3 s after the last door closes. When the driver places the dome lamp switch in the OFF position, the dome lamps will be disabled. In the event that the dome lamps were to remain illuminated for more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the dome lamps control circuit to prevent total battery discharge.

Conditions for Running the DTC

Battery voltage must be between 9 - 16 V.

Conditions for Setting the DTC

- The BCM detects a short to ground in the dome/courtesy lamps control circuit.

Actions Taken When the DTC Sets

The dome/courtesy lamps are inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

- [Interior Lights Wiring Schematics](#)

Connector End View Reference

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

Scan Tool Reference

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

Circuit/System Testing

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

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

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

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

- E37RR Dome/Reading Lamps - Right Rear
- 2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - A98 Front Overhead Console Assembly terminal 5
 - E37LR Dome/Reading Lamps - Left Rear terminal 3
 - E37RR Dome/Reading Lamps - Right Rear terminal 3
 - **If 10 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.
 - A98 Front Overhead Console Assembly terminal 8
 - E37LR Dome/Reading Lamps - Left Rear terminal 4
 - E37RR Dome/Reading Lamps - Right Rear terminal 4
- 4. Verify the test lamp turns ON and OFF when commanding the Courtesy Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 dome/courtesy lamp.

Repair Instructions

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

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

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

Diagnostic Instructions

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

DTC Descriptor

DTC B2625 02

Diagnostic Fault Information

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	-
Front Overhead Console Assembly Indicator Control	5	5	5	-
Drive Mode Select Switch Indicator Control	3, 4	3, 4	3, 4	-
Multifunction Switch - Center Console Indicator Control	4	4	4	-
Park Assist On/Off Switch Indicator Control	2	2	2	-
Door Lock Switch - Driver Ground	-	1	-	-
Door Lock Switch - Passenger Ground	-	1	-	-
1. Interior Backlighting Malfunction 2. Park Assist System Malfunction 3. Lane Departure Warning System Malfunction 4. All Wheel Drive Indicator Malfunction 5. Dome Lamps Malfunction				

Circuit/System Description

The instrument panel dimmer switch is used to increase and decrease the brightness of the interior backlighting components. The instrument panel dimmer switch provides a voltage signal to the body control module (BCM) that will increase as the brightness of the lights are increased and decrease as the brightness of the lights are decreased. The BCM provides a low reference, signal, and B+ voltage reference circuits to the instrument panel dimmer switch. When the instrument panel dimmer switch is placed in the desired position, the dimmed voltage setting is applied from the instrument panel dimmer switch through the instrument panel dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies a pulse width modulated voltage through the LED backlight dimming control circuit illuminating the dome lamp switch, all wheel drive switch, lane departure warning switch, park assist switch, and driver and passenger door lock switch amber LED's to the requested level of brightness.

Conditions for Running the DTC

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

Conditions for Setting the DTC

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

- [Interior Lights Dimming Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

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

[Circuit/System Testing](#)

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

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

1. Ignition OFF, disconnect the harness connector at the appropriate switch listed below.

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

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

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

- A98 Front Overhead Console Assembly terminal 18
- S48E Multifunction Switch - Center Console terminal 5 (Chevrolet)
- S126 Drive Mode Select Switch terminal 8 (GMC)
- S107 Parking Assist On/Off Switch terminal 5 (UFQ)
- S13D Door Lock Switch - Driver terminal 5
- S13P Door Lock Switch - Passenger terminal 5

• If the test lamp does not illuminate

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

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

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

3. Test for less than 2 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 illuminates**
- Place the instrument panel dimmer switch in the LOW position for low backlighting intensity.
 - Verify a test lamp does not illuminate at FULL intensity between the appropriate control circuit terminal listed below and ground.
 - A98 Front Overhead Console Assembly terminal 18
 - S48E Multifunction Switch - Center Console terminal 5 (Chevrolet)
 - S126 Drive Mode Select Switch terminal 8 (GMC)
 - S107 Parking Assist On/Off Switch terminal 5 (UFQ)
 - S13D Door Lock Switch - Driver terminal 5
 - S13P Door Lock Switch - Passenger terminal 5
 - If the test lamp illuminates at full intensity**
 - Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
 - Test for less than 1 V between the control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K9 Body Control Module.
 - Go to next step: If the test lamp does not illuminate at full intensity**
- Test or replace the inoperative component.

Repair Instructions

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

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

DTC B2645: AMBIENT LIGHT SENSOR CIRCUIT LOW/HIGH VOLTAGE

Diagnostic Instructions

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

DTC Descriptors

DTC B2645 03

Ambient Light Sensor Circuit Low Voltage

DTC B2645 07

Ambient Light Sensor Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ambient Light Sensor Signal	B2645 03	B2645 07	B2645 07	-

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

Circuit/System Description

Without CE1

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

With CE1

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

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

DTC B2645 03

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

DTC B2645 07

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

Actions Taken When the DTC Sets

- Automatic headlamp system and daytime running lamps are inoperative.
- The BCM defaults to low light status and commands the low beam headlamps ON.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

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Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the B10B Ambient Light/Sunload Sensor. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 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.
 - 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.

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

DTC B2740: FRONT FOG LAMP SWITCH CIRCUIT MALFUNCTION

Diagnostic Instructions

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

DTC Descriptor

DTC B2740 00

Front Fog Lamp Switch Circuit Malfunction

Diagnostic Fault Information

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

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

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

Actions Taken When the DTC Sets

The front fog lamps are inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

[Fog Lights Wiring Schematics](#)

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

Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the 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.
 - 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.

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

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

Diagnostic Instructions

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

DTC Descriptors

DTC B3410 02

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

DTC B3410 05

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

DTC B3410 08

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

DTC B3410 5A

Headlamp Leveling Control Module Front Axle Sensor Signal Circuit Not Plausible

DTC B3420 02

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

DTC B3420 05

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

DTC B3420 08

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

DTC B3420 5A

Headlamp Leveling Control Module Rear Axle Sensor Signal Circuit Not Plausible

Diagnostic Fault Information

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

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

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3410 02

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

DTC B3410 05

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

DTC B3410 08 or B3410 5A

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

DTC B3420 02

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

DTC B3420 05

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

DTC B3420 08 or B3420 05

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Special Tools

J-38522 Variable Signal Generator

For equivalent regional tools, refer to Special Tools

Circuit/System Testing

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

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

Repair Instructions

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

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

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

Diagnostic Instructions

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

DTC Descriptors

DTC B3415 01

Headlamp Leveling Control Module Axle Sensor Supply Circuit Short to Ground

DTC B3415 02

Headlamp Leveling Control Module Axle Sensor Supply Circuit Short to Battery

Diagnostic Fault Information

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

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3415 01

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

DTC B3415 02

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

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

Special Tools

J-38522 Variable Signal Generator

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

Circuit/System Testing

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

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

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K26 Headlamp Control Module.

• **Go to next step: If between 4.8 - 5.2 V**

5. Verify the appropriate scan tool Leveling Position Sensor Signal parameter is less than 1 mm.

• **If 1 mm or greater**

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

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

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K26 Headlamp Control Module.

• **Go to next step: If less than 1 mm**

6. Ignition OFF.

7. Connect the red lead of the **J-38522** Variable Signal Generator to the signal circuit terminal 3 and the black lead of the **J-38522** Variable Signal Generator to the low reference circuit terminal 2.

8. Adjust the **J-38522** Variable Signal Generator to the settings listed below:

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

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

• **If not 11 mm**

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

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

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

3. Test for less than 2 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 K26 Headlamp Control Module.

• **Go to next step: If 11 mm**

10. Test or replace the B51 Suspension Height Sensor.

Repair Instructions

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

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

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

Diagnostic Instructions

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

DTC Descriptors

DTC B3435 00

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

DTC B3440 00

Diagnostic Fault Information

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

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3435 00

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

DTC B3440 00

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

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

Connector End View Reference

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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 appropriate E13 Headlamp Assembly.
2. Test for less than 15 Ω between the ground circuit terminal 8 and ground.
 - **If 15 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 15 Ω**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 6 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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. Replace the M29 Headlamp Leveling Actuator.
6. Ignition ON.
7. Verify the appropriate headlamp operates to the UP and DOWN positions when commanding the appropriate Headlamp Vertical Motor UP and DOWN with a scan tool.
 - **If the headlamp does not operate UP and DOWN**

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

Repair Instructions

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

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

DTC B3596: HAZARD LAMPS REQUEST CIRCUIT MALFUNCTION

Diagnostic Instructions

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

DTC Descriptor

DTC B3596 00

Hazard Lamps Request Circuit Malfunction

Diagnostic Fault Information

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

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

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

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

Actions Taken When the DTC Sets

The hazard lamps are inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Exterior Lights Wiring Schematics

Connector End View Reference

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Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S26 Hazard Warning Switch. 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. Ignition ON.

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

- **If not Inactive**

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

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

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

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

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

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

- **If not Active**

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

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

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

3. Test for less than 2 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.

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

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

Diagnostic Instructions

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

DTC Descriptors

DTC B3600 03

Passenger Compartment Dimming Request Signal Circuit Low Voltage

DTC B3600 07

Passenger Compartment Dimming Request Signal Circuit High Voltage

Diagnostic Fault Information

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

Circuit/System Description

The instrument panel dimmer switch is used to increase and decrease the brightness of the interior backlighting components. The instrument panel dimmer switch provides a voltage signal to the body control module (BCM) that will increase as the brightness of the lights are increased and decrease as the brightness of the lights are decreased. The BCM provides a low reference, signal, and B+ voltage reference to the instrument panel dimmer switch. When the instrument panel dimmer switch is placed in the desired position, the dimmed voltage setting is applied from the instrument panel dimmer switch through the instrument panel dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies a pulse width modulated voltage through the LED dimming 1 and dimming 2 control circuits illuminating the interior backlighting to the requested level of brightness.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3600 03

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

DTC B3600 07

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

Actions Taken When the DTC Sets

The BCM will not dim any interior backlighting. All interior backlighting will default to the FULL bright.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Interior Lights Dimming Wiring Schematics

Connector End View Reference

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Interior Lighting Systems Description and Operation

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

- If less than 1 V
3. Test for less than 2 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+**
 1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
 2. Test for less than 1 V between the B+ circuit terminal 12 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 6. Test or replace the S30 Headlamp Switch.

Repair Instructions

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

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

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

Diagnostic Instructions

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

DTC Descriptor

DTC B3650 08

High Beam Request Signal Circuit Performance - Signal Invalid

Diagnostic Fault Information

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

Circuit/System Description

When the low beam headlamps are on and the turn signal/multifunction switch is placed in the high beam position, ground is applied to the body control module (BCM) through the high beam signal

circuit. The BCM responds to the high beam request by applying ground to the high beam relay control circuit which energizes the high beam relay. With the high beam relay energized, the switch contacts close allowing battery voltage to flow through the high beam fuses to the high beam control circuits illuminating the high beam headlamps.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

The BCM detects a short to ground in the turn signal/multifunction switch high beam signal circuit.

Actions Taken When the DTC Sets

The high beam headlamps will not operate.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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Exterior Lighting Systems Description and Operation

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

Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S78 Turn Signal/Multifunction Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 3 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 ON.
4. Verify the scan tool High Beam Select Switch parameter is Inactive.

- **If not Inactive**

1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the signal circuit terminal 7 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.

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

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

- **If not Active**

1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the signal circuit terminal 7 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
3. Test for less than 2 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.

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

DTC B3806: HIGH BEAM AND HEADLAMP FLASH SELECT CIRCUIT MALFUNCTION

Diagnostic Instructions

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

DTC Descriptor

DTC B3806 00

High Beam and Headlamp Flash Select Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp Switch Headlamps OFF Signal	B257A 00	1	1	-
Headlamp Switch Headlamps ON Signal	B257A 00	1	1	-
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	-
Turn Signal/Multifunction Switch Flash To Pass Signal	B3806 00	1	1	-
Turn Signal/Multifunction Switch High Beam Signal	B3650 08	1	1	-
Headlamp Switch Ground	-	1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Turn Signal/Multifunction Switch Ground	-	1	-	-
1. Headlamps Malfunction 2. Park, License, and/or Tail Lamps Malfunction				

Circuit/System Description

When the turn signal/multifunction switch is momentarily placed in the flash to pass position, ground is applied to the body control module (BCM) through the flash to pass signal circuit. The BCM responds to the flash to pass request by applying ground to the high beam relay control circuit which energizes the high beam relay. With the high beam relay energized, the switch contacts close allowing battery voltage to flow through the high beam fuses to the high beam control circuits illuminating the high beam headlamps. The high beam headlamps will only illuminate for as long as the flash to pass switch is activated.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

The BCM detects a short to ground in the turn signal/multifunction switch flash to pass signal circuit.

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

systems to power down.

2. Test for less than 5 Ω between the ground circuit terminal 3 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 ON.

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

- **If not Inactive**

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

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

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

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

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

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

- **If not Active**

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

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

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

3. Test for less than 2 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.

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

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

Diagnostic Instructions

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

DTC Descriptors

DTC B380A 01

Passenger Compartment Lamp On/Off Switch Circuit Short to Battery

DTC B380B 02

Diagnostic Fault Information

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

Schematic Reference

Interior Lights Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF/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 Door.
 - **If Cancel**
 1. Ignition OFF/Vehicle OFF, disconnect the X6 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the signal circuit terminal 21 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
 - **If On**
 1. Ignition OFF/Vehicle OFF, disconnect the X7 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the signal circuit terminal 3 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
 - **Go to next step: If Door**
5. Install a 3 A fused jumper wire between the signal circuit terminal 21 and ground.
6. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Cancel.
 - **If not Cancel**
 1. Ignition OFF/Vehicle OFF, disconnect the X6 harness connector at the K9 Body Control Module, ignition ON/vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit terminal 21 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Test for less than 2 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.
 - 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.

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

DTC B3881 OR B3882: TAIL LAMP CIRCUITS

Diagnostic Instructions

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

DTC Descriptors

DTC B3881 01

Tail Lamp Circuit Short to Battery

DTC B3881 02

Tail Lamp Circuit Short to Ground

DTC B3881 04

Tail Lamp Circuit Open

DTC B3882 01

Right Tail Lamp Circuit Short to Battery

DTC B3882 02

Right Tail Lamp Circuit Short to Ground

DTC B3882 04

Right Tail Lamp Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Stop Lamp - Left Control	B3881 02	B3881 01, B3881 04	B3881 01, B3881 04	-
Stop Lamp - Right Control	B3882 02	B3882 01, B3882 04	B3882 01, B3882 04	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Tail Lamp Assembly - Left Ground	-	1	-	-
Tail Lamp Assembly - Right Ground	-	1	-	-
1. Stop Lamps Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3881 01 and B3881 04

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

DTC B3881 02

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

DTC B3882 01 and B3882 04

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

DTC B3882 02

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

Actions Taken When the DTC Sets

The appropriate stop lamp will not operate.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

- [Exterior Lights Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

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

Circuit/System Testing

DTC B3881

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below.
 - E5LE Tail/Stop Lamp - Left Outer (Z88/X88-UGE)
 - E42L Tail Lamp Assembly - Left (X88+UGE)
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
 - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
 - E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
 - **If 5 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.
 - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
 - E42L Tail Lamp Assembly - Left terminal 1 (X88+UGE)
4. Verify the test lamp turns ON and OFF when commanding the Left Stop Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 left tail/stop lamp.

DTC B3882

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below.
 - E5RE Tail/Stop Lamp - Right Outer (Z88/X88-UGE)
 - E42R Tail Lamp Assembly - Right (X88+UGE)
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
 - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
 - E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)
 - **If 5 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.
 - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
 - E42R Tail Lamp Assembly - Right terminal 1 (X88+UGE)
4. Verify the test lamp turns ON and OFF when commanding the Right Stop Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 right tail/stop lamp.

Repair Instructions

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

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

DTC B3883: LICENSE PLATE LAMP CIRCUIT

Diagnostic Instructions

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

DTC Descriptors

DTC B3883 01

License Plate Lamp Circuit Short to Battery

DTC B3883 02

License Plate Lamp Circuit Short to Ground

DTC B3883 04

License Plate Lamp Circuit Open

Diagnostic Fault Information

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

Circuit/System Description

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

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

DTC B3883 01

Headlamp switch in OFF position.

DTC B3883 02 or B3883 04

Headlamp switch in AUTO, PARK or ON positions.

Conditions for Setting the DTC

DTC B3883 01

- The BCM detects a short to voltage in the license lamps control circuit.
- The BCM detects an open/high resistance in the license lamps ground circuit.

DTC B3883 02

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

DTC B3883 04

- The BCM detects an open/high resistance in the license lamps control circuit.
- The BCM detects an open/high resistance in the license lamps ground circuit.

Actions Taken When the DTC Sets

DTC B3883 01

License lamps always ON.

DTC B3883 02 or B3883 04

License lamps inoperative.

Conditions for Clearing the DTC

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

Diagnostic Aids

When testing at the license plate lamp bulb sockets, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Exterior Lights Wiring Schematics

Connector End View Reference

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Exterior Lighting Systems 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, exterior lamps OFF, remove both E7 License Plate Lamp bulbs.
2. Test for less than 5 Ω between each ground circuit terminal 1 and ground.
 - **If 5 Ω or greater**
 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 E7L License Plate Lamp - Left control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance

3. Test for less than 2 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 E7R License Plate Lamp - Right control circuit terminal 2 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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.

Repair Instructions

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

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

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

Diagnostic Instructions

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

DTC Descriptor

DTC B3884 02

Center High Mounted Brake Lamp Circuit Short to Ground

Diagnostic Fault Information

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

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Exterior Lights Wiring Schematics

Connector End View Reference

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Exterior Lights Wiring Schematics

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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, exterior lamps OFF, trunk latch latched, disconnect the harness connector at the E6 Center High Mounted Stop Lamp.
2. Test for less than 10 Ω between the ground circuit terminal A 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 B and ground, ignition ON.
 4. Verify the test lamp turns ON and OFF when commanding the Center Stop Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E6 Center High Mounted Stop Lamp.

Repair Instructions

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

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

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

Diagnostic Instructions

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

DTC Descriptors

DTC B3948 01

Left Front Turn Signal Circuit Short to Battery

DTC B3948 02

Left Front Turn Signal Circuit Short to Ground

DTC B3948 04

Left Front Turn Signal Circuit Open

DTC B3949 01

Right Front Turn Signal Circuit Short to Battery

DTC B3949 02

DTC B3949 04

Right Front Turn Signal Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Turn Signal - Left Front Control	B3948 02	B3948 01, B3948 04	1	-
Turn Signal - Right Front Control	B3949 02	B3949 01, B3949 04	1	-
Turn Signal Lamp - Left Front Ground	-	1	-	-
Turn Signal Lamp - Right Front Ground	-	1	-	-
Turn Signal Repeater Lamp - Left Ground	-	1	-	-
Turn Signal Repeater Lamp - Right Ground	-	1	-	-
1. Turn Signal Lamps and/or Indicators Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC**DTC B3948 01 and B3948 04**

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

DTC B3948 02

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

DTC B3949 01 and B3949 04

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

DTC B3949 02

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

Actions Taken When the DTC Sets**DTC B3948**

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

DTC B3949

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

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

Schematic Reference

- [Exterior Lights Wiring Schematics](#)

Connector End View Reference

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[Exterior Lighting Systems Description and Operation](#)

Electrical Information Reference

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

Scan Tool Reference

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

Circuit/System Testing

DTC B3948

1. Ignition OFF, exterior lamps OFF, remove the appropriate E4 Turn Signal Lamp - Left listed below.
 - E4LF Turn Signal Lamp - Left Front
 - E4Y Turn Signal Repeater Lamp - Left
2. Test for less than 10 Ω between the appropriate 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 appropriate control circuit at the socket terminal and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Left Front Turn Signal Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E4 Turn Signal Lamp - Left.

DTC B3949

1. Ignition OFF, exterior lamps OFF, remove the appropriate E4 Turn Signal Lamp - Right listed below.
 - E4RF Turn Signal Lamp - Right Front
 - E4Z Turn Signal Repeater Lamp - Right
2. Test for less than 10 Ω between the appropriate 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 appropriate control circuit at the socket terminal and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Right Front Turn Signal Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E4 Turn Signal Lamp - Right.

Repair Instructions

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

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

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

Diagnostic Instructions

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

DTC Descriptors

DTC B3950 01

Left Rear Turn Signal Circuit Short to Battery

DTC B3950 02

Left Rear Turn Signal Circuit Short to Ground

DTC B3950 04

Left Rear Turn Signal Circuit Open

DTC B3951 01

Right Rear Turn Signal Circuit Short to Battery

DTC B3951 02

Right Rear Turn Signal Circuit Short to Ground

DTC B3951 04

Right Rear Turn Signal Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Turn Signal - Left Rear Control	B3950 02	B3950 01, B3950 04	1	-
Turn Signal - Right Rear Control	B3951 02	B3951 01, B3951 04	1	-
Tail Lamp Assembly - Left Ground	-	1	-	-
Tail Lamp Assembly - Right Ground	-	1	-	-
1. Turn Signal Lamps and/or Indicators Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

DTC B3950 01 and B3950 04

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

DTC B3950 02

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

DTC B3951 01 and B3951 04

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

DTC B3951 02

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

Actions Taken When the DTC Sets

DTC B3950

- The left rear turn signal is inoperative.
- The "Check Left Rear Turn Signal Lamp" message is displayed on the driver information center display.
- The left turn signal indicator on the instrument cluster flashes rapidly.

DTC B3951

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

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

- [Exterior Lights Wiring Schematics](#)

Connector End View Reference

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- [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 appropriate component listed below.
 - E5LE Tail/Stop Lamp - Left Outer (Z88/X88-UGE)
 - E42L Tail Lamp Assembly - Left (X88+UGE)
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
 - E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
 - **If 10 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.
 - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
 - E42L Tail Lamp Assembly - Left terminal 1 (X88+UGE)
4. Verify the test lamp turns ON and OFF when commanding the Left Rear Turn Signal Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E5LE Tail/Stop Lamp - Left Outer.

DTC B3951

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below.
 - E5RE Tail/Stop Lamp - Right Outer (Z88/X88-UGE)
 - E42R Tail Lamp Assembly - Right (X88+UGE)
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
 - E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)
 - **If 10 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.
 - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
 - E42R Tail Lamp Assembly - Right terminal 1 (X88+UGE)
4. Verify the test lamp turns ON and OFF when commanding the Right Rear Turn Signal Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E5RE Tail/Stop Lamp - Right Outer.

Repair Instructions

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

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

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

Diagnostic Instructions

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

DTC Descriptors

DTC C0277 06

Brake Pedal Position Sensor Circuit Low Voltage/Open

DTC C0277 07

Brake Pedal Position Sensor Circuit High Voltage

DTC C0277 09

Brake Pedal Position Sensor Circuit Too Fast Transitions

DTC C0277 12

Brake Pedal Position Sensor Circuit Malfunction

DTC C0277 4B

Brake Pedal Position Sensor Circuit Calibration Not Learned

DTC C0890 03

Control Module Voltage Reference Output 3 Circuit Low Voltage

DTC C0890 07

Control Module Voltage Reference Output 3 Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F23DA (BCM 1) Fuse B+	C0890 03, B101E 43, B1405 03, B1529 03, U0121 00	C0890 03, B101E 43, B1405 03, B1529 03, U0121 00	-	-
Brake Pedal Position Sensor 5 V Reference	C0277 06, C0890 03, U0140 71	C0277 06, U0140 71	C0277 07, C0890 07, U0140 71	-
Brake Pedal Position Sensor Signal	C0277 06, U0140 71	C0277 06, U0140 71	C0277 07, C0890 07, U0140 71	C0277 09, C0277 12
Center High Mounted Stop Lamp Control	B3884 02	2	2	-
Stop Lamp - Left Control	1	1	1	-
Stop Lamp - Right Control	1	1	1	-
Brake Pedal Position Sensor Low Reference	-	C0277 07, U0140 71	1	-
Center High Mounted Stop Lamp Ground	-	2	-	-

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

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC C0277 06

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

DTC C0277 07

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

DTC C0277 09

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

DTC C0277 4B

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

DTC C0890 03

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

DTC C0890 07

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Exterior Lights Wiring Schematics

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

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

Circuit/System Testing

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

1. Ignition OFF, disconnect the harness connector at the B22 Brake Pedal Position Sensor, ignition ON.
2. Verify a test lamp illuminates between the low reference circuit terminal 2 and B+.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
 2. Test for less than 2 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 1 and ground.
 - **If less than 4.8 V**
 1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the 5 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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. Verify the scan tool Brake Pedal Applied parameter is Inactive.
 - **If not Inactive**
 1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit terminal 3 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K9 Body Control Module.
 - **Go to next step: If Inactive**
6. Install a 3 A fused jumper wire between the 5 V reference circuit terminal 1 and signal circuit terminal 3.
7. Verify the scan tool Brake Pedal Applied parameter is Active.
 - **If not Active**
 1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [Brake Pedal Position Sensor Calibration](#).
9. Verify the DTC does not reset while operating the vehicle under the conditions for running the DTC.
 - If the DTC resets, replace the B22 Brake Pedal Position sensor.
 - If the DTC does not reset
10. All OK.

DTC C0277 4B

1. Verify DTC C0277 4B is not set.
 - **If DTC C0277 4B is set**
 1. Ignition ON
 2. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [Brake Pedal Position Sensor Calibration](#).
 3. Verify the DTC does not reset while operating the vehicle under the conditions for running the DTC.
 - If the DTC resets, replace the B22 Brake Pedal Position sensor.
 - If the DTC does not reset
 - 4. All OK.
 - **Go to next step: If DTC C0277 4B is not set**
2. All OK.

DTC C0277 09 and DTC C0277 12

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

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

1. Replace the B22 Brake Pedal Position sensor.
2. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [Brake Pedal Position Sensor Calibration](#).
3. Verify the DTC does not reset while operating the vehicle under the conditions for running the DTC.
 - If the DTC resets, replace the K9 Body Control Module.
 - If the DTC does not reset

4. All OK.

- **Go to next step: If DTC C0277 09 or C0277 12 is not set**

2. All OK.

Repair Instructions

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

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

DTC C0297: BRAKE APPLIED OUTPUT CIRCUIT SHORT TO GROUND

Diagnostic Instructions

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

DTC Descriptor

DTC C0297 02

Brake Applied Output Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Brake Applied Signal	C0297 02	C0297 02	1	-
1. Cruise Control Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

The BCM detects a short to ground or an open/high resistance on the brake applied signal circuit.

Actions Taken When the DTC Sets

The cruise control system is disabled.

Conditions for Clearing the DTC

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

Diagnostic Aids

Verify that the brake pedal position sensor is properly calibrated.

Reference Information

Schematic Reference

Cruise Control Wiring Schematics

Connector End View Reference

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

Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the K20 Engine Control Module.
2. Connect a test lamp between the appropriate signal circuit terminal listed below and ground, ignition ON.
 - Terminal 50 (LTG/LYX)
 - Terminal 29 (LH7)
3. Verify the test lamp turns ON and OFF while pressing and releasing the brake pedal.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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.

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

SYMPTOMS - LIGHTING

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

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

Visual/Physical Inspection

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

Intermittent

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

Symptom List

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

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

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

ADAPTIVE FORWARD LIGHTING MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

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

Reference Information

Schematic Reference

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

Connector End View Reference

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[Exterior Lighting Systems Description and Operation](#)

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

- [Wiring Repairs](#)

Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
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 a test lamp illuminates between the B+ circuit terminal 6 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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. Replace the E13 Headlamp Assembly.
6. Ignition ON.
7. Verify the appropriate headlamp operates to the LEFT and RIGHT positions when commanding the appropriate Headlamp Horizontal Motor control LEFT and RIGHT with a scan tool.
 - **If the headlamp does not operate LEFT and RIGHT**

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

Repair Instructions

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

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

BACKUP LAMPS MALFUNCTION (AUTOMATIC TRANSMISSION)

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

With the engine running and the transmission in the reverse position, the transmission control module (TCM) sends a serial data message to the body control module (BCM). The message indicates that the gear selector is in the reverse position. The BCM applies battery voltage to the backup lamps control circuit illuminating the backup lamps. Once the driver moves the gear selector out of the reverse position, a message is sent by the TCM via serial data requesting the BCM to remove battery voltage from the backup lamps control circuit. The engine must be running for the backup lamps to operate.

Diagnostic Aids

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

Reference Information

Schematic Reference

- [Exterior Lights Wiring Schematics](#)

Connector End View Reference

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- [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, remove the appropriate E5 Backup Lamp bulb.
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 Backup Lamps ON and OFF with a scan tool.

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

1. Ignition OFF, 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
2. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module and all other components associated with the control circuit.
3. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.

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

1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K9 Body Control Module.

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

5. Test or replace the E5 Backup Lamp.

Repair Instructions

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

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

BACKUP LAMPS MALFUNCTION (MANUAL TRANSMISSION)

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

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

Reference Information

Exterior Lights Wiring Schematics

Connector End View Reference

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Engine ON.
2. Verify the scan tool Reverse Position Switch parameter changes between ON and OFF while shifting the vehicle between the neutral and reverse gears.
 - **If the parameter does not change**
Refer to Backup Lamp Switch Malfunction.
 - **Go to next step: If the parameter changes**
3. Verify the backup lamps turn ON and OFF when commanding the Backup Lamps ON and OFF with a scan tool.
 - **If the backup lamps do not turn ON and OFF**
Refer to Backup Lamps Malfunction.
 - **Go to next step: If the backup lamps turn ON and OFF**
4. All OK.

Circuit/System Testing

Backup Lamp Switch Malfunction

1. Ignition OFF, exterior lamps OFF, all doors closed, disconnect the harness connector at the B16 Backup Lamp Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 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. Ignition ON.
4. Verify the scan tool Reverse Position Switch parameter is Off.
 - **If not Off**
 1. Ignition OFF, disconnect the X3 harness connector at the K20 Engine Control Module.

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

Backup Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E5 Backup Lamp.
2. Test for less than 5 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 Backup Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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.

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

COURTESY LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

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

Reference Information

Schematic Reference

[Interior Lights Wiring Schematics](#)

Connector End View Reference

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- [Wiring Repairs](#)

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connectors at the components listed below.
 - A3L Sunshade - Left
 - A3R Sunshade - Right
 - A98 Front Overhead Console Assembly
 - E28 Center Console Compartment Lamp
 - E37LR Dome/Reading Lamps - Left Rear
 - E37RR Dome/Reading Lamps - Right Rear
2. Test for less than 10 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
 - E28 Center Console Compartment Lamp terminal 1
 - E37LR Dome/Reading Lamps - Left Rear terminal 3
 - E37RR Dome/Reading Lamps - Right Rear terminal 3
 - **If 10 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
 - E28 Center Console Compartment Lamp terminal 2
 - E37LR Dome/Reading Lamps - Left Rear terminal 1
 - E37RR Dome/Reading Lamps - Right Rear terminal 1
4. Verify the test lamp turns ON and OFF when commanding the Inadvertent Load ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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.

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

DAYTIME RUNNING LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

Daytime Running Lamps With CE1

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

Daytime Running Lamps Without CE1

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

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

Diagnostic Aids

When testing at the park/daytime running lamp bulb socket, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the left daytime running lamp turns ON and OFF while commanding the Left Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
 - **If the left daytime running lamp does not turn ON and OFF**

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

Refer to Daytime Running Lamps Malfunction.
 - **Go to next step: If the right daytime running lamp turns ON and OFF**

NOTE:

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

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

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

Refer to Rain Sensing Module Malfunction.

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

Refer to Ambient Light Sensor Malfunction.

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

5. All OK.

Circuit/System Testing

Daytime Running Lamps Malfunction (Without T4L)

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

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

- Terminal 4 (Z88+T4F)
- Terminal 5 (All others without 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 appropriate control circuit terminal listed below and ground, ignition ON.

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

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

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

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

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

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

3. Test for less than 2 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 E13 Headlamp Assembly.

Daytime Running Lamps Malfunction (With T4L)

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

Ambient Light Sensor Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the B10B Ambient Light/Sunload Sensor. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the low reference circuit terminal 6 and ground.
 - **If 5 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 5 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 5 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, replace the K9 Body Control Module.
 - **Go to next step: If greater than 4.65 V**
5. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the low reference circuit terminal 6.
 6. Verify the scan tool Ambient Light Sensor parameter is less than 0.196 V.
 - **If 0.196 V or greater**
 1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit terminal 5 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Test for less than 2 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.

Rain Sensing Module Malfunction

1. Verify the B200 Rain Sensor Module is properly installed and there is no windshield damage or tinted window film than may obstruct or obscure the sensor.
 - **If incorrectly installed or the sensor is obstructed**
Repair as necessary.
 - **Go to next step: If installed properly with no obstructions**
2. Ignition OFF, all vehicle systems OFF, disconnect the harness connector at the B200 Rain Sensor Module. It may take up to 2 min for all vehicle systems to power down.
3. Test for less than 10 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**
4. Ignition ON.
5. Verify a test lamp illuminates between the B+ circuit terminal 1 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF, remove the test lamp.
 2. Test for less than 2 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 test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the B200 Rain Sensor Module.
 - **Go to next step: If the test lamp illuminates**
6. Test for 5.0 - 10.0 V between the serial data circuit terminal 2 and ground.
 - **If less than 5.0 V**
 1. Ignition OFF, disconnect the X6 harness connector at the K9 Body Control Module.

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

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

3. Test for less than 2 Ω in the serial data 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 10.0 V**

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

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

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

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

7. Test or replace the B200 Rain Sensor Module.

Multifunction LED Control Module Malfunction

1. Ignition OFF, disconnect the KR50 Headlamp Relay.

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

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

Replace the X50A Fuse Block - Underhood.

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

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

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

Replace the X50A Fuse Block - Underhood.

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

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

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

• **If the test lamp is always OFF**

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

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

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

3. Ignition OFF.

4. Test for less than 2 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.

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

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

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

6. Ignition OFF, connect the KR50 Headlamp Relay.

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

8. Test for less than 10 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**

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

Repair Instructions

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

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

DOMELAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

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

Circuit/System Description

The dome lamp switch has 3 positions: DOOR, OFF, and ON. The ON position provides a ground for continuous operation and the dome lamp will remain illuminated until the switch is placed in either the DOOR or OFF position. When in the DOOR position, the dome lamp operation is controlled by the body control module (BCM). When any door is opened, the door ajar switch contacts close and the BCM receives a door-open input. The BCM illuminates the dome lamp when any door is opened or a door lock/unlock request is activated with the key fob. After all doors have been closed, the dome lamp will remain illuminated approximately 3 s after the last door closes. When the driver places the dome lamp switch in the OFF position, the dome lamp will be disabled. In the event that the dome lamp were to remain illuminated for more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the dome lamp control circuit to prevent total battery discharge.

Reference Information

Schematic Reference

Interior Lights Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

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

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Door Ajar Sw. parameter changes between Active and Inactive while opening and closing each vehicle door.
 - **If the parameter does not change**
Refer to [Door Ajar Indicator Malfunction](#).
 - **Go to next step: If the parameter changes**
3. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter changes between Door, On, and Cancel while placing the dome lamp switch in the Door, On, and Cancel positions.
 - **If the parameter does not change**

Refer to Dome Lamp Switch Malfunction.

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

4. Verify the dome lamps turn ON and OFF while commanding the Courtesy Lamps ON and OFF with a scan tool.

- **If the dome lamps do not turn ON and OFF**

Refer to Dome Lamps Malfunction.

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

5. All OK.

Circuit/System Testing

Dome Lamp Switch Malfunction

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

2. Test for less than 10 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 Door.

- **If Cancel**

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

2. Test for infinite resistance between the signal circuit terminal 21 and ground.

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

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

- **If On**

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

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

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

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

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

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

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

- **If not Cancel**

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

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

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

- If less than 1 V

3. Test for less than 2 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.
 - 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.

Dome Lamps Malfunction

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

- Each dome lamps control and ground circuit terminals
 - All dome lamps equipped on the vehicle
 - Component locations on the dome lamps control circuits
1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connectors at the following components. It may take up to 2 min for all vehicle systems to power down.
 - A98 Front Overhead Console Assembly
 - E37LR Dome/Reading Lamps - Left Rear
 - E37RR Dome/Reading Lamps - Right Rear
 2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - A98 Front Overhead Console Assembly terminal 5
 - E37LR Dome/Reading Lamps - Left Rear terminal 3
 - E37RR Dome/Reading Lamps - Right Rear terminal 3
 - **If 10 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.
 - A98 Front Overhead Console Assembly terminal 8
 - E37LR Dome/Reading Lamps - Left Rear terminal 4
 - E37RR Dome/Reading Lamps - Right Rear terminal 4
 4. Verify the test lamp turns ON and OFF when commanding the Courtesy Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance

3. Test for less than 2 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 dome/courtesy lamp.

Repair Instructions

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

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

FRONT FOG LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamp Fuse B+	1	1	-	-
Front Fog Lamp Switch Signal	B2740 00	1	1	-
Front Fog Lamp Relay Control	B2530 02, B2530 04	B2530 02, B2530 04	B2530 01	-
Front Fog Lamp Control	1	1	1	-
Front Fog Lamp Ground - Left	-	1	-	-
Front Fog Lamp Ground - Right	-	1	-	-
1. Front Fog Lamps Malfunction				

Circuit/System Description

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

Reference Information

Schematic Reference

Fog Lights Wiring Schematics

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

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

Circuit/System Verification

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

Refer to Front Fog Lamp Switch Malfunction.
 - **Go to next step: If the parameter changes**
3. Verify the front fog lamps turn ON and OFF when commanding the Front Fog Lamps ON and OFF with a scan tool.
 - **If the front fog lamps do not turn ON and OFF**

Refer to Front Fog Lamps Malfunction.
 - **Go to next step: If the front fog lamps turn ON and OFF**
4. Verify the front fog lamp indicator on the instrument cluster turns ON and OFF while commanding the front fog lamps ON and OFF with the front fog lamp switch.
 - **If the front fog lamp indicator does not turn ON and OFF**

Refer to Front Fog Lamp Indicator Malfunction.
 - **Go to next step: If the front fog lamp indicator turns ON and OFF**
5. All OK.

Circuit/System Testing

Front Fog Lamp Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 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.
 - 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, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the control circuit terminal 10 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block - Underhood.
 2. Test for infinite resistance between the control circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 10 and ground.
4. Remove the front fog lamp fuse at the X50A Fuse Block - Underhood, ignition ON.
5. Verify a test lamp illuminates between the front fog lamp fuse B+ switch control terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block - Underhood, ignition ON.
 2. Test for less than 1 V between the control circuit terminal 10 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X50A Fuse Block - Underhood.
 - **Go to next step: If the test lamp illuminates**
6. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
7. Install the front fog lamp fuse at the X50A Fuse Block - Underhood.
8. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E29 Fog Lamp.
9. Test for less than 5 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**

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

11. Verify the test lamp turns ON and OFF when commanding the Front Fog Lamps ON and OFF with a scan tool.

• **If the test lamp is always OFF**

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

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

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

3. Test for less than 2 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 X50A Fuse Block - Underhood, ignition ON.

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

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

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

12. Test or replace the appropriate E29 Fog Lamp.

Front Fog Lamp Indicator Malfunction

1. Ignition ON.

2. Verify the front fog lamp indicator turns ON and OFF when commanding the Instrument Cluster All Indicators Test ON and OFF with a scan tool.

• **If the front fog lamp indicator is always OFF or remains ON**

Replace the P16 Instrument Cluster.

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

3. Replace the K9 Body Control Module.

Repair Instructions

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

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

HAZARD LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

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

The instrument panel dimmer switch controls are located on the headlamp switch assembly and are used to increase and decrease the brightness of the interior backlighting components. When the instrument panel dimmer switch is placed in a desired brightness position, the body control module (BCM) receives a signal from the instrument panel dimmer switch and responds by applying a pulse width modulated voltage to the hazard switch LED backlighting control circuit illuminating the LED to the desired level of brightness.

Reference Information

Schematic Reference

Exterior Lights Wiring Schematics

Connector End View Reference

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 Hazard Lamps Switch parameter changes between Active and Inactive while commanding the hazard lamps ON and OFF with the hazard warning switch.
 - **If the parameter does not change**
Refer to Hazard Warning Switch Malfunction.
 - **Go to next step: If the parameter changes**

3. Verify all left and right turn signal lamps turn ON and OFF while commanding the hazard lamps ON and OFF with the hazard warning switch.

- **If all turn signal lamps do not turn ON and OFF**

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

- **Go to next step: If all turn signal lamps turn ON and OFF**

4. Verify the hazard warning switch backlighting turns ON and OFF while commanding the Hazard Lamps Switch Backlight ON and OFF with a scan tool.

- **If the hazard warning switch backlighting does not turn ON and OFF**

Refer to Hazard Warning Switch Backlighting Malfunction.

- **Go to next step: If the hazard warning switch backlighting turns ON and OFF**

5. All OK.

Circuit/System Testing

Hazard Warning Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S26 Hazard Warning Switch. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 5 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. Ignition ON.

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

- **If not Inactive**

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

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

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

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

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

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

- **If not Active**

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

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

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

3. Test for less than 2 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.

Hazard Warning Switch Backlighting Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S26 Hazard Warning Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 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 4 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Hazard Lamps Switch Backlight ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 S26 Hazard Warning Switch.

Repair Instructions

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

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

HEADLAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

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

Circuit/System Description

Low Beams

The body control module (BCM) monitors three signal circuits from the headlamp switch. When the headlamp switch is in the AUTO position, all three signal circuits are open. When placed in the AUTO position, the BCM monitors inputs from the ambient light sensor to determine if headlamps are required or if daytime running lamps will be activated based on outside lighting conditions. When the headlamp switch is placed in the OFF position, the headlamp switch headlamps OFF signal circuit is grounded, indicating to the BCM that the exterior lamps should be turned OFF. With the headlamp switch in the PARK position, the headlamp switch park lamps ON signal circuit is grounded, indicating that the park lamps have been requested. When the headlamp switch is placed in the HEADLAMP position, both the headlamp switch park lamps ON signal circuit and the headlamp switch headlamps ON signal circuit are grounded. The BCM responds to the inputs by illuminating the park lamps and headlamps. When the low beam headlamps are requested, the BCM applies B+ to both low beam headlamp control circuits illuminating the low beam headlamps.

High Beams

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

high beam relay control circuit which energizes the high beam relay. With the high beam relay energized, the switch contacts close allowing battery voltage to flow through the high beam fuse's to the high beam control circuits actuating the left and right high beam solenoid actuators opening the right and left high beam shutters exposing the full headlamps for high beam operation.

Flash to Pass

When the turn signal/multifunction switch is momentarily placed in the flash to pass position, ground is applied to the BCM through the flash to pass signal circuit. The BCM responds by applying ground to the high beam relay control circuit which energizes the high beam relay illuminating the high beams for a brief moment or until the flash to pass switch is released.

With CE1

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

Without CE1

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

Diagnostic Aids

When testing at the headlamp bulb sockets, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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

1. Ignition ON.
2. Verify the scan tool Headlamps On Switch parameter changes between Active and Inactive while commanding the headlamp ON and OFF with the headlamp switch.
 - **If the parameter does not change**
Refer to Headlamp Switch Malfunction.
 - **Go to next step: If the parameter changes**
3. Verify the scan tool Automatic Headlamps Disable Switch parameter changes between Active and Inactive while commanding the automatic lamp control ON and OFF with the headlamp switch.
 - **If the parameter does not change**
Refer to Headlamp Switch Malfunction.
 - **Go to next step: If the parameter changes**
4. Verify the scan tool Headlamps Flash Switch parameter changes between Active and Inactive while commanding the flash to pass ON and OFF with the turn signal/multifunction switch.
 - **If the parameter does not change**
Refer to Turn Signal/Multifunction Switch Malfunction.
 - **Go to next step: If the parameter changes**
5. Verify the scan tool High Beam Select Switch parameter changes between Active and Inactive while commanding the high beams ON and OFF with the turn signal/multifunction switch.
 - **If the parameter does not change**
Refer to Turn Signal/Multifunction Switch Malfunction.
 - **Go to next step: If the parameter changes**
6. Verify the left low beam headlamp turns ON and OFF when commanding the Left Headlamp Low Beam ON and OFF with a scan tool.
 - **If the left low beam headlamp does not turn ON and OFF**
Refer to Headlamps Malfunction - Low Beam.
 - **Go to next step: If the left low beam headlamp turns ON and OFF**
7. Verify the right low beam headlamp turns ON and OFF when commanding the Right Headlamp Low Beam ON and OFF with a scan tool.
 - **If the right low beam headlamp does not turn ON and OFF**
Refer to Headlamps Malfunction - Low Beam.
 - **Go to next step: If the right low beam headlamp turns ON and OFF**
8. Verify the high beams turn ON and OFF when commanding the High Beams ON and OFF with a scan tool.
 - **If the high beams do not turn ON and OFF**
Refer to Headlamps Malfunction - High Beam.
 - **Go to next step: If the high beams turn ON and OFF**
9. Verify the high beam indicator on the instrument cluster turns ON and OFF while commanding the All Indicators Test ON and OFF with a scan tool.
 - **If the high beam indicator does not turn ON and OFF**
Refer to High Beam Indicator Malfunction.
 - **Go to next step: If the high beam indicator turns ON and OFF**

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

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

Refer to Automatic High Beam Select Switch Malfunction.

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

NOTE:

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

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

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

Refer to Rain Sensing Module Malfunction.

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

Refer to Ambient Light Sensor Malfunction.

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

12. All OK.

Circuit/System Testing

Headlamp Switch Malfunction

1. Ignition OFF, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10 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.
 - 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.
 - 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.
 - 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.

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

Headlamps Malfunction - Low Beam (T4A)

1. Ignition OFF, scan tool disconnected, all doors closed, exterior lamps OFF, remove the appropriate E4 Headlamp - Low Beam. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 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 appropriate Headlamp Low Beam ON and OFF with a scan tool.
 - **If the test lamp is always OFF**

1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 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 E4 Headlamp - Low Beam.

Headlamps Malfunction - Low Beam (T4F)

1. Ignition OFF, scan tool disconnected, all doors closed, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 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 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the appropriate Headlamp Low Beam ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E4 Headlamp - Low Beam bulb.
6. Ignition ON, verify the appropriate low beam headlamp illuminates when commanded ON with the headlamp switch.
 - **If the low beam headlamp does not illuminate**
 1. Test or replace the appropriate E13 Headlamp Assembly.

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

7. All OK.

Headlamps Malfunction - Low Beam (T4L)

1. Ignition OFF, scan tool disconnected, all doors closed, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 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 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the appropriate Headlamp Low Beam ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E13 Headlamp Assembly.

Headlamps Malfunction - High Beam (T4A/T4F)

1. Ignition OFF, disconnect the KR48 Headlamp High Beam Relay, ignition ON
2. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate**
Replace the X50A Fuse Block - Underhood.
 - **Go to next step: If the test lamp illuminates**
3. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.
 - **If the test lamp does not illuminate**
Replace the X50A Fuse Block - Underhood.
 - **Go to next step: If the test lamp illuminates**
4. Connect a test lamp between the control circuit terminal 1 and B+, ignition ON.
5. Verify the test lamp turns ON and OFF when commanding the High Beams ON and OFF with a scan tool.
 - **If the test lamp is always OFF**

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

Headlamps Malfunction - High Beam (T4L)

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

Replace the X50A Fuse Block - Underhood.

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

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

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

Replace the X50A Fuse Block - Underhood.

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

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

5. Verify the test lamp turns ON and OFF when commanding the High Beams ON and OFF with a scan tool.

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

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

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

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

3. Ignition OFF.

4. Test for less than 2 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.

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

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

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

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

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

8. Test for less than 10 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**

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

10. Verify the test lamp turns ON and OFF when commanding the High Beams ON and OFF with a scan tool.

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

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

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

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

3. Test for less than 2 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 X50A Fuse Block - Underhood, ignition ON.
2. Test for less than 1 V between the control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K9 Body Control Module.
- **Go to next step: If the test lamp turns ON and OFF**
11. Test or replace the appropriate E13 Headlamp Assembly.

High Beam Indicator Malfunction

1. Ignition ON.
2. Verify the high beam indicator turns ON and OFF when commanding the Instrument Cluster All Indicators Test ON and OFF with a scan tool.
 - **If the high beam indicator is always OFF or remains ON**

Replace the P16 Instrument Cluster.
 - **Go to next step: If the high beam indicator turns ON and OFF**
3. Replace the K9 Body Control Module.

Ambient Light Sensor Malfunction

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

Rain Sensing Module Malfunction

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

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

Repair as necessary.

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

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

3. Test for less than 10 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**

4. Ignition ON.

5. Verify a test lamp illuminates between the B+ circuit terminal 1 and ground.

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

1. Ignition OFF, remove the test lamp.

2. Test for less than 2 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 test lamp.

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

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the B200 Rain Sensor Module.

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

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

- **If less than 5.0 V**

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

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

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

3. Test for less than 2 Ω in the serial data 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 10.0 V**

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

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

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

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

7. Test or replace the B200 Rain Sensor Module.

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

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

HEADLAMP LEVELING MALFUNCTION (AUTOMATIC HEADLAMP LEVELING)

Diagnostic Instructions

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

Diagnostic Fault Information

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

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

Circuit/System Description

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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](#)

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

Special Tools

J-38522 Variable Signal Generator

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

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Front Leveling Position Sensor Signal parameter is between 5% and 90%.
 - **If the parameter is not between 5% and 90%**

Refer to Headlamp Leveling Sensor Malfunction.
 - **Go to next step: If the parameter is between 5% and 90%**
3. Verify the scan tool Rear Leveling Position Sensor Signal parameter is between 5% and 90%.
 - **If the parameter is not between 5% and 90%**

Refer to Headlamp Leveling Sensor Malfunction.
 - **Go to next step: If the parameter is between 5% and 90%**
4. Verify the left and right headlamps operate to the UP and DOWN positions when commanding the Right and Left Headlamp Vertical Motor controls UP and DOWN with a scan tool.
 - **If the left and right headlamps do not operate UP and DOWN**

Refer to Headlamp Leveling Actuator Malfunction
 - **Go to next step: If the left and right headlamps operate UP and DOWN**
5. All OK.

Circuit/System Testing

Headlamp Leveling Actuator Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly.
2. Test for less than 10 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 a test lamp illuminates between the B+ circuit terminal 6 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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. Replace the E13 Headlamp Assembly.

6. Ignition ON.

7. Verify the appropriate headlamp operates to the UP and DOWN positions when commanding the appropriate Headlamp Vertical Motor control UP and DOWN with a scan tool.

- **If the headlamp does not operate UP and DOWN**

Replace the K26 Headlamp Control Module.

- **Go to next step: If the headlamp operates UP and DOWN**

8. All OK.

Headlamp Leveling Sensor Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate B51 Suspension Height Sensor, ignition ON.

2. Verify a test lamp illuminates between the low reference circuit terminal 2 and B+.

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

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

2. Test for less than 2 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 K26 Headlamp Control Module.

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

3. Ignition ON.

4. Test for 4.8 - 5.2 V between the 5 V reference circuit terminal 1 and ground.

- **If less than 4.8 V**

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

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

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

3. Test for less than 2 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 K26 Headlamp Control Module.

- **If greater than 5.2 V**

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

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

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K26 Headlamp Control Module.

- **Go to next step: If between 4.8 - 5.2 V**

5. Verify the appropriate scan tool Leveling Position Sensor Signal parameter is less than 1 mm.

- **If 1 mm or greater**

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

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

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K26 Headlamp Control Module.

- **Go to next step: If less than 1 mm**

6. Ignition OFF.

7. Connect the red lead of the **J-38522** Variable Signal Generator to the signal circuit terminal 3 and the black lead of the **J-38522** Variable Signal Generator to the low reference circuit terminal 2.

8. Adjust the **J-38522** Variable Signal Generator to the settings listed below:

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

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

- **If not 11 mm**

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

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

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

3. Test for less than 2 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 K26 Headlamp Control Module.

- **Go to next step: If 11 mm**

10. Test or replace the B51 Suspension Height Sensor.

Repair Instructions

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

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

HEADLAMP LEVELING MALFUNCTION (MANUAL HEADLAMP LEVELING)

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

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

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

Diagnostic Aids

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Wiring Schematics

Connector End View Reference

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Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

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

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. 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 8 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 ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 6 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the X50A Fuse Block - Underhood.
 - **Go to next step: If the test lamp illuminates**
5. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.

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

Repair Instructions

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

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

INTERIOR ACCENT LIGHTING MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

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

Reference Information

Schematic Reference

Interior Lights Wiring Schematics

Connector End View Reference

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Description and Operation

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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 wiring schematics to identify the following:

- **Courtesy lamps the vehicle is equipped with**
 - **Each component's control and ground circuit terminals**
 - **Component locations on the exterior courtesy lamps control circuit**
1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the inoperative accent/flood lamp. It may take up to 2 min for all vehicle systems to power down.
 2. Test for less than 10 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 X7 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 accent/flood lamp.

Repair Instructions

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

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

INTERIOR BACKLIGHTING MALFUNCTION

Diagnostic Instructions

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

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

Diagnostic Fault Information

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

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
1. Interior Backlighting Malfunction 2. Switch Indicator LED Backlighting Malfunction 3. Dimmer Switch Malfunction 4. Dome Lamps Malfunction 5. Lane Departure Warning System Malfunction 6. All Wheel Drive Malfunction 7. Park Assist System Malfunction				

Circuit/System Description

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

Reference Information

Schematic Reference

- [Interior Lights Dimming Wiring Schematics](#)

Connector End View Reference

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- [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 indicator amber LED's for the components listed below turn ON and OFF while turning the associated switches ON and OFF.
 - A98 Front Overhead Console Assembly
 - S48E Multifunction Switch - Center Console

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

Refer to Switch Indicator LED Backlighting Malfunction.

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

4. Verify the backlighting components turn ON and OFF while commanding the LED Backlight Dimming ON and OFF with a scan tool.

- **If the backlighting components do not turn ON and OFF**

Refer to Interior Backlighting Malfunction.

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

5. All OK.

Circuit/System Testing

Dimmer Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S30 Headlamp Switch, ignition ON.
2. Test for B+ between the B+ circuit terminal 12 and ground.

- **If less than B+**

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

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

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

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

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

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

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

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

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

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

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

3. Test for less than 2 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**

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

- **If the test lamp illuminates**

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

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

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

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

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

- **If less than B+**

1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the signal circuit terminal 11 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
3. Test for less than 2 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+**

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

6. Test or replace the S30 Headlamp Switch.

Interior Backlighting Malfunction

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

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

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

2. Test for less than 5 Ω between the appropriate ground circuit 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 appropriate control circuit terminal and ground, ignition ON.

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

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

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
 - X2 terminal 8
 - X7 terminal 9
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 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

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

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

1. Ignition OFF, disconnect the harness connector at the appropriate switch listed below.

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

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

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

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

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

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

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

3. Test for less than 2 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 illuminates**

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

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

- A98 Front Overhead Console Assembly terminal 18

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

Repair Instructions

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

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

PARK, LICENSE, AND/OR TAIL LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	-
License Plate Lamp Control	B3883 02	B3883 01, B3883 04	B3883 01	-
Multifunction LED Control Module Relay Control	3	3	3	-
Park/Daytime Running Lamp - Left Control	B260D 02	1	1	-
Park/Daytime Running Lamp - Right Control	B260E 02	1	1	-
Park/Tail Lamps Control - Rear	1	1	1	-
Headlamp Switch Ground	-	2	-	-
Headlamp Assembly - Left Ground	-	1	-	-
Headlamp Assembly - Right Ground	-	1	-	-
License Plate Lamp - Left Ground	-	1	-	-
License Plate Lamp - Right Ground	-	1	-	-
Liftgate Tail Lamp Assembly - Left Ground	-	1	-	-
Liftgate Tail Lamp Assembly - Right Ground	-	1	-	-
Tail Lamp Assembly - Left Ground	-	1	-	-
Tail Lamp Assembly - Right Ground	-	1	-	-
1. Park, License, and/or Tail Lamps Malfunction 2. Park Lamp Switch Malfunction 3. Multifunction LED Control Module Malfunction				

Circuit/System Description

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

Diagnostic Aids

When testing at the park/license lamp bulb sockets, make sure all measurements and test lamp connections are in the correct terminal location and do not come in contact with each other during testing.

Reference Information

Schematic Reference

Exterior Lights Wiring Schematics

Connector End View Reference

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Description and Operation

Exterior Lighting Systems Description and Operation

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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 Park Lamp Switch parameter changes between Active and Inactive while commanding the park lamps ON and OFF with the headlamp switch.
 - **If the parameter does not change**
Refer to Park Lamp Switch Malfunction.
 - **Go to next step: If the parameter changes**
3. Verify the left front park lamp turns ON and OFF while commanding the Left Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
 - **If the left front park lamp does not turn ON and OFF**
Refer to Park Lamps Malfunction - Front.
 - **Go to next step: If the left front park lamp turns ON and OFF**
4. Verify the right front park lamp turns ON and OFF while commanding the Right Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
 - **If the right front park lamp does not turn ON and OFF**
Refer to Park Lamps Malfunction - Front.
 - **Go to next step: If the right front park lamp turns ON and OFF**
5. Verify the left front side marker lamp and left rear park lamps turn ON and OFF when commanding the Park Lamps ON and OFF with a scan tool.
 - **If the left front side marker lamp and left rear park lamps do not turn ON and OFF**
Refer to Park Lamps Malfunction - Rear.
 - **Go to next step: If the left front side marker lamp and left rear park lamps turn ON and OFF**
6. Verify the right front side marker lamp and right rear park lamps turn ON and OFF when commanding the Right Park Lamps ON and OFF with a scan tool.
 - **If the right front side marker lamp and right rear park lamps do not turn ON and OFF**
Refer to Park Lamps Malfunction - Rear.
 - **Go to next step: If the right front side marker lamp and right rear park lamps turn ON and OFF**
7. Verify the license plate lamps turn ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.
 - **If the license plate lamps do not turn ON and OFF**
Refer to License Plate Lamps Malfunction.
 - **Go to next step: If the license plate lamps turn ON and OFF**

8. All OK.

Circuit/System Testing

Park Lamp Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 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.
 - 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 - Front

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
 - E13LA Headlamp Assembly - Left terminal 5 (X88)
 - E13RA Headlamp Assembly - Right terminal 5 (X88)
 - E13LA Headlamp Assembly - Left terminal 4 (Z88)
 - E13RA Headlamp Assembly - Right terminal 4 (Z88)
 - **If 15 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 15 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E13LA Headlamp Assembly - Left terminal 4 (X88)
 - E13RA Headlamp Assembly - Right terminal 4 (X88)
 - E13LA Headlamp Assembly - Left terminal 7 (Z88)
 - E13RA Headlamp Assembly - Right terminal 7 (Z88)
 4. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E4A Park/Daytime Running Lamp.

Park Lamps Malfunction - Rear

1. Ignition OFF, disconnect the KR53 Park Lamps Relay, ignition ON
2. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate**
Replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
3. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.
 - **If the test lamp does not illuminate**
Replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
4. Connect a test lamp between the control circuit terminal 1 and B+, ignition ON.
5. Verify the test lamp turns ON and OFF when commanding the Rear Park Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
 2. Test for less than 1 V between the control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF.
 4. Test for less than 2 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.
 2. Test for infinite resistance between the control circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp turns ON and OFF**
- 6. Ignition OFF, exterior lamps OFF, connect the KR53 Park Lamps Relay.
- 7. Disconnect the harness connector at the appropriate component listed below.
 - E42L Tail Lamp Assembly - Left
 - E42R Tail Lamp Assembly - Right
 - E43L Liftgate Tail Lamp Assembly - Left
 - E43R Liftgate Tail Lamp Assembly - Right
 - E13LA Headlamp Assembly - Left
 - E13RA Headlamp Assembly - Right
- 8. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
 - E42L Tail Lamp Assembly - Left terminal 1
 - E42R Tail Lamp Assembly - Right terminal 1
 - E43L Liftgate Tail Lamp Assembly - Left terminal 1
 - E43R Liftgate Tail Lamp Assembly - Right terminal 1
 - E13LA Headlamp Assembly - Left terminal 5 (X88)
 - E13LA Headlamp Assembly - Left terminal 4 (Z88)
 - E13RA Headlamp Assembly - Right terminal 5 (X88)
 - E13RA Headlamp Assembly - Right terminal 4 (Z88)
 - **If 10 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**
- 9. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
 - E42L Tail Lamp Assembly - Left terminal 2
 - E42R Tail Lamp Assembly - Right terminal 2
 - E43L Liftgate Tail Lamp Assembly - Left terminal 2
 - E43R Liftgate Tail Lamp Assembly - Right terminal 2
 - E13LA Headlamp Assembly - Left terminal 6 (X88)
 - E13LA Headlamp Assembly - Left terminal 12 (Z88)
 - E13RA Headlamp Assembly - Right terminal 6 (X88)
 - E13RA Headlamp Assembly - Right terminal 12 (Z88)
- 10. Verify the test lamp turns ON and OFF when commanding the Rear Park Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the harness connector at the X53A Fuse Block - Rear Body.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 KR53 Park Lamps Relay.

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

1. Ignition OFF, disconnect the harness connector at the X53A Fuse Block - Rear Body, ignition ON.
2. Test for less than 1 V between the control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the KR53 Park Lamps Relay.

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

11. Test or replace the inoperative park lamp.

Multifunction LED Control Module Malfunction

1. Ignition OFF, disconnect the KR50 Headlamp Relay.
2. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

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

Replace the X50A Fuse Block - Underhood.

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

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

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

Replace the X50A Fuse Block - Underhood.

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

4. Connect a test lamp between the control circuit terminal 1 and B+, ignition ON.
5. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.

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

1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the control circuit terminal 13 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V

3. Ignition OFF.

4. Test for less than 2 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.
2. Test for infinite resistance between the control circuit terminal 13 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.

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

6. Ignition OFF, connect the KR50 Headlamp Relay.
7. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
8. Test for less than 10 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**

9. Connect a test lamp between the control circuit terminal 5 and ground, ignition ON.
10. Verify the test lamp turns ON and OFF when commanding the appropriate Front Park Lamp/Daytime Running Lamp ON and OFF with a scan tool.

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

1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood.
2. Test for infinite resistance between the control circuit terminal 5 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 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 KR50 Headlamp Relay.

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

1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block - Underhood, ignition ON.
2. Test for less than 1 V between the control circuit terminal 5 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the KR50 Headlamp Relay.

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

11. Test or replace the appropriate E13 Headlamp Assembly.

License Plate Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, remove both E7 License Plate Lamp bulbs.
2. Test for less than 10 Ω between each 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 E7L License Plate Lamp - Left control circuit terminal 2 and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.

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

1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 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 E7R License Plate Lamp - Right control circuit terminal 2 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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.

Repair Instructions

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

- Refer to [Headlamp Switch Replacement \(Equinox, Denali\)](#) [Headlamp Switch Replacement \(Terrain Base\)](#)
- Refer to [Headlamp Replacement \(Chevrolet\)](#) [Headlamp Replacement \(GMC\)](#)
- Refer to [Side Marker Bulb Replacement \(Without UGE\)](#)
- Refer to [Rear Body Structure Stop Lamp Replacement \(Chevrolet Without UGE\)](#) [Rear Body Structure Stop Lamp Replacement \(Chevrolet With UGE\)](#) [Rear Body Structure Stop Lamp Replacement \(GMC\)](#)
- Refer to [Rear Combination Lamp Replacement \(Chevrolet\)](#) [Rear Combination Lamp Replacement \(GMC\)](#)
- Refer to [Rear License Plate Lamp Replacement \(Chevrolet\)](#) [Rear License Plate Lamp Replacement \(GMC\)](#)
- Refer to [Relay Replacement \(Attached to Wire Harness\)](#) [Relay Replacement \(Within an Electrical Center\)](#)
- Refer to [Rear Body Fuse Block Replacement \(Equinox\)](#) [Rear Body Fuse Block Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

REAR COMPARTMENT LAMP MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

The body control module (BCM) applies battery voltage to the rear compartment courtesy lamp through the rear compartment lamp control circuit. When the BCM receives a rear compartment lid open input

from the rear compartment lid latch, the BCM applies battery voltage to the rear compartment lamp control circuit illuminating the rear compartment courtesy lamp. In the event that the rear compartment lamp were to remain illuminated for more than 10 min with the ignition switch in the OFF position, the BCM will deactivate the rear compartment lamp control circuit to prevent total battery discharge.

Reference Information

Schematic Reference

Interior Lights Wiring Schematics

Connector End View Reference

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Interior Lighting Systems Description and Operation

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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, trunk latch latched, disconnect the harness connector at the E8S Rear Compartment Courtesy Lamp.
2. Test for less than 5 Ω between the ground circuit terminal 3 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 turns ON and OFF when commanding the Trunk Lamp ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 E8S Rear Compartment Courtesy Lamp.

Repair Instructions

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

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

STOP LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Brake Pedal Position Sensor 5 V Reference	C0277 06, C0890 03, U0140 71	C0277 06, U0140 71	C0277 07, C0890 07, U0140 71	-
Brake Pedal Position Sensor Signal	C0277 06, U0140 71	C0277 06, U0140 71	C0277 07, C0890 07, U0140 71	C0277 09, C0277 12
Tail/Stop Lamp Outage Detection Signal - Left Outer	3	3	3	-
Tail/Stop Lamp Outage Detection Signal - Right Outer	3	3	3	-
Center High Mounted Stop Lamp Control	B3884 02	2	2	-
Stop Lamp - Left Control	B3881 02	B3881 01, B3881 04	B3881 01, B3881 04	-
Stop Lamp - Right Control	B3882 02	B3882 01, B3882 04	B3882 01, B3882 04	-
Brake Pedal Position Sensor Low Reference	-	C0277 07, U0140 71	1	-
Center High Mounted Stop Lamp Ground	-	2	-	-
Tail Lamp Assembly - Left Ground	-	1	-	-
Tail Lamp Assembly - Right Ground	-	1	-	-
1. Stop Lamps Malfunction 2. Center High Mounted Stop Lamp Malfunction 3. Tail/Stop Lamp Outage Detection Malfunction				

Circuit/System Description

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

Schematic Reference

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

Connector End View Reference

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Scan Tool Reference

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

Circuit/System Verification

1. Ignition ON.
2. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [Brake Pedal Position Sensor Calibration](#).
3. Verify the scan tool Brake Pedal Applied parameter changes between Active and Inactive while pressing and releasing the brake pedal.
 - **If the parameter does not change**
Refer to Brake Pedal Position Sensor Malfunction.
 - **Go to next step: If the parameter changes**
4. Verify the center high mounted stop lamp turns ON and OFF when commanding the Center Stop Lamp ON and OFF with a scan tool.
 - **If the center high mounted stop does not turn ON and OFF**
Refer to Center High Mount Stop Lamp Malfunction.
 - **Go to next step: If the center high mounted stop turns ON and OFF**
5. Verify the left stop lamp turns ON and OFF when commanding the Left Stop Lamp ON and OFF with a scan tool.
 - **If the left stop lamp does not turn ON and OFF**
Refer to Stop Lamps Malfunction
 - **Go to next step: If the left stop lamp turns ON and OFF**
6. Verify the right stop lamp turns ON and OFF when commanding the Right Stop Lamp ON and OFF with a scan tool.
 - **If the right stop lamp does not turn ON and OFF**
Refer to Stop Lamps Malfunction.
 - **Go to next step: If the right stop lamp turns ON and OFF**

7. Observe the left and right outer tail/stop lamps while activating the stop lamps. The left and right outer tail/stop lamps should illuminate when turned ON.

- **If the left or right outer tail/stop lamp does not illuminate**

Refer to Tail/Stop Lamp Outage Detection Malfunction.

- **Go to next step: If the left and right outer tail/stop lamps illuminate**

8. All OK.

Circuit/System Testing

Brake Pedal Position Sensor Malfunction

1. Ignition OFF, disconnect the harness connector at the B22 Brake Pedal Position Sensor, ignition ON.

2. Verify a test lamp illuminates between the low reference circuit terminal 2 and B+.

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

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

2. Test for less than 2 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. Test for less than 1 V between the low reference circuit terminal 2 and B+.

- **If 1 V or greater**

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

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

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

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

4. Test for 4.8 - 5.2 V between the 5 V reference circuit terminal 1 and ground.

- **If less than 4.8 V**

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

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

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

3. Test for less than 2 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. Verify the scan tool Brake Pedal Applied parameter is Inactive.

- **If not Inactive**

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

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

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

- If less than 1 V, replace the K9 Body Control Module.
 - **Go to next step: If Inactive**
6. Install a 3 A fused jumper wire between the 5 V reference circuit terminal 1 and signal circuit terminal 3.
 7. Verify the scan tool Brake Pedal Applied parameter is Active.
 - **If not Active**
 1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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. Connect the harness connector at the B22 Brake Pedal Position Sensor.
 9. Perform the brake pedal position sensor learn procedure for the K9 Body Control Module. Refer to [Brake Pedal Position Sensor Calibration](#).
 10. Verify the scan tool Brake Pedal Applied parameter changes between Active and Inactive while pressing and releasing the brake pedal.
 - **If the parameter does not change**

Test or replace the B22 Brake Pedal Position Sensor.
 - **Go to next step: If the parameter changes**

All OK

Stop Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below.
 - E5LE Tail/Stop Lamp - Left Outer (Z88/X88-UGE)
 - E5RE Tail/Stop Lamp - Right Outer (Z88/X88-UGE)
 - E42L Tail Lamp Assembly - Left (X88+UGE)
 - E42R Tail Lamp Assembly - Right (X88+UGE)
2. Test for less than 5 Ω between the appropriate ground circuit terminal listed below and ground.
 - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
 - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
 - E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
 - E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)
 - **If 5 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.
 - E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
 - E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
 - E42L Tail Lamp Assembly - Left terminal 1 (X88+UGE)
 - E42R Tail Lamp Assembly - Right terminal 1 (X88+UGE)

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

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

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

- X4 - left stop lamps
- X5 - right stop lamps

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

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

3. Test for less than 2 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.

- X4 - left stop lamps
- X5 - right stop lamps

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

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

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

5. Test or replace the appropriate E5 Tail/Stop Lamp - Outer.

Tail/Stop Lamp Outage Detection Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate E42 Tail Lamp Assembly, ignition ON.

2. Test for B+ between the signal circuit terminal 3 and ground.

- **If not B+**

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

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

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

3. Test for less than 2 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 3 and ground.

- **If the test lamp illuminates**

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

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

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

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

4. Test or replace the E5 Tail/Stop Lamp - Outer.

Center High Mount Stop Lamp Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E6 Center High Mounted Stop Lamp.

2. Test for less than 10 Ω between the ground circuit terminal A 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 B and ground, ignition ON.

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

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

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

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

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

3. Test for less than 2 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 E6 Center High Mounted Stop Lamp.

Repair Instructions

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

- Refer to [High Mount Stop Lamp Replacement \(Chevrolet\)](#), [High Mount Stop Lamp Replacement \(GMC\)](#).
- Refer to [Brake Pedal Position Sensor Replacement](#)
- Refer to [Brake Pedal Position Sensor Calibration](#)
- Refer to [Rear Body Structure Stop Lamp Replacement \(Chevrolet Without UGE\)](#), [Rear Body Structure Stop Lamp Replacement \(Chevrolet With UGE\)](#), [Rear Body Structure Stop Lamp Replacement \(GMC\)](#).
- Refer to [Stop Bulb Replacement \(Chevrolet Without UGE\)](#).
- Refer to [Rear Combination Lamp Replacement \(Chevrolet\)](#), [Rear Combination Lamp Replacement \(GMC\)](#).
- Refer to [Control Module References](#) for BCM replacement, programming, and setup

TRAILER LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Lamps Relay Control	1	1	1	-
Trailer Backup Lamps Relay Control	1	1	1	-
Trailer Stop/Turn Signal Lamp Relay - Left Control	1	1	1	-
Trailer Stop/Turn Signal Lamp Relay - Right Control	1	1	1	-
Park Lamps Control	1	1	1	-
Trailer Backup Lamps Control	1	1	1	-
Trailer Stop/Turn Signal Lamp Control - Left	1	1	1	-
Trailer Stop/Turn Signal Lamp Control - Right	1	1	1	-
Trailer Connector Ground	-	1	-	-
1. Trailer Lamps Malfunction				

Circuit/System Description

Park Lamps

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

Stop Lamps

For stop lamp operation, the left and right trailer stop/turn signal lamp relay's are supplied with battery voltage at all times. The brake pedal position sensor is used to sense the action of the driver application of the brake pedal. The brake pedal position sensor provides an analog voltage signal that will increase as the brake pedal is applied. The body control module (BCM) provides a low reference signal and a 5 V reference voltage to the brake pedal position sensor. When the variable signal reaches a voltage threshold indicating the brakes have been applied, the BCM energizes the left and right trailer stop/turn signal lamp relay's by applying voltage to the left and right stop lamp relay control circuits. With the left and right trailer stop/turn signal lamp relay's energized, the relay switch contacts close and battery voltage is applied through the left and right trailer stop/turn signal fuse's to the trailer stop lamp control circuits which illuminates the trailer stop lamps.

Turn Signal Lamps

For turn signal lamp operation, the left and right trailer stop/turn signal lamp relay's are supplied with battery voltage at all times. Ground is applied at all times to the turn signal/multifunction switch. The turn signal lamps may only be activated with the ignition switch in the ON or START positions. When the turn signal/multifunction switch is placed in either the TURN RIGHT or TURN LEFT position, ground is applied to the body control module (BCM) through either the right turn or left turn signal switch signal circuit. The BCM responds to the turn signal switch input by applying a pulsating voltage to the left and right trailer stop/turn signal lamp relay control circuits energizing the relay's in an ON and OFF cycle. With the left and right trailer stop/turn signal lamp relay's energized, the relay switch contacts cycle ON and OFF applying battery voltage through the left and right trailer stop/turn signal fuse's to the trailer turn signal lamp control circuits which illuminates the trailer turn signal lamps in an ON and OFF cycle.

Diagnostic Aids

For testing purposes, the vehicle must be diagnosed with the trailer/trailer lighting connector disconnected.

Reference Information

- Trailer Connector/Provision Wiring Schematics

Connector End View Reference

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 park lamps turn ON and OFF when commanding the Park Lamps ON and OFF with a scan tool.
 - **If the vehicles park lamps do not turn ON and OFF**
Refer to **Park, License, and/or Tail Lamps Malfunction**.
 - **Go to next step: If the vehicles park lamps turn ON and OFF**
3. Verify the vehicles backup lamps turn ON and OFF when commanding the Backup Lamps ON and OFF with a scan tool.
 - **If the vehicles backup lamps do not turn ON and OFF**
Refer to **Backup Lamps Malfunction (Automatic Transmission)Backup Lamps Malfunction (Manual Transmission)**.
 - **Go to next step: If the vehicles backup lamps turn ON and OFF**
4. Verify the vehicles left stop lamp turns ON and OFF when commanding the Left Stop Lamp ON and OFF with a scan tool.
 - **If the vehicles left stop lamp does not turn ON and OFF**
Refer to **Stop Lamps Malfunction**.
 - **Go to next step: If the vehicles left stop lamp turns ON and OFF**
5. Verify the vehicles right stop lamp turns ON and OFF when commanding the Right Stop Lamp ON and OFF with a scan tool.
 - **If the vehicles right stop lamp does not turn ON and OFF**
Refer to **Stop Lamps Malfunction**.
 - **Go to next step: If the vehicles right stop lamp turns ON and OFF**
6. Verify the vehicles left and right turn signal lamps turn ON and OFF when commanding the left and right turn signal lamps ON and OFF with the turn signal/multifunction switch.
 - **If the vehicles left or right turn signal lamps do not turn ON and OFF**
Refer to **Turn Signal Lamps and/or Indicators Malfunction**.

- **Go to next step: If the vehicles left and right turn signal lamps turn ON and OFF**

7. Refer to Circuit/System Testing.

Circuit/System Testing

Trailer Park Lamps Malfunction (6-pin trailer connector)

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 10 Ω between the ground circuit terminal 2 at the X88 Trailer Connector 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. Remove the KR53 Park Lamps Relay from the X53A Fuse Block - Rear Body, ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
5. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.
 - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
6. Verify a test lamp does not illuminate between the control circuit terminal 1 and ground.
 - **If the test lamp illuminates**
 1. Ignition ON.
 2. Test for less than 1 V between the control circuit terminal 1 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X88 Trailer Connector.
 - **Go to next step: If the test lamp does not illuminate**
7. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 1 and B+, ignition ON.
8. Verify a test lamp illuminates between the control circuit terminal 1 at the X88 Trailer Connector and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the 3 A fused jumper wire.
 2. Test for infinite resistance between the control circuit terminal 1 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 X88 Trailer Connector.
 - **Go to next step: If the test lamp illuminates**
9. Ignition OFF, install the KR53 Park Lamps Relay.
10. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
11. Verify a test lamp illuminates between the control circuit terminal 22 and ground.
 - **If the test lamp does not illuminate**

1. Ignition OFF, remove the KR53 Park Lamps Relay.
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 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 X53A Fuse Block - Rear Body.
- **Go to next step: If the test lamp illuminates**
12. Connect a 3 A fused jumper between the control circuit terminal 22 and ground, ignition ON.
13. Verify a test lamp illuminates between the control circuit terminal 1 at the X88 Trailer Connector and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the KR53 Park Lamps Relay, ignition ON.
 2. Test for less than 1 V between the control circuit terminal 22 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
14. Test or replace the K9 Body Control Module.

Trailer Park Lamps Malfunction (7-pin trailer connector)

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 10 Ω between the ground circuit terminal B at the X88 Trailer Connector 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. Remove the KR53 Park Lamps Relay from the X53A Fuse Block - Rear Body, ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
5. Verify a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
6. Verify a test lamp does not illuminate between the control circuit terminal 1 and ground.
 - **If the test lamp illuminates**
 1. Ignition ON.
 2. Test for less than 1 V between the control circuit terminal 1 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X88 Trailer Connector.
 - **Go to next step: If the test lamp does not illuminate**
7. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 1 and B+, ignition ON.

8. Verify a test lamp illuminates between the control circuit terminal F at the X88 Trailer Connector and ground.

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

1. Ignition OFF, remove the 3 A fused jumper wire.
2. Test for infinite resistance between the control circuit terminal 1 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 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 X88 Trailer Connector.

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

9. Ignition OFF, install the KR53 Park Lamps Relay.

10. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.

11. Verify a test lamp illuminates between the control circuit terminal 22 and ground.

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

1. Ignition OFF, remove the KR53 Park Lamps Relay.
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 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 X53A Fuse Block - Rear Body.

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

12. Connect a 3 A fused jumper between the control circuit terminal 22 and ground, ignition ON.

13. Verify a test lamp illuminates between the control circuit terminal F at the X88 Trailer Connector and ground.

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

1. Ignition OFF, remove the KR53 Park Lamps Relay, ignition ON.
2. Test for less than 1 V between the control circuit terminal 22 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X53A Fuse Block - Rear Body.

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

14. Test or replace the K9 Body Control Module.

Trailer Backup Lamps Malfunction (7 - pin trailer connector)

1. Ignition OFF, exterior lamps OFF, remove the KR61 Trailer Backup Lamps Relay from the X53A Fuse Block - Rear Body.

2. Test for less than 10 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. Ignition ON, verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

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

Replace the X53A Fuse Block - Rear Body.

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

4. Verify a test lamp does not illuminate between the control circuit terminal 1 and ground.
 - **If the test lamp illuminates**
 1. Ignition ON.
 2. Test for less than 1 V between the control circuit terminal 1 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X88 Trailer Connector.
 - **Go to next step: If the test lamp does not illuminate**
5. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 1 and B+, ignition ON.
6. Verify a test lamp illuminates between the control circuit terminal A at the X88 Trailer Connector and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the 3 A fused jumper wire.
 2. Test for infinite resistance between the control circuit terminal 1 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 X88 Trailer Connector.
 - **Go to next step: If the test lamp illuminates**
7. Ignition OFF, install the KR61 Trailer Backup Lamps Relay.
8. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
9. Verify a test lamp illuminates between the control circuit terminal 11 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the KR61 Trailer Backup Lamps Relay.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
10. Connect a 3 A fused jumper between the control circuit terminal 11 and ground, ignition ON.
11. Verify a test lamp illuminates between the control circuit terminal A at the X88 Trailer Connector and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the KR61 Trailer Backup Lamps Relay, ignition ON.
 2. Test for less than 1 V between the control circuit terminal 11 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
12. Test or replace the K9 Body Control Module.

Trailer Stop/Turn Signal Lamps Malfunction

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 10 Ω between the ground circuit terminal B at the X88 Trailer Connector 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 OFF, disconnect the appropriate KR63 Trailer Stop/Turn Signal Lamp Relay.
4. 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**
5. Ignition ON, verify a test lamp illuminates between the B+ circuit terminal 3 and ground.
 - **If the test lamp does not illuminate**

Replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
6. Verify a test lamp does not illuminate between the control circuit terminal 1 and ground.
 - **If the test lamp illuminates**
 1. Ignition ON.
 2. Test for less than 1 V between the control circuit terminal 1 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X88 Trailer Connector.
 - **Go to next step: If the test lamp does not illuminate**
7. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 1 and B+, ignition ON.
8. Verify a test lamp illuminates between the appropriate control circuit terminal listed below at the X88 Trailer Connector and ground.
 - Terminal G - left stop/turn signal
 - Terminal D - right stop/turn signal
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the 3 A fused jumper wire.
 2. Test for infinite resistance between the control circuit terminal 1 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 X88 Trailer Connector.
 - **Go to next step: If the test lamp illuminates**
9. Ignition OFF, install the KR63 Trailer Stop/Turn Signal Lamp Relay.
10. Disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
11. Verify a test lamp illuminates between the appropriate control circuit terminal listed below and ground.
 - Terminal 5 - left stop/turn signal
 - Terminal 8 - right stop/turn signal
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the appropriate KR63 Trailer Stop/Turn Signal Lamp Relay.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance
3. Test for less than 2 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 X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
 12. Connect a 3 A fused jumper between the appropriate control circuit terminal listed below and ground, ignition ON.
 - Terminal 5 - left stop/turn signal
 - Terminal 8 - right stop/turn signal
 13. Verify a test lamp illuminates between the appropriate control circuit terminal listed below at the X88 Trailer Connector and ground.
 - Terminal G - left stop/turn signal
 - Terminal D - right stop/turn signal
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the appropriate KR63 Trailer Stop/Turn Signal Lamp Relay, ignition ON.
 2. Test for less than 1 V between the appropriate control circuit terminal listed below and ground.
 - Terminal 5 - left stop/turn signal
 - Terminal 8 - right stop/turn signal
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X53A Fuse Block - Rear Body.
 - **Go to next step: If the test lamp illuminates**
 14. Test or replace the K9 Body Control Module.

Repair Instructions

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

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

TURN SIGNAL LAMPS AND/OR INDICATORS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Tail/Stop Lamp Outage Detection Signal - Left Outer	3	3	3	-
Tail/Stop Lamp Outage Detection Signal - Right Outer	3	3	3	-
Turn Signal Switch - Left Signal	2	2	2	-
Turn Signal Switch - Right Signal	2	2	2	-
Turn Signal - Left Front Control	B3948 02	B3948 01, B3948 04	1	-

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

Circuit/System Description

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

Diagnostic Aids

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

Reference Information

Schematic Reference

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

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

- [Circuit Testing](#)

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

Scan Tool Reference

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

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Right Turn Signal Switch and Left Turn Signal Switch parameters change between Active and Inactive while cycling the turn signal switch between the right and left positions.
 - **If the parameters do not change**
Refer to Turn Signal/Multifunction Switch Malfunction.
 - **Go to next step: If the parameters change**
3. Verify the left front turn signal lamps turn ON and OFF while commanding the Left Front Turn Signal Lamp ON and OFF with a scan tool.
 - **If the left front turn signal lamps do not turn ON and OFF**
Refer to Turn Signal Lamps Malfunction.
 - **Go to next step: If the left front turn signal lamps turn ON and OFF**
4. Verify the right front turn signal lamps turn ON and OFF while commanding the Right Front Turn Signal Lamp ON and OFF with a scan tool.
 - **If the right front turn signal lamps do not turn ON and OFF**
Refer to Turn Signal Lamps Malfunction.
 - **Go to next step: If the right front turn signal lamps turn ON and OFF**
5. Verify the left rear turn signal lamps turn ON and OFF while commanding the Left Rear Turn Signal Lamp ON and OFF with a scan tool.
 - **If the left rear turn signal lamps do not turn ON and OFF**
Refer to Turn Signal Lamps Malfunction.
 - **Go to next step: If the left rear turn signal lamps turn ON and OFF**
6. Verify the right rear turn signal lamps turn ON and OFF while commanding the Right Rear Turn Signal Lamp ON and OFF with a scan tool.
 - **If the right rear turn signal lamps do not turn ON and OFF**
Refer to Turn Signal Lamps Malfunction.
 - **Go to next step: If the right rear turn signal lamps turn ON and OFF**
7. Verify the left and right turn signal indicators turn ON and OFF while commanding the All Indicators Test ON and OFF with a scan tool.
 - **If the left or right turn signal indicators do not turn ON and OFF**
Refer to Turn Signal Indicators Malfunction.
 - **Go to next step: If the left and right turn signal indicators turn ON and OFF**
8. Observe the left and right outer tail/stop lamps and turn signal indicators on the instrument cluster while activating the left and right turn signals. The left and right outer tail/stop lamps and indicators should illuminate and flash at a normal rate when turned ON.
 - **If the left and right outer tail/stop lamps and indicators illuminate but flash in a rapid manner**

- **Go to next step: If the left and right outer tail/stop lamps and indicators operate normally**

9. All OK.

Circuit/System Testing

Turn Signal/Multifunction Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S78 Turn Signal/Multifunction Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 Ω between the ground circuit terminal 3 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 ON.
4. Verify the scan tool Left Turn Signal Switch parameter is Inactive.
 - **If not Inactive**
 1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the signal circuit terminal 1 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
 - **Go to next step: If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground.
6. Verify the scan tool Left Turn Signal Switch parameter is Active.
 - **If not Active**
 1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit terminal 1 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Test for less than 2 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.
- 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 E4 Turn Signal Lamp listed below.

- E4LF Turn Signal Lamp - Left Front
- E4Y Turn Signal Repeater Lamp - Left
- E5LE Tail/Stop Lamp - Left Outer (Z88/X88-UGE)
- E42L Tail Lamp Assembly - Left (X88+UGE)
- E4RF Turn Signal Lamp - Right Front
- E4Z Turn Signal Repeater Lamp - Right
- E5RE Tail/Stop Lamp - Right Outer (Z88/X88-UGE)
- E42R Tail Lamp Assembly - Right (X88+UGE)

2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.

- E4LF Turn Signal Lamp - Left Front socket terminal
- E4Y Turn Signal Repeater Lamp - Left socket terminal
- E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
- E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
- E4RF Turn Signal Lamp - Right Front socket terminal
- E4Z Turn Signal Repeater Lamp - Right socket terminal
- E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
- E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)

• **If 10 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.

- E4LF Turn Signal Lamp - Left Front socket terminal
- E4Y Turn Signal Repeater Lamp - Left socket terminal
- E5LE Tail/Stop Lamp - Left Outer socket terminal (Z88/X88-UGE)
- E42L Tail Lamp Assembly - Left terminal 4 (X88+UGE)
- E4RF Turn Signal Lamp - Right Front socket terminal
- E4Z Turn Signal Repeater Lamp - Right socket terminal
- E5RE Tail/Stop Lamp - Right Outer socket terminal (Z88/X88-UGE)
- E42R Tail Lamp Assembly - Right terminal 4 (X88+UGE)

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

• **If the test lamp is always OFF**

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
 - X5 left front and right rear turn signals
 - X4 right front and left rear turn signals
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 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.
 - X5 left front and right rear turn signals
 - X4 right front and left rear turn signals
 2. Test for less than 1 V between the control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K9 Body Control Module.
- **Go to next step: If the test lamp turns ON and OFF**
5. Test or replace the appropriate turn signal lamp.

Tail/Stop Lamp Outage Detection Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate E42 Tail Lamp Assembly, ignition ON.
2. Test for B+ between the signal circuit terminal 3 and ground.
 - **If not B+**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 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 3 and ground.
 - **If the test lamp illuminates**
 1. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp does not illuminate**
4. Test or replace the E5 Tail/Stop Lamp - Outer.

Turn Signal Indicators Malfunction

1. Ignition ON.
2. Verify the left and right turn signal indicators turn ON and OFF while commanding the All Indicators Test ON and OFF with a scan tool.
 - **If the left or right turn signal indicators are always OFF or remain ON**

Replace the P16 Instrument Cluster.

- **Go to next step: If the left and right turn signal indicators turn ON and OFF**

3. Replace the K9 Body Control Module.

Repair Instructions

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

- Refer to [Turn Signal Switch Replacement \(Equinox\)](#), [Turn Signal Switch Replacement \(Terrain\)](#).
 - Refer to [Turn Signal Bulb Replacement - Left Side \(Chevrolet\)](#), [Turn Signal Bulb Replacement - Left Side \(GMC\)](#).
 - Refer to [Turn Signal Bulb Replacement - Right Side \(Chevrolet\)](#), [Turn Signal Bulb Replacement - Right Side \(GMC\)](#).
 - Refer to [Outside Rearview Mirror Turn Signal Lamp Replacement](#).
 - Refer to [Rear Combination Lamp Replacement \(Chevrolet\)](#), [Rear Combination Lamp Replacement \(GMC\)](#).
 - Refer to [Rear Fascia Signal Lamp Replacement \(Chevrolet\)](#), [Rear Fascia Signal Lamp Replacement \(GMC\)](#).
 - Refer to [Control Module References](#) for BCM or instrument cluster replacement, programming, and setup
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2018 ACCESSORIES & EQUIPMENT

Lighting - Repair Instructions - Equinox, Terrain

REPAIR INSTRUCTIONS

WIRE TO WIRE REPAIR - LIGHTING

Special Tools

- **EL-38125-10** Splice Sleeve Crimping Tool (non GMNA)
- **J-38125-5A** Ultra Torch Special Tool
- **J-38125-8** Splice Sleeve Crimping Tool (GMNA)

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

WARNING: In order to reduce the risk of personal injury, loss of high voltage isolation to ground and higher system impedance, do not attempt to repair any HV wiring, connector, or terminal that is damaged. High voltage coaxial type cables are not repairable. Never attempt to repair a coaxial type cable. The entire cable/harness or component must be replaced. In order to maintain system integrity and personal safety, never attempt to repair any high voltage wiring, cables, or terminals. Performing this procedure on high voltage circuits may result in serious injury or death.

NOTE: If the wiring harness internal to the transmission is damaged, the wiring harness must be replaced. The use of splice sleeves in an attempt to repair the internal transmission wires, connectors, or terminals could result in performance issues.

NOTE: Do not splice wires in Door Harness Grommets.

NOTE: The DuraSeal splice sleeves have the following 2 critical features:

- A special heat shrink sleeve environmentally seals the splice. The heat shrink sleeve contains a sealing adhesive inside.
- A cross hatched (knurled) core crimp provides the necessary low resistance contact integrity for these sensitive, low energy circuits.

Use only DuraSeal splice sleeves to form a one-to-one splice on all types of insulation except high voltage and specialty cables. Use DuraSeal splice sleeves where there are special requirements such as moisture sealing. Follow the instructions below in order to splice copper wire using DuraSeal splice sleeves.

Splice Sleeve Selection

Splice Sleeve Color	Crimp Tool Nest Color		Wire Gauge mm ² / (AWG)
	3 Crimp Nests	4 Crimp Nests	
Salmon (Yellow-Pink) 19300089	Red (1) or Red/Green (1)	Red (2)	0.22 - 0.8/(18 - 26)
Blue 19168447	Blue (2)	Blue (3)	1.0 - 2.0/(14 - 16)
Yellow 19168448	Yellow (3)	Yellow (4)	3.0 - 5.0/(10 - 12)

1. Open the harness by removing any tape:

NOTE: You must perform the following procedures in the listed order. Repeat the procedure if any wire strands are damaged. You must obtain a clean strip with all of the wire strands intact.

- Use a sewing seam ripper, available from sewing supply stores, in order to cut open the harness in order to avoid wire insulation damage.
 - Use the DuraSeal splice sleeves on all types of insulation except Tefzel and coaxial.
 - Do not use the crimp and DuraSeal splice sleeve to form a splice with more than 2 wires coming together.
2. Cut as little wire off the harness as possible. You may need the extra length of wire in order to change the location of a splice.

Adjust splice locations so that each splice is at least 40 mm (1.5 in) away from the other splices, harness branches, or connectors.

3. Strip the insulation:

- When adding a length of wire to the existing harness, use the same size wire as the original wire.
 - Perform one of the following items in order to find the correct wire size:
 - Find the wire on the schematic and convert to regional wiring gauge size.
 - If you are unsure of the wire size, begin with the largest opening in the wire stripper and work down until achieving a clean strip of the insulation.
 - Strip approximately 5.0 mm (0.20 in) of insulation from each wire to be spliced.
 - Do not nick or cut any of the strands. Inspect the stripped wire for nicks or cut strands.
 - If the wire is damaged, repeat this procedure after removing the damaged section.
4. For high temperature wiring, slide a section of high temperature SCT1 shrink tubing down the length of wire to be spliced. Ensure that the shrink tubing will not interfere with the splice procedure.
 5. Select the proper DuraSeal splice sleeve according to the wire size. Refer to the above table at the beginning of the repair procedure for the color coding of the DuraSeal splice sleeves and the crimp tool nests.

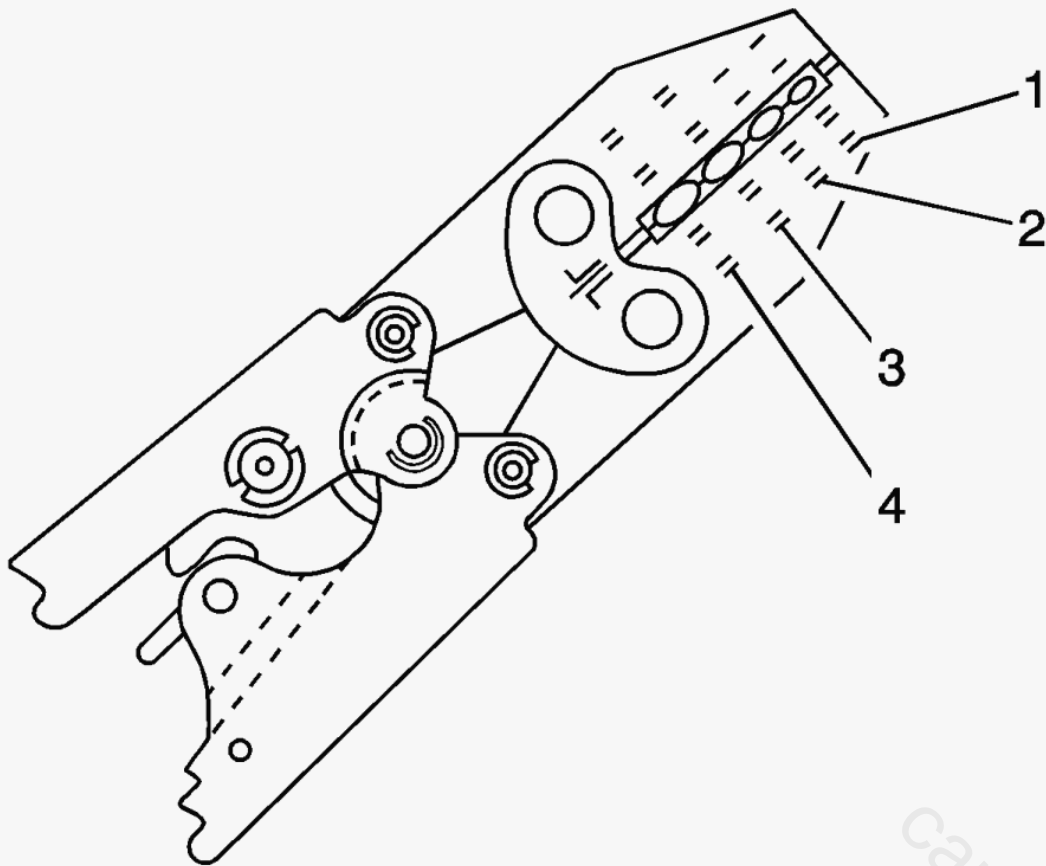


Fig. 1: Splice Sleeve Crimping Tool With 4 Crimp Nests

Courtesy of GENERAL MOTORS COMPANY

6. The **EL-38125-10** splice sleeve crimping tool has four crimp nests. The largest crimp nest (4) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (3) is used for crimping 14 and 16 gauge wires. The third largest crimp nest (2) is used for crimping 18 and 20 gauge wires. The smallest crimp nest (1) is used for crimping 22 to 26 gauge wires. The crimp nests are referenced in the table (farther above) under the crimp tool nest color.

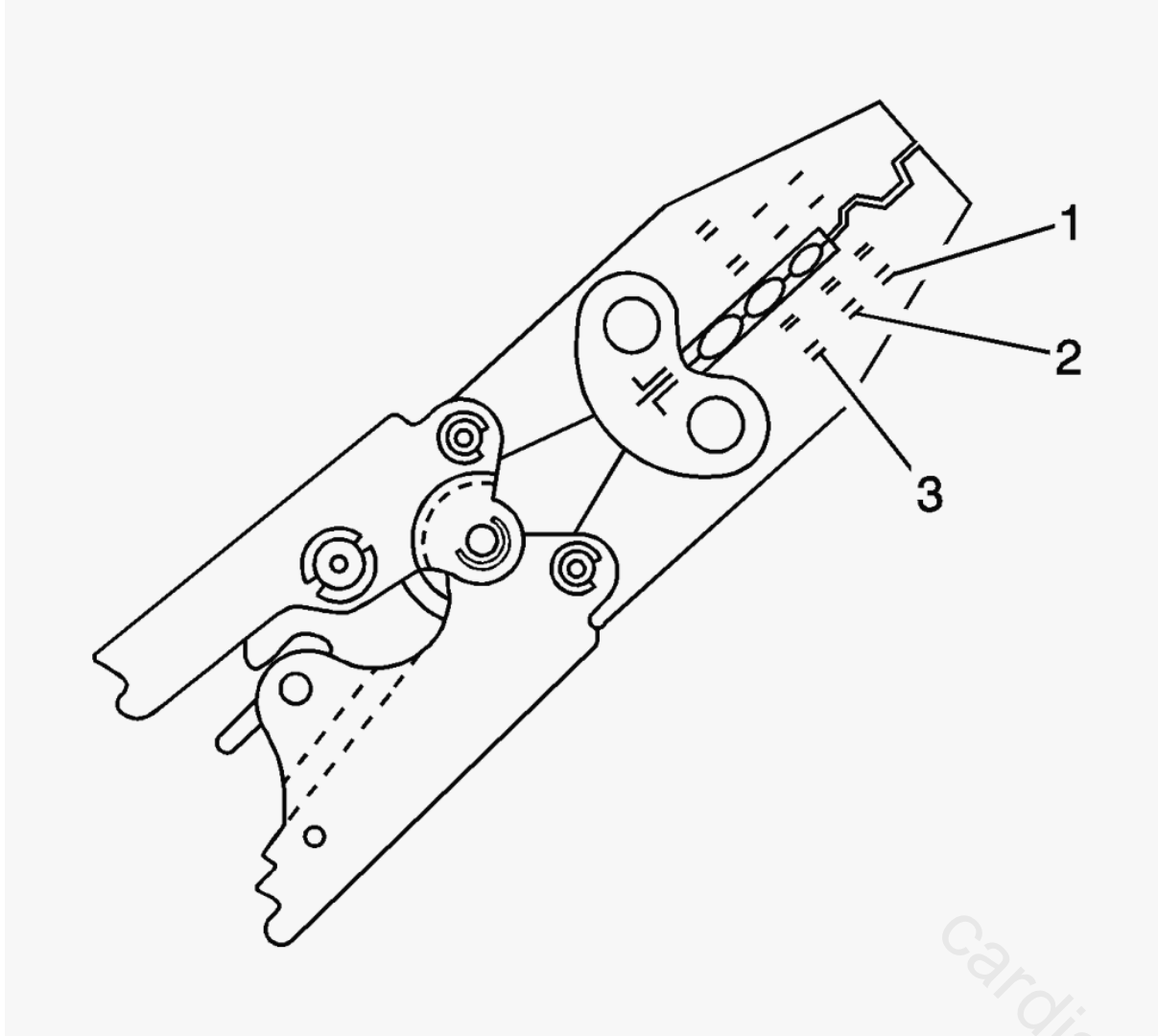


Fig. 2: Splice Sleeve Crimping Tool With 3 Crimp Nests
Courtesy of GENERAL MOTORS COMPANY

7. The **J-38125-8** splice sleeve crimping tool has three crimp nests. The largest crimp nest (3) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (2) is used for crimping 14 and 16 gauge wires. The smallest crimp nest (1) is used for crimping 18 to 20 gauge wires. The crimp nests are referenced in the table (farther above) under the crimp tool nest color.
8. Use the splice sleeve crimp tool in order to position the DuraSeal splice sleeve in the proper color nest of the splice sleeve crimp tool. For the four crimp nest tool, use the three largest crimp nests to crimp the splice sleeves. For the three crimp nest tool, use all three crimp nests to crimp the splice sleeves. Use the four and three crimp tool diagrams (above) and the table (farther above) to match the splice sleeve with the correct crimp nest. The crimp tool diagram callout numbers match the numbers in the table (under crimp tool nest color).

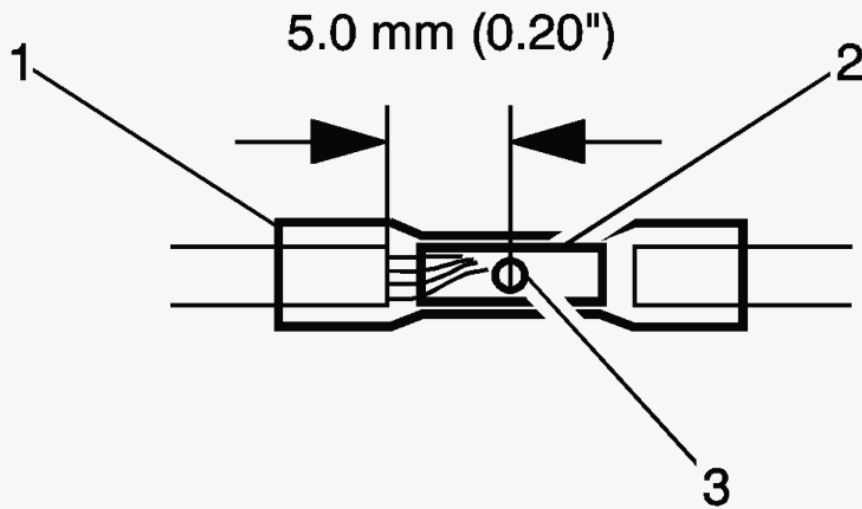


Fig. 3: Identifying Duraseal Splice Sleeve

Courtesy of GENERAL MOTORS COMPANY

9. Place the DuraSeal splice sleeve in the nest. Ensure that the crimp falls midway between the end of the barrel and the stop. The sleeve has a stop (3) in the middle of the barrel (2) in order to prevent the wire (1) from going further. Close the hand crimper handles slightly in order to firmly hold the DuraSeal splice sleeve in the proper nest.



Fig. 4: Crimped DuraSeal Splice Sleeve

Courtesy of GENERAL MOTORS COMPANY

10. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop. Refer to **Folded-Over Wire Repair** for splicing wires of 0.35 mm or less (22, 24, 26 gauge sizes) and for splicing wires of different gauges.
11. Tightly close the handles of the crimp tool until the crimper handles open when released.

The crimper handles will not open until you apply the proper amount of pressure to the DuraSeal splice sleeve. Repeat steps 4 and 6 for the opposite end of the splice.



Fig. 5: Heated Splice Sleeve

Courtesy of GENERAL MOTORS COMPANY

12. Using the heat torch, apply heat to the crimped area of the barrel.
13. Start in the middle and gradually move the heat barrel to the open ends of the tubing:
 - The tubing will shrink completely as the heat is moved along the insulation.
 - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

Weatherpack™ Wiring Repair

NOTE: Some replacement pigtail connectors may be delivered without the terminated leads installed into the connector. For Weatherpack™ connectors, all terminated leads included in the package should to be installed into the connector. If the connector end view shows that a terminal is not occupied, the extra terminated lead(s) need to be installed and the end(s) sealed using a DuraSeal splice sleeve and taped back into the harness.

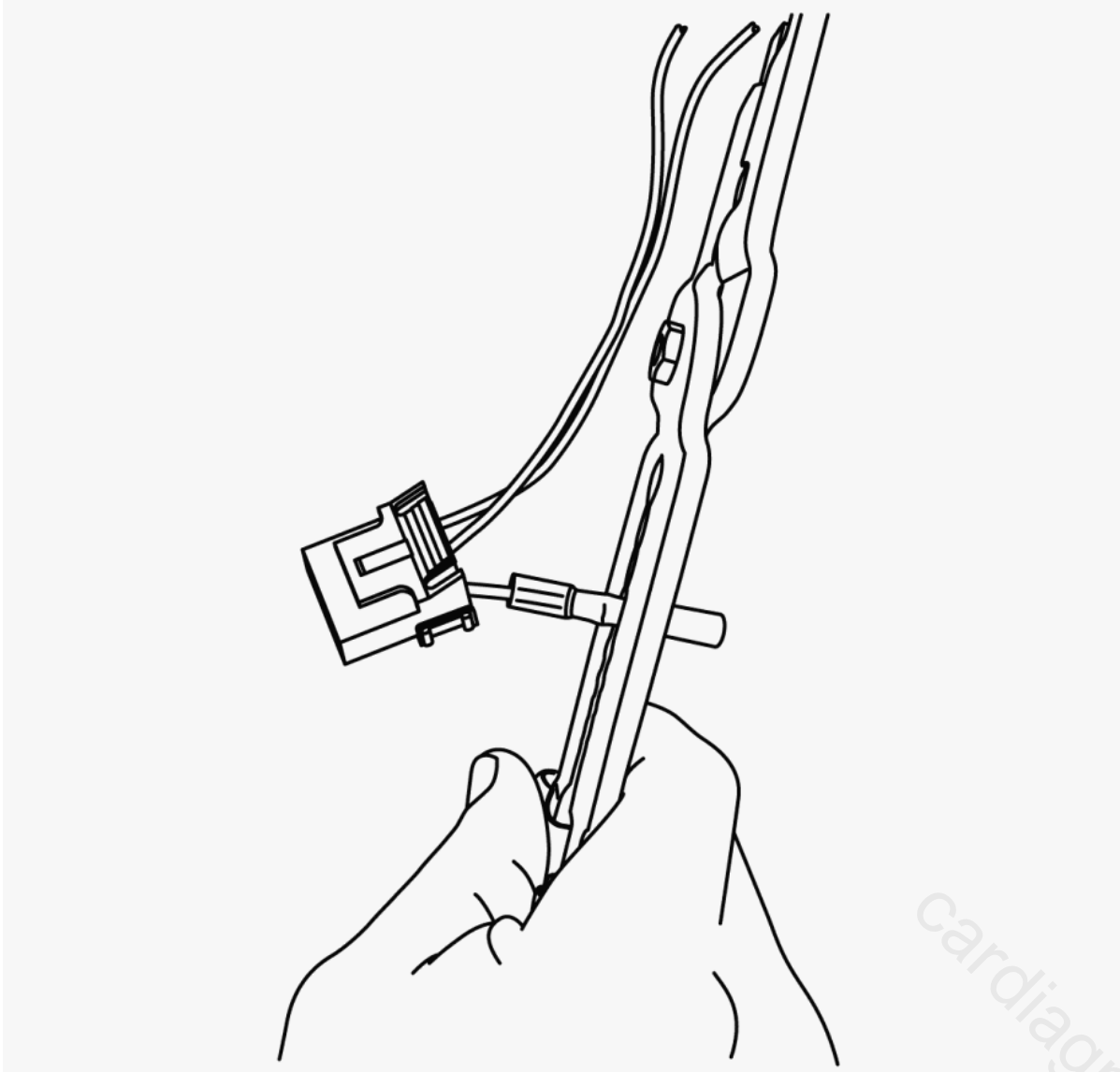


Fig. 6: Tightly Close Handles Of Crimp Tool

Courtesy of GENERAL MOTORS COMPANY

1. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop. Refer to **Folded-Over Wire Repair** for splicing wires of 0.35 mm or less (22, 24, 26 gauge sizes) and for splicing wires of different gauges.
2. Tightly close the handles of the crimp tool until the crimper handles open when released.

The crimper handles will not open until you apply the proper amount of pressure to the DuraSeal splice sleeve. Holding the DuraSEAL with one hand gently tug on the wire to ensure it is crimped in the DuraSeal.

3. Using the heat torch, apply heat to the crimped area of the barrel.

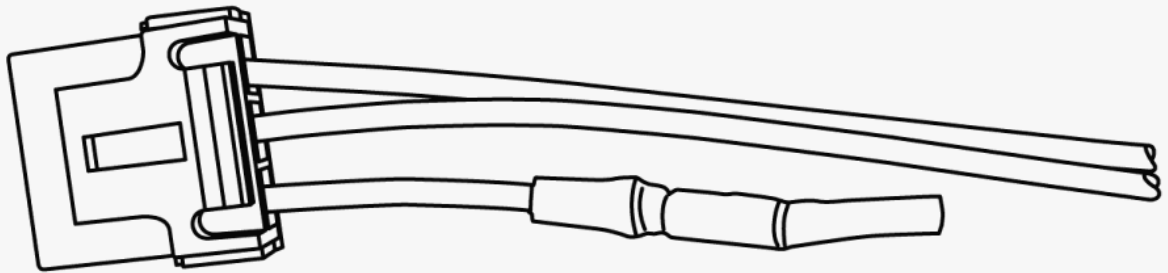


Fig. 7: Heat To Crimped Area Of Barrel

Courtesy of GENERAL MOTORS COMPANY

4. Start in the middle and gradually move the heat barrel to the open ends of the tubing:
 - The tubing will shrink completely as the heat is moved along the insulation.
 - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

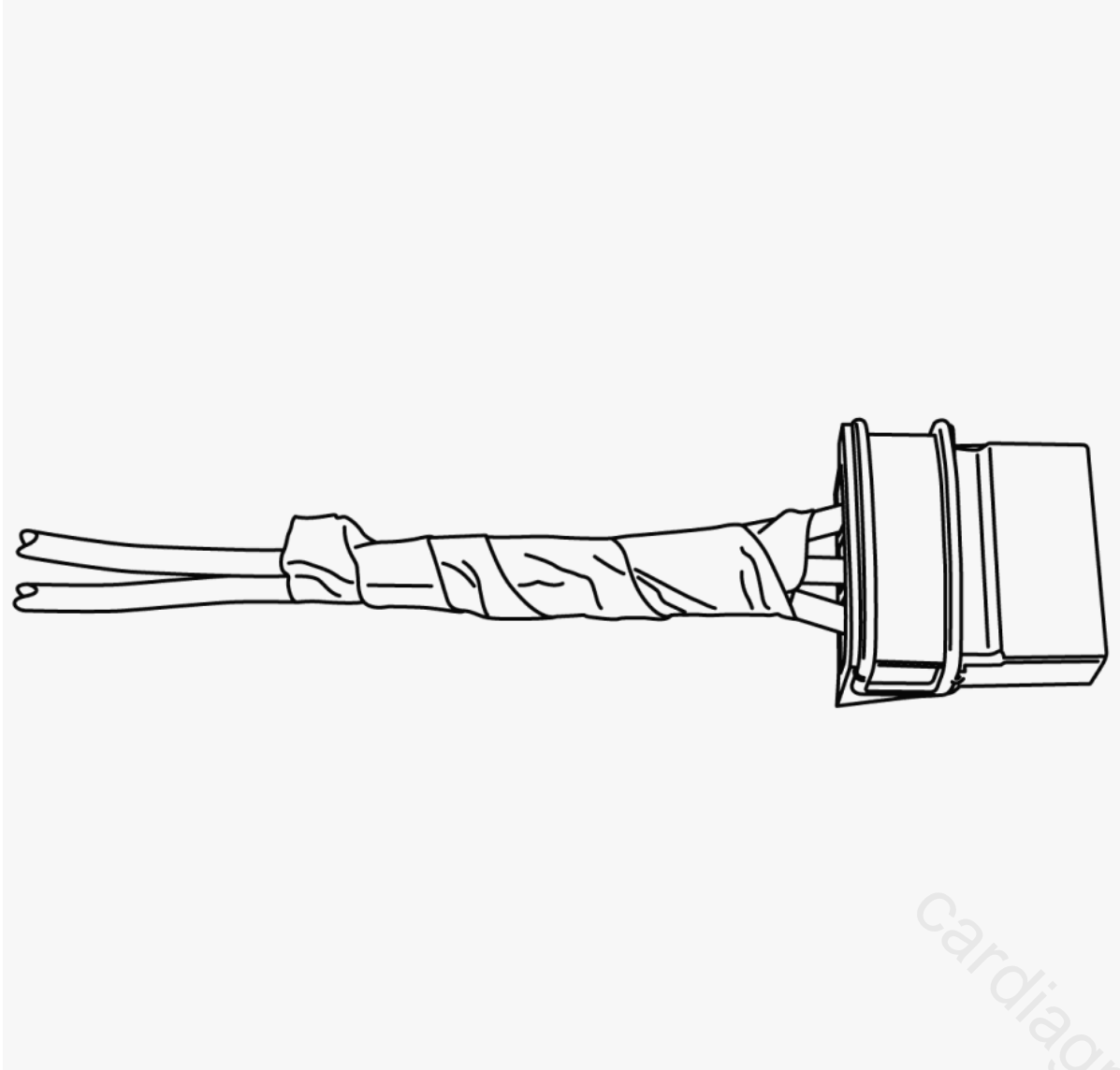


Fig. 8: Taping Extra Terminated Leads Back Into Harness
Courtesy of GENERAL MOTORS COMPANY

5. Tape the extra terminated lead(s) back into the harness.

High Temperature Wiring Repairs

Use the following procedures to perform high temperature wiring repairs:

1. Center the high temperature SCT1 shrink tube over the DuraSeal splice sleeve.
2. Using the heat torch, apply heat to the high temperature heat shrink tubing.
3. Gradually move the heat from the center to the open end of the tubing:
 - The tubing will shrink completely as the heat is moved along the insulation.
 - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.
4. Replace any reflective tape and clips that may have been removed during the repair.

CONNECTOR RECONNECTION - LIGHTING

Special Tools

EL-35616 Terminal Test Probe Kit

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

When the condition is not currently present, but is indicated in DTC history, the cause may be intermittent. An intermittent may also be the cause when there is a customer complaint, but the symptom cannot be duplicated. Refer to the Symptom Table of the system that is suspect of causing the condition before trying to locate an intermittent condition.

Most intermittent conditions are caused by faulty electrical connections or wiring. Inspect for the following items:

- Loose, corroded, or painted terminal stud/fastener
- Wiring broken inside the insulation
- Poor connection between the male and female terminal at a connector
- A terminal not seated all the way into the connector body
- Poor terminal to wire connection - Some conditions which fall under this description are poor crimps, poor solder joints, crimping over the wire insulation rather than the wire itself, and corrosion in the wire to terminal contact area, etc.
- Pierced or damaged insulation can allow moisture to enter the wiring causing corrosion. The conductor can corrode inside the insulation, with little visible evidence. Look for swollen and stiff sections of wire in the suspect circuits.
- Wiring which has been pinched, cut, or its insulation rubbed through may cause an intermittent open or short as the bare area touches other wiring or parts of the vehicle.
- Wiring that comes in contact with hot or exhaust components
- Refer to [Inducing Intermittent Fault Conditions](#) in order to duplicate the conditions required, in order to verify the customer concern.
- Refer to [Testing for Electrical Intermittents](#) for test procedures to detect intermittent open, high resistance, short to ground, and short to voltage conditions.
- Refer to [Scan Tool Snapshot Procedure](#) for advanced intermittent diagnosis and Vehicle Data Recorder operation.

Testing for Terminal Fretting

Some intermittent conditions can be caused by wire terminal fretting corrosion. Fretting corrosion is a build-up of insulating, oxidized wear debris that can form when there is a small motion between electrical contacts. The oxidized wear debris can pile up enough at the electrical contact spots that the electrical resistance across the connection increases. Movement between the contacting surfaces as small as 10 to 100 microns can cause fretting. To put this in perspective, a sheet of paper is about 100 microns thick, so fretting motion is small and hard to see. Vibration and thermal expansion/contraction are the main sources that create fretting motion. Since vehicles vibrate and can experience large temperature swings, they are a good source for fretting motion. Tin, copper, nickel, and iron surfaces are all susceptible to fretting corrosion. Fretting corrosion can be difficult to see but it looks like small, dark smudges on the terminals contact surface.

To correct a fretting condition disconnect the suspect connector and add dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to both sides of the connector terminals. Then reconnect the connector and wipe away any excess lubricant. This will correct the additional terminal contact resistance due to the terminal fretting corrosion.

Testing for Proper Terminal Contact

It is important to test terminal contact at the component and any inline connectors before replacing a suspect component. Mating terminals must be inspected to ensure good terminal contact. A poor connection between the male and female terminal at a connector may be the result of contamination or deformation.

Contamination may be caused by the connector halves being improperly connected. A missing or damaged connector seal, damage to the connector itself, or exposing the terminals to moisture and dirt can also cause contamination. Contamination, usually in the underhood or underbody connectors, leads to terminal corrosion, causing an open circuit or intermittently open circuit.

Deformation is caused by probing the mating side of a connector terminal without the proper adapter. Always use the **EL-35616** kit when probing connectors. Other causes of terminal deformation are improperly joining the connector halves, or repeatedly separating and joining the connector halves. Deformation, usually to the female terminal contact tang, can result in poor terminal contact causing an open or intermittently open circuit.

Testing for Proper Terminal Contact in Bussed Electrical Centers

It is very important to use the correct test adapter when testing for proper terminal contact of fuses and relays in a bussed electrical center. Use the **EL-35616** kit to test for proper terminal contact. Failure to use the **EL-35616** kit can result in improper diagnosis of the bussed electrical center.

Follow the procedure below in order to test terminal contact:

1. Separate the connector halves.
2. Visually inspect the connector halves for contamination. Contamination may result in a white or green build-up within the connector body or between terminals. This causes high terminal resistance, intermittent contact, or an open circuit. An underhood or underbody connector that shows signs of contamination should be replaced in its entirety: terminals, seals, and connector body.
3. Using an equivalent male terminal/terminated lead, verify that the retention force is significantly different between a known good terminal and the suspect terminal. Replace the female terminal in question.

Flat Wire Connectors

There are no serviceable parts for flat wire connectors on the harness side or the component side.

Follow the procedure below in order to test terminal contact:

1. Remove the component in question.
2. Visually inspect each side of the connector for signs of contamination. Avoid touching either side of the connector as oil from your skin may be a source of contamination as well.
3. Visually inspect the terminal bearing surfaces of the flat wire circuits for splits, cracks, or other imperfections that could cause poor terminal contact. Visually inspect the component side connector to ensure that all of the terminals are uniform and free of damage or deformation.
4. Insert the appropriate adapter into the flat wire harness connector in order to test the circuit in question.

Control Module/Component Voltage and Grounds

Poor voltage or ground connections can cause widely varying symptoms.

- Test all control module voltage supply circuits. Many vehicles have multiple circuits supplying voltage to a control module. Other components in the system may have separate voltage supply circuits that may also need to be tested. Inspect connections at the module/component connectors, fuses and any intermediate connections between the voltage source and the module/component. A test lamp or a DMM may indicate that voltage is present, but neither tests the ability of the circuit to carry sufficient current. Operate the component to test the ability of the circuit to carry sufficient current. Refer to [Circuit Testing](#) and Power Distribution Wiring Schematics .
- Test all control module ground and system ground circuits. The control module may have multiple ground circuits. Other components in the system may have separate grounds that may also need to be tested. Inspect grounds for clean and tight connections at the grounding point (screw or stud). Inspect the connections at the component and in splice packs, where applicable. Operate the component to test the ability of the circuit to carry sufficient current. Refer to [Circuit Testing](#) and Ground Distribution Wiring Schematics .

Temperature Sensitivity

- An intermittent condition may occur when a component/connection reaches normal operating temperature. The condition may occur only when the component/connection is cold, or only when the component/connection is hot.
- Freeze Frame, Failure Records, Snapshot or Vehicle Data Recorder data may help with this type of intermittent condition, where applicable.
- If the intermittent is related to heat, review the data for a relationship with the following:
 - High ambient temperatures
 - Underhood/engine generated heat
 - Circuit generated heat due to a poor connection, or high electrical load

- Higher than normal load conditions, towing, etc.
- If the intermittent is related to cold, review the data for the following:
 - Low ambient temperatures - In extremely low temperatures, ice may form in a connection or component. Inspect for water intrusion.
 - The condition only occurs on a cold start.
 - The condition goes away when the vehicle warms up.
- Information from the customer may help to determine if the trouble follows a pattern that is temperature related.
- If temperature is suspected of causing an intermittent fault condition, attempt to duplicate the condition. Refer to [Inducing Intermittent Fault Conditions](#) in order to duplicate the conditions required.

Electromagnetic Interference and Electrical Noise

Some electrical components/circuits are sensitive to electromagnetic interference or other types of electrical noise. Inspect for the following conditions:

- A mis-routed harness that is too close to high voltage/high current devices such as secondary ignition components, motors, generator etc. - These components may induce electrical noise on a circuit that could interfere with normal circuit operation.
- Electrical system interference caused by a malfunctioning relay, or a control module driven solenoid or switch - These conditions can cause a sharp electrical surge. Normally, the condition will occur when the malfunctioning component is operating.
- Installation of non-factory or aftermarket add on accessories such as lights, 2-way radios, amplifiers, electric motors, remote starters, alarm systems, cell phones, etc. - These accessories may create interference in other circuits while operating and the interference would disappear when the accessory is not operating. Refer to [Checking Aftermarket Accessories](#).
- Test for an open diode across the A/C compressor clutch and for other open diodes. Some relays may contain a clamping diode.
- The generator may be allowing AC noise into the electrical system.

Incorrect Control Module

- There are only a few situations where reprogramming a control module is appropriate:
 - A new service control module is installed.
 - A control module from another vehicle is installed.
 - Revised software/calibration files have been released for this vehicle.

NOTE: **DO NOT re-program the control module with the SAME software/calibration files that are already present in the control module. This is not an effective repair for any type of concern.**

- Verify that the control module contains the correct software/calibration. If incorrect programming is found, reprogram the control module with the most current software/calibration. Refer to [Control Module References](#) for replacement, setup and programming.

BRAKE PEDAL POSITION SENSOR CALIBRATION

Calibration Criteria

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

Brake pedal position sensor calibration must be performed after the brake pedal position sensor, body control module (BCM), engine control module (ECM), or hybrid powertrain control module have been serviced. The calibration procedure will set the brake pedal position sensor home value. This value is

used by the BCM and ECM/HPCM to determine the action of the driver applying the brake system and to provide this information to the vehicle subsystems via serial data.

Calibration Procedure

1. Apply the parking brake.
2. Ignition ON, engine OFF, place the transmission in the PARK position for automatic transmission or NEUTRAL position for manual transmission.
3. Install a scan tool.
4. Clear all DTCs before proceeding.
5. Navigate to the Configuration/Reset Functions menu of the BCM.
6. Select the Brake Pedal Position Sensor Learn procedure and follow the directions displayed on the screen.
7. Navigate to the Configuration/Reset Functions menu of the ECM/HPCM.
8. Select the Learn Functions menu.
9. Select the Brake Pedal Position Sensor Learn procedure and follow the directions displayed on the screen.

BRAKE PEDAL POSITION SENSOR REPLACEMENT

Removal Procedure

1. Remove Floor Front Air Outlet Duct - Left Side - [Floor Front Air Outlet Duct Replacement - Left Side](#)

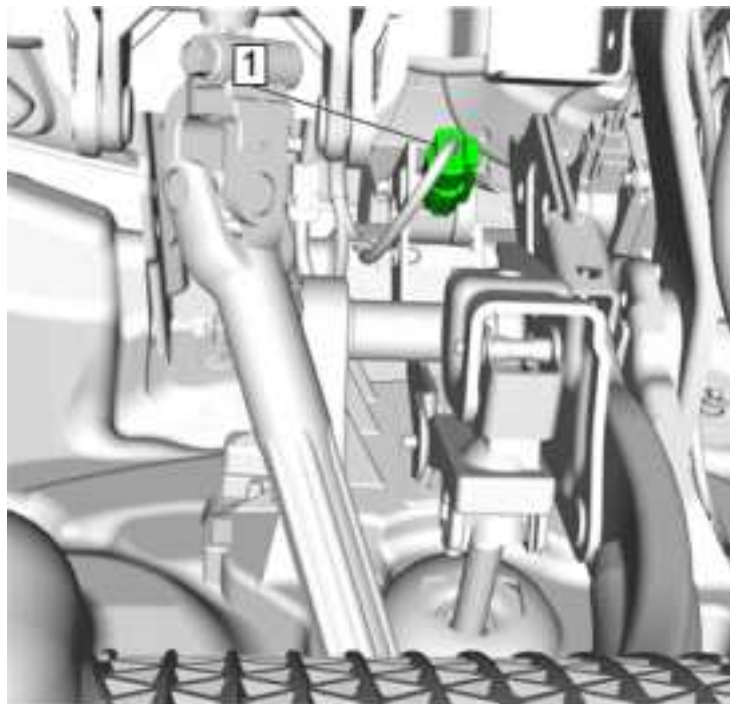


Fig. 9: Electrical Connector

Courtesy of GENERAL MOTORS COMPANY

2. Disconnect Electrical Connector (1)

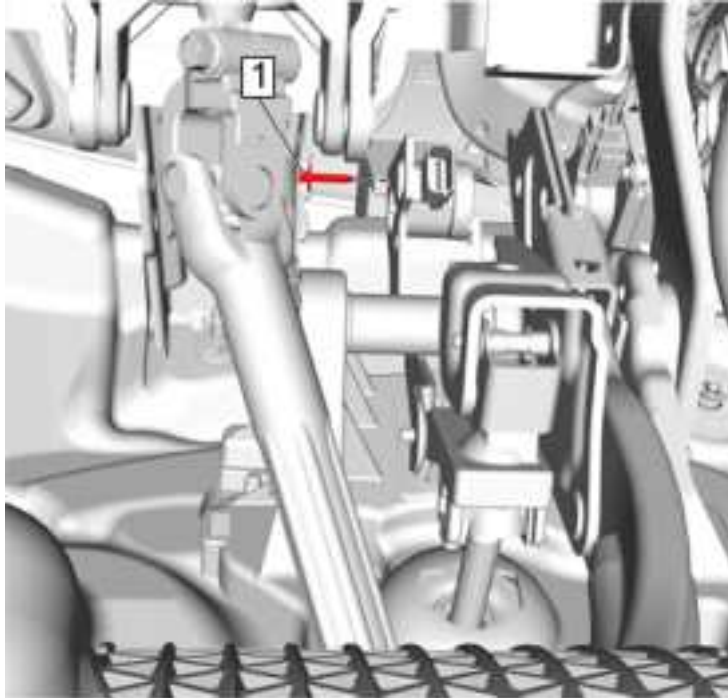


Fig. 10: Brake Pedal Position Sensor Bolt
Courtesy of GENERAL MOTORS COMPANY

3. Remove Brake Pedal Position Sensor Bolt (1).

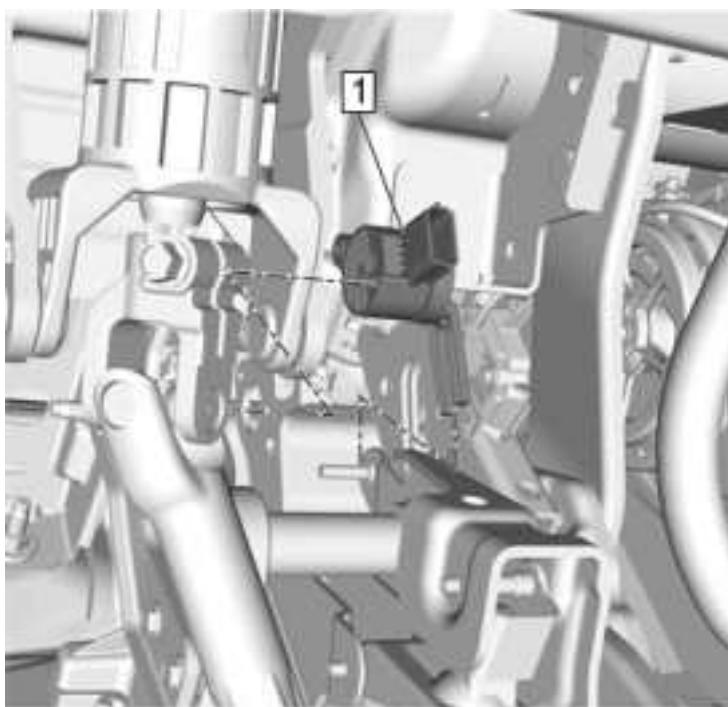


Fig. 11: Brake Pedal Position Sensor
Courtesy of GENERAL MOTORS COMPANY

4. Remove Brake Pedal Position Sensor (1).

Installation Procedure

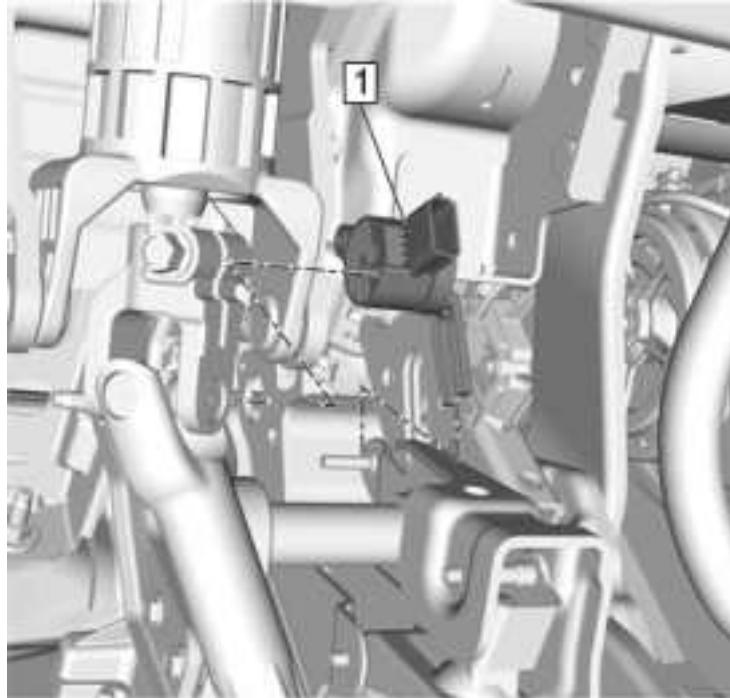


Fig. 12: Brake Pedal Position Sensor

Courtesy of GENERAL MOTORS COMPANY

NOTE: Position the fork of the brake pedal position sensor over the post on the brake pedal.

1. Install Brake Pedal Position Sensor (1).

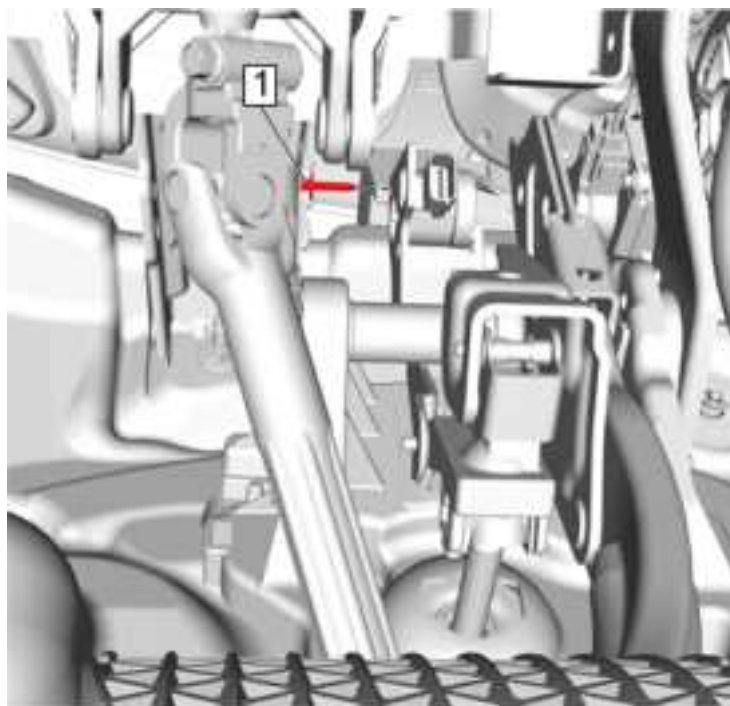


Fig. 13: Brake Pedal Position Sensor Bolt

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to [Fastener Caution](#) .

2. Install Brake Pedal Position Sensor Bolt (1) and tighten 3 N.m (27 lb in)

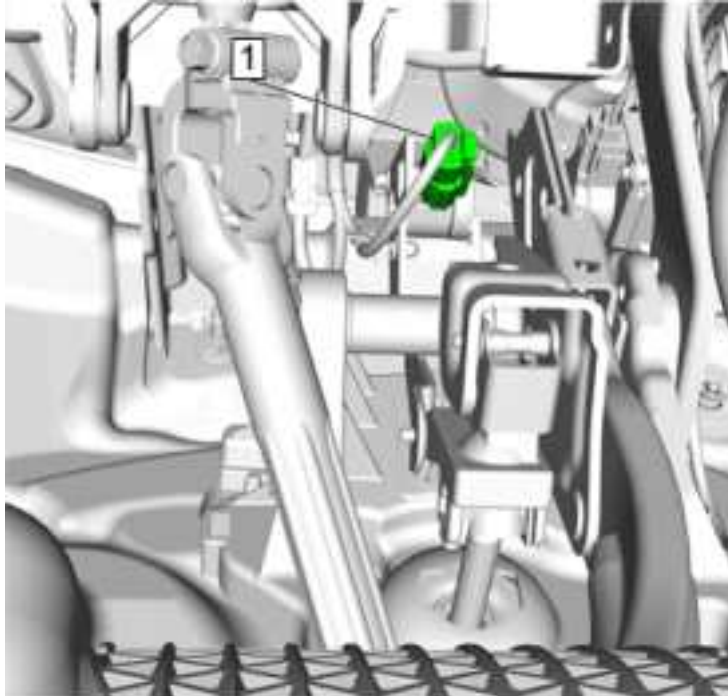


Fig. 14: Electrical Connector

Courtesy of GENERAL MOTORS COMPANY

3. Connect Electrical Connector (1).
4. Install Floor Front Air Outlet Duct - Left Side - [Floor Front Air Outlet Duct Replacement - Left Side](#)
5. Calibrate the brake pedal position sensor. Refer to [Brake Pedal Position Sensor Calibration](#)

HEADLAMP SWITCH REPLACEMENT (EQUINOX, DENALI)

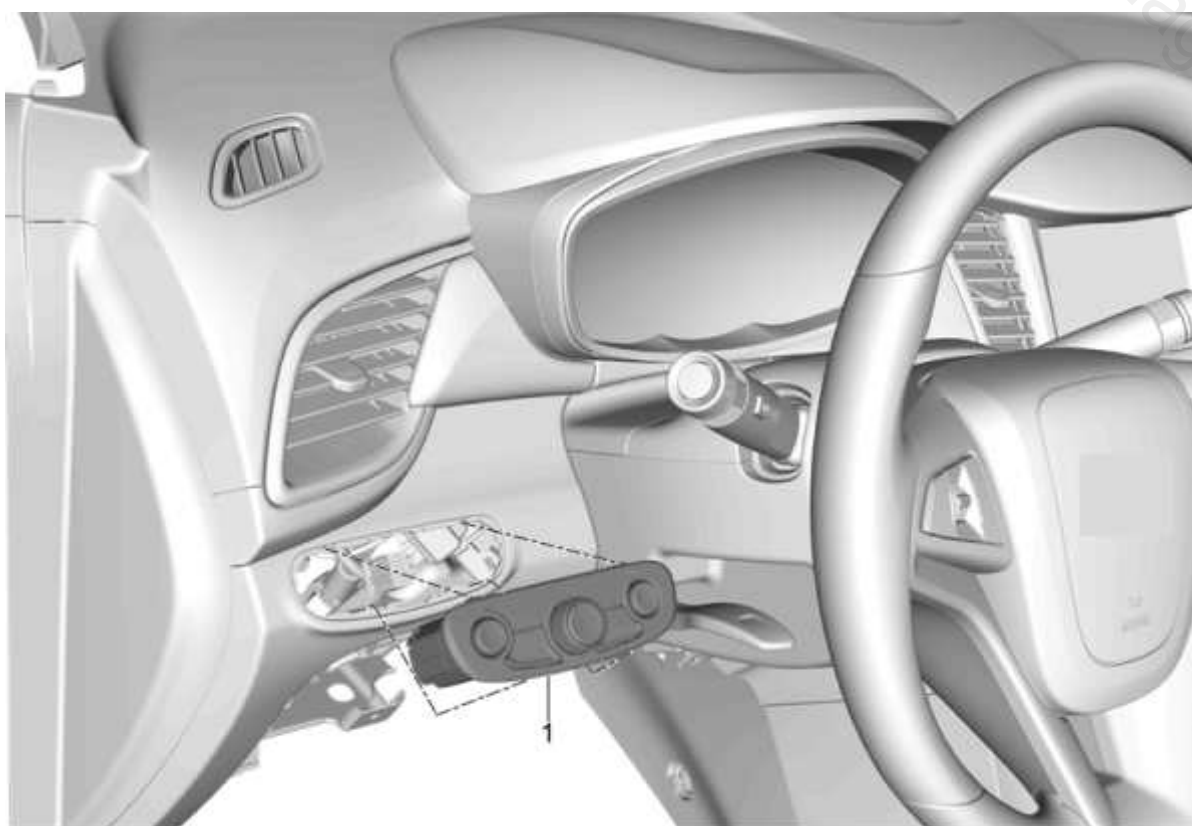


Fig. 15: Headlamp Switch

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Instrument Panel Knee Bolster Replacement (Equinox).</u>	

Callout	Component Name
1	Headlamp Switch Procedure 1. Depress the tabs on the lamp switch to remove. 2. Disconnect the electrical connector.

HEADLAMP SWITCH REPLACEMENT (TERRAIN BASE)

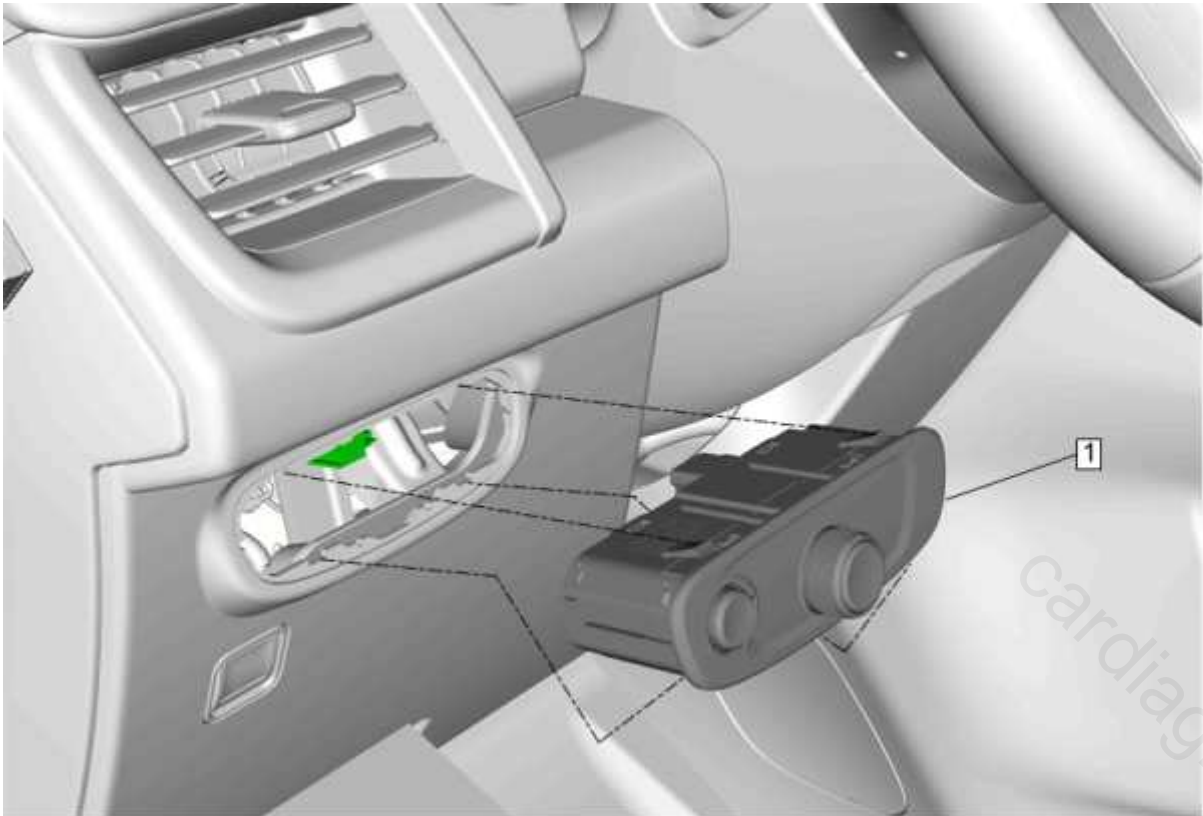


Fig. 16: Headlamp Switch (Terrain Base).
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Instrument Panel Knee Bolster Replacement (Terrain).</u>	
1	Headlamp Switch Procedure 1. Depress the tabs on the lamp switch to remove. 2. Disconnect the electrical connector.

INTERIOR LAMP BEZEL REPLACEMENT

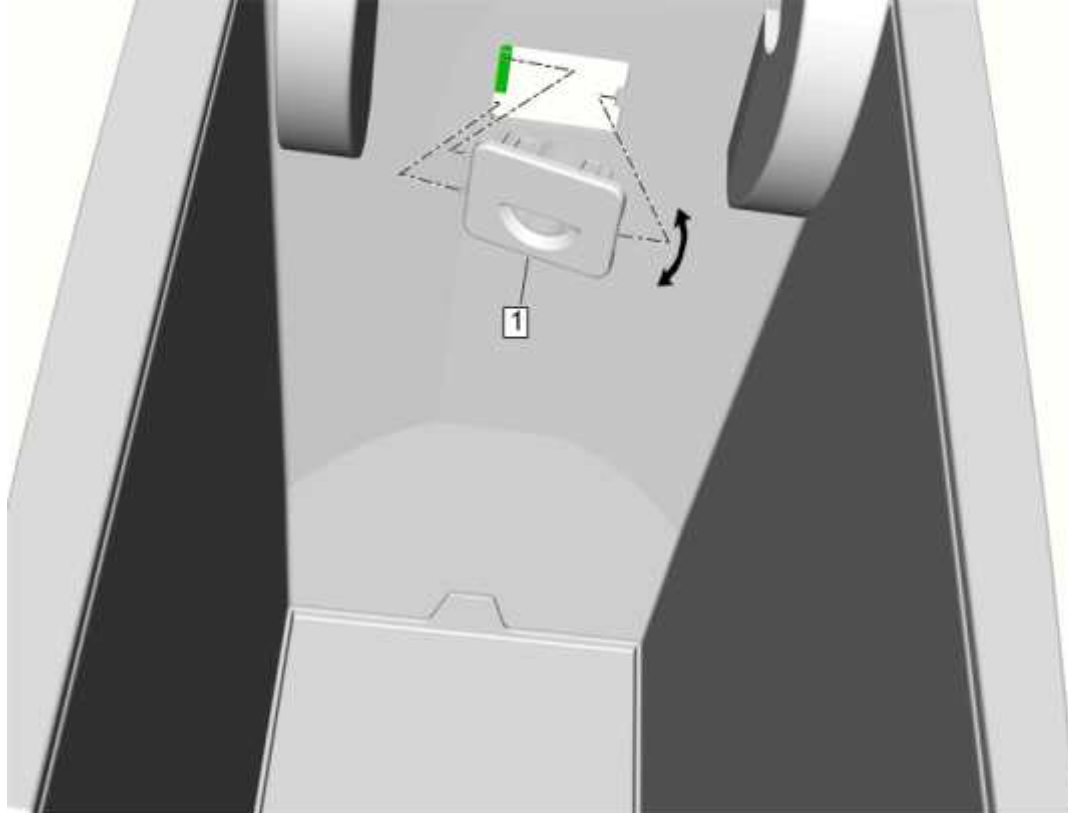


Fig. 17: Interior Lamp Bezel

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Interior Lamp Bezel Procedure 1. Open the armrest cover. 2. Using a flat-bladed tool, rotate the right side of the bezel forward from the console. 3. Disconnect the electrical connector. 4. Transfer components as necessary.

HAZARD WARNING SWITCH REPLACEMENT (EQUINOX)

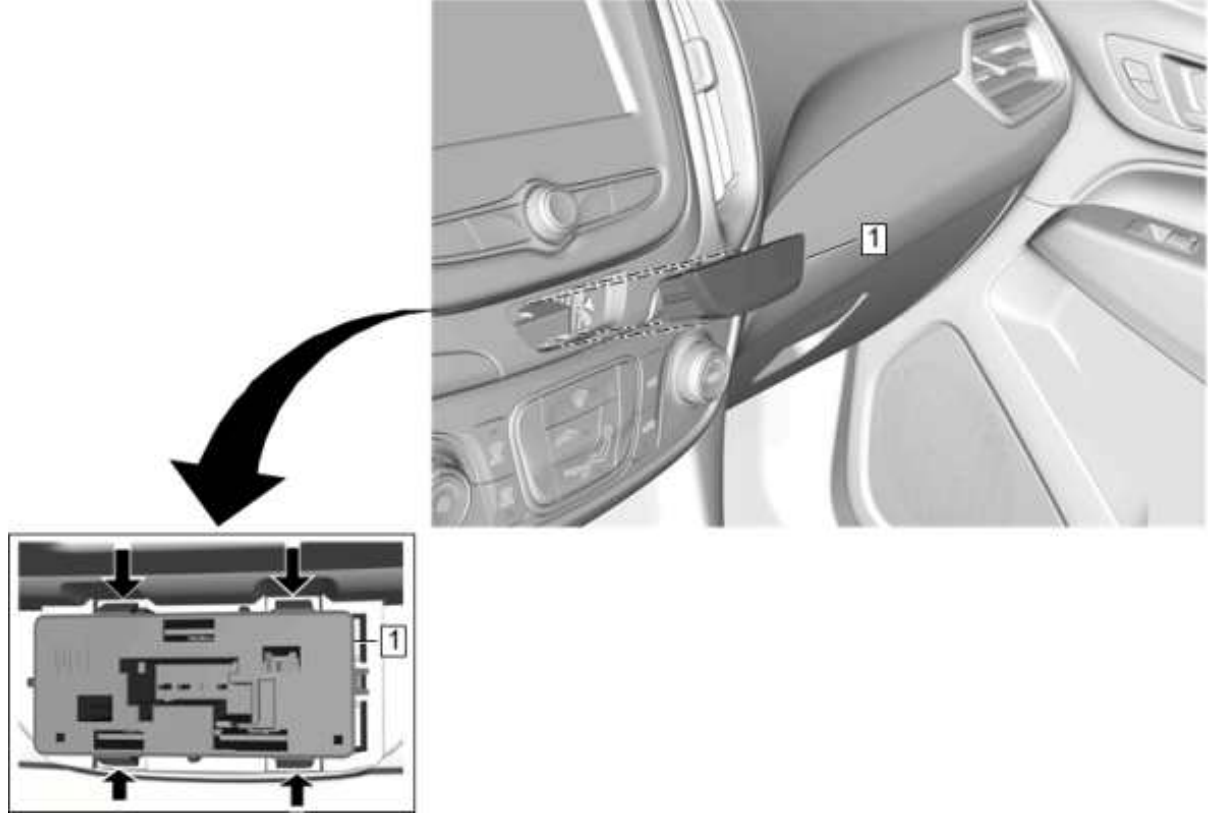


Fig. 18: Hazard Warning Switch (Equinox)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Heater and Air Conditioning User Interface Control Replacement (Equinox)</u>	
1	Hazard Warning Switch Procedure 1. Disconnect the electrical connector. 2. Release the tabs and remove the switch.

HAZARD WARNING SWITCH REPLACEMENT (TERRAIN)

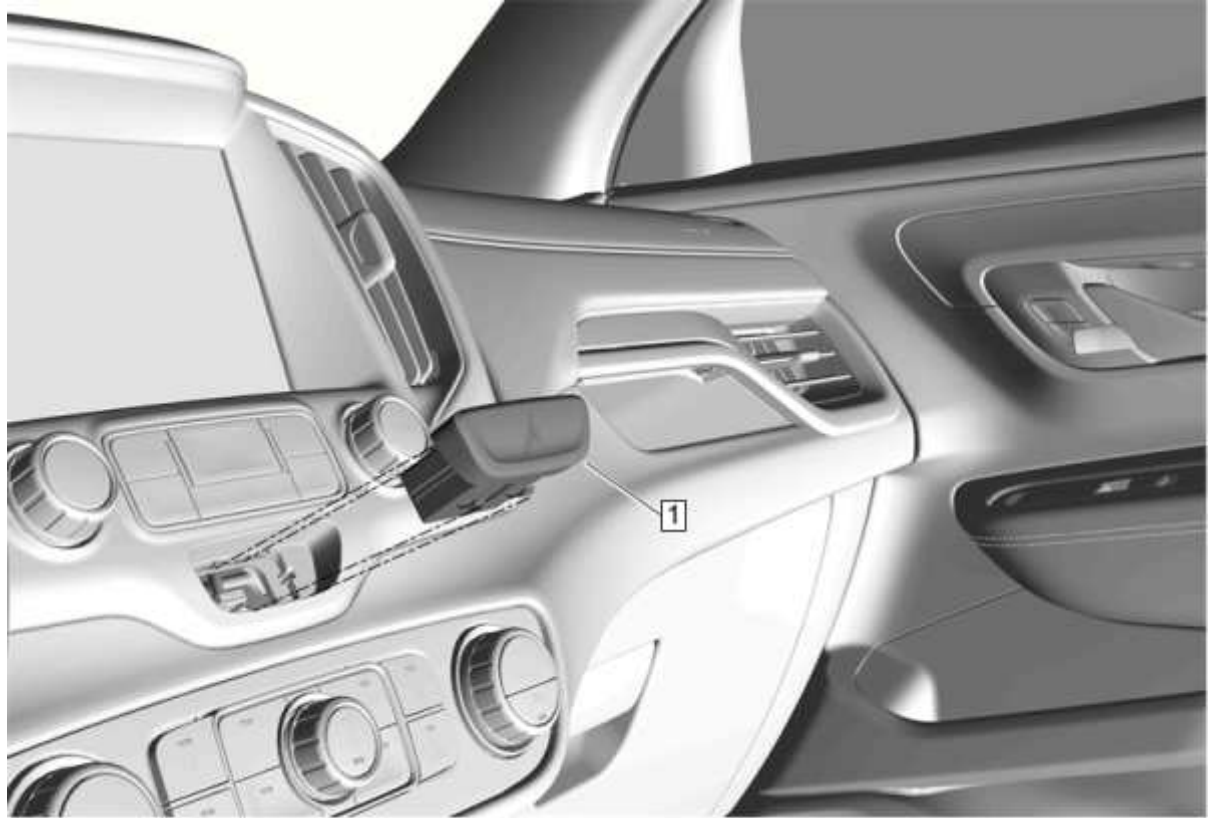


Fig. 19: Hazard Warning Switch (Terrain)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Heater and Air Conditioning User Interface Control Replacement (Terrain)</u>	
1	Hazard Warning Switch Procedure Release the tabs and remove the switch.

FRONT FLOOR CONSOLE COMPARTMENT LAMP REPLACEMENT

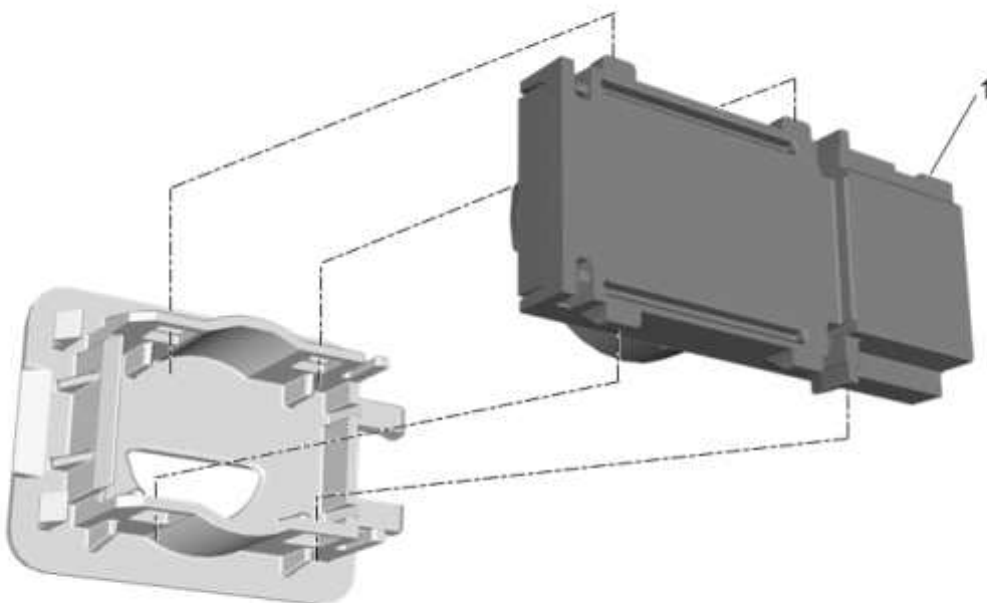


Fig. 20: Front Floor Console Compartment Lamp

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Interior Lamp Bezel Replacement</u>	
1	Front Floor Console Compartment Lamp Procedure Release the retaining tabs.

FRONT FLOOR CONSOLE LIGHT CONDUCTOR LAMP LENS REPLACEMENT

Removal Procedure

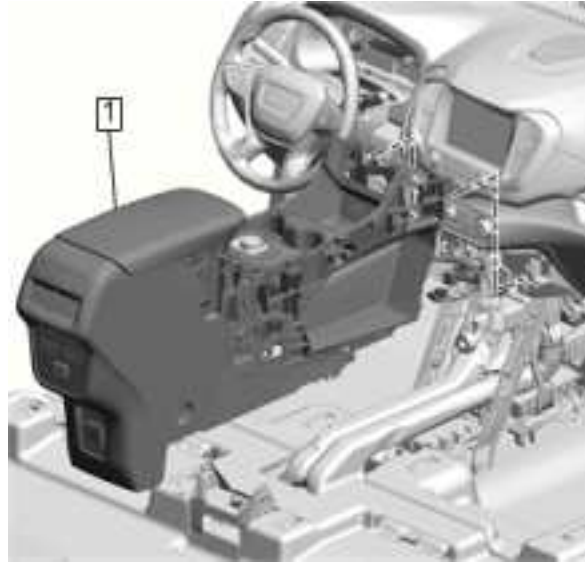


Fig. 21: Console

Courtesy of GENERAL MOTORS COMPANY

1. With the aid of an assistant, remove the console (1) from the vehicle. **Front Floor Console Replacement (Equinox)** **Front Floor Console Replacement (Terrain)**

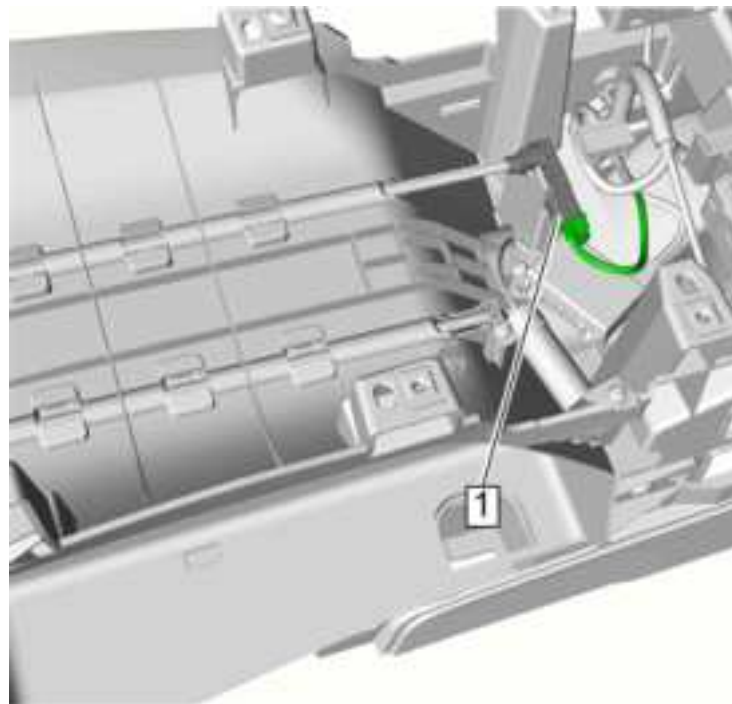


Fig. 22: Front Floor Console Light Conductor Lamp Bulb

Courtesy of GENERAL MOTORS COMPANY

2. Remove Front Floor Console Light Conductor Lamp Bulb (1) - **Front Floor Console Light Conductor Lamp Bulb Replacement**

NOTE: Use padding to protect the console from scratches while performing repairs.

3. Turn the console upside down and place on a suitable working area.

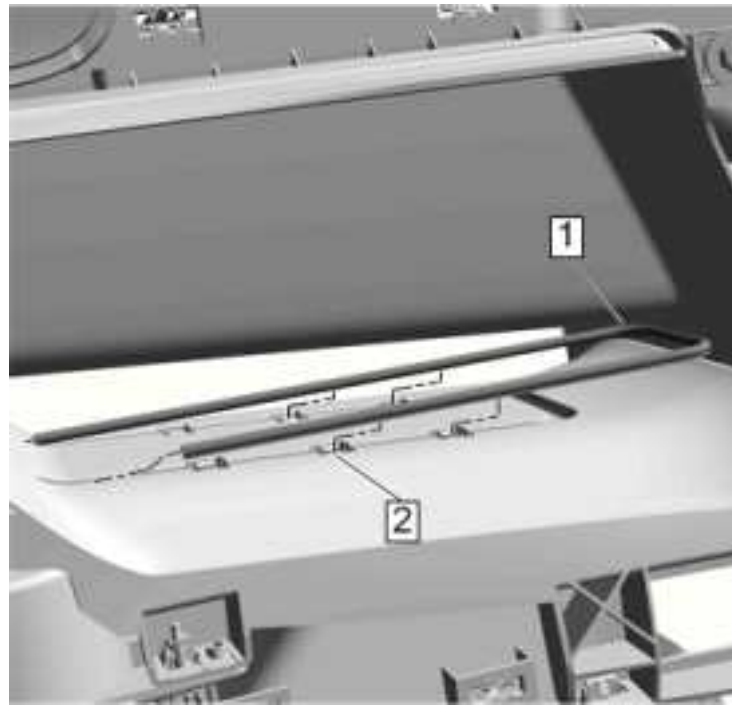


Fig. 23: Front Floor Console Light Conductor Lamp Lens
Courtesy of GENERAL MOTORS COMPANY

4. Remove the front floor console light conductor lamp lens (1) from the [6x] tabs (2) in the channel.

Installation Procedure

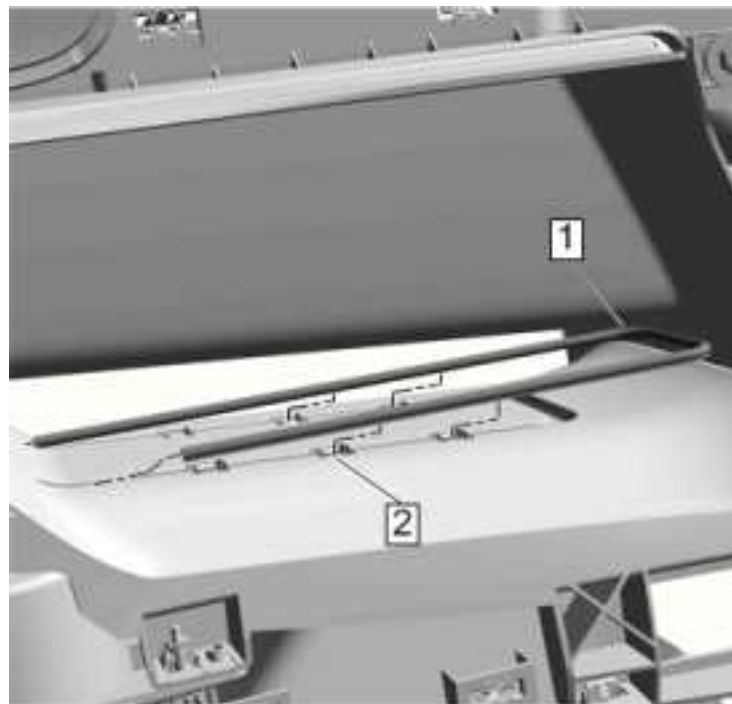


Fig. 24: Front Floor Console Light Conductor Lamp Lens
Courtesy of GENERAL MOTORS COMPANY

NOTE: The front floor console light conductor lamp lens has uneven lengths. The longer end is the input end. The longer end must be aligned with the bulb retainer in order to operate properly.

1. Carefully install the front floor console light conductor lamp lens (1) into the [6x] tabs (2) in the channel.

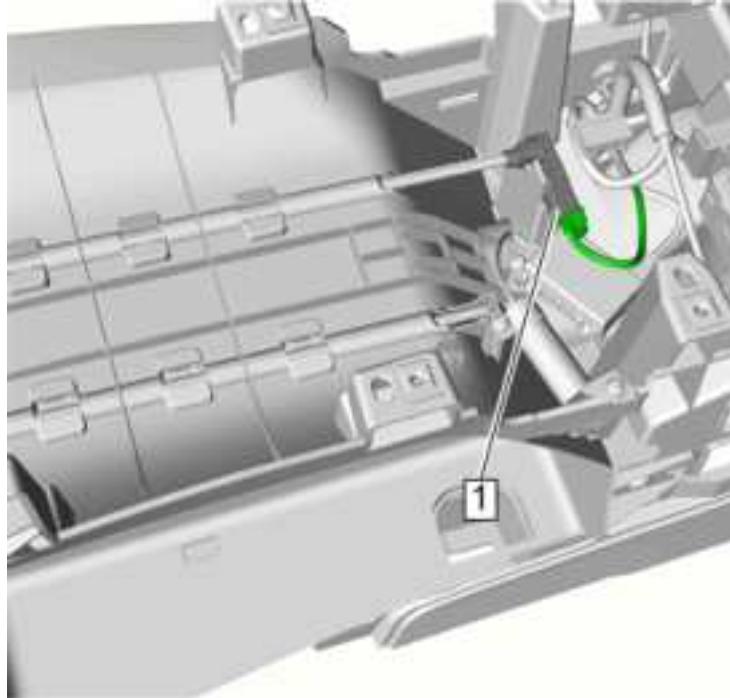


Fig. 25: Front Floor Console Light Conductor Lamp Bulb
Courtesy of GENERAL MOTORS COMPANY

2. Turn the console right side up.
3. Install Front Floor Console Light Conductor Lamp Bulb (1) - **Front Floor Console Light Conductor Lamp Bulb Replacement**

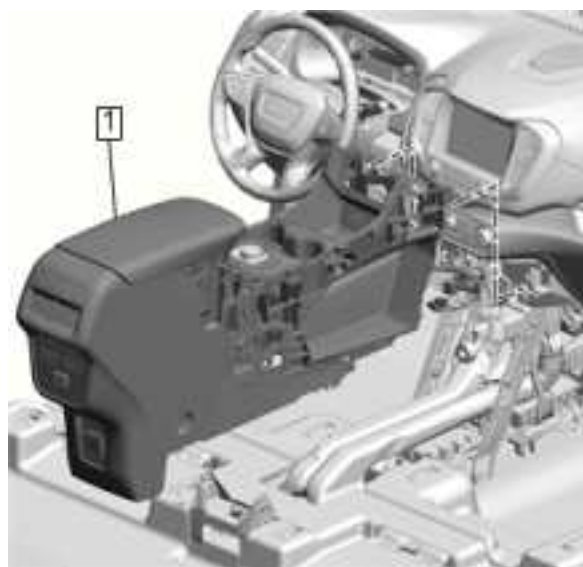


Fig. 26: Console
Courtesy of GENERAL MOTORS COMPANY

4. With the aid of an assistant, install the console (1) to the vehicle. **Front Floor Console Replacement (Equinox)** **Front Floor Console Replacement (Terrain)**

FRONT FLOOR CONSOLE LIGHT CONDUCTOR LAMP BULB REPLACEMENT

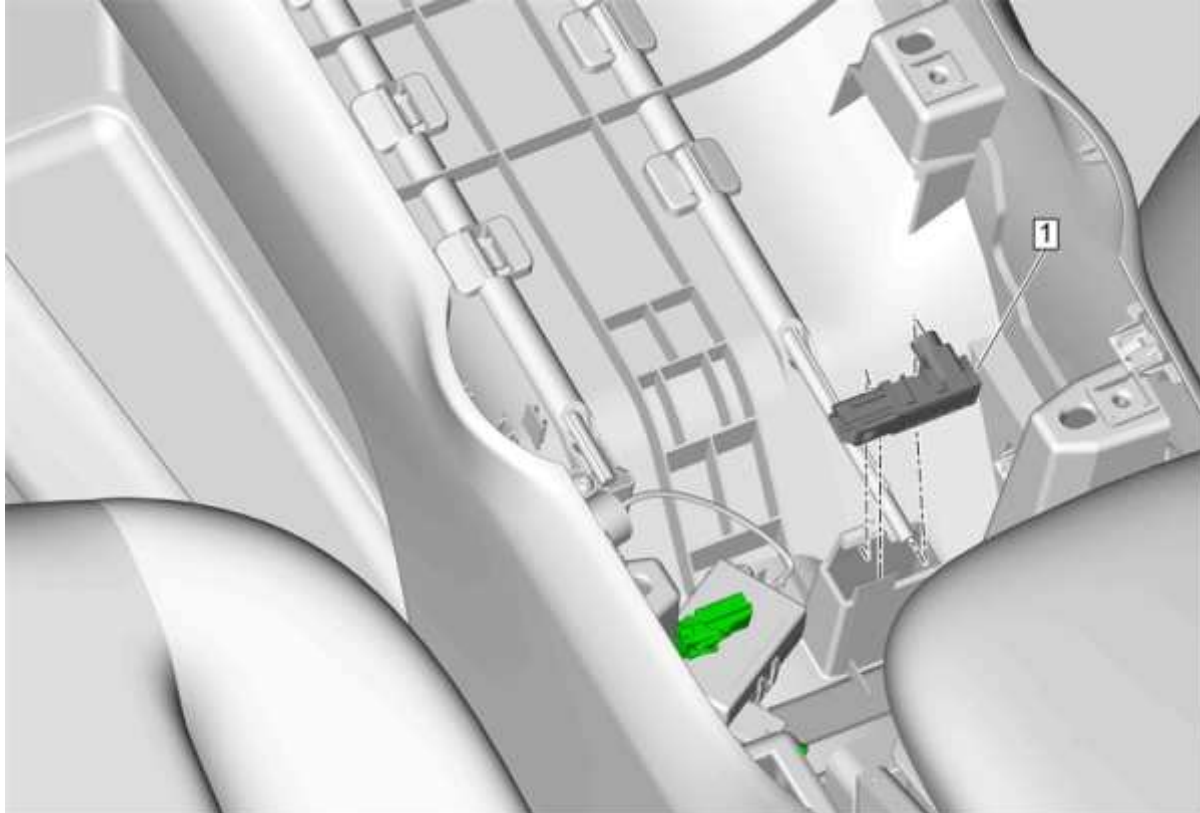


Fig. 27: Front Floor Console Light Conductor Lamp Bulb

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Front Floor Console Applique Replacement (Equinox)</u>	
1	Front Floor Console Light Conductor Lamp Bulb Procedure 1. Disconnect the electrical connector. 2. Release the retaining tab. 3. Pull the bulb straight from the lamp lens.

FRONT SIDE DOOR INSIDE HANDLE ILLUMINATION LAMP REPLACEMENT (EQUINOX)

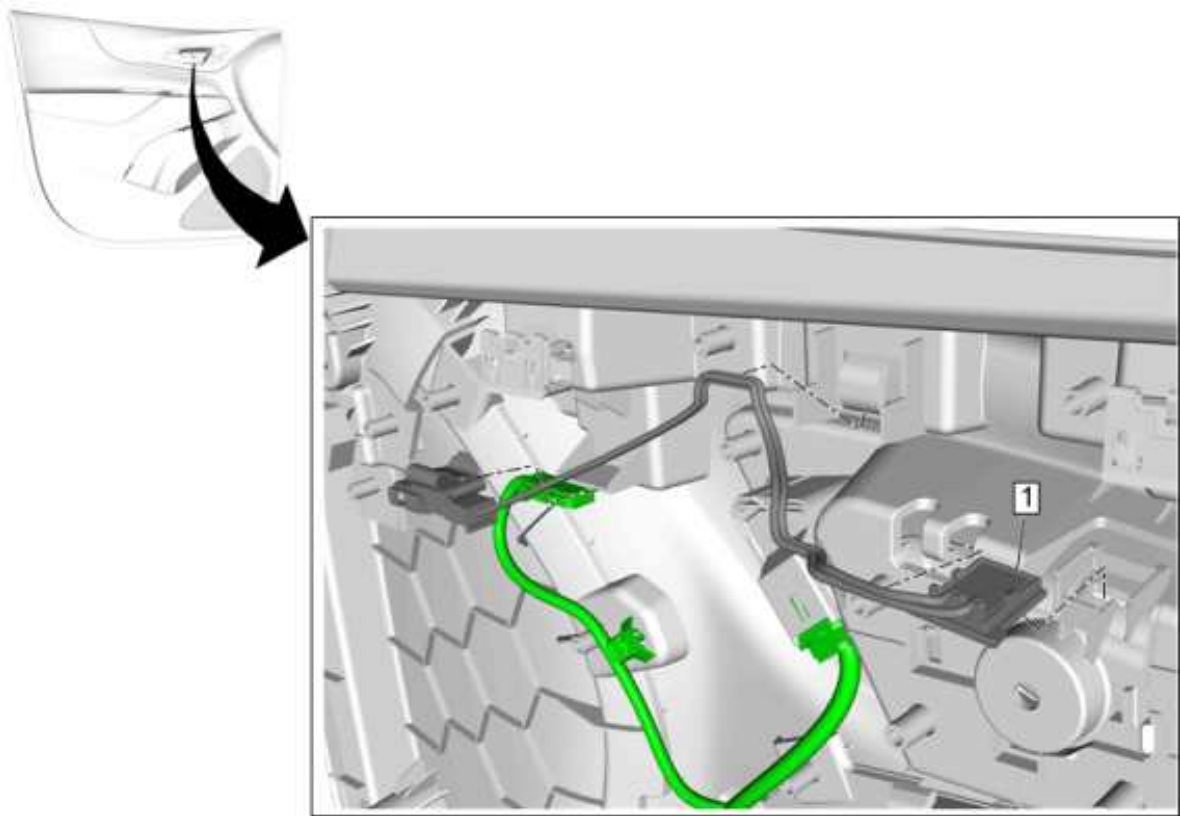


Fig. 28: Front Side Door Inside Handle Illumination Lamp.(Equinox).

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Front Side Door Trim Replacement (Equinox).</u>	
1	Front Side Door Inside Handle Illumination Lamp Procedure 1. Disconnect the electrical connector. 2. Unsnap the lamp from the trim panel tabs.

FRONT SIDE DOOR INSIDE HANDLE ILLUMINATION LAMP REPLACEMENT (DENALI)

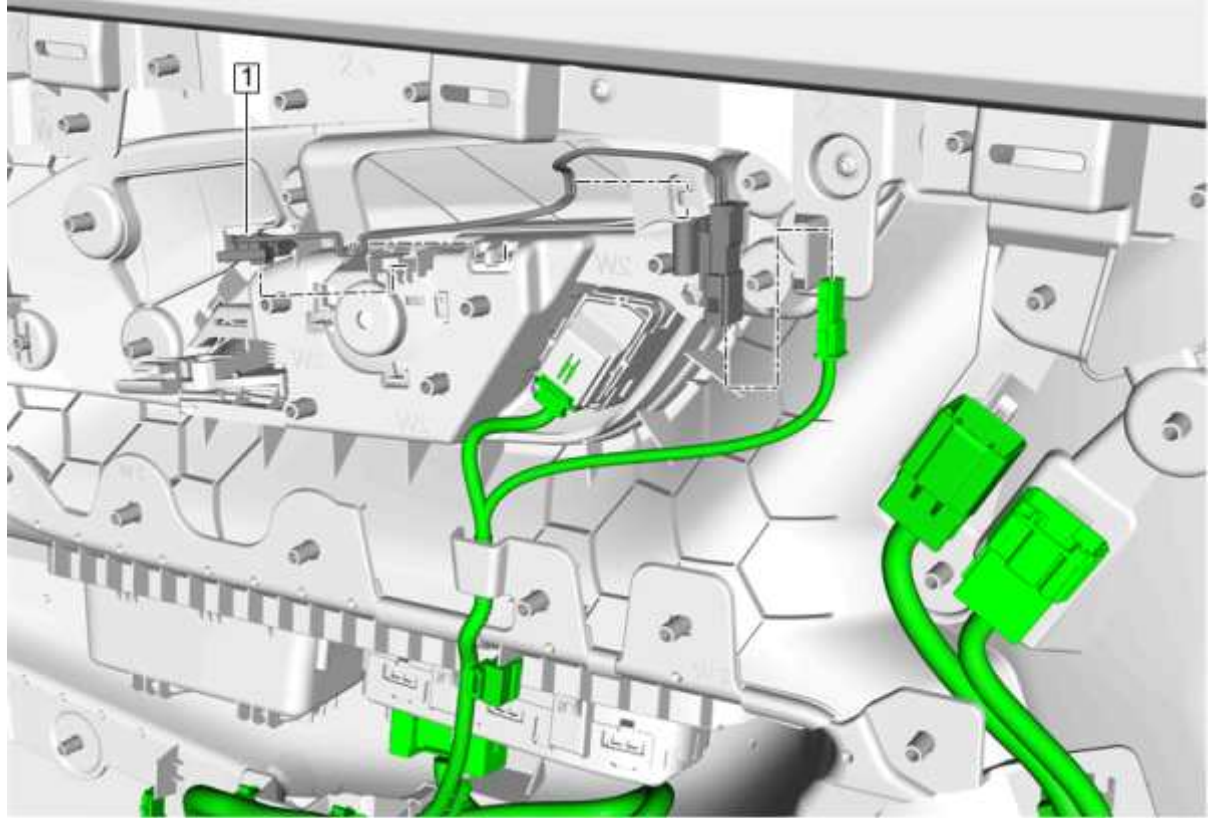


Fig. 29: Front Side Door Inside Handle Illumination Lamp (Denali)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Front Side Door Trim Replacement (Equinox)</u> <u>Front Side Door Trim Replacement (Terrain)</u>	
1	Front Side Door Inside Handle Illumination Lamp Procedure 1. Disconnect the electrical connector. 2. Unsnap the lamp from the trim panel tabs.

INSTRUMENT PANEL LIGHT CONDUCTOR LAMP REPLACEMENT (EQUINOX)

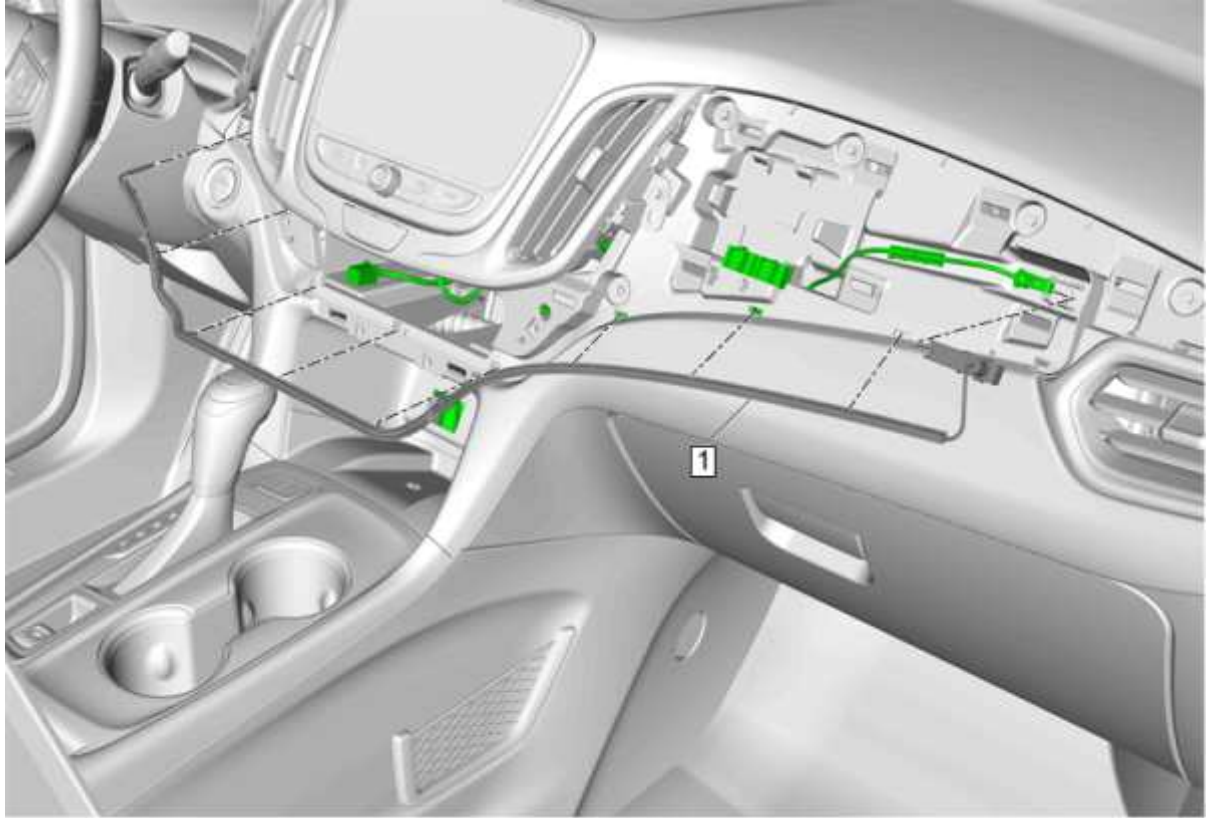


Fig. 30: Instrument Panel Light Conductor Lamp
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Heater and Air Conditioning User Interface Control Replacement (Equinox)</u>	
1	Instrument Panel Light Conductor Lamp Procedure 1. Disconnect the electrical connector. 2. Release the retaining tabs.

INSTRUMENT PANEL LIGHT CONDUCTOR LAMP REPLACEMENT (GMC)

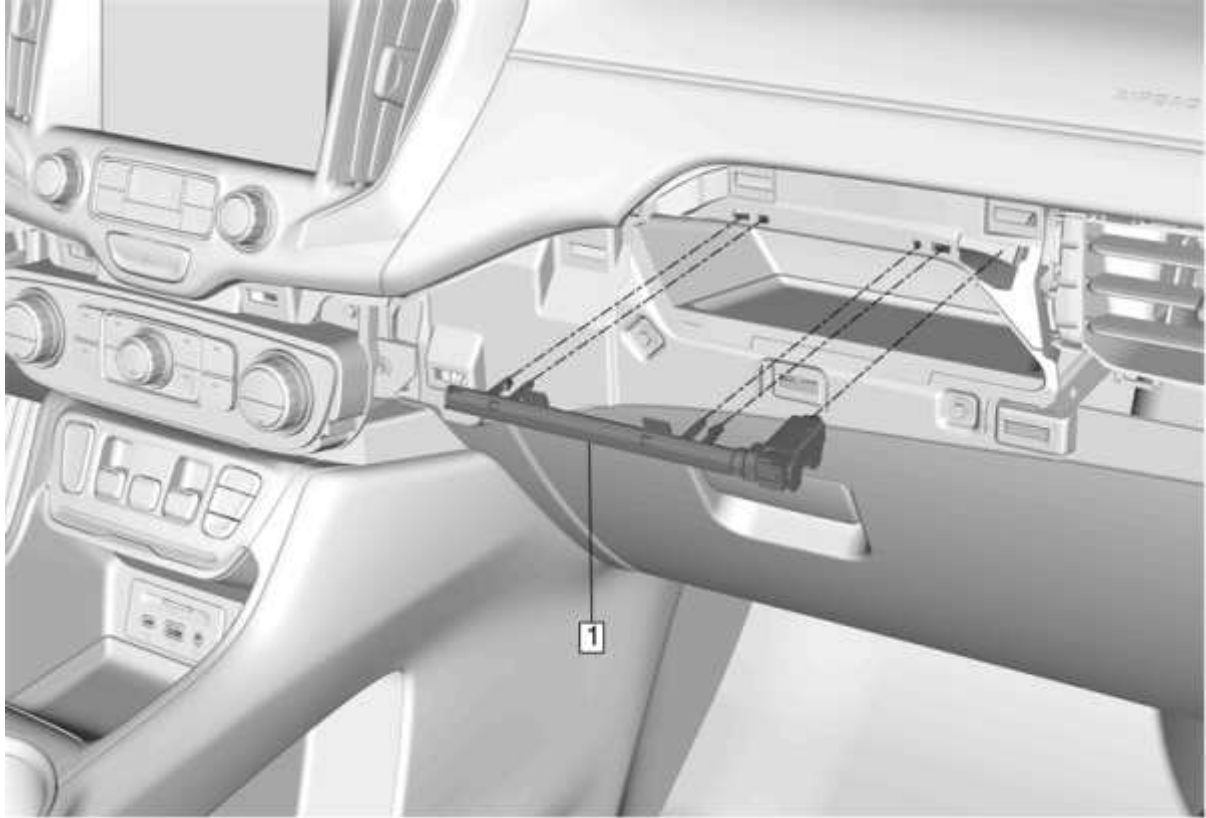


Fig. 31: Instrument Panel Light Conductor Lamp
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Instrument Panel Trim Pad Replacement - Right Side (Terrain)</u>	
1	Instrument Panel Light Conductor Lamp Procedure 1. Disconnect the electrical connector. 2. Release the retaining tabs.

ROOF RAIL REAR SEAT POSITION READING AND COURTESY LAMP REPLACEMENT

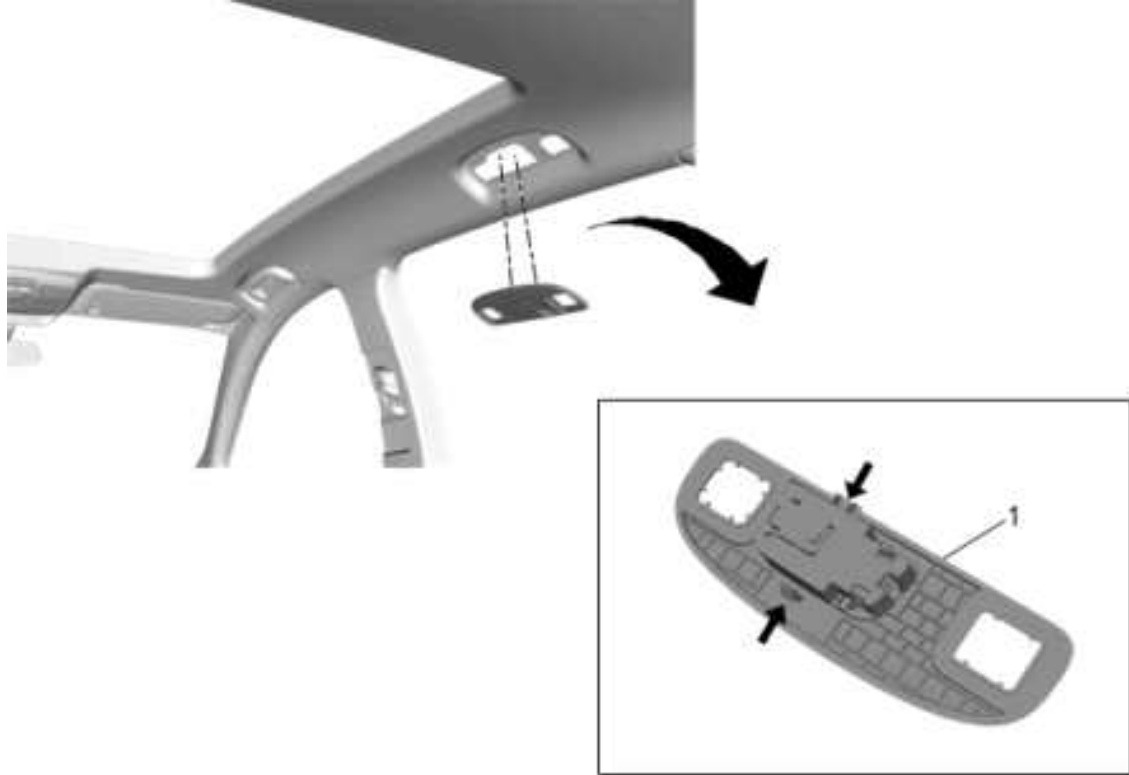


Fig. 32: Roof Rail Rear Seat Position Reading and Courtesy Lamp
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Roof Rail Assist Handle Replacement (Front, Equinox) Roof Rail Assist Handle Replacement (Rear) Roof Rail Assist Handle Replacement (Front, Terrain)</u>	
1	Roof Rail Rear Seat Position Reading and Courtesy Lamp Procedure 1. Use a suitable tool.Unlock the retaining tabs. 2. Disconnect the electrical connector.

FRONT SIDE DOOR MAP POCKET ILLUMINATION LAMP REPLACEMENT

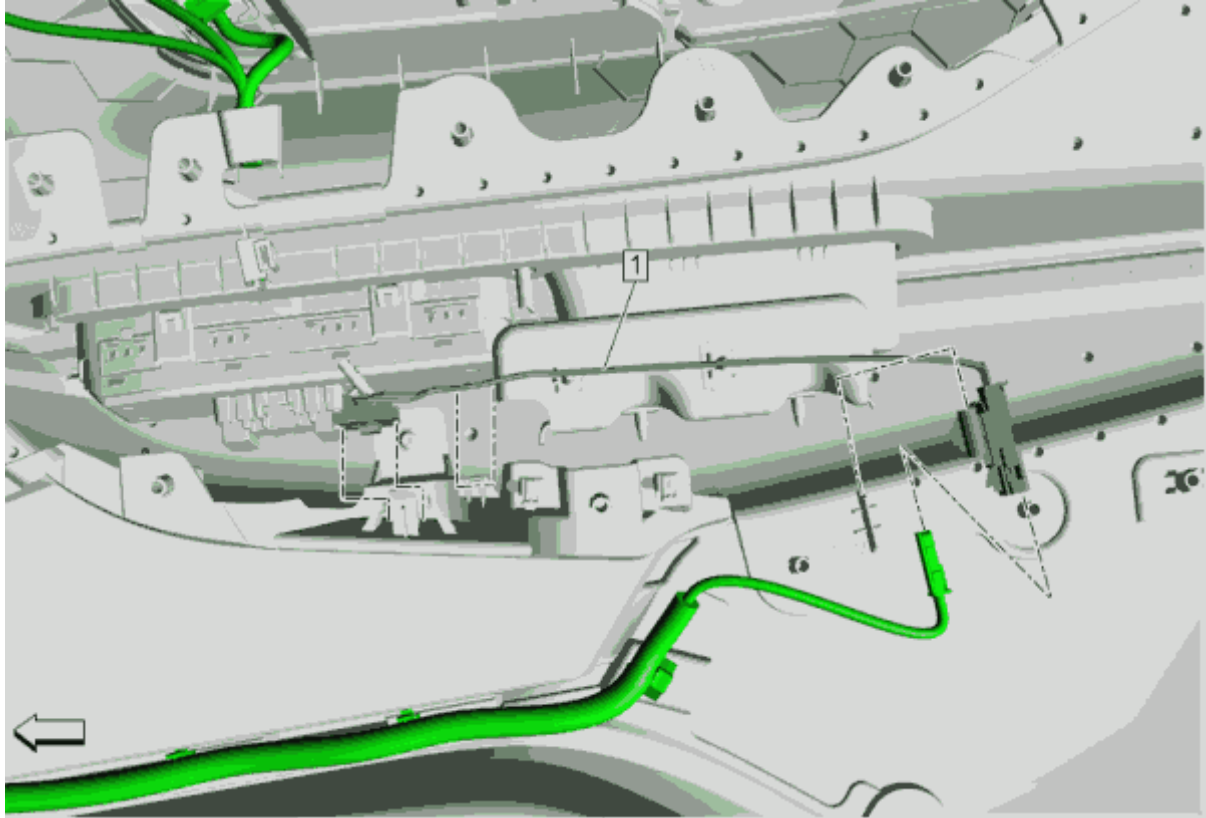


Fig. 33: Front Side Door Map Pocket Illumination Lamp

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Front Side Door Trim Replacement (Equinox)</u> <u>Front Side Door Trim Replacement (Terrain)</u>	
1	Front Side Door Map Pocket Illumination Lamp Procedure 1. Disconnect the electrical connector. 2. Unsnap the lamp from the trim panel tabs.

OUTSIDE REARVIEW MIRROR TURN SIGNAL LAMP REPLACEMENT

Removal Procedure

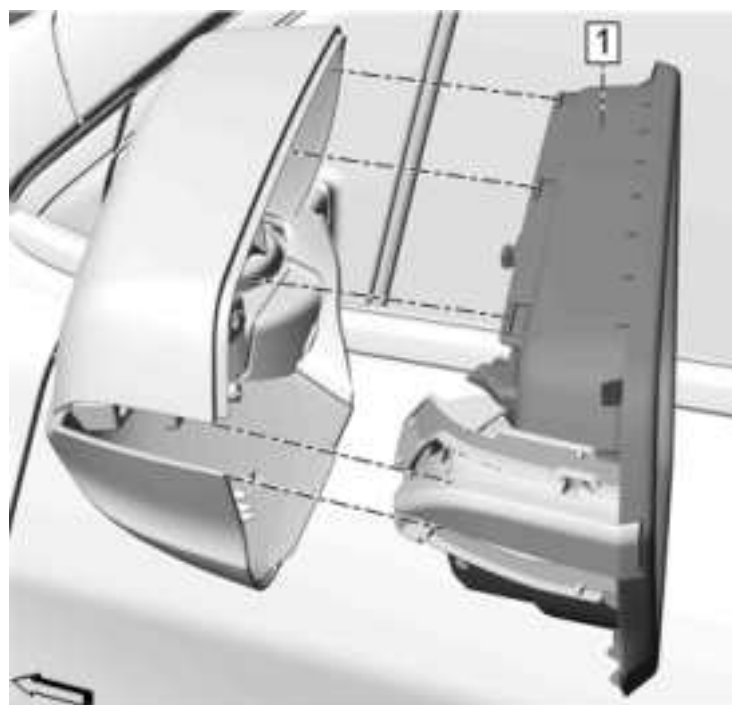


Fig. 34: Outside Rearview Mirror Housing Bezel
Courtesy of GENERAL MOTORS COMPANY

1. Remove Outside Rearview Mirror Housing Bezel (1) - **Outside Rearview Mirror Housing Bezel Replacement**

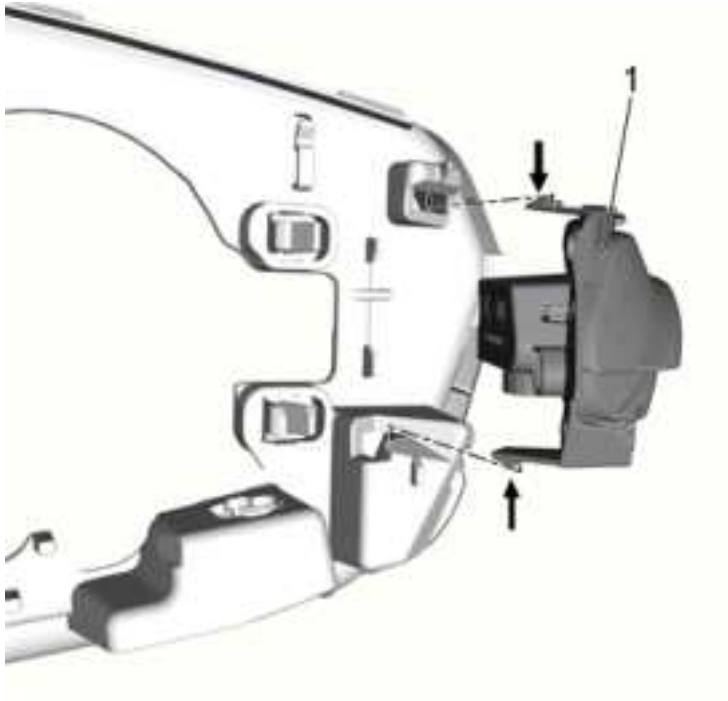


Fig. 35: Outside Rearview Mirror Turn Signal Lamp
Courtesy of GENERAL MOTORS COMPANY

2. Release the tabs and remove the outside rearview mirror turn signal lamp. (1)

Installation Procedure

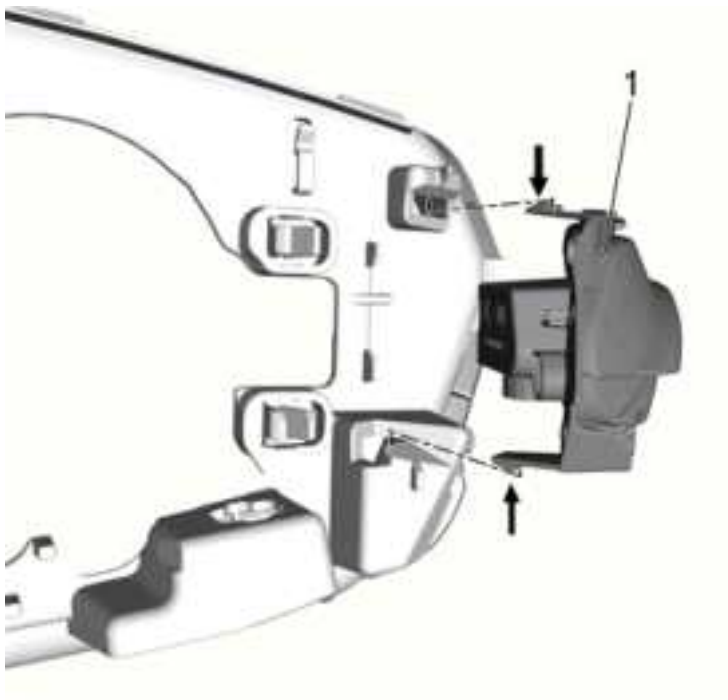


Fig. 36: Outside Rearview Mirror Turn Signal Lamp
Courtesy of GENERAL MOTORS COMPANY

1. Install Outside Rearview Mirror Turn Signal Lamp (1).

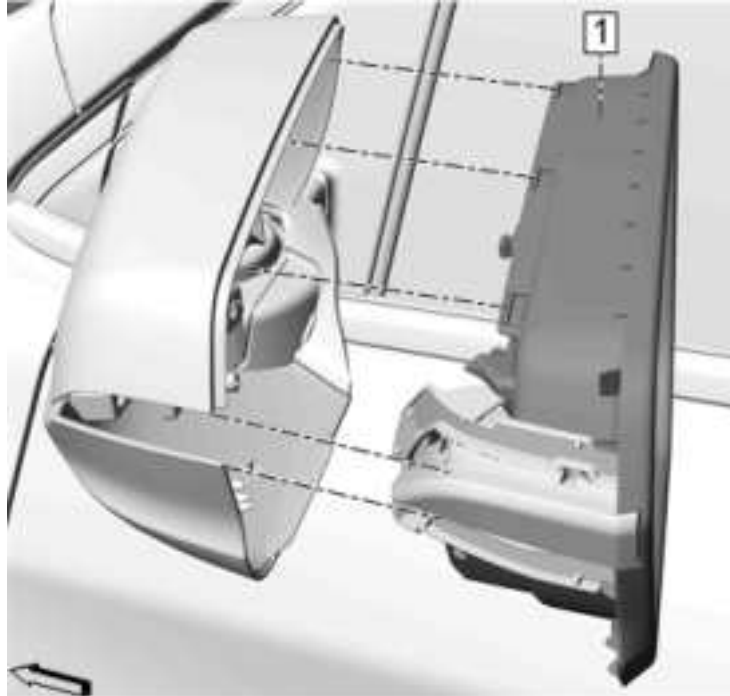


Fig. 37: Outside Rearview Mirror Housing Bezel
 Courtesy of GENERAL MOTORS COMPANY

2. Install Outside Rearview Mirror Housing Bezel (1). **Outside Rearview Mirror Housing Bezel Replacement**

HEADLAMP REPLACEMENT (CHEVROLET)

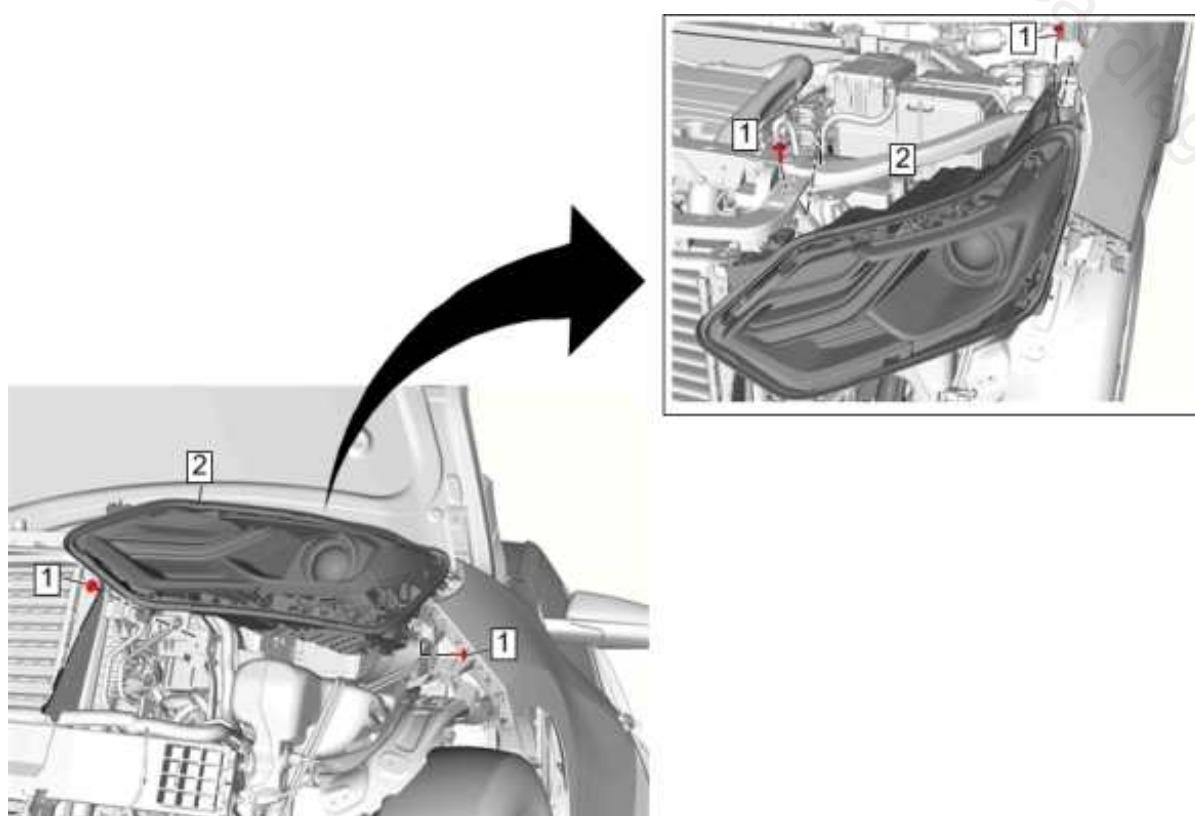


Fig. 38: Headlamp (Chevrolet-Equinox)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Front Bumper Fascia Replacement (Equinox)</u>	

Callout	Component Name
1	Headlamp Screw [4x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	Headlamp Procedure 1. Disconnect the electrical connector. 2. After installation, aim the headlamps. Headlamp Aiming

HEADLAMP REPLACEMENT (GMC)

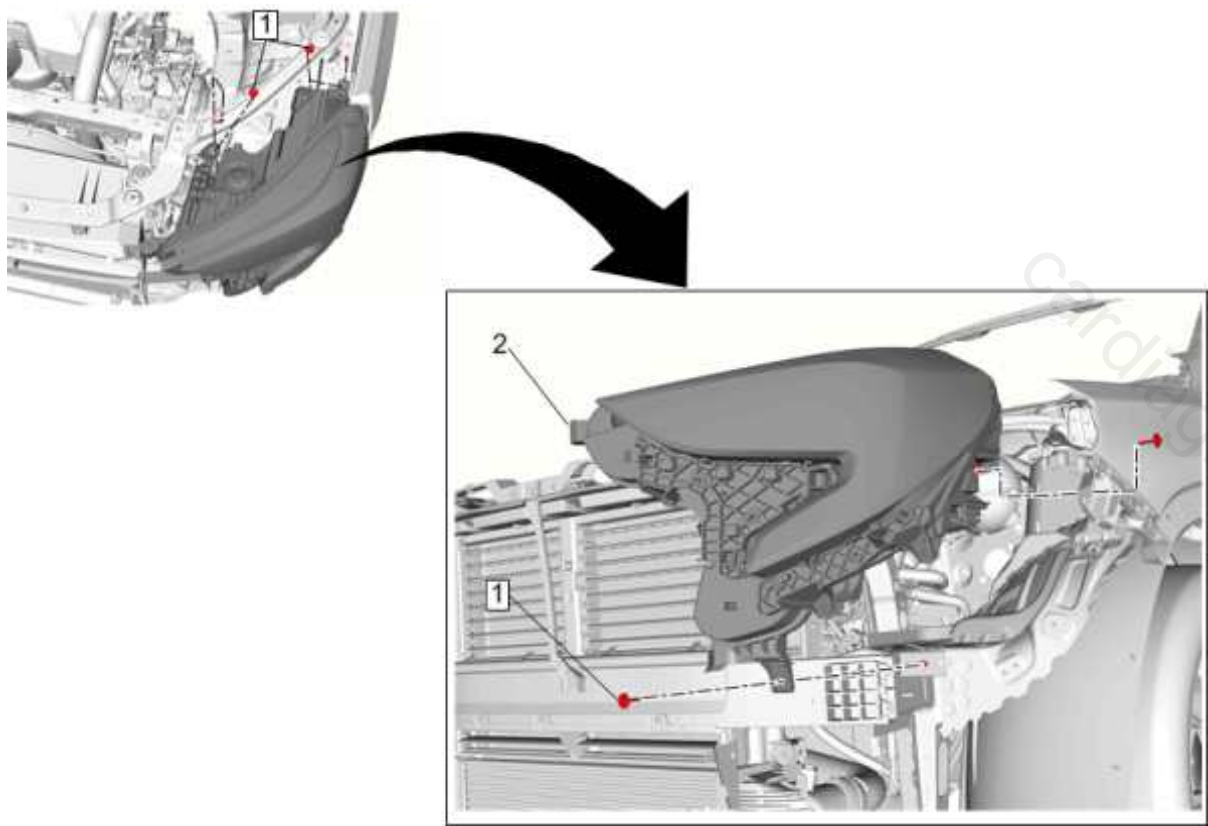


Fig. 39: Headlamp (GMC-Terrain)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Bumper Fascia Replacement (Terrain)	
1	Headlamp Bolt [4x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)

Callout	Component Name
2	Headlamp Procedure 1. Disconnect all electrical connectors. 2. Transfer components as necessary. 3. After installation, aim the headlamps. Refer to Headlamp Aiming

HEADLAMP BULB REPLACEMENT - LEFT SIDE (CHEVROLET WITH T4A)

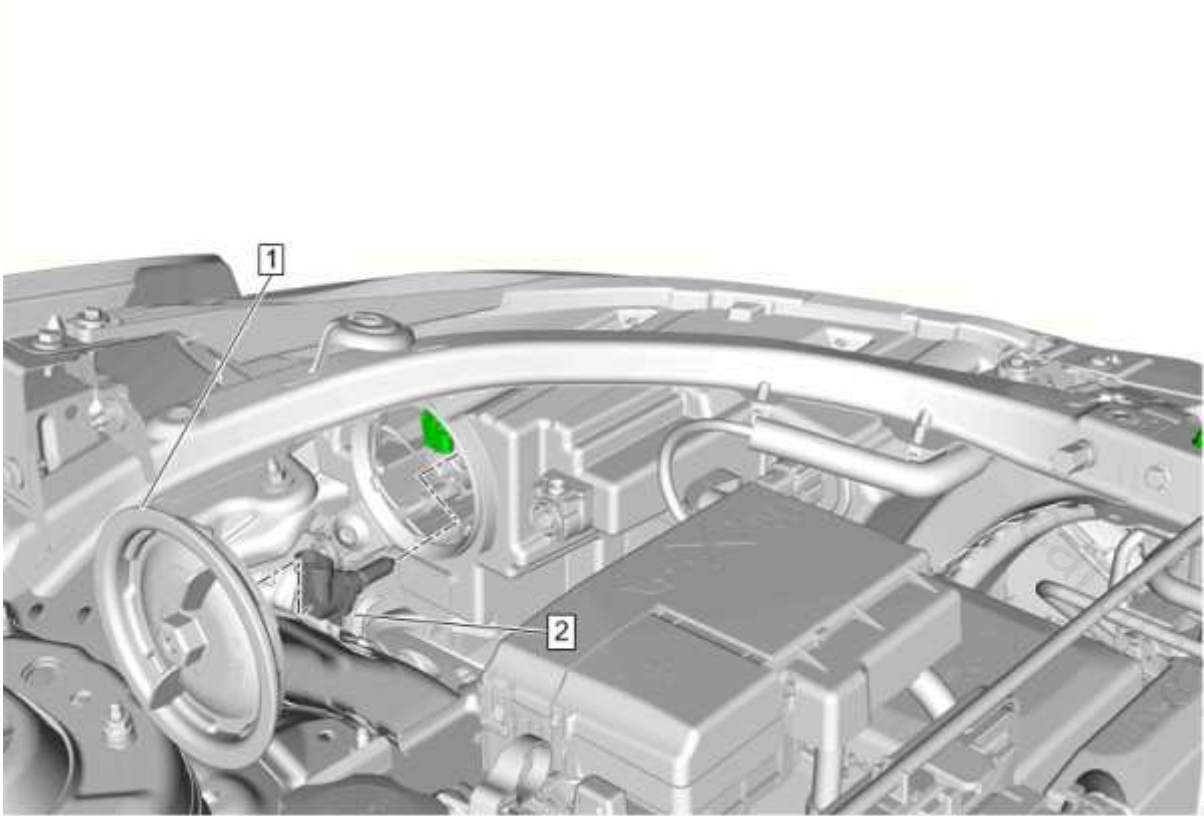


Fig. 40: Headlamp Bulb - Left Side (Chevrolet With T4A)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: Refer to Halogen Bulb Warning . Procedure 1. Disconnect the electrical connector. 2. Rotate the bulb socket counterclockwise to remove it from the lamp housing.

HEADLAMP BULB REPLACEMENT - LEFT SIDE (GMC WITH T4F)

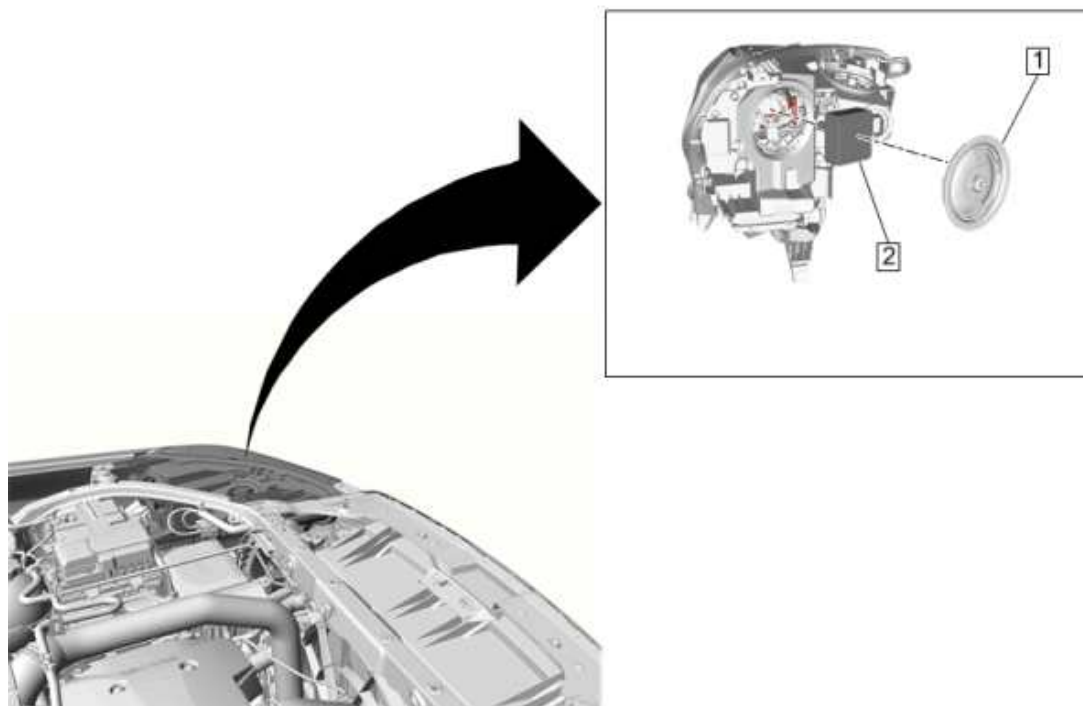


Fig. 41: Headlamp Bulb - Left Side (GMC With T4F).
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system. WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly. Procedure 1. Rotate the retainer down and out of the way to remove the headlamp bulb. 2. Disconnect the electrical connector. 3. When installing, rotate the retainer up and into the locked position. NOTE: The retainer must be fully seated against the bulb to hold the bulb securely in the housing.

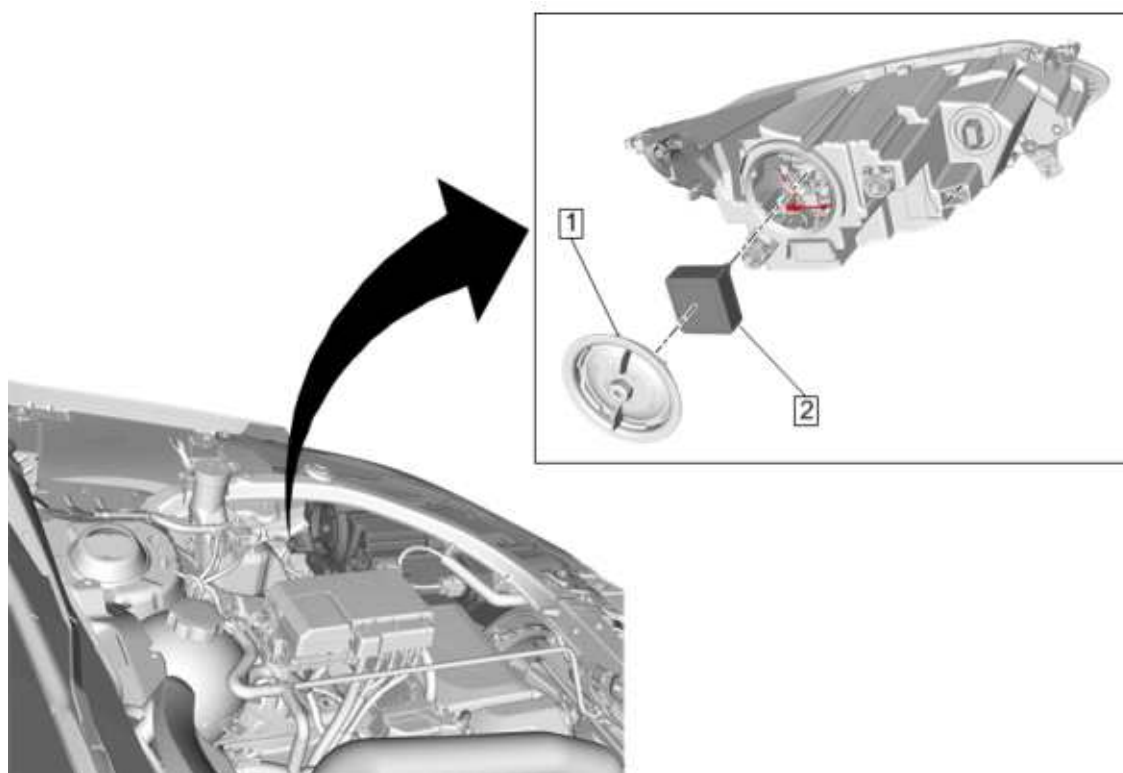


Fig. 42: Headlamp Bulb - Left Side (Chevrolet With T4F)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system. WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly. Procedure 1. Rotate the retainer down and out of the way to remove the headlamp bulb. 2. Disconnect the electrical connector. 3. When installing, rotate the retainer up and into the locked position. NOTE: The retainer must be fully seated against the bulb to hold the bulb securely in the housing.

HEADLAMP BULB REPLACEMENT - RIGHT SIDE (CHEVROLET WITH T4A AND LYX)

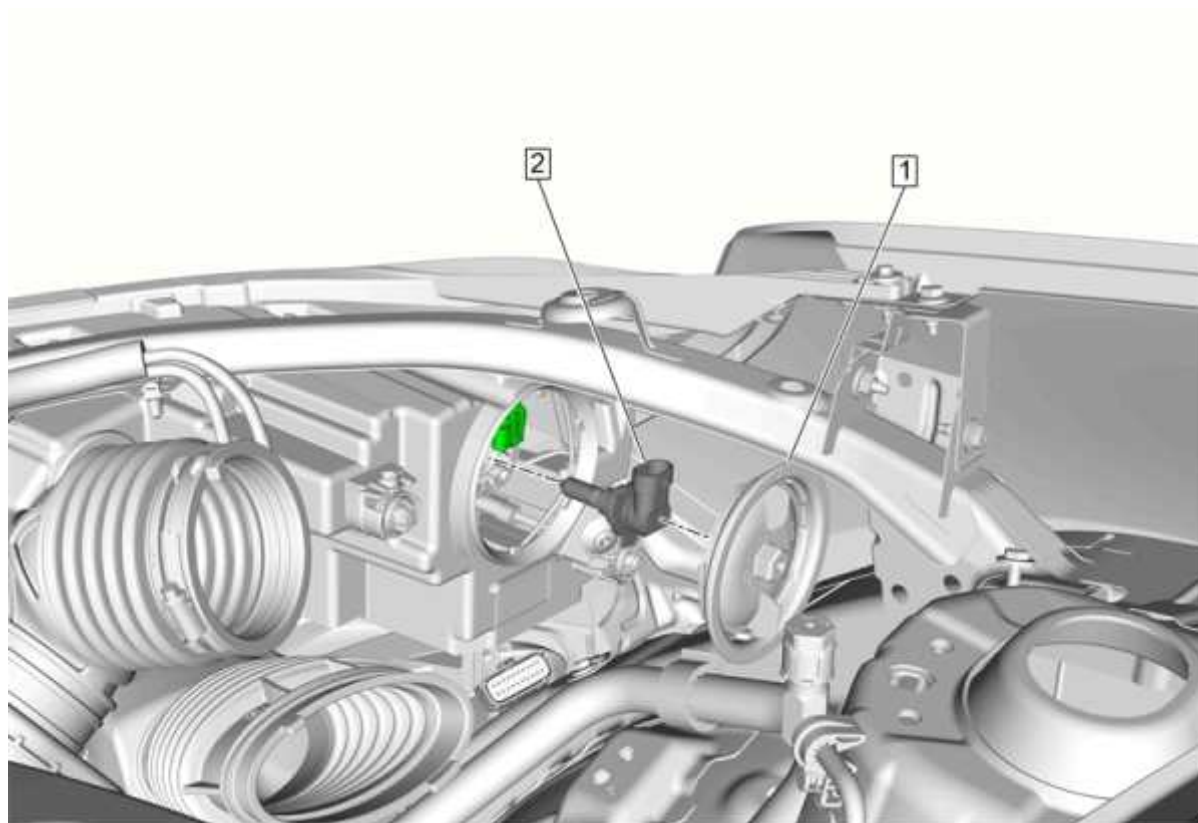


Fig. 43: Headlamp Bulb - Right Side (Chevrolet With T4A And LYX)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Air Cleaner Assembly Replacement</u>	
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure 1. Disconnect the electrical connector. 2. Rotate the bulb socket counterclockwise to remove it from the lamp housing.

HEADLAMP BULB REPLACEMENT - RIGHT SIDE (CHEVROLET WITH T4F AND LYX)

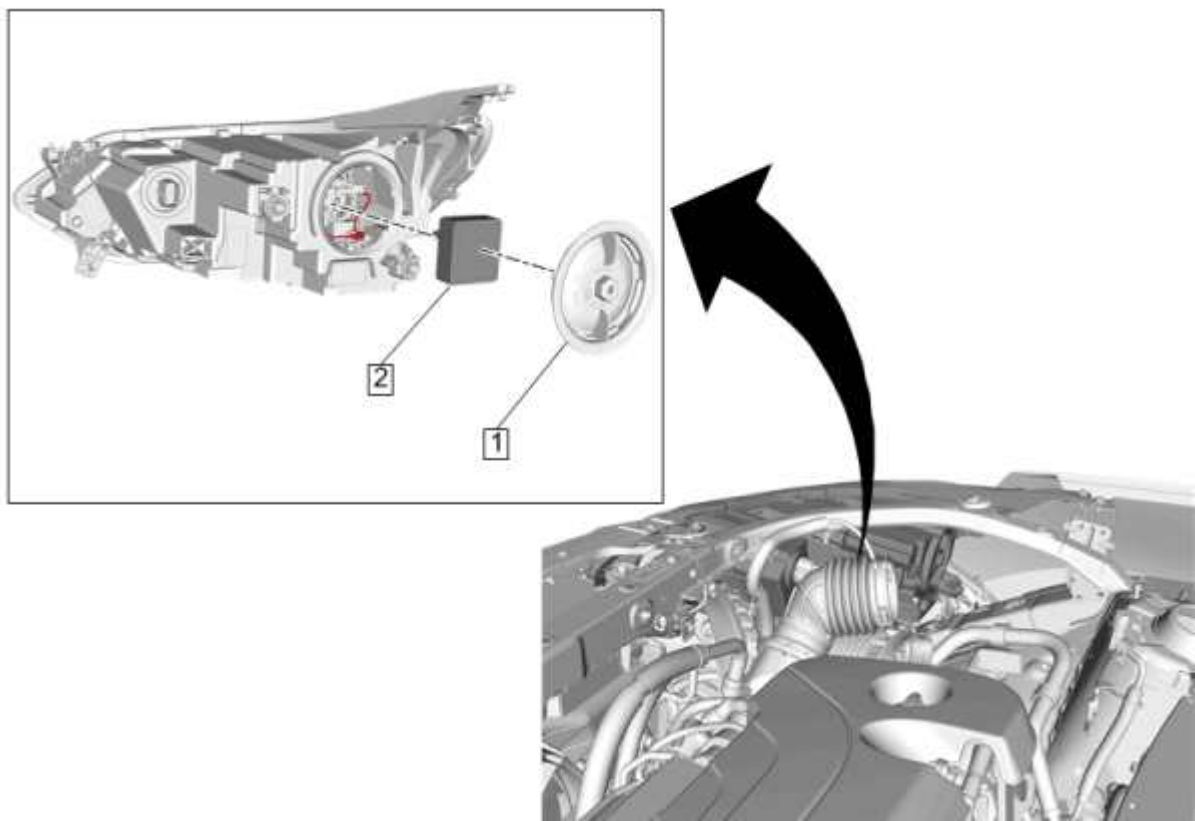


Fig. 44: Headlamp Bulb - Right Side (Chevrolet With T4F And LYX)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Air Cleaner Assembly Replacement</u>	
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.

Callout	Component Name
2	Headlamp Bulb WARNING: The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system. WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly. Procedure 1. Rotate the retainer down and out of the way to remove the headlamp bulb. 2. Disconnect the electrical connector. 3. When installing, rotate the retainer up and into the locked position. NOTE: The retainer must be fully seated against the bulb to hold the bulb securely in the housing.

HEADLAMP BULB REPLACEMENT - RIGHT SIDE (GMC WITH T4F AND LTG)

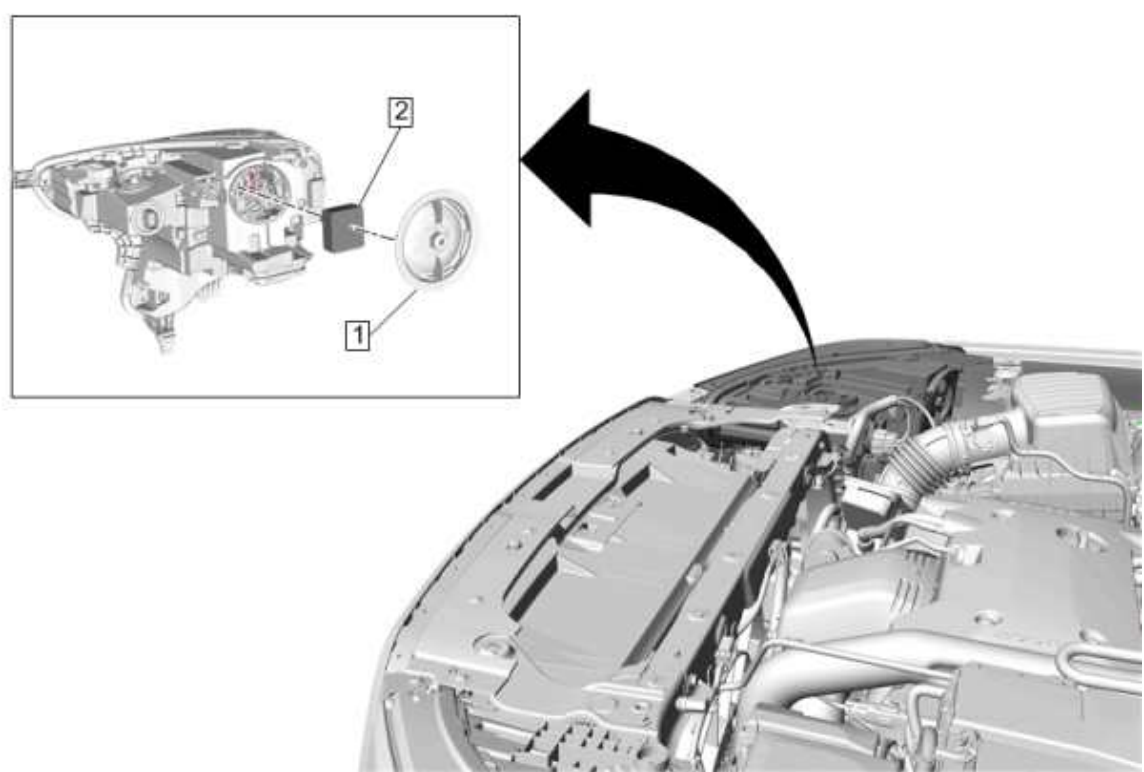


Fig. 45: Headlamp Bulb - Right Side (GMC With T4F And LTG).
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
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Callout	Component Name
Preliminary Procedure <u>Air Cleaner Assembly Replacement</u>	
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system. WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly. Procedure 1. Rotate the retainer down and out of the way to remove the headlamp bulb. 2. Disconnect the electrical connector. 3. When installing, rotate the retainer up and into the locked position. NOTE: The retainer must be fully seated against the bulb to hold the bulb securely in the housing.

HEADLAMP BULB REPLACEMENT - RIGHT SIDE (GMC WITH T4F AND LYX)

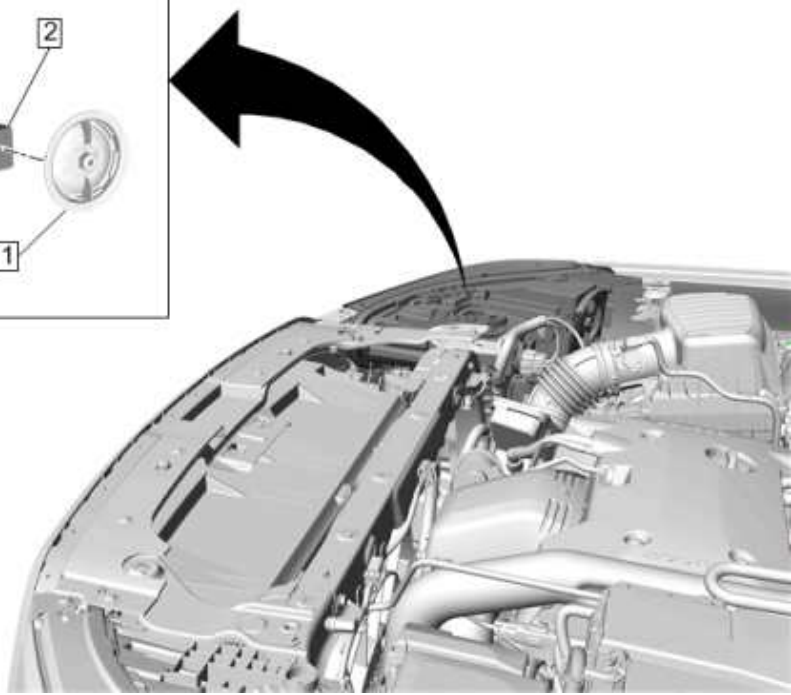
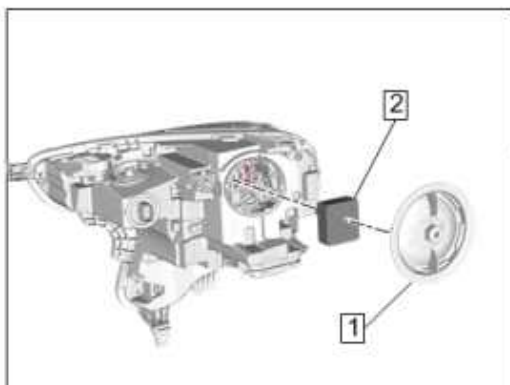


Fig. 46: Headlamp Bulb - Right Side (GMC With T4F And LYX).
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Air Cleaner Assembly Replacement	
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system. WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly. Procedure 1. Rotate the retainer down and out of the way to remove the headlamp bulb. 2. Disconnect the electrical connector. 3. When installing, rotate the retainer up and into the locked position. NOTE: The retainer must be fully seated against the bulb to hold the bulb securely in the housing.

HEADLAMP BULB REPLACEMENT - RIGHT SIDE (GMC WITH T4F AND LH7)

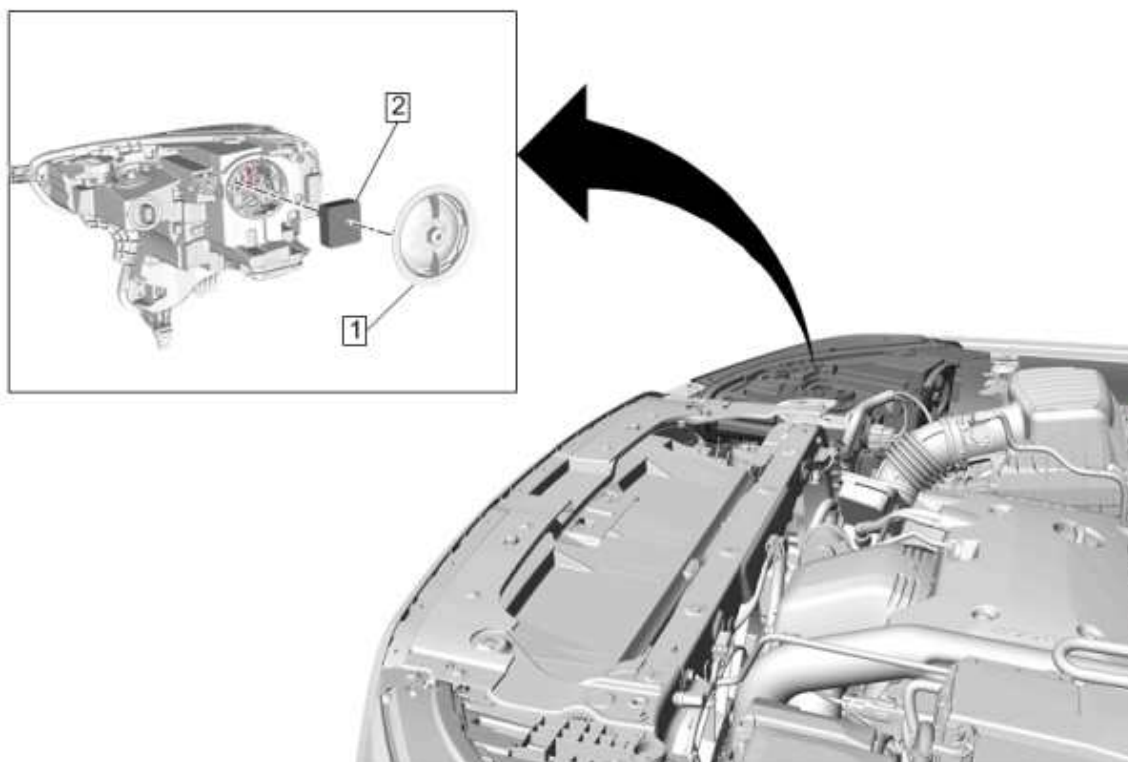


Fig. 47: Headlamp Bulb - Right Side (GMC With T4F And LH7).
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Air Cleaner Assembly Replacement</u>	
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.

Callout	Component Name
2	Headlamp Bulb WARNING: The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system. WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly. Procedure 1. Rotate the retainer down and out of the way to remove the headlamp bulb. 2. Disconnect the electrical connector. 3. When installing, rotate the retainer up and into the locked position. NOTE: The retainer must be fully seated against the bulb to hold the bulb securely in the housing.

HEADLAMP BULB REPLACEMENT - RIGHT SIDE (CHEVROLET WITH T4F AND LTG)

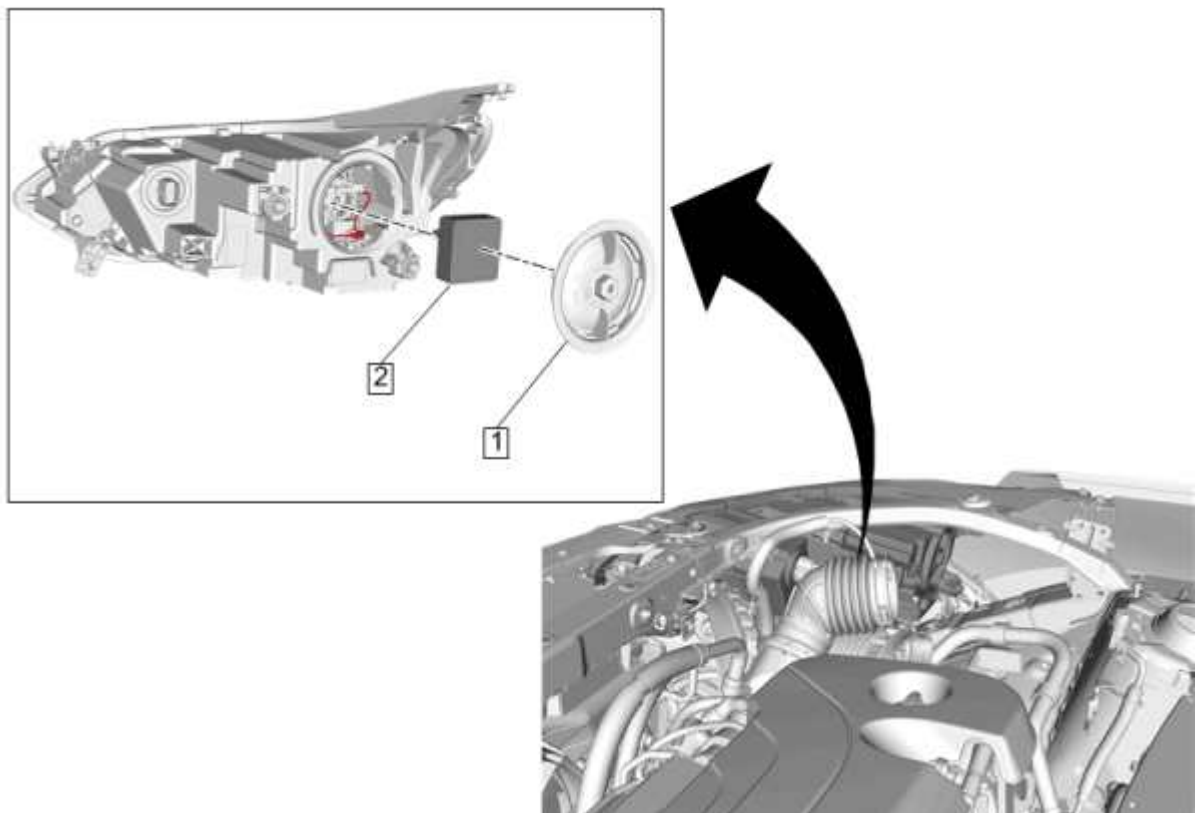


Fig. 48: Headlamp Bulb - Right Side (Chevrolet With T4F And LTG).
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Callout	Component Name
Preliminary Procedure <u>Air Cleaner Assembly Replacement</u>	
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system. WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly. Procedure 1. Rotate the retainer down and out of the way to remove the headlamp bulb. 2. Disconnect the electrical connector. 3. When installing, rotate the retainer up and into the locked position. NOTE: The retainer must be fully seated against the bulb to hold the bulb securely in the housing.

HEADLAMP BULB REPLACEMENT - RIGHT SIDE (CHEVROLET WITH T4F AND LH7)

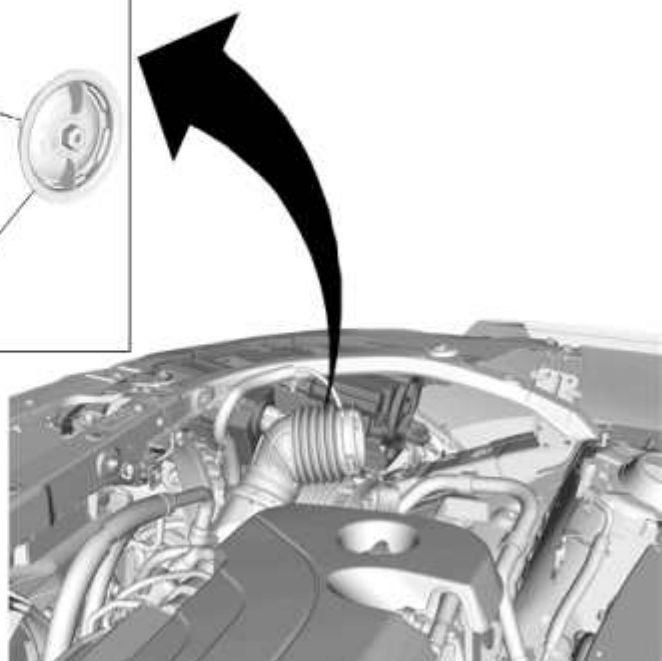
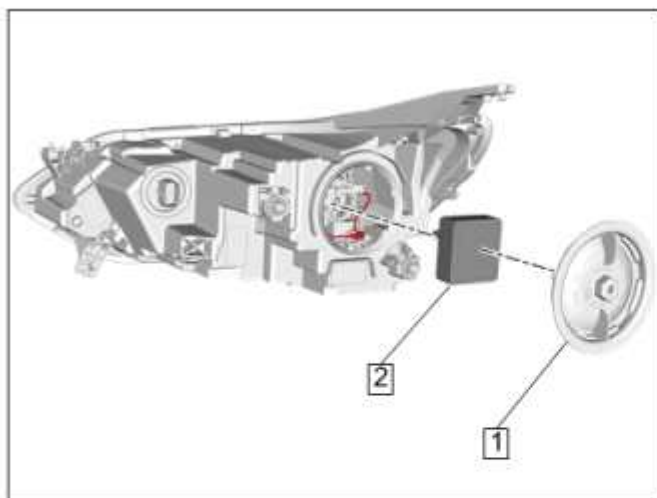


Fig. 49: Headlamp Bulb - Right Side (Chevrolet With T4F And LH7)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Air Cleaner Assembly Replacement</u>	
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: The high intensity discharge system produces high voltage and current. In order to reduce the risk of severe shocks and burns, the battery negative cable must be disconnected any time service work is being performed on or around the high intensity discharge system. WARNING: The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly. Procedure 1. Rotate the retainer down and out of the way to remove the headlamp bulb. 2. Disconnect the electrical connector. 3. When installing, rotate the retainer up and into the locked position. NOTE: The retainer must be fully seated against the bulb to hold the bulb securely in the housing.

HEADLAMP BULB REPLACEMENT - RIGHT SIDE (CHEVROLET WITH T4A AND LH7)

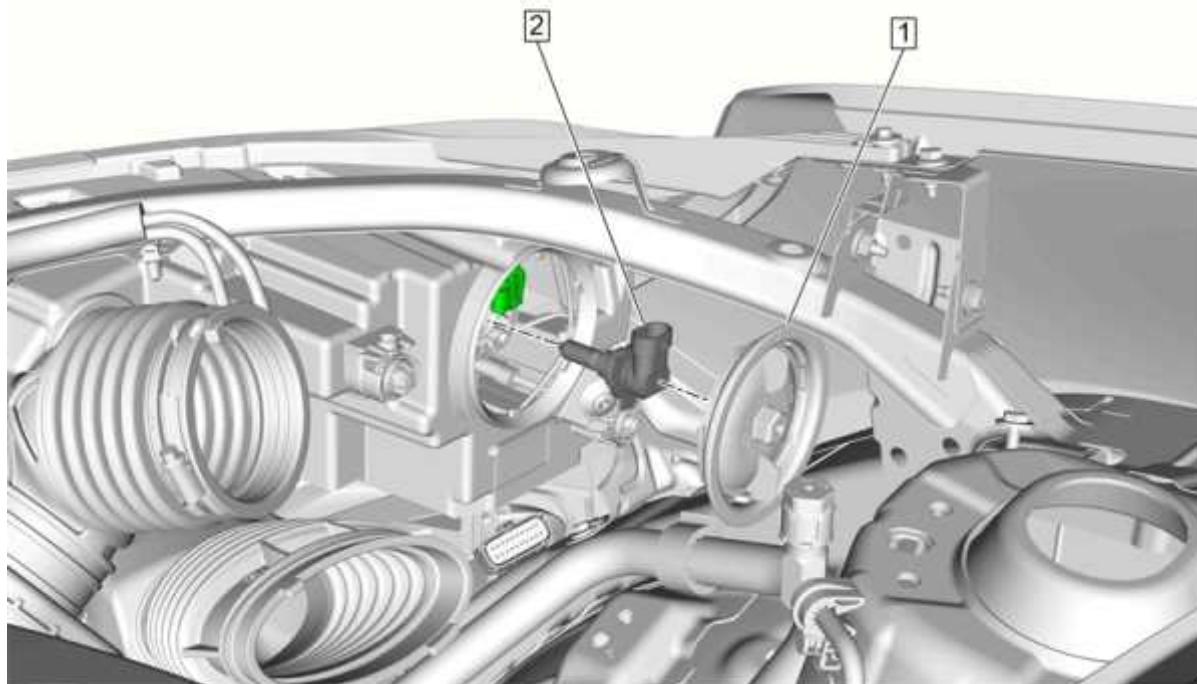


Fig. 50: Headlamp Bulb - Right Side (Chevrolet With T4A And LH7)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Air Cleaner Assembly Replacement</u>	
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure 1. Disconnect the electrical connector. 2. Rotate the bulb socket counterclockwise to remove it from the lamp housing.

HEADLAMP BULB REPLACEMENT - RIGHT SIDE (CHEVROLET WITH T4A AND LTG)

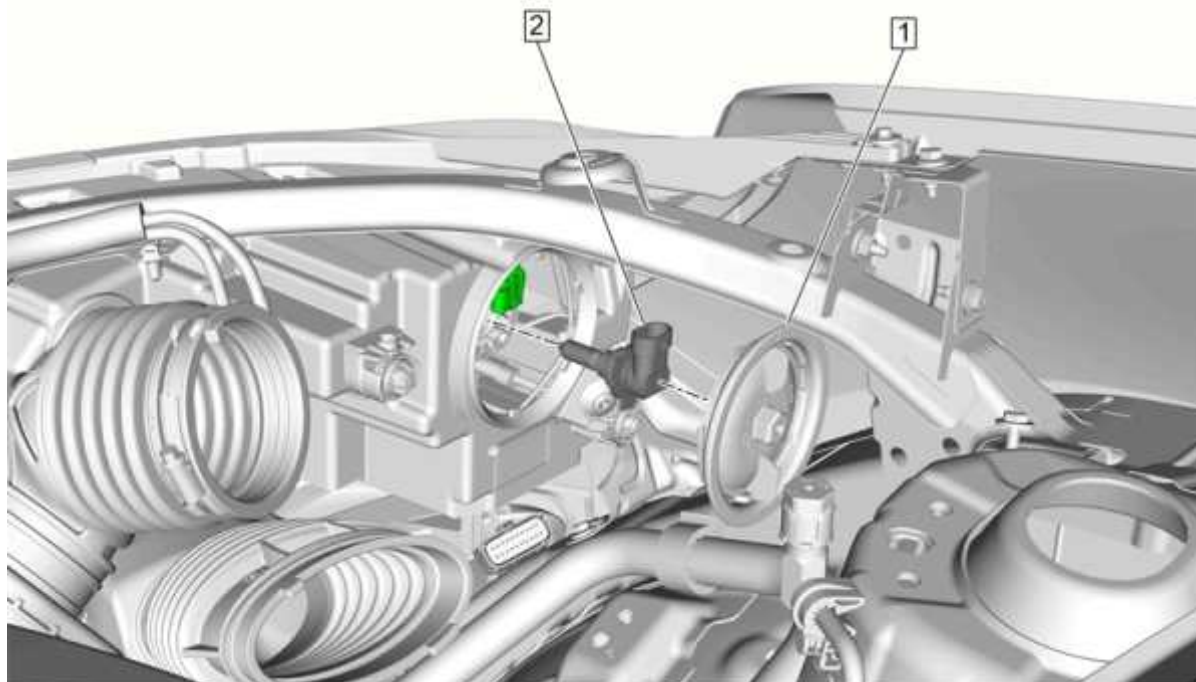


Fig. 51: Headlamp Bulb - Right Side (Chevrolet With T4A And LTG)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Air Cleaner Assembly Replacement</u>	
1	Headlamp Bulb Access Cover Procedure Rotate the bulb access cover counterclockwise to remove it from the lamp housing.
2	Headlamp Bulb WARNING: Refer to <u>Halogen Bulb Warning</u> . Procedure 1. Disconnect the electrical connector. 2. Rotate the bulb socket counterclockwise to remove it from the lamp housing.

HEADLAMP AIMING

Visual Aiming Preparation Procedure

NOTE: Some state and local laws specify requirements for headlamp aim. Comply with all of these laws when performing any headlamp aiming operations.

Headlamp aim should be checked:

- When a new headlamp capsule is installed.
- If service or repairs to the front end area have, or may have, disturbed the headlamps or their mounting.

The aiming screen should meet the following criteria:

- The area will consist of a level surface large enough to allow for a vehicle and an additional 7.62 m (25 ft) measured from face of lamps to the front of the aiming screen.

- The screen will be 1.52 m (5 ft) high x 3.66 m (12 ft) wide with a matte white surface well shaded from extraneous light, and properly adjusted to the floor on which the vehicle stands. Provisions should be made to align the aiming screen parallel with the vehicle.
- The screen shall be provided with a fixed vertical centerline, two laterally adjustable vertical tapes, and one vertically adjustable horizontal tape.
- If a regular commercial aiming screen is not available, the screen may consist of a vertical wall having a clear uninterrupted area approximately 1.83 m (6 ft) high and 3.66 m (12 ft) wide. The surface should be finished with a washable non-gloss white paint.

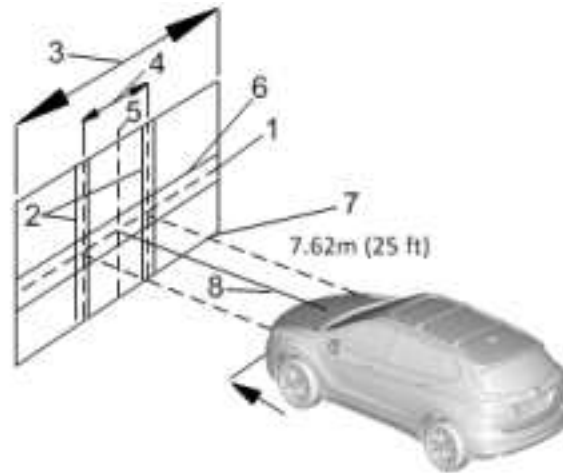


Fig. 52: Headlight Alignment

Courtesy of GENERAL MOTORS COMPANY

- After the aiming screen has been set up in a permanent location, paint a reference line on the floor directly under the lens of the lamps to indicate the proper location of the headlamps when they are being aimed:
 - Distance between headlamps (1)
 - Center line of screen (2)
 - Adjustable vertical pointer (3)
 - Adjustable horizontal tape (4)
 - Diagram of light screen (5)
 - Vertical center line ahead of right headlamp pointer position (6)
 - 7.62 m (25 ft) (7)
 - Car axis (8)
 - Adjustable vertical pointer
 - Horizontal center line of lamps
 - Vertical center line ahead of left headlamp

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

1. Remove any snow, ice or mud from the vehicle.
2. The vehicle must have a full tank of gas.
3. Stop all other work on the vehicle.
4. If any service has been performed on the vehicle, make sure that all of the components are back in their original place.
5. The vehicle must be on a level surface.
6. The vehicle left tires must be aligned with the reference line extending from the screen with the headlamps aligned with the reference line.
7. Do not load any cargo in the vehicle.
8. The vehicle must contain approximately 75 kg (165 lb) on the driver seat.
9. Inflate the tires to the proper pressure.

10. Simulate the vehicle loads if the intended use of the vehicle is for hauling heavy loads or towing a trailer.
11. Rock the vehicle in order to stabilize the suspension.
12. Turn on the headlamps to low beam and observe the left and the top edges of the high intensity zone on the screen. The edges of the high intensity zone should fall within the specifications.

Headlamp Aiming Procedure

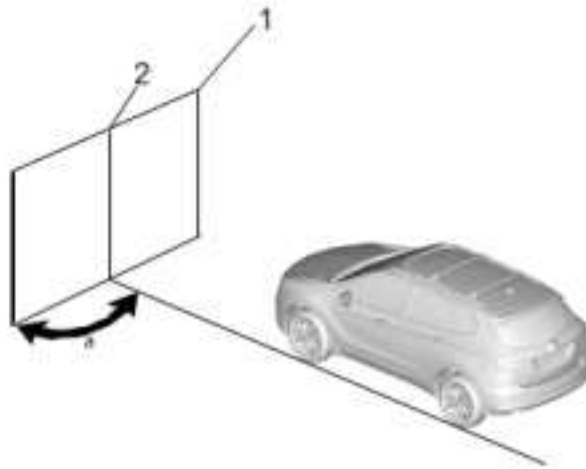


Fig. 53: Headlamp Aiming

Courtesy of GENERAL MOTORS COMPANY

1. Open the hood.
2. Measure from the floor to the center of the headlamp bulb. Some headlamps have an aim dot marked on the headlamp lens.
3. At the screen, measure from the floor and place the horizontal tape at the measured distance.
4. Measure from the reference line on the floor to the left headlamp bulb centerline.
5. At the screen (1), measure from the reference line and place the vertical tape at the measured distance.
6. Measure from the reference line on the floor to the right headlamp bulb centerline.
7. At the screen, measure from the reference line and place the vertical tape (2) at the measured distance.

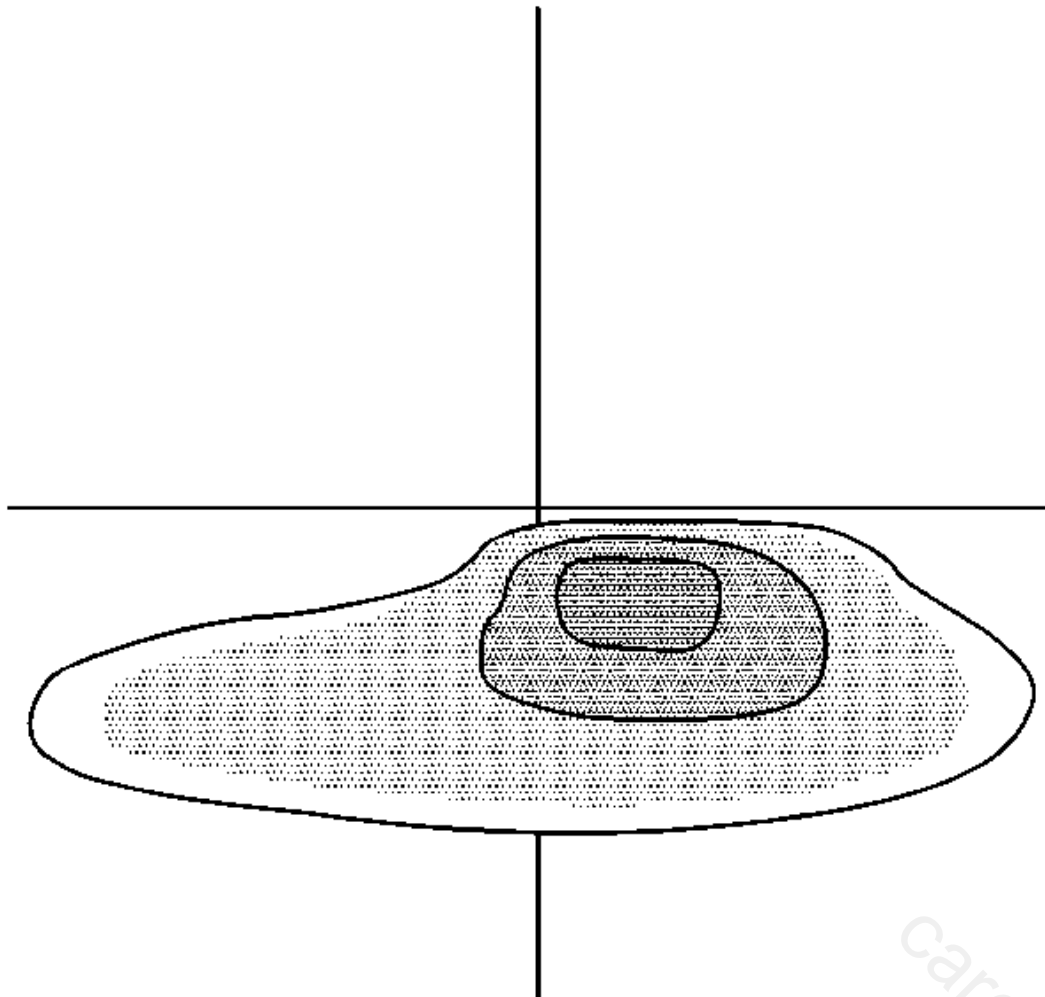


Fig. 54: Identifying Right Side Low Beam Proper Screen Positioning
 Courtesy of GENERAL MOTORS COMPANY

NOTE: DO NOT cover the headlamp. This may cause excessive heat build up.

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

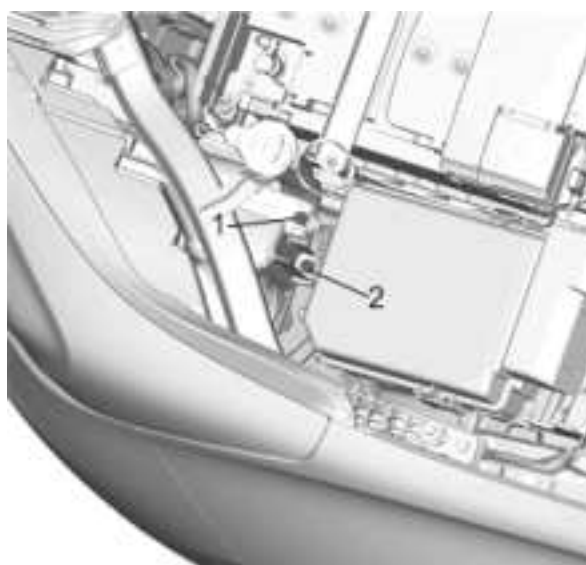


Fig. 55: Aim Screws
 Courtesy of GENERAL MOTORS COMPANY

9. Adjust the vertical aim screw (1) and the horizontal aim screw (2) of the headlamps to the specifications required by the state and the local authorities, or as shown in step number 8.
10. Repeat the aiming procedure for the passenger side headlamp while blocking the light from projecting onto the screen from the driver side headlamp.
11. Turn the headlamps OFF.
12. Close the hood.

FRONT SUSPENSION AUTOMATIC FORWARD LIGHTING POSITION SENSOR REPLACEMENT

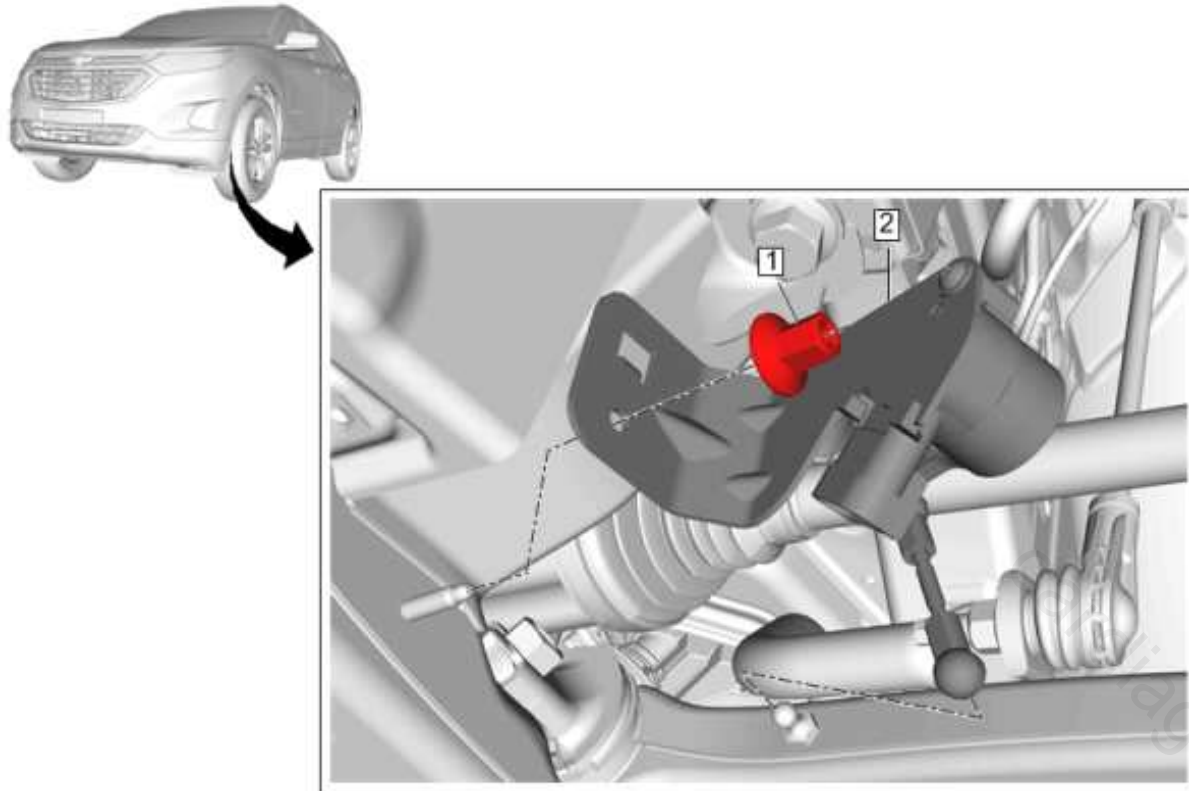


Fig. 56: Front Suspension Automatic Forward Lighting Position Sensor
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Lifting and Jacking the Vehicle</u>	
1	Front Suspension Automatic Forward Lighting Position Sensor Nut CAUTION: Refer to <u>Fastener Caution</u> . Procedure Disconnect the electrical connector. Tighten 9 N.m (80 lb in)
2	Front Suspension Automatic Forward Lighting Position Sensor Procedure Disconnect the ball socket from the ball stud.

HEADLAMP AUTOMATIC CONTROL MODULE REPLACEMENT

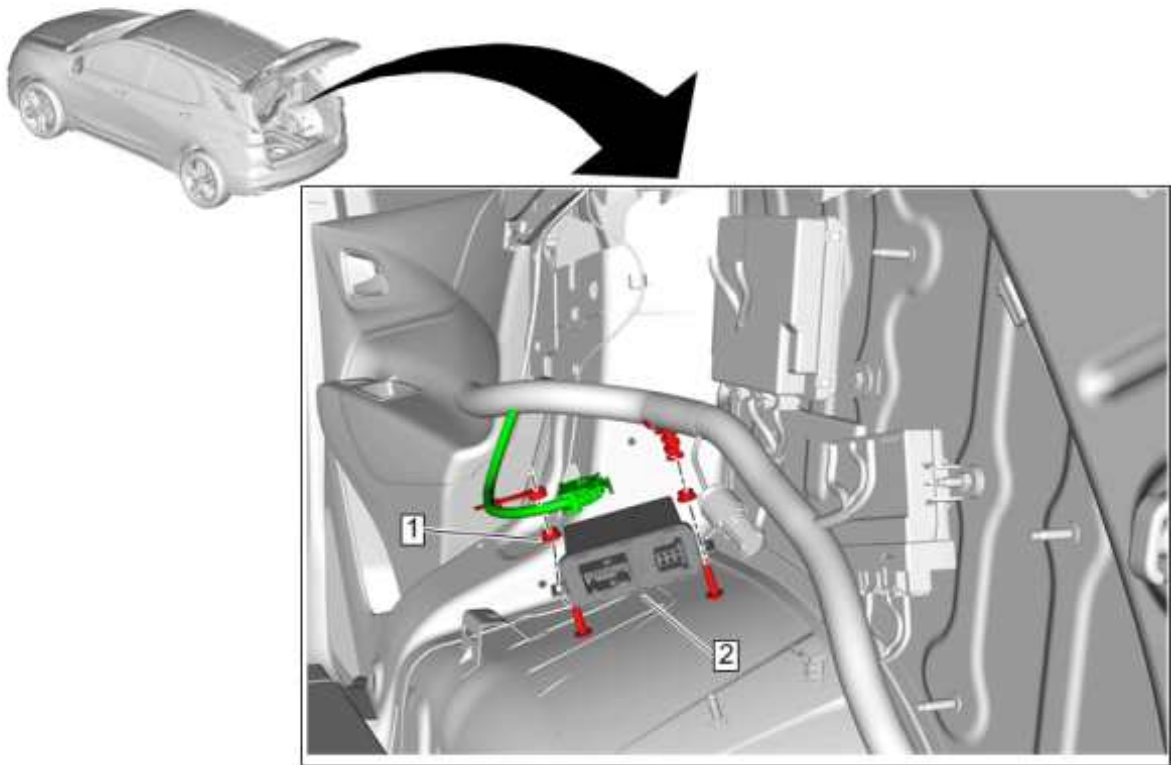


Fig. 57: Headlamp Automatic Control Module
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove Rear Quarter Lower Trim Panel Assembly-Right Side - Quarter Lower Rear Trim Panel Replacement (Left Side) Quarter Lower Rear Trim Panel Replacement (Right Side)	
1	Headlamp Control Module Nut [2x] CAUTION: Refer to Fastener Caution Tighten 6 N.m (53 lb in)
2	Headlamp Control Module Procedure 1. Disconnect the electrical connector. 2. Perform the necessary programming and setup procedure: Control Module References

FRONT FOG LAMP REPLACEMENT (CHEVROLET)

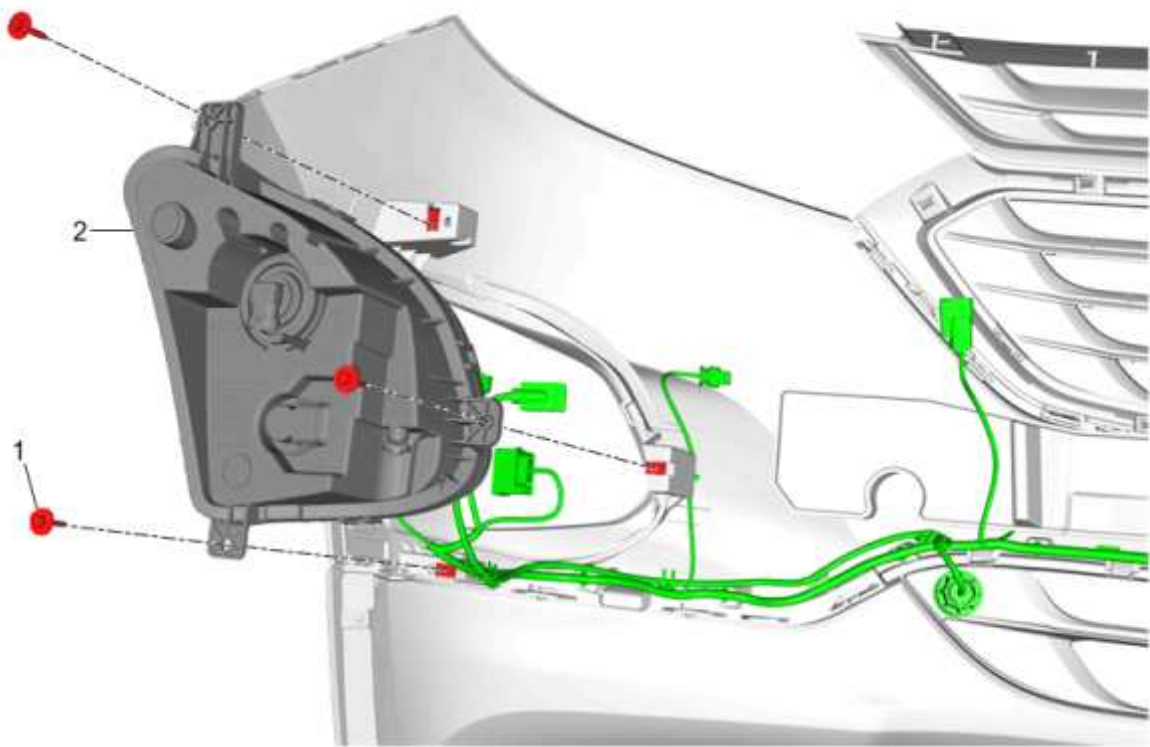


Fig. 58: Front Fog Lamp (Chevrolet)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Front Bumper Fascia Replacement (Equinox) - Disconnect the electrical connector. - Disconnect and reposition harness as necessary.	
1	Front Fog Lamp Screw [3x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	Front Fog Lamp Procedure - Transfer components as necessary. - After installation, aim the fog lamps. Refer to Fog Lamp Aiming

FRONT FOG LAMP REPLACEMENT (GMC - LEFT)

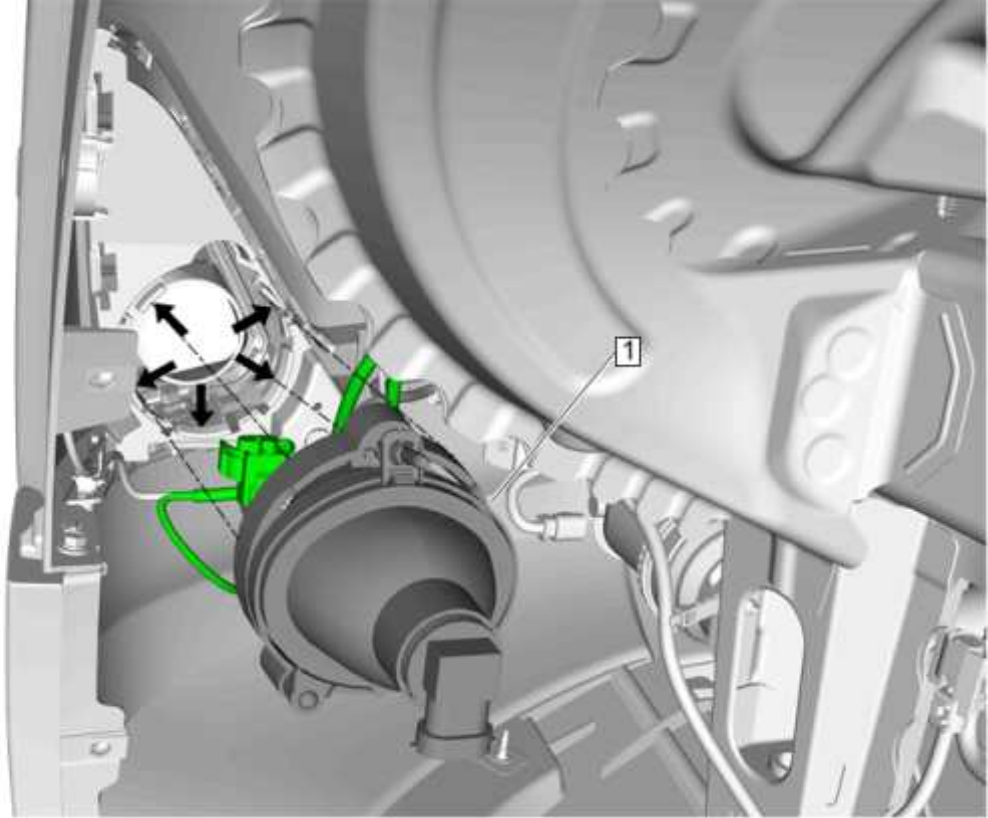


Fig. 59: Front Fog Lamp (GMC - Left)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Reposition the forward half of the left front wheelhouse liner away to gain access to the component. Refer to <u>Front Wheelhouse Liner Replacement - Left Side (Terrain)</u>	
1	Front Fog Lamp Procedure 1. Disconnect the electrical connector. 2. Release the retainers. 3. Transfer components as necessary. 4. Front Fog Lamp - Adjust - <u>Fog Lamp Aiming</u>

FRONT FOG LAMP REPLACEMENT (GMC - RIGHT)

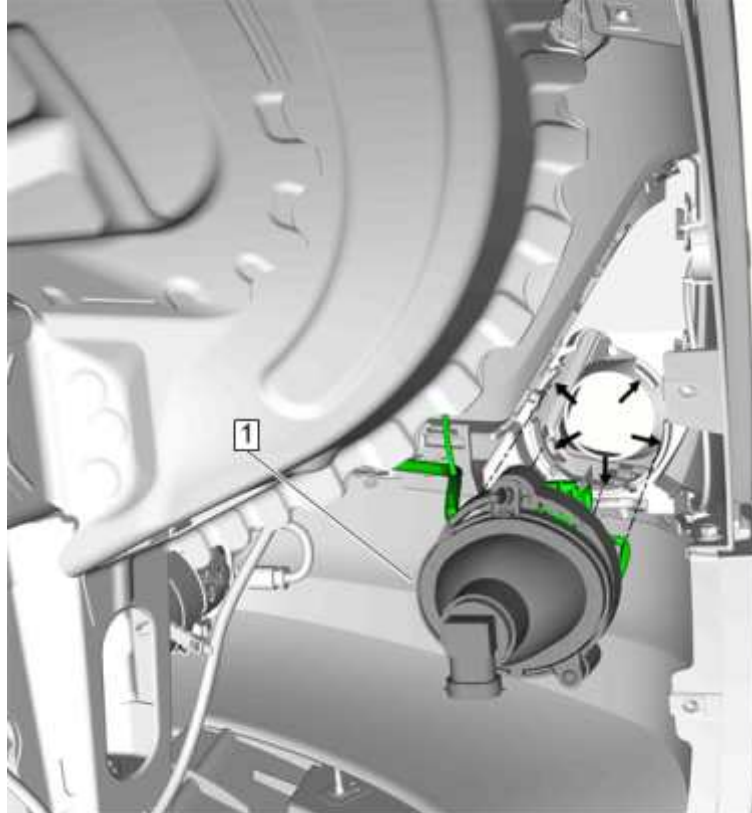


Fig. 60: Front Fog Lamp (GMC - Right)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Reposition the forward half of the right front wheelhouse liner away to gain access to the component. Front Wheelhouse Liner Replacement - Right Side (Terrain)	
1	Front Fog Lamp Procedure 1. Disconnect the electrical connector. 2. Release the retainers. 3. Transfer components as necessary. 4. Front Fog Lamp - Adjust - Fog Lamp Aiming

FRONT FOG LAMP BULB REPLACEMENT (CHEVROLET - LEFT SIDE)

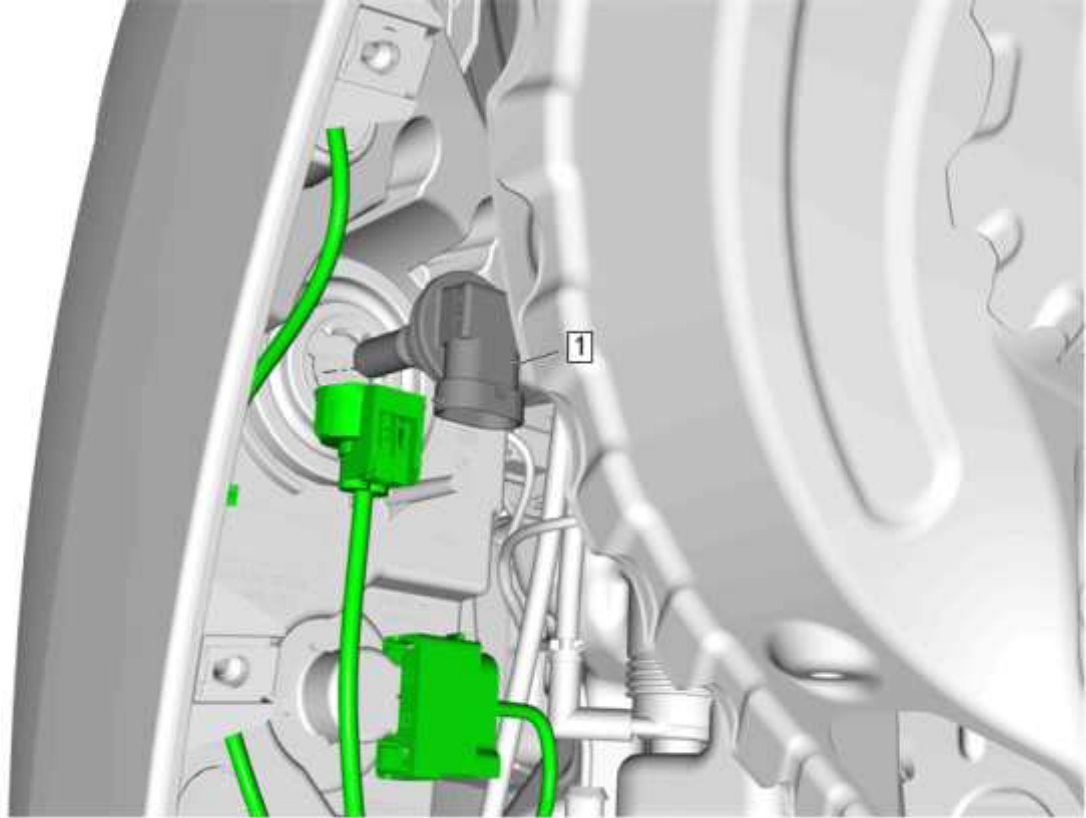


Fig. 61: Front Fog Lamp Bulb (Chevrolet - Left Side)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	WARNING: Refer to Halogen Bulb Warning . Front Fog Lamp Bulb-Left Side Procedure 1. Open fog lamp access door. 2. Disconnect the electrical connector. 3. Rotate the bulb socket a quarter turn counterclockwise and remove.

FRONT FOG LAMP BULB REPLACEMENT (CHEVROLET - RIGHT SIDE)

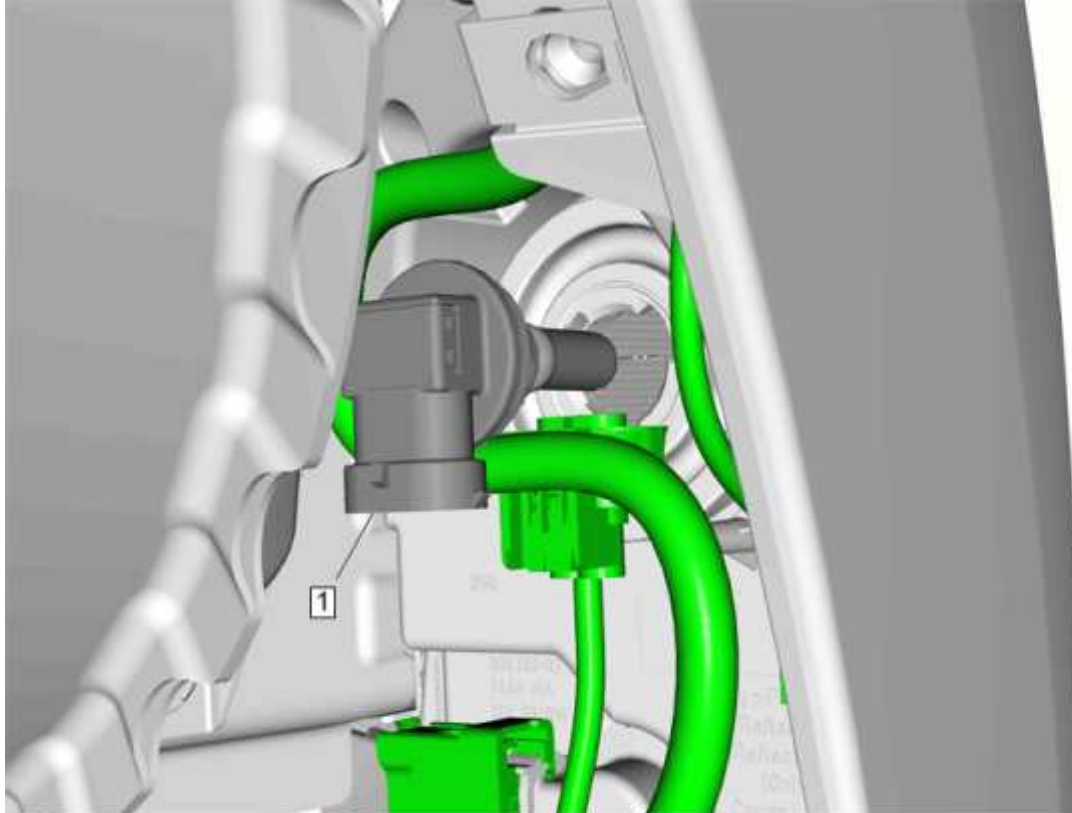


Fig. 62: Front Fog Lamp Bulb (Chevrolet - Right Side)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	WARNING: Refer to Halogen Bulb Warning . Front Fog Lamp Bulb-Right Side Procedure 1. Open fog lamp access door. 2. Disconnect the electrical connector. 3. Rotate the bulb socket a quarter turn counterclockwise and remove.

FRONT FOG LAMP BULB REPLACEMENT (GMC - LEFT)

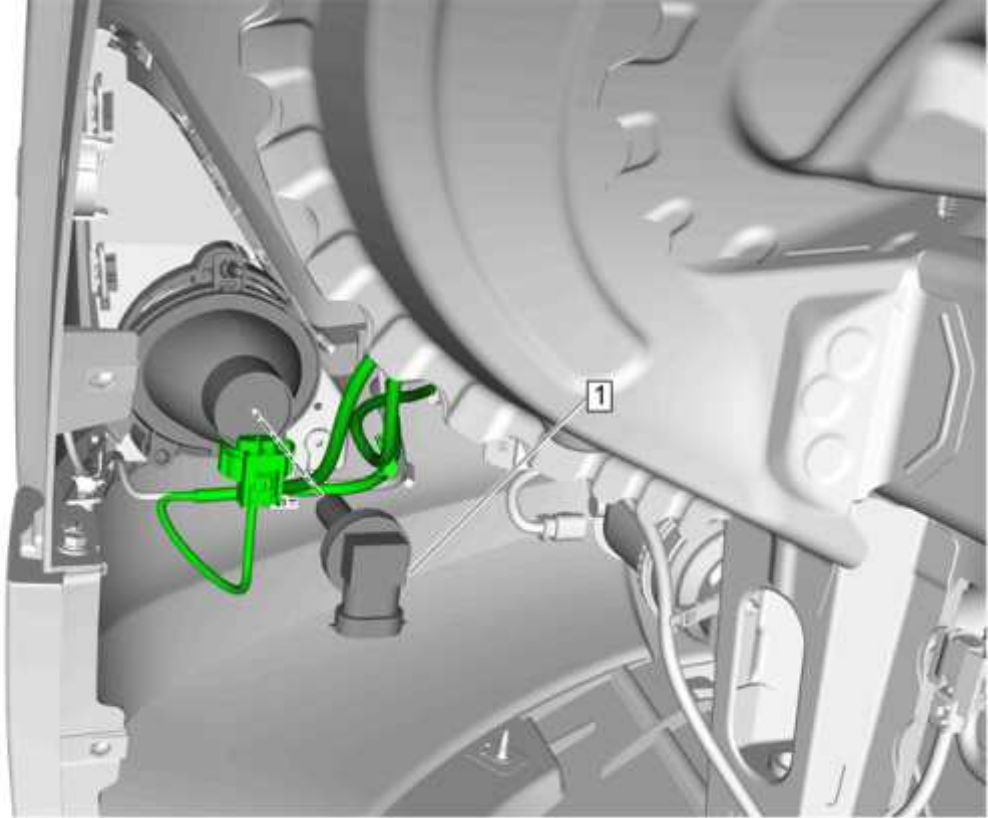


Fig. 63: Front Fog Lamp Bulb (GMC - Left)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: Refer to Halogen Bulb Warning .	
Preliminary Procedure Reposition the forward half of the left front wheelhouse liner away to gain access to the component. Front Wheelhouse Liner Replacement - Left Side (Terrain)	
1	Front Fog Lamp Bulb Procedure 1. Disconnect the electrical connector. 2. Rotate the bulb a quarter turn counterclockwise and remove.

FRONT FOG LAMP BULB REPLACEMENT (GMC - RIGHT)

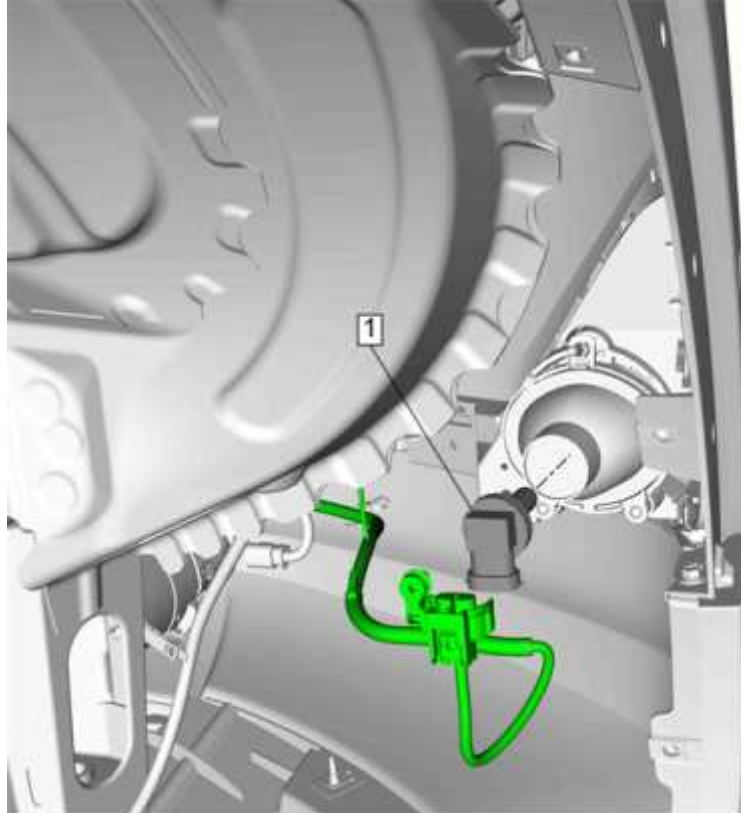


Fig. 64: Front Fog Lamp Bulb (GMC - Right)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: Refer to Halogen Bulb Warning .	
Preliminary Procedure Reposition the forward half of the right front wheelhouse liner away to gain access to the component. Front Wheelhouse Liner Replacement - Right Side (Terrain)	
1	Front Fog Lamp Bulb Procedure 1. Disconnect the electrical connector. 2. Rotate the bulb a quarter turn counterclockwise and remove.

FOG LAMP AIMING

Preparation Procedure

NOTE: Horizontal aim is not adjustable on this vehicle. Adjust the fog lamp as required using the adjusting screw above the projector lens on the outside of the front bumper fascia. Prior to aiming the fog lamps, perform the following steps:

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

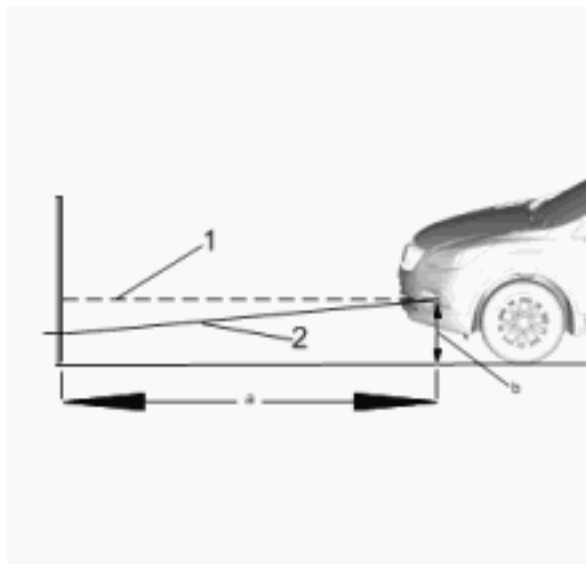


Fig. 65: Horizontal Centerline

Courtesy of GENERAL MOTORS COMPANY

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



Fig. 66: Adjusting Screw

Courtesy of GENERAL MOTORS COMPANY

6. Adjust the fog lamp as required using the adjusting screw (1) above the projector lens on the outside of the front bumper fascia.
7. After the adjustments are made, turn OFF the fog lamps.

SIDE MARKER BULB REPLACEMENT (WITHOUT UGE)

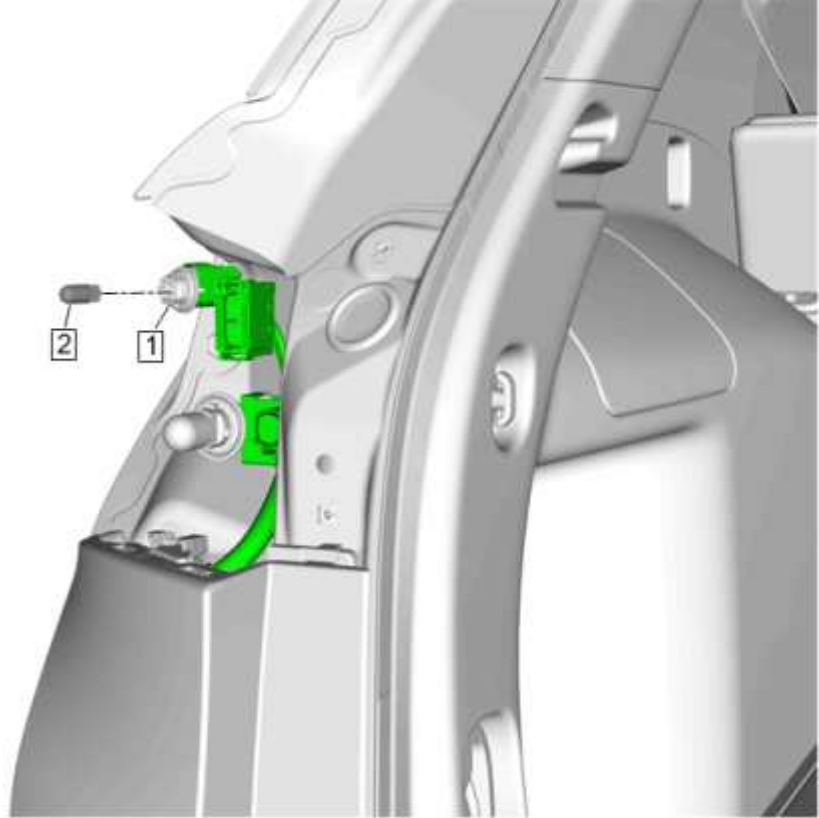


Fig. 67: Side Marker Bulb

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Reposition and support the rear body structure stop lamp. Rear Body Structure Stop Lamp Replacement (Chevrolet Without UGE)	
1	Side Marker Lamp Bulb Socket Procedure Rotate the bulb socket a quarter turn counterclockwise and remove.
2	Side Marker Bulb Procedure Pull the bulb straight from the lamp socket.

TURN SIGNAL BULB REPLACEMENT - LEFT SIDE (CHEVROLET)

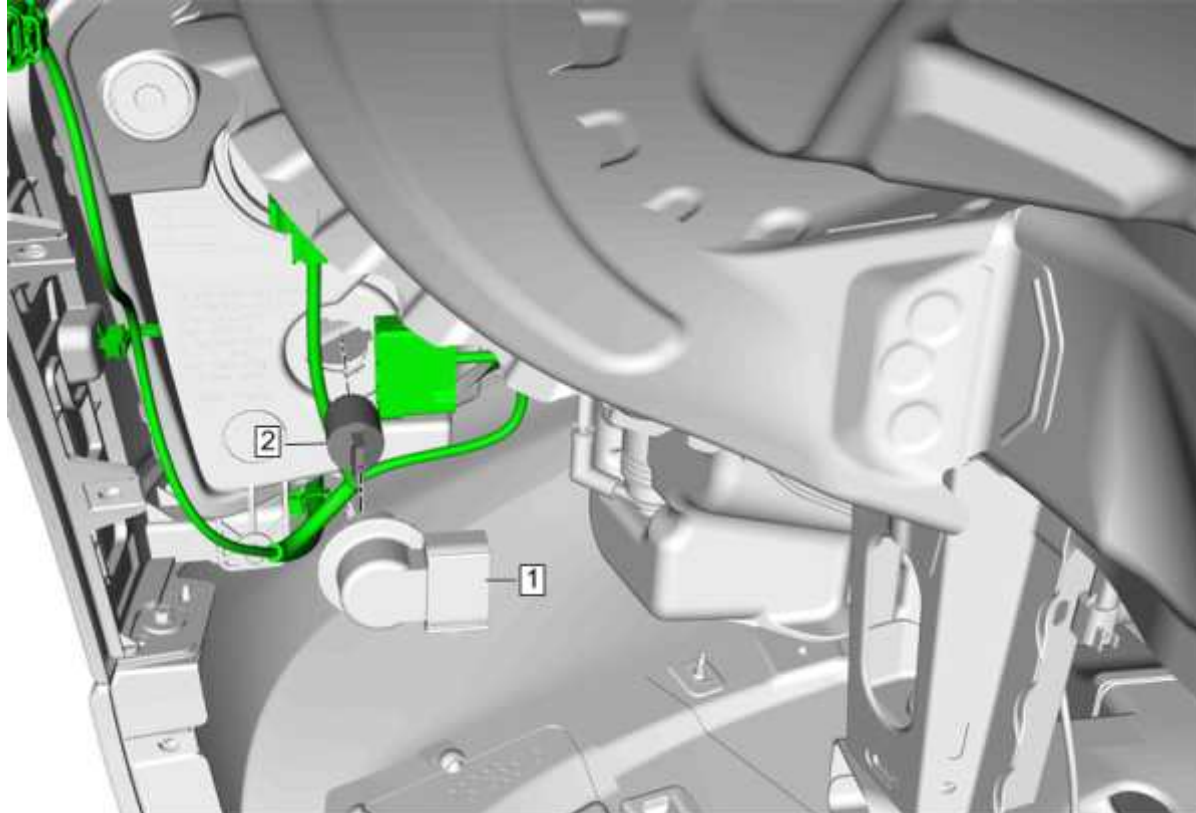


Fig. 68: Turn Signal Bulb - Left Side (Chevrolet)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Front Turn Signal Lamp Bulb Socket Procedure 1. Open fog lamp access door. 2. Disconnect the electrical connector. 3. Disconnect and reposition harness as necessary. 4. Rotate the bulb socket a quarter turn counterclockwise and remove.
2	Turn Signal Bulb - Left Side WARNING: Refer to Halogen Bulb Warning . Procedure Pull the bulb straight from the lamp socket.

TURN SIGNAL BULB REPLACEMENT - LEFT SIDE (GMC)

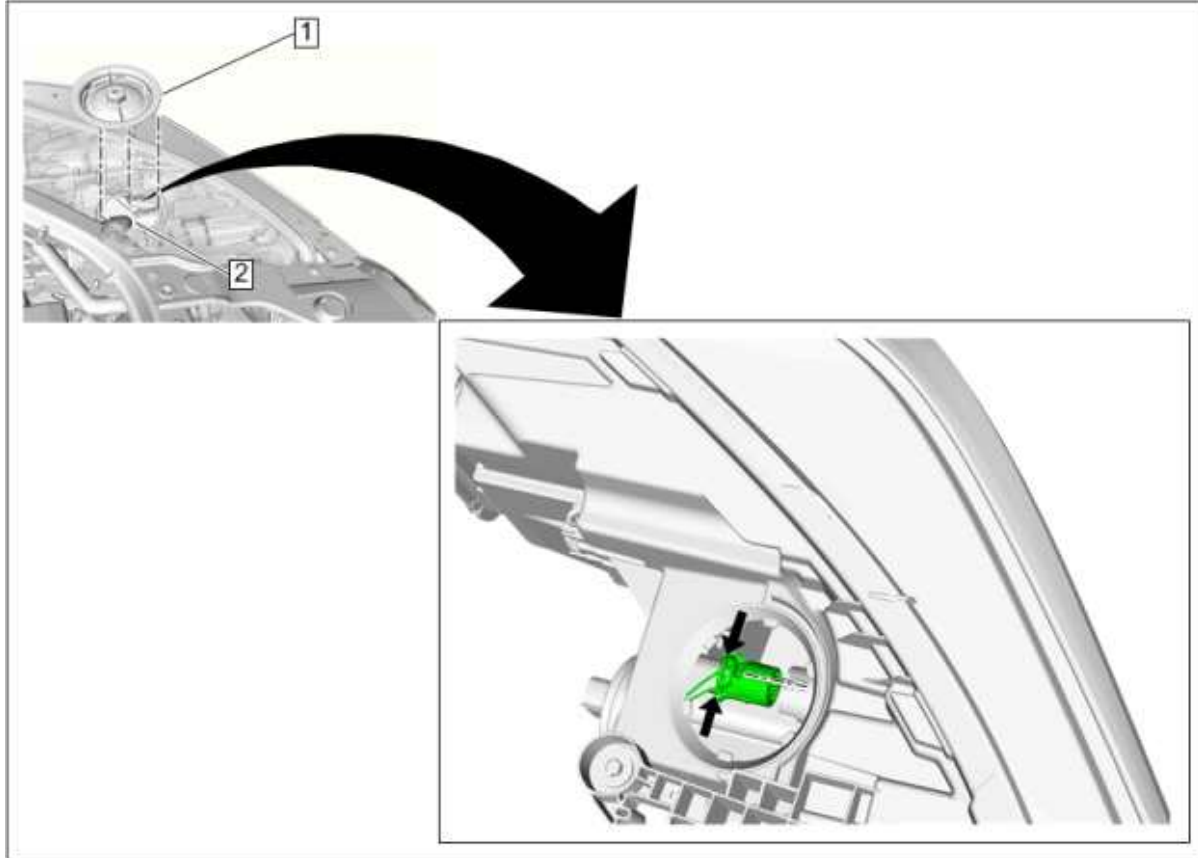


Fig. 69: Turn Signal Bulb - Left Side (GMC)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Headlamp Bulb Access Cover Procedure Rotate the headlamp bulb access hole cover counterclockwise and pull from the headlamp.
2	Turn Signal Bulb Procedure 1. Squeeze the tabs and pull rearward to release the socket from the housing. 2. Pull the bulb straight from the lamp socket.

TURN SIGNAL BULB REPLACEMENT - RIGHT SIDE (CHEVROLET)

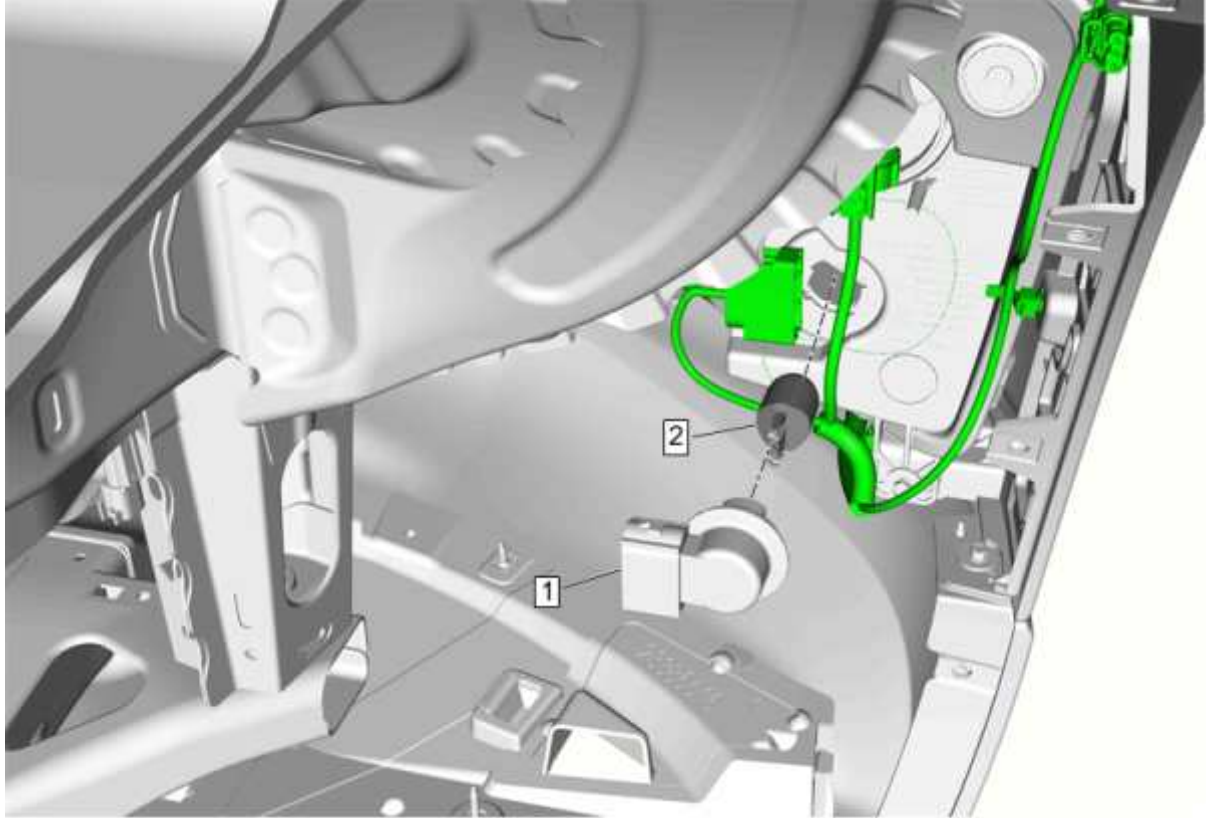


Fig. 70: Turn Signal Bulb - Right Side (Chevrolet)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Front Turn Signal Lamp Bulb Socket Procedure 1. Open fog lamp access door. 2. Disconnect the electrical connector. 3. Disconnect and reposition harness as necessary. 4. Rotate the bulb socket a quarter turn counterclockwise and remove.
2	Turn Signal Bulb - Right Side WARNING: Refer to Halogen Bulb Warning . Procedure Pull the bulb straight from the lamp socket.

TURN SIGNAL BULB REPLACEMENT - RIGHT SIDE (GMC)

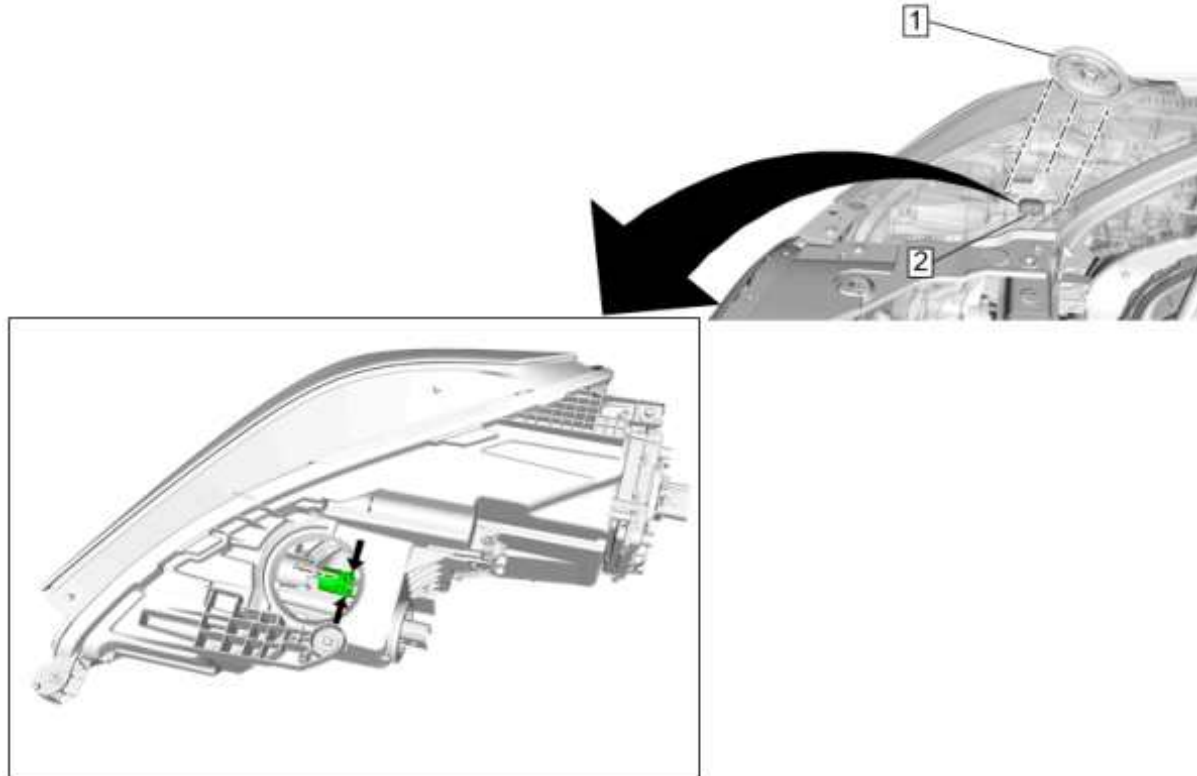


Fig. 71: Turn Signal Bulb - Right Side (GMC).
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Headlamp Bulb Access Cover Procedure Rotate the headlamp bulb access hole cover counterclockwise and pull from the headlamp.
2	Turn Signal Bulb Procedure 1. Squeeze the tabs and pull rearward to release the socket from the housing. 2. Pull the bulb straight from the lamp socket.

HIGH MOUNT STOP LAMP REPLACEMENT (CHEVROLET)

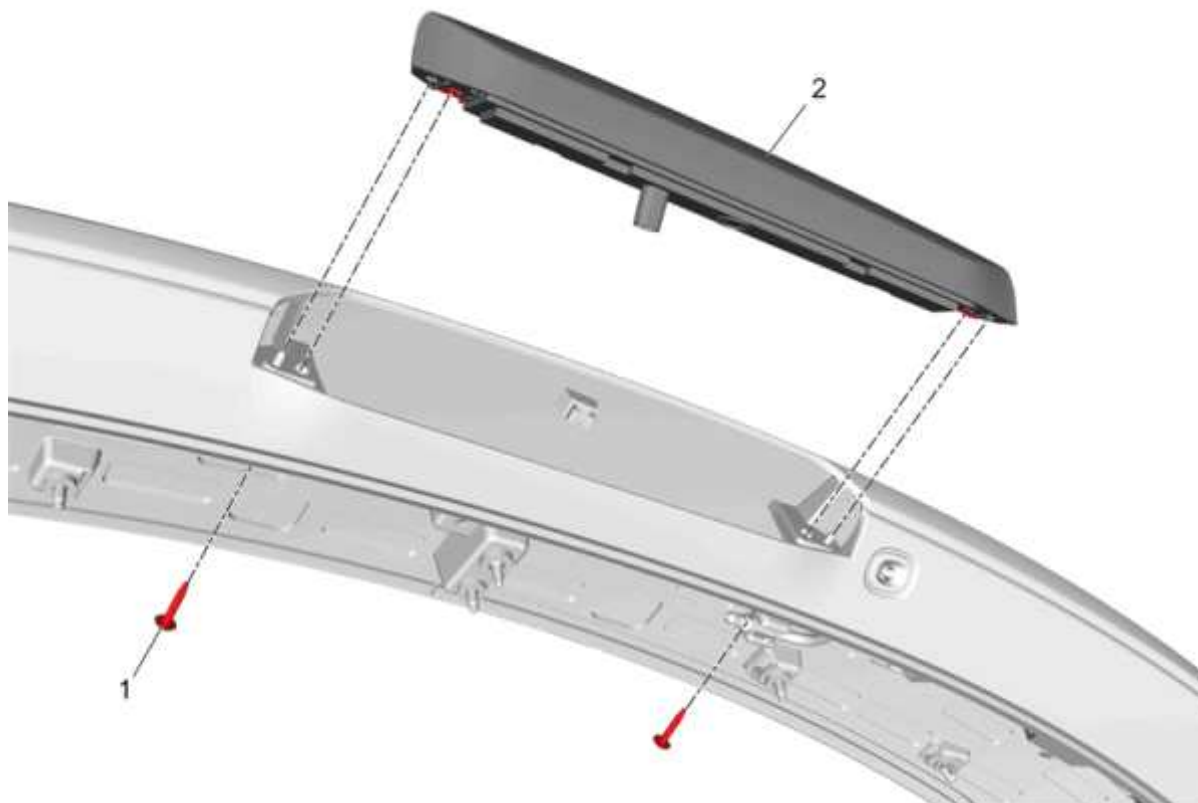


Fig. 72: High Mount Stop Lamp (Chevrolet)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Rear End Spoiler Replacement (Equinox)	
1	High Mount Stop Lamp Screw [2x] CAUTION: Refer to Fastener Caution . Tighten 1.4 N.m (12 lb in)
2	High Mount Stop Lamp Procedure Disconnect the electrical connector.

HIGH MOUNT STOP LAMP REPLACEMENT (GMC)

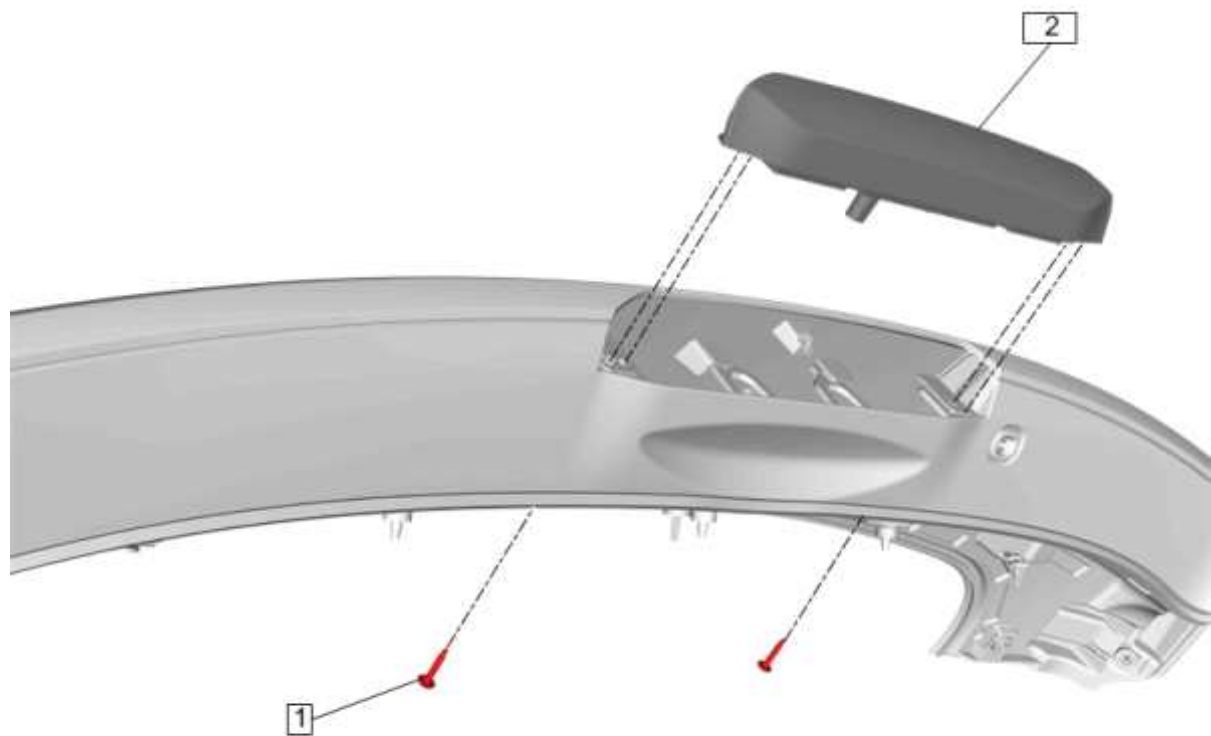


Fig. 73: High Mount Stop Lamp (GMC)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Rear End Spoiler Replacement (Terrain)	
1	High Mount Stop Lamp Screw [2x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	High Mount Stop Lamp Procedure Disconnect the electrical connector.

REAR BODY STRUCTURE STOP LAMP REPLACEMENT (CHEVROLET WITHOUT UGE)

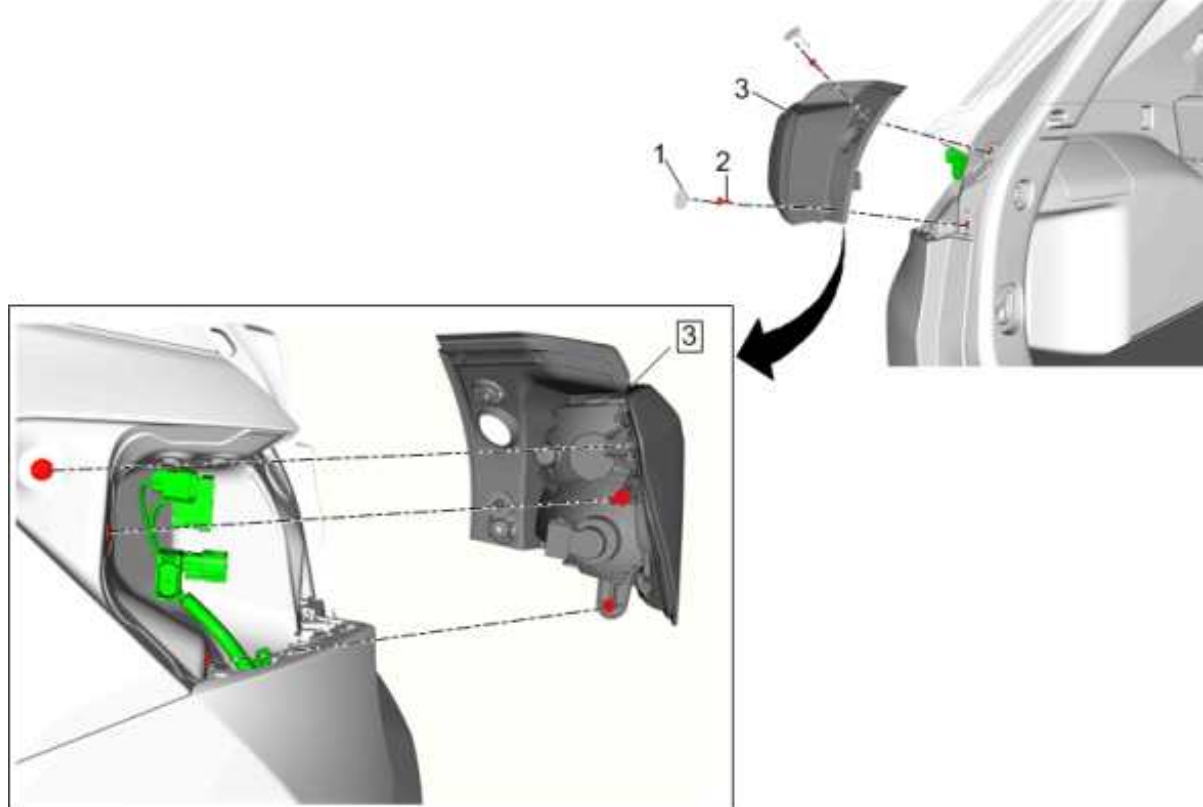


Fig. 74: Rear Body Structure Stop Lamp (Chevrolet Without UGE)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Rear Body Structure Stop Lamp Cap [2x]
2	Rear Body Structure Stop Lamp Screw [2x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
3	Rear Body Structure Stop Lamp Procedure 1. Carefully pull the lamp rearward in order to disengage the locator pins from the body side outer panel. 2. Disconnect the electrical connectors. 3. Transfer components as necessary.

REAR BODY STRUCTURE STOP LAMP REPLACEMENT (CHEVROLET WITH UGE)

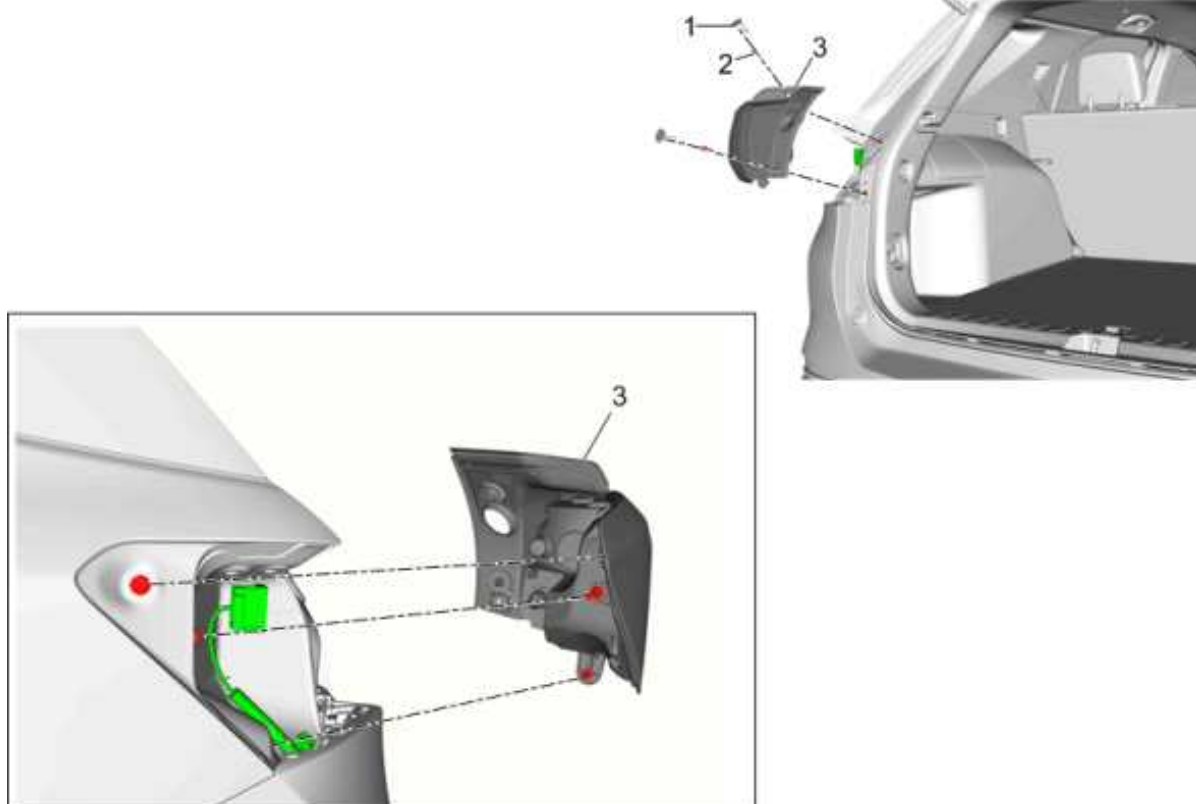


Fig. 75: Rear Body Structure Stop Lamp (Chevrolet With UGE).

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Rear Body Structure Stop Lamp Cap [2x]
2	Rear Body Structure Stop Lamp Screw [2x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
3	Rear Body Structure Stop Lamp Procedure 1. Carefully pull the lamp rearward in order to disengage the locator pins from the body side outer panel. 2. Disconnect the electrical connector.

REAR BODY STRUCTURE STOP LAMP REPLACEMENT (GMC)

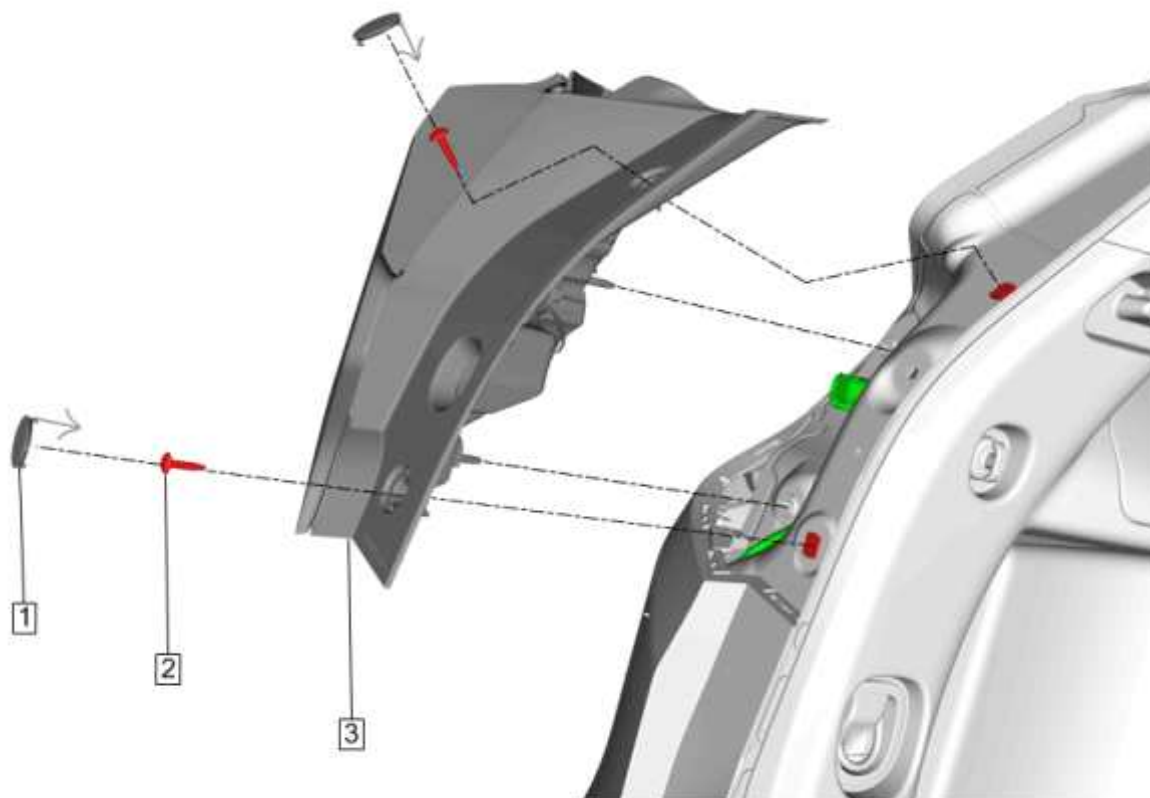


Fig. 76: Rear Body Structure Stop Lamp (GMC)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Rear Body Structure Stop Lamp Cap [2x]
2	Rear Body Structure Stop Lamp Screw [2x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
3	Rear Body Structure Stop Lamp Procedure 1. Carefully pull the lamp rearward in order to disengage the locator pins from the body side outer panel. 2. Disconnect the electrical connector. 3. Transfer components as necessary.

CARGO CENTER COURTESY LAMP REPLACEMENT

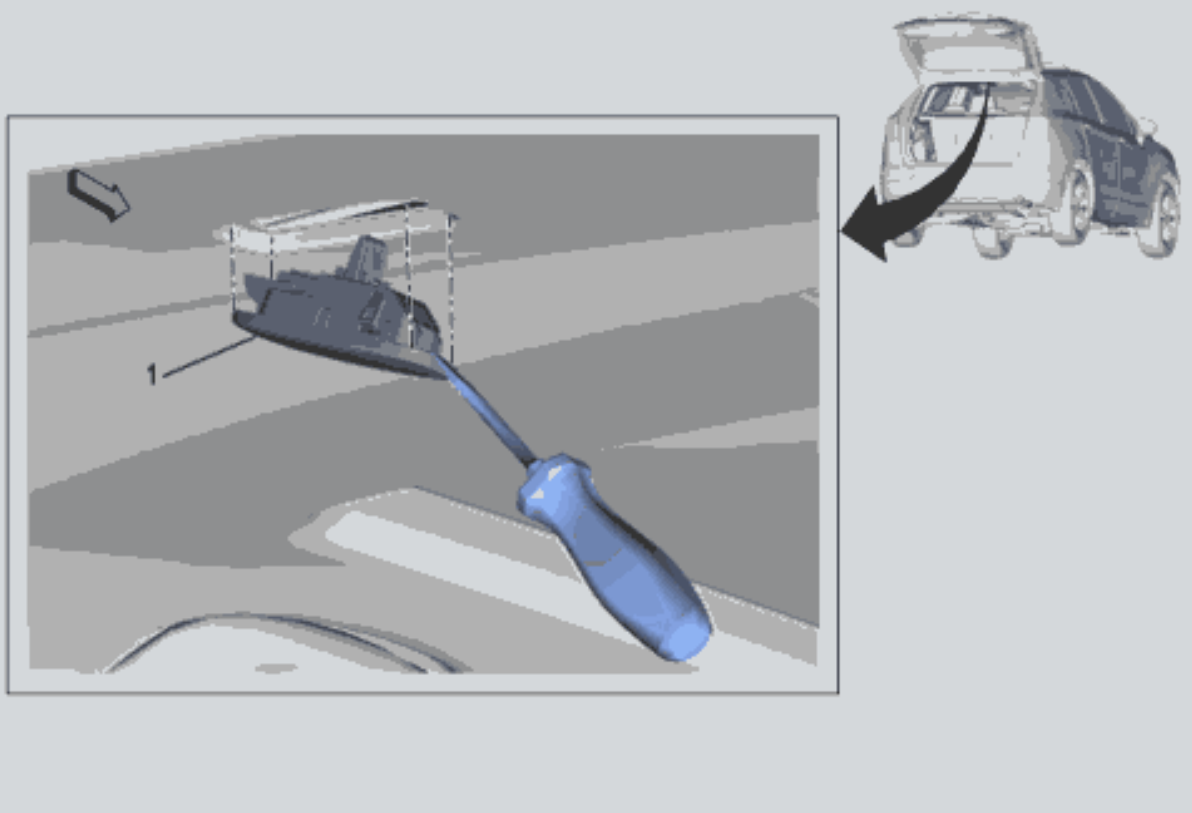


Fig. 77: Cargo Center Courtesy Lamp
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Open the liftgate.	
1	Cargo Center Courtesy Lamp Procedure 1. Use an appropriate tool to release the lamp from the headlining trim panel. 2. Disconnect the electrical connector.

BACKUP BULB REPLACEMENT (CHEVROLET)

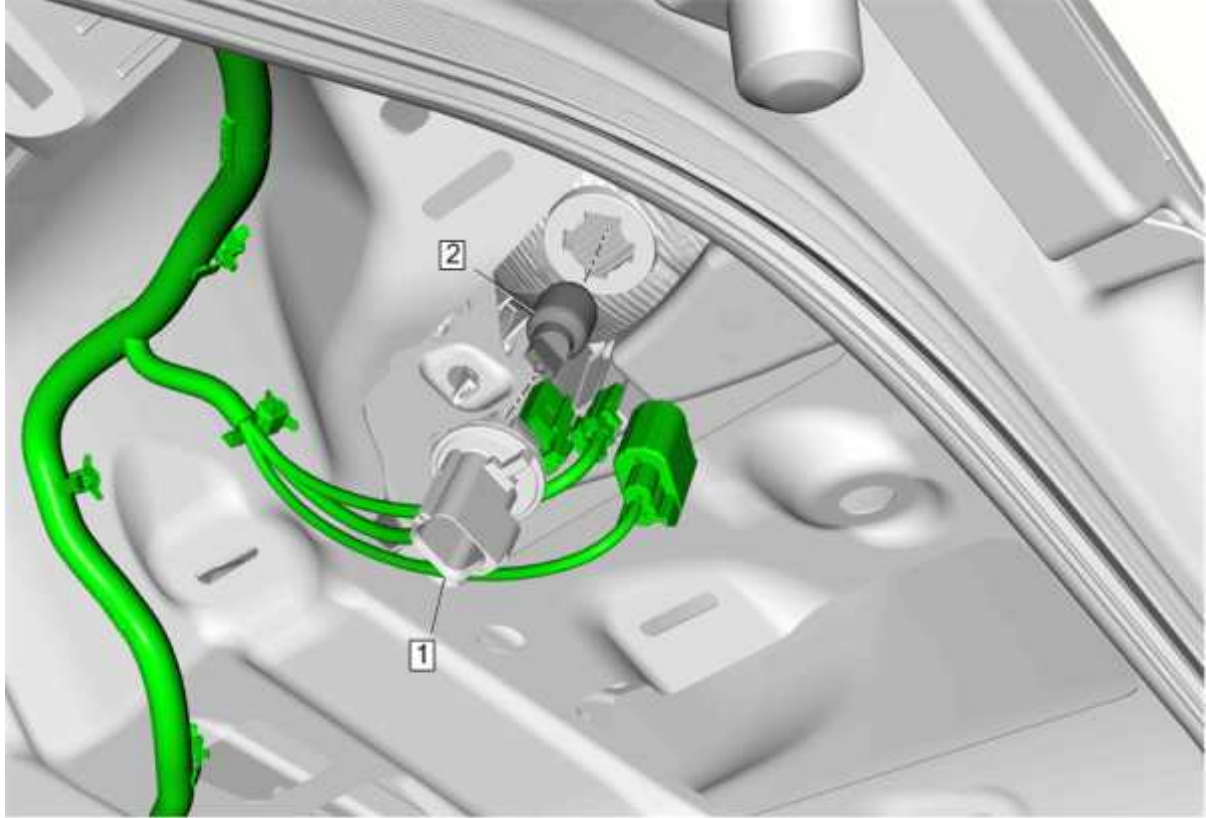


Fig. 78: Backup Bulb (Chevrolet)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Liftgate Lower Trim Finish Panel Replacement</u>	
1	Backup Lamp Bulb Socket Procedure Rotate the bulb socket a quarter turn counterclockwise and remove.
2	Backup Bulb Procedure Pull the bulb straight from the lamp socket.

BACKUP BULB REPLACEMENT (GMC)

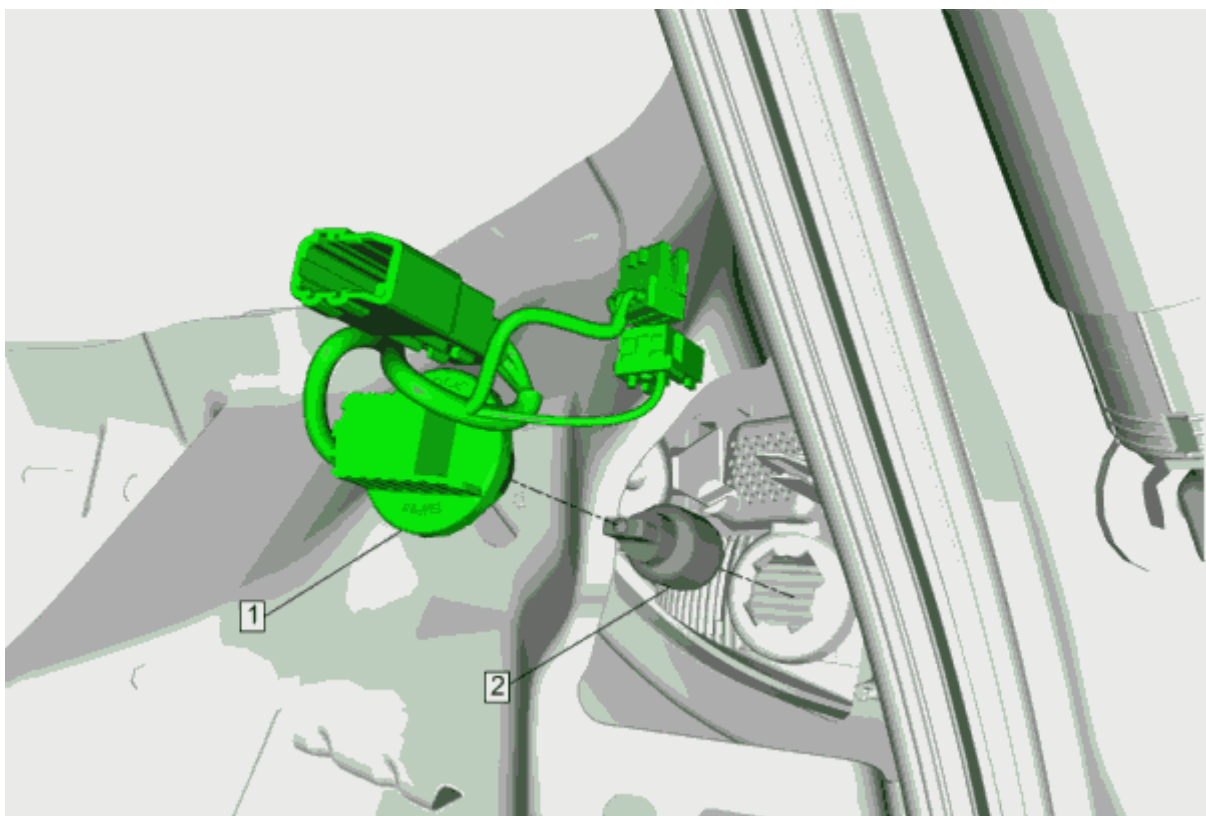


Fig. 79: Backup Bulb (GMC)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Liftgate Lower Trim Finish Panel Replacement</u>	
1	Backup Lamp Bulb Socket Procedure Rotate the bulb socket a quarter turn counterclockwise and remove.
2	Backup Bulb Procedure Pull the bulb straight from the lamp socket.

REAR LICENSE PLATE LAMP REPLACEMENT (CHEVROLET)

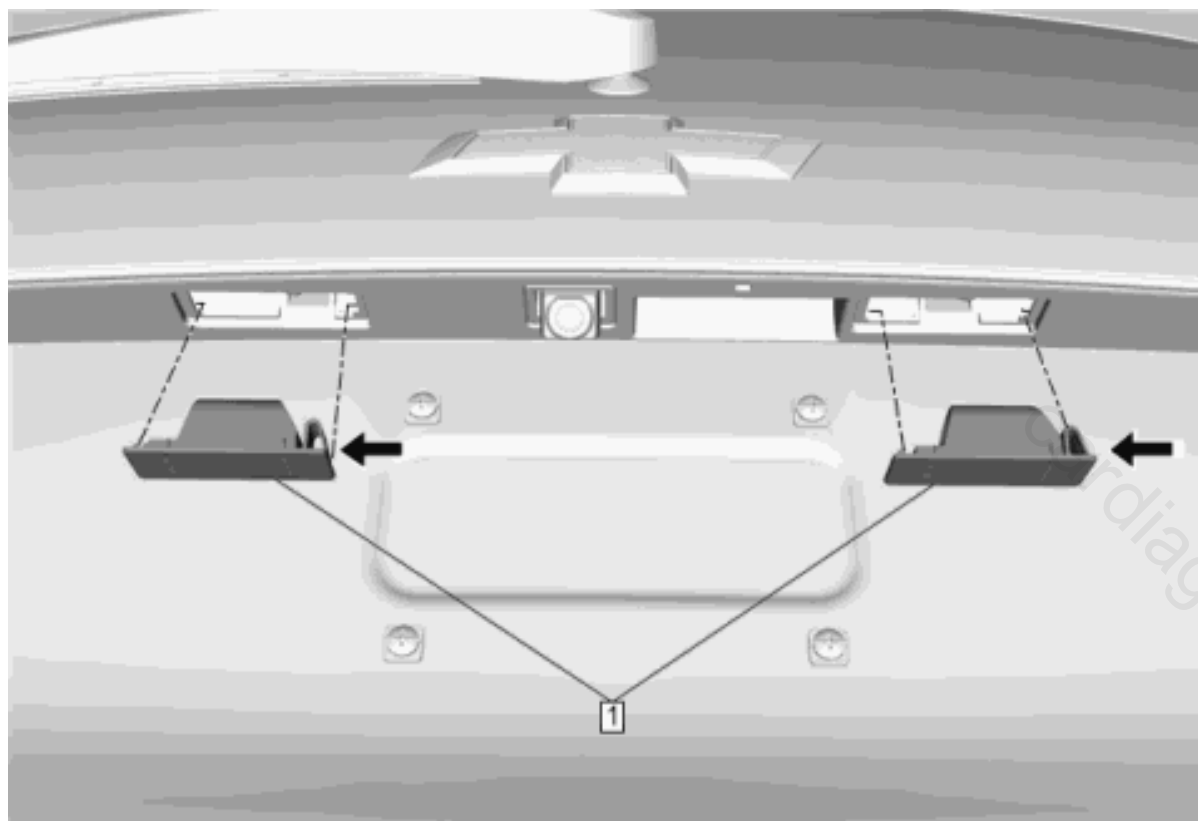


Fig. 80: Rear License Plate Lamp (Chevrolet)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Rear License Plate Lamp Procedure 1. Using a flat-bladed tool, depress the tab and pull downward to remove the lamp. 2. Disconnect the electrical connector. 3. Transfer components as necessary.

REAR LICENSE PLATE LAMP REPLACEMENT (GMC)

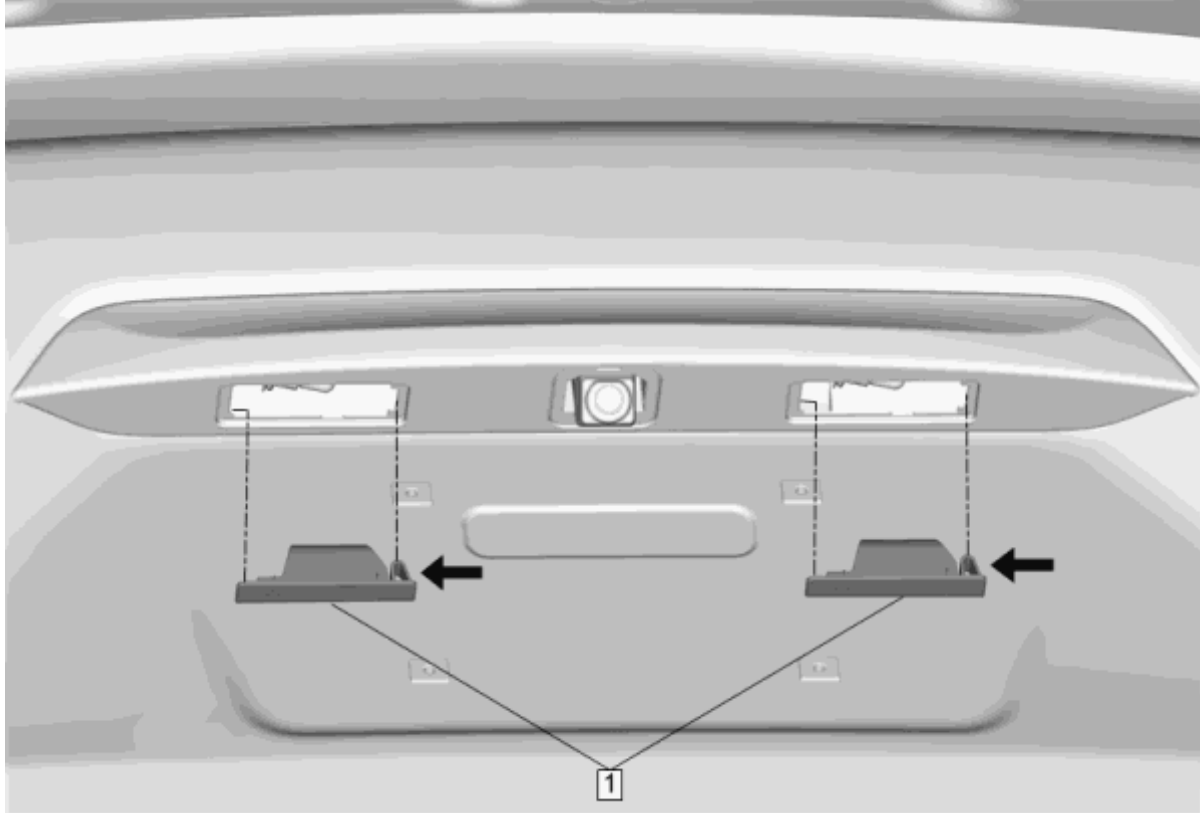


Fig. 81: Rear License Plate Lamp (GMC)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Rear License Plate Lamp Procedure 1. Using a flat-bladed tool, depress the tab and pull downward to remove the lamp. 2. Disconnect the electrical connector. 3. Transfer components as necessary.

REAR LICENSE PLATE LAMP BULB REPLACEMENT

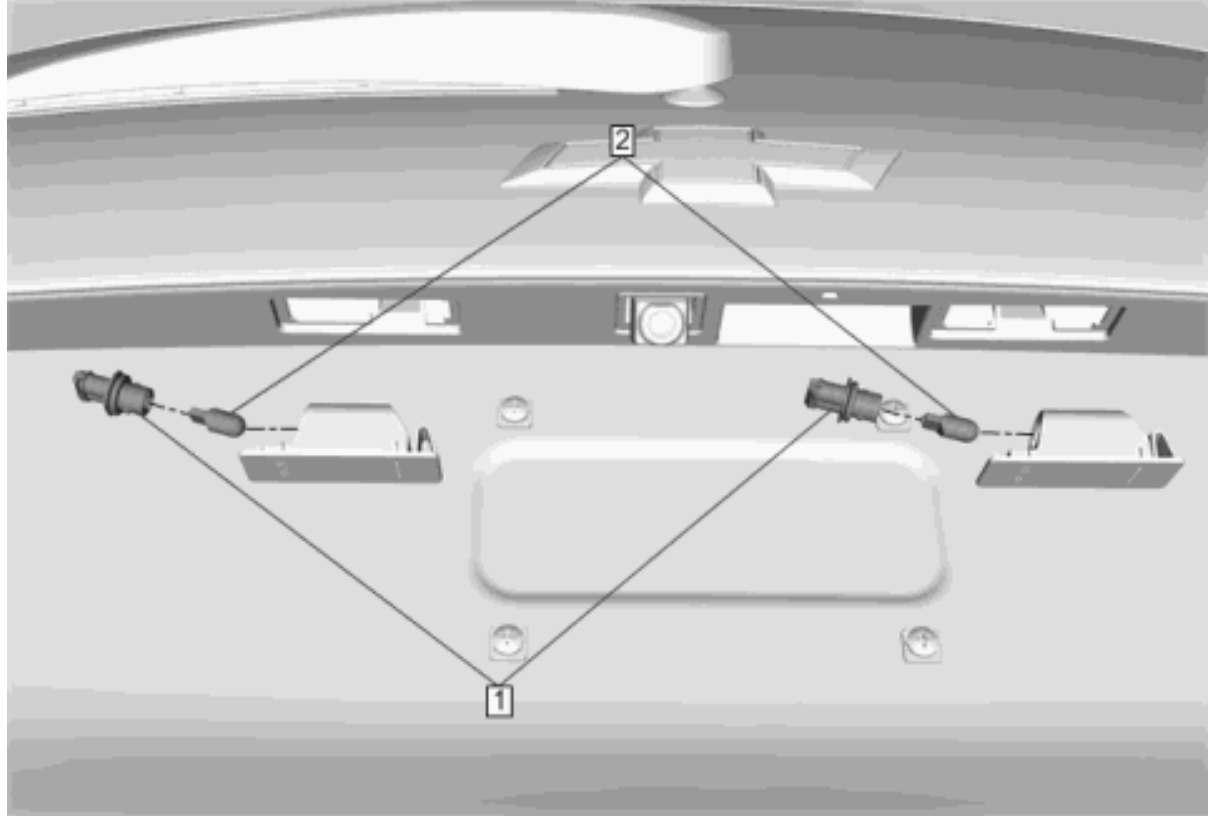


Fig. 82: Rear License Plate Lamp Bulb
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Rear License Plate Lamp Replacement (Chevrolet)</u> <u>Rear License Plate Lamp Replacement (GMC)</u>	
1	License Plate Lamp Socket Procedure Rotate the bulb socket counterclockwise to remove it from the lamp housing.
2	Rear License Plate Lamp Bulb Procedure Pull the bulb straight from the lamp socket.

REAR COMBINATION LAMP REPLACEMENT (CHEVROLET)

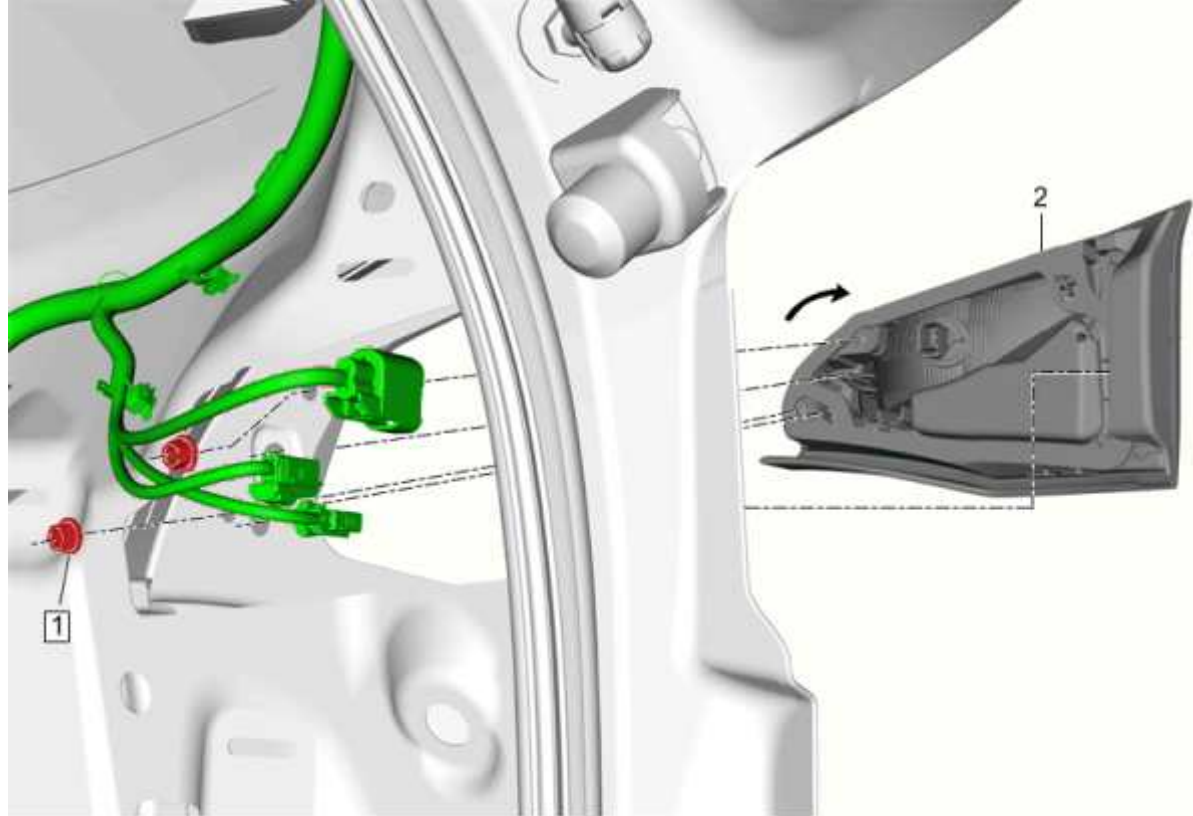


Fig. 83: Rear Combination Lamp (Chevrolet)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Liftgate Lower Trim Finish Panel Replacement</u>	
1	Rear Combination Lamp Nut [2x] CAUTION: Refer to <u>Fastener Caution</u> Tighten 4.7 N.m (42 lb in)
2	Rear Combination Lamp Procedure 1. Disconnect the electrical connectors. 2. Pull lamp rearward and tilt outward to remove from liftgate.

REAR COMBINATION LAMP REPLACEMENT (GMC)

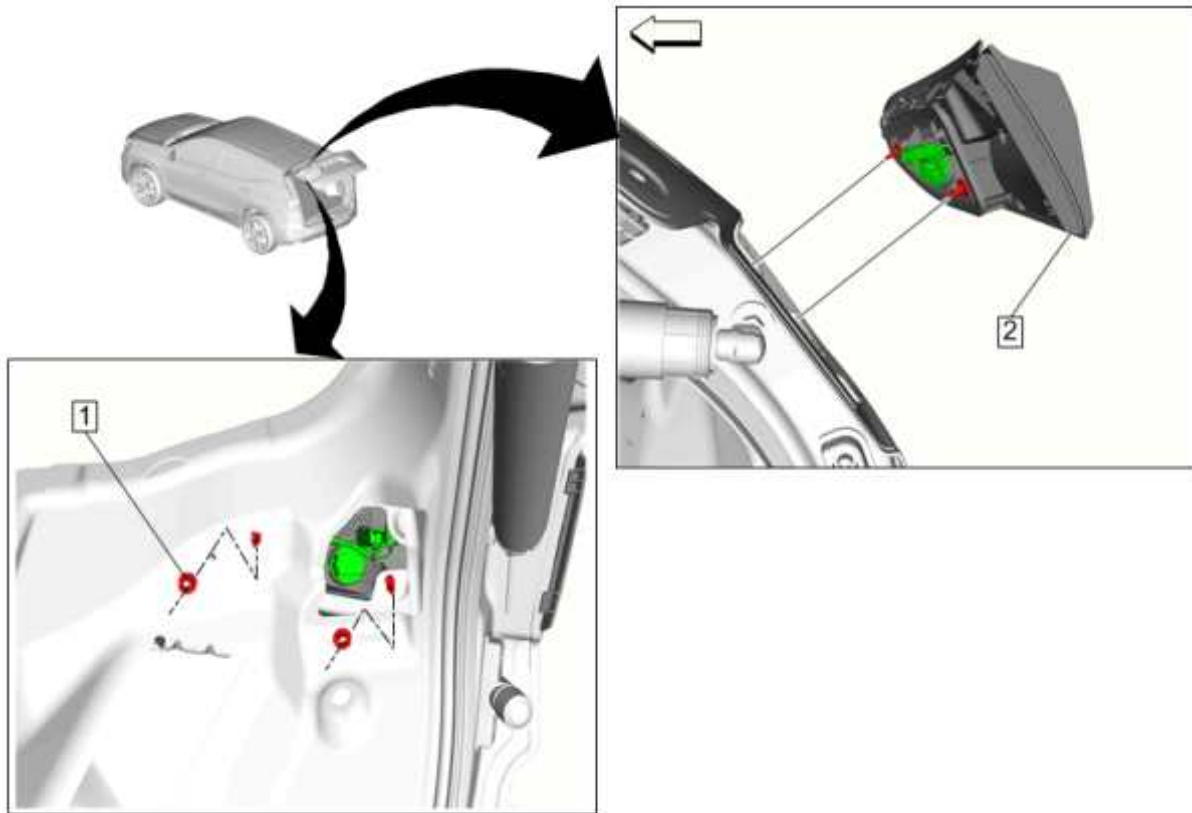


Fig. 84: Rear Combination Lamp (GMC)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Liftgate Lower Trim Finish Panel Replacement</u>	
1	Rear Combination Lamp Nut [2x] CAUTION: Refer to <u>Fastener Caution</u> Tighten 4.7 N.m (42 lb in)
2	Rear Combination Lamp Procedure 1. Disconnect the electrical connectors. 2. Tilt the inboard edge of the lamp rearward while shifting the outboard edge off the lip of the liftgate.

STOP BULB REPLACEMENT (CHEVROLET WITHOUT UGE)

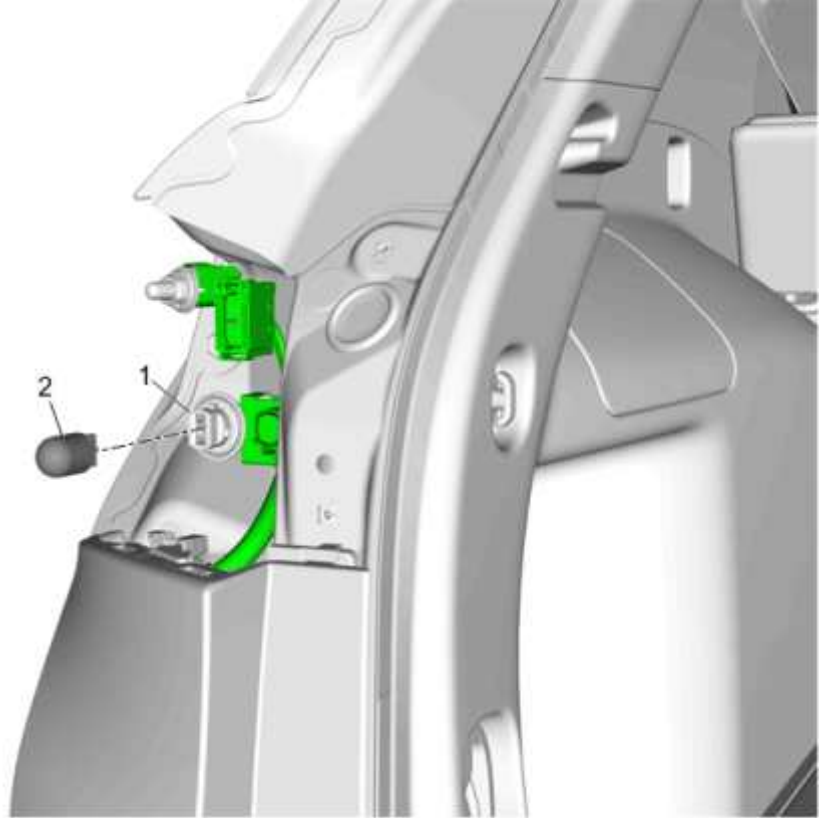


Fig. 85: Stop Bulb (Chevrolet Without UGE)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Reposition and support the rear body structure stop lamp. Refer to Rear Body Structure Stop Lamp Replacement (Chevrolet Without UGE) .	
1	Stop Lamp Bulb Socket Procedure Rotate the bulb socket a quarter turn counterclockwise and remove.
2	Stop Bulb Procedure Pull the bulb straight from the lamp socket.

REAR FASCIA SIGNAL LAMP REPLACEMENT (CHEVROLET)

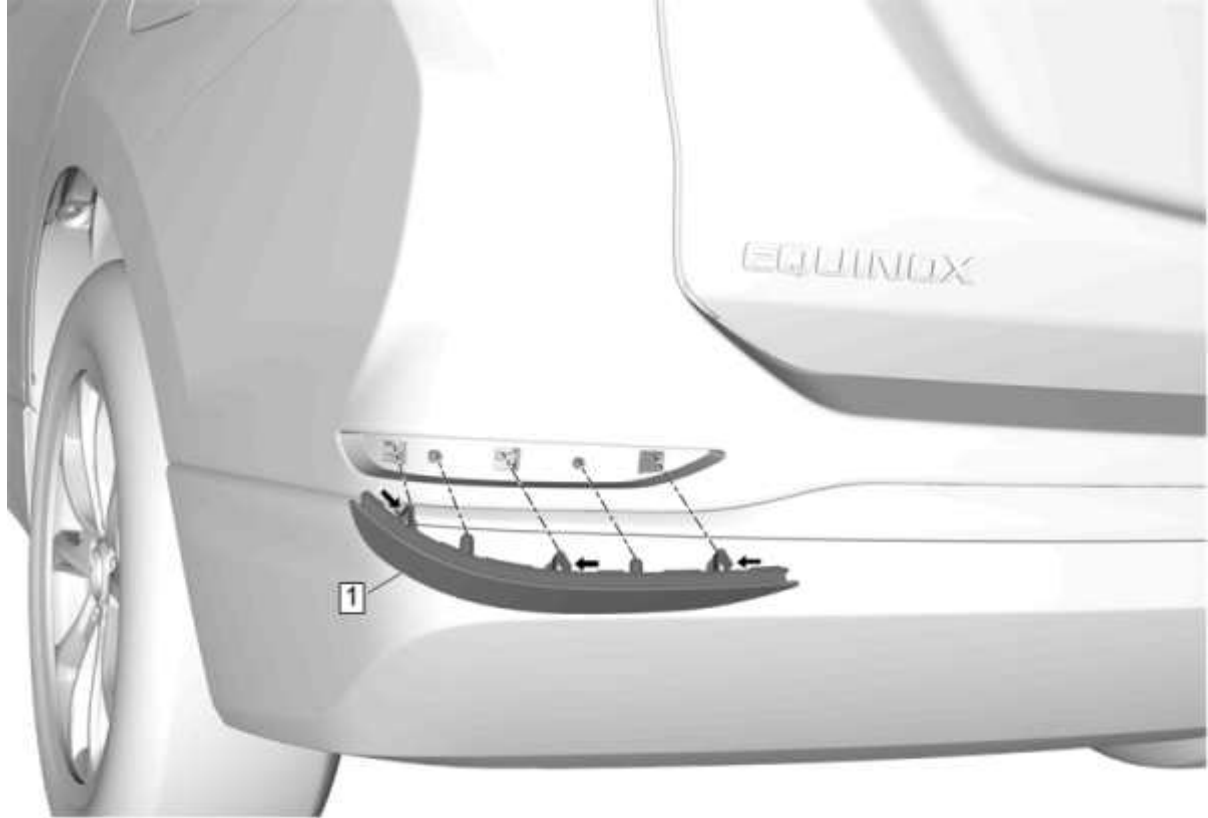


Fig. 86: Rear Fascia Signal Lamp (Chevrolet)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Rear Fascia Signal Lamp Procedure 1. Release the retaining tabs. 2. Lower the vehicle. Refer to Lifting and Jacking the Vehicle

REAR FASCIA SIGNAL LAMP REPLACEMENT (GMC)

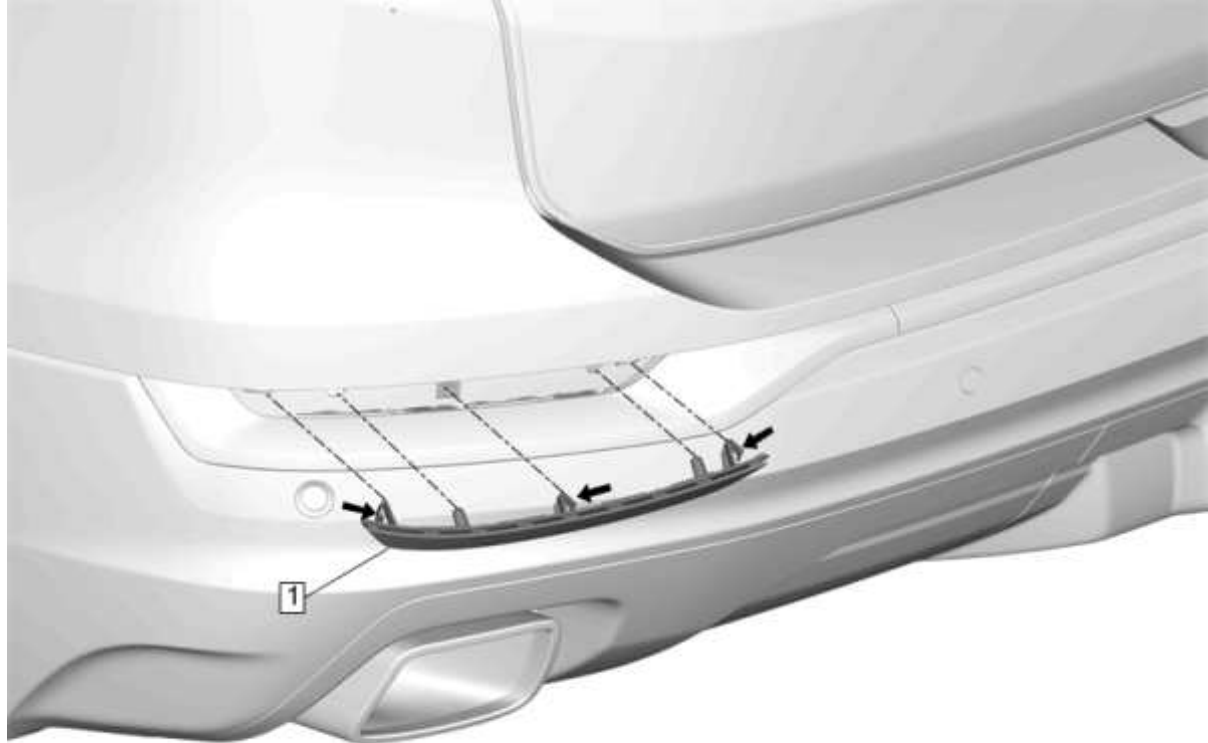


Fig. 87: Rear Fascia Signal Lamp (GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Rear Fascia Signal Lamp Procedure 1. Release the retaining tabs. 2. Lower the vehicle. Refer to Lifting and Jacking the Vehicle

2018 ACCESSORIES & EQUIPMENT

Lighting - Schematic And Routing Diagrams - Equinox & Terrain

SCHEMATIC WIRING DIAGRAMS

HEADLIGHTS/DAYTIME RUNNING LIGHTS (DRL)WIRING SCHEMATICS

Controls and Indicators

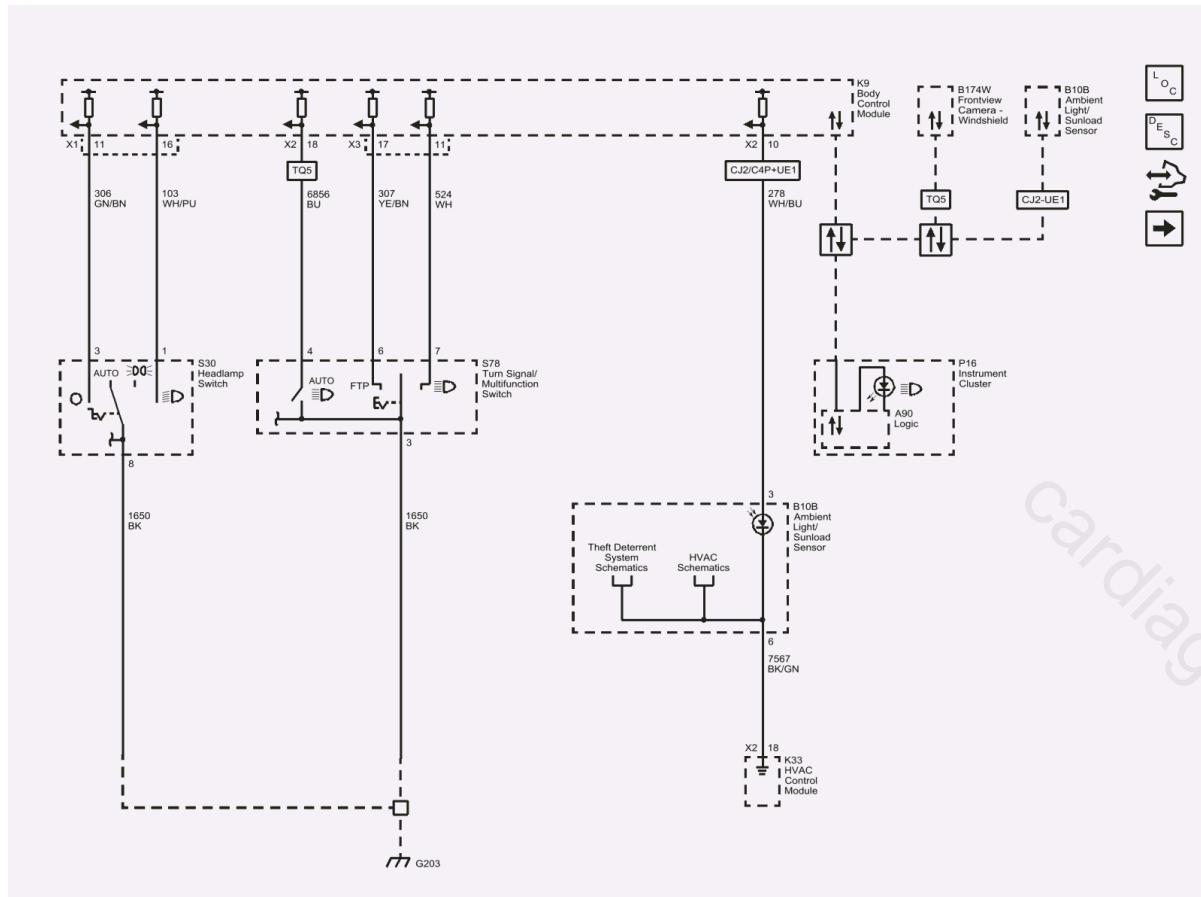


Fig. 1: Controls and Indicators

Courtesy of GENERAL MOTORS COMPANY

Headlamps and Daytime Running Lamps (T4A)

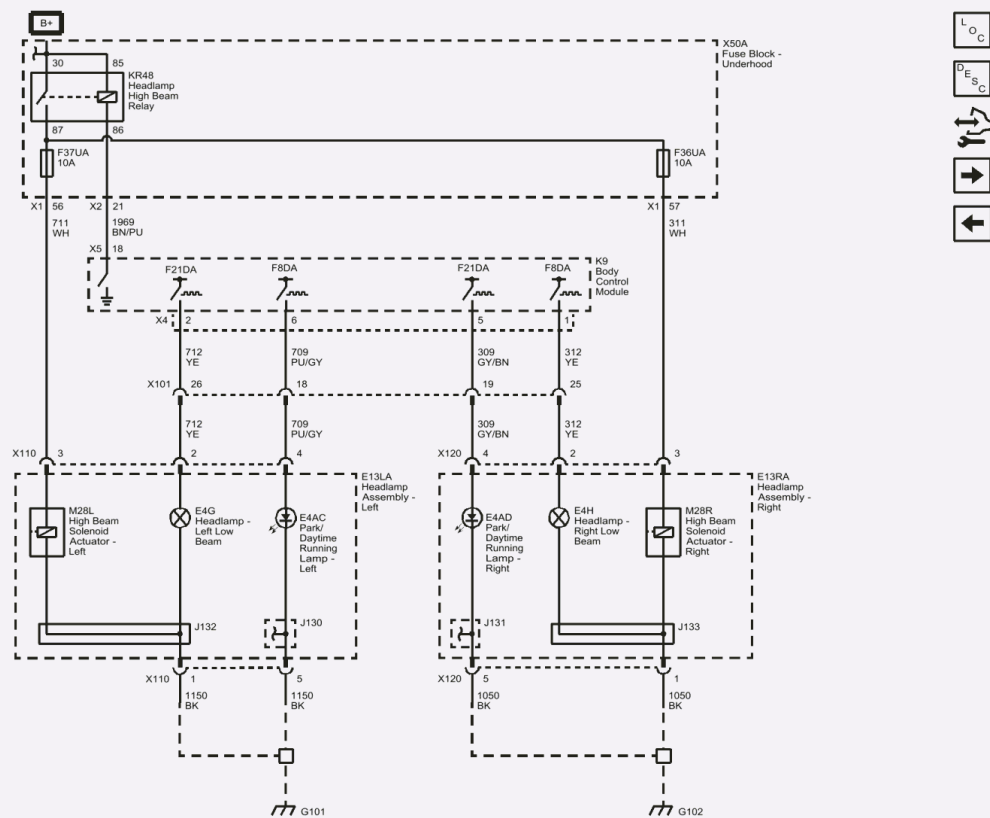


Fig. 2: Headlamps and Daytime Running Lamps (T4A)
Courtesy of GENERAL MOTORS COMPANY

Headlamps (T4F) and Daytime Running Lamps (T4F or T4L with X88)

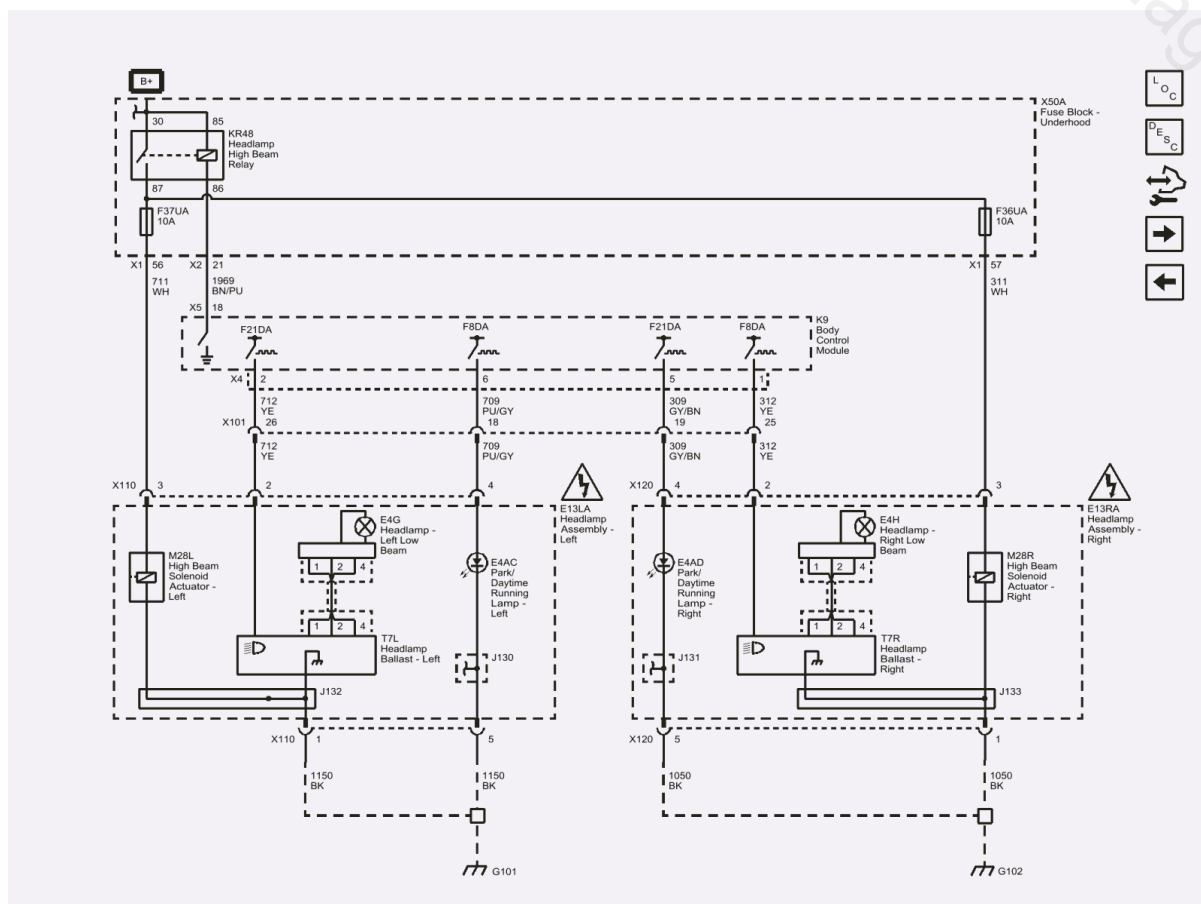


Fig. 3: Headlamps (T4F) and Daytime Running Lamps (T4F or T4L with X88)
Courtesy of GENERAL MOTORS COMPANY

Headlamps (T4L)

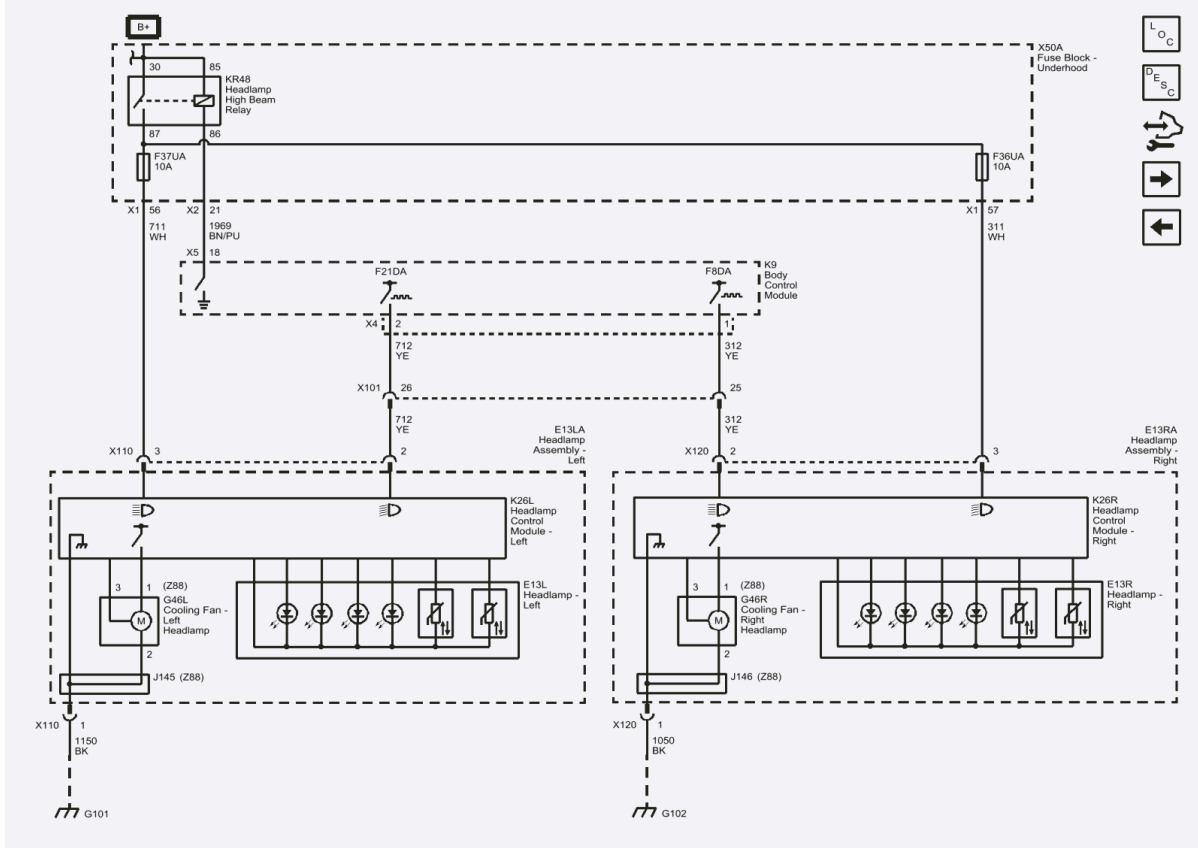


Fig. 4: Headlamps (T4L)

Courtesy of GENERAL MOTORS COMPANY

Daytime Running Lamps (T4F or T4L with Z88)

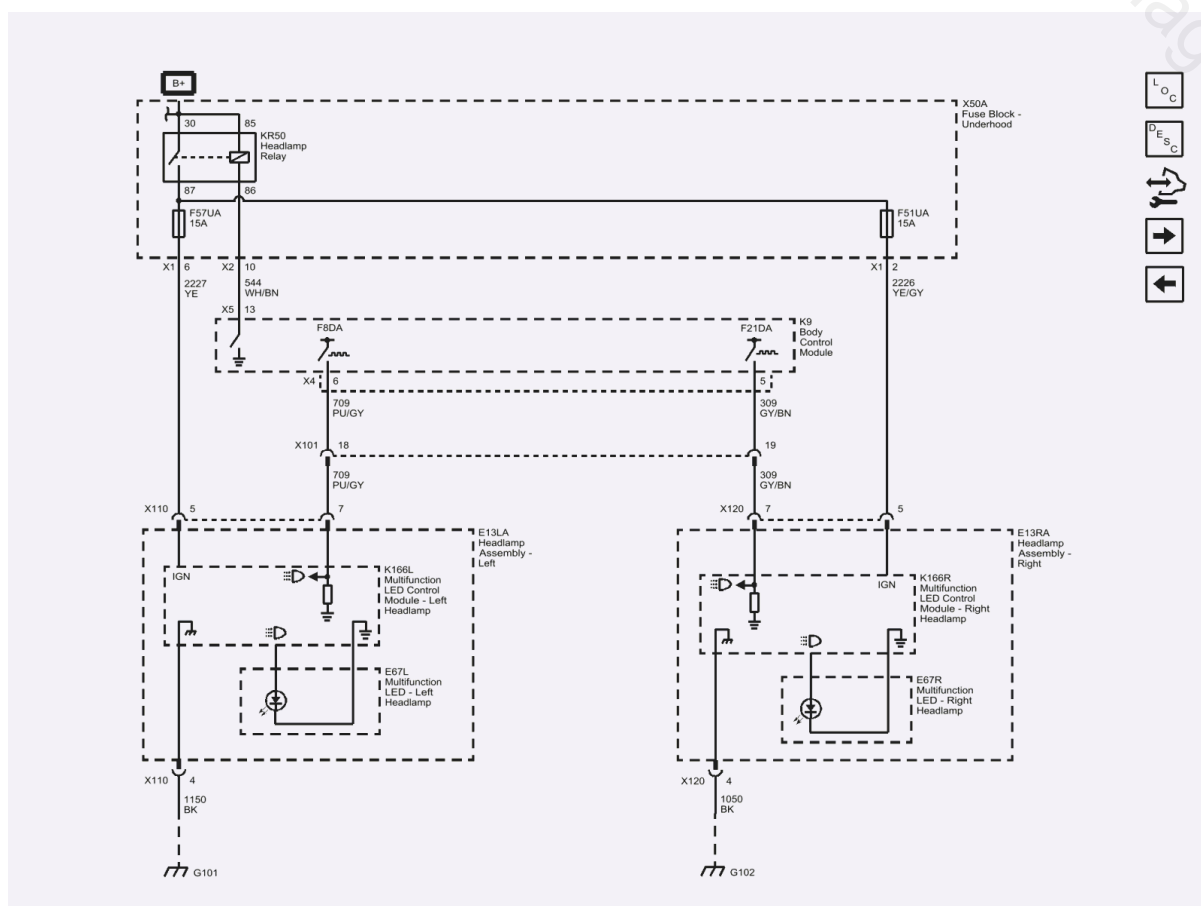


Fig. 5: Daytime Running Lamps (T4F or T4L with Z88)

Courtesy of GENERAL MOTORS COMPANY

Manual Headlamp Leveling (TR6)

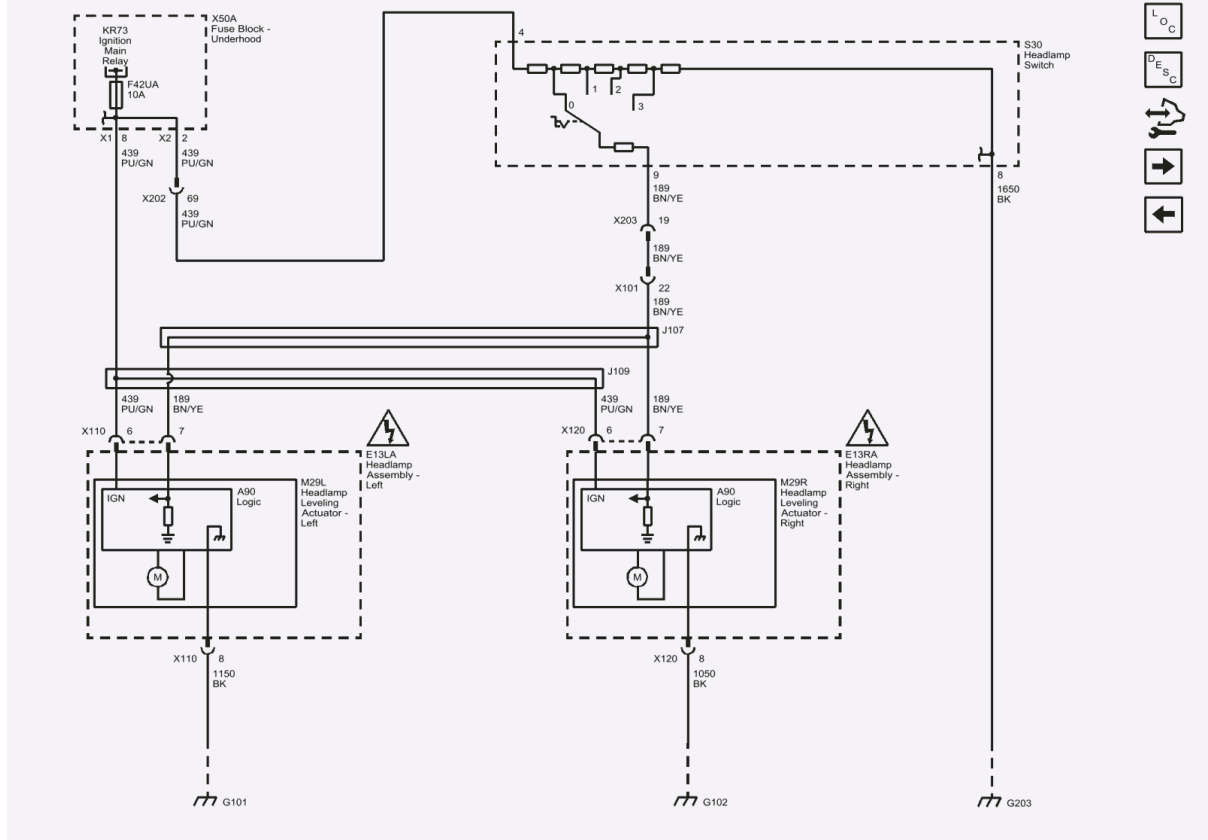


Fig. 6: Manual Headlamp Leveling (TR6)
 Courtesy of GENERAL MOTORS COMPANY

Adaptive Forward Lighting - Power, Ground, Serial Data and Suspension Sensors (TR7)

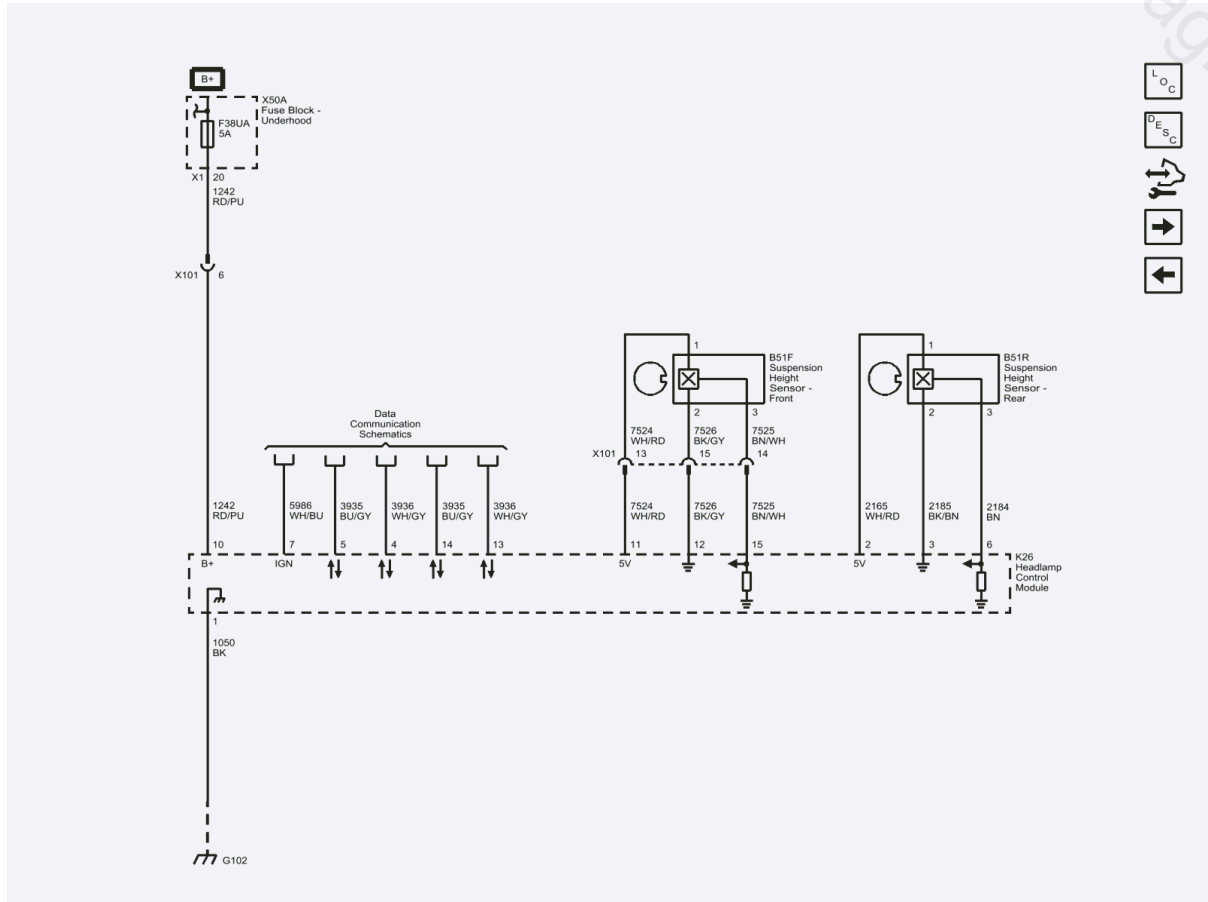


Fig. 7: Adaptive Forward Lighting - Power, Ground, Serial Data and Suspension Sensors (TR7)
 Courtesy of GENERAL MOTORS COMPANY

Adaptive Forward Lighting - Headlamp Actuators (TR7)

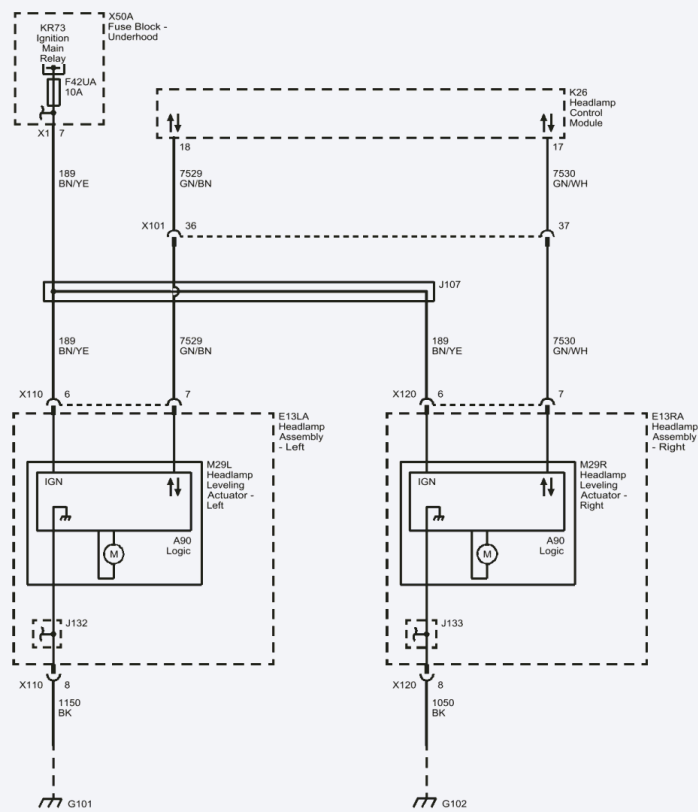


Fig. 8: Adaptive Forward Lighting - Headlamp Actuators (TR7).
Courtesy of GENERAL MOTORS COMPANY

FOG LIGHTS WIRING SCHEMATICS

Fog Lamps

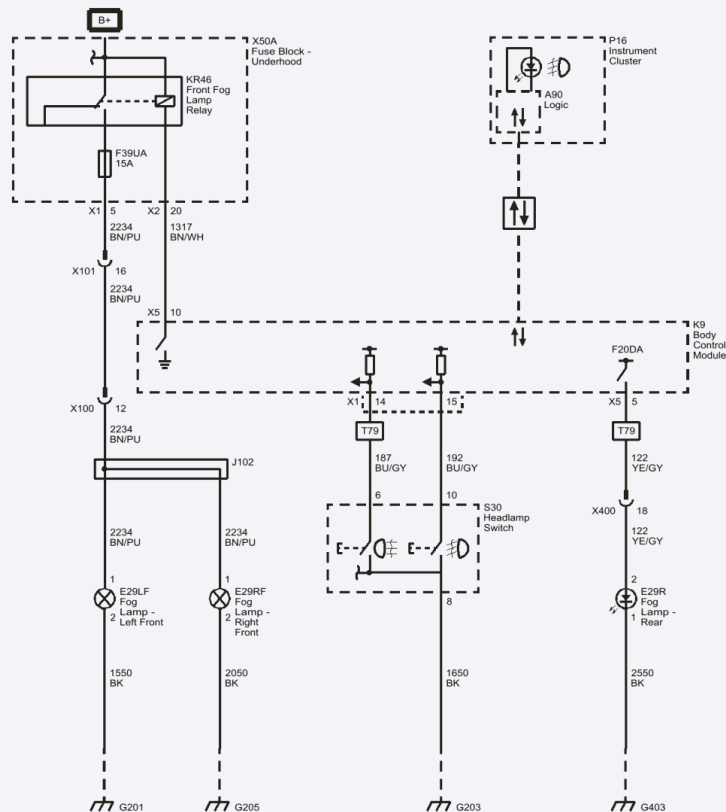


Fig. 9: Fog Lamps
Courtesy of GENERAL MOTORS COMPANY

EXTERIOR LIGHTS WIRING SCHEMATICS

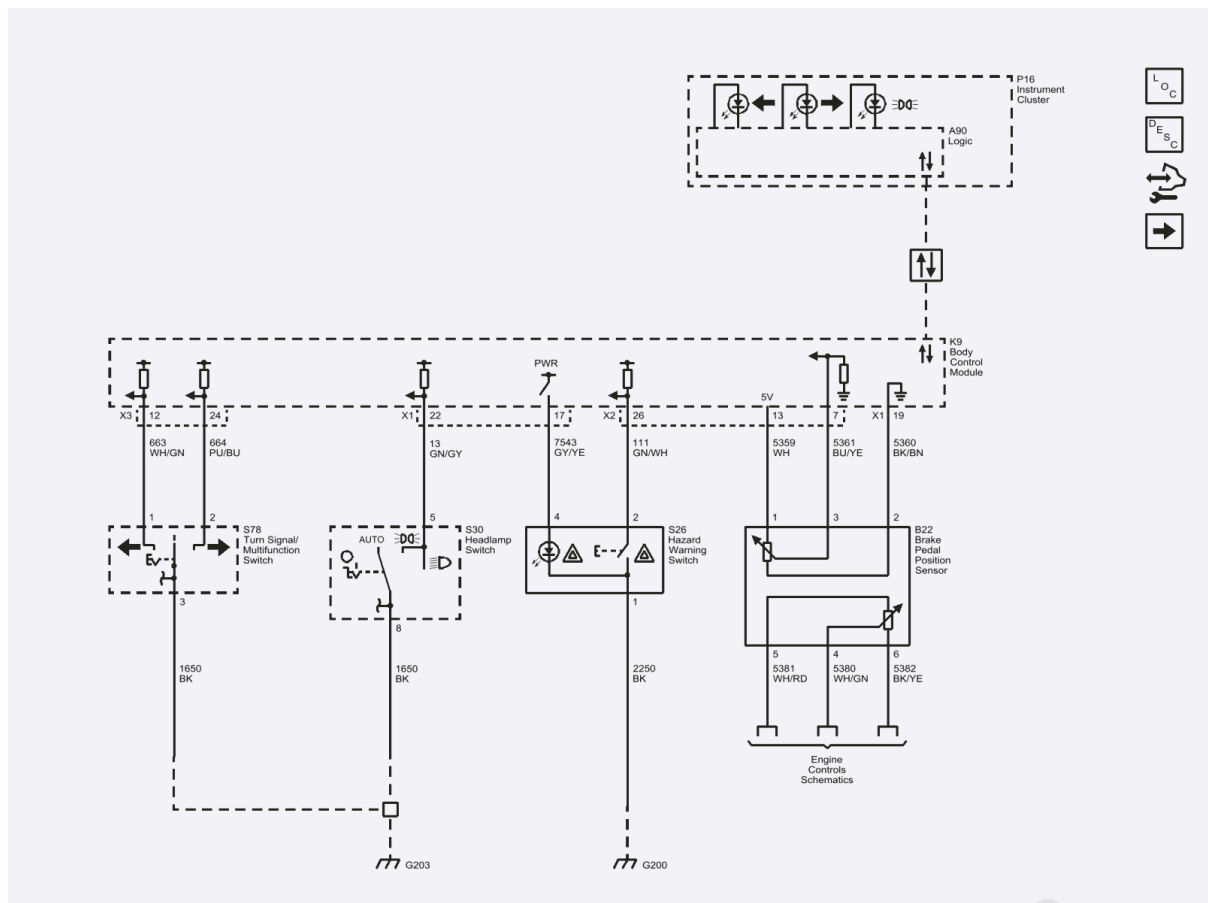


Fig. 10: Controls and Indicators
Courtesy of GENERAL MOTORS COMPANY

Turn Signals (X88 without UGE)

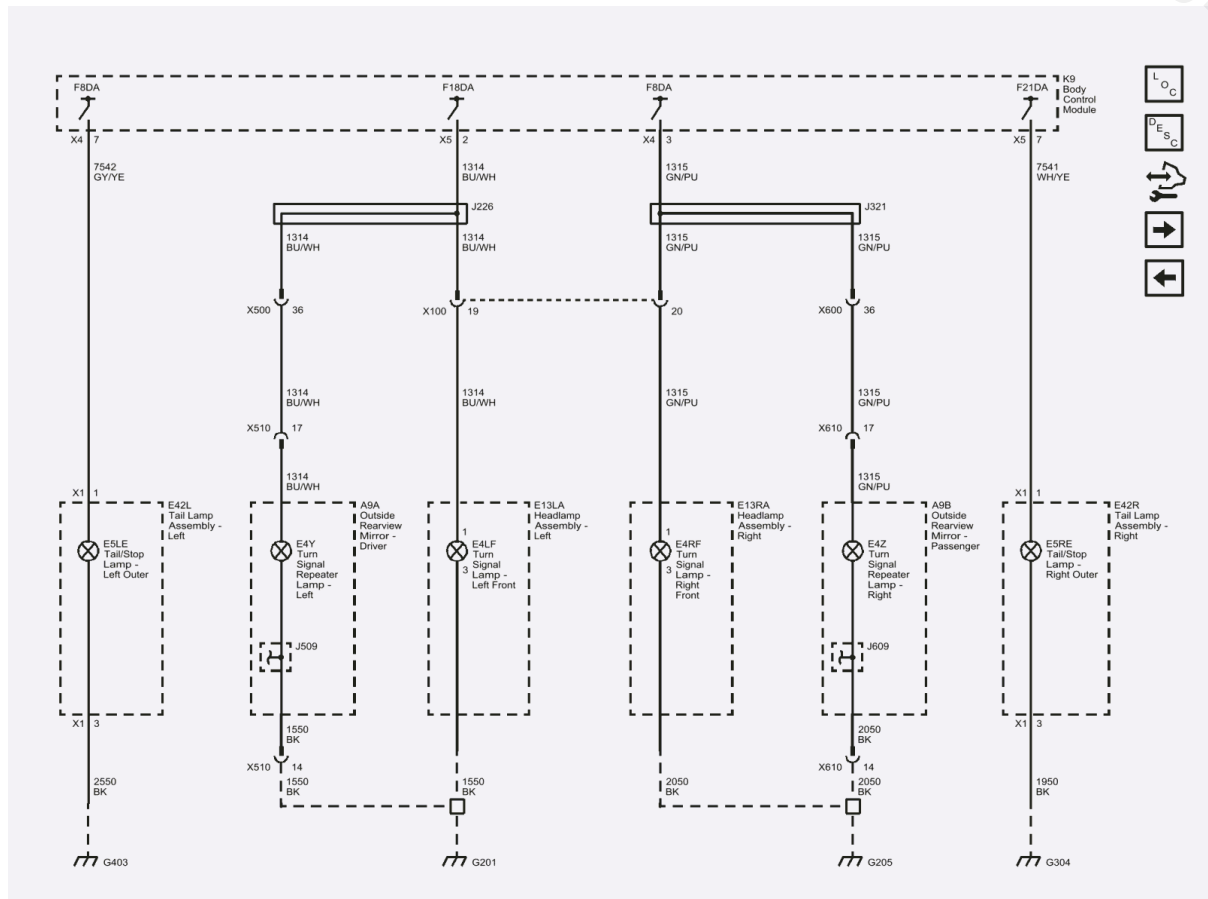


Fig. 11: Turn Signals (X88 without UGE)
Courtesy of GENERAL MOTORS COMPANY

Turn Signals (X88 with UGE)

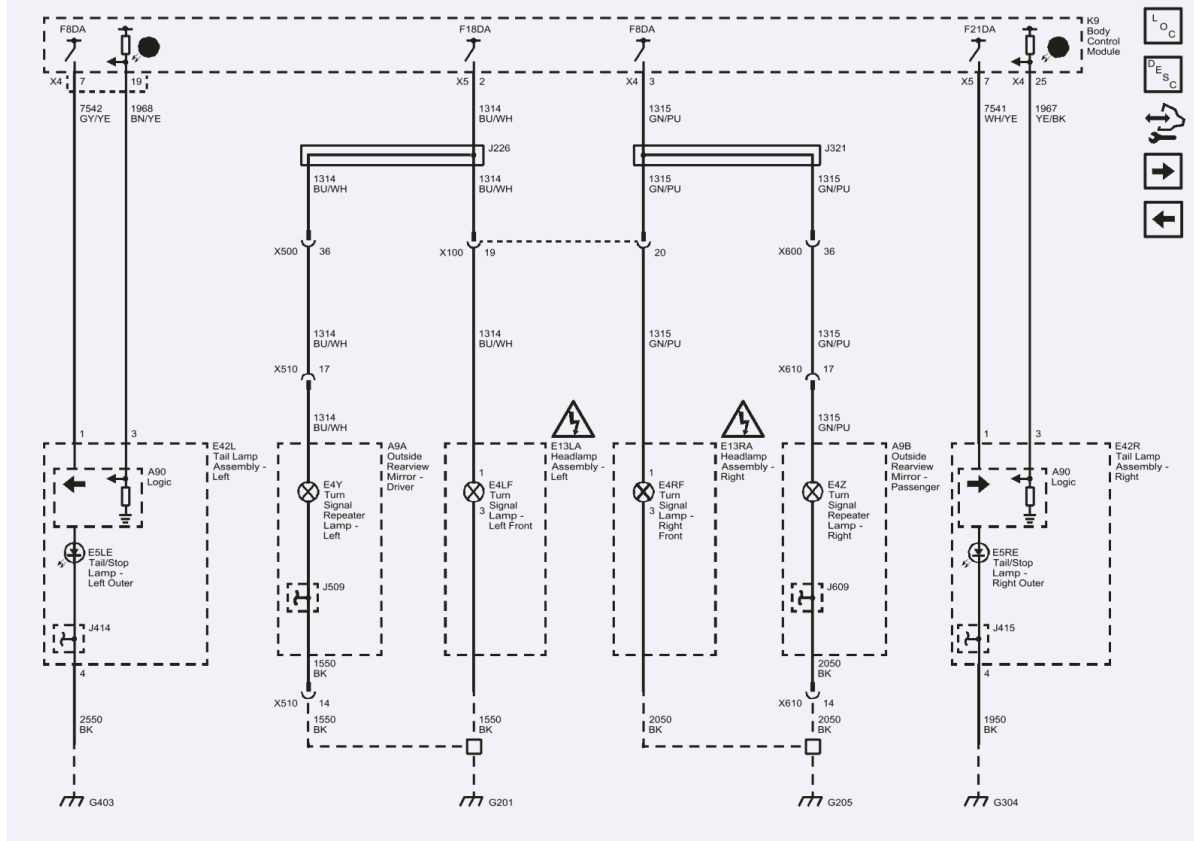


Fig. 12: Turn Signals (X88 with UGE)
 Courtesy of GENERAL MOTORS COMPANY

Turn Signals (Z88)

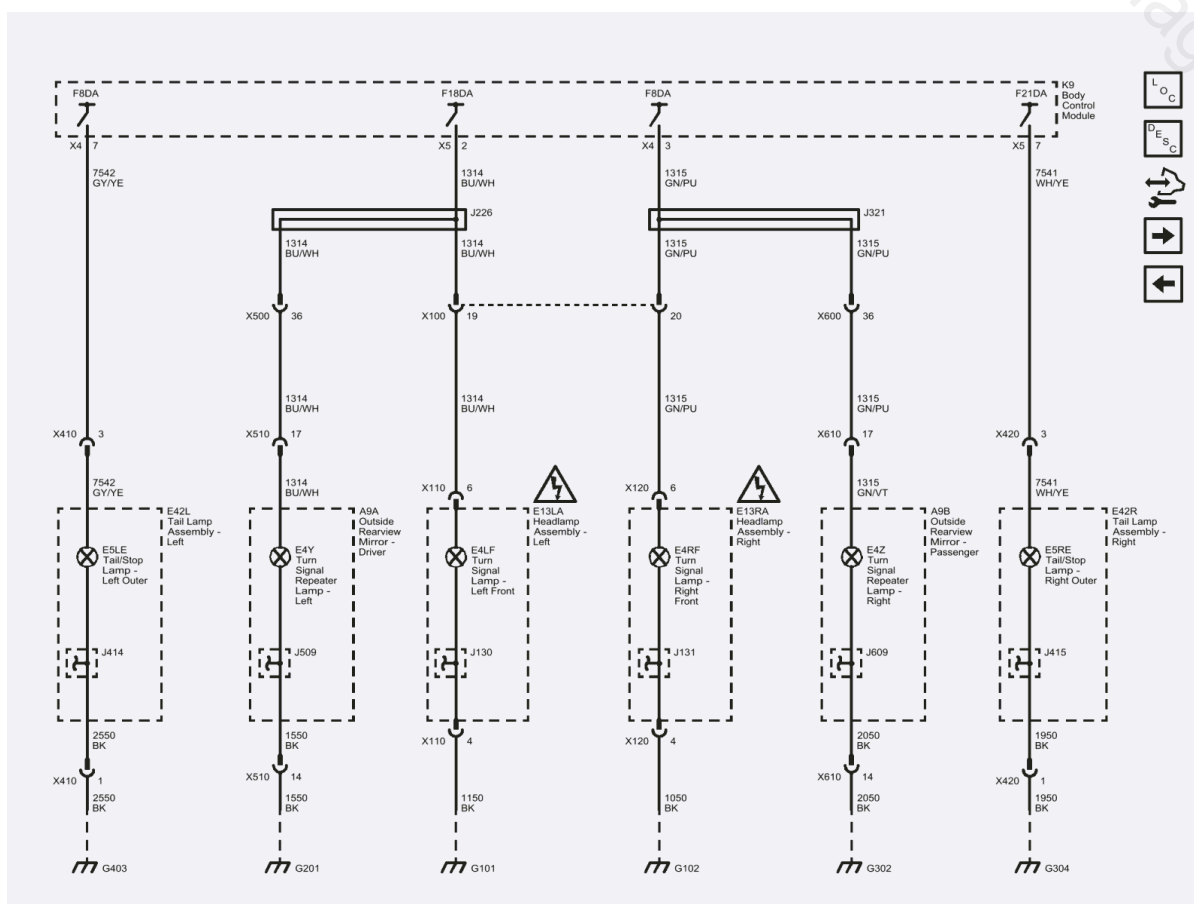


Fig. 13: Turn Signals (Z88)
 Courtesy of GENERAL MOTORS COMPANY

Park/Position and Tail Lamps

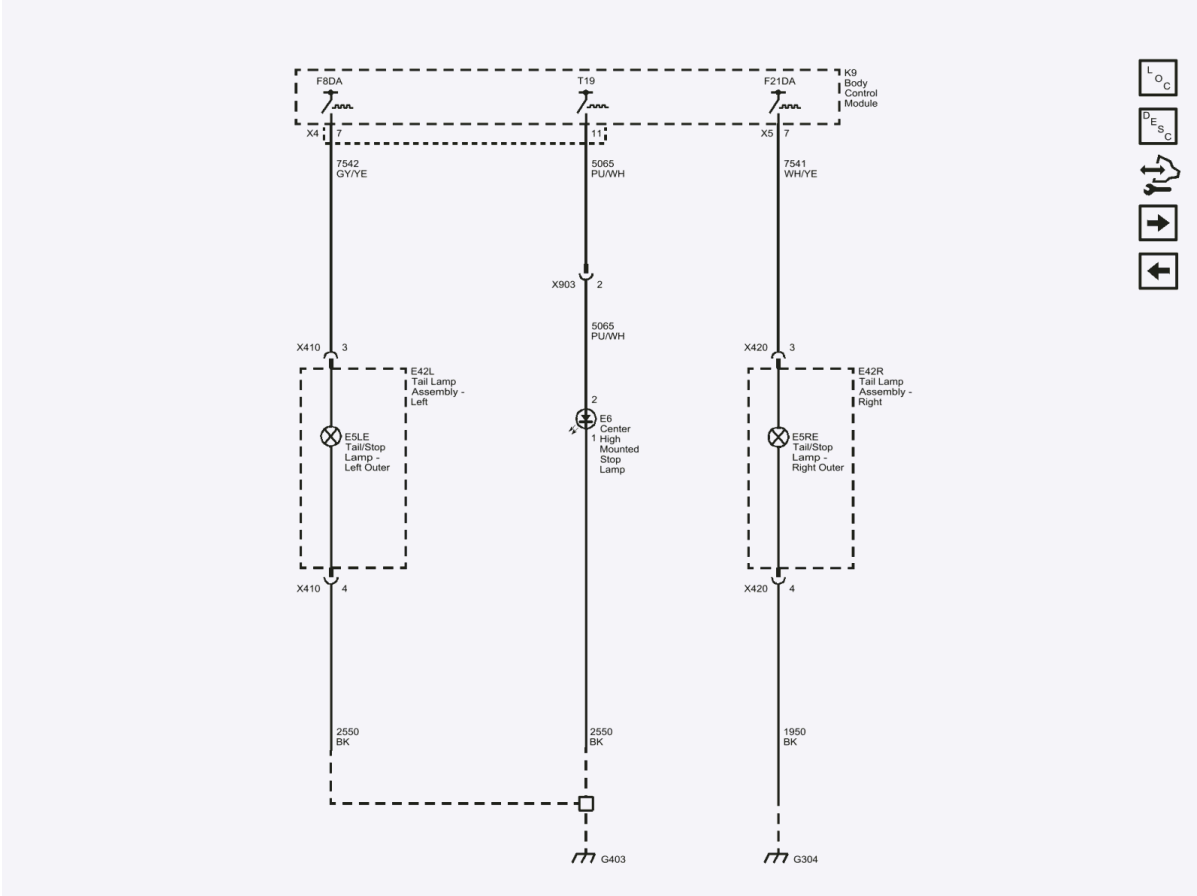


Fig. 16: Stop Lamps (Z88)
 Courtesy of GENERAL MOTORS COMPANY

Backup and License Lamps

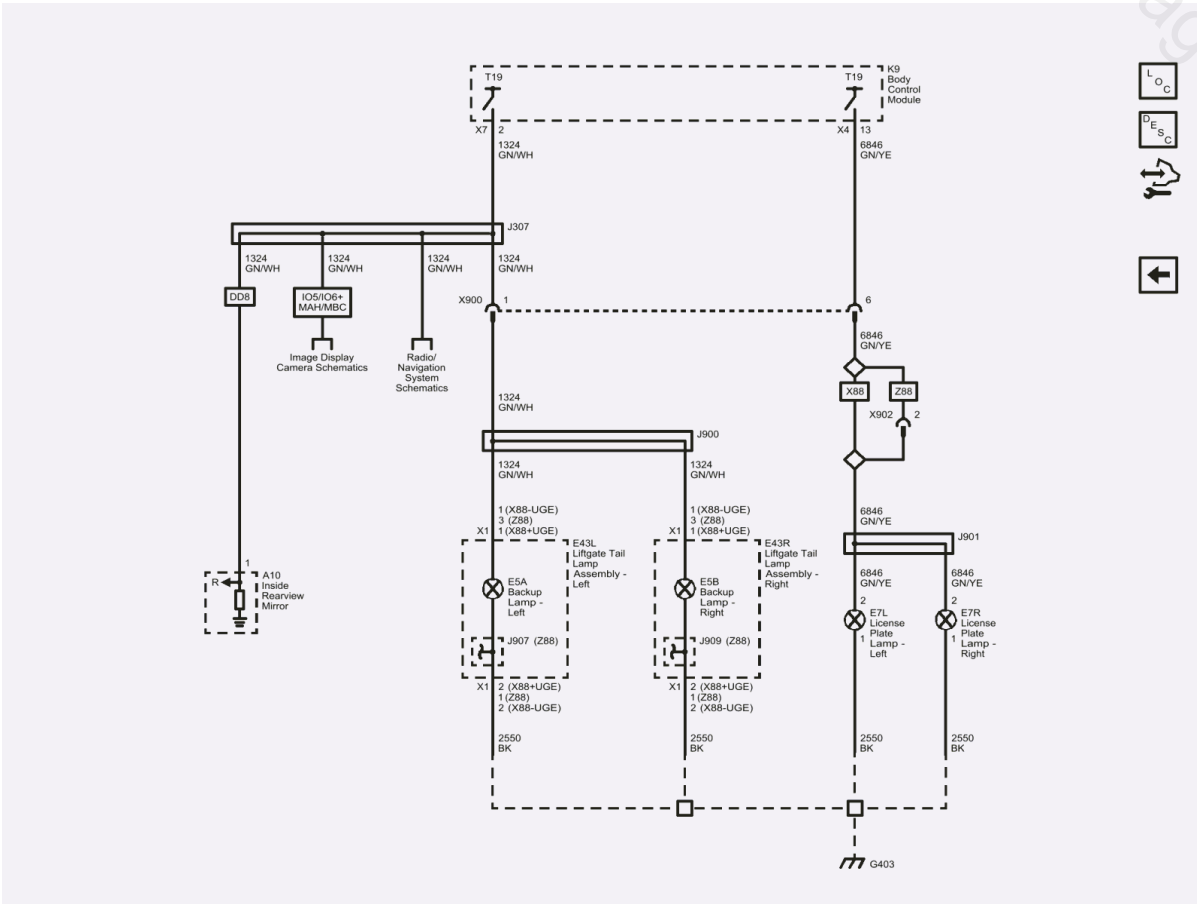


Fig. 17: Backup and License Lamps
 Courtesy of GENERAL MOTORS COMPANY

INTERIOR LIGHTS WIRING SCHEMATICS

Controls and Courtesy Lamps

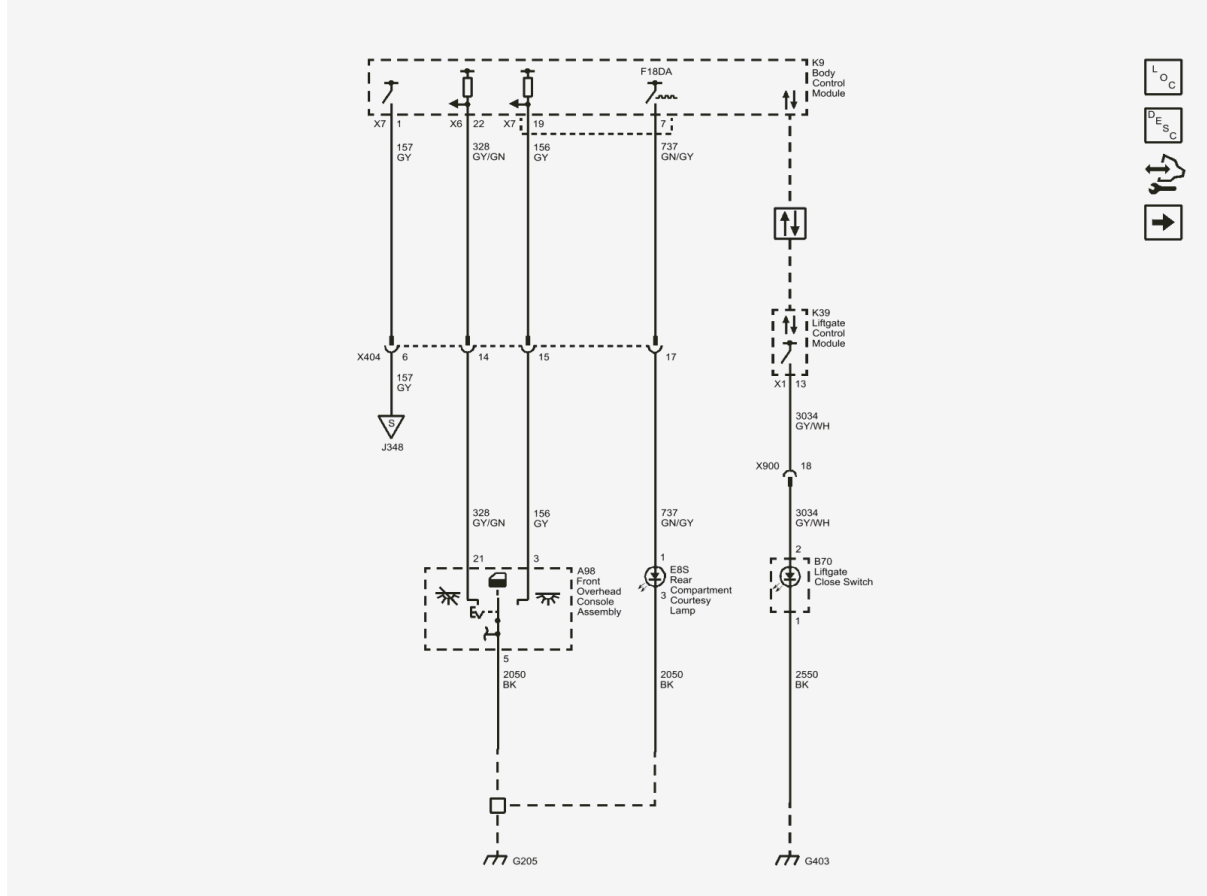


Fig. 18: Controls and Courtesy Lamps
Courtesy of GENERAL MOTORS COMPANY

Instrument Panel Compartment and Overhead Lamps

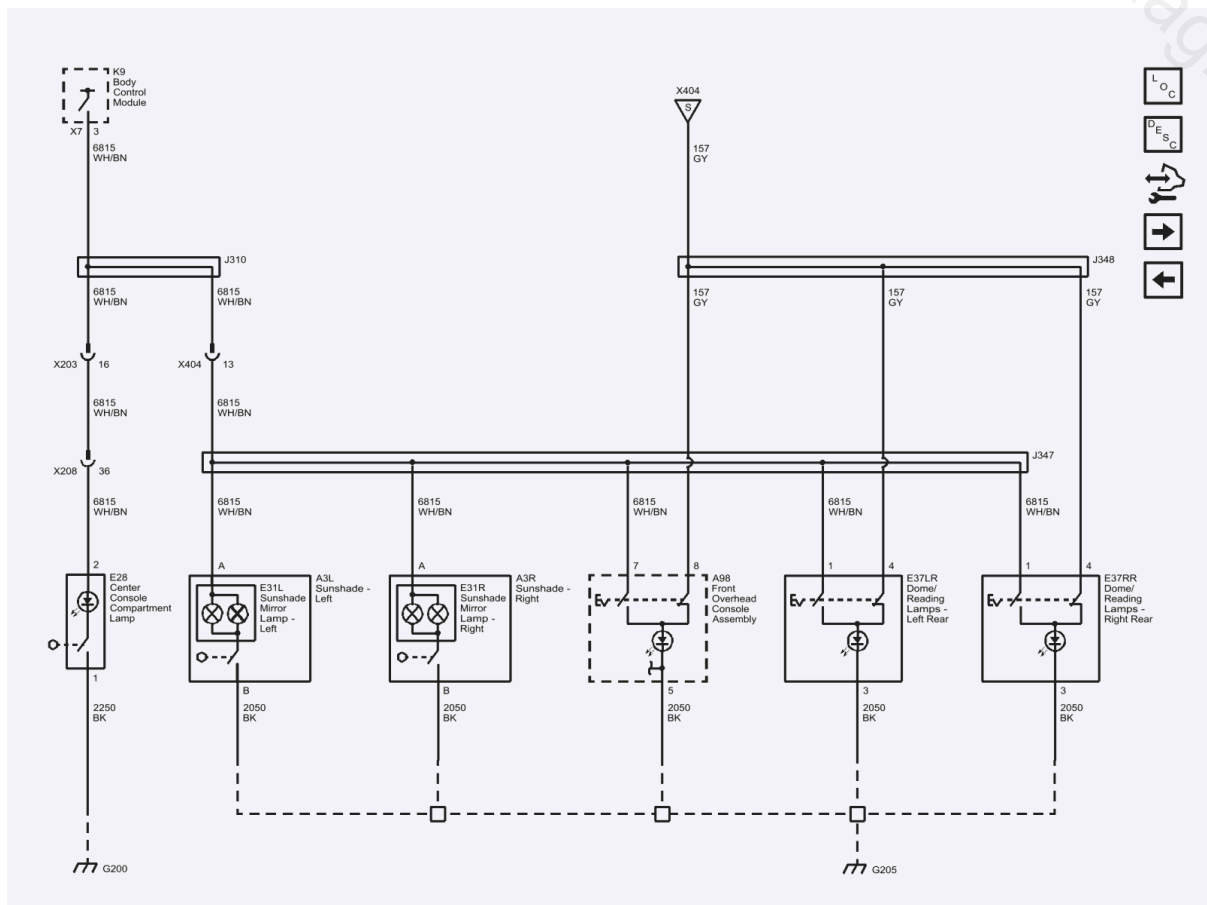


Fig. 19: Instrument Panel Compartment and Overhead Lamps
Courtesy of GENERAL MOTORS COMPANY

Accent and Flood Lamps

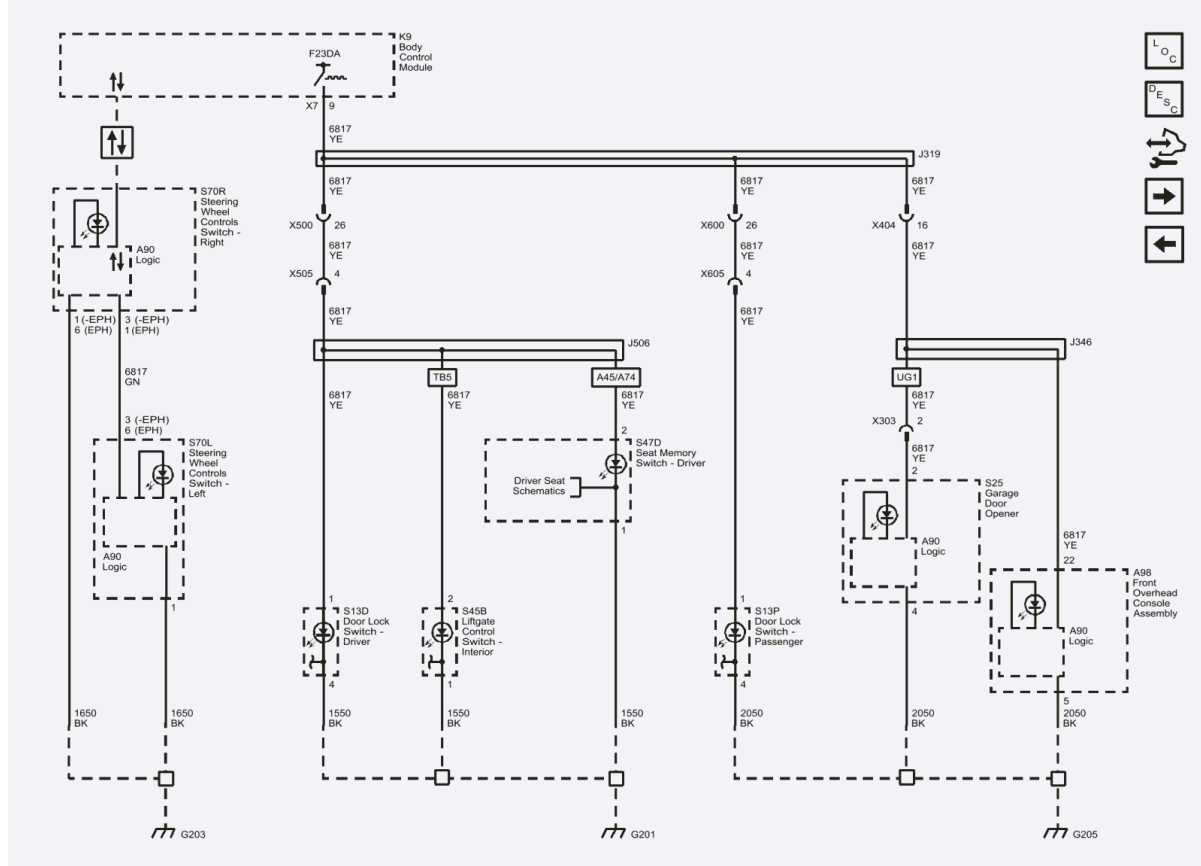


Fig. 22: Door and Overhead Lamps
Courtesy of GENERAL MOTORS COMPANY

Instrument Panel, Floor Console and Door Lamps - Serial Data

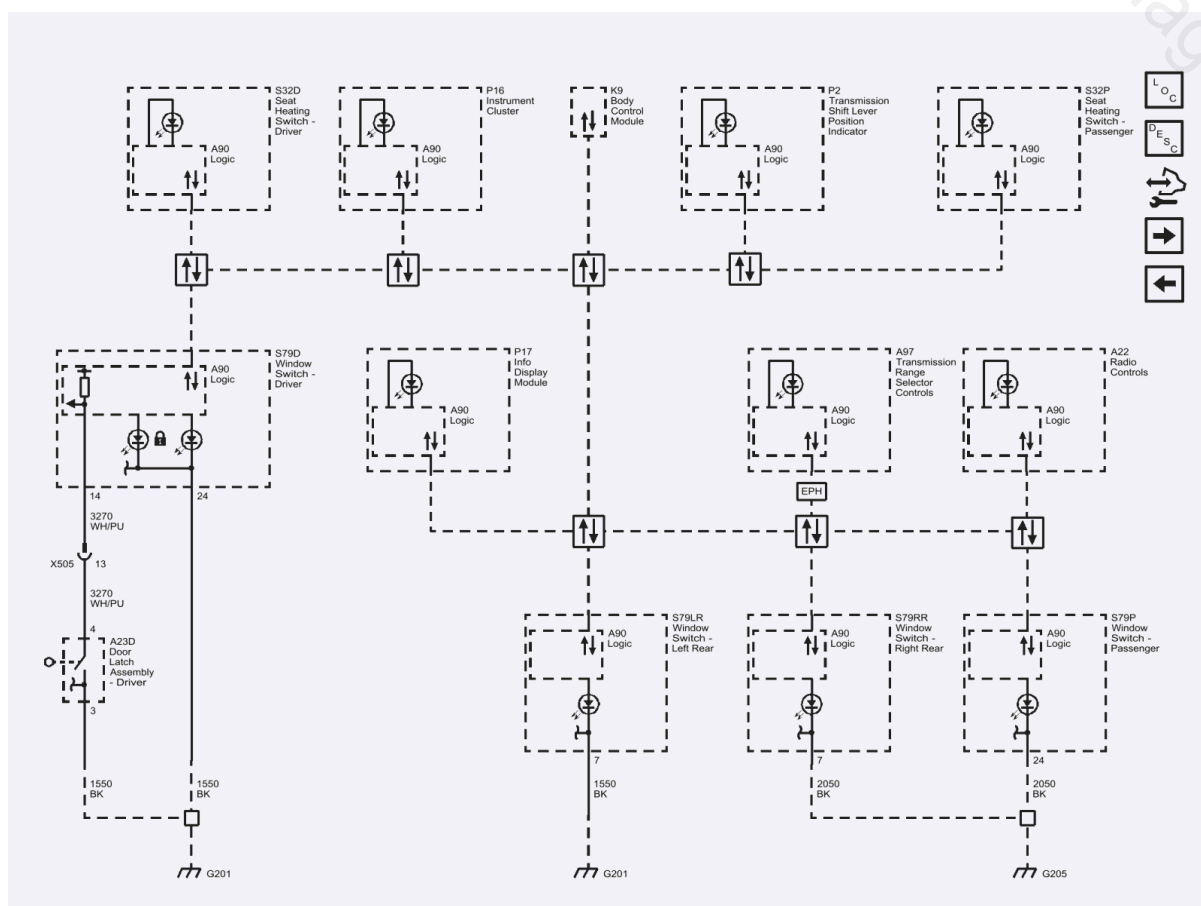


Fig. 23: Instrument Panel, Floor Console and Door Lamps - Serial Data
Courtesy of GENERAL MOTORS COMPANY

Indicator Lamps (1 of 2)

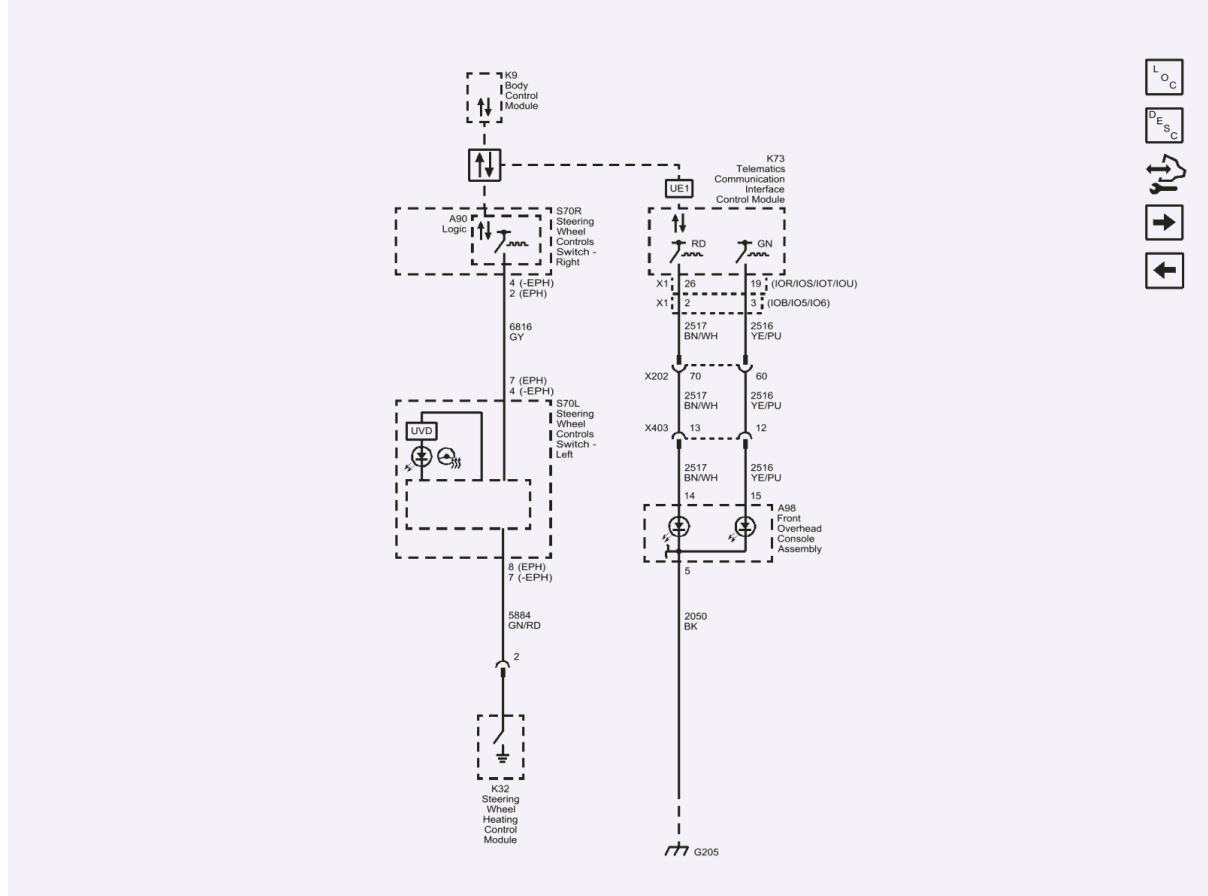


Fig. 24: Indicator Lamps (1 of 2)
Courtesy of GENERAL MOTORS COMPANY

Indicator Lamps (2 of 2)

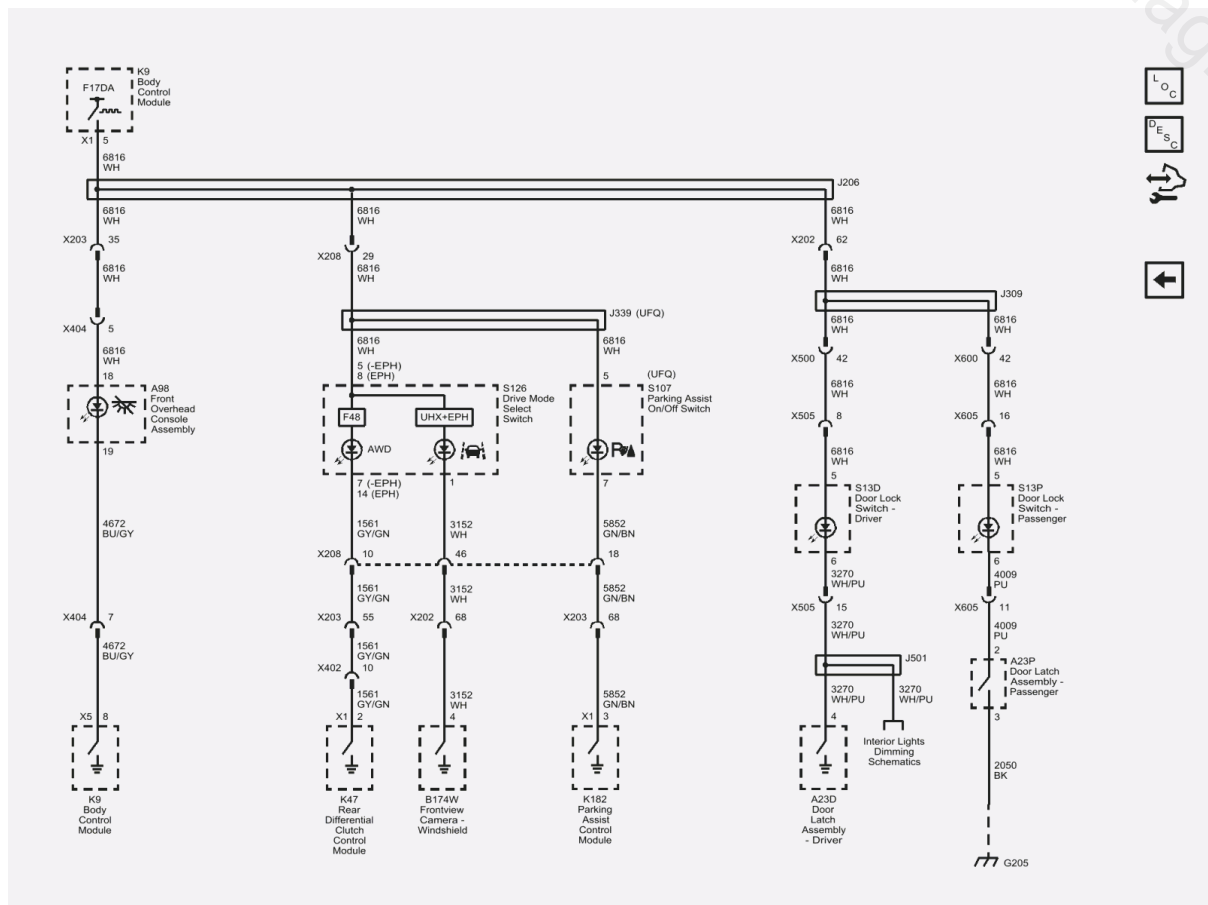


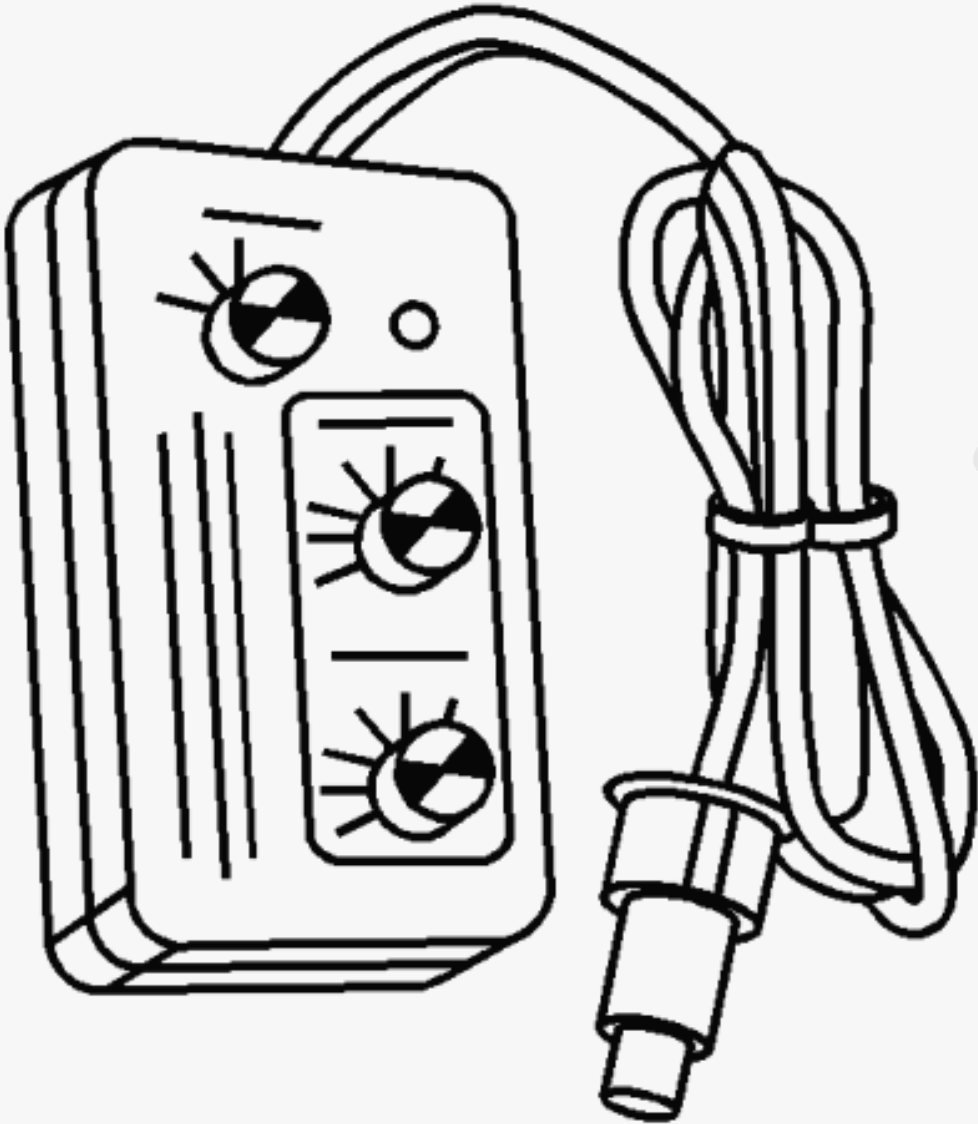
Fig. 25: Indicator Lamps (2 of 2)
Courtesy of GENERAL MOTORS COMPANY

2018 ACCESSORIES & EQUIPMENT

Lighting - Special Tools And Equipment - Special Tools

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/Description
 A line drawing of a rectangular electronic device, likely a signal generator. It features three circular indicators or lights arranged vertically on the front panel. A cable is connected to the top of the device, and the other end of the cable has a specialized, multi-pin connector. The device has a simple, functional design with a few control elements.	EL-38522 J-38522 Variable Signal Generator

2018 ACCESSORIES & EQUIPMENT

Lighting - Specifications - Fastener Specifications - Equinox & Terrain

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Brake Pedal Position Sensor Bolt	3 N.m (27 lb in)
Front Fog Lamp Screw	2.5 N.m (22 lb in)
Headlamp Ballast Screw	1.4 N.m (12 lb in)
Headlamp Screw	2.5 N.m (22 lb in)
High Mount Stop Lamp Screw	1.4 N.m (12 lb in)
Rear Body Structure Stop Lamp Screw	2.5 N.m (22 lb in)
Rear Combination Lamp Nut	4.7 N.m (42 lb in)

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