ACCESSORIES & EQUIPMENT

Lighting - Description and Operation - Escalade, Suburban, Tahoe, Yukon

DESCRIPTION AND OPERATION

EXTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

The exterior lighting system consist of the following lamps:

- Automatic high beam assist
- Backup lamps
- Cornering lamps (Z75)
- Daytime running lamps
- Hazard warning lamps
- Headlamps
- Park, tail, license, and marker lamps
- Stop lamps
- Turn signal lamps

Low Beam Headlamps

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 AUTO position, for automatic lamp control
- When the headlamp switch is placed in the AUTO position, with the windshield wipers ON in daylight conditions, after a 6 second delay

The BCM will also command the low beam headlamps ON during daylight conditions when the following conditions are met:

- Headlamp switch in the AUTO position
- Windshield wipers ON
- Vehicle in any gear but PARK

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

Low Beam Headlamps (without T4F)

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.

Low Beam Headlamps (with Z75)

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 to the left and right multifunction light emitting diode (LED) control modules located in each headlamp assembly. The multifunction LED control modules respond the to the B+ input from the BCM by illuminating the left and right low beam LED headlamps.

Low Beam Headlamps (with T4F)

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.**

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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 low beam request by applying ground to the low beam relay control circuit which energizes the low beam relay. With the low beam relay energized, the switch contacts close allowing battery voltage to flow through the low beam fuses. Battery voltage is then applied from the fuses, 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 that the start up amperage. After the lamp receives the strike from the starter and the arc is established, the ballast uses its operating voltage in order to provide the run up power needed in order to keep the lamp on. The lamp rapidly increases in intensity from a dim glow to a very high-intensity, bright light called a steady state. Within a few seconds of the arc being established in the bulb, the majority of steady state is complete. 100 percent of the steady state is completed shortly there after. A high watt power level is necessary in order to bring the lamp to a steady state in such a short period of time. The high watt power level allows the lamp to meet the SAE light vs. time specification.

When To Change The HID Bulb

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

The following symptoms are noticeable signs of bulb failure:

- Flickering light, caused in the early stages of bulb failure

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- Lights go out, caused when the ballast detects excessive, repetitive bulb re-strike
- Color change - The lamp may change to a dim pink glow.

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

Light Color

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

High Beam Headlamps (with and without 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 3 pin high beam fuse to the high beam control circuits illuminating the left and right high beam headlamps.

High Beam Headlamps (with Z75)

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 3 pin high beam fuse to the high beam control circuits. The high beam control circuits are connected to the left and right multifunction light emitting diode (LED) control modules located in each headlamp assembly. The multifunction LED control modules respond the to the B+ input from the high beam relay by illuminating the left and right high beam LED headlamps.

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

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module. AHBA can be deactivated when the headlamp dimmer switch is moved from the neutral position to the high beam or flash to pass 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
- 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
- AHBA is deactivated automatically when the front or rear fog lamps are turned ON

AHBA System Indicator

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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.

Cornering Lamps (with Z75)

The cornering lamps are activated automatically at vehicle speeds below 25 MPH (40 km/h) when the turn signal/multifunction switch is placed in either the left or right turn positions and/or when the steering angle is changed from the straight-ahead position towards the side the vehicle is turning. When the body control module (BCM) detects that one of these operations has occurred, the BCM responds to the cornering lamp request by applying voltage to cornering lamp control circuit illuminating the appropriate cornering lamp in the area that the vehicle is turning. The cornering lamps are deactivated automatically when the turn signal/multifunction switch is placed in the neutral position and/or the steering angle has returned in the straight-ahead position. The cornering lamps will not operate at vehicle speeds above 25 MPH (40 km/h).

Daytime Running Lamps

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

- The ignition is in the RUN or CRANK position
- The shift lever is out of the PARK position for vehicles equipped with automatic transmissions or the parking brake is released for vehicles with manual transmissions
- The low and high beam headlamps are OFF

Daytime Running Lamps (without T4F)

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

Daytime Running Lamps (X88 with TB8 or T4F) or (Z88)

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 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 applies B+ to both daytime running lamp control circuits to the left and right multifunction light emitting diode (LED) control modules located

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in each headlamp assembly. The multifunction LED control modules respond the to the B+ input from the BCM by illuminating the left and right daytime running lamp LED's. When the daytime running lamps are ON and a turn signal is activated, the lower portion of the daytime running lamp halo is used for the turn signal and color changes to amber. The remaining portion of the daytime running lamp halo turns OFF for as long as the respective turn signal is active. When the turn signal is turned OFF the full daytime running lamp halo illuminates at normal color. Any function or condition that turns on the low beam headlamps will cancel daytime running lamps operation.

Daytime Running Lamps (Z75)

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 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 applies B+ to both daytime running lamp control circuits to the left and right multifunction light emitting diode (LED) control modules located in each headlamp assembly and multifunction lamp assemblies - front fascias. The multifunction LED control modules respond the to the B+ input from the BCM by illuminating the left and right daytime running lamp LED's located in each headlamp assembly as well as each multifunction lamp assembly located in the front fascia. Any function or condition that turns on the low beam headlamps will cancel daytime running lamps operation.

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 3 pin high beam fuse. Battery voltage is applied from the high beam fuse through the high beam control circuit to the high beam headlamp assemblies. This causes the high beam headlamps to illuminate at full brightness momentarily.

Hazard Lamps

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

The instrument panel dimmer switch controls 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 light emitting diode (LED) backlighting control circuit illuminating the LED to the desired level of brightness.

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Park, Tail, and License Lamps

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

Stop Lamps

The brake pedal position 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.

Turn Signal Lamps

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

Backup Lamps

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

Trailer Lamps

Backup Lamps

For backup lamp operation, the backup lamp relay is supplied with battery voltage at all times. 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 energizes the backup lamp relay by applying battery voltage to the backup lamp relay control circuit. When the backup lamp relay is energized, the relay switch contacts close and battery voltage is applied through the backup lamp fuses to the

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backup lamp control circuits which illuminates the backup lamps. Once the driver moves the gear selector out of the reverse position, a message is sent by the TCM via serial data requesting the BCM to remove battery voltage from the backup lamp relay control circuit.

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.

Trailer Lamps (Export VQ9)

The trailer interface control module is supplied with battery voltage as well as ignition voltage from the rear body fuse block and is permanently grounded. For lighting operation, the trailer interface control module receives serial data messages from the body control module (BCM) indicating what lamps have been activated on the vehicle. The trailer interface control module responds by applying voltage to the appropriate control circuits for the requested lamps illuminating the lamps on the attached trailer.

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For stop lamp operation, the trailer interface control module receives an input from the center high mount stop lamp control circuit. When the brakes are applied on the vehicle, the trailer interface control module receives the brake applied input from the center high mount stop lamp control circuit. The trailer interface control module responds by applying voltage to the trailer stop lamp control circuit illuminating the trailer stop lamps. The trailer interface control module also receives a serial data message from the BCM indicating that the vehicle brakes have been applied.

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 minute timer. At the end of the 10 minutes, the BCM will turn off the control power output to the park lamp controls as well as the headlamp relay coils, deactivating the exterior lamps. This feature will be cancelled if any power mode other than OFF becomes active. The BCM will disable battery run down protection if any of the following conditions exist. The park or headlamp switch is placed in the ON to OFF position, and back to the ON position during battery run down protection. The BCM determined that the park or headlamp switch was not active when the ignition was turned OFF.

INTERIOR LIGHTING SYSTEMS DESCRIPTION AND OPERATION

Interior Lamps

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

- Dome lamps
- Instrument panel compartment lamps
- Reading lamps
- Rear compartment courtesy lamp
- Sunshade mirror lamps

Dome Lamps

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 seconds 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 minutes 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.

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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 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 minutes has passed since any switch activation has been detected by the BCM.

Instrument Panel Compartment Lamp

The inadvertent power supply voltage circuit from the BCM provides battery voltage to the instrument panel compartment (glove box) lamp. When the instrument panel compartment is opened, the instrument panel compartment lamp switch contacts close providing a path to ground and the instrument panel compartment lamp illuminates. If the operator inadvertently leaves the instrument panel compartment door open with the instrument panel compartment lamp ON, the BCM will turn all interior lamps OFF after 10 minutes has passed since any switch activation has been detected by the BCM.

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 minutes 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 minutes has passed since any switch activation has been detected by the BCM.

Keyless Entry Interior Illumination

When the operator uses the keyless entry transmitter in order to unlock the doors, the BCM receives a door-unlock signal. The BCM must receive inputs from various systems that indicate that the ignition switch is OFF, the courtesy lamp switch is OFF, and all doors are closed before the BCM will activate the interior lamps. 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 seconds after the last door closes. The BCM will turn off the courtesy lamps through

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the theater dimming feature. The BCM keeps the courtesy lamps on for 40 seconds 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.

- Dome/reading lamps - front
- Dome/reading lamps - rear
- Door lock switch - driver
- Door lock switch - passenger
- Headlamp switch
- Hazard switch
- HVAC control head assembly
- Ignition mode switch
- Multifunction switch - instrument panel
- Outside rearview mirror switch
- Park brake switch
- Radio
- Rear compartment lid unlatch switch
- Steering wheel control switch - left
- Steering wheel control switch - right
- Sun roof switch
- Sun roof tilt switch
- Window switch - passenger

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 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

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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.

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 minutes 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 minute period, the timer resets for another 10 minutes.

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ACCESSORIES & EQUIPMENT

Lighting - Diagnostic Information and Procedures - Escalade, Suburban, Tahoe, Yukon

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B0655: STOP LAMP SWITCH CIRCUIT NOT PLAUSIBLE

Diagnostic Instructions

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

DTC Descriptor

DTC B0655 5A

Stop Lamp Switch Circuit Not Plausible

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	B0655 5A
Center High Mounted Stop Lamp Ground	-	1	-	-
1. Center High Mounted Stop Lamp Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

The BCM sets this DTC when the brake applied signal and the serial data message from the BCM do not match when the brakes are applied.

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 and the ignition is cycled.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - 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**

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the center high mounted stop lamp on the vehicle turns ON and OFF when commanding the Center Brake Lamp ON and OFF with a scan tool.
    - **If the center high mounted stop lamp does not turn ON and OFF**

      Refer to **Stop Lamps Malfunction**.

    - **If the center high mounted stop lamp turns ON and OFF**

      Test or replace the K9 Body Control Module.

Repair Instructions

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

Control Module References for BCM replacement, programming, and setup

DTC B1395: CONTROL MODULE VOLTAGE REFERENCE OUTPUT 1

Diagnostic Instructions

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

DTC Descriptors

DTC B1395 03

Control Module Voltage Reference Output 1 Circuit Low Voltage

DTC B1395 07

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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.

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- 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 Schematics

Connector End View Reference

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Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S30 Headlamp Switch, ignition ON.

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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.
    - **If B+**
3. Verify a test lamp does not illuminate between the B+ circuit terminal 12 and ground.
    - **If the test lamp illuminates**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
    2. Test for less than 1 V between the B+ circuit terminal 12 and ground.
        - If 1 V or greater, repair the short to voltage on the circuit.
        - If less than 1 V, replace the K9 Body Control Module.
    - **If the test lamp does not illuminate**
4. Verify a test lamp illuminates between the B+ circuit terminal 12 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.
    - **If the test lamp illuminates**
5. Verify a test lamp does not illuminate between the B+ circuit terminal 12 and the signal circuit terminal 11.
    - **If the test lamp illuminates**

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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.

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

6. 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.

- **If B+**

7. Test or replace the S30 Headlamp Switch.

Repair Instructions

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

- **Headlamp Switch Replacement (Chevrolet / GMC)** **Headlamp Switch Replacement (Cadillac)**
- **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.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

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DTC B1480 02

Battery Rundown Protection Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F46DR (BCM 6) Fuse B+	1	1	-	-
Courtesy Lamps Control - Terminal 3 X7	B1480 02	1	1	-
Center Console Compartment Lamp Ground	-	1	-	-
Dome/Reading Lamps - Front Overhead Console Left Ground	-	1	-	-
Dome/Reading Lamps - Front Overhead Console Right Ground	-	1	-	-
Dome/Reading Lamps - 2nd Row Ground	-	1	-	-
Dome/Reading Lamps - 3rd Row Ground	-	1	-	-
Dome/Reading Lamps - Left Roof Rail Ground	-	1	-	-
Dome/Reading Lamps - Right Roof Rail Ground	-	1	-	-
Sunshade Mirror Lamp - Left Ground	-	1	-	-
Sunshade Mirror Lamp - Right Ground	-	1	-	-
Video Display - 2nd Row Ground	-	1	-	-
Video Display - 3rd Row Ground	-	1	-	-
1. Courtesy Lamps Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

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Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

The BCM detects a short to ground in the courtesy lamps control circuit terminal 3 X7.

Actions Taken When the DTC Sets

The BCM will disable the circuit and all lamps controlled by the courtesy lamps control circuit will be inoperative.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- Disconnect the negative battery cable for 30 s.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Interior Lights Schematics

Connector End View Reference

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Interior 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

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Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the harness connectors at the components listed below.
    - A3L Sunshade - Left
    - A3R Sunshade - Right
    - E28 Center Console Compartment Lamp
    - E37B Dome/Reading Lamps - 2nd Row
    - E37C Dome/Reading Lamps - 3rd Row
    - E37EL Dome/Reading Lamps - Front Overhead Console Left
    - E37ER Dome/Reading Lamps - Front Overhead Console Right
    - E37H Dome/Reading Lamps - Left Roof Rail
    - E37J Dome/Reading Lamps - Right Roof Rail
    - P22A Video Display - 2nd Row
    - P22B Video Display - 3rd Row
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
    - E28 Center Console Compartment Lamp - terminal 1
    - E37B Dome/Reading Lamps - 2nd Row terminal A (without U42)
    - E37C Dome/Reading Lamps - 3rd Row terminal A (without U42)
    - E37EL Dome/Reading Lamps - Front Overhead Console Left terminal 2
    - E37ER Dome/Reading Lamps - Front Overhead Console Right terminal 2
    - E37H Dome/Reading Lamps - Left Roof Rail terminal 2
    - E37J Dome/Reading Lamps - Right Roof Rail terminal 2
    - P22A Video Display - 2nd Row terminal 5
    - P22B Video Display - 3rd Row terminal 5
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**

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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.

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

4. Test or replace the appropriate courtesy lamp.

Repair Instructions

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

- **Sunshade Replacement**
- **Center Reading and Courtesy Lamp Replacement (Front)** **Center Reading and Courtesy Lamp Replacement (Rear)**
- **Rear Seat Position Center Reading and Courtesy Lamp Replacement**
- **Cargo Center Courtesy Lamp Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC B2530: FRONT FOG LAMPS CONTROL

Diagnostic Instructions

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

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DTC Descriptors

DTC 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 Switch Signal	B2740 00	1	1	-
Front Fog Lamp Relay Control	B2530 02	B2530 04	B2530 01	-
Front Fog Lamp Control	1	1	1	-
Headlamp Switch Ground	-	1	-	-
Front Fog Lamp Ground - Left	-	1	-	-
Front Fog Lamp Ground - Right	-	1	-	-
1. Front Fog Lamps Malfunction				

Circuit/System Description

The front fog lamp relay is supplied with battery voltage at all times. The front fog lamp switch signal circuit is grounded momentarily by pressing the front fog lamp switch. The body control module (BCM) energizes the front fog lamp relay by applying 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 F94UA 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.

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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/high resistance 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 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 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 X3 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.
    - **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 F94UA fog lamp fuse at the X50A Fuse Block - Underhood, ignition ON.
5. Verify a test lamp illuminates between the F94UA fog lamp fuse B+ switch control terminal and ground.
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X3 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.
    - **If the test lamp illuminates**
6. Test or replace the K9 Body Control Module.

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Repair Instructions

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

- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC B2545: BACKUP LAMPS

Diagnostic Instructions

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

DTC Descriptors

DTC B2545 01

Backup Lamps Circuit Short to Battery

DTC B2545 02

Backup Lamps Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F11DL (BCM 5) Fuse B+	B2545 01	B2545 01	-	-
Backup Lamps Relay Control	B2545 02	B2545 01	B2545 01	-
Backup Lamp Control	1	1	1	-
Backup Lamp Relay Ground	-	1	-	-
Backup Lamp Ground - Left	-	1	-	-
Backup Lamp Ground - Right	-	1	-	-
1. Backup Lamps Malfunction				

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Circuit/System Description

The backup lamp relay is supplied with battery voltage at all times. 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 energizes the backup lamp relay by applying battery voltage to the backup lamp relay control circuit. When the backup lamp relay is energized, the relay switch contacts close and battery voltage is applied through the backup lamp fuses to the backup lamp control circuits which illuminates the backup lamps. Once the driver moves the gear selector out of the reverse position, a message is sent by the TCM via serial data requesting the BCM to remove battery voltage from the backup lamp relay control circuit. The engine must be running for the backup lamps to operate.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2545 01

- The BCM detects a short to voltage or an open/high resistance in the backup lamps relay control circuit.
- The BCM detects a short to ground or an open/high resistance in the F11DL (BCM 5) fuse B+ circuit.

DTC B2545 02

The BCM detects a short to ground in the backup lamps relay 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

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Schematic Reference

- **Exterior Lights Schematics**
- **Body Control System 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 X2 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 X2 harness connector at the X51L Fuse Block - Instrument Panel Left.
    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 X2 harness connector at the X51L Fuse Block - Instrument Panel Left.

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2. Test for infinite resistance between the B+ circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance, replace the K9 Body Control Module.
- **If the test lamp illuminates**

3. Ignition OFF, connect the X2 harness connector at the K9 Body Control Module.
4. Ignition OFF, all vehicle systems OFF, disconnect the X2 Harness connector at the X50A Fuse Block - Underhood. 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 F2 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.
    - **If less than 10 Ω**
6. Connect the X2 harness connector at the X50A Fuse Block - Underhood.
7. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.

NOTE: **The test lamp will illuminate at low intensity for the following test.**

8. Verify a test lamp illuminates between the control circuit terminal 26 and B+.
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X4 harness connector at the X50A Fuse Block - Underhood, ignition ON.
    2. Test for less than 1 V between the control circuit terminal 26 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 control circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the X50A Fuse Block - Underhood.
    - **If the test lamp illuminates**
9. Connect a 3 A fused jumper between the control circuit terminal 26 and B+, ignition ON.

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10. Verify the backup lamps illuminate.
    - **If the backup lamps do not illuminate**
    1. Ignition OFF, disconnect the X4 harness connector at the X50A Fuse Block - Underhood.
    2. Test for infinite resistance between the control circuit terminal 26 and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the X50A Fuse Block - Underhood.
    - **If the backup lamps illuminate**
11. Test or replace the K9 Body Control Module.

Repair Instructions

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

- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC B255D: PASSENGER COMPARTMENT LAMP CONTROL 2

Diagnostic Instructions

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

DTC Descriptors

DTC B255D 01

Passenger Compartment Lamp Control 2 Circuit Short to Battery

DTC B255D 02

Passenger Compartment Lamp Control 2 Circuit Short to Ground

DTC B255D 04

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Passenger Compartment Lamp Control 2 Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Accent Lamp Control - Terminal 23 X1	B255D 02	B255D 04	B255D 01	-
Flood Lamp - Center Console Ground	-	1	-	-
Video Display - 2nd Row Ground	-	1	-	-
Video Display - 3rd Row 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 B255D 01

The BCM detects a short to voltage in the accent lamp control circuit terminal 23 X1.

DTC B255D 02

The BCM detects a short to ground in the accent lamp control circuit terminal 23 X1.

DTC B255D 04

The BCM detects an open/high resistance in the accent lamp control circuit terminal 23 X1.

Actions Taken When the DTC Sets

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The BCM will disable the accent lamp control circuit terminal 23 X1.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Interior Lights Schematics

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 schematics to identify the following:**

- **Courtesy lamps the vehicle is equipped with**

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- **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 appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E38 Flood Lamp - Center Console
    - P22A Video Display - 2nd Row (with U42)
    - P22B Video Display - 3rd Row (with DNU)
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - E38 Flood Lamp - Center Console terminal 2
    - P22A Video Display - 2nd Row terminal 8 (with U42)
    - P22B Video Display - 3rd Row terminal 8 (with DNU)
    - **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.
    - **If less than 15 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E38 Flood Lamp - Center Console terminal 1
    - P22A Video Display - 2nd Row terminal 1 (with U42)
    - P22B Video Display - 3rd Row terminal 1 (with DNU)
4. Verify the test lamp turns ON and OFF when commanding the Accent Lighting 2 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.

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- 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.

- **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.

- **Front Floor Console Flood Lamp Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC B255F: INTERIOR DOOR HANDLE BACKLIGHT

Diagnostic Instructions

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

DTC Descriptors

DTC B255F 02

Interior Door Handle Backlight Circuit Short to Ground

DTC B255F 04

Interior Door Handle Backlight Circuit Open

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Accent Lamp Control - Terminal 22 X7	B255F 02	B255F 04	1	-
Accent Lamp - Driver Door Ground	-	1	-	-
Accent Lamp - Driver Door Handle Ground	-	1	-	-
Accent Lamp - Driver Seat Ground	-	1	-	-
Accent Lamp - Left Rear Door Ground	-	1	-	-
Accent Lamp - Left Rear Door Handle Ground	-	1	-	-
Accent Lamp - Passenger Door Ground	-	1	-	-
Accent Lamp - Passenger Door Handle Ground	-	1	-	-
Accent Lamp - Passenger Seat Ground	-	1	-	-
Accent Lamp - Right Rear Door Ground	-	1	-	-
Accent Lamp - Right Rear Door Handle Ground	-	1	-	-
Flood Lamp - Driver Door Handle Ground	-	1	-	-
Flood Lamp - Left Rear Door Pocket Ground	-	1	-	-
Flood Lamp - Passenger Door Handle Ground	-	1	-	-
Flood Lamp - Right Rear Door Pocket Ground	-	1	-	-
Floor Accent Lamp - Right Front Ground	-	1	-	-
Floor Accent Lamp - Left Front 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

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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.
- Ignition OFF, wait 30 s.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Interior Lights Schematics

Connector End View Reference

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Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

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Control Module References for scan tool information

Circuit/System Testing

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

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

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the component with the inoperative LED backlighting. 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 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.
   - **If less than 15 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**

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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.

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

5. Test or replace the appropriate accent lamp.

Repair Instructions

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

- **Front Floor Flood Lamp Replacement (Right Side)** **Front Floor Flood Lamp Replacement (Left Side)**
- **Front Side Door Inside Handle Illumination Lamp Replacement (Chevrolet / GMC)** **Front Side Door Inside Handle Illumination Lamp Replacement (Cadillac)**
- **Rear Side Door Inside Handle Illumination Lamp Replacement (Chevrolet / GMC)** **Rear Side Door Inside Handle Illumination Lamp Replacement (Cadillac)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B2575 OR B2699: HEADLAMP CONTROL

Diagnostic Instructions

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

DTC Descriptors

DTC B2575 01

Headlamps Control Circuit Short to Battery

DTC B2575 02

Headlamps Control Circuit Short to Ground

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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
F10DL (BCM 3) Fuse B+	1	1	-	-
F19DR (BCM 4) Fuse B+	1	1	-	-
Low Beam Headlamp - Left Control	B2575 02	B2575 04	B2575 01	-
Low Beam Headlamp - Right Control	B2699 02	B2699 04	B2699 01	-
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.

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- Low beam headlamps ON.

Conditions for Setting the DTC

DTC B2575 01 and B2575 04

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

DTC B2575 02

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

DTC B2699 01 and B2699 04

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

DTC B2699 02

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

- **Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88)** **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**
- **Body Control System 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

DTC B2575

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E4G Headlamp - Left Low Beam (halogen)
    - E13LA Headlamp Assembly - Left (with AVF)
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
    - E4G Headlamp - Left Low Beam socket terminal (halogen)
    - E13LA Headlamp Assembly - Left terminal 1 and terminal 4 (with AVF)
    - **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.
    - **If less than 10 Ω**

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3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E4G Headlamp - Left Low Beam socket terminal (halogen)
    - E13LA Headlamp Assembly - Left terminal 2 (with AVF)
4. Verify the test lamp turns ON and OFF when commanding the Low Beam Headlamps ON and OFF with the S30 Headlamp Switch.
    - **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.
    - **If the test lamp turns ON and OFF**
5. Test or replace the headlamp - left low beam.

DTC B2699

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E4F Headlamp - Right Low Beam (halogen)
    - E13RA Headlamp Assembly - Right (with AVF)
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
    - E4F Headlamp - Right Low Beam socket terminal (halogen)
    - E13RA Headlamp Assembly - Right terminal 1 and terminal 4 (with AVF)
    - **If 10 Ω or greater**

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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.

- **If less than 10 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E4F Headlamp - Right Low Beam socket terminal (halogen)
    - E13RA Headlamp Assembly - Right terminal 2 (with AVF)
4. Verify the test lamp turns ON and OFF when commanding the Low Beam Headlamps ON and OFF with the S30 Headlamp Switch.

- **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.

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

5. Test or replace the headlamp - right low beam.

Repair Instructions

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

- **Headlamp Control Module Replacement (Multifunction LED)**

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- Headlamp Bulb Replacement (GMC, HID, Left Side) Headlamp Bulb Replacement (Chevrolet, HID, Left Side) Headlamp Bulb Replacement (GMC, Halogen, Left Side) Headlamp Bulb Replacement (Chevrolet, Halogen, Left Side) Headlamp Bulb Replacement (GMC, High-Beam, Left Side) Headlamp Bulb Replacement (Chevrolet, High-Beam, Left Side) Headlamp Bulb Replacement (GMC, HID, Right Side) Headlamp Bulb Replacement (GMC, Halogen, Right Side) Headlamp Bulb Replacement (GMC, High-Beam, Right Side) Headlamp Bulb Replacement (Chevrolet, HID, Right Side) Headlamp Bulb Replacement (Chevrolet, Halogen, Right Side) Headlamp Bulb Replacement (Chevrolet, High-Beam, Right Side)
- 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.
- Diagnostic Procedure Instructions provides an overview of each diagnostic category.

DTC Descriptor

DTC B257A 00

Headlamp Switch Input Signals Correlation Malfunction

Diagnostic Fault Information

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

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88) **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**

Connector End View Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 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.
    - **If less than 15 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.

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

- **If Inactive**

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

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

- **If Active**

10. Verify the scan tool Headlamps On Switch parameter is Inactive.
    - **If not Inactive**
    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.
    - **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.
    - **If Active**
13. Test or replace the S30 Headlamp Switch.

Repair Instructions

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

- **Headlamp Switch Replacement (Chevrolet / GMC)** **Headlamp Switch Replacement (Cadillac)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B2580: HIGH BEAM CONTROL

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Diagnostic Instructions

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

DTC Descriptors

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

Circuit/System Description

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

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relay energized, the switch contacts close allowing battery voltage to flow through the high beam fuse to the high beam control circuits illuminating the high beam headlamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2580 01

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

DTC B2580 02 and DTC B2580 04

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88) **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**

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 18 and ground.
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X3 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.
    - **If the test lamp illuminates**
3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 18 and ground.
4. Verify the high beam headlamps illuminate.
    - **If the high beam headlamps do not illuminate**
    1. Ignition OFF, disconnect the X3 harness connector at the X50A Fuse Block - Underhood, 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.

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- If less than 1 V, replace the X50A Fuse Block - Underhood.
- **If the high beam headlamps illuminate**

5. Test or replace the K9 Body Control Module.

Repair Instructions

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

- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC B258A: LOW BEAM CONTROL

Diagnostic Instructions

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

DTC Descriptors

DTC B258A 01

Low Beam Control Circuit Short to Battery

DTC B258A 02

Low Beam Control Circuit Short to Ground

DTC B258A 04

Low Beam Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Headlamp Low Beam Relay Control	B258A 02, B258A	B258A 02, B258A 04,	B258A 01, U1511	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
	04	U1511 00, U1521 00	00, U1521 00	
Low Beam Headlamp Control - Left	1	1	1	-
Low Beam Headlamp Control - Right	1	1	1	-
Headlamp Assembly Ground - Left	-	1	-	-
Headlamp Assembly Ground - Right	-	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 ground to the low beam relay control circuit which energizes the low beam relay. With the low beam relay energized, the switch contacts close allowing battery voltage to flow through the low beam fuses to the low beam 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 B258A 01

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

DTC B258A 02 and B258A 04

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

Actions Taken When the DTC Sets

DTC B258A 01 or B258A 04

- The low beam headlamps will not operate.
- The driver information center will display "Left Low Beam Failure" and "Right Low Beam Failure".

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DTC B258A 02

The low beam headlamps will always be ON.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88) **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**

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.

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

2. Verify a test lamp illuminates between the control circuit terminal 13 and ground.
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X4 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.
    - **If the test lamp illuminates**
3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 13 and ground.
4. Verify the low beam headlamps illuminate.
    - **If the low beam headlamps do not illuminate**
    1. Ignition OFF, disconnect the X4 harness connector at the X50A Fuse Block - Underhood, 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, replace the X50A Fuse Block - Underhood.
    - **If the low beam headlamps illuminate**
5. Test or replace the K9 Body Control Module.

Repair Instructions

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

- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC B2590 OR B2595: LEFT/RIGHT CORNERING LAMP CIRCUIT SHORT TO GROUND

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Diagnostic Instructions

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

DTC Descriptors

DTC B2590 02

Left Cornering Lamp Circuit Short to Ground

DTC B2595 02

Right Cornering Lamp Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Cornering Lamp - Left Control	B2590 02	1	1	-
Cornering Lamp - Right Control	B2595 02	1	1	-
Multifunction Lamp Assembly - Front Fascia Left Ground	-	1	-	-
Multifunction Lamp Assembly - Front Fascia Right Ground	-	1	-	-
1. Cornering Lamps Malfunction				

Circuit/System Description

The cornering lamps are activated automatically at vehicle speeds below 25 MPH (40 km/h) when the turn signal/multifunction switch is placed in either the left or right turn positions and/or when the steering angle is changed from the straight-ahead position towards the side the vehicle is turning. When the body control module (BCM) detects that one of these operations has occurred, the BCM responds to the cornering lamp request by applying voltage to cornering lamp control circuit illuminating the appropriate cornering lamp in the area that the vehicle is turning. The cornering lamps are deactivated automatically when the turn signal/multifunction switch is placed in the neutral position and/or the steering angle has returned in the straight-ahead position. The cornering lamps will not operate at vehicle speeds above 25 MPH (40 km/h).

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Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2590 02

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

DTC B2595 02

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

Actions Taken When the DTC Sets

The BCM will not illuminate the affected corning lamp.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

DTC B2590

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E69L Multifunction Lamp Assembly - Front Fascia Left. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 1 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.
   - **If less than 15 Ω**
3. Connect a test lamp between the control circuit terminal 6 and ground, ignition ON.

   NOTE: **This is a low current circuit that will illuminate the test lamp at LOW intensity. This is normal circuit operation.**

4. Verify the test lamp turns ON and OFF when commanding the cornering lamp ON and OFF while operating the turn signal/multifunction switch between the LEFT TURN and OFF positions.
   - **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.

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- 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.

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

5. Test or replace the E69L Multifunction Lamp Assembly - Front Fascia Left.

DTC B2595

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the E69R Multifunction Lamp Assembly - Front Fascia Right. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 1 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.

    - **If less than 15 Ω**

3. Connect a test lamp between the control circuit terminal 6 and ground, ignition ON.

NOTE: **This is a low current circuit that will illuminate the test lamp at LOW intensity. This is normal circuit operation.**

4. Verify the test lamp turns ON and OFF when commanding the cornering lamp ON and OFF while operating the turn signal/multifunction switch between the RIGHT TURN and OFF positions.
    - **If the test lamp is always OFF**

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1. Ignition OFF, disconnect the X6 harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the control circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K9 Body Control Module.

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

1. Ignition OFF, disconnect the X6 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the control circuit terminal and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V, replace the K9 Body Control Module.

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

5. Test or replace the E69R Multifunction Lamp Assembly - Front Fascia Right.

Repair Instructions

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

- **Windshield Outside Moisture/Ambient Light and Humidity Sensor Replacement**
- **Control Module References** for BCM or HVAC control module replacement, programming, and setup

DTC B2600 OR B2605: LEFT/RIGHT DAYTIME RUNNING LAMPS CONTROL

Diagnostic Instructions

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

DTC Descriptors

DTC B2600 01

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Left Daytime Running Lamps Control Circuit short to Battery

DTC B2600 02

Left Daytime Running Lamps Control Circuit Short to Ground

DTC B2600 04

Left Daytime Running Lamps Control Circuit Open

DTC B2605 01

Right Daytime Running Lamps Control Circuit short to Battery

DTC B2605 02

Right Daytime Running Lamps Control Circuit Short to Ground

DTC B2605 04

Right Daytime Running Lamps Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ambient Light Sensor Signal	B2645 03	B2645 07	B2645 07	-
Park/Daytime Running Lamp - Left Control	B2600 02	B2600 04	B2600 01	-
Park/Daytime Running Lamp - Right Control	B2605 02	B2605 04	B2605 01	-
Ambient Light Sensor Low Reference	1	B2645 07, B0163 05, B0183 05,	1	-
Headlamp Assembly - Left Ground	-	1	-	-
Headlamp Assembly - Right Ground	-	1	-	-
Multifunction Lamp Assembly - Front Fascia Left Ground	-	1	-	-
Multifunction Lamp Assembly - Front Fascia Right Ground	-	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
1. Daytime Running Lamps Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2600 01

The BCM detects a short to voltage in the left park/daytime running lamp control circuit.

DTC B2600 02

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

DTC B2600 04

The BCM detects an open/high resistance in the left park/daytime running lamp control circuit.

DTC B2605 01

The BCM detects a short to voltage in the right park/daytime running lamp control circuit.

DTC B2605 02

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

DTC B2605 04

The BCM detects an open/high resistance in the right park/daytime running lamp control circuit.

Actions Taken When the DTC Sets

- When DTC B2600 sets, the left park/daytime running lamp will be inoperative.
- When DTC B2605 sets, the right park/daytime running 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

Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88) **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**

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

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Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E13LA Headlamp Assembly - Left
    - E13RA Headlamp Assembly - Right
    - E69L Multifunction Lamp Assembly - Front Fascia Left
    - E69R Multifunction Lamp Assembly - Front Fascia Right
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
    - E13LA Headlamp Assembly - Left terminal 1 and terminal 4
    - E13RA Headlamp Assembly - Right terminal 1 and terminal 4
    - E69L Multifunction Lamp Assembly - Front Fascia Left terminal 1
    - E69R Multifunction Lamp Assembly - Front Fascia Right terminal 1
    - **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.
    - **If less than 10 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E13LA Headlamp Assembly - Left terminal 6
    - E13RA Headlamp Assembly - Right terminal 6
    - E69L Multifunction Lamp Assembly - Front Fascia Left terminal 4
    - E69R Multifunction Lamp Assembly - Front Fascia Right terminal 4
4. Verify the test lamp turns ON and OFF when commanding the appropriate Dedicated Daytime Running Lamp ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
        - X4 - left daytime running lamp

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- X4 - right daytime running lamp (without AVF)
- X5 - right daytime running lamp

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

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

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
   - X4 - left daytime running lamp
   - X4 - right daytime running lamp (without AVF)
   - X5 - right daytime running lamp
2. Test for less than 1 V between the control circuit terminal and ground.
   - If 1 V or greater, repair the short to voltage on the circuit.
   - If less than 1 V, replace the K9 Body Control Module.

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

5. Test or replace the park/daytime running lamp.

Repair Instructions

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

- **Headlamp Replacement (GMC)** **Headlamp Replacement (Chevrolet)** **Headlamp Replacement (Cadillac)**
- **Headlamp Control Module Replacement (Multifunction LED)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B260D OR B260E: LEFT/RIGHT DAYTIME RUNNING LAMPS CONTROL

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

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- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B260D 02

Left Daytime Running Lamps Control Circuit Short to Ground

DTC B260E 02

Right Daytime Running Lamps Control Circuit Short to Ground

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	-
Park/Daytime Running Lamp - Left Control	B260D 02	1	1	-
Park/Daytime Running Lamp - Right Control	B260E 02	1	1	-
Ambient Light Sensor Low Reference	1	B2645 07, B0163 05, B0183 05,	1	-
Headlamp Assembly - Left Ground	-	1	-	-
Headlamp Assembly - Right Ground	-	1	-	-
Multifunction Lamp Assembly - Front Fascia Left Ground	-	1	-	-
Multifunction Lamp Assembly - Front Fascia Right Ground	-	1	-	-
1. Daytime Running Lamps Malfunction				

Circuit/System Description

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

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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.
- Headlamp switch in AUTO position.

Conditions for Setting the DTC

DTC B260D 02

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

DTC B260E 02

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

Actions Taken When the DTC Sets

- When DTC B260D sets, the left park/daytime running lamp will be inoperative.
- When DTC B260E sets, the right park/daytime running 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

Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88) **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E13LA Headlamp Assembly - Left
    - E13RA Headlamp Assembly - Right
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
    - E13LA Headlamp Assembly - Left terminal 1 and terminal 4
    - E13RA Headlamp Assembly - Right terminal 1 and terminal 4
    - **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.
    - **If less than 10 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E13LA Headlamp Assembly - Left terminal 6
    - E13RA Headlamp Assembly - Right terminal 6
4. Verify the test lamp turns ON and OFF when commanding the appropriate Dedicated Daytime Running Lamp ON and OFF with a scan tool.

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- **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 daytime running lamp
    - X5 - right daytime running lamp
2. Test for infinite resistance between the control circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K9 Body Control Module.

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

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
    - X4 - left daytime running lamp
    - X5 - right daytime running lamp
2. Test for less than 1 V between the control circuit terminal and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V, replace the K9 Body Control Module.

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

5. Test or replace the park/daytime running lamp.

Repair Instructions

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

- **Headlamp Replacement (GMC)** **Headlamp Replacement (Chevrolet)** **Headlamp Replacement (Cadillac)**
- **Headlamp Control Module Replacement (Multifunction LED)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B2610: PASSENGER COMPARTMENT DIMMING 1

Diagnostic Instructions

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

DTC Descriptors

DTC 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 04	-
LED Backlight Dimming Control Terminal 9 X7	B2610 02	B2610 04	B2610 04	-
Center Console Compartment Cooler Box Switch Ground	-	1	-	-
Content Theft Deterrent Sensor Disable Switch Ground	-	1	-	-
Dome Lamp Switch Ground	-	1	-	-
Dome/Reading Lamps - Front Overhead Console Left Ground	-	1	-	-
Dome/Reading Lamps - Front Overhead Console Right Ground	-	1	-	-
Dome/Reading Lamps - Left Roof Rail Ground	-	1	-	-
Dome/Reading Lamps - Right Roof Rail Ground	-	1	-	-
Dome/Reading Lamps - 2nd Row Ground	-	1	-	-
Dome/Reading Lamps - 3rd Row Ground	-	1	-	-
Door Lock Switch - Driver Ground	-	1	-	-
Door Lock Switch - Passenger Ground	-	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Garage Door Opener Ground	-	1	-	-
Headlamp Switch Ground	-	1	-	-
Head-Up Display Switch Ground	-	1	-	-
Ignition Mode Switch Ground	-	1	-	-
Liftgate Control Switch - Interior Ground	-	1	-	-
Media Disc Eject Switch Ground	-	1	-	-
Multifunction Switch - Instrument Panel Ground	-	1	-	-
Outside Rearview Mirror Switch Ground	-	1	-	-
Park Brake Control Switch Ground	-	1	-	-
Passenger Air Bag Disable Indicator Ground	-	1	-	-
Seat Memory Switch - Driver Ground	-	1	-	-
Steering Wheel Controls Switch - Right Ground	-	1	-	-
Steering Wheel Controls Switch - Left Ground	-	1	-	-
Sunroof Switch Ground	-	1	-	-
Trailer Brake Control Switch Ground	-	1	-	-
Transfer Case Shift Control Switch Ground	-	1	-	-
Video Display - 2nd Row Ground	-	1	-	-
Video Display - 3rd Row Ground	-	1	-	-
Window Switch - Passenger 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 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 dimmer switch. When the dimmer switch is placed in the desired position, the dimmed voltage setting is applied from the dimmer switch through the dimmer switch signal circuit to the BCM. The BCM interprets the signal and applies a pulse width modulated voltage through the light emitting diode dimming control circuits illuminating the interior backlighting to the requested level of brightness.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B2610 02

The BCM detects a short to ground in the LED backlight dimming control 1 circuit terminal 8 X2 or LED backlight dimming control 2 circuit terminal 9 X7.

DTC B2610 04

The BCM detects a short to voltage or an open/high resistance in the LED backlight dimming control 1 circuit terminal 8 X2 or LED backlight dimming control 2 circuit terminal 9 X7.

Actions Taken When the DTC Sets

The BCM will disable the LED backlight dimming control circuits.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- Disconnect the negative battery cable for 30 s.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Interior Lights Dimming Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Interior Lighting Systems 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 Verification

1. Ignition ON.
2. Verify the courtesy lamps listed below operate normally when activated.
    - Dome/reading lamps - front overhead console
    - Sunshade lamps
    - Center console compartment lamp
    - **If the courtesy lamps do not operate normally**

      Refer to **Courtesy Lamps Malfunction**.

    - **If the courtesy lamps operate normally**
3. Refer to Circuit/System Testing.

Circuit/System Testing

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

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

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the

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component with inoperative backlighting. 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 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.
    - **If less than 15 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.
    - **If the test lamp turns ON and OFF**
5. Test or replace the component with inoperative backlighting.

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Repair Instructions

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

- **Headlamp Switch Replacement (Chevrolet / GMC)** **Headlamp Switch Replacement (Cadillac)**
- **Emergency Vehicle Roof Lamp Switch Replacement**
- **Radio Control Switch Replacement - Steering Wheel (Cadillac)** **Radio Control Switch Replacement - Steering Wheel (Chevrolet/GMC)**
- **Instrument Panel Airbag Arming Status Display Replacement**
- **Driver or Passenger Seat Heater Switch Replacement**
- **Front Seat Adjuster Memory Switch Replacement (Cadillac)** **Front Seat Adjuster Memory Switch Replacement (Chevrolet / GMC)**
- **Door Lock Switch Replacement - Driver Side (Chevrolet, GMC)** **Door Lock Switch Replacement - Driver Side (Cadillac)**
- **Door Lock Switch Replacement - Passenger Front (Chevrolet, GMC)** **Door Lock Switch Replacement - Passenger Front (Cadillac)**
- **Front Side Door Window Control Switch Replacement (Chevrolet, GMC)** **Front Side Door Window Control Switch Replacement (Cadillac)**
- **Center Reading and Courtesy Lamp Replacement (Front)** **Center Reading and Courtesy Lamp Replacement (Rear)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B2615: PASSENGER COMPARTMENT DIMMING 2

Diagnostic Instructions

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

DTC Descriptors

DTC B2615 02

Passenger Compartment Dimming 2 Circuit Short to Ground

DTC B2615 04

Passenger Compartment Dimming 2 Circuit Open

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F47DR (BCM 7) Fuse B+	1	1	-	-
Dome/Courtesy Lamps Control - Terminal 1 X7	B2615 02	B2615 04	1	-
Dome Lamp Ground (Z75 without SWB)	-	1	-	-
Dome/Reading Lamps - Front Overhead Console Left Ground	-	1	-	-
Dome/Reading Lamps - Front Overhead Console Right Ground	-	1	-	-
Dome/Reading Lamps - Left Roof Rail Ground (with AZ3)	-	1	-	-
Dome/Reading Lamps - Right Roof Rail Ground (with AZ3)	-	1	-	-
Dome/Reading Lamps - 2nd Row Ground (without U42)	-	1	-	-
Dome/Reading Lamps - 3rd Row Ground (without DNU)	-	1	-	-
Door Sill Plate Lamp - Driver Ground (with Z75)	-	1	-	-
Door Sill Plate Lamp - Left Rear Ground (with Z75)	-	1	-	-
Door Sill Plate Lamp - Passenger Ground (with Z75)	-	1	-	-
Door Sill Plate Lamp - Right Rear Ground (with Z75)	-	1	-	-
Video Display - 2nd Row Ground (with U42)	-	1	-	-
Video Display - 3rd Row Ground (with DNU)	-	1	-	-
1. Dome Lamps Malfunction				

Circuit/System Description

The body control module (BCM) applies battery voltage to the interior dome/courtesy lamps through the dome/courtesy lamps control circuit at terminal 1 X7. When any door is opened, the jam switch contacts close and the BCM receives a door-ajar input. If the BCM receives a door lock or unlock input or a rear hatch open input, the BCM will activate the dome/courtesy lamps control circuit terminal 1 X7, providing battery voltage to all dome/courtesy lamps supplied by the circuit. The dome lamp switch contains 3 positions: DOOR, OFF, and ON. The ON position provides a ground

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for continuous operation and the dome/courtesy lamps will remain illuminated until the switch is placed in either the DOOR or OFF position. When placed in the DOOR position, the dome/courtesy lamps operation is controlled by the body control module (BCM) based on inputs mentioned above. With the dome lamp switch in the OFF position, all dome/courtesy lamps operation will be disabled and will not illuminate until the dome lamp switch is placed in the ON or DOOR positions. In the event that any of these dome/courtesy lamps were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position, the BCM will deactivate the dome/courtesy 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 terminal 1 X7.

Actions Taken When the DTC Sets

The BCM will disable the dome/courtesy lamps control circuit terminal 1 X7.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- Disconnect the negative battery cable for 30 s.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Interior Lights Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Interior Lighting Systems 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 with backlighting may need to be disconnected to isolate a short to voltage or short to ground. Use the schematics to identify the following:**

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

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the component with the inoperative dome/courtesy lamp. 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.
   - E36AH Dome Lamp terminal B (Z75 without SWB)
   - E37B Dome/Reading Lamps - 2nd Row terminal B (without U42)
   - E37C Dome/Reading Lamps - 3rd Row terminal B (without DNU)
   - E37H Dome/Reading Lamps - Left Roof Rail terminal 4 (with AZ3)
   - E37J Dome/Reading Lamps - Right Roof Rail terminal 4 (with AZ3)
   - E37EL Dome/Reading Lamps - Front Overhead Console Left terminal 4
   - E37ER Dome/Reading Lamps - Front Overhead Console Right terminal 4
   - E8A Door Sill Plate Lamp - Driver terminal 2 (with Z75)
   - E8B Door Sill Plate Lamp - Passenger terminal 2 (with Z75)
   - E8Q Door Sill Plate Lamp - Left Rear terminal 2 (with Z75)

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- E8R Door Sill Plate Lamp - Right Rear terminal 2 (with Z75)
- P22A Video Display - 2nd Row terminal 2 (with U42)
- P22B Video Display - 3rd Row terminal 2 (with DNU)
- **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.

- **If less than 15 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E36AH Dome Lamp terminal A (Z75 without SWB)
    - E37B Dome/Reading Lamps - 2nd Row terminal C (without U42)
    - E37C Dome/Reading Lamps - 3rd Row terminal C (without DNU)
    - E37H Dome/Reading Lamps - Left Roof Rail terminal 3 (with AZ3)
    - E37J Dome/Reading Lamps - Right Roof Rail terminal 3 (with AZ3)
    - E37EL Dome/Reading Lamps - Front Overhead Console Left terminal 3
    - E37ER Dome/Reading Lamps - Front Overhead Console Right terminal 3
    - E8A Door Sill Plate Lamp - Driver terminal 1 (with Z75)
    - E8B Door Sill Plate Lamp - Passenger terminal 1 (with Z75)
    - E8Q Door Sill Plate Lamp - Left Rear terminal 1 (with Z75)
    - E8R Door Sill Plate Lamp - Right Rear terminal 1 (with Z75)
    - P22A Video Display - 2nd Row terminal 3 (with U42)
    - P22B Video Display - 3rd Row terminal 3 (with DNU)
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

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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.
- **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.

- **Center Reading and Courtesy Lamp Replacement (Front)** **Center Reading and Courtesy Lamp Replacement (Rear)**
- **Front Side Door Sill Garnish Molding Replacement**
- **Rear Side Door Sill Garnish Molding Replacement**
- **Cargo Center Courtesy Lamp Replacement**
- **Rear Seat Position Center Reading and Courtesy Lamp Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC B2625: DISPLAY DIMMING PULSE WIDTH MODULATION OUTPUT

Diagnostic Instructions

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

DTC Descriptors

DTC B2625 01

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Display Dimming Pulse Width Modulation Output Circuit Short to Battery

DTC B2625 02

Display Dimming Pulse Width Modulation Output Circuit Short to Ground

DTC B2625 04

Display Dimming Pulse Width Modulation Output Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Switch Indicator LED Backlight Dimming Control Terminal 5 X1	B2625 02	B2625 04	B2625 01	-
Center Console Compartment Cooler Switch Control (DCK)	1	1	1	-
Door Lock Switch - Driver Control (Z75)	1	1	1	-
Door Lock Switch - Passenger Control (Z75)	1	1	1	-
Glove Box Switch Ground	1	1	1	-
Lane Departure Switch Amber Indicator Control	2	B0987 06	B0987 01, B0987 0B	-
Media Disc Eject Switch Ground	1	1	1	-
Park Assist Switch Amber Indicator Control	3	3	B0968 01	-
Transfer Case Shift Control Switch Auto 4WD Indicator Control (NPO/NQH)	B0770 06	B0770 06	B0770 01	-
Transfer Case Shift Control Switch 2 High Indicator Control (NPO/NQH)	B0785 06	B0785 06	B0785 01	-
Transfer Case Shift Control Switch 4 High Indicator Control (NPO/NQH)	B0775 06	B0775 06	B0775 01	-
Transfer Case Shift Control Switch 4 Low Indicator Control (NPO/NQH)	B0780 06	B0780 06	B0780 01	-
Window Switch - Driver Control (X88/Z75/Z88)	4	4	4	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
1. Interior Backlighting Malfunction 2. Lane Departure Warning System Malfunction 3. Parking Assist System Malfunction 4. Power Door Child Lock 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.

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

- Center console compartment cooler switch amber LED indicator (X88/Z75/Z88)
- Door lock switch - driver red LED indicator (Z75)
- Door lock switch - passenger red LED indicator (Z75)
- Glove box release switch backlighting (Z75)
- Lane departure switch amber LED indicator (X88/Z75/Z88)
- Media disk eject switch backlighting (Z75)
- Park assist switch amber LED indicator (X88/Z75/Z88)
- Transfer case control switch amber LED indicator (NPO/NQH)
- Window switch - driver child safety lock switch amber LED indicator (X88/Z75/Z88)

Conditions for Running the DTC

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

Conditions for Setting the DTC

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DTC B2625 01

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

DTC B2625 02

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

DTC B2625 04

The BCM detects an open/high resistance in the switch indicator LED backlight dimming control circuit terminal 5 X1.

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- Disconnect the negative battery cable for 30 s.
- A history DTC will clear once 100 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

- **Interior Lights Dimming Schematics**
- **Object Detection Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

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

1. Ignition OFF, disconnect the harness connectors at the components listed below.
   - S13D Door Lock Switch - Driver (Z75)
   - S13P Door Lock Switch - Passenger (Z75)
   - S48A Multifunction Switch - Instrument Panel (X88/Z88)
   - S48D Multifunction Switch 2 - Instrument Panel (Z75)
   - S48C Multifunction Switch 1 - Instrument Panel (Z75)
   - S77 Transfer Case Shift Control Switch (NPO/NQH)
   - S79D Window Switch - Driver
   - S140 Media Disk Eject Switch (Z75)
   - S145 Center Console Compartment Cooler Switch (DCK)
2. Ignition ON, place the dimmer switch in the HIGH position for high backlighting intensity.

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

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3. Verify a test lamp illuminates between each control circuit terminal listed below and ground.
    - S13D Door Lock Switch - Driver terminal 5 (Z75)
    - S13P Door Lock Switch - Passenger terminal 5 (Z75)
    - S48A Multifunction Switch - Instrument Panel terminal 5 (X88/Z88)
    - S48D Multifunction Switch 2 - Instrument Panel terminal 3 (Z75)
    - S48C Multifunction Switch 1 - Instrument Panel terminal 3 (Z75)
    - S77 Transfer Case Shift Control Switch terminal 4 (NPO/NQH)
    - S79D Window Switch - Driver terminal 11
    - S140 Media Disk Eject Switch terminal 3 (Z75)
    - S145 Center Console Compartment Cooler Switch terminal 6 (DCK)
    - **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.

    - **If the test lamp illuminates**

4. Place the dimmer switch in the LOW position for low backlighting intensity.
5. Verify a test lamp does not illuminate at FULL intensity between each control circuit terminal listed below and ground.
    - S13D Door Lock Switch - Driver terminal 5 (Z75)
    - S13P Door Lock Switch - Passenger terminal 5 (Z75)
    - S48A Multifunction Switch - Instrument Panel terminal 5 (X88/Z88)
    - S48D Multifunction Switch 2 - Instrument Panel terminal 3 (Z75)
    - S48C Multifunction Switch 1 - Instrument Panel terminal 3 (Z75)
    - S77 Transfer Case Shift Control Switch terminal 4 (NPO/NQH)
    - S79D Window Switch - Driver terminal 11
    - S140 Media Disk Eject Switch terminal 3 (Z75)

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- S145 Center Console Compartment Cooler Switch terminal 6 (DCK)
- **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.

- **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.

- **Door Lock Switch Replacement - Driver Side (Chevrolet, GMC)** **Door Lock Switch Replacement - Driver Side (Cadillac)**
- **Door Lock Switch Replacement - Passenger Front (Chevrolet, GMC)** **Door Lock Switch Replacement - Passenger Front (Cadillac)**
- **Radio Control Assembly Replacement (Chevrolet / GMC)** **Radio Control Assembly Replacement (Cadillac)**
- **Front Side Door Window Control Switch Replacement (Chevrolet, GMC)** **Front Side Door Window Control Switch Replacement (Cadillac)**
- **Transfer Case Selector Switch Replacement (Chevrolet / GMC)** **Transfer Case Selector Switch Replacement (Cadillac)**
- **Vehicle Stability Control System Switch Replacement (Chevrolet / GMC)** **Vehicle Stability Control System Switch Replacement (Cadillac)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B263A: EXTERIOR ILLUMINATION LAMP

Diagnostic Instructions

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

DTC Descriptors

DTC B263A 02

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Exterior Illumination Lamp Circuit Short to Ground

DTC B263A 04

Exterior Illumination Lamp Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F47DR (BCM 7) Fuse B+	1	1	-	-
Exterior Courtesy Lamps Control - Terminal 8 X7	B263A 02	B263A 04	1	-
Door Handle Courtesy Lamp - Driver Exterior Ground	-	1	-	-
Door Handle Courtesy Lamp - Left Rear Exterior Ground	-	1	-	-
Door Handle Courtesy Lamp - Passenger Exterior Ground	-	1	-	-
Door Handle Courtesy Lamp - Right Rear Exterior Ground	-	1	-	-
Outside Rearview Mirror Courtesy Lamp - Driver Ground	-	1	-	-
Outside Rearview Mirror Courtesy Lamp - Passenger Ground	-	1	-	-
Running Board Step Courtesy Lamp - Left Ground	-	1	-	-
Running Board Step Courtesy Lamp - Right Ground	-	1	-	-
1. Exterior Courtesy Lamps Malfunction				

Circuit/System Description

The body control module (BCM) supplies battery voltage to each exterior door handles LED backlighting, the LED lighting located under each outside rearview mirror for approach lighting, and both running board steps courtesy lamps when equipped. When the keyless entry transmitter is

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operated to the lock/unlock functions the LED lighting located under each outside rearview mirror, exterior door handles, and both running board steps are commanded ON for approach lighting.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B263A 02

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

DTC B263A 04

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

Actions Taken When the DTC Sets

The BCM will disable the exterior courtesy lamps control circuit.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

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Description and Operation

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Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

- **Exterior 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 appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
   - A9A Outside Rearview Mirror - Driver
   - A9B Outside Rearview Mirror - Passenger
   - A24D Door Handle Assembly - Driver Exterior
   - A24P Door Handle Assembly - Passenger Exterior
   - A24LR Door Handle Assembly - Left Rear Exterior
   - A24RR Door Handle Assembly - Right Rear Exterior
   - E8ZL Running Board Step Courtesy Lamp - Left
   - E8ZR Running Board Step Courtesy Lamp - Right
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.

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- A9A Outside Rearview Mirror - Driver terminal 5
- A9B Outside Rearview Mirror - Passenger terminal 5
- A24D Door Handle Assembly - Driver Exterior terminal 5
- A24P Door Handle Assembly - Passenger Exterior terminal 5
- A24LR Door Handle Assembly - Left Rear Exterior terminal 5
- A24RR Door Handle Assembly - Right Rear Exterior terminal 5
- E8ZL Running Board Step Courtesy Lamp - Left terminal 2
- E8ZR Running Board Step Courtesy Lamp - Right terminal 2
- **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.

- **If less than 15 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - A9A Outside Rearview Mirror - Driver terminal 1
    - A9B Outside Rearview Mirror - Passenger terminal 1
    - A24D Door Handle Assembly - Driver Exterior terminal 3
    - A24P Door Handle Assembly - Passenger Exterior terminal 3
    - A24LR Door Handle Assembly - Left Rear Exterior terminal 3
    - A24RR Door Handle Assembly - Right Rear Exterior terminal 3
    - E8ZL Running Board Step Courtesy Lamp - Left terminal 1
    - E8ZR Running Board Step Courtesy Lamp - Right terminal 1
4. Verify the test lamp turns ON and OFF when commanding the Outside Rear View Mirror Courtesy 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

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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.
- **If the test lamp turns ON and OFF**

5. Test or replace the inoperative component.

Repair Instructions

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

- **Front Side Door Outside Handle Replacement (without ATH)** **Front Side Door Outside Handle Replacement (with ATH)**
- **Rear Side Door Outside Handle Replacement (without ATH)** **Rear Side Door Outside Handle Replacement (with ATH)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B2645: AMBIENT LIGHT SENSOR

Diagnostic Instructions

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

DTC Descriptors

DTC B2645 03

Ambient Light Sensor Circuit Low Voltage

DTC B2645 07

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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	-
Daytime Running Lamp Control - Left	B2600 02	B2600 04	B2600 01	-
Daytime Running Lamp Control - Right	B2605 02	B2605 04	B2605 01	-
Ambient Light Sensor Low Reference	1	B2645 07, B0163 05, B0183 05,	1	-
Headlamp Assembly Ground - Left	-	1	-	-
Headlamp Assembly Ground - Right	-	1	-	-
1. Daytime Running Lamps Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

DTC B2645 03

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

DTC B2645 07

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

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- 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) Schematics (X88 or Z88) **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

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

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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.
    - **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 5 and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the K9 Body Control Module.
    - **If greater than 4.65 V**
5. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the 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.
    - **If less than 0.196 V**
7. Test or replace the B10B Ambient Light/Sunload Sensor.

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Repair Instructions

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

- **Sun Load Temperature and Headlamp Automatic Control Ambient Light Sensor Replacement** **Sun Load Temperature and Headlamp Automatic Control Ambient Light Sensor Replacement (Z75)**
- **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.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B2740 00

Front Fog Lamp Switch Circuit Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamp Switch Signal	B2740 00	2	2	-
Front Fog Lamp Relay Control	B2530 02	B2530 04	B2530 01	-
Front Fog Lamp Control	1	1	1	-
Headlamp Switch Ground	-	2	-	-
Front Fog Lamp Ground - Left	-	1	-	-
Front Fog Lamp Ground - Right	-	1	-	-
1. Front Fog Lamps Malfunction 2. Front Fog Lamp Switch Malfunction				

Circuit/System Description

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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 F94UA fog lamp fuse to the front fog lamp control circuit which illuminates the front fog lamps. With the front fog lamp switch activated the BCM sends a message via serial data to the instrument cluster requesting the instrument cluster to illuminate the front fog indicator.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Fog lamps On.

Conditions for Setting the DTC

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

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 Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, 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.
    - **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.
    - **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**

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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.

- **If Active**

7. Test or replace the S30 Headlamp Switch.

Repair Instructions

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

- **Headlamp Switch Replacement (Chevrolet / GMC)** **Headlamp Switch Replacement (Cadillac)**
- **Control Module References** for BCM 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.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3596 00

Hazard Lamps Request Circuit Malfunction

Diagnostic Fault Information

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

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hazard Warning Switch Signal	B3596 00	1	1	-
Turn Signal/Multifunction 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 BCM detects a short to ground in the hazard warning switch signal circuit.

Actions Taken When the DTC Sets

The hazard lamps are inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the X2 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 15 Ω between the ground circuit terminal C 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.
    - **If less than 15 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 G and ground.

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

- **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal G 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 G 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.
   - **If Active**
7. Test or replace the S78 Turn Signal/Multifunction Switch.

Repair Instructions

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

- **Turn Signal Switch Replacement (N33, N37)** **Turn Signal Switch Replacement (N38)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B3600: PASSENGER COMPARTMENT DIMMING REQUEST SIGNAL

Diagnostic Instructions

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

DTC Descriptors

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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.

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- 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 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

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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.
    - **If B+**
3. Verify a test lamp illuminates between the B+ circuit terminal 12 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.
    - **If the test lamp illuminates**
4. Verify a test lamp does not illuminate between the B+ circuit terminal 12 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.

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

- **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.
   - **If B+**
6. Test or replace the S30 Headlamp Switch.

Repair Instructions

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

- **Headlamp Switch Replacement (Chevrolet / GMC)** **Headlamp Switch Replacement (Cadillac)**
- **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.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3650 08

High Beam Request Signal Circuit Performance - Signal Invalid

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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, 2	-	-
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

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88) **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**

Connector End View Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the X1 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 15 Ω between the ground circuit terminal 13 and ground.
    - **If 15 Ω or greater**

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

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

- **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool High Beam Select Switch parameter is Inactive.
   - **If not Inactive**
   1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.
   2. Test for infinite resistance between the signal circuit terminal 14 and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance, replace the K9 Body Control Module.
   - **If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 14 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 14 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.
   - **If Active**
7. Test or replace the S78 Turn Signal/Multifunction Switch.

Repair Instructions

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

- **Turn Signal Switch Replacement (N33, N37)** **Turn Signal Switch Replacement (N38)**
- **Control Module References** for BCM replacement, programming, and setup

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

DTC Descriptor

DTC B3806 00

High Beam and Headlamp Flash Select Circuit Malfunction

Diagnostic Fault Information

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

Circuit/System Description

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

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88) **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**

Connector End View Reference

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

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the X1 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 15 Ω between the ground circuit terminal 13 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.
    - **If less than 15 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 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.
    - **If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 10 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 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.

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

- **If Active**

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

Repair Instructions

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

- **Turn Signal Switch Replacement (N33, N37)** **Turn Signal Switch Replacement (N38)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B3881 OR B3882: TAIL LAMP

Diagnostic Instructions

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

DTC Descriptors

DTC B3881 02

Tail Lamp Circuit Short to Ground

DTC B3882 02

Right Tail Lamp Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Stop Lamp Control - Left (with Z75/Z88 and X88 with T89)	B3881 02	1	1	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Stop Lamp Control - Right (with Z75/Z88 and X88 with T89)	B3882 02	1	1	-
Tail Lamp Assembly Ground - Left	-	1	-	-
Tail Lamp Assembly Ground - Right	-	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 relay 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 02

The BCM detects a short to ground in the left 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.

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

Diagnostic Aids

When testing at the stop 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 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, all doors closed, open and close drivers door, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.

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- E5L Stop Lamp - Left (X88 with T89)
- E42L Tail Lamp Assembly - Left (X75/Z88)

2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
   - E5L Stop Lamp - Left socket terminal (X88 with T89)
   - E42L Tail Lamp Assembly - Left terminal 6 (X75/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.
   - **If less than 15 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
   - E5L Stop Lamp - Left socket terminal (X88 with T89)
   - E42L Tail Lamp Assembly - Left terminal 4 (X75/Z88)
4. Verify the test lamp turns ON and OFF when commanding the 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.
   - **If the test lamp turns ON and OFF**

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5. Test or replace the stop lamp - left.

DTC B3882

1. Ignition OFF, exterior lamps OFF, all doors closed, open and close drivers door, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E5R Stop Lamp - Right (X88 with T89)
    - E42R Tail Lamp Assembly - Right (X75/Z88)
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - E5R Stop Lamp - Right socket terminal (X88 with T89)
    - E42R Tail Lamp Assembly - Right terminal 6 (X75/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.
    - **If less than 15 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E5R Stop Lamp - Right socket terminal (X88 with T89)
    - E42R Tail Lamp Assembly - Right terminal 4 (X75/Z88)
4. Verify the test lamp turns ON and OFF when commanding the 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**

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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.

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

5. Test or replace the stop lamp - right.

Repair Instructions

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

- **Stop and Turn Signal Lamp Bulb Replacement**
- **Rear Body Structure Stop Lamp Replacement** **Rear Body Structure Stop Lamp Replacement (Escalade)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B3883: LICENSE PLATE LAMP

Diagnostic Instructions

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

DTC Descriptors

DTC B3883 01

License Plate Lamp Circuit Short to Battery

DTC B3883 02

License Plate Lamp Circuit Short to Ground

DTC B3883 04

License Plate Lamp Circuit Open

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Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F19DL (BCM 1) Fuse B+	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01,	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01,	-	-
License Plate Lamps Control	B3883 02	B3883 01, B3883 04	B3883 01, B3883 04	-
License Plate Lamp Ground - Right	-	1	-	-
License Plate Lamp Ground - Left	-	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 and DTC B3883 04

- The BCM detects a short to voltage or an open/high resistance in the license lamps control circuit.
- The BCM detects an open/high resistance in the license lamps ground circuit.
- The BCM detects a short to ground or an open/high resistance in the F19DL (BCM 1) fuse B+ circuit.

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DTC B3883 02

The BCM detects a short to ground in the license lamps control 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 Schematics**
- **Body Control System Schematics**

Connector End View Reference

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Description and Operation

Exterior Lighting Systems 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

1. Ignition OFF, exterior lamps OFF, all doors closed, open and close drivers door, remove both E7 License Plate Lamp bulbs. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between each ground circuit terminal 2 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.
    - **If less than 15 Ω**
3. Connect a test lamp between the E7L License Plate Lamp - Left control circuit terminal 1 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.

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- **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.

- **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 1 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.
    - **If the test lamp is always OFF**

    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 the test lamp turns ON and OFF**

8. Test or replace the E7 License Plate Lamp bulb.

Repair Instructions

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

- **Rear License Plate Lamp Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC B3884: CENTER HIGH MOUNTED STOP LAMP

Diagnostic Instructions

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

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

DTC Descriptors

DTC B3884 01

Center High Mounted Stop Lamp Circuit Short to Battery

DTC B3884 02

Center High Mounted Stop Lamp Circuit Short to Ground

DTC B3884 04

Center High Mounted Stop Lamp Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F19DL (BCM 1) Fuse B+	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01,	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01,	-	-
Center High Mounted Stop Lamp Control	B3884 02	B3884 01, B3884 04	B3884 01, B3884 04	-
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.

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- Brakes APPLIED.

Conditions for Setting the DTC

DTC B3884 01 and B3884 04

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

DTC B3884 02

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

Actions Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Exterior Lights Schematics

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**

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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, all doors closed, open and close drivers door, disconnect the harness connector at the E6 Center High Mounted Stop Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal B 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.
    - **If less than 15 Ω**
3. Connect a test lamp between the control circuit terminal A and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Center 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.

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

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

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

Repair Instructions

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

- **High Mount Stop Lamp Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC B3885 OR B3886: TRAILER LEFT/RIGHT TAIL LAMP

Diagnostic Instructions

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

DTC Descriptors

DTC B3885 02

Trailer Left Tail Lamp Circuit Short to Ground

DTC B3885 04

Trailer Left Tail Lamp Circuit Open

DTC B3886 02

Trailer Right Tail Lamp Circuit Short to Ground

DTC B3886 04

Trailer Right Tail Lamp Circuit Open

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Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Tail Lamp Control - Left	B3885 02	B3885 04	1	-
Trailer Tail Lamp Control - Right	B3886 02	B3886 04	1	-
1. Trailer Lamps Malfunction				

Circuit/System Description

The trailer lighting control module receives a serial data message from the body control module (BCM) indicating that the vehicle park lamps have been activated. The trailer lighting control module responds by applying battery voltage to the left and right trailer tail lamp control circuits illuminating the trailer tail lamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3885 02

The trailer lighting control module detects a short to ground in the left trailer tail lamp control circuit.

DTC B3885 04

The trailer lighting control module detects an open/high resistance in the left trailer tail lamp control circuit.

DTC B3886 02

The trailer lighting control module detects a short to ground in the right trailer tail lamp control circuit.

DTC B3886 04

The trailer lighting control module detects an open/high resistance in the right trailer tail lamp control circuit.

Actions Taken When the DTC Sets

The appropriate trailer tail lamp will be inoperative.

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Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Trailer Connector/Provision 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

DTC B3885

1. Ignition OFF.
2. Connect a test lamp between the control circuit terminal 7 (circuit 5185 GY) at the X88 Trailer Connector and ground, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the Left Trailer Tail Lamp ON and OFF with a scan tool.

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

1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 circuits.
    - If infinite resistance
3. Test for less than 2 Ω in the control circuits end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K101 Trailer Interface Control Module.

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

1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

4. Test or replace the X88 Trailer Connector.

DTC B3886

1. Ignition OFF.
2. Connect a test lamp between the control circuit terminal 5 (circuit 5184 BN/GY) at the X88 Trailer Connector and ground, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the Right Trailer Tail 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 K101 Trailer Interface 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 circuits.
        - If infinite resistance
    3. Test for less than 2 Ω in the control circuits end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the K101 Trailer Interface Control Module.

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

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1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.
- **If the test lamp turns ON and OFF**

4. Test or replace the X88 Trailer Connector.

Repair Instructions

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

Control Module References for Trailer Lamp Control Module replacement, programming, and setup

DTC B3887 OR B3888: TRAILER LEFT/RIGHT TURN SIGNAL

Diagnostic Instructions

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

DTC Descriptors

DTC B3887 02

Trailer Left Turn Signal Circuit Short to Ground

DTC B3887 04

Trailer Left Turn Signal Circuit Open

DTC B3888 02

Trailer Right Turn Signal Circuit Short to Ground

DTC B3888 04

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Trailer Right Turn Signal Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Turn Signal Control - Left	B3887 02	B3887 04	1	-
Trailer Turn Signal Control - Right	B3888 02	B3888 04	1	-
1. Trailer Lamps Malfunction				

Circuit/System Description

The trailer lighting control module receives a serial data message from the body control module (BCM) indicating that the vehicle left or right turn signal lamp has been activated. The trailer lighting control module responds by applying a pulsating voltage to the appropriate trailer turn signal lamp through their respective control circuit illuminating the desired trailer turn signal lamp.

Conditions for Running the DTC

- Battery voltage must be between 9-16 V.
- Turn Signal ACTIVE.

Conditions for Setting the DTC

DTC B3887 02

The trailer lighting control module detects a short to ground in the left trailer turn signal control circuit.

DTC B3887 04

The trailer lighting control module detects an open/high resistance in the left trailer turn signal control circuit.

DTC B3888 02

The trailer lighting control module detects a short to ground in the right trailer turn signal control circuit.

DTC B3888 04

The trailer lighting control module detects an open/high resistance in the right trailer turn signal control circuit.

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Actions Taken When the DTC Sets

The appropriate trailer turn signal lamp will be inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Trailer Connector/Provision 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

DTC B3887

1. Ignition OFF.

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2. Connect a test lamp between the control circuit terminal 1 (circuit 5186 BU/WH) at the X88 Trailer Connector and ground, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the Left Trailer Turn Signal 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 K101 Trailer Interface 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 K101 Trailer Interface Control Module.
    - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.
    - **If the test lamp turns ON and OFF**
4. Test or replace the X88 Trailer Connector.

DTC B3888

1. Ignition OFF.
2. Connect a test lamp between the control circuit terminal 4 (circuit 5187 N.mE/GY) at the X88 Trailer Connector and ground, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the Right Trailer Turn Signal 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 K101 Trailer Interface 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.

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- If less than 2 Ω, replace the K101 Trailer Interface Control Module.

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

1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

4. Test or replace the X88 Trailer Connector.

Repair Instructions

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

Control Module References for Trailer Lamp Control Module replacement, programming, and setup

DTC B3889: TRAILER BRAKE LAMPS

Diagnostic Instructions

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

DTC Descriptors

DTC B3889 02

Trailer Brake Lamps Circuit Short to Ground

DTC B3889 04

Trailer Brake Lamps Circuit Open

Diagnostic Fault Information

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

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		Resistance		
Center High Mounted Stop Lamp Control	B3884 02	2	2	B0655 5A
Trailer Stop Lamp Control	B3889 02	B3889 04	1	-
1. Trailer Lamps Malfunction 2. 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 applies battery voltage to the center high mounted stop lamp control circuit and trailer lighting control module. The trailer lighting control module responds by applying battery voltage to the trailer stop lamp control circuit illuminating the trailer stop lamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3889 02

The trailer lighting control module detects a short to ground in the trailer stop lamp control circuit.

DTC B3889 04

The trailer lighting control module detects an open/high resistance in the trailer stop lamp control circuit.

Actions Taken When the DTC Sets

The trailer stop lamps will be inoperative.

Conditions for Clearing the DTC

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

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Reference Information

Schematic Reference

- **Trailer Connector/Provision Schematics**
- **Exterior Lights Schematics**

Connector End View Reference

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Description and Operation

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF.
2. Connect a test lamp between the control circuit terminal 6 (circuit 5188 BN/YE) at the X88 Trailer Connector and ground, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the Trailer Brake 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 K101 Trailer Interface 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.

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- 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 K101 Trailer Interface Control Module.
- **If the test lamp is always ON**

1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.
- **If the test lamp turns ON and OFF**

4. Test or replace the X88 Trailer Connector.

Repair Instructions

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

Control Module References for Trailer Lamp Control Module replacement, programming, and setup

DTC B388E: TRAILER LAMPS NUMBER OF INTERMITTENT SHORT CIRCUIT DETECTIONS EXCEEDED SIGNAL CROSS COUPLED

Diagnostic Instructions

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

DTC Descriptor

DTC B388E 1B

Trailer Lamps Number of Intermittent Short Circuit Detections Exceeded Signal Cross Coupled

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Interface Control Module B+	1	1	-	-
Center High Mounted Stop Lamp Control	B3884 02	2	2	B0655 5A
Trailer Backup Lamps Control	B3890 02	B3890 04	1	-
Trailer Stop Lamp Control	B3889 02	B3889 04	1	-
Trailer Turn Signal Control - Left	B3887 02	B3887 04	1	-
Trailer Turn Signal Control - Right	B3888 02	B3888 04	1	-
Trailer Fog Lamps Control	B3891 02	B3891 04	1	-
Trailer Tail Lamp Control - Left	B3885 02	B3885 04	1	-
Trailer Tail Lamp Control - Right	B3886 02	B3886 04	1	-
Trailer Interface Control Module Ground	-	1	-	-
Trailer Connector Grounds	-	1	-	-
1. Trailer Lamps Malfunction 2. Center High Mounted Stop Lamp Malfunction				

Circuit/System Description

The trailer interface control module is supplied with battery voltage as well as ignition voltage from the rear body fuse block and is permanently grounded. For lighting operation, the trailer interface control module receives serial data messages from the body control module (BCM) indicating what lamps have been activated on the vehicle. The trailer interface control module responds by applying voltage to the appropriate control circuits for the requested lamps illuminating the lamps on the attached trailer.

For stop lamp operation, the trailer interface control module receives an input from the center high mount stop lamp control circuit. When the brakes are applied on the vehicle, the trailer interface control module receives the brake applied input from the center high mount stop lamp control circuit. The trailer interface control module responds by applying voltage to the trailer stop lamp control circuit illuminating the trailer stop lamps. The trailer interface control module also receives a serial data message from the BCM indicating that the vehicle brakes have been applied.

Conditions for Running the DTC

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

Conditions for Setting the DTC

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The trailer interface control module internal counter reaches 60% of the maximum allowed short circuits for the lighting control circuits.

Conditions for Clearing the DTC

The condition responsible for setting the DTC no longer exists and the ignition is cycled.

Diagnostic Aids

- The service technician should inform the customer about detected short circuits by the trailer interface control module in the trailer.
- A replacement of the trailer interface control module is recommended.

Reference Information

Schematic Reference

- **Trailer Connector/Provision Schematics**
- **Exterior Lights 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

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1. Ignition ON, Exterior lights ON, trailer disconnected, verify that no additional trailer interface control module DTC's are present.
    - **If additional trailer interface control module DTC's are present**

      Diagnose all trailer interface control module DTC's before proceeding. Refer to **Diagnostic Trouble Code (DTC) List - Vehicle** , and **Symptoms - Lighting**.

    - **If additional trailer interface control module DTC's are not present**
2. Verify that DTC B388E 1B is not set.
    - **If DTC B388E 1B is set**

      Test or replace the K101 Trailer Interface Control Module.

    - **If DTC B388E 1B does not set**
3. All OK.

Repair Instructions

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

Control Module References for Trailer Interface Control Module replacement, programming, and setup

DTC B3890: TRAILER BACKUP LAMPS

Diagnostic Instructions

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

DTC Descriptors

DTC B3890 02

Trailer Backup Lamps Circuit Short to Ground

DTC B3890 04

Trailer Backup Lamps Circuit Open

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Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Backup Lamps Control	B3890 02	B3890 04	1	-
1. Trailer Lamps Malfunction				

Circuit/System Description

The trailer lighting control module receives a serial data message from the body control module (BCM) indicating that the vehicle backup lamps have been activated. The trailer lighting control module responds by applying battery voltage to the trailer backup lamp control circuit illuminating the trailer backup lamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3890 02

The trailer lighting control module detects a short to ground in the trailer backup lamps control circuit.

DTC B3890 04

The trailer lighting control module detects an open/high resistance in the trailer backup lamps control circuit.

Actions Taken When the DTC Sets

The trailer backup lamps will be inoperative.

Conditions for Clearing the DTC

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

Reference Information

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Schematic Reference

Trailer Connector/Provision Schematics

Connector End View Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF.
2. Connect a test lamp between the control circuit terminal 2 (circuit 5189 GN/WH) at the X88 Trailer Connector and ground, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the Trailer Backup 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 K101 Trailer Interface 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.

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- If less than 2 Ω, replace the K101 Trailer Interface Control Module.

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

1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

4. Test or replace the X88 Trailer Connector.

Repair Instructions

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

Control Module References for Trailer Lamp Control Module replacement, programming, and setup

DTC B3891: TRAILER FOG LAMPS

Diagnostic Instructions

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

DTC Descriptors

DTC B3891 02

Trailer Fog Lamps Circuit Short to Ground

DTC B3891 04

Trailer Fog Lamps Circuit Open

Diagnostic Fault Information

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

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		Resistance		
Trailer Fog Lamps Control	B3891 02	B3891 04	1	-
1. Trailer Lamps Malfunction				

Circuit/System Description

The trailer lighting control module receives a serial data message from the body control module (BCM) indicating that the vehicle rear fog lamp have been activated. The trailer lighting control module responds by applying battery voltage to the trailer fog lamp control circuit illuminating the trailer fog lamps.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC B3891 02

The trailer lighting control module detects a short to ground in the trailer fog lamps control circuit.

DTC B3891 04

The trailer lighting control module detects an open/high resistance in the trailer fog lamps control circuit.

Actions Taken When the DTC Sets

The trailer fog lamps will be inoperative.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Trailer Connector/Provision Schematics

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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.
2. Connect a test lamp between the control circuit terminal 8 (circuit 5190 N.mE/WH) at the X88 Trailer Connector and ground, ignition ON.
3. Verify the test lamp turns ON and OFF when commanding the Trailer Fog Lamp(s) ON and OFF with a scan tool.
    - **If the test lamp is always OFF**

    1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

    1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface Control Module, ignition ON.

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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 K101 Trailer Interface Control Module.
- **If the test lamp turns ON and OFF**

4. Test or replace the X88 Trailer Connector.

Repair Instructions

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

Control Module References for Trailer Lamp Control Module replacement, programming, and setup

DTC B3948 OR B3949: LEFT/RIGHT FRONT TURN SIGNAL

Diagnostic Instructions

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

DTC Descriptors

DTC B3948 01

Left Front Turn Signal Circuit Short to Battery

DTC B3948 02

Left Front Turn Signal Circuit Short to Ground

DTC B3948 04

Left Front Turn Signal Circuit Open

DTC B3949 01

Right Front Turn Signal Circuit Short to Battery

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DTC B3949 02

Right Front Turn Signal Circuit Short to Ground

DTC B3949 04

Right Front Turn Signal Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F10DL (BCM 3) Fuse B+	1	1	-	-
F19DR (BCM 4) Fuse B+	1	1	-	-
F46DR (BCM 6) Fuse B+	1	1	-	-
F47DR (BCM 7) Fuse B+	1	1	-	-
Turn Signal Switch Signal - Left	2	2	2	-
Turn Signal Switch Signal - Right	2	2	2	-
Turn Signal Lamp Outage Detection Signal - Left Front (Z75)	3	3	3	-
Turn Signal Lamp Outage Detection Signal - Left Rear (Z75/Z88)	3	3	3	-
Turn Signal Lamp Outage Detection Signal - Right Front (Z75)	3	3	3	-
Turn Signal Lamp Outage Detection Signal - Right Rear (Z75/Z88)	3	3	3	-
Turn Signal Lamp Control - Left Front	B3948 02	B3948 04	B3948 01, B3948 04	-
Turn Signal Lamp Control - Left Rear (Z75/Z88)	1	1	1	-
Turn Signal Lamp Control - Left Rear (X88 with T89)	B3950 02, B3950 04	B3950 04	B3950 01, B3950 04	-
Stop/Turn Signal Lamp Control - Left Rear (X88 without T89)	B3950 02, B3950 04	B3950 04	B3950 01, B3950 04	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Turn Signal Lamp Control - Right Front	B3949 02	B3949 04	B3949 01, B3949 04	-
Turn Signal Lamp Control - Right Rear (Z75/Z88)	1	1	1	-
Turn Signal Lamp Control - Right Rear (X88 with T89)	B3951 02, B3951 04	B3951 04	B3951 01, B3951 04	-
Stop/Turn Signal Lamp Control - Right (X88 without T89)	B3951 02, B3951 04	B3951 04	B3951 01, B3951 04	-
Turn Signal Lamp Ground - Left Front	-	1	-	-
Turn Signal Lamp Ground - Right Front	-	1	-	-
Turn Signal Lamp Ground - Left Rear	-	1	-	-
Turn Signal Lamp Ground - Right Rear	-	1	-	-
Turn Signal/Multifunction Switch Ground	-	2	-	-
1. Turn Signal Lamps and/or Indicators Malfunction 2. Turn Signal/Multifunction Switch Malfunction 3. Turn Signal Lamp Outage Detection Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

DTC B3948 01 and B3948 04

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

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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 Front Turn Indicator Failure" message is displayed on the driver information center display.
- The left turn signal indicator on the instrument cluster flashes rapidly.

DTC B3949

- The right front turn signal is inoperative.
- The "Right Front Turn Indicator Failure" 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 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

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Schematic Reference

- **Exterior Lights Schematics**
- **Body Control System 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

DTC B3948

1. Ignition OFF, exterior lamps OFF, All doors closed, open and close drivers door, disconnect the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - A9A Outside Rearview Mirror - Driver (DR4)
    - E4LF Turn Signal Lamp - Left Front (Z75/X88)
    - E13LA Headlamp Assembly - Left
    - A17D Outside Rearview Mirror Glass - Driver (DL3)
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - A9A Outside Rearview Mirror - Driver terminal 5 (DR4)

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- E4LF Turn Signal Lamp - Left Front terminal 2 (Z75/X88)
- E13LA Headlamp Assembly - Left terminals 1 and 4
- A17D Outside Rearview Mirror Glass - Driver terminal 2 (DL3)
- **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.

- **If less than 15 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - A9A Outside Rearview Mirror - Driver terminal 13 (DR4)
    - E4LF Turn Signal Lamp - Left Front terminal 1 (Z75/X88)
    - E13LA Headlamp Assembly - Left terminals 5
    - A17D Outside Rearview Mirror Glass - Driver terminal 1 (DL3)
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.

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

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5. Test or replace the appropriate turn signal lamp - left.

DTC B3949

1. Ignition OFF, exterior lamps OFF, All doors closed, open and close drivers door, disconnect the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - A9B Outside Rearview Mirror - Passenger (DR4)
    - E4RF Turn Signal Lamp - Right Front (Z75/X88)
    - E13RA Headlamp Assembly - Right
    - A17P Outside Rearview Mirror Glass - Passenger (DL3)
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - A9B Outside Rearview Mirror - Passenger terminal 5 (DR4)
    - E4RF Turn Signal Lamp - Right Front terminal 2 (Z75/X88)
    - E13RA Headlamp Assembly - Right terminals 1 and 4
    - A17P Outside Rearview Mirror Glass - Passenger terminal 2 (DL3)
    - **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.
    - **If less than 15 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - A9B Outside Rearview Mirror - Passenger terminal 13 (DR4)
    - E4RF Turn Signal Lamp - Right Front terminal 1 (Z75/X88)
    - E13RA Headlamp Assembly - Right terminals 5
    - A17P Outside Rearview Mirror Glass - Passenger terminal 1 (DL3)
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.

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- 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.

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

5. Test or replace the appropriate turn signal lamp - right.

Repair Instructions

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

- **Auxiliary Side Front Turn Signal Lamp Bulb Replacement (Left Side)** **Auxiliary Side Front Turn Signal Lamp Bulb Replacement (Right Side)**
- **Headlamp Control Module Replacement (Multifunction LED)**
- **Front Side Turn Signal Lamp Replacement**
- **Outside Rearview Mirror Housing Replacement**
- **Exterior Lamp Control Module Replacement (Multifunction LED)**
- **Control Module References** for BCM replacement, programming, and setup

DTC B3950 OR B3951: LEFT/RIGHT REAR TURN SIGNAL

Diagnostic Instructions

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

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DTC Descriptors

DTC B3950 01

Left Rear Turn Signal Circuit Short to Battery

DTC B3950 02

Left Rear Turn Signal Circuit Short to Ground

DTC B3950 04

Left Rear Turn Signal Circuit Open

DTC B3951 01

Right Rear Turn Signal Circuit Short to Battery

DTC B3951 02

Right Rear Turn Signal Circuit Short to Ground

DTC B3951 04

Right Rear Turn Signal Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F10DL (BCM 3) Fuse B+	1	1	-	-
F19DR (BCM 4) Fuse B+	1	1	-	-
F46DR (BCM 6) Fuse B+	1	1	-	-
F47DR (BCM 7) Fuse B+	1	1	-	-
Turn Signal Switch Signal - Left	2	2	2	-
Turn Signal Switch Signal - Right	2	2	2	-
Turn Signal Lamp Outage Detection Signal - Left	3	3	3	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front (Z75)				
Turn Signal Lamp Outage Detection Signal - Left Rear (Z75/Z88)	3	3	3	-
Turn Signal Lamp Outage Detection Signal - Right Front (Z75)	3	3	3	-
Turn Signal Lamp Outage Detection Signal - Right Rear (Z75/Z88)	3	3	3	-
Turn Signal Lamp Control - Left Front	B3948 02	B3948 04	B3948 01, B3948 04	-
Turn Signal Lamp Control - Left Rear (Z75/Z88)	1	1	1	-
Turn Signal Lamp Control - Left Rear (X88 with T89)	B3950 02, B3950 04	B3950 04	B3950 01, B3950 04	-
Stop/Turn Signal Lamp Control - Left Rear (X88 without T89)	B3950 02, B3950 04	B3950 04	B3950 01, B3950 04	-
Turn Signal Lamp Control - Right Front	B3949 02	B3949 04	B3949 01, B3949 04	-
Turn Signal Lamp Control - Right Rear (Z75/Z88)	1	1	1	-
Turn Signal Lamp Control - Right Rear (X88 with T89)	B3951 02, B3951 04	B3951 04	B3951 01, B3951 04	-
Stop/Turn Signal Lamp Control - Right (X88 without T89)	B3951 02, B3951 04	B3951 04	B3951 01, B3951 04	-
Turn Signal Lamp Ground - Left Front	-	1	-	-
Turn Signal Lamp Ground - Right Front	-	1	-	-
Turn Signal Lamp Ground - Left Rear	-	1	-	-
Turn Signal Lamp Ground - Right Rear	-	1	-	-
Turn Signal/Multifunction Switch Ground	-	2	-	-
1. Turn Signal Lamps and/or Indicators Malfunction 2. Turn Signal/Multifunction Switch Malfunction 3. Turn Signal Lamp Outage Detection Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

DTC B3950 01

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

DTC B3950 02 and B3950 04

- The BCM detects a short to ground or 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 B3951 01

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

DTC B3951 02 and B3951 04

- The BCM detects a short to ground or 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.

Actions Taken When the DTC Sets

DTC B3950

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

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DTC B3951

- The right rear turn signal is inoperative.
- The "Right Rear Turn Indicator Failure" 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 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 Schematics**
- **Body Control System Schematics**

Connector End View Reference

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- **Wiring Repairs**

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

DTC B3950

1. Ignition OFF, exterior lamps OFF, All doors closed, open and close drivers door, disconnect the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E4LR Turn Signal Lamp - Left Rear (X88 with T89)
    - E42L Tail Lamp Assembly - Left (Z75/Z88)
    - E5AS Stop/Turn Signal Lamp - Left Upper (X88 without T89)
    - E5AT Stop/Turn Signal Lamp - Left Lower (X88 without T89)
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - E4LR Turn Signal Lamp - Left Rear socket terminal (X88 with T89)
    - E42L Tail Lamp Assembly - Left terminal 6 (Z75/Z88)
    - E5AS Stop/Turn Signal Lamp - Left Upper socket terminal (X88 without T89)
    - E5AT Stop/Turn Signal Lamp - Left Lower socket terminal (X88 without T89)
    - **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.
    - **If less than 15 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E4LR Turn Signal Lamp - Left Rear socket terminal (X88 with T89)
    - E42L Tail Lamp Assembly - Left terminal 2 (Z75/Z88)
    - E5AS Stop/Turn Signal Lamp - Left Upper socket terminal (X88 without T89)
    - E5AT Stop/Turn Signal Lamp - Left Lower socket terminal (X88 without T89)
4. Verify the test lamp turns ON and OFF when commanding the Left Rear Turn Signal/Stop Lamp ON and OFF with a scan tool.

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- **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.

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

5. Replace the appropriate turn signal lamp - left rear.

DTC B3951

1. Ignition OFF, exterior lamps OFF, All doors closed, open and close drivers door, disconnect the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E4RR Turn Signal Lamp - Right Rear (X88 with T89)
    - E42R Tail Lamp Assembly - Right (Z75/Z88)
    - E5AU Stop/Turn Signal Lamp - Right Upper (X88 without T89)
    - E5AV Stop/Turn Signal Lamp - Right Lower (X88 without T89)
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - E4RR Turn Signal Lamp - Right Rear socket terminal (X88 with T89)
    - E42R Tail Lamp Assembly - Right terminal 6 (Z75/Z88)
    - E5AU Stop/Turn Signal Lamp - Right Upper socket terminal (X88 without T89)
    - E4AV Stop/Turn Signal Lamp - Right Lower socket terminal (X88 without T89)
    - **If 15 Ω or greater**

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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.

- **If less than 15 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E4RR Turn Signal Lamp - Right Rear socket terminal (X88 with T89)
    - E42R Tail Lamp Assembly - Right terminal 2 (Z75/Z88)
    - E5AU Stop/Turn Signal Lamp - Right Upper socket terminal (X88 without T89)
    - E4AV Stop/Turn Signal Lamp - Right Lower socket terminal (X88 without T89)
4. Verify the test lamp turns ON and OFF when commanding the Right Rear Turn Signal/Stop Lamp ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the 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.
    - **If the test lamp turns ON and OFF**
5. Replace the appropriate stop/turn signal lamp - right rear.

Repair Instructions

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

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- **Stop and Turn Signal Lamp Bulb Replacement**
- **Rear Body Structure Stop Lamp Replacement** **Rear Body Structure Stop Lamp Replacement (Escalade)**
- **Control Module References** for BCM replacement, programming, and setup

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

Diagnostic Instructions

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

DTC Descriptors

DTC C0277 06

Brake Pedal Position Sensor Circuit Low Voltage/Open

DTC C0277 07

Brake Pedal Position Sensor Circuit High Voltage

DTC C0277 09

Brake Pedal Position Sensor Circuit Too Fast Transitions

DTC C0277 12

Brake Pedal Position Sensor Circuit Below Minimum Threshold

DTC C0277 4B

Brake Pedal Position Sensor Circuit Calibration Not Learned

DTC C0890 03

Control Module Voltage Reference Output 3 Circuit Low Voltage

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DTC C0890 07

Control Module Voltage Reference Output 3 Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Brake Pedal Position Sensor 5 V Reference	C0277 06, C0890 03, U0422 00, U0422 71	C0277 06, U0422 00, U0422 71	C0277 07, C0890 07, U0422 00, U0422 71	C0277 09, C0277 12
Brake Pedal Position Sensor Signal	C0277 06, U0422 00, U0422 71	C0277 06, U0422 00, U0422 71	C0277 07, C0890 07, U0422 00, U0422 71	C0277 09, C0277 12
Brake Pedal Position Sensor Low Reference	-	C0277 07, U0422 00, U0422 71	1	-
1. Stop Lamps Malfunction				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC C0277 06 and C0277 12

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

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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.

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 Malfunction indicator is commanded ON.
- "Service Stabilitrak" message on driver information center is 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.
- Disconnect the negative battery cable for 30 s.
- 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.

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- A DTC will not clear the current status until the next ignition cycle.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Brake Pedal Position Sensor Learned Release Position parameter, located in the BCM Chassis Control Data display, is within 0.1 V of the Brake Pedal Position Sensor parameter when the brake pedal is fully released.
   - **If the difference is greater than 0.1 V**

     Perform the **Brake Pedal Position Sensor Calibration** .
   - **If the difference is less than 0.1 V**

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3. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records data.
4. Verify the DTC does not set.
    - **If the DTC sets**

      Refer to Circuit/System Testing.

    - **If the DTC does not set**
5. All OK.

Circuit/System Testing

DTC C0277 06, C0277 07, C0277 12, C0890 03, and C0890 07

1. Ignition OFF, disconnect the harness connector at the B22 Brake Pedal Position Sensor, ignition ON.
2. Verify a test lamp illuminates between the low reference circuit terminal 1 and B+.
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.
    2. Test for less than 2 Ω in the low reference circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the K9 Body Control Module.
    - **If the test lamp illuminates**
3. Ignition ON.
4. Test for 4.8-5.2 V between the 5 V reference circuit terminal 2 and ground.
    - **If less than 4.8 V**
    1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
    2. Test for infinite resistance between the 5 V reference circuit and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - 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.

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- **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.

- **If between 4.8-5.2 V**

5. Test for less than 1 V between the signal circuit terminal 3 and ground.
    - **If 1 V or greater**

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

- **If less than 1 V**

NOTE: **The scan tool Brake Pedal Applied parameter will change to Active for 2 seconds as the 3 A fused jumper wire is connected between the 5 V reference circuit and the signal circuit and then default to Inactive. This is normal operation.**

6. Install a 3 A fused jumper wire between the 5 V reference circuit terminal 2 and the signal circuit terminal 3.
7. Verify the scan tool Brake Pedal Applied parameter is Active for 2 s before defaulting to Inactive.
    - **If not Active**

1. Ignition OFF, disconnect the X2 harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the signal circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - 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 Active**

8. Test or replace the B22 Brake Pedal Position Sensor.

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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 calibration 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.
    - **If DTC C0277 4B is not set**
2. All OK.

DTC C0277 09

1. Verify DTC C0277 09 is not set.
    - **If DTC C0277 09 is set**
    1. Replace the B22 Brake Pedal Position Sensor.
    2. Perform the brake pedal position sensor calibration 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.
    - **If DTC C0277 09 is not set**
2. All OK.

Repair Instructions

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

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- **Brake Pedal Position Sensor Calibration**
- **Brake Pedal Position Sensor Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DTC C0297: BRAKE APPLIED OUTPUT

Diagnostic Instructions

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

DTC Descriptors

DTC C0297 01

Brake Applied Output Circuit Short to Battery

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
F19DL (BCM 1) Fuse B+	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	-	-
Brake Applied Signal	C0297 02	1	C0297 01	-
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

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BCM will apply battery voltage to the right and left stop lamp control circuits, engine control module (ECM), and center high mounted stop lamp relay control circuit.

Conditions for Running the DTC

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

Conditions for Setting the DTC

DTC C0297 01

- The BCM detects a short to voltage in the brake applied signal circuit.
- The BCM detects a short to ground or an open/high resistance in the F19DL (BCM 1) fuse B+ circuit.

DTC C0297 02

The BCM detects a short to ground in the brake applied signal circuit.

Actions Taken When the DTC Sets

The cruise control system is disabled.

Conditions for Clearing the DTC

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

Diagnostic Aids

Verify that the brake pedal position sensor is properly calibrated.

Reference Information

Schematic Reference

- **Cruise Control Schematics**
- **Body Control System Schematics**

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Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the K20 Engine Control Module.
2. Connect a test lamp between the signal circuit terminal 57 and ground, ignition ON.
3. Verify the test lamp turns ON and OFF while pressing and releasing the brake pedal.
    - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X5 harness connector at the K9 Body Control Module.
    2. Test for infinite resistance between the signal circuit and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - 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.

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2. Test for less than 1 V between the signal circuit terminal and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V, replace the K9 Body Control Module.
- **If the test lamp turns ON and OFF**

4. Replace the K20 Engine Control Module.

Repair Instructions

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

- **Brake Pedal Position Sensor Calibration**
- **Control Module References** for BCM or ECM replacement, programming, and setup

SYMPTOMS - LIGHTING

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

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

Visual/Physical Inspection

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

Intermittent

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

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Symptom List

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

- **Backup Lamps Malfunction**
- **Courtesy Lamps Malfunction**
- **Daytime Running Lamps Malfunction**
- **Dome Lamps Malfunction**
- **Emergency Vehicle Lamps Malfunction**
- **Exterior Courtesy Lamps Malfunction**
- **Front Fog Lamps Malfunction**
- **Hazard Lamps Malfunction**
- **Headlamps Malfunction (Chevrolet, GMC)Headlamps Malfunction (Cadillac)**
- **Interior Accent Lighting Malfunction**
- **Interior Backlighting Malfunction**
- **Park, License, and/or Tail Lamps Malfunction**
- **Stop Lamps Malfunction**
- **Trailer Lamps Malfunction (North America)Trailer Lamps Malfunction (Export (VQ9))**
- **Turn Signal Lamps and/or Indicators Malfunction**

BACKUP LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F11DL (BCM 5) Fuse B+	B2545 01	B2545 01	-	-

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

Circuit/System Description

The backup lamp relay is supplied with battery voltage at all times. 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 energizes the backup lamp relay by applying battery voltage to the backup lamp relay control circuit. When the backup lamp relay is energized, the relay switch contacts close and battery voltage is applied through the backup lamp fuses to the backup lamp control circuits which illuminates the backup lamps. Once the driver moves the gear selector out of the reverse position, a message is sent by the TCM via serial data requesting the BCM to remove battery voltage from the backup lamp relay control circuit. The engine must be running for the backup lamps to operate.

Diagnostic Aids

When testing at the backup 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 Schematics**
- **Body Control System Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

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Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, all doors closed, open and close drivers door, disconnect the appropriate harness connector listed below. It may take up to 2 min for all vehicle systems to power down.
    - E5A Backup Lamp - Left (X88/Z88)
    - E5B Backup Lamp - Right (X88/Z88)
    - E42L Tail Lamp Assembly - Left (Z75)
    - E42R Tail Lamp Assembly - Right (Z75)
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - E5A Backup Lamp - Left socket terminal (X88/Z88)
    - E5B Backup Lamp - Right socket terminal (X88/Z88)
    - E42L Tail Lamp Assembly - Left terminal 6 (Z75)
    - E42R Tail Lamp Assembly - Right socket terminal 6 (Z75)
    - **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.

    - **If less than 15 Ω**

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3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E5A Backup Lamp - Left socket terminal (X88/Z88)
    - E5B Backup Lamp - Right socket terminal (X88/Z88)
    - E42L Tail Lamp Assembly - Left terminal 1 (Z75)
    - E42R Tail Lamp Assembly - Right socket terminal 1 (Z75)
4. Verify the test lamp does not turn ON and OFF when commanding the Backup Lamps ON and OFF with a scan tool.
    - **If the test lamp turns ON and OFF**
    - Test or replace the E5 Backup Lamp (X88/Z88) or E42 Tail Lamp Assembly (Z75).
    - **If the test lamp does not turn ON and OFF**
5. Ignition OFF, connect the E5 Backup Lamp (X88/Z88) or E42 Tail Lamp Assembly (Z75).
6. Disconnect the X5 harness connector at the X50A Fuse Block - Underhood, ignition ON.
7. Verify the backup lamps do not illuminate.
    - **If the backup lamps illuminate**
    1. Ignition OFF, disconnect the appropriate E5 Backup Lamp (X88/Z88) or E42 Tail Lamp Assembly (Z75), ignition ON.
    2. Test for less than 1 V between the appropriate control circuit terminal listed below and ground.
        - E5A Backup Lamp - Left socket terminal (X88/Z88)
        - E5B Backup Lamp - Right socket terminal (X88/Z88)
        - E42L Tail Lamp Assembly - Left terminal 1 (Z75)
        - E42R Tail Lamp Assembly - Right socket terminal 1 (Z75)
        - If 1 V or greater, repair the short to voltage on the circuit.
        - If less than 1 V, replace the E5 Backup Lamp (X88/Z88) or E42 Tail Lamp Assembly (Z75).
    - **If the backup lamps do not illuminate**
8. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal C1 and B+, ignition ON.
9. Verify the backup lamps illuminate.
    - **If the backup lamps do not illuminate**
    1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the appropriate E5 Backup Lamp (X88/Z88) or E42 Tail Lamp Assembly (Z75).
    2. Test for infinite resistance between the control circuit terminal C1 and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.

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- If infinite resistance

3. Test for less than 2 Ω in the control circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, all OK.

- **If the backup lamps illuminate**

10. Ignition OFF, all vehicle systems OFF, disconnect the X2 Harness connector at the X50A Fuse Block - Underhood. It may take up to 2 min for all vehicle systems to power down.
11. Test for less than 10 Ω between the ground circuit terminal F2 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.

    - **If less than 10 Ω**

12. Connect the X2 and X5 harness connectors at the X50A Fuse Block - Underhood.
13. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.

NOTE: **The test lamp will illuminate at low intensity for the following test.**

14. Verify a test lamp illuminates between the control circuit terminal 26 and B+.
    - **If the test lamp does not illuminate**

    1. Ignition OFF, disconnect the X4 harness connector at the X50A Fuse Block - Underhood, ignition ON.
    2. Test for less than 1 V between the control circuit terminal 26 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 control circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the X50A Fuse Block - Underhood.

    - **If the test lamp illuminates**

15. Connect a 3 A fused jumper between the control circuit terminal 26 and B+, ignition ON.

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16. Verify the backup lamps illuminate.
    - **If the backup lamps do not illuminate**
    1. Ignition OFF, disconnect the X4 harness connector at the X50A Fuse Block - Underhood.
    2. Test for infinite resistance between the control circuit terminal 26 and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the X50A Fuse Block - Underhood.
    - **If the backup lamps illuminate**
17. Test or replace the K9 Body Control Module.

Repair Instructions

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

- **Rear Body Structure Stop Lamp Replacement** **Rear Body Structure Stop Lamp Replacement (Escalade)**
- **Backup Bulb Replacement (GMC)** **Backup Bulb Replacement (Chevrolet)**
- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, programming, and setup

CORNERING LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Cornering Lamp - Left Control	B2590 02	1	1	-
Cornering Lamp - Right Control	B2595 02	1	1	-
Multifunction Lamp Assembly - Front Fascia Left Ground	-	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Multifunction Lamp Assembly - Front Fascia Right Ground	-	1	-	-
1. Cornering Lamps Malfunction				

Circuit/System Description

The cornering lamps are activated automatically at vehicle speeds below 25 MPH (40 km/h) when the turn signal/multifunction switch is placed in either the left or right turn positions and/or when the steering angle is changed from the straight-ahead position towards the side the vehicle is turning. When the body control module (BCM) detects that one of these operations has occurred, the BCM responds to the cornering lamp request by applying voltage to cornering lamp control circuit illuminating the appropriate cornering lamp in the area that the vehicle is turning. The cornering lamps are deactivated automatically when the turn signal/multifunction switch is placed in the neutral position and/or the steering angle has returned in the straight-ahead position. The cornering lamps will not operate at vehicle speeds above 25 MPH (40 km/h).

Reference Information

Schematic Reference

Exterior Lights 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

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Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E69 Multifunction Lamp Assembly - Front Fascia. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 1 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.
    - **If less than 15 Ω**
3. Connect a test lamp between the control circuit terminal 6 and ground, ignition ON.

    NOTE: **This is a low current circuit that will illuminate the test lamp at LOW intensity. This is normal circuit operation.**

4. Verify the test lamp turns ON and OFF when commanding the appropriate cornering lamp ON and OFF while operating the turn signal/multifunction switch ON and OFF for the appropriate turn signal position.
    - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
        - X6 - right cornering lamp
        - X7 - left cornering lamp
    2. Test for infinite resistance between the control circuit and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - 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**

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1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
    - X6 - right cornering lamp
    - X7 - left cornering lamp
2. Test for less than 1 V between the control circuit terminal and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V, replace the K9 Body Control Module.

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

5. Test or replace the E69 Multifunction Lamp Assembly - Front Fascia.

Repair Instructions

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

- **Windshield Outside Moisture/Ambient Light and Humidity Sensor Replacement**
- **Control Module References** for BCM or HVAC control module replacement, programming, and setup

COURTESY LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F46DR (BCM 6) Fuse B+	1	1	-	-
Courtesy Lamps Control - Terminal 3 X7	B1480 02	1	1	-
Center Console Compartment Lamp Ground	-	1	-	-
Dome/Reading Lamps - Front Overhead Console Left Ground	-	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Dome/Reading Lamps - Front Overhead Console Right Ground	-	1	-	-
Dome/Reading Lamps - 2nd Row Ground	-	1	-	-
Dome/Reading Lamps - 3rd Row Ground	-	1	-	-
Dome/Reading Lamps - Left Roof Rail Ground	-	1	-	-
Dome/Reading Lamps - Right Roof Rail Ground	-	1	-	-
Sunshade Mirror Lamp - Left Ground	-	1	-	-
Sunshade Mirror Lamp - Right Ground	-	1	-	-
Video Display - 2nd Row Ground	-	1	-	-
Video Display - 3rd Row Ground	-	1	-	-
1. Courtesy Lamps Malfunction				

Circuit/System Description

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

Reference Information

Schematic Reference

- **Interior Lights Schematics**
- **Body Control System Schematics**

Connector End View Reference

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Description and Operation

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Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the inoperative courtesy lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - A3L Sunshade - Left terminal B
    - A3R Sunshade - Right terminal B
    - E28 Center Console Compartment Lamp - terminal 2
    - E37B Dome/Reading Lamps - 2nd Row terminal B (without U42)
    - E37C Dome/Reading Lamps - 3rd Row terminal B (without U42)
    - E37EL Dome/Reading Lamps - Front Overhead Console Left terminal 4
    - E37ER Dome/Reading Lamps - Front Overhead Console Right terminal 4
    - E37H Dome/Reading Lamps - Left Roof Rail terminal 4
    - E37J Dome/Reading Lamps - Right Roof Rail terminal 4
    - P22A Video Display - 2nd Row terminal 2
    - P22B Video Display - 3rd Row terminal 2
    - **If 15 Ω or greater**

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

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

- **If less than 15 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
   - A3L Sunshade - Left terminal A
   - A3R Sunshade - Right terminal A
   - E28 Center Console Compartment Lamp - terminal 1
   - E37B Dome/Reading Lamps - 2nd Row terminal A (without U42)
   - E37C Dome/Reading Lamps - 3rd Row terminal A (without U42)
   - E37EL Dome/Reading Lamps - Front Overhead Console Left terminal 2
   - E37ER Dome/Reading Lamps - Front Overhead Console Right terminal 2
   - E37H Dome/Reading Lamps - Left Roof Rail terminal 2
   - E37J Dome/Reading Lamps - Right Roof Rail terminal 2
   - P22A Video Display - 2nd Row terminal 5
   - P22B Video Display - 3rd Row terminal 5
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.

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

5. Test or replace the appropriate courtesy lamp.

Repair Instructions

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

- **Sunshade Replacement**
- **Center Reading and Courtesy Lamp Replacement (Front)** **Center Reading and Courtesy Lamp Replacement (Rear)**
- **Rear Seat Position Center Reading and Courtesy Lamp Replacement**
- **Cargo Center Courtesy Lamp Replacement**
- **Control Module References** for BCM replacement, programming, and setup

DAYTIME RUNNING LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ambient Light Sensor Signal	B2645 03	B2645 07	B2645 07	-
Park/Daytime Running Lamp - Left Control (X88 with TB8/T4F or Z88)	B260D 02	1	1	-
Park/Daytime Running Lamp - Right Control (X88 with TB8/T4F or Z88)	B260E 02	1	1	-
Park/Daytime Running Lamp - Left Control (Z75)	B2600 02	B2600 04	B2600 01	-
Park/Daytime Running Lamp - Right Control (Z75)	B2605 02	B2605 04	B2605 01	-

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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	-
Headlamp Assembly - Left Ground	-	1	-	-
Headlamp Assembly - Right Ground	-	1	-	-
Multifunction Lamp Assembly - Front Fascia Left Ground	-	1	-	-
Multifunction Lamp Assembly - Front Fascia Right Ground	-	1	-	-
1. Daytime Running Lamps Malfunction				

Circuit/System Description

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

Reference Information

Schematic Reference

- **Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88)** **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**
- **Body Control System 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 Verification

1. Ignition ON.
2. Verify the left daytime running lamps turns ON and OFF while commanding the Left Dedicated Daytime Running Lamp ON and OFF with a scan tool.
   - **If the left daytime running lamps do not turn ON and OFF**

     Refer to Daytime Running Lamp Malfunction.

   - **If the left daytime running lamps turn ON and OFF**
3. Verify the right daytime running lamps turns ON and OFF while commanding the Right Dedicated Daytime Running Lamp ON and OFF with a scan tool.
   - **If the right daytime running lamps do not turn ON and OFF**

     Refer to Daytime Running Lamp Malfunction.

   - **If the right daytime running lamps turn ON and OFF**
4. Refer to Ambient Light Sensor Malfunction.

Circuit/System Testing

Daytime Running Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
   - E13LA Headlamp Assembly - Left
   - E13RA Headlamp Assembly - Right

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- E69L Multifunction Lamp Assembly - Front Fascia Left (with Z75)
- E69R Multifunction Lamp Assembly - Front Fascia Right (with Z75)

2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
   - E13LA Headlamp Assembly - Left terminal 1 and terminal 4
   - E13RA Headlamp Assembly - Right terminal 1 and terminal 4
   - E69L Multifunction Lamp Assembly - Front Fascia Left terminal 1 (with Z75)
   - E69R Multifunction Lamp Assembly - Front Fascia Right terminal 1 (with Z75)
   - **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.
   - **If less than 10 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
   - E13LA Headlamp Assembly - Left terminal 6
   - E13RA Headlamp Assembly - Right terminal 6
   - E69L Multifunction Lamp Assembly - Front Fascia Left terminal 4 (with Z75)
   - E69R Multifunction Lamp Assembly - Front Fascia Right terminal 4 (with Z75)
4. Verify the test lamp turns ON and OFF when commanding the appropriate Dedicated Daytime Running Lamp ON and OFF with a scan tool.
   - **If the test lamp is always OFF**
   1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
      - X4 - left daytime running lamp
      - X4 - right daytime running lamp (Z75 without AVF)
      - X5 - right daytime running lamp
   2. Test for infinite resistance between the control circuit and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - 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.

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

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

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
   - X4 - left daytime running lamp
   - X4 - right daytime running lamp (Z75 without AVF)
   - X5 - right daytime running lamp
2. Test for less than 1 V between the control circuit terminal and ground.
   - If 1 V or greater, repair the short to voltage on the circuit.
   - If less than 1 V, replace the K9 Body Control Module.

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

5. Test or replace the park/daytime running lamp.

Ambient Light Sensor Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the B10B Ambient Light/Sunload Sensor. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the low reference circuit terminal 6 and ground.
   - **If 10 Ω or greater**
   1. Ignition OFF, disconnect the X2 harness connector at the K33 HVAC Control Module.
   2. Test for less than 2 Ω in the low reference circuit end to end.
      - If 2 Ω or greater, repair the open/high resistance in the circuit.
      - If less than 2 Ω, replace the K33 K33 HVAC Control Module.
   - **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 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.

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- **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.
    - **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.

- **Headlamp Replacement (GMC)** **Headlamp Replacement (Chevrolet)** **Headlamp Replacement (Cadillac)**
- **Headlamp Control Module Replacement (Multifunction LED)**
- **Sun Load Temperature and Headlamp Automatic Control Ambient Light Sensor Replacement** **Sun Load Temperature and Headlamp Automatic Control Ambient Light Sensor Replacement (Z75)**
- **Control Module References** for BCM or HVAC control module replacement, programming, and setup

DOME LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F47DR (BCM 7) Fuse B+	1	1	-	-
Dome/Courtesy Lamps Control - Terminal 1 X7	B2615 02	B2615 04	1	-
Dome Lamp Switch Cancel Signal	2	2	2	-
Dome Lamp Switch ON Signal	2	2	2	-
Dome Lamp Switch Ground	-	1	-	-
Dome Lamp Ground (Z75 without SWB)	-	1	-	-
Dome/Reading Lamps - Front Overhead Console Left Ground	-	1	-	-
Dome/Reading Lamps - Front Overhead Console Right Ground	-	1	-	-
Dome/Reading Lamps - Left Roof Rail Ground (with AZ3)	-	1	-	-
Dome/Reading Lamps - Right Roof Rail Ground (with AZ3)	-	1	-	-
Dome/Reading Lamps - 2nd Row Ground (without U42)	-	1	-	-
Dome/Reading Lamps - 3rd Row Ground (without DNU)	-	1	-	-
Door Sill Plate Lamp - Driver Ground (with Z75)	-	1	-	-
Door Sill Plate Lamp - Left Rear Ground (with Z75)	-	1	-	-
Door Sill Plate Lamp - Passenger Ground (with Z75)	-	1	-	-
Door Sill Plate Lamp - Right Rear Ground (with Z75)	-	1	-	-
Video Display - 2nd Row Ground (with U42)	-	1	-	-
Video Display - 3rd Row Ground (with DNU)	-	1	-	-
1. Dome Lamps Malfunction 2. Dome Lamp Switch Malfunction				

Circuit/System Description

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The body control module (BCM) applies battery voltage to the interior dome/courtesy lamps through the dome/courtesy lamps control circuit at terminal 1 X7. When any door is opened, the jam switch contacts close and the BCM receives a door-ajar input. If the BCM receives a door lock or unlock input or a rear hatch open input, the BCM will activate the dome/courtesy lamps control circuit terminal 1 X7, providing battery voltage to all dome/courtesy lamps supplied by the circuit. The dome lamp switch contains 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 placed in the DOOR position, the dome/courtesy lamps operation is controlled by the body control module (BCM) based on inputs mentioned above. With the dome lamp switch in the OFF position, all dome/courtesy lamps operation will be disabled and will not illuminate until the dome lamp switch is placed in the ON or DOOR positions. In the event that any of these dome/courtesy lamps were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position, the BCM will deactivate the dome/courtesy lamp control circuit to prevent total battery discharge.

Reference Information

Schematic Reference

- **Interior Lights Schematics**
- **Body Control System Schematics**

Connector End View Reference

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

Scan Tool Reference

Control Module References for scan tool information

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Circuit/System Verification

1. Ignition ON.
2. Verify the exterior courtesy lamps listed below, if equipped, turn ON and OFF while commanding the Outside Rear View Mirror Courtesy Lamp ON and OFF with a scan tool.
   - A9A Outside Rearview Mirror - Driver (with DL3/DR4)
   - A9B Outside Rearview Mirror - Passenger (with DL3/DR4)
   - A24D Door Handle Assembly - Driver Exterior (with Z75)
   - A24P Door Handle Assembly - Passenger Exterior (with Z75)
   - A24LR Door Handle Assembly - Left Rear Exterior (with Z75)
   - A24RR Door Handle Assembly - Right Rear Exterior (with Z75)
   - E8ZL Running Board Step Courtesy Lamp - Left (with BRS)
   - E8ZR Running Board Step Courtesy Lamp - Right (with BRS)
   - **If the exterior courtesy lamps do not turn ON and OFF**

     Refer to **Exterior Courtesy Lamps Malfunction**.

   - **If the exterior courtesy lamps turn ON and OFF**
3. Verify the center console compartment lamp, both sunshade lamps, and ALL reading lamps operate ON/OFF when activated.
   - **If the center console compartment lamp, both sunshade lamps, and ALL reading lamps do not activate**

     Refer to **Courtesy Lamps Malfunction**.

   - **If the center console compartment lamp, both sunshade lamps, and ALL reading lamps activate**
4. Verify the scan tool Door Ajar Switch 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** .

   - **If the parameter changes**
5. 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**

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Refer to Dome Lamp Switch Malfunction.

- **If the parameter changes**

6. Verify the dome lamps and door sill plate lamps if equipped, 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.

   - **If the dome lamps turn ON and OFF**
7. All OK.

Circuit/System Testing

Dome Lamp Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the S12 Dome Lamp Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 1 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.
   - **If less than 15 Ω**
3. Ignition ON.
4. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Door.
   - **If Cancel**
   1. Ignition OFF, disconnect the X1 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.

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- **If On**

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

- **If Door**

5. Install a 3 A fused jumper wire between the signal circuit terminal 2 and ground.
6. Verify the scan tool Interior/Courtesy Lighting Master Switch parameter is Cancel.

- **If not Cancel**

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 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.

- **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, disconnect the X7 harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the signal circuit terminal 3 and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - 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.

- **If On**

9. Test or replace the S12 Dome Lamp Switch.

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Dome/Courtesy Lamps Malfunction

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

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

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the component with the inoperative dome/courtesy lamp. 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.
   - E36AH Dome Lamp terminal B (Z75 without SWB)
   - E37B Dome/Reading Lamps - 2nd Row terminal B (without U42)
   - E37C Dome/Reading Lamps - 3rd Row terminal B (without DNU)
   - E37H Dome/Reading Lamps - Left Roof Rail terminal 4 (with AZ3)
   - E37J Dome/Reading Lamps - Right Roof Rail terminal 4 (with AZ3)
   - E37EL Dome/Reading Lamps - Front Overhead Console Left terminal 4
   - E37ER Dome/Reading Lamps - Front Overhead Console Right terminal 4
   - E8A Door Sill Plate Lamp - Driver terminal 2 (with Z75)
   - E8B Door Sill Plate Lamp - Passenger terminal 2 (with Z75)
   - E8Q Door Sill Plate Lamp - Left Rear terminal 2 (with Z75)
   - E8R Door Sill Plate Lamp - Right Rear terminal 2 (with Z75)
   - P22A Video Display - 2nd Row terminal 2 (with U42)
   - P22B Video Display - 3rd Row terminal 2 (with DNU)
   - **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.

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- **If less than 15 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E36AH Dome Lamp terminal A (Z75 without SWB)
    - E37B Dome/Reading Lamps - 2nd Row terminal C (without U42)
    - E37C Dome/Reading Lamps - 3rd Row terminal C (without DNU)
    - E37H Dome/Reading Lamps - Left Roof Rail terminal 3 (with AZ3)
    - E37J Dome/Reading Lamps - Right Roof Rail terminal 3 (with AZ3)
    - E37EL Dome/Reading Lamps - Front Overhead Console Left terminal 3
    - E37ER Dome/Reading Lamps - Front Overhead Console Right terminal 3
    - E8A Door Sill Plate Lamp - Driver terminal 1 (with Z75)
    - E8B Door Sill Plate Lamp - Passenger terminal 1 (with Z75)
    - E8Q Door Sill Plate Lamp - Left Rear terminal 1 (with Z75)
    - E8R Door Sill Plate Lamp - Right Rear terminal 1 (with Z75)
    - P22A Video Display - 2nd Row terminal 3 (with U42)
    - P22B Video Display - 3rd Row terminal 3 (with DNU)
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.

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- **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.

- **Center Reading and Courtesy Lamp Replacement (Front)** **Center Reading and Courtesy Lamp Replacement (Rear)**
- **Front Side Door Sill Garnish Molding Replacement**
- **Rear Side Door Sill Garnish Molding Replacement**
- **Cargo Center Courtesy Lamp Replacement**
- **Rear Seat Position Center Reading and Courtesy Lamp Replacement**
- **Control Module References** for BCM replacement, programming, and setup

EMERGENCY VEHICLE LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Exterior Spot Lamp - Left Control	1	1	1	-
Exterior Spot Lamp - Right Control	1	1	1	-
Exterior Spot Lamp - Left Ground	-	1	-	-
Exterior Spot Lamp - Right Ground	-	1	-	-
1. Emergency Vehicle Lamps Malfunction				

Circuit/System Description

The left and right exterior spot lamps are supplied with battery voltage at all times. The exterior spot lamps are each controlled by individual switch's.

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When the switch is activated, the switch contacts close allowing battery voltage to flow from the F26DL fuse located in the fuse block instrument panel - right through the switch contact to the spot lamp illuminating the spot lamp.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate E35 Exterior Spot Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal and ground.
    - **If 15 Ω or greater**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.

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

- **If less than 15 Ω**

3. Ignition ON.
4. Verify a test lamp illuminates between the control circuit terminal A and ground.
   - **If the test lamp does not illuminate**
   1. Ignition OFF, disconnect the X2 harness connector at the X51L Fuse Block - Instrument Panel Left.
   2. Test for infinite resistance between the control circuit terminal A 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 X51L Fuse Block - Instrument Panel Left.
   - **If the test lamp illuminates**
5. Ignition OFF, remove the F26DL fuse at the X51L Fuse Block - Instrument Panel Left, ignition ON.
6. Verify a test lamp does not illuminate between the control circuit terminal A and ground.
   - **If the test lamp illuminates**
   1. Ignition OFF, disconnect the X2 harness connector at the X51L Fuse Block - Instrument Panel Left, ignition ON.
   2. Test for less than 1 V between the control circuit terminal A and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V, replace the X51L Fuse Block - Instrument Panel Left.
   - **If the test lamp does not illuminate**
7. Test or replace the E35 Exterior Spot Lamp.

Repair Instructions

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

EXTERIOR COURTESY LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F47DR (BCM 7) Fuse B+	1	1	-	-
Exterior Courtesy Lamps Control - Terminal 8 X7	B263A 02	B263A 04	1	-
Door Handle Courtesy Lamp - Driver Exterior Ground	-	1	-	-
Door Handle Courtesy Lamp - Left Rear Exterior Ground	-	1	-	-
Door Handle Courtesy Lamp - Passenger Exterior Ground	-	1	-	-
Door Handle Courtesy Lamp - Right Rear Exterior Ground	-	1	-	-
Outside Rearview Mirror Courtesy Lamp - Driver Ground	-	1	-	-
Outside Rearview Mirror Courtesy Lamp - Passenger Ground	-	1	-	-
Running Board Step Courtesy Lamp - Left Ground	-	1	-	-
Running Board Step Courtesy Lamp - Right Ground	-	1	-	-
1. Exterior Courtesy Lamps Malfunction				

Circuit/System Description

The body control module (BCM) supplies battery voltage to each exterior door handles LED backlighting, the LED lighting located under each outside rearview mirror for approach lighting, and both running board steps courtesy lamps when equipped. When the keyless entry transmitter is operated to the lock/unlock functions the LED lighting located under each outside rearview mirror, exterior door handles, and both running board

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steps are commanded ON for approach lighting.

Diagnostic Aid

When a fault is present in the exterior courtesy lamps control circuit terminal 8 X7, the BCM will respond by turning the output driver for this circuit off until the fault is removed.

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

- **Exterior courtesy lamps the vehicle is equipped with**

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- **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 appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - A9A Outside Rearview Mirror - Driver
    - A9B Outside Rearview Mirror - Passenger
    - A24D Door Handle Assembly - Driver Exterior
    - A24P Door Handle Assembly - Passenger Exterior
    - A24LR Door Handle Assembly - Left Rear Exterior
    - A24RR Door Handle Assembly - Right Rear Exterior
    - E8ZL Running Board Step Courtesy Lamp - Left
    - E8ZR Running Board Step Courtesy Lamp - Right
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - A9A Outside Rearview Mirror - Driver terminal 5
    - A9B Outside Rearview Mirror - Passenger terminal 5
    - A24D Door Handle Assembly - Driver Exterior terminal 5
    - A24P Door Handle Assembly - Passenger Exterior terminal 5
    - A24LR Door Handle Assembly - Left Rear Exterior terminal 5
    - A24RR Door Handle Assembly - Right Rear Exterior terminal 5
    - E8ZL Running Board Step Courtesy Lamp - Left terminal 2
    - E8ZR Running Board Step Courtesy Lamp - Right terminal 2
    - **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.

    - **If less than 15 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.

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- A9A Outside Rearview Mirror - Driver terminal 1
- A9B Outside Rearview Mirror - Passenger terminal 1
- A24D Door Handle Assembly - Driver Exterior terminal 3
- A24P Door Handle Assembly - Passenger Exterior terminal 3
- A24LR Door Handle Assembly - Left Rear Exterior terminal 3
- A24RR Door Handle Assembly - Right Rear Exterior terminal 3
- E8ZL Running Board Step Courtesy Lamp - Left terminal 1
- E8ZR Running Board Step Courtesy Lamp - Right terminal 1

4. Verify the test lamp turns ON and OFF when commanding the Outside Rear View Mirror Courtesy 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.
   - **If the test lamp turns ON and OFF**
5. Test or replace the inoperative component.

Repair Instructions

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

- **Front Side Door Outside Handle Replacement (without ATH)** **Front Side Door Outside Handle Replacement (with ATH)**

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- **Rear Side Door Outside Handle Replacement (without ATH)** **Rear Side Door Outside Handle Replacement (with ATH)**
- **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.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Fog Lamp Switch Signal	B2740 00	2	2	-
Front Fog Lamp Relay Control	B2530 02	B2530 04	B2530 01	-
Front Fog Lamp Control	1	1	1	-
Headlamp Switch Ground	-	2	-	-
Front Fog Lamp Ground - Left	-	1	-	-
Front Fog Lamp Ground - Right	-	1	-	-
1. Front Fog Lamps Malfunction 2. Front Fog Lamp Switch Malfunction				

Circuit/System Description

The front fog lamp relay is supplied with battery voltage at all times. The front fog lamp switch signal circuit is grounded momentarily by pressing the front fog lamp switch. The body control module (BCM) energizes the front fog lamp relay by applying 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 F94UA fog lamp fuse to the front fog lamp control circuit which illuminates the front fog lamps. With the front fog lamp switch activated the BCM sends a message via serial data to the instrument cluster requesting the instrument cluster to illuminate the front fog indicator.

Reference Information

Schematic Reference

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

     Refer to Front Fog Lamp Switch Malfunction.

   - **If the parameter changes**
3. Verify the front fog lamps turn ON and OFF when commanding the Front Fog Lamps ON and OFF with a scan tool.
   - **If the front fog lamps do not turn ON and OFF**

     Refer to Front Fog Lamps Malfunction.

   - **If the front fog lamps turn ON and OFF**

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4. 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 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.
    - **If less than 15 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.
    - **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.

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

- **If Active**

7. Test or replace the S30 Headlamp Switch.

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 X3 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.
   - **If the test lamp illuminates**
3. Ignition OFF, remove the F94UA fog lamp fuse at the X50A Fuse Block - Underhood.
4. Connect a 3 A fused jumper between the control circuit terminal 10 and ground, ignition ON.
5. Verify a test lamp illuminates between the F94UA fog lamp fuse B+ switch control terminal and ground.
   - **If the test lamp does not illuminate**
   1. Ignition OFF, disconnect the X3 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.
   - **If the test lamp illuminates**
6. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
7. Install the F94UA 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. It may take up to 2 min for all vehicle

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systems to power down.

9. Test for less than 10 Ω between the ground circuit terminal B 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.
    - **If less than 10 Ω**
10. Connect a test lamp between the control circuit terminal A 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.
    - **If the test lamp turns ON and OFF**
12. Test or replace the E29 Fog Lamp.

Repair Instructions

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

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- Headlamp Switch Replacement (Chevrolet / GMC) Headlamp Switch Replacement (Cadillac)
- Front Fog Lamp Replacement
- Front Fog Lamp Bulb Replacement
- Underhood Electrical Center or Junction Block Replacement
- 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.
- Diagnostic Procedure Instructions provides an overview of each diagnostic category.

Diagnostic Fault Information

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

Circuit/System Description

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

Reference Information

Schematic Reference

Exterior Lights Schematics

Connector End View Reference

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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 Circuit/System Testing.

   - **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**

   - **If all turn signal lamps turn ON and OFF**
4. All OK.

Circuit/System Testing

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1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the X2 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 15 Ω between the ground circuit terminal C 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.
    - **If less than 15 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 G and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the K9 Body Control Module.
    - **If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal G 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 G 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.
    - **If Active**
7. Test or replace the S78 Turn Signal/Multifunction Switch.

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Repair Instructions

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

- **Turn Signal Switch Replacement (N33, N37)** **Turn Signal Switch Replacement (N38)**
- **Control Module References** for BCM replacement, programming, and setup

HEADLAMPS MALFUNCTION (CHEVROLET, GMC)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F10DL (BCM 3) Fuse B+	1	1	-	-
F19DR (BCM 4) Fuse B+	1	1	-	-
Headlamp High Beam Relay Control	B2580 02, B2580 04	B2580 02, B2580 04	B2580 01	-
Low Beam Headlamp - Left Control	B2575 02	B2575 04	B2575 01	-
Low Beam Headlamp - Right Control	B2699 02	B2699 04	B2699 01	-
High Beam Headlamp - Left Control	2	2	2	-
High Beam Headlamp - Right Control	2	2	2	-
Headlamp Switch Park Lamps ON Signal	3	B257A 00	3	-
Headlamp Switch Headlamps OFF Signal	B257A 00	3	3	-
Headlamp Switch Headlamps ON Signal	B257A 00	3	3	-
Turn Signal/Multifunction Switch Flash To Pass Signal	B3806 00	4	4	-
Turn Signal/Multifunction Switch High Beam Signal	B3650 08	4	4	-
Headlamp Assembly - Left Ground	-	1	-	-

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

Circuit/System Description

Low Beam Headlamps - without T4F

For headlamp operation, the body control module (BCM) monitors three signal circuits from the headlamp switch. When the headlamp switch is in the AUTO position, the three signal circuits are unaffected 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 low beam headlamps ON. With the headlamp switch in the HEADLAMP or AUTO position, the BCM responds by applying battery positive voltage to the left and right low beam headlamp control circuits illuminating the low beam headlamps.

Low Beam Headlamps - with T4F

For headlamp operation, the body control module (BCM) monitors three signal circuits from the headlamp switch. When the headlamp switch is in the AUTO position, the three signal circuits are unaffected 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 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 low beam request by applying ground to the low beam relay control circuit which energizes the low beam relay. With the low beam relay energized, the switch contacts close allowing battery voltage to flow through the low beam fuses. Battery voltage is then applied from the fuses, 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

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discharge headlamps do not have filaments like traditional bulbs, instead the starter uses a high voltage transformer to convert the input voltage into a higher voltage. This increased voltage is used in order to create an arc between the electrodes in the bulb illuminating the low beam headlamps.

High Beam Headlamps

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

Flash to Pass

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

Reference Information

Schematic Reference

- **Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88)** **Headlights/Daytime Running Lights (DRL) Schematics (Z75)**
- **Body Control System 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**

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- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify ALL turn signals operate when activated with the turn signal switch.
    - **If the turn signals do not operate when activated**

      Refer to **Turn Signal Lamps and/or Indicators Malfunction**.

    - **If the turn signals operate when activated**
3. Verify the scan tool Headlamps On Switch parameter changes between Active and Inactive while commanding the headlamps ON and OFF with the headlamp switch.
    - **If the parameter does not change**

      Refer to Headlamp Switch Malfunction.

    - **If the parameter changes**
4. Verify the scan tool Automatic Headlamps Disable Switch parameter changes between Active and Inactive while commanding the automatic lamp control ON and OFF with the headlamp switch.
    - **If the parameter does not change**

      Refer to Headlamp Switch Malfunction.

    - **If the parameter changes**
5. Verify the scan tool Headlamps Flash Switch parameter changes between Active and Inactive while commanding the flash to pass ON and OFF with the turn signal/multifunction switch.
    - **If the parameter does not change**

      Refer to Turn Signal/Multifunction Switch Malfunction.

    - **If the parameter changes**

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6. Verify the scan tool High Beam Select Switch parameter changes between Active and Inactive while commanding the high beams ON and OFF with the turn signal/multifunction switch.
    - **If the parameter does not change**

      Refer to Turn Signal/Multifunction Switch Malfunction.

    - **If the parameter changes**
7. Verify the left low beam headlamp turns ON and OFF when commanding the Left Low Beam/Daytime Running Lamp 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.

    - **If the left low beam headlamp turns ON and OFF**
8. Verify the right low beam headlamp turns ON and OFF when commanding the Right Low Beam/Daytime Running Lamp 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.

    - **If the right low beam headlamp turns ON and OFF**
9. Verify the high beams turn ON and OFF when commanding the High Beams ON and OFF with a scan tool.
    - **If the high beams do not turn ON and OFF**

      Refer to Headlamps Malfunction - High Beam.

    - **If the high beams turn ON and OFF**
10. Verify the high beam indicator on the instrument cluster turns ON and OFF while commanding the All Indicators Test ON and OFF with a scan tool.
    - **If the high beam indicator does not turn ON and OFF**

      Refer to High Beam Indicator Malfunction.

    - **If the high beam indicator turns ON and OFF**
11. All OK.

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Circuit/System Testing

Headlamp Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.
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.
    - **If less than 15 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.
    - **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.

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

- **If Active**

7. Verify the scan tool Park Lamps Switch parameter is Inactive.
   - **If not Inactive**
   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.
   - **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.
   - **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.
    - **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.

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- **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.

- **If Active**

13. Test or replace the S30 Headlamp Switch.

Turn Signal/Multifunction Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the X1 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 15 Ω between the ground circuit terminal 13 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.

    - **If less than 15 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 14 and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the K9 Body Control Module.

    - **If Inactive**

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5. Install a 3 A fused jumper wire between the signal circuit terminal 14 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 14 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.
    - **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 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.
    - **If Inactive**
8. Install a 3 A fused jumper wire between the signal circuit terminal 10 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 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.
    - **If Active**

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

Headlamps Malfunction - Low Beam (without T4F)

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E4G Headlamp - Left Low Beam
    - E4H Headlamp - Right Low Beam
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
    - E4G Headlamp - Left Low Beam socket terminal
    - E4H Headlamp - Right Low Beam socket terminal
    - **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.
    - **If less than 10 Ω**
3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E4G Headlamp - Left Low Beam socket terminal
    - E4H Headlamp - Right Low Beam socket terminal
4. Verify the test lamp turns ON and OFF when commanding the appropriate Low Beam/Daytime Running Lamp ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
    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**

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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.

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

5. Test or replace the E4 Headlamp - Low beam.

Headlamps Malfunction - Low Beam (with T4F)

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

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

2. Verify a test lamp illuminates between the control circuit terminal 13 and ground.
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X4 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.
    - **If the test lamp illuminates**
3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 13 and ground.
4. Remove the left low beam fuse (F122UA) at the X50A Fuse Block - Underhood, ignition ON.
5. Verify a test lamp illuminates between the left low beam fuse (F122UA) B+ switch control terminal and ground.
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X4 harness connector at the X50A Fuse Block - Underhood, 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.

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- If less than 1 V, replace the X50A Fuse Block - Underhood.
- **If the test lamp illuminates**

6. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
7. Install the left low beam fuse (F122UA) at the X50A Fuse Block - Underhood.
8. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
   - E13LA Headlamp Assembly - Left
   - E13RA Headlamp Assembly - Right
9. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
   - E13LA Headlamp Assembly - Left terminal 1 and terminal 4
   - E13RA Headlamp Assembly - Right terminal 1 and terminal 4
   - **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.
   - **If less than 10 Ω**
10. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E13LA Headlamp Assembly - Left terminal 2
    - E13RA Headlamp Assembly - Right terminal 2
11. Verify the test lamp turns ON and OFF when commanding the Low Beam Headlamps ON and OFF with the S30 Headlamp Switch.
    - **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.

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- **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.

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

12. Ignition OFF, replace the T7 Headlamp Ballast.
13. Ignition ON, verify the appropriate low beam headlamp illuminates when commanded ON with the S30 Headlamp Switch.
    - **If the low beam headlamp does not illuminate**

    1. Replace the E4 Headlamp - Low Beam bulb.

    - **If the low beam headlamp illuminates**

14. All OK.

Headlamps Malfunction - High Beam

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

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

2. Verify a test lamp illuminates between the control circuit terminal 18 and ground.
    - **If the test lamp does not illuminate**

    1. Ignition OFF, disconnect the X3 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.

    - **If the test lamp illuminates**

3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 18 and ground.

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4. Remove the high beam fuse (F95UA) at the X50A Fuse Block - Underhood, ignition ON.
5. Verify a test lamp illuminates between the high beam fuse (F95UA) B+ switch control terminal and ground.
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X3 harness connector at the X50A Fuse Block - Underhood, 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, replace the X50A Fuse Block - Underhood.
    - **If the test lamp illuminates**
6. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
7. Install the high beam fuse (F95UA) at the X50A Fuse Block - Underhood.
8. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E4E Headlamp - Left High Beam
    - E4F Headlamp - Right High Beam
9. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
    - E4E Headlamp - Left High Beam socket terminal
    - E4F Headlamp - Right High Beam socket terminal
    - **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.
    - **If less than 10 Ω**
10. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E4E Headlamp - Left High Beam socket terminal
    - E4F Headlamp - Right High Beam socket terminal
11. 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.

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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.

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

12. Test or replace the E4 Headlamp - High Beam.

High Beam Indicator Malfunction

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

      Replace the P16 Instrument Cluster.

    - **If the high beam indicator turns ON and OFF**
3. Replace the K9 Body Control Module.

Repair Instructions

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

- **Headlamp Switch Replacement (Chevrolet / GMC)**
- **Headlamp Bulb Replacement (GMC, HID, Left Side) Headlamp Bulb Replacement (Chevrolet, HID, Left Side) Headlamp Bulb Replacement (GMC, Halogen, Left Side) Headlamp Bulb Replacement (Chevrolet, Halogen, Left Side) Headlamp Bulb Replacement (GMC, High-Beam, Left Side) Headlamp Bulb Replacement (Chevrolet, High-Beam, Left Side) Headlamp Bulb Replacement (GMC,**

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HID, Right Side) Headlamp Bulb Replacement (GMC, Halogen, Right Side) Headlamp Bulb Replacement (GMC, High-Beam, Right Side) Headlamp Bulb Replacement (Chevrolet, HID, Right Side) Headlamp Bulb Replacement (Chevrolet, Halogen, Right Side) Headlamp Bulb Replacement (Chevrolet, High-Beam, Right Side)

- Headlamp Ballast Replacement (GMC) Headlamp Ballast Replacement (Chevrolet)
- Circuit Protection - Fusible Links
- Turn Signal Switch Replacement (N33, N37) Turn Signal Switch Replacement (N38)
- Control Module References for BCM or Instrument Cluster replacement, programming, and setup

HEADLAMPS MALFUNCTION (CADILLAC)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F10DL (BCM 3) Fuse B+	1	1	-	-
F19DR (BCM 4) Fuse B+	1	1	-	-
Headlamp High Beam Relay Control	B2580 02, B2580 04	B2580 02, B2580 04	B2580 01	-
Low Beam Headlamp - Left Control	B2575 02	B2575 04	B2575 01	-
Low Beam Headlamp - Right Control	B2699 02	B2699 04	B2699 01	-
High Beam Headlamp - Left Control	2	2	2	-
High Beam Headlamp - Right Control	2	2	2	-
Headlamp Switch Park Lamps ON Signal	3	B257A 00	3	-
Headlamp Switch Headlamps OFF Signal	B257A 00	3	3	-
Headlamp Switch Headlamps ON Signal	B257A 00	3	3	-
Turn Signal/Multifunction Switch Flash To Pass Signal	B3806 00	4	4	-

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

Circuit/System Description

Low Beam Headlamps

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 low beam headlamps ON. With the headlamp switch in the HEADLAMP or AUTO position, the BCM responds by applying battery positive voltage to the left and right low beam headlamp control circuits illuminating the low beam headlamps.

High Beam Headlamps

The high beam and flash to pass functions are contained within the turn signal/multifunction switch. The BCM provides the turn signal/multifunction switch with two signal circuits, the high beam signal circuit and the flash to pass signal circuit. When the low beam headlamps are ON and the turn signal/multifunction switch is placed in the high beam position, ground is applied to the BCM through the high beam signal circuit. The BCM responds to the high beam request by applying ground to the high beam relay control circuit which energizes the high beam relay. With the high beam relay energized, the switch contacts close allowing battery voltage to flow through the 3 pin high beam fuse to the left and right high beam control circuits illuminating the high beam headlamps.

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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.

Reference Information

Schematic Reference

- **Headlights/Daytime Running Lights (DRL) Schematics (X88 or Z88) Headlights/Daytime Running Lights (DRL) Schematics (Z75)**
- **Body Control System Schematics**

Connector End View Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify ALL turn signals operate when activated with the turn signal switch.
    - **If the turn signals do not operate when activated**

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Refer to **Turn Signal Lamps and/or Indicators Malfunction**.

- **If the turn signals operate when activated**

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

     Refer to Headlamp Switch Malfunction.

   - **If the parameter changes**
4. Verify the scan tool Automatic Headlamps Disable Switch parameter changes between Active and Inactive while commanding the automatic lamp control ON and OFF with the headlamp switch.
   - **If the parameter does not change**

     Refer to Headlamp Switch Malfunction.

   - **If the parameter changes**
5. Verify the scan tool Headlamps Flash Switch parameter changes between Active and Inactive while commanding the flash to pass ON and OFF with the turn signal/multifunction switch.
   - **If the parameter does not change**

     Refer to Turn Signal/Multifunction Switch Malfunction.

   - **If the parameter changes**
6. Verify the scan tool High Beam Select Switch parameter changes between Active and Inactive while commanding the high beams ON and OFF with the turn signal/multifunction switch.
   - **If the parameter does not change**

     Refer to Turn Signal/Multifunction Switch Malfunction.

   - **If the parameter changes**
7. Verify the left low beam headlamp turns ON and OFF when commanding the Left 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.

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- **If the left low beam headlamp turns ON and OFF**

8. Verify the right low beam headlamp turns ON and OFF when commanding the Right 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.

   - **If the right low beam headlamp turns ON and OFF**
9. Verify the high beams turn ON and OFF when commanding the High Beams ON and OFF with a scan tool.
   - **If the high beams do not turn ON and OFF**

     Refer to Headlamps Malfunction - High Beam.

   - **If the high beams turn ON and OFF**
10. All OK.

Circuit/System Testing

Headlamp Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.
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.
   - **If less than 15 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.

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

- **If Inactive**

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

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

- **If Active**

10. Verify the scan tool Headlamps On Switch parameter is Inactive.
    - **If not Inactive**
    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.
    - **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.
    - **If Active**
13. Test or replace the S30 Headlamp Switch.

Turn Signal/Multifunction Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the X1 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 15 Ω between the ground circuit terminal 13 and ground.
    - **If 15 Ω or greater**
    1. Ignition OFF.

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2. Test for less than 2 Ω in the ground circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, repair the open/high resistance in the ground connection.
- **If less than 15 Ω**

3. Ignition ON.
4. Verify the scan tool High Beam Select Switch parameter is Inactive.
    - **If not Inactive**
    1. Ignition OFF, disconnect the X3 harness connector at the K9 Body Control Module.
    2. Test for infinite resistance between the signal circuit terminal 14 and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the K9 Body Control Module.
    - **If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 14 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 14 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.
    - **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 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.

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- **If Inactive**

8. Install a 3 A fused jumper wire between the signal circuit terminal 10 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 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.
    - **If Active**
10. Test or replace the S78 Turn Signal/Multifunction Switch.

Headlamps Malfunction - Low Beam

1. Ignition OFF, exterior lamps OFF, disconnect the harness connector at the appropriate E13 Headlamp Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
    - E13LA Headlamp Assembly - Left terminal 1 and terminal 4
    - E13RA Headlamp Assembly - Right terminal 1 and terminal 4
    - **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.
    - **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 Low Beam Headlamps ON and OFF with the S30 Headlamp Switch.
    - **If the test lamp is always OFF**

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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.

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

5. Test or replace the K166 Multifunction LED Control Module - Headlamp.

Headlamps Malfunction - High Beam

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

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

2. Verify a test lamp illuminates between the control circuit terminal 18 and ground.
    - **If the test lamp does not illuminate**

1. Ignition OFF, disconnect the X3 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.

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- **If the test lamp illuminates**

3. Ignition OFF, connect a 3 A fused jumper between the control circuit terminal 18 and ground.
4. Remove the high beam fuse (F95UA) at the X50A Fuse Block - Underhood, ignition ON.
5. Verify a test lamp illuminates between the high beam fuse (F95UA) B+ switch control terminal and ground.
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X3 harness connector at the X50A Fuse Block - Underhood, 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, replace the X50A Fuse Block - Underhood.
    - **If the test lamp illuminates**
6. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
7. Install the high beam fuse (F95UA) at the X50A Fuse Block - Underhood.
8. 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.
9. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
    - E13LA Headlamp Assembly - Left terminal 1 and terminal 4
    - E13RA Headlamp Assembly - Right terminal 1 and terminal 4
    - **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.
    - **If less than 10 Ω**
10. Connect a test lamp between the control circuit terminal 3 and ground, ignition ON.
11. 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.

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- 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.

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

12. Test or replace the K166 Multifunction LED Control Module - Headlamp.

Repair Instructions

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

- **Headlamp Switch Replacement (Cadillac)**
- **Headlamp Control Module Replacement (Multifunction LED)**
- **Underhood Electrical Center or Junction Block Replacement**
- **Turn Signal Switch Replacement (N33, N37)** **Turn Signal Switch Replacement (N38)**
- **Control Module References** for BCM replacement, programming, and setup

INTERIOR ACCENT LIGHTING MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

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		Resistance		
F19DL (BCM 4) Fuse B+	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	-	-
Accent Lamp Control - Terminal 22 X7	B255F 02	B255F 04	1	-
Accent Lamp Control - Terminal 23 X1	B255D 02	B255D 04	B255D 01	-
Accent Lamp - Driver Door Ground	-	1	-	-
Accent Lamp - Driver Door Handle Ground	-	1	-	-
Accent Lamp - Driver Seat Ground	-	1	-	-
Accent Lamp - Left Rear Door Ground	-	1	-	-
Accent Lamp - Left Rear Door Handle Ground	-	1	-	-
Accent Lamp - Passenger Door Ground	-	1	-	-
Accent Lamp - Passenger Door Handle Ground	-	1	-	-
Accent Lamp - Passenger Seat Ground	-	1	-	-
Accent Lamp - Right Rear Door Ground	-	1	-	-
Accent Lamp - Right Rear Door Handle Ground	-	1	-	-
Flood Lamp - Center Console Ground	-	1	-	-
Flood Lamp - Driver Door Handle Ground	-	1	-	-
Flood Lamp - Left Rear Door Pocket Ground	-	1	-	-
Flood Lamp - Passenger Door Handle Ground	-	1	-	-
Flood Lamp - Right Rear Door Pocket Ground	-	1	-	-
Floor Accent Lamp - Right Front Ground	-	1	-	-
Floor Accent Lamp - Left Front Ground	-	1	-	-
Video Display - 2nd Row Ground	-	1	-	-
Video Display - 3rd Row 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.

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Reference Information

Schematic Reference

Interior Lights Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

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

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the component with the inoperative LED backlighting. 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 and ground.

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- **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.

- **If less than 15 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 appropriate accent lighting listed below ON and OFF with a scan tool.
    - Accent Lighting 1 - terminal 22 X7
    - Accent Lighting 2 - terminal 23 X1
    - **If the test lamp is always OFF**

    1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
        - X1
        - X7
    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.
        - X1
        - X7
    2. Test for less than 1 V between the control circuit terminal and ground.
        - If 1 V or greater, repair the short to voltage on the circuit.
        - If less than 1 V, replace the K9 Body Control Module.

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

5. Test or replace the appropriate accent lamp.

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Repair Instructions

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

- **Front Floor Console Flood Lamp Replacement**
- **Front Floor Flood Lamp Replacement (Right Side)** **Front Floor Flood Lamp Replacement (Left Side)**
- **Front Side Door Inside Handle Illumination Lamp Replacement (Chevrolet / GMC)** **Front Side Door Inside Handle Illumination Lamp Replacement (Cadillac)**
- **Rear Side Door Inside Handle Illumination Lamp Replacement (Chevrolet / GMC)** **Rear Side Door Inside Handle Illumination Lamp Replacement (Cadillac)**
- **Control Module References** for BCM replacement, programming, and setup

INTERIOR BACKLIGHTING MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F11DL (BCM 5) Fuse B+	B2545 01	B2545 01	-	-
F23DL (IPC IGN/SDM IGN) Fuse B+	4	4	-	-
F46DR (BCM 6) Fuse B+	2	2	-	-
Instrument Panel Dimmer Switch B+	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 04	-
LED Backlight Dimming Control Terminal 9 X7	B2610 02	B2610 04	B2610 04	-
Switch Indicator LED Backlight Dimming Control Terminal 5 X1	B2625 02	B2625 04	B2625 01	-
Lane Departure Switch Amber Indicator Control	5	B0987 06	B0987 01, B0987 0B	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park Assist Switch Amber Indicator Control	6	6	B0968 01	-
Transfer Case Shift Control Switch Auto 4WD Indicator Control (NPO/NQH)	B0770 06	B0770 06	B0770 01	-
Transfer Case Shift Control Switch 2 High Indicator Control (NPO/NQH)	B0785 06	B0785 06	B0785 01	-
Transfer Case Shift Control Switch 4 High Indicator Control (NPO/NQH)	B0775 06	B0775 06	B0775 01	-
Transfer Case Shift Control Switch 4 Low Indicator Control (NPO/NQH)	B0780 06	B0780 06	B0780 01	-
Window Switch - Driver Control (X88/Z75/Z88)	7	7	7	-
Content Theft Deterrent Sensor Disable Switch Ground	-	2	-	-
Dome Lamp Switch Ground	-	2	-	-
Dome/Reading Lamps - Front Overhead Console Left Ground	-	2	-	-
Dome/Reading Lamps - Front Overhead Console Right Ground	-	2	-	-
Dome/Reading Lamps - Left Roof Rail Ground	-	2	-	-
Dome/Reading Lamps - Right Roof Rail Ground	-	2	-	-
Dome/Reading Lamps - 2nd Row Ground	-	2	-	-
Dome/Reading Lamps - 3rd Row Ground	-	2	-	-
Door Lock Switch - Driver Ground (Z75)	-	3	-	-
Door Lock Switch - Passenger Ground (Z75)	-	3	-	-
Door Lock Switch - Driver Ground	-	2	-	-
Door Lock Switch - Passenger Ground	-	2	-	-
Garage Door Opener Ground	-	2	-	-
Glove Box Switch Ground	-	3	-	-
Headlamp Switch Ground	-	1, 2	-	-
Head-Up Display Switch Ground	-	2	-	-
Ignition Mode Switch Ground	-	2	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Control Switch - Interior Ground	-	2	-	-
Media Disc Eject Switch Ground	-	3	-	-
Multifunction Switch - Instrument Panel Ground	-	2	-	-
Multifunction Switch 1 - Instrument Panel Ground (Z75)	-	3	-	-
Outside Rearview Mirror Switch Ground	-	2	-	-
Park Brake Control Switch Ground	-	2	-	-
Passenger Air Bag Disable Indicator Ground	-	4	-	-
Seat Memory Switch - Driver Ground	-	2	-	-
Steering Wheel Controls Switch - Right Ground	-	2	-	-
Steering Wheel Controls Switch - Left Ground	-	2	-	-
Sunroof Switch Ground	-	2	-	-
Trailer Brake Control Switch Ground	-	2	-	-
Transfer Case Shift Control Switch Ground	-	2	-	-
Video Display - 2nd Row Ground	-	2	-	-
Video Display - 3rd Row Ground	-	2	-	-
Window Switch - Passenger Ground	-	2	-	-
1. Dimmer Switch Malfunction 2. Interior Backlighting Malfunction 3. Switch Indicator LED Backlighting Malfunction 4. Passenger Air Bag Disable Indicator Backlighting Malfunction 5. Lane Departure Switch Indicator Malfunction 6. Park Assist Switch Indicator Malfunction 7. Power Door Child Lock 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

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pulse width modulated voltage through the LED dimming 1 and dimming 2 control circuits illuminating the interior backlighting to the requested level of brightness.

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

- Center console compartment cooler switch amber LED indicator (X88/Z75/Z88)
- Door lock switch - driver red LED indicator (Z75)
- Door lock switch - passenger red LED indicator (Z75)
- Glove box release switch backlighting (Z75)
- Lane departure switch amber LED indicator (X88/Z75/Z88)
- Media disk eject switch backlighting (Z75)
- Park assist switch amber LED indicator (X88/Z75/Z88)
- Transfer case control switch amber LED indicator (NPO/NQH)
- Window switch - driver child safety lock switch amber LED indicator (X88/Z75/Z88)

Diagnostic Aids

When a fault is present in the Switch Indicator LED Backlight Dimming Control Terminal 5 X1 circuit, it is necessary to remove the negative battery cable for 30 seconds after the fault has been repaired.

Reference Information

Schematic Reference

- **Interior Lights Dimming Schematics**
- **Object Detection Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Interior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool LED Backlight Dimming Command parameter changes between a high percentage to a low percentage while operating the dimmer switch from high to low.
   - **If the parameter does not change**

     Refer to Dimmer Switch Malfunction.

   - **If the parameter changes**
3. Verify the switch indictor amber/red LED's for the components listed below turn ON and OFF while operating the switches ON and OFF.
   - Center console compartment cooler switch amber LED indicator (X88/Z75/Z88)
   - Door lock switch - driver red LED indicator (Z75)
   - Door lock switch - passenger red LED indicator (Z75)
   - Lane departure switch amber LED indicator (X88/Z75/Z88)
   - Park assist switch amber LED indicator (X88/Z75/Z88)
   - Transfer case control switch amber LED indicator (NPO/NQH)
   - Window switch - driver child safety lock switch amber LED indicator (X88/Z75/Z88)
   - **If the switch indicator amber/red LED's do not turn ON and OFF**

     Refer to Switch Indicator LED Backlighting Malfunction.

   - **If the switch indicator amber/red LED's turn ON and OFF**
4. Verify the switch backlighting for the components listed below, if equipped, dim from LOW to HIGH while operating the dimmer switch from LOW to HIGH.

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- Glove box release switch backlighting (Z75)
- Lane departure switch backlighting (X88/Z75/Z88)
- Media disk eject switch backlighting (Z75)
- Park assist switch backlighting (X88/Z75/Z88)
- Pedal adjustment switch backlighting (X88/Z75/Z88)
- Suspension mode switch backlighting (X88/Z75/Z88)
- Traction control switch backlighting (X88/Z75/Z88)
- **If the switch backlighting does not dim from LOW to HIGH**

  Refer to Switch Indicator LED Backlighting Malfunction.

- **If the switch backlighting dim's from LOW to HIGH**

5. Verify all backlighting components turn ON and OFF while commanding the LED Backlight Dimming ON and OFF with a scan tool.
   - **If all backlighting components do not turn ON and OFF**

     Refer to Interior Backlighting Malfunction.

   - **If all backlighting components turn ON and OFF**
6. Verify the phrase PASSENGER AIR BAG is illuminated on the Passenger Air Bag Disable Indicator.
   - **If the phrase PASSENGER AIR BAG is not illuminated**

     Refer to Passenger Air Bag Disable Indicator Backlighting Malfunction.

   - **If the phrase PASSENGER AIR BAG is illuminated**
7. All OK.

Circuit/System Testing

Dimmer Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S30 Headlamp Switch, ignition ON.
2. Test for B+ between the B+ circuit terminal 12 and ground.
   - **If less than B+**
   1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module.

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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.

- **If B+**

3. Verify a test lamp illuminates between the B+ circuit terminal 12 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.

- **If the test lamp illuminates**

4. Verify a test lamp does not illuminate between the B+ circuit terminal 12 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.

- **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.

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- 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.
- **If B+**

6. Test or replace the S30 Headlamp Switch.

Interior Backlighting Malfunction

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

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

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the component with inoperative backlighting. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the appropriate ground circuit terminal 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.
    - **If less than 15 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

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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.

- **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 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 connectors at the components listed below.
    - S13D Door Lock Switch - Driver (Z75)
    - S13P Door Lock Switch - Passenger (Z75)
    - S48A Multifunction Switch - Instrument Panel (X88/Z88)
    - S48D Multifunction Switch 2 - Instrument Panel (Z75)
    - S48C Multifunction Switch 1 - Instrument Panel (Z75)

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- S77 Transfer Case Shift Control Switch (NPO/NQH)
- S79D Window Switch - Driver
- S140 Media Disk Eject Switch (Z75)
- S145 Center Console Compartment Cooler Switch (DCK)

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

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

3. Verify a test lamp illuminates between each control circuit terminal listed below and ground.
   - S13D Door Lock Switch - Driver terminal 5 (Z75)
   - S13P Door Lock Switch - Passenger terminal 5 (Z75)
   - S48A Multifunction Switch - Instrument Panel terminal 5 (X88/Z88)
   - S48D Multifunction Switch 2 - Instrument Panel terminal 3 (Z75)
   - S48C Multifunction Switch 1 - Instrument Panel terminal 3 (Z75)
   - S77 Transfer Case Shift Control Switch terminal 4 (NPO/NQH)
   - S79D Window Switch - Driver terminal 11
   - S140 Media Disk Eject Switch terminal 3 (Z75)
   - S145 Center Console Compartment Cooler Switch terminal 6 (DCK)
   - **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.

   - **If the test lamp illuminates**

4. Place the dimmer switch in the LOW position for low backlighting intensity.
5. Verify a test lamp does not illuminate at FULL intensity between each control circuit terminal listed below and ground.

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- S13D Door Lock Switch - Driver terminal 5 (Z75)
- S13P Door Lock Switch - Passenger terminal 5 (Z75)
- S48A Multifunction Switch - Instrument Panel terminal 5 (X88/Z88)
- S48D Multifunction Switch 2 - Instrument Panel terminal 3 (Z75)
- S48C Multifunction Switch 1 - Instrument Panel terminal 3 (Z75)
- S77 Transfer Case Shift Control Switch terminal 4 (NPO/NQH)
- S79D Window Switch - Driver terminal 11
- S140 Media Disk Eject Switch terminal 3 (Z75)
- S145 Center Console Compartment Cooler Switch terminal 6 (DCK)
- **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.

- **If the test lamp does not illuminate at full intensity**

6. Test or replace the inoperative component.

Passenger Air Bag Disable Indicator Backlighting Malfunction

1. Ignition OFF, all doors closed, all accessories OFF, open and close drivers door, disconnect the harness connector at the P14 Passenger Air Bag Disable Indicator. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal 2 and ground.
    - **If 15 Ω or greater**

    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.

    - **If less than 15 Ω**

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

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

1. Ignition OFF, disconnect the X3 harness connector at the X51L Fuse Block - Instrument Panel Left.
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 X51L Fuse Block - Instrument Panel Left.

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

1. Ignition OFF, disconnect the X3 harness connector at the X51L Fuse Block - Instrument Panel Left, 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 X51L Fuse Block - Instrument Panel Left.

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

5. Test or replace the P14 Passenger Air Bag Disable Indicator.

Repair Instructions

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

- **Headlamp Switch Replacement (Chevrolet / GMC)** **Headlamp Switch Replacement (Cadillac)**
- **Emergency Vehicle Roof Lamp Switch Replacement**
- **Interior Lamp Switch Replacement**
- **Radio Control Switch Replacement - Steering Wheel (Cadillac)** **Radio Control Switch Replacement - Steering Wheel (Chevrolet/GMC)**
- **Instrument Panel Airbag Arming Status Display Replacement**
- **Driver or Passenger Seat Heater Switch Replacement**
- **Front Seat Adjuster Memory Switch Replacement (Cadillac)** **Front Seat Adjuster Memory Switch Replacement (Chevrolet / GMC)**
- **Door Lock Switch Replacement - Driver Side (Chevrolet, GMC)** **Door Lock Switch Replacement - Driver Side (Cadillac)**
- **Door Lock Switch Replacement - Passenger Front (Chevrolet, GMC)** **Door Lock Switch Replacement - Passenger Front (Cadillac)**
- **Instrument Panel Airbag Arming Status Display Replacement**

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- Front Side Door Window Control Switch Replacement (Chevrolet, GMC) Front Side Door Window Control Switch Replacement (Cadillac)
- Transfer Case Selector Switch Replacement (Chevrolet / GMC) Transfer Case Selector Switch Replacement (Cadillac)
- Center Reading and Courtesy Lamp Replacement (Front) Center Reading and Courtesy Lamp Replacement (Rear)
- Vehicle Stability Control System Switch Replacement (Chevrolet / GMC) Vehicle Stability Control System Switch Replacement (Cadillac)
- Control Module References for BCM replacement, programming, and setup

PARK, LICENSE, AND/OR TAIL LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F19DL (BCM 1) Fuse B+	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01,	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01,	-	-
Headlamp Switch Park Lamps ON Signal	2	B257A 00	2	-
License Plate Lamps Control	B3883 02	B3883 01, B3883 04	B3883 01, B3883 04	-
Park Lamps Relay Control	1	1	1	-
Park/Daytime Running lamp Control - Left (with Y91)	B2600 02	B2600 01, B2600 04	B2600 01, B2600 04	-
Park/Daytime Running lamp Control - Right (with Y91)	B2605 02	B2605 01, B2605 04	B2605 01, B2605 04	-
Park Lamps Control - Left (without Y91)	1	1	1	-
Park Lamps Control - Right (without Y91)	1	1	1	-
Headlamp Switch Ground	-	2	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
License Plate Lamp Ground - Left	-	1	-	-
License Plate Lamp Ground - Right	-	1	-	-
Side Marker Lamp Ground - Left Front Ground	-	1	-	-
Side Marker Lamp Ground - Right Front Ground	-	1	-	-
Tail Lamp Assembly Ground - Left Ground	-	1	-	-
Tail Lamp Assembly Ground - Right Ground	-	1	-	-
1. Park, License, and/or Tail Lamps Malfunction (without Y91) 2. Headlamp Switch Malfunction				

Circuit/System Description

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

Diagnostic Aids

When testing at the park/marker/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 Schematics**
- **Body Control System Schematics**
- **Trailer Connector/Provision Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Exterior Lighting Systems 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 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 Headlamp Switch Malfunction.

   - **If the parameter changes**
3. Verify the park and side marker lamps turn ON and OFF when commanding the Park Lamps ON and OFF with a scan tool.
   - **If the park and side marker lamps do not turn ON and OFF**

     Refer to Park Lamps Malfunction.

   - **If the park and side marker lamps turn ON and OFF**
4. Verify the license plate lamps turn ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.
   - **If the license plate lamps do not turn ON and OFF**

     Refer to License Plate Lamps Malfunction.

   - **If the license plate lamps turn ON and OFF**
5. All OK.

Circuit/System Testing

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Headlamp Switch Malfunction

1. Ignition OFF, scan tool disconnected, all doors closed, all accessories OFF, disconnect the harness connector at the S30 Headlamp Switch. It may take up to 2 min for all vehicle systems to power down.
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.
    - **If less than 15 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.
    - **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.

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- **If Active**

7. Test or replace the S30 Headlamp Switch.

Park Lamps Malfunction (without Y91)

1. Ignition OFF, disconnect the KR53 Park Lamps Relay, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 30 and ground.
    - **If the test lamp does not illuminate**

      Replace the X50A Fuse Block - Underhood.

    - **If the test lamp illuminates**
3. Verify a test lamp illuminates between the B+ circuit terminal 86 and ground.
    - **If the test lamp does not illuminate**

      Replace the X50A Fuse Block - Underhood.

    - **If the test lamp illuminates**
4. Ignition OFF, connect a test lamp between the control circuit terminal 85 and B+, ignition ON.
5. Verify the test lamp turns ON and OFF when commanding the Park Lamps ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the 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.

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

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

6. Ignition OFF, connect the KR53 Park Lamps Relay.
7. Ignition OFF, exterior lamps OFF, all doors closed, open and close drivers door, disconnect or remove the inoperative park/marker lamp bulb. It may take up to 2 min for all vehicle systems to power down.
8. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
   - E13LA Headlamp Assembly - Left terminal 1 and terminal 4
   - E13RA Headlamp Assembly - Right terminal 1 and terminal 4
   - E42L Tail Lamp Assembly - Left terminal 6
   - E42R Tail Lamp Assembly - Right terminal 6
   - E69L Multifunction Lamp Assembly - Front Fascia Left terminal 1 (with Z75)
   - E69R Multifunction Lamp Assembly - Front Fascia Right terminal 1 (with Z75)
   - **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.
   - **If less than 15 Ω**
9. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
   - E13LA Headlamp Assembly - Left terminal 7 (with Z75)
   - E13RA Headlamp Assembly - Right terminal 7 (with Z75)
   - E13LA Headlamp Assembly - Left terminal 6 (with X88/Z88 without Y91)
   - E13LA Headlamp Assembly - Left terminal 7 (with X88/Z88)
   - E13RA Headlamp Assembly - Right terminal 6 (with X88/Z88 without Y91)
   - E13RA Headlamp Assembly - Right terminal 7 (with X88/Z88)
   - E42L Tail Lamp Assembly - Left terminal 5
   - E42R Tail Lamp Assembly - Right terminal 5
   - E69L Multifunction Lamp Assembly - Front Fascia Left terminal 3 (with Z75)

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- E69R Multifunction Lamp Assembly - Front Fascia Right terminal 3 (with Z75)

10. Verify the test lamp turns ON and OFF when commanding the Park Lamps ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the appropriate harness connector listed below at the X50A Fuse Block - Underhood.
        - X1 - Front Park Lamps
        - X5 - Rear Park 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 KR53 Park Lamps Relay.
    - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the appropriate harness connector listed below at the X50A Fuse Block - Underhood, ignition ON.
        - X1 - Front Park Lamps
        - X5 - Rear Park 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 KR53 Park Lamps Relay.
    - **If the test lamp turns ON and OFF**
11. Test or replace the park/marker lamp.

Park/Daytime Running Lamps Malfunction - Front (with Y91)

1. Ignition OFF, exterior lamps OFF, all doors closed, open and close drivers door, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E13LA Headlamp Assembly - Left
    - E13RA Headlamp Assembly - Right
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - E13LA Headlamp Assembly - Left terminal 1 and terminal 4

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- E13RA Headlamp Assembly - Right terminal 1 and terminal 4
- **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.

- **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 6
    - E13RA Headlamp Assembly - Right terminal 6
4. Verify the test lamp turns ON and OFF when commanding the appropriate Park/Daytime Running Lamp ON and OFF with a scan tool.

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

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
    - X4 - left park/daytime running lamp
    - X5 - right park/daytime running lamp
2. Test for infinite resistance between the control circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K9 Body Control Module.

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

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
    - X4 - left park/daytime running lamp
    - X5 - right park/daytime running lamp
2. Test for less than 1 V between the control circuit terminal and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V, replace the K9 Body Control Module.

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

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5. Test or replace the park/daytime running lamp.

License Plate Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, all doors closed, open and close drivers door, remove both E7 License Plate Lamp bulbs. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between each ground circuit terminal 2 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.
    - **If less than 15 Ω**
3. Connect a test lamp between the E7L License Plate Lamp - Left control circuit terminal 1 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.
    - **If the test lamp turns ON and OFF**
5. Ignition OFF.

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6. Connect a test lamp between the E7R License Plate Lamp - Right control circuit terminal 1 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the License Plate Lamps ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
    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 the test lamp turns ON and OFF**
8. Test or replace the E7 License Plate Lamp bulb.

Repair Instructions

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

- **Headlamp Switch Replacement (Chevrolet / GMC)** **Headlamp Switch Replacement (Cadillac)**
- **Rear License Plate Lamp Replacement**
- **Headlamp Control Module Replacement (Multifunction LED)**
- **Relay Replacement (Attached to Wire Harness)** **Relay Replacement (Within an Electrical Center)**
- **Rear Body Structure Stop Lamp Replacement** **Rear Body Structure Stop Lamp Replacement (Escalade)**
- **Exterior Lamp Control Module Replacement (Multifunction LED)**
- **Control Module References** for BCM replacement, programming, and setup

STOP LAMPS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F19DL (BCM 1) Fuse B+	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	B1325 03, B3873 01, B3873 04, B3883 01, B3883 04, C0297 01	-	-
F19DR (BCM 4) Fuse B+	1	1	-	-
F47DR (BCM 7) Fuse B+	1	1	-	-
Brake Pedal Position Sensor 5 V Reference	C0277 06, C0890 03, U0422 00, U0422 71	C0277 06, U0422 00, U0422 71	C0277 07, C0890 07, U0422 00, U0422 71	C0277 09, C0277 12
Brake Pedal Position Sensor Signal	C0277 06, U0422 00, U0422 71	C0277 06, U0422 00, U0422 71	C0277 07, C0890 07, U0422 00, U0422 71	C0277 09, C0277 12
Center High Mounted Stop Lamp Control	B3884 02	B3884 01, B3884 04	B3884 01, B3884 04	-
Stop Lamp Control - Left (with Z75/Z88)	1	1	1	-
Stop Lamp Control - Right (with Z75/Z88)	1	1	1	-
Stop Lamp Control - Left (X88 with T89)	B3881 02	1	1	-
Stop Lamp Control - Right (X88 with T89)	B3882 02	1	1	-
Stop/Turn Signal Lamp Control - Left (X88 without T89)	B3950 02, B3950 04	B3950 04	B3950 01	-
Stop/Turn Signal Lamp Control - Right (X88 without T89)	B3951 02, B3951 04	B3951 04	B3951 01	-
Brake Pedal Position Sensor Low Reference	-	C0277 07, U0422 00, U0422 71	1	-
Center High Mounted Stop Lamp Ground	-	2	-	-
Tail Lamp Assembly Ground - Left	-	1	-	-
Tail Lamp Assembly Ground - Right	-	1	-	-
1. Stop Lamps Malfunction 2. Center High Mounted Stop Lamp Malfunction				

Circuit/System Description

The brake pedal position sensor is used to sense the action of the driver application of the brake pedal. The brake pedal position sensor provides an analog voltage signal that will increase as the brake pedal is applied. The body control module (BCM) provides a low reference signal and a 5 V

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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 relay control circuit illuminating the left and right stop lamps and the center high mounted stop lamp.

Diagnostic Aids

When testing at the stop 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 Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Exterior Lighting Systems Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Brake Pedal Applied parameter changes between Active and Inactive while pressing and releasing the brake pedal.

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- **If the parameter does not change**

  Refer to Brake Pedal Position Sensor Malfunction.

- **If the parameter changes**

3. Verify the scan tool Brake Pedal Position Sensor Learned Release Position parameter, located in the BCM Chassis Control Data display, is within 0.1 V of the Brake Pedal Position Sensor parameter when the brake pedal is fully released.
   - **If the difference is greater than 0.1 V**

     Perform the **Brake Pedal Position Sensor Calibration** .

   - **If the difference is less than 0.1 V**
4. Verify the left brake lamp turns ON and OFF when commanding the Left Stop Lamp ON and OFF with a scan tool.
   - **If the left brake lamp does not turn ON and OFF**

     Refer to Stop Lamps Malfunction.

   - **If the left brake lamp turns ON and OFF**
5. Verify the right brake lamp turns ON and OFF when commanding the Right Stop Lamp ON and OFF with a scan tool.
   - **If the right brake lamp does not turn ON and OFF**

     Refer to Stop Lamps Malfunction.

   - **If the right brake lamp turns ON and OFF**
6. 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.

   - **If the center high mounted stop turns ON and OFF**
7. All OK.

Circuit/System Testing

Brake Pedal Position Sensor Malfunction

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1. Ignition OFF, disconnect the harness connector at the B22 Brake Pedal Position Sensor, ignition ON.
2. Test for less than 1 V between the low reference circuit terminal 1 and ground.
    - **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.
    - **If less than 1 V**
3. Test or replace the B22 Brake Pedal Position Sensor.

Stop Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, all doors closed, open and close drivers door, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - E5AS Stop/Turn Signal Lamp - Left Upper (X88 without T89)
    - E5AT Stop/Turn Signal Lamp - Left Lower (X88 without T89)
    - E5AU Stop/Turn Signal Lamp - Right(X88 without T89)
    - E5AV Stop/Turn Signal Lamp - Right Lower (X88 without T89)
    - E5L Stop Lamp - Left (X88 with T89)
    - E5R Stop Lamp - Right (X88 with T89)
    - E42L Tail Lamp Assembly - Left (X75/Z88)
    - E42R Tail Lamp Assembly - Right (X75/Z88)
2. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - E5AS Stop/Turn Signal Lamp - Left Upper socket terminal (X88 without T89)
    - E5AT Stop/Turn Signal Lamp - Left Lower socket terminal (X88 without T89)
    - E5AU Stop/Turn Signal Lamp - Right Upper socket terminal (X88 without T89)
    - E5AV Stop/Turn Signal Lamp - Right Lower socket terminal (X88 without T89)
    - E5L Stop Lamp - Left socket terminal (X88 with T89)
    - E5R Stop Lamp - Right socket terminal (X88 with T89)
    - E42L Tail Lamp Assembly - Left terminal 6 (X75/Z88)

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- E42R Tail Lamp Assembly - Right terminal 6 (X75/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.

- **If less than 15 Ω**

3. Connect a test lamp between the appropriate control circuit terminal listed below and ground, ignition ON.
    - E5AS Stop/Turn Signal Lamp - Left Upper socket terminal (X88 without T89)
    - E5AT Stop/Turn Signal Lamp - Left Lower socket terminal (X88 without T89)
    - E5AU Stop/Turn Signal Lamp - Right Upper socket terminal (X88 without T89)
    - E5AV Stop/Turn Signal Lamp - Right Lower socket terminal (X88 without T89)
    - E5L Stop Lamp - Left socket terminal (X88 with T89)
    - E5R Stop Lamp - Right socket terminal (X88 with T89)
    - E42L Tail Lamp Assembly - Left terminal 4 (X75/Z88)
    - E42R Tail Lamp Assembly - Right terminal 4 (X75/Z88)
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
        - X5 left stop/turn signal lamp (X88 without T89)
    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.

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- X4
- X5 left stop/turn signal lamp (X88 without T89)

2. Test for less than 1 V between the control circuit terminal and ground.
   - If 1 V or greater, repair the short to voltage on the circuit.
   - If less than 1 V, replace the K9 Body Control Module.

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

5. Test or replace the stop lamp.

Center High Mount Stop Lamp Malfunction

1. Ignition OFF, exterior lamps OFF, all doors closed, open and close drivers door, disconnect the harness connector at the E6 Center High Mounted Stop Lamp. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 15 Ω between the ground circuit terminal B 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.
   - **If less than 15 Ω**
3. Connect a test lamp between the control circuit terminal A and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Center 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**

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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.

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

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

Repair Instructions

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

- **High Mount Stop Lamp Replacement**
- **Brake Pedal Position Sensor Replacement**
- **Brake Pedal Position Sensor Calibration**
- **Stop and Turn Signal Lamp Bulb Replacement**
- **Rear Body Structure Stop Lamp Replacement** **Rear Body Structure Stop Lamp Replacement (Escalade)**
- **Control Module References** for BCM replacement, programming, and setup

TRAILER LAMPS MALFUNCTION (NORTH AMERICA)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Stop/Turn Signal Lamp Relay Control - Left	1	1	1	-
Trailer Stop/Turn Signal Lamp Relay Control - Right	1	1	1	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Backup Lamps Control	1	1	1	-
Trailer Park Lamps Control	1	1	1	-
Trailer Stop/Turn Signal Lamp Control - Left	1	1	1	-
Trailer Stop/Turn Signal Lamp Control - Right	1	1	1	-
Trailer Connector Ground	-	1	-	-
1. Trailer Lamps Malfunction				

Circuit/System Description

Backup Lamps

For backup lamp operation, the backup lamp relay is supplied with battery voltage at all times. 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 energizes the backup lamp relay by applying battery voltage to the backup lamp relay control circuit. When the backup lamp relay is energized, the relay switch contacts close and battery voltage is applied through the backup lamp fuses to the backup lamp control circuits which illuminates the backup lamps. Once the driver moves the gear selector out of the reverse position, a message is sent by the TCM via serial data requesting the BCM to remove battery voltage from the backup lamp relay control circuit.

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.

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Turn Signal Lamps

For turn signal lamp operation, the left and right trailer stop/turn signal lamp relay's are supplied with battery voltage at all times. Ground is applied at all times to the turn signal/multifunction switch. The turn signal lamps may only be activated with the ignition switch in the ON or START positions. When the turn signal/multifunction switch is placed in either the TURN RIGHT or TURN LEFT position, ground is applied to the body control module (BCM) through either the right turn or left turn signal switch signal circuit. The BCM responds to the turn signal switch input by applying a pulsating voltage to the left and right trailer stop/turn signal lamp relay control circuits energizing the relay's in an ON and OFF cycle. With the left and right trailer stop/turn signal lamp relay's energized, the relay switch contacts cycle ON and OFF applying battery voltage through the left and right trailer stop/turn signal fuse's to the trailer turn signal lamp control circuits which illuminates the trailer turn signal lamps in an ON and OFF cycle.

Diagnostic Aids

For testing purposes, the vehicle must be diagnosed with the trailer/trailer lighting connector disconnected.

Reference Information

Schematic Reference

- **Exterior Lights Schematics**
- **Body Control System Schematics**
- **Trailer Connector/Provision Schematics**

Connector End View Reference

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- **Wiring Repairs**

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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**.

   - **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**.

   - **If the vehicles backup lamps turn ON and OFF**
4. Verify the vehicles left brake lamp turns ON and OFF when commanding the Left Brake Lamp ON and OFF with a scan tool.
   - **If the vehicles left brake lamp does not turn ON and OFF**

     Refer to **Stop Lamps Malfunction**.

   - **If the vehicles left brake lamp turns ON and OFF**
5. Verify the vehicles right brake lamp turns ON and OFF when commanding the Right Brake Lamp ON and OFF with a scan tool.
   - **If the vehicles right brake lamp does not turn ON and OFF**

     Refer to **Stop Lamps Malfunction**.

   - **If the vehicles right brake lamp turns ON and OFF**
6. Verify the vehicles left and right turn signal lamps turn ON and OFF when commanding the left and right turn signal lamps ON and OFF with the turn signal/multifunction switch.
   - **If the vehicles left or right turn signal lamps do not turn ON and OFF**

     Refer to **Turn Signal Lamps and/or Indicators Malfunction**.

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- **If the vehicles left and right turn signal lamps turn ON and OFF**

7. Refer to Circuit/System Testing.

Circuit/System Testing

Trailer Backup Lamps Malfunction

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 5 Ω between the ground circuit terminal B at the X88 Trailer Connector and ground.
    - **If 5 Ω or greater**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, repair the open/high resistance in the ground connection.
    - **If less than 5 Ω**
3. Connect a test lamp between the control circuit terminal A at the X88 Trailer Connector 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 X5 harness connector at the X50A Fuse Block - Underhood.
    2. Test for infinite resistance between the control circuit and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance
    3. Test for less than 2 Ω in the control circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the X50A Fuse Block - Underhood.
    - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X5 harness connector at the X50A Fuse Block - Underhood, ignition ON.
    2. Test for less than 1 V between the control circuit terminal and ground.
        - If 1 V or greater, repair the short to voltage on the circuit.
        - If less than 1 V, replace the X50A Fuse Block - Underhood.

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

5. Test or replace the X88 Trailer Connector.

Trailer Park Lamps Malfunction

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 5 Ω between the ground circuit terminal B at the X88 Trailer Connector and ground.
   - **If 5 Ω or greater**
   1. Ignition OFF.
   2. Test for less than 2 Ω in the ground circuit end to end.
      - If 2 Ω or greater, repair the open/high resistance in the circuit.
      - If less than 2 Ω, repair the open/high resistance in the ground connection.
   - **If less than 5 Ω**
3. Connect a test lamp between the control circuit terminal F at the X88 Trailer Connector and ground, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Park Lamps ON and OFF with a scan tool.
   - **If the test lamp is always OFF**
   1. Ignition OFF, disconnect the X5 harness connector at the X50A Fuse Block - Underhood.
   2. Test for infinite resistance between the control circuit and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance
   3. Test for less than 2 Ω in the control circuit end to end.
      - If 2 Ω or greater, repair the open/high resistance in the circuit.
      - If less than 2 Ω, replace the X50A Fuse Block - Underhood.
   - **If the test lamp is always ON**
   1. Ignition OFF, disconnect the X5 harness connector at the X50A Fuse Block - Underhood, ignition ON.
   2. Test for less than 1 V between the control circuit terminal and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V, replace the X50A Fuse Block - Underhood.
   - **If the test lamp turns ON and OFF**
5. Test or replace the X88 Trailer Connector.

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Trailer Stop/Turn Signal Lamps Malfunction

1. Ignition OFF, exterior lamps OFF.
2. Test for less than 5 Ω between the ground circuit terminal B at the X88 Trailer Connector and ground.
    - **If 5 Ω or greater**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, repair the open/high resistance in the ground connection.
    - **If less than 5 Ω**
3. Disconnect the X5 harness connector at the X50A Fuse Block - Underhood, ignition ON.
4. Verify a test lamp does not illuminate between the appropriate control circuit terminal listed below and ground.
    - Terminal K5 - left stop/turn signal
    - Terminal K6 - right stop/turn signal
    - **If the test lamp illuminates**
    1. 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 X88 Trailer Connector.
    - **If the test lamp does not illuminate**
5. Ignition OFF, connect a 3 A fused jumper between the appropriate control circuit terminal listed below and B+, ignition ON.
    - Terminal K5 - left stop/turn signal
    - Terminal K6 - right stop/turn signal
6. 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 and ground.

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- 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.

- **If the test lamp illuminates**

7. Ignition OFF, connect the X5 harness connector at the X50A Fuse Block - Underhood.
8. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
9. Verify a test lamp illuminates between the appropriate control circuit terminal listed below and ground.
    - Terminal 8 - left stop/turn signal
    - Terminal 17 - right stop/turn signal
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the X4 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 X50A Fuse Block - Underhood.
    - **If the test lamp illuminates**
10. Connect a 3 A fused jumper between the appropriate control circuit terminal listed below and ground, ignition ON.
    - Terminal 8 - left stop/turn signal
    - Terminal 17 - right stop/turn signal
11. 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, disconnect the X4 harness connector at the X50A Fuse Block - Underhood, ignition ON.
    2. Test for less than 1 V between the appropriate control circuit terminal listed below and ground.

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- Terminal 8 - left stop/turn signal
- Terminal 17 - right stop/turn signal
- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the X50A Fuse Block - Underhood.

- **If the test lamp illuminates**

12. Test or replace the K9 Body Control Module.

Repair Instructions

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

- **Underhood Electrical Center or Junction Block Replacement**
- **Wiring Harness Connector Replacement - Trailer Brake**
- **Control Module References** for BCM replacement, programming, and setup

TRAILER LAMPS MALFUNCTION (EXPORT (VQ9))

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Interface Control Module B+	1	1	-	-
Center High Mounted Stop Lamp Control	B3884 02	2	2	B0655 5A
Trailer Backup Lamps Control	B3890 02	B3890 04	1	-
Trailer Stop Lamp Control	B3889 02	B3889 04	1	-
Trailer Turn Signal Control - Left	B3887 02	B3887 04	1	-
Trailer Turn Signal Control - Right	B3888 02	B3888 04	1	-
Trailer Fog Lamps Control	B3891 02	B3891 04	1	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Trailer Tail Lamp Control - Left	B3885 02	B3885 04	1	-
Trailer Tail Lamp Control - Right	B3886 02	B3886 04	1	-
Trailer Interface Control Module Ground	-	1	-	-
Trailer Connector Grounds	-	1	-	-
1. Trailer Lamps Malfunction 2. Center High Mounted Stop Lamp Malfunction				

Circuit/System Description

The trailer interface control module is supplied with battery voltage as well as ignition voltage from the rear body fuse block and is permanently grounded. For lighting operation, the trailer interface control module receives serial data messages from the body control module (BCM) indicating what lamps have been activated on the vehicle. The trailer interface control module responds by applying voltage to the appropriate control circuits for the requested lamps illuminating the lamps on the attached trailer.

For stop lamp operation, the trailer interface control module receives an input from the center high mount stop lamp control circuit. When the brakes are applied on the vehicle, the trailer interface control module receives the brake applied input from the center high mount stop lamp control circuit. The trailer interface control module responds by applying voltage to the trailer stop lamp control circuit illuminating the trailer stop lamps. The trailer interface control module also receives a serial data message from the BCM indicating that the vehicle brakes have been applied.

Diagnostic Aids

For testing purposes, the vehicle must be diagnosed with the trailer/trailer lighting connector disconnected.

Reference Information

Schematic Reference

- **Trailer Connector/Provision Schematics**
- **Exterior Lights 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 center high mounted stop lamp on the vehicle turns ON and OFF when commanding the Center Brake Lamp ON and OFF with a scan tool.
    - **If the center high mounted stop does not turn ON and OFF**

      Refer to Stop Lamps Malfunction.

    - **If the center high mounted stop turns ON and OFF**

      Refer to Circuit/System Testing.

Circuit/System Testing

Trailer Backup Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
2. Test for less than 5 Ω between the ground circuit terminal 1 X2 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.

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

- **If less than 5 Ω**

3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminals listed below and ground.
   - B+ terminal 3 X2
   - Ignition voltage terminal 13 X1
   - **If the test lamp does not illuminate**
   1. Ignition OFF, disconnect the appropriate harness connector at the X50A Fuse Block - Underhood.
   2. Test for infinite resistance between the B+ 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.
   - **If the test lamp illuminates**
5. Ignition OFF, connect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
6. Connect a test lamp between the control circuit terminal 2 (circuit 5189 GN/WH) at the X88 Trailer Connector and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Trailer Backup 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 K101 Trailer Interface 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 K101 Trailer Interface Control Module.
   - **If the test lamp is always ON**
   1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface Control Module, ignition ON.
   2. Test for less than 1 V between the control circuit terminal and ground.

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- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K101 Trailer Interface Control Module.

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

8. Test or replace the X88 Trailer Connector.

Trailer Fog Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
2. Test for less than 5 Ω between the ground circuit terminal 1 X2 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.
   - **If less than 5 Ω**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminals listed below and ground.
   - B+ terminal 3 X2
   - Ignition voltage terminal 13 X1
   - **If the test lamp does not illuminate**
   1. Ignition OFF, disconnect the appropriate harness connector at the X50A Fuse Block - Underhood.
   2. Test for infinite resistance between the B+ 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.
   - **If the test lamp illuminates**
5. Ignition OFF, connect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
6. Connect a test lamp between the control circuit terminal 8 (circuit 5190 N.mE/WH) at the X88 Trailer Connector and ground, ignition ON.

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7. Verify the test lamp turns ON and OFF when commanding the Trailer Fog Lamp(s) ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.
    - **If the test lamp is always ON**
    1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.
    - **If the test lamp turns ON and OFF**
8. Test or replace the X88 Trailer Connector.

Trailer Tail Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
2. Test for less than 5 Ω between the ground circuit terminal 1 X2 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.
    - **If less than 5 Ω**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminals listed below and ground.
    - B+ terminal 3 X2

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- Ignition voltage terminal 13 X1
- **If the test lamp does not illuminate**

1. Ignition OFF, disconnect the appropriate harness connector at the X50A Fuse Block - Underhood.
2. Test for infinite resistance between the B+ 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.

- **If the test lamp illuminates**

5. Ignition OFF, connect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
6. Connect a test lamp between the appropriate control circuit terminal listed below at the X88 Trailer Connector and ground, ignition ON.
    - Left tail lamp control terminal 7 (circuit 5185 GY)
    - Right tail lamp control terminal 5 (circuit 5184 BN/GY)
7. Verify the test lamp turns ON and OFF when commanding the appropriate Trailer Tail 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 K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

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8. Test or replace the X88 Trailer Connector.

Trailer Turn Signal Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
2. Test for less than 5 Ω between the ground circuit terminal 1 X2 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.
    - **If less than 5 Ω**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminals listed below and ground.
    - B+ terminal 3 X2
    - Ignition voltage terminal 13 X1
    - **If the test lamp does not illuminate**
    1. Ignition OFF, disconnect the appropriate harness connector at the X50A Fuse Block - Underhood.
    2. Test for infinite resistance between the B+ 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.
    - **If the test lamp illuminates**
5. Ignition OFF, connect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
6. Connect a test lamp between the appropriate control circuit terminal listed below at the X88 Trailer Connector and ground, ignition ON.
    - Left turn signal lamp control terminal 1 (circuit 5186 BU/WH)
    - Right turn signal lamp control terminal 4 (circuit 5187 N.mE/GY)
7. Verify the test lamp turns ON and OFF when commanding the appropriate Trailer Turn Signal Lamp ON and OFF with a scan tool.

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

1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

8. Test or replace the X88 Trailer Connector.

Trailer Stop Lamps Malfunction

1. Ignition OFF, exterior lamps OFF, disconnect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
2. Test for less than 5 Ω between the ground circuit terminal 1 X2 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.

    - **If less than 5 Ω**

3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminals listed below and ground.
    - B+ terminal 3 X2
    - Ignition voltage terminal 13 X1

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

1. Ignition OFF, disconnect the appropriate harness connector at the X50A Fuse Block - Underhood.
2. Test for infinite resistance between the B+ 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.

- **If the test lamp illuminates**

5. Ignition OFF, connect the X1 and X2 harness connectors at the K101 Trailer Interface Control Module.
6. Connect a test lamp between the control circuit terminal 6 (circuit 5188 BN/YE) at the X88 Trailer Connector and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when commanding the Trailer Brake 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 K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

1. Ignition OFF, disconnect the X1 harness connector at the K101 Trailer Interface 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 K101 Trailer Interface Control Module.

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

8. Test or replace the X88 Trailer Connector.

Repair Instructions

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

Control Module References for BCM or Trailer Interface Control Module replacement, programming, and setup

TURN SIGNAL LAMPS AND/OR INDICATORS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
F10DL (BCM 3) Fuse B+	1	1	-	-
F19DR (BCM 4) Fuse B+	1	1	-	-
F46DR (BCM 6) Fuse B+	1	1	-	-
F47DR (BCM 7) Fuse B+	1	1	-	-
Turn Signal Switch Signal - Left	2	2	2	-
Turn Signal Switch Signal - Right	2	2	2	-
Turn Signal Lamp Outage Detection Signal - Left Front (Z75)	3	3	3	-
Turn Signal Lamp Outage Detection Signal - Left Rear (Z75/Z88)	3	3	3	-
Turn Signal Lamp Outage Detection Signal - Right Front (Z75)	3	3	3	-
Turn Signal Lamp Outage Detection Signal - Right Rear (Z75/Z88)	3	3	3	-
Turn Signal Lamp Control - Left Front	B3948 02	B3948 04	B3948 01, B3948 04	-
Turn Signal Lamp Control - Left Rear (Z75/Z88)	1	1	1	-
Turn Signal Lamp Control - Left Rear (X88 with T89)	B3950 02, B3950 04	B3950 04	B3950 01, B3950 04	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Stop/Turn Signal Lamp Control - Left Rear (X88 without T89)	B3950 02, B3950 04	B3950 04	B3950 01, B3950 04	-
Turn Signal Lamp Control - Right Front	B3949 02	B3949 04	B3949 01, B3949 04	-
Turn Signal Lamp Control - Right Rear (Z75/Z88)	1	1	1	-
Turn Signal Lamp Control - Right Rear (X88 with T89)	B3951 02, B3951 04	B3951 04	B3951 01, B3951 04	-
Stop/Turn Signal Lamp Control - Right (X88 without T89)	B3951 02, B3951 04	B3951 04	B3951 01, B3951 04	-
Turn Signal Lamp Ground - Left Front	-	1	-	-
Turn Signal Lamp Ground - Right Front	-	1	-	-
Turn Signal Lamp Ground - Left Rear	-	1	-	-
Turn Signal Lamp Ground - Right Rear	-	1	-	-
Turn Signal/Multifunction Switch Ground	-	2	-	-
1. Turn Signal Lamps and/or Indicators Malfunction 2. Turn Signal/Multifunction Switch Malfunction 3. Turn Signal Lamp Outage Detection Malfunction				

Circuit/System Description

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

Diagnostic Aids

When testing at the turn signal lamp bulb 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

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Schematic Reference

- **Exterior Lights Schematics**
- **Body Control System 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.

   - **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**

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Refer to Turn Signal Lamps Malfunction.

- **If the left front turn signal lamps turn ON and OFF**

4. Verify the right front turn signal lamps turn ON and OFF while commanding the Right Front Turn Signal Lamp ON and OFF with a scan tool.
   - **If the right front turn signal lamps do not turn ON and OFF**

     Refer to Turn Signal Lamps Malfunction.

   - **If the right front turn signal lamps turn ON and OFF**
5. Verify the left rear turn signal lamp turns ON and OFF while commanding the Left Rear Turn Signal Lamp ON and OFF with a scan tool.
   - **If the left rear turn signal lamp does not turn ON and OFF**

     Refer to Turn Signal Lamps Malfunction.

   - **If the left rear turn signal lamp turns ON and OFF**
6. Verify the right rear turn signal lamp turns ON and OFF while commanding the Right Rear Turn Signal Lamp ON and OFF with a scan tool.
   - **If the right rear turn signal lamp does not turn ON and OFF**

     Refer to Turn Signal Lamps Malfunction.

   - **If the right rear turn signal lamp turns ON and OFF**
7. Observe the left and right turn signal lamps and turn signal indicators on the instrument panel cluster while activating the left and right turn signals. The left and right turn signal lamps and indicators should illuminate and flash at a normal rate when turned ON.
   - **If the left and right turn signal lamps and indictors illuminate but flash in a rapid manner**

     Refer to Turn Signal Lamp Outage Detection Malfunction.

   - **If the left and right turn signal lamps and indictors operate normally**
8. All OK.

Circuit/System Testing

Turn Signal/Multifunction Switch Malfunction

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

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2. Test for less than 15 Ω between the ground circuit terminal F 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.
    - **If less than 15 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 E and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the K9 Body Control Module.
    - **If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal E 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 E 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.
    - **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.

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2. Test for infinite resistance between the signal circuit terminal D and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance, replace the K9 Body Control Module.
- **If Inactive**

8. Install a 3 A fused jumper wire between the signal circuit terminal D 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 D 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.
    - **If Active**

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

Turn Signal Lamps Malfunction

1. Ignition OFF, disconnect the X1 harness connector at the K9 Body Control Module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.
    - **If the test lamp does not illuminate and the circuit fuse is good**

    1. Ignition OFF, disconnect the X2 harness connector at the X51L Fuse Block - Instrument Panel Left.
    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 X2 harness connector at the X51L Fuse Block - Instrument Panel Left.
    2. Test for infinite resistance between the B+ circuit and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.

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

- **If the test lamp illuminates**

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

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

1. Ignition OFF, disconnect the X2 harness connector at the X51R Fuse Block - Instrument Panel Right.
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 X2 harness connector at the X51R Fuse Block - Instrument Panel Right.
2. Test for infinite resistance between the B+ circuit and ground.

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

- **If the test lamp illuminates**

4. Ignition OFF, connect the X1 harness connector at the K9 Body Control Module.
5. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
6. Verify a test lamp illuminates between the B+ circuit terminal 3 and ground.

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

1. Ignition OFF, disconnect the X1 harness connector at the X51L Fuse Block - Instrument Panel Left.
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 X1 harness connector at the X51L Fuse Block - Instrument Panel Left.
2. Test for infinite resistance between the B+ circuit and ground.

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

- **If the test lamp illuminates**

7. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.

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

1. Ignition OFF, disconnect the X1 harness connector at the X51R Fuse Block - Instrument Panel Right.
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 X1 harness connector at the X51R Fuse Block - Instrument Panel Right.
2. Test for infinite resistance between the B+ circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance, replace the K9 Body Control Module.

- **If the test lamp illuminates**

8. Ignition OFF, connect the X5 harness connector at the K9 Body Control Module.
9. Ignition OFF, exterior lamps OFF, all doors closed, open and close drivers door, disconnect the harness connector at the appropriate component listed below. It may take up to 2 min for all vehicle systems to power down.
    - A9A Outside Rearview Mirror - Driver (DR4)
    - A9B Outside Rearview Mirror - Passenger (DR4)
    - A17D Outside Rearview Mirror Glass - Driver (DL3)
    - A17P Outside Rearview Mirror Glass - Passenger (DL3)
    - E4LF Turn Signal Lamp - Left Front (Z75/X88)
    - E4RF Turn Signal Lamp - Right Front (Z75/X88)
    - E13LA Headlamp Assembly - Left
    - E13RA Headlamp Assembly - Right
    - E4LR Turn Signal Lamp - Left Rear (X88 with T89)
    - E4RR Turn Signal Lamp - Right Rear (X88 with T89)
    - E42L Tail Lamp Assembly - Left (Z75/Z88)
    - E42R Tail Lamp Assembly - Right (Z75/Z88)
    - E5AS Stop/Turn Signal Lamp - Left Upper (X88 without T89)
    - E5AT Stop/Turn Signal Lamp - Left Lower (X88 without T89)
    - E5AU Stop/Turn Signal Lamp - Right Upper (X88 without T89)

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- E5AV Stop/Turn Signal Lamp - Right Lower (X88 without T89)
- E69L Multifunction Lamp Assembly - Front Fascia Left (Z75)
- E69R Multifunction Lamp Assembly - Front Fascia Right (Z75)

10. Test for less than 15 Ω between the appropriate ground circuit terminal listed below and ground.
    - A9A Outside Rearview Mirror - Driver terminal 5 (DR4)
    - A9B Outside Rearview Mirror - Passenger terminal 5 (DR4)
    - A17D Outside Rearview Mirror Glass - Driver terminal 2 (DL3)
    - A17P Outside Rearview Mirror Glass - Passenger terminal 2 (DL3)
    - E4LF Turn Signal Lamp - Left Front terminal 2 (Z75/X88)
    - E4RF Turn Signal Lamp - Right Front terminal 2 (Z75/X88)
    - E13LA Headlamp Assembly - Left terminals 1 and 4
    - E13RA Headlamp Assembly - Right terminals 1 and 4
    - E4LR Turn Signal Lamp - Left Rear socket terminal (X88 with T89)
    - E4RR Turn Signal Lamp - Right Rear socket terminal (X88 with T89)
    - E42L Tail Lamp Assembly - Left terminal 6 (Z75/Z88)
    - E42R Tail Lamp Assembly - Right terminal 6 (Z75/Z88)
    - E5AS Stop/Turn Signal Lamp - Left Upper socket terminal (X88 without T89)
    - E5AT Stop/Turn Signal Lamp - Left Lower socket terminal (X88 without T89)
    - E5AU Stop/Turn Signal Lamp - Right Upper socket terminal (X88 without T89)
    - E4AV Stop/Turn Signal Lamp - Right Lower socket terminal (X88 without T89)
    - E69L Multifunction Lamp Assembly - Front Fascia Left terminal 1 (Z75)
    - E69R Multifunction Lamp Assembly - Front Fascia Right terminal 1 (Z75)
    - **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.

    - **If less than 15 Ω**

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

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- A9A Outside Rearview Mirror - Driver terminal 13 (DR4)
- A9B Outside Rearview Mirror - Passenger terminal 13 (DR4)
- A17D Outside Rearview Mirror Glass - Driver terminal 1 (DL3)
- A17P Outside Rearview Mirror Glass - Passenger terminal 1 (DL3)
- E4LF Turn Signal Lamp - Left Front terminal 1 (Z75/X88)
- E4RF Turn Signal Lamp - Right Front terminal 1 (Z75/X88)
- E13RA Headlamp Assembly - Right terminals 5
- E13LA Headlamp Assembly - Left terminals 5
- E4LR Turn Signal Lamp - Left Rear socket terminal (X88 with T89)
- E4RR Turn Signal Lamp - Right Rear socket terminal (X88 with T89)
- E42L Tail Lamp Assembly - Left terminal 2 (Z75/Z88)
- E42R Tail Lamp Assembly - Right terminal 2 (Z75/Z88)
- E5AS Stop/Turn Signal Lamp - Left Upper socket terminal (X88 without T89)
- E5AT Stop/Turn Signal Lamp - Left Lower socket terminal (X88 without T89)
- E5AU Stop/Turn Signal Lamp - Right Upper socket terminal (X88 without T89)
- E4AV Stop/Turn Signal Lamp - Right Lower socket terminal (X88 without T89)
- E69L Multifunction Lamp Assembly - Front Fascia Left terminal 6 (Z75)
- E69R Multifunction Lamp Assembly - Front Fascia Right terminal 6 (Z75)

12. Verify the test lamp turns ON and OFF when commanding the appropriate Turn Signal Lamp ON and OFF with a scan tool.
    - **If the test lamp is always OFF**
    1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module.
        - X4 right turn signals
        - X5 left turn signals
        - X6 right front turn signal - front fascia (Z75)
        - X7 left front turn signal - front fascia (Z75)
    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.

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

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

1. Ignition OFF, disconnect the appropriate harness connector listed below at the K9 Body Control Module, ignition ON.
   - X4 right turn signals
   - X5 left turn signals
   - X6 right front turn signal - front fascia (Z75)
   - X7 left front turn signal - front fascia (Z75)
2. Test for less than 1 V between the control circuit terminal and ground.
   - If 1 V or greater, repair the short to voltage on the circuit.
   - If less than 1 V, replace the K9 Body Control Module.

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

13. Test or replace the turn signal lamp.

Turn Signal Lamp Outage Detection Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate component listed below, ignition ON.
   - E13LA Headlamp Assembly - Left
   - E13RA Headlamp Assembly - Right
   - E42L Tail Lamp Assembly - Left
   - E42R Tail Lamp Assembly - Right
2. Test for 10.5 V or greater between the appropriate signal circuit terminal listed below and ground.
   - E13LA Headlamp Assembly - Left terminal 8
   - E13RA Headlamp Assembly - Right terminal 8
   - E42L Tail Lamp Assembly - Left terminal 3
   - E42R Tail Lamp Assembly - Right terminal 3
   - **If less that 10.5 V**

   1. Ignition OFF, disconnect the X6 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.

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- 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 10.5 V or greater**

3. Verify a test lamp does not illuminate between the appropriate signal circuit terminal listed below and ground.
    - E13LA Headlamp Assembly - Left terminal 8
    - E13RA Headlamp Assembly - Right terminal 8
    - E42L Tail Lamp Assembly - Left terminal 3
    - E42R Tail Lamp Assembly - Right terminal 3
    - **If the test lamp illuminates**

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

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

4. Test or replace the appropriate lamp assembly.

Repair Instructions

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

- **Headlamp Control Module Replacement (Multifunction LED)**
- **Turn Signal Switch Replacement (N33, N37)** **Turn Signal Switch Replacement (N38)**
- **Front Side Turn Signal Lamp Replacement**
- **Stop and Turn Signal Lamp Bulb Replacement**
- **Exterior Lamp Control Module Replacement (Multifunction LED)**
- **Control Module References** for BCM replacement, programming, and setup

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ACCESSORIES & EQUIPMENT

Lighting - Repair Instructions - Escalade, Suburban, Tahoe, Yukon

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.**

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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)

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.**

1. Open the harness by removing any tape:
   - 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.

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- 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.

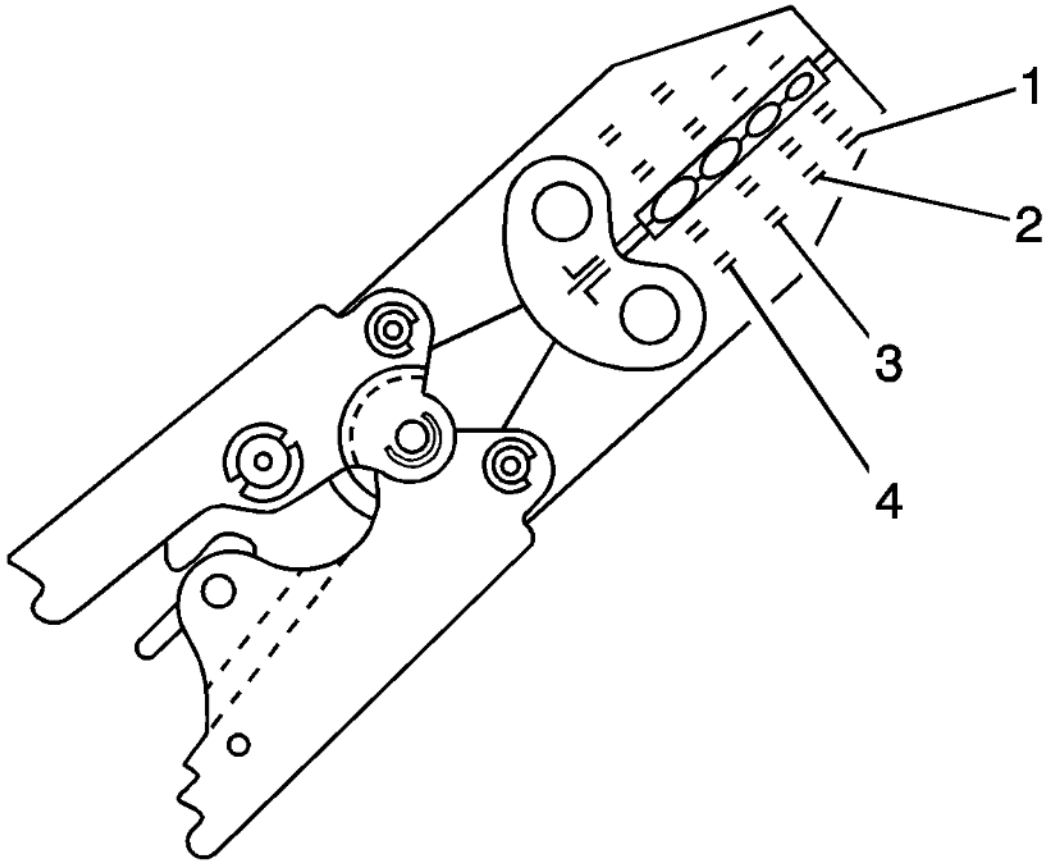


Fig. 1: Splice Sleeve Crimping Tool With 4 Crimp Nests

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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.

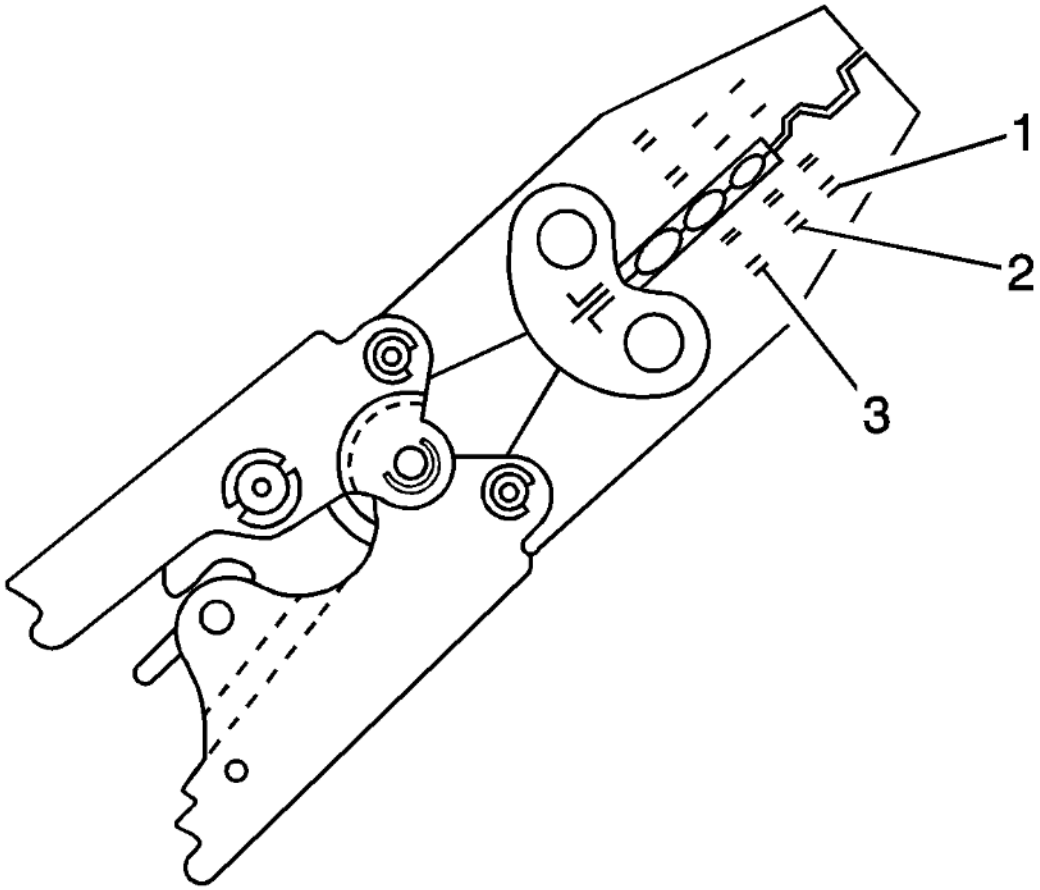


Fig. 2: Splice Sleeve Crimping Tool With 3 Crimp Nests

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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).

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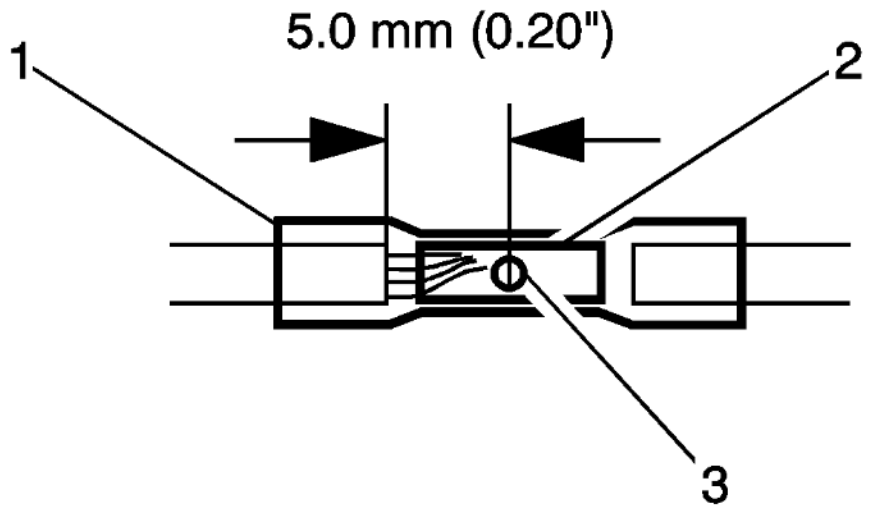


Fig. 3: Identifying DuraSeal Splice Sleeve
Courtesy of GENERAL MOTORS COMPANY

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.

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Fig. 4: Crimped DuraSeal Splice Sleeve
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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.

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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.



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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.**

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.

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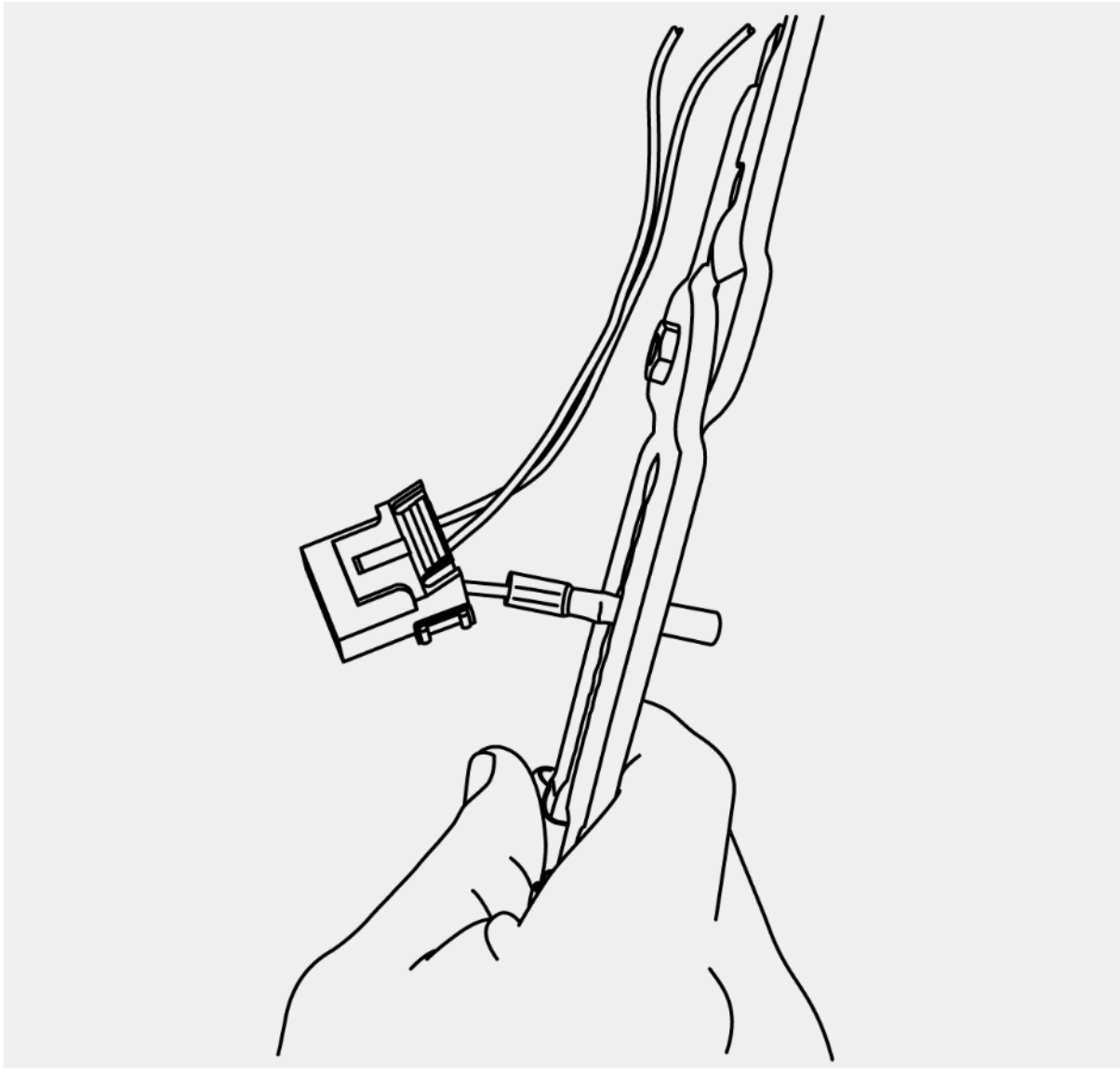


Fig. 6: Tightly Close Handles Of Crimp Tool
Courtesy of GENERAL MOTORS COMPANY

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

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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.

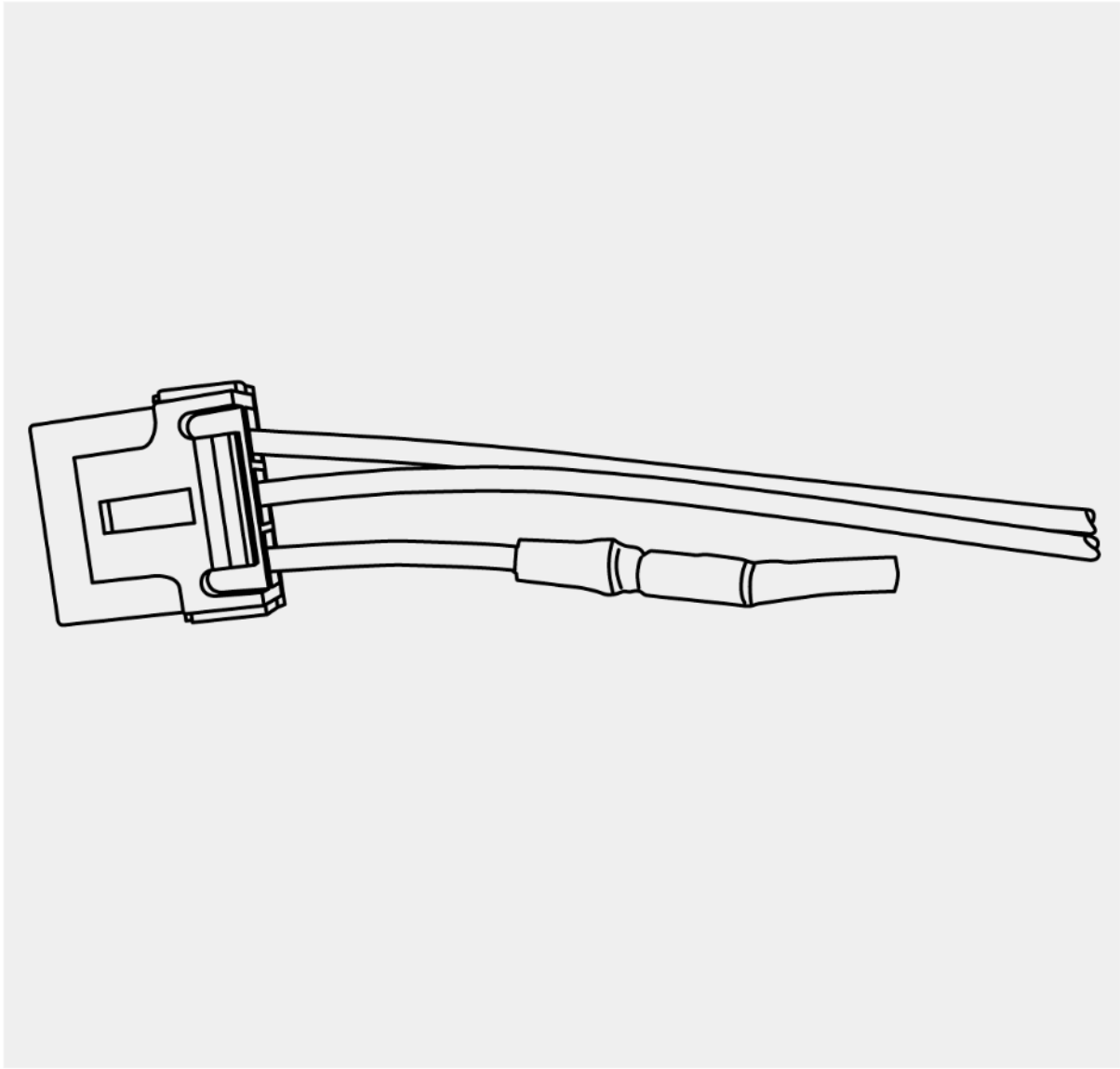


Fig. 7: Heat To Crimped Area Of Barrel
Courtesy of GENERAL MOTORS COMPANY

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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.

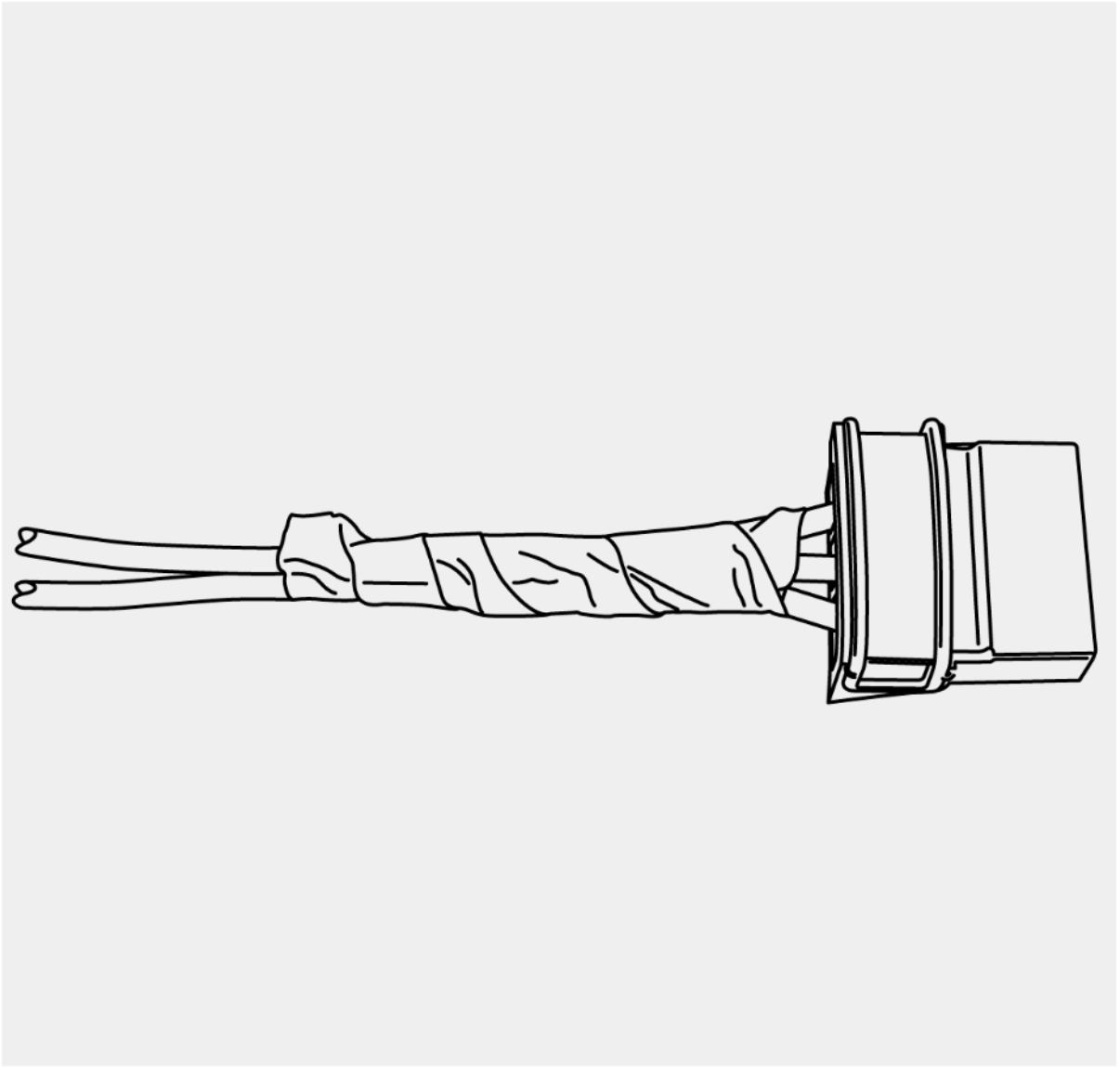


Fig. 8: Taping Extra Terminated Leads Back Into Harness
Courtesy of GENERAL MOTORS COMPANY

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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:

- 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

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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

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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 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.

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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 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** .

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- 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

NOTE: **Brake system does not use a brake switch, stoplight switch or brakelight switch. System uses a Brake Pedal Position Sensor to control these functions.**

Calibration Criteria

NOTE: **Do not apply the brake pedal during the brake pedal position sensor calibration procedure. Any movement of the brake pedal during this procedure will cause the calibration procedure to fail. If this occurs, the brake pedal position sensor calibration must be repeated.**

Brake pedal position sensor calibration must be performed after the brake pedal position sensor, 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

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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

NOTE: **Brake system does not use a brake switch, stoplight switch or brakelight switch. System uses a Brake Pedal Position Sensor to control these functions.**

Removal Procedure

1. Place the ignition switch in the OFF position.
2. Disconnect the steering column wiring harness electrical connector and position the harness aside.
3. Disconnect the brake pedal position sensor electrical connector.

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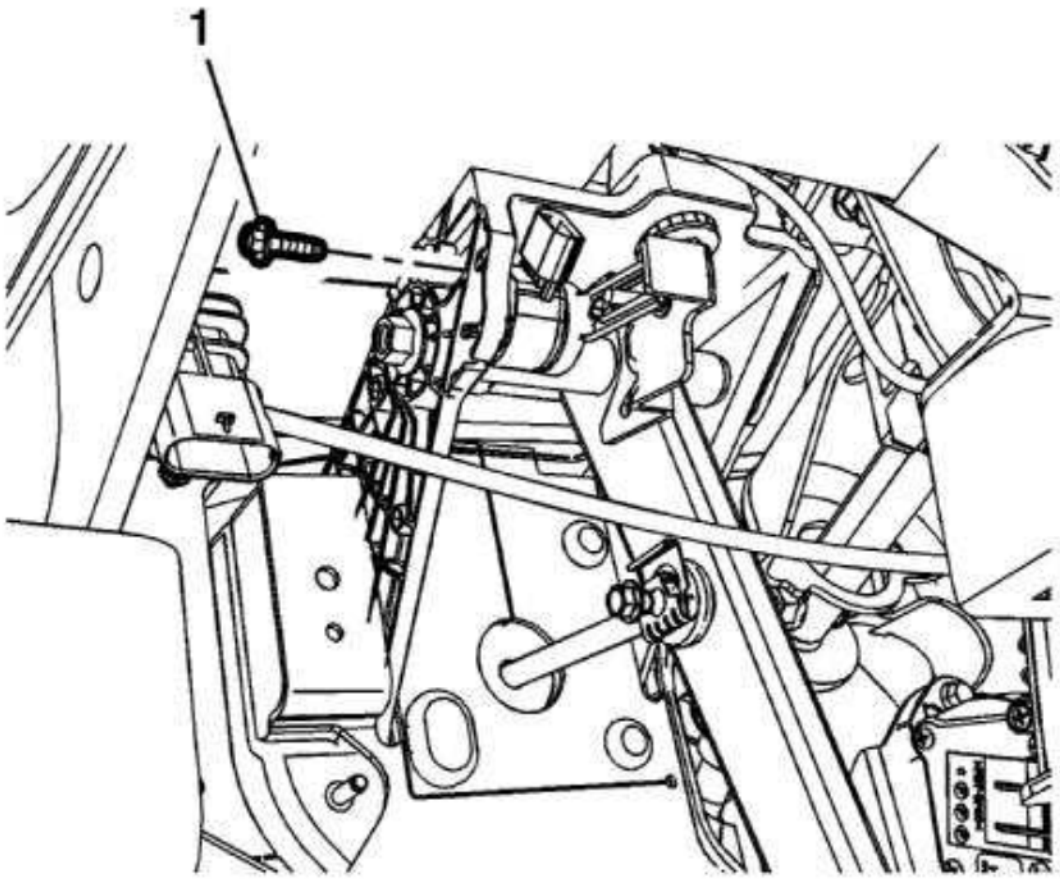


Fig. 9: Brake Pedal Position Sensor Bolt
Courtesy of GENERAL MOTORS COMPANY

4. Remove the brake pedal position sensor bolt (1).

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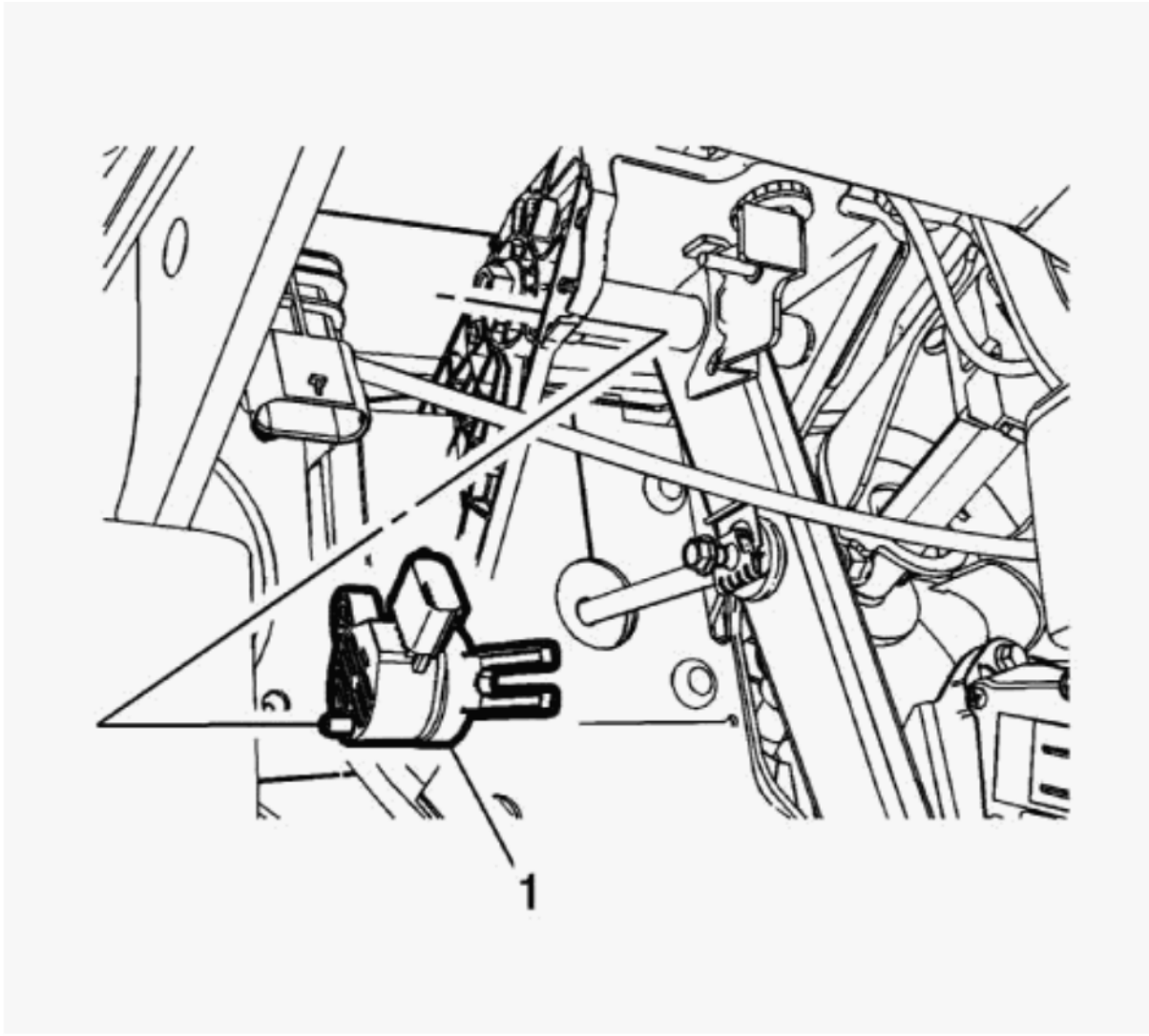


Fig. 10: Brake Pedal Position Sensor
Courtesy of GENERAL MOTORS COMPANY

5. Remove the brake pedal position sensor (1).

Installation Procedure

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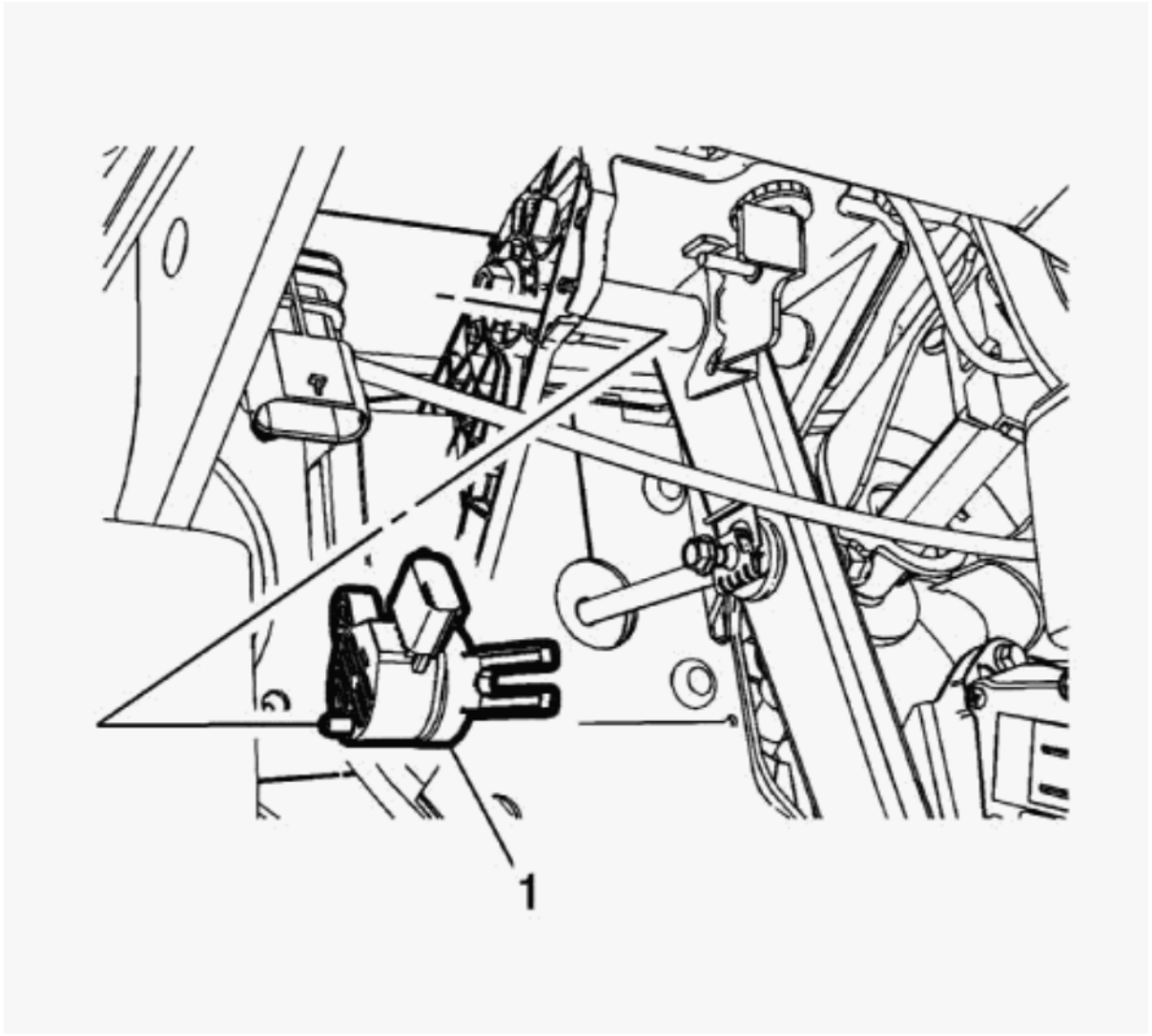


Fig. 11: Brake Pedal Position Sensor
Courtesy of GENERAL MOTORS COMPANY

1. Install the brake pedal position sensor (1).

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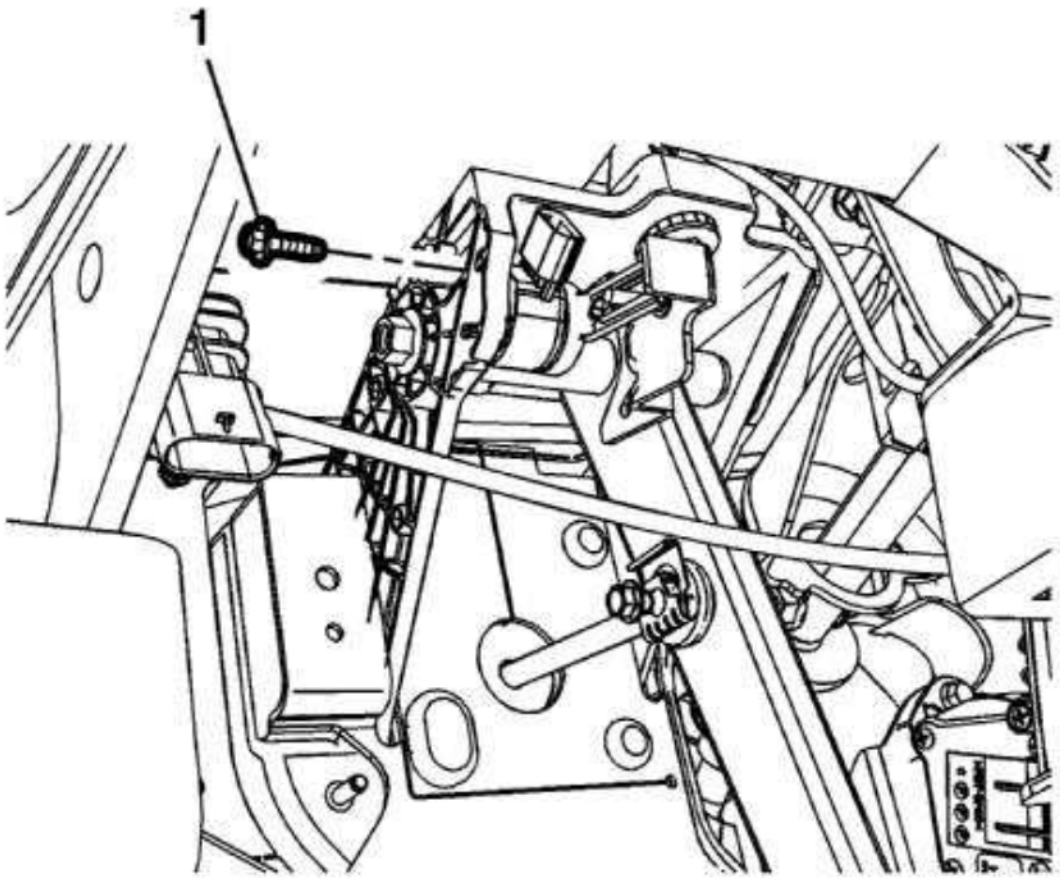


Fig. 12: Brake Pedal Position Sensor Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

2. Install the brake pedal position sensor bolt (1).
3. Connect the brake pedal position sensor electrical connector.

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4. Reposition the steering column wiring harness and connect the electrical connector.
5. Calibrate the brake pedal position sensor. Refer to **Brake Pedal Position Sensor Calibration**.

HEADLAMP SWITCH REPLACEMENT (CHEVROLET / GMC)

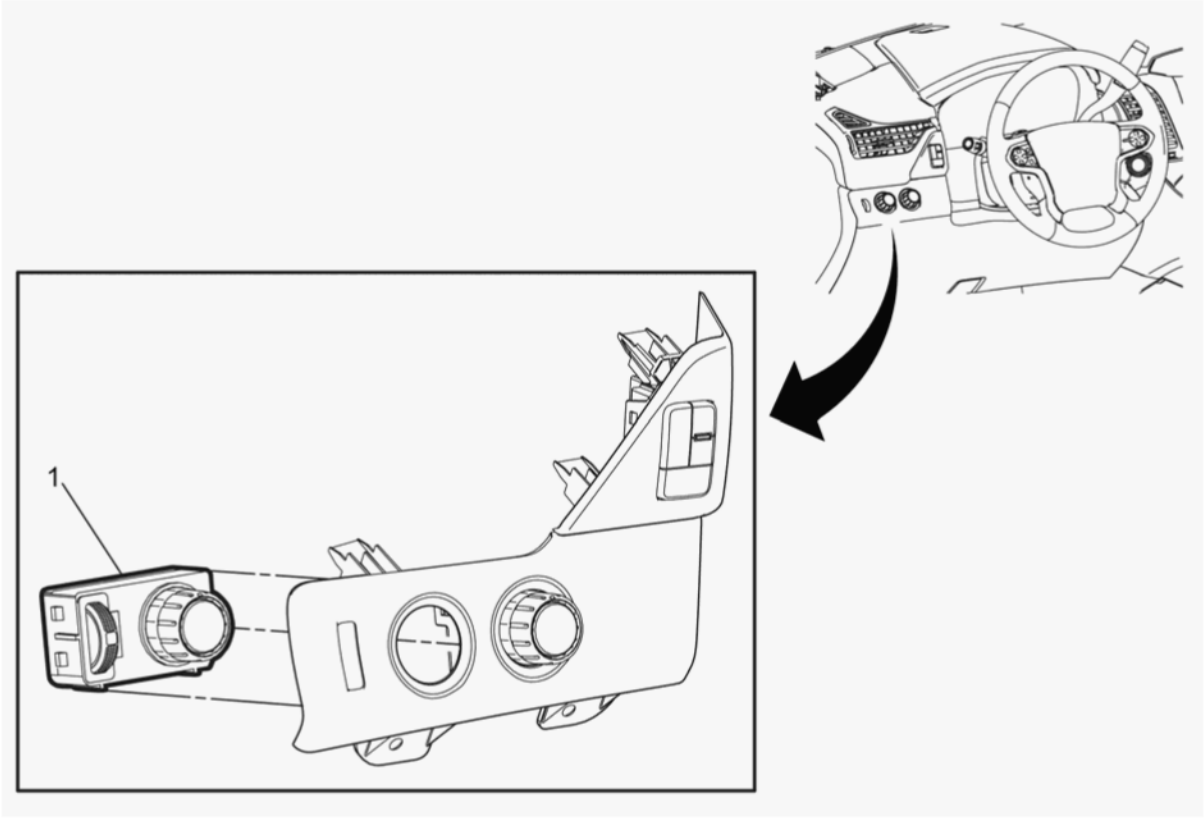


Fig. 13: Headlamp Switch (Chevrolet / GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove instrument panel accessory bezel. Refer to **Instrument Panel Accessory Bezel Replacement (Chevrolet / GMC)** .	
1	Headlamp Switch **Procedure** Using the appropriate tool gently depress tabs to remove the switch assembly from the bezel.

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HEADLAMP SWITCH REPLACEMENT (CADILLAC)

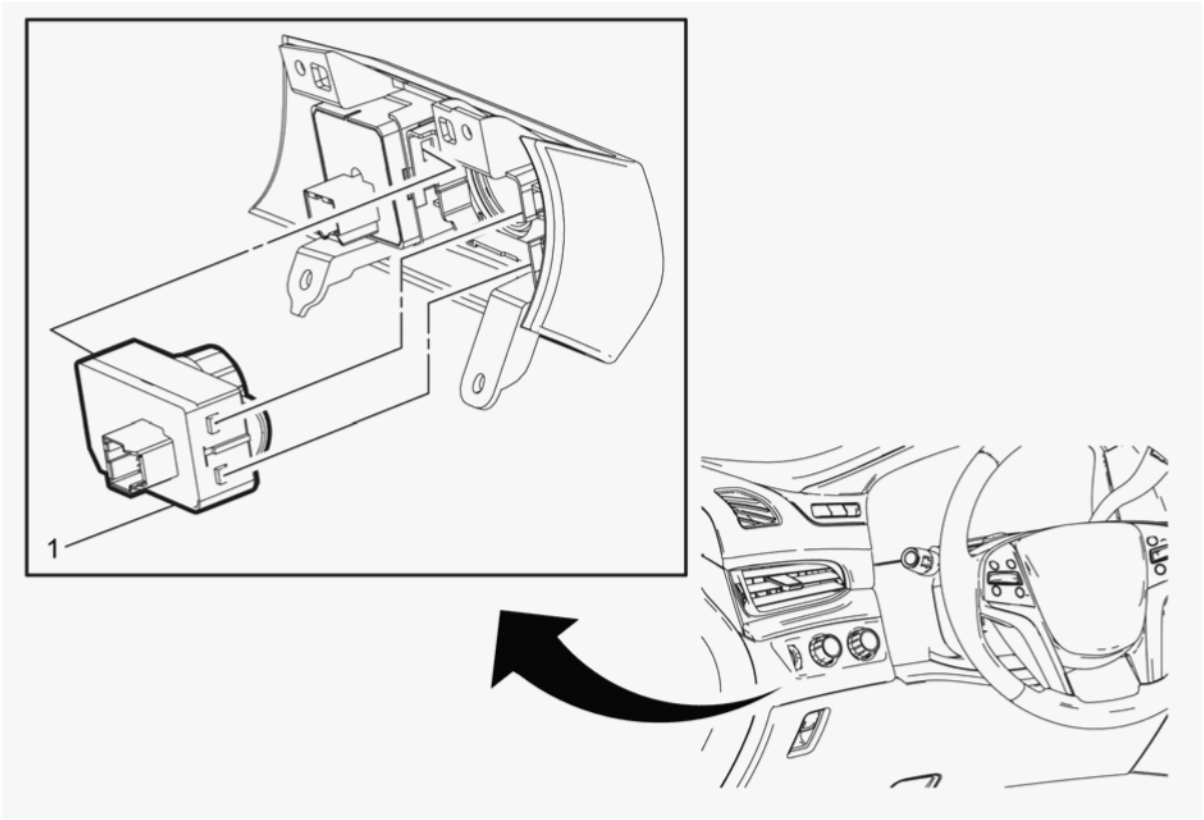


Fig. 14: Headlamp Switch (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove instrument panel accessory bezel. Refer to **Instrument Panel Accessory Bezel Replacement (Cadillac)** .	
1	Headlamp Switch **Procedure** Using the appropriate tool gently depress tabs to remove the switch assembly from the bezel.

INTERIOR LAMP SWITCH REPLACEMENT

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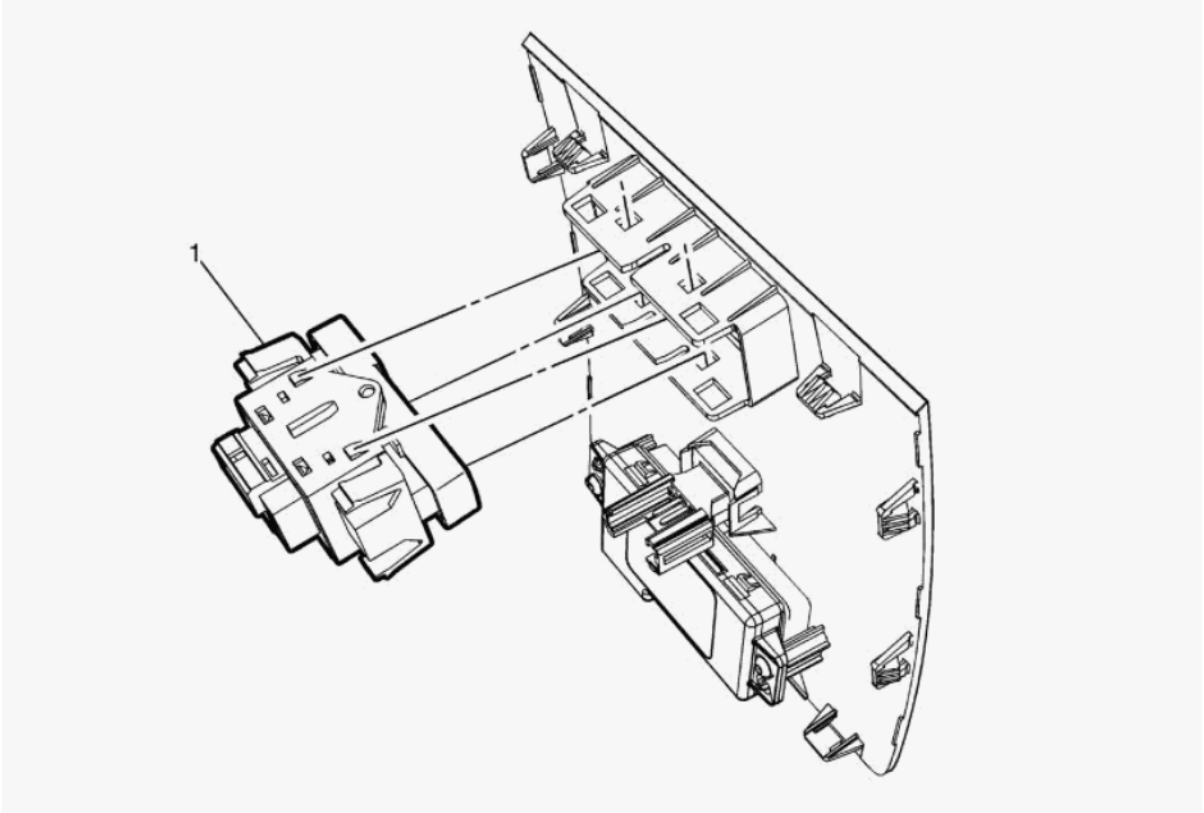


Fig. 15: Interior Lamp Switch
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the roof console opening trim plate. Refer to **Roof Console Opening Trim Plate Replacement** .	
1	Interior Lamp Switch **Procedure** Release the tabs and remove the switch.

EXTERIOR LAMP CONTROL MODULE REPLACEMENT (MULTIFUNCTION LED)

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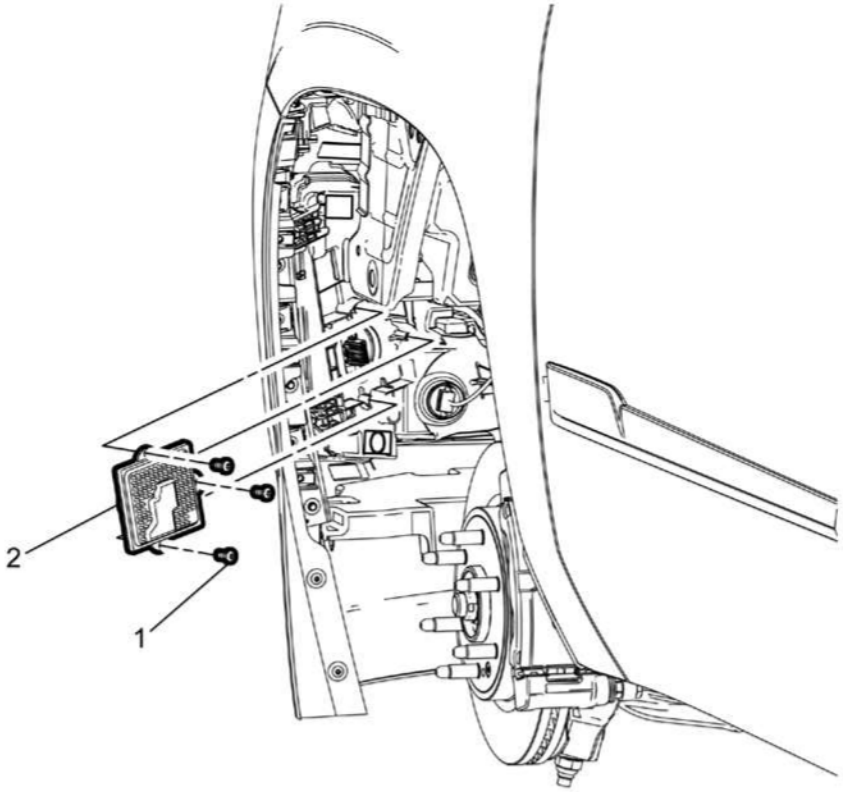


Fig. 16: Exterior Lamp Control Module (Multifunction LED)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
1. If working on the left side, reposition the front wheelhouse liner-left side. Refer to **Front Wheelhouse Liner Replacement - Left Side (Cadillac)** **Front Wheelhouse Liner Replacement - Left Side (GMC)** **Front Wheelhouse Liner Replacement - Left Side (Chevrolet)** .	
2. If working on the right side, reposition the front wheelhouse liner-right side. Refer to **Front Wheelhouse Liner Replacement - Right Side (Cadillac)** **Front Wheelhouse Liner Replacement - Right Side (Chevrolet)** **Front Wheelhouse Liner Replacement - Right Side (GMC)** .	

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Callout	Component Name
1	Exterior Lamp Control Module Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener** **Caution .**
2	Exterior Lamp Control Module **Procedure** Pull the headlamp automatic control module straight out and disconnect the electrical connector to remove.

EMERGENCY VEHICLE ROOF LAMP SWITCH REPLACEMENT

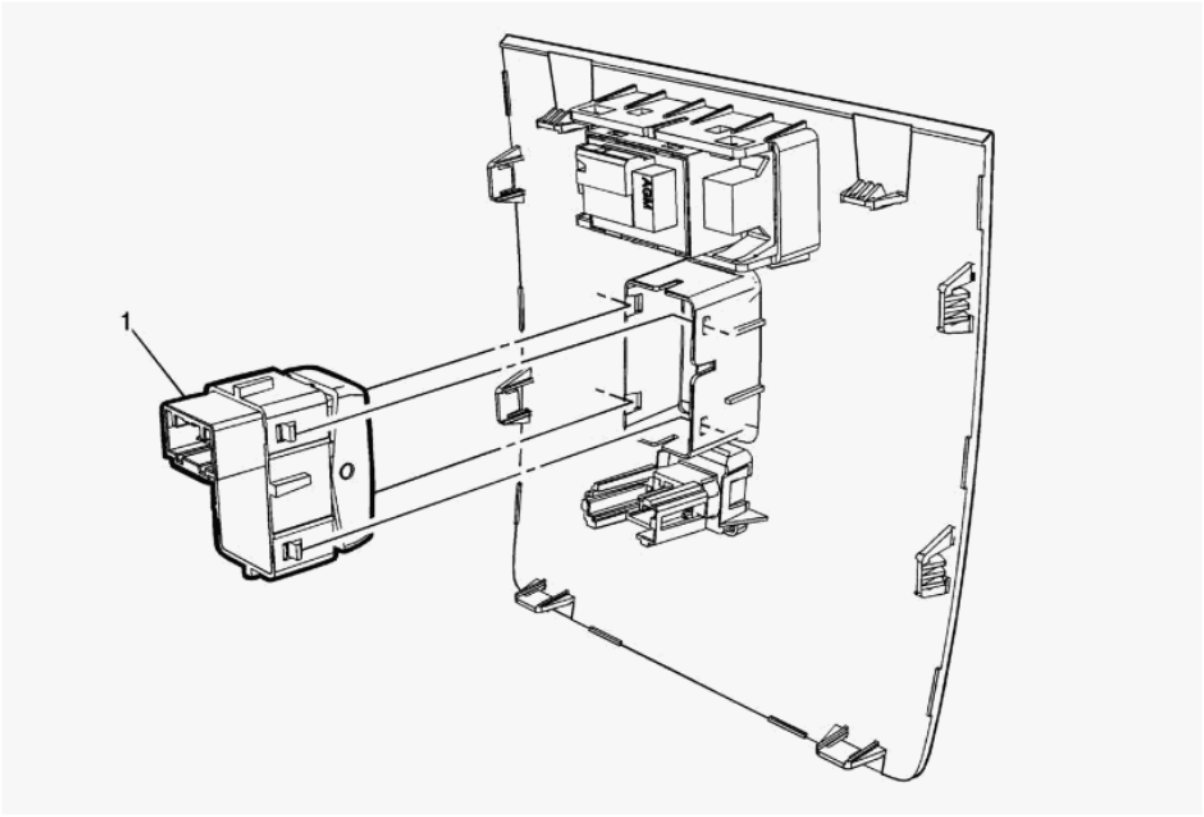


Fig. 17: Emergency Vehicle Roof Lamp Switch

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Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the roof console opening trim plate. Refer to **Roof Console Opening Trim Plate Replacement** .	
1	Emergency Vehicle Lamp Switch **Procedure** Release the tabs and remove the switch.

READING LAMP SWITCH PUSHBUTTON REPLACEMENT (FRONT)

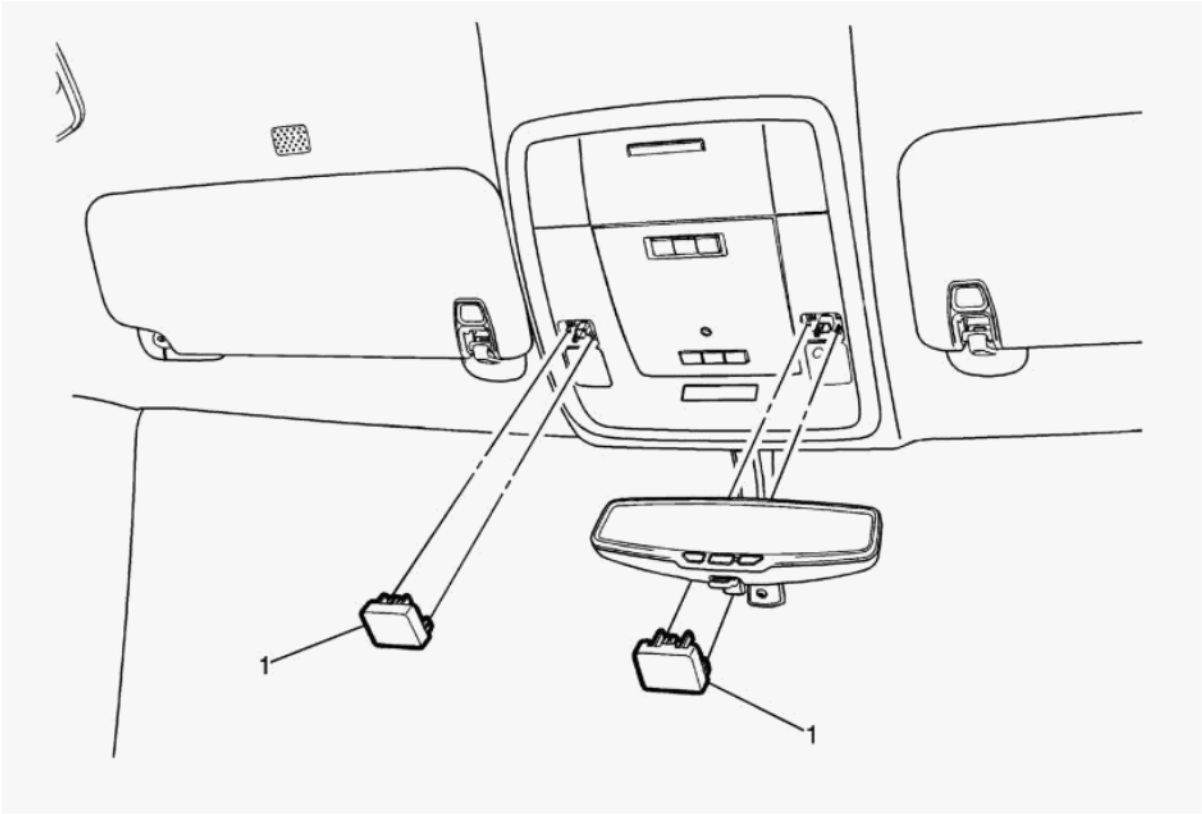


Fig. 18: Reading Lamp Switch Pushbutton (Front)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
1	Reading Lamp Switch Pushbutton **Procedure** Using the appropriate tool, carefully release the retainers securing the switch to the roof console.

READING LAMP SWITCH PUSHBUTTON REPLACEMENT (REAR)

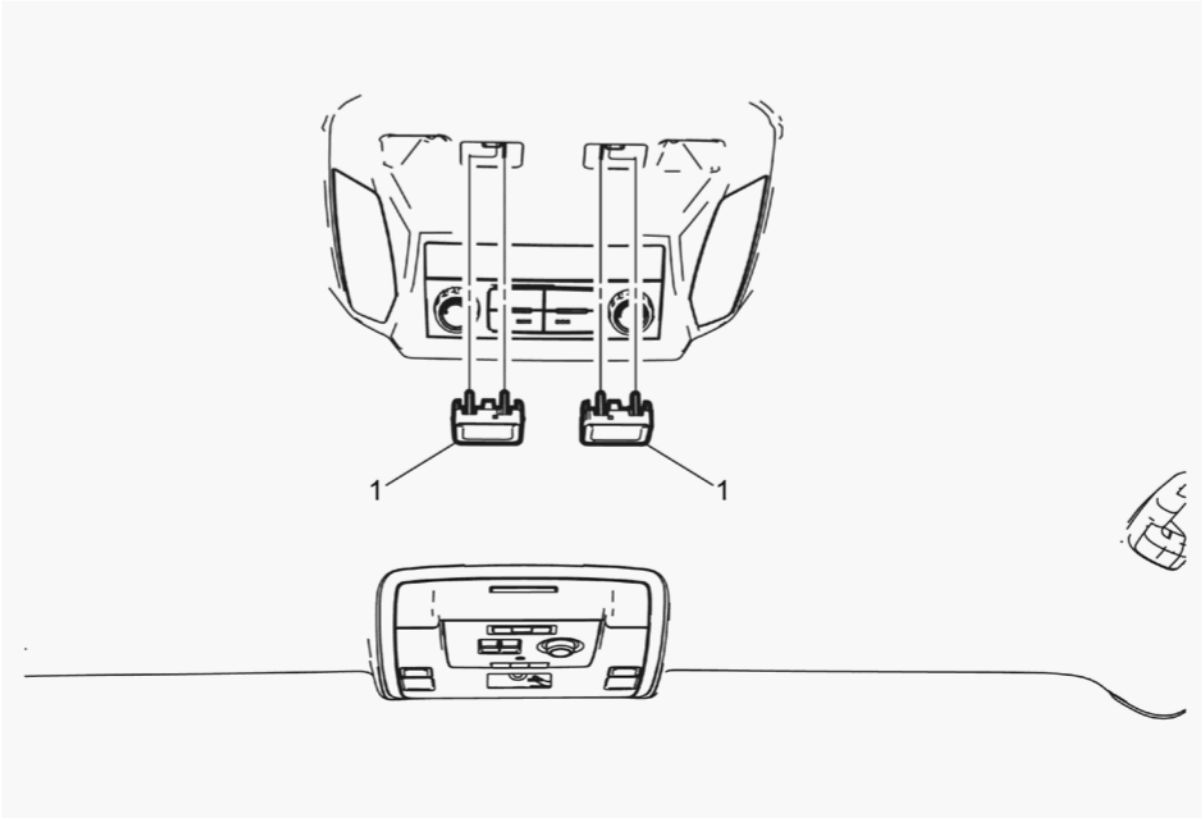


Fig. 19: Reading Lamp Switch Pushbutton (Rear)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Reading Lamp Switch Pushbutton **Procedure** Using the appropriate tool, carefully release the retainers securing the switch to the roof console.

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CENTER READING AND COURTESY LAMP REPLACEMENT (FRONT)

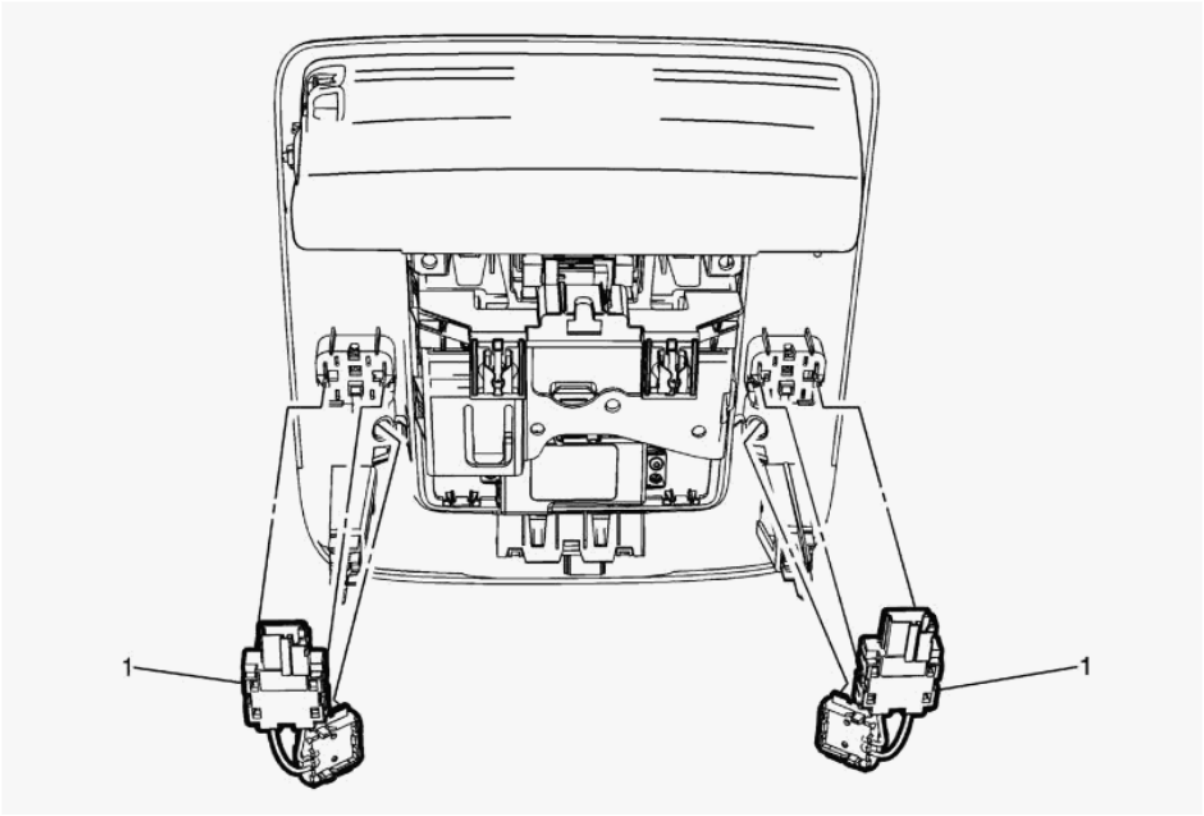


Fig. 20: Center Reading and Courtesy Lamp (Front)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the roof console. Refer to **Roof Console Replacement** .	
1	Center Reading and Courtesy Lamp (Qty : 2) **Procedure** Depress the tabs on the lamp and the switch and gently remove from the console.

CENTER READING AND COURTESY LAMP REPLACEMENT (REAR)

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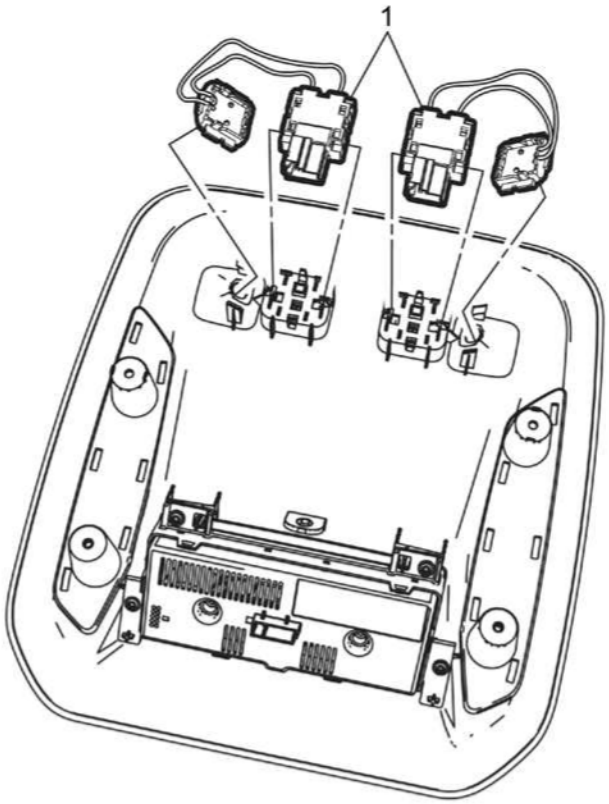


Fig. 21: Center Reading and Courtesy Lamp (Rear)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the roof rear console. Refer to **Roof Rear Console Replacement (Chevrolet / GMC)** .	
1	Center Reading and Courtesy Lamp (Qty : 2) **Procedure** Depress the tabs on the lamp and the switch and gently remove from the console.

FRONT FLOOR CONSOLE FLOOD LAMP REPLACEMENT

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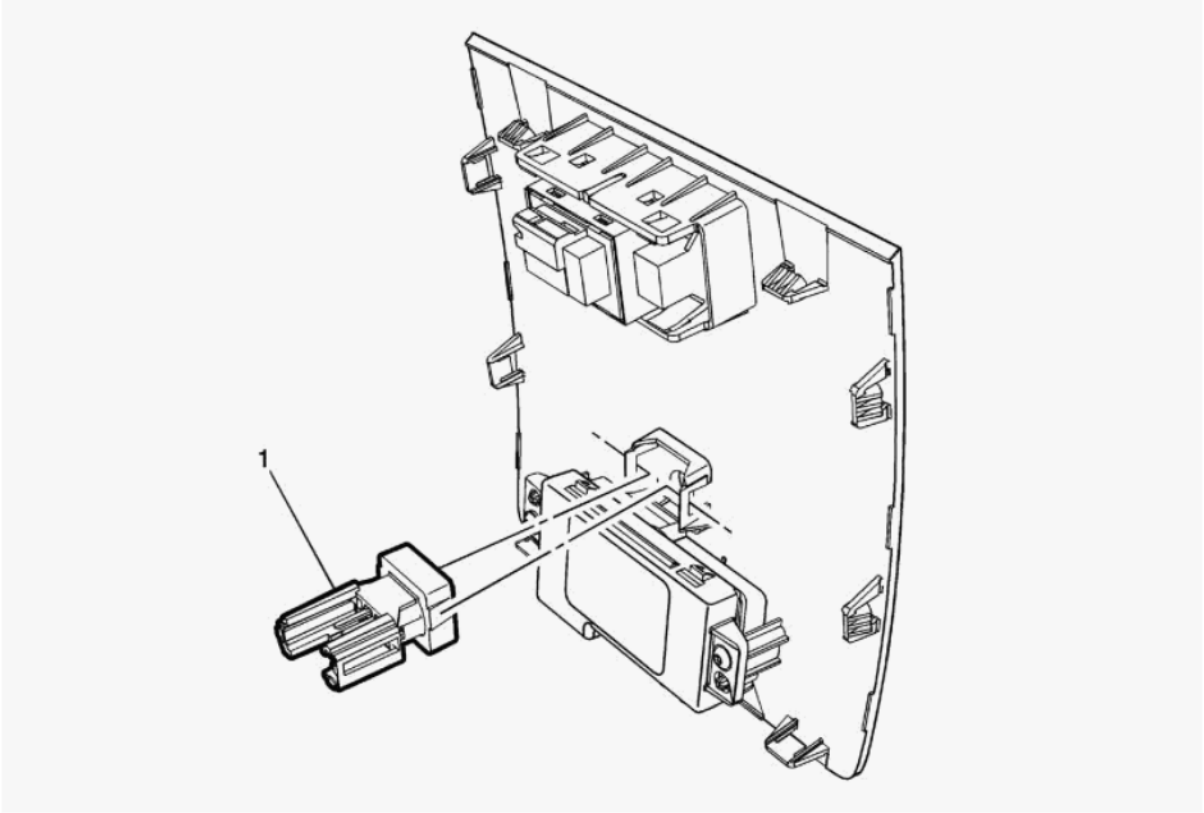


Fig. 22: Front Floor Console Flood Lamp
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the roof console opening trim plate. Refer to **Roof Console Opening Trim Plate Replacement** .	
1	Front Floor Console Flood Lamp **Procedure** Release the tabs to remove the lamp.

FRONT FLOOR CONSOLE COMPARTMENT LAMP REPLACEMENT (CHEVROLET / GMC)

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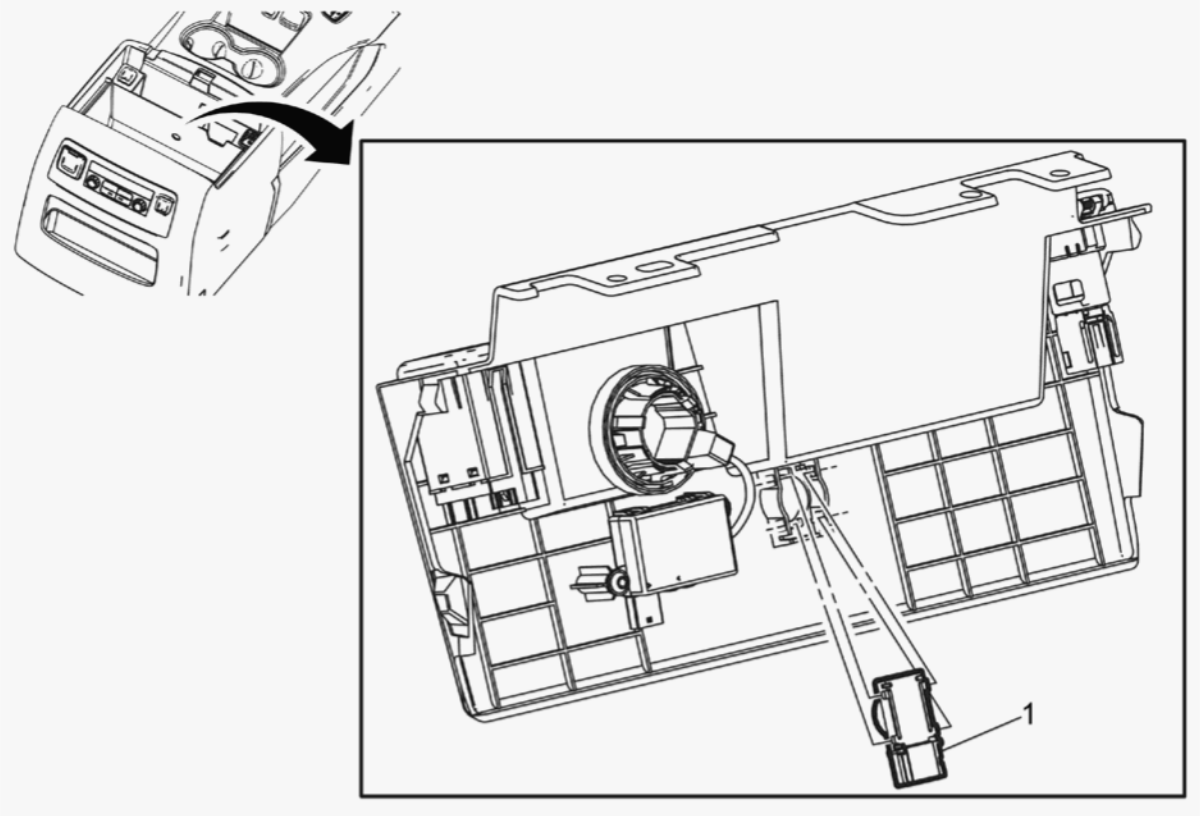


Fig. 23: Front Floor Console Compartment Lamp (Chevrolet / GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front floor console front compartment. Refer to **Front Floor Console Front Compartment Replacement (Chevrolet / GMC)** .	
1	Front Floor Console Compartment Lamp **Procedure** Using the appropriate tool, depress the tabs on the lamp to remove from the compartment.

FRONT FLOOR CONSOLE COMPARTMENT LAMP REPLACEMENT (CADILLAC)

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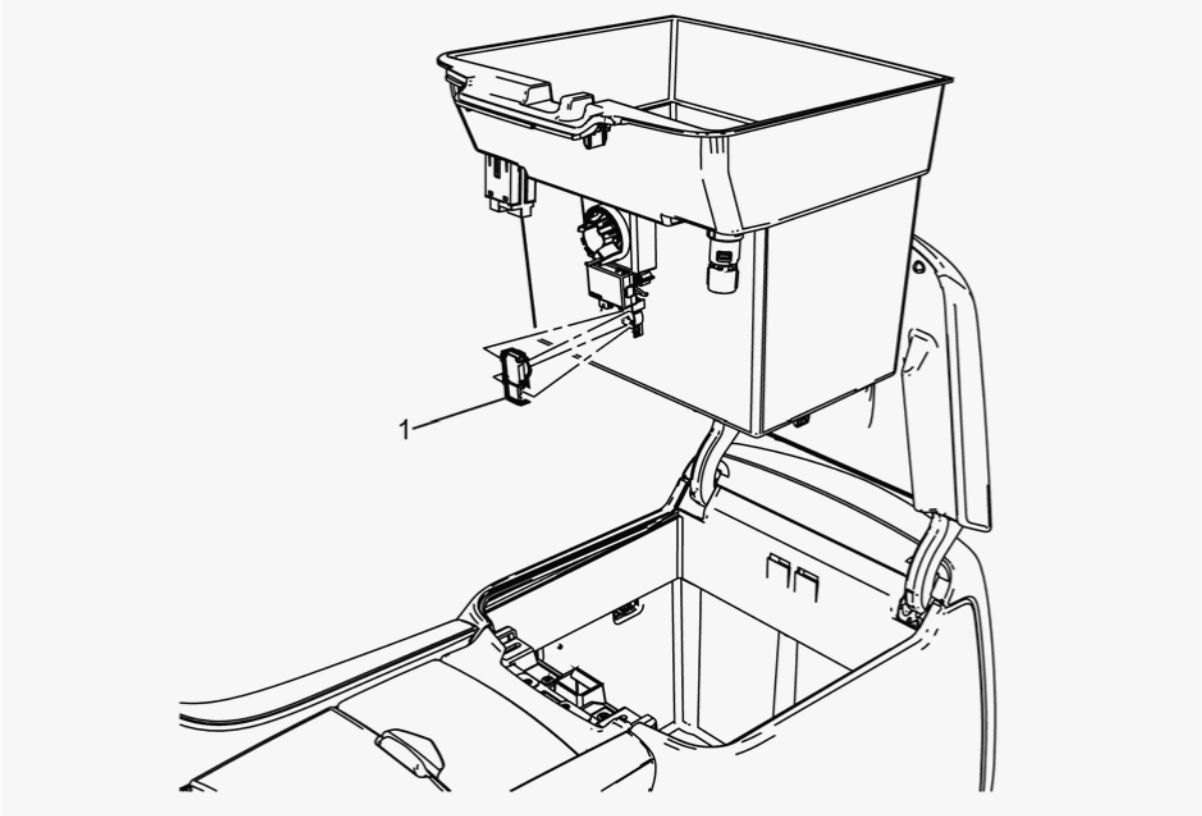


Fig. 24: Front Floor Console Compartment Lamp (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front floor console front compartment. Refer to **Front Floor Console Front Compartment Replacement (Cadillac)** .	
1	Front Floor Console Compartment Lamp **Procedure** Using the appropriate tool, depress the tabs on the lamp to remove from the compartment.

FRONT FLOOR CONSOLE COMPARTMENT LAMP SWITCH REPLACEMENT

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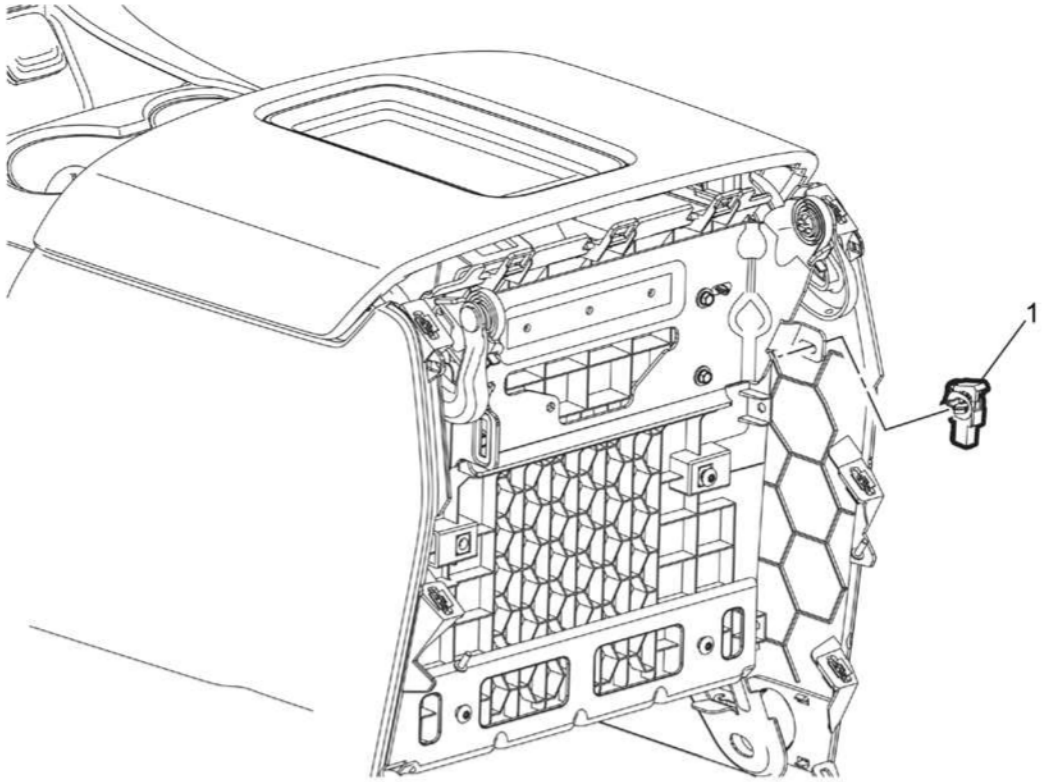


Fig. 25: Front Floor Console Compartment Lamp Switch
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front floor console rear trim panel. Refer to **Front Floor Console Rear Trim Panel Replacement (Chevrolet / GMC)** **Front Floor Console Rear Trim Panel Replacement (Cadillac)** **Front Floor Console Rear Trim Panel Replacement (Storage Structure)** .	
1	Front Floor Console Compartment Lamp Switch **Procedure** 1. Gently unclip lamp from bracket. 2. Disconnect the electrical connector.

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FRONT SIDE DOOR INSIDE HANDLE ILLUMINATION LAMP REPLACEMENT (CHEVROLET / GMC)

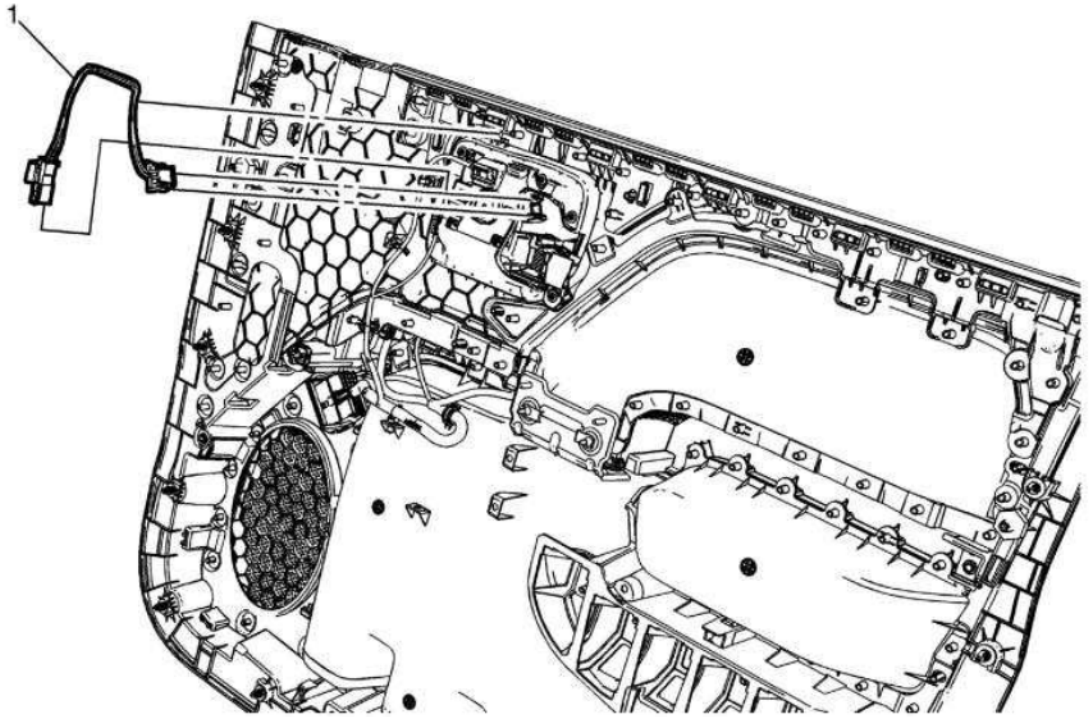


Fig. 26: Front Side Door Inside Handle Illumination Lamp (Chevrolet / GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front side door trim. Refer to **Front Side Door Trim Replacement** .	
1	Front Side Door Inside Handle Illumination Lamp **Procedure** 1. Disconnect the electrical connectors. 2. Unsnap lamp assembly from trim panel tabs.

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FRONT SIDE DOOR INSIDE HANDLE ILLUMINATION LAMP REPLACEMENT (CADILLAC)

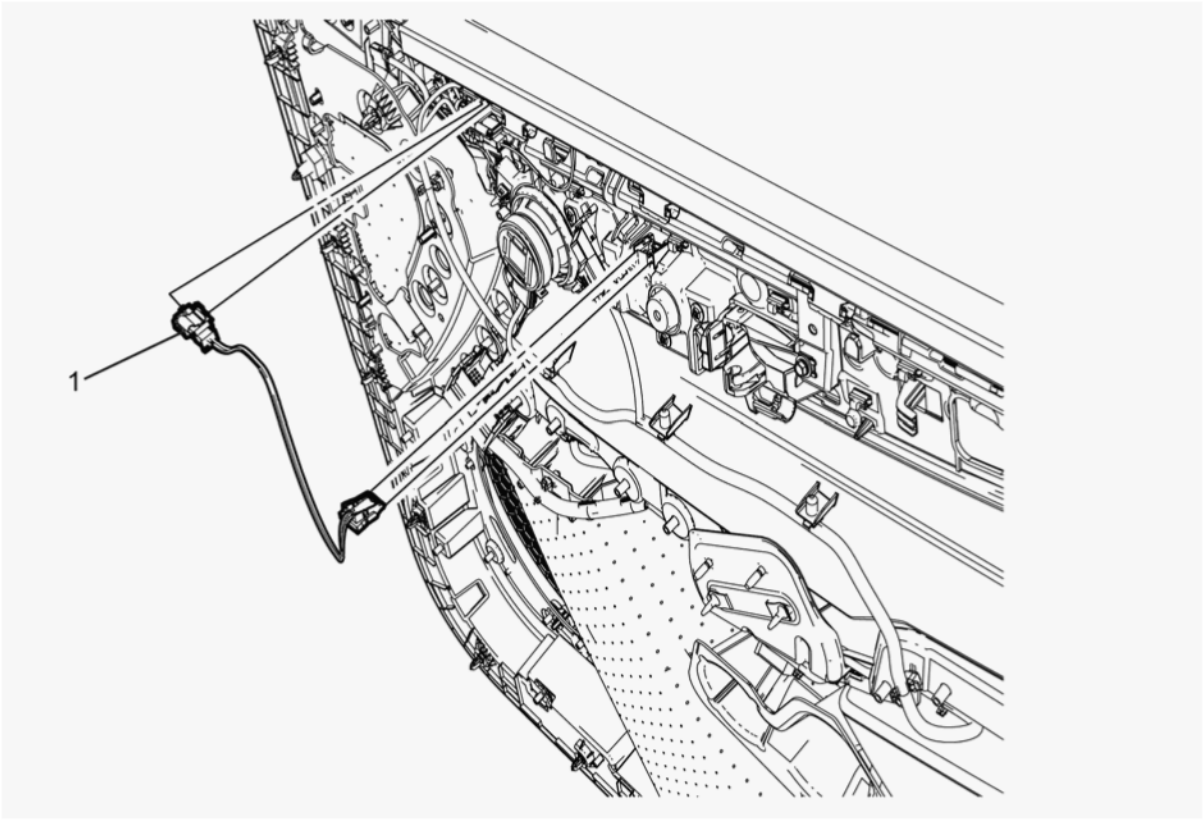


Fig. 27: Front Side Door Inside Handle Illumination Lamp (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front side door trim. Refer to **Front Side Door Trim Replacement** .	
1	Front Side Door Inside Handle Illumination Lamp **Procedure** 1. Disconnect the electrical connector. 2. Unsnap lamp assembly from the trim panel tab and inside handle.

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FRONT SIDE DOOR PULL CUP ILLUMINATION LAMP REPLACEMENT (CADILLAC)

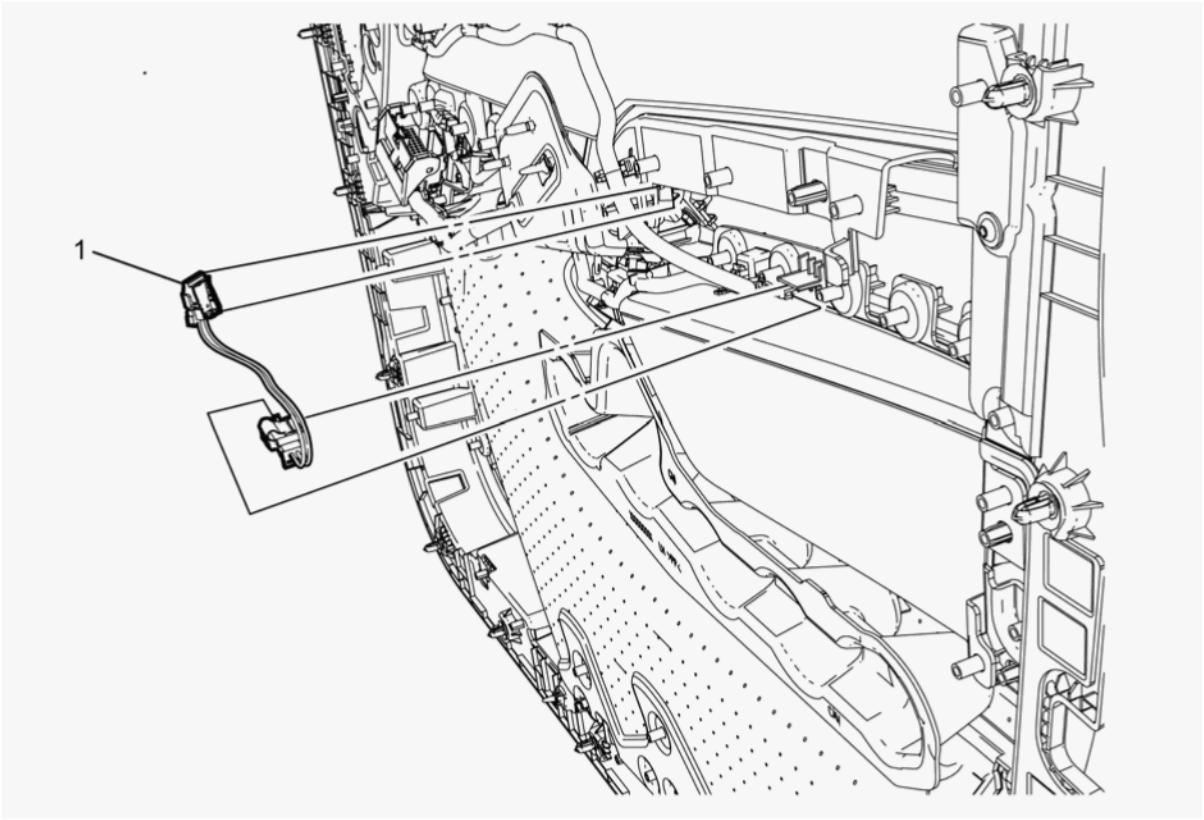


Fig. 28: Front Side Door Pull Cup Illumination Lamp (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front side door trim. Refer to **Front Side Door Trim Replacement** .	
1	Front Side Door Pull Cup Illumination Lamp **Procedure** 1. Reposition the insulator, as necessary to access the lamp. 2. Disconnect the electrical connector.

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Callout	Component Name
	3. Unsnap lamp assembly from the trim panel tab.

REAR SIDE DOOR INSIDE HANDLE ILLUMINATION LAMP REPLACEMENT (CHEVROLET / GMC)

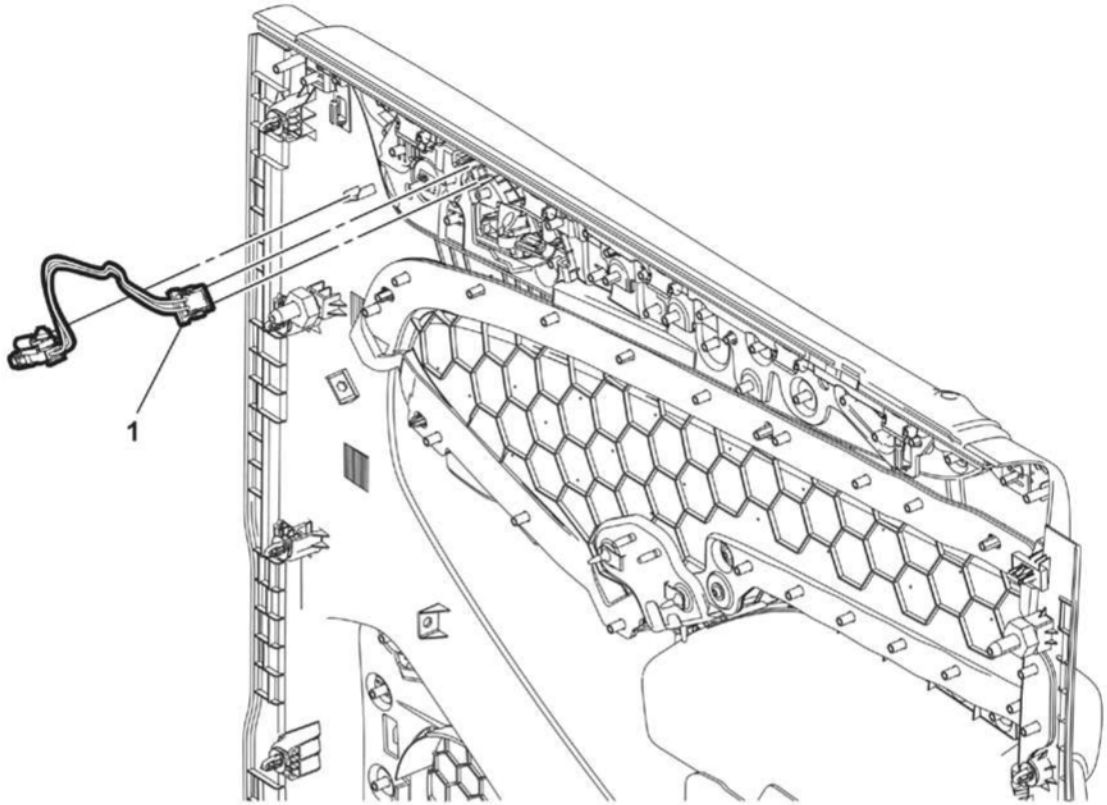


Fig. 29: Rear Side Door Inside Handle Illumination Lamp (Chevrolet / GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the rear side door trim. Refer to **Rear Side Door Trim Replacement (Chevrolet, GMC)** .	
1	Rear Side Door Inside Handle Illumination Lamp

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Callout	Component Name
	Procedure 1. Disconnect the electrical connectors. 2. Unsnap lamp assembly from trim panel tabs.

REAR SIDE DOOR INSIDE HANDLE ILLUMINATION LAMP REPLACEMENT (CADILLAC)

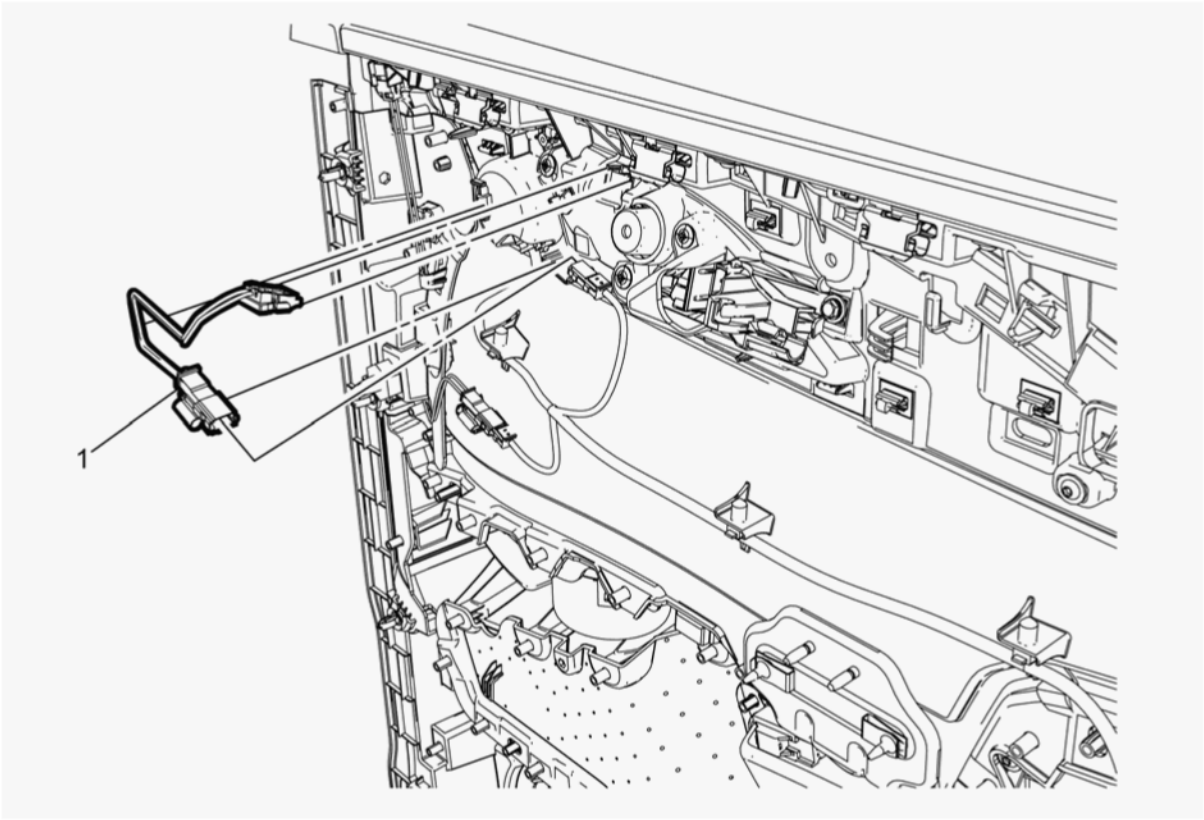


Fig. 30: Rear Side Door Inside Handle Illumination Lamp (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	

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Callout	Component Name
Remove the rear side door trim. Refer to **Rear Side Door Trim Replacement (Cadillac)** .	
1	Rear Side Door Inside Handle Illumination Lamp **Procedure** 1. Disconnect the electrical connector. 2. Unsnap lamp assembly from the trim panel tab and the inside handle.

REAR SIDE DOOR PULL CUP ILLUMINATION LAMP REPLACEMENT (CADILLAC)

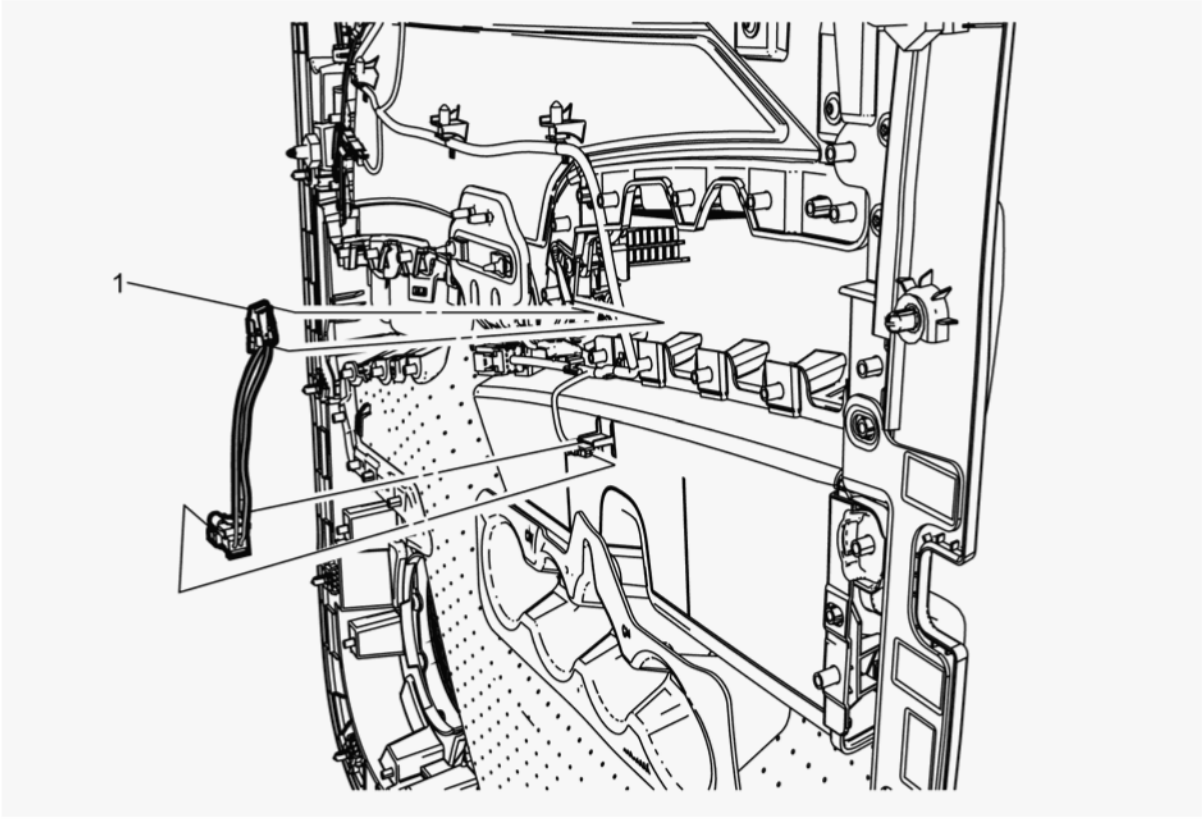


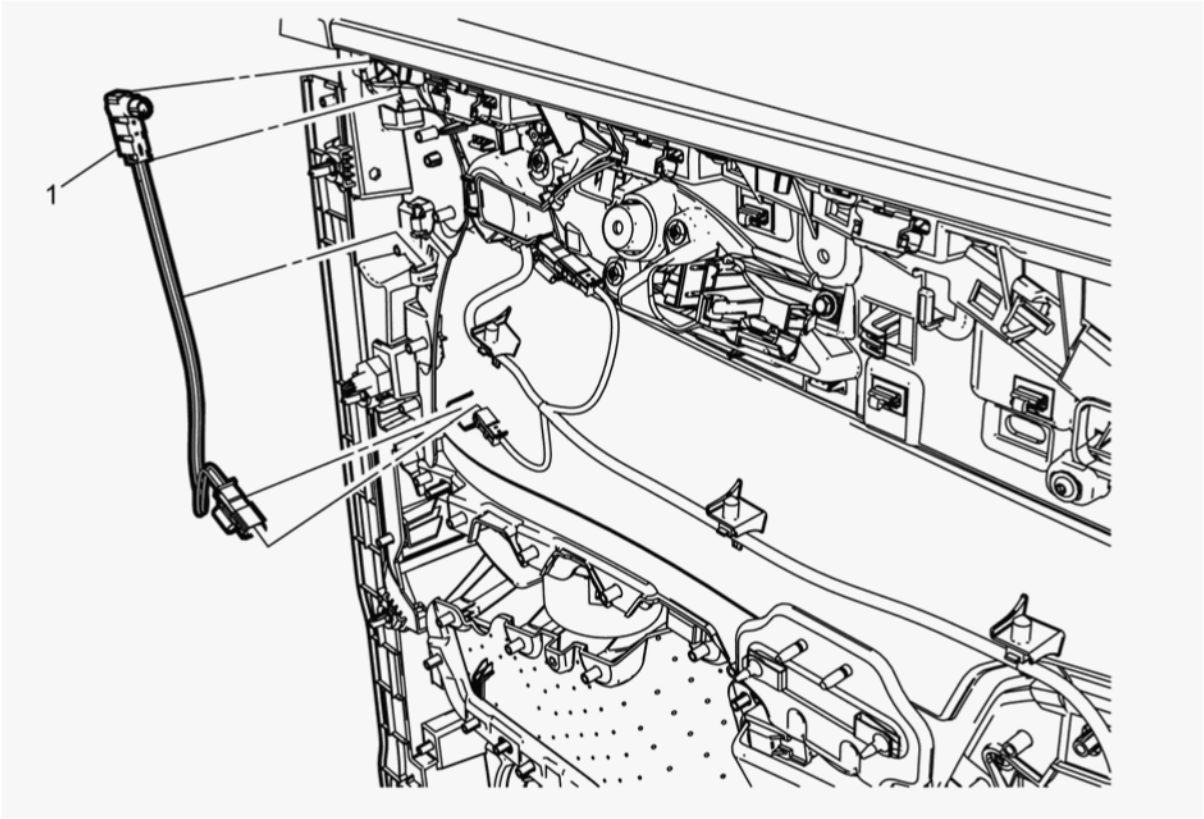
Fig. 31: Rear Side Door Pull Cup Illumination Lamp (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
Preliminary Procedure Remove the rear side door trim. Refer to **Rear Side Door Trim Replacement (Cadillac)** .	
1	Rear Side Door Pull Cup Illumination Lamp **Procedure** 1. Reposition the insulator as necessary for access to the lamp. 2. Disconnect the electrical connector. 3. Unsnap lamp assembly from the trim panel tab.

REAR SIDE DOOR LIGHT CONDUCTOR LAMP BULB REPLACEMENT (CADILLAC)



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Fig. 32: Rear Side Door Light Conductor Lamp Bulb (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the rear side door trim. Refer to **Rear Side Door Trim Replacement (Cadillac)** .	
1	Rear Side Door Light Conductor Lamp Bulb **Procedure** 1. Disconnect the bulb from the light tube. It is not necessary to remove the tube. 2. Disconnect the electrical connector. 3. Unsnap lamp wiring from trim panel tab.

FRONT SIDE DOOR LIGHT CONDUCTOR LAMP BULB REPLACEMENT (CADILLAC)

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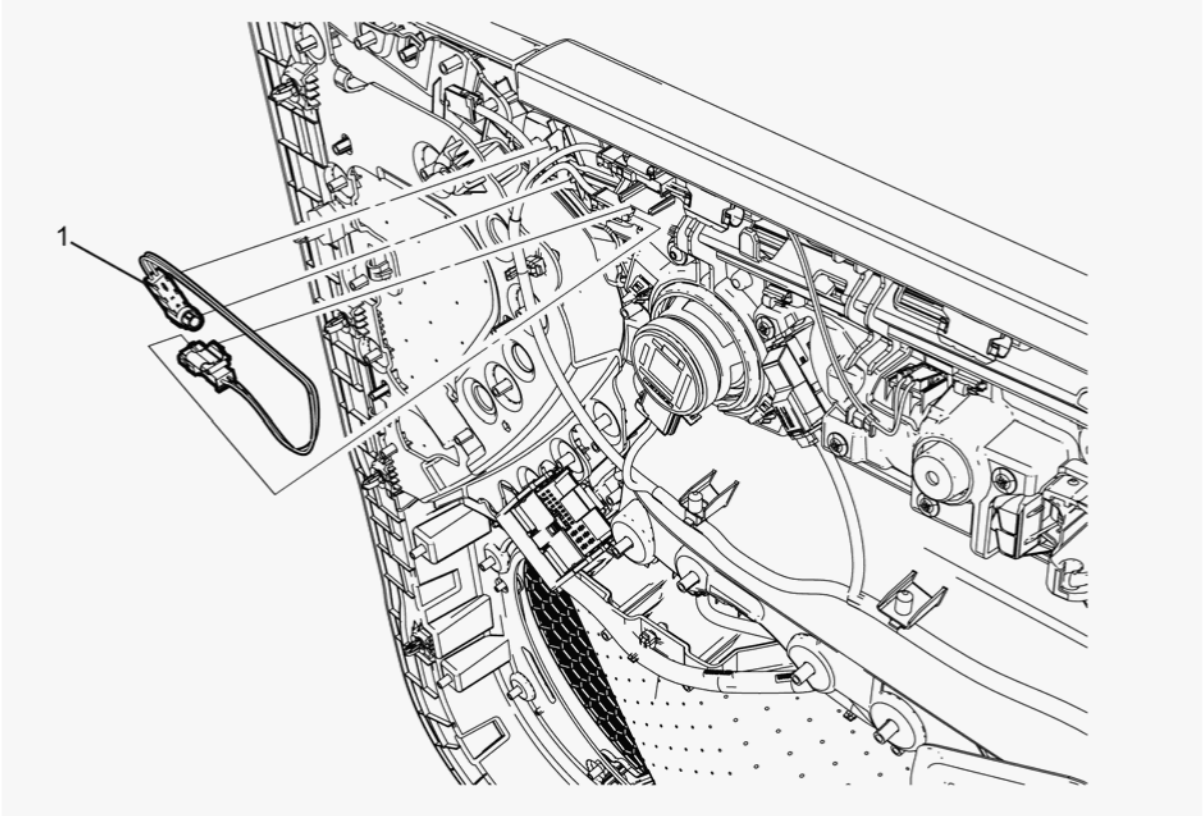


Fig. 33: Front Side Door Light Conductor Lamp Bulb (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front side door trim. Refer to **Front Side Door Trim Replacement** .	
1	Front Side Door Light Conductor Lamp Bulb **Procedure** 1. Disconnect the bulb from the light tube. It is not necessary to remove the tube. 2. Disconnect the electrical connector. 3. Unsnap lamp wiring from trim panel tab.

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FRONT FLOOR FLOOD LAMP REPLACEMENT (RIGHT SIDE)

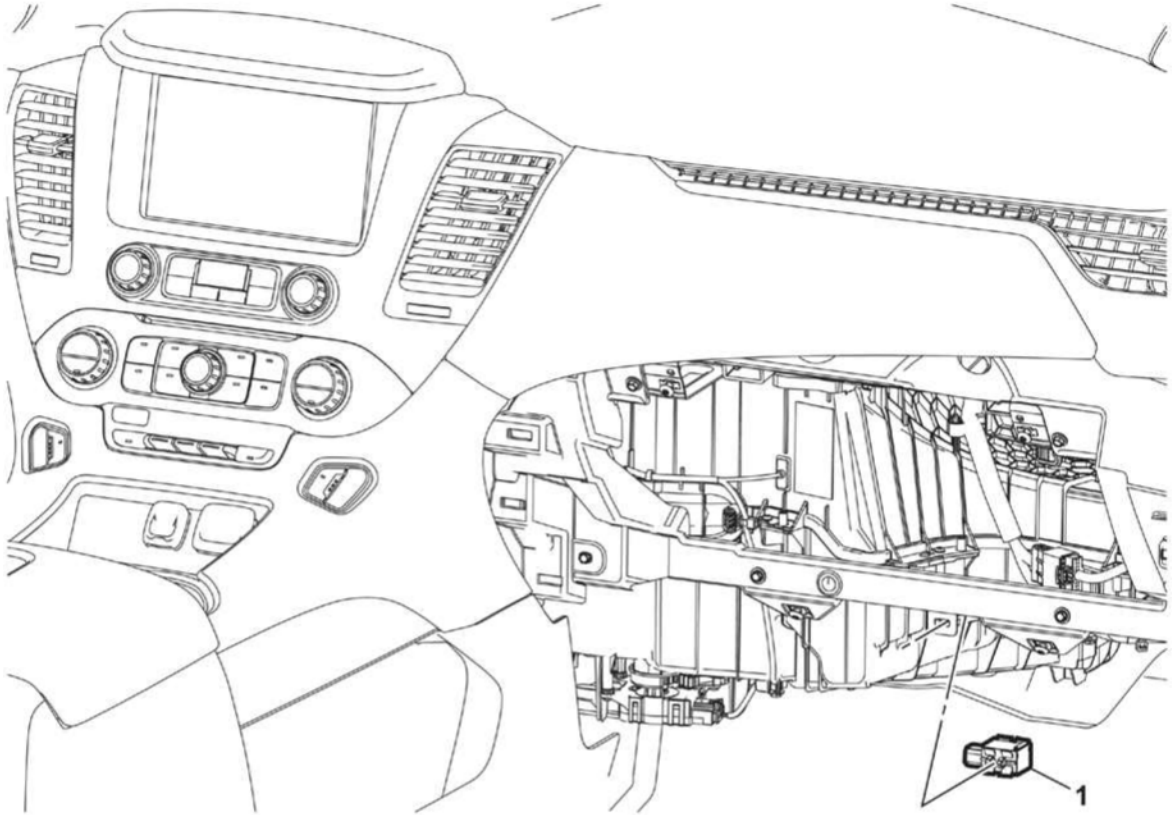


Fig. 34: Front Floor Flood Lamp (Right Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the instrument panel insulator. Refer to **Instrument Panel Insulator Replacement (Chevrolet / GMC)** **Instrument Panel Insulator Replacement (Cadillac)** .	
1	Front Floor Flood Lamp **Procedure** 1. Disconnect the electrical connector.

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Callout	Component Name
	2. Gently release the tab on the lamp assembly.

FRONT FLOOR FLOOD LAMP REPLACEMENT (LEFT SIDE)

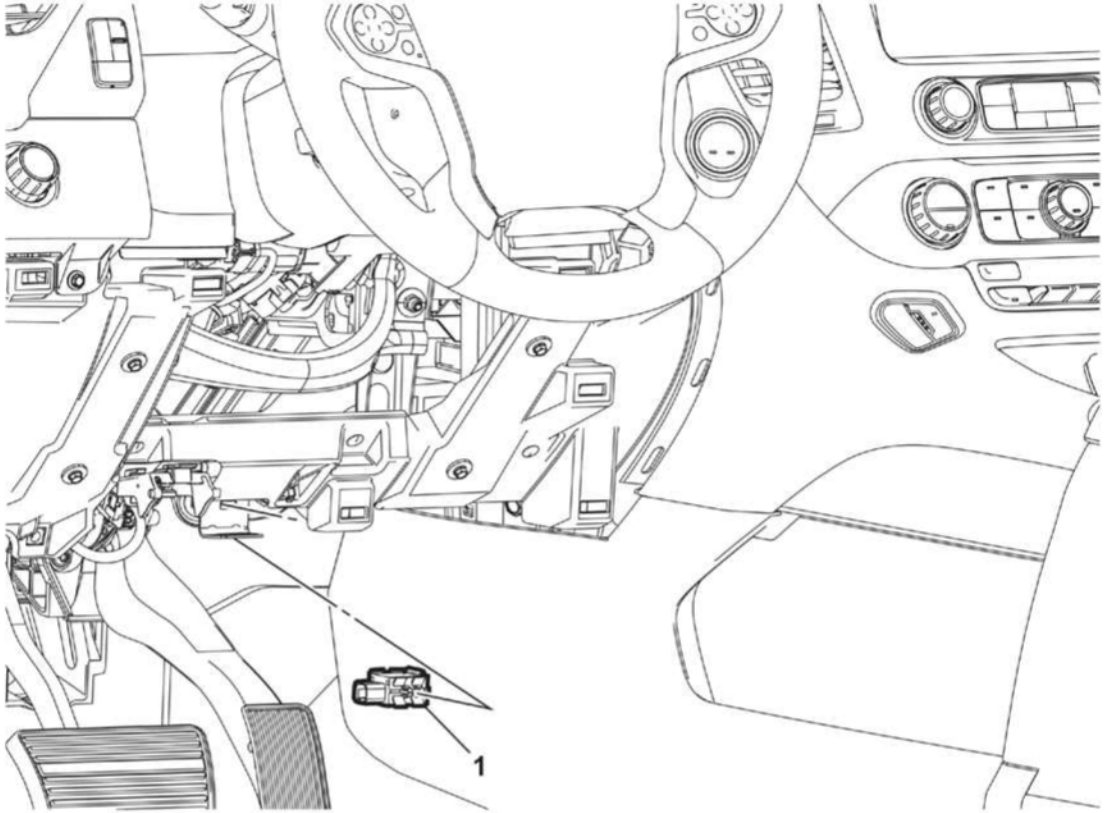


Fig. 35: Front Floor Flood Lamp (Left Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Remove the instrument panel knee bolster. Refer to **Instrument Panel Knee Bolster Replacement (Chevrolet / GMC)** **Instrument Panel Knee Bolster Replacement (Cadillac)** .	

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Callout	Component Name
1	Front Floor Flood Lamp **Procedure** 1. Disconnect the electrical connector. 2. Gently release the tab on the lamp assembly.

REAR SEAT POSITION CENTER READING AND COURTESY LAMP REPLACEMENT

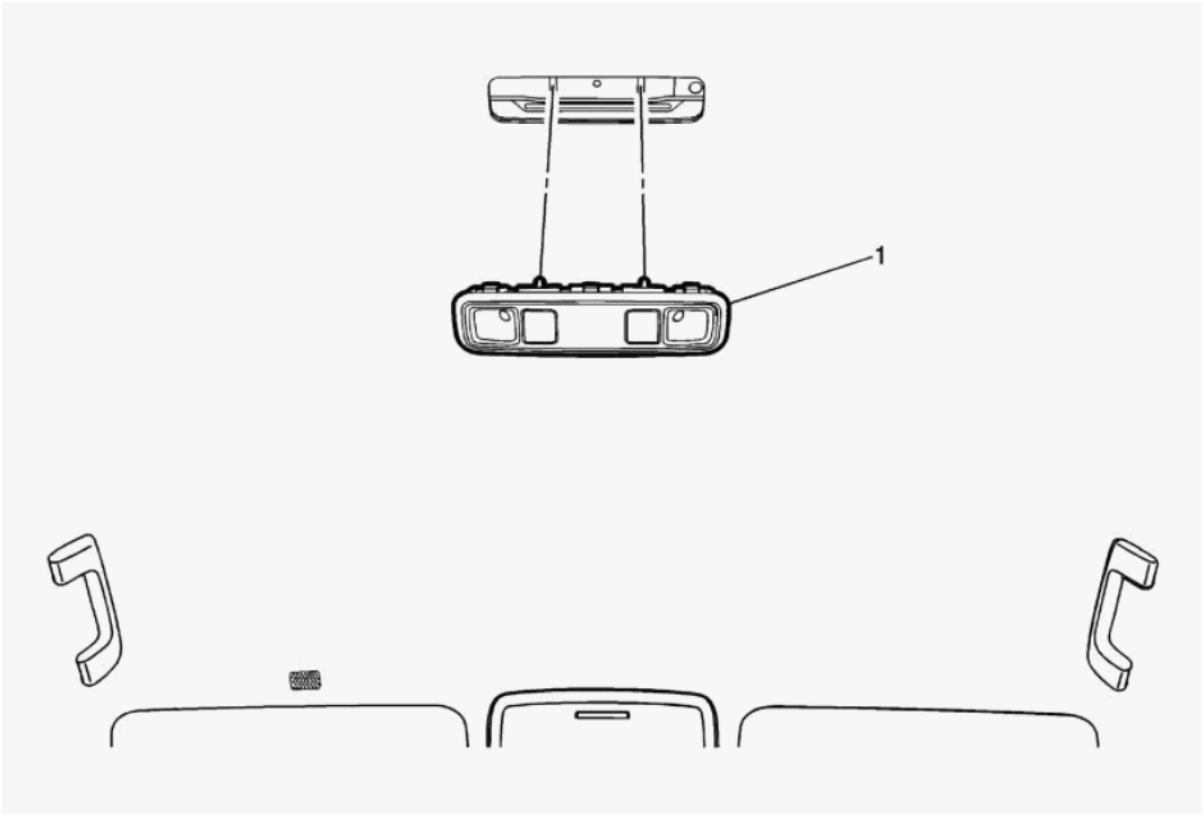


Fig. 36: Rear Seat Position Center Reading and Courtesy Lamp
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

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Callout	Component Name
1	Rear Seat Position Center Reading and Courtesy Lamp **Procedures** 1. Grasp the reading and courtesy lamp assembly and pull downward to release the retainer clips securing the assembly to the headliner and the roof panel sheet metal bow. **NOTE:** **There are two retainers that secure the lamp to the roof panel sheet metal bow and three metal tension tabs that secure the lamp to the headliner.** 2. Disconnect the electrical connections.

HEADLAMP REPLACEMENT (GMC)

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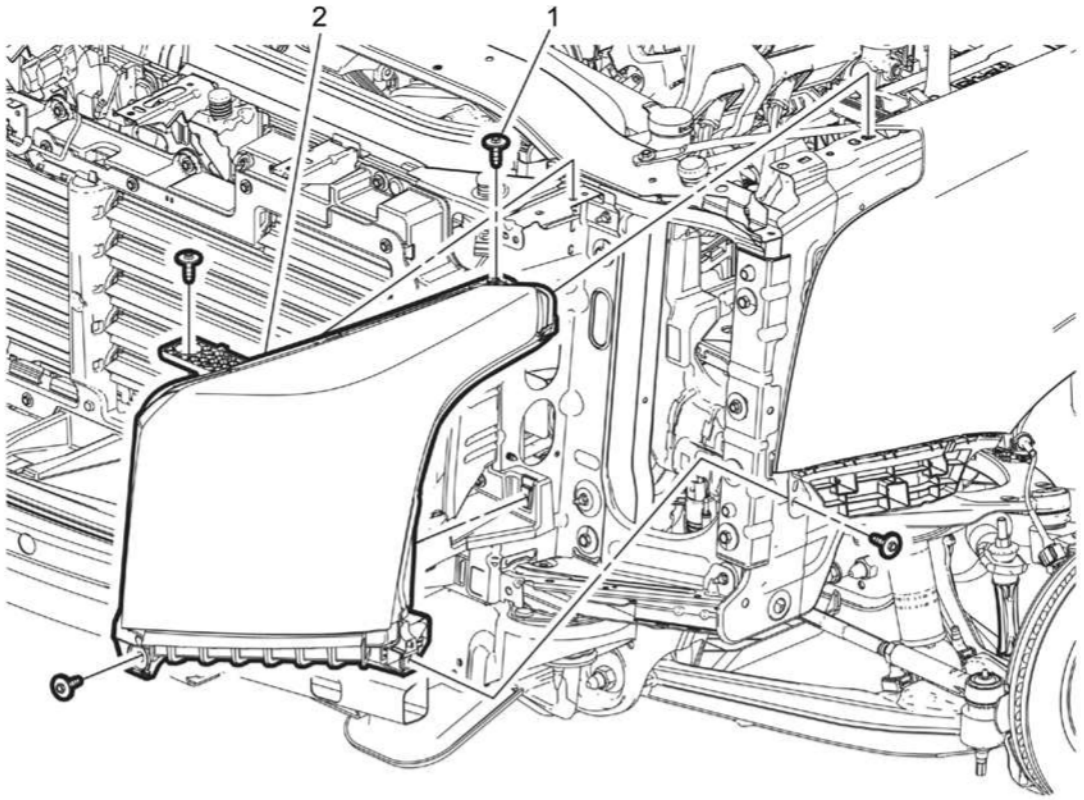


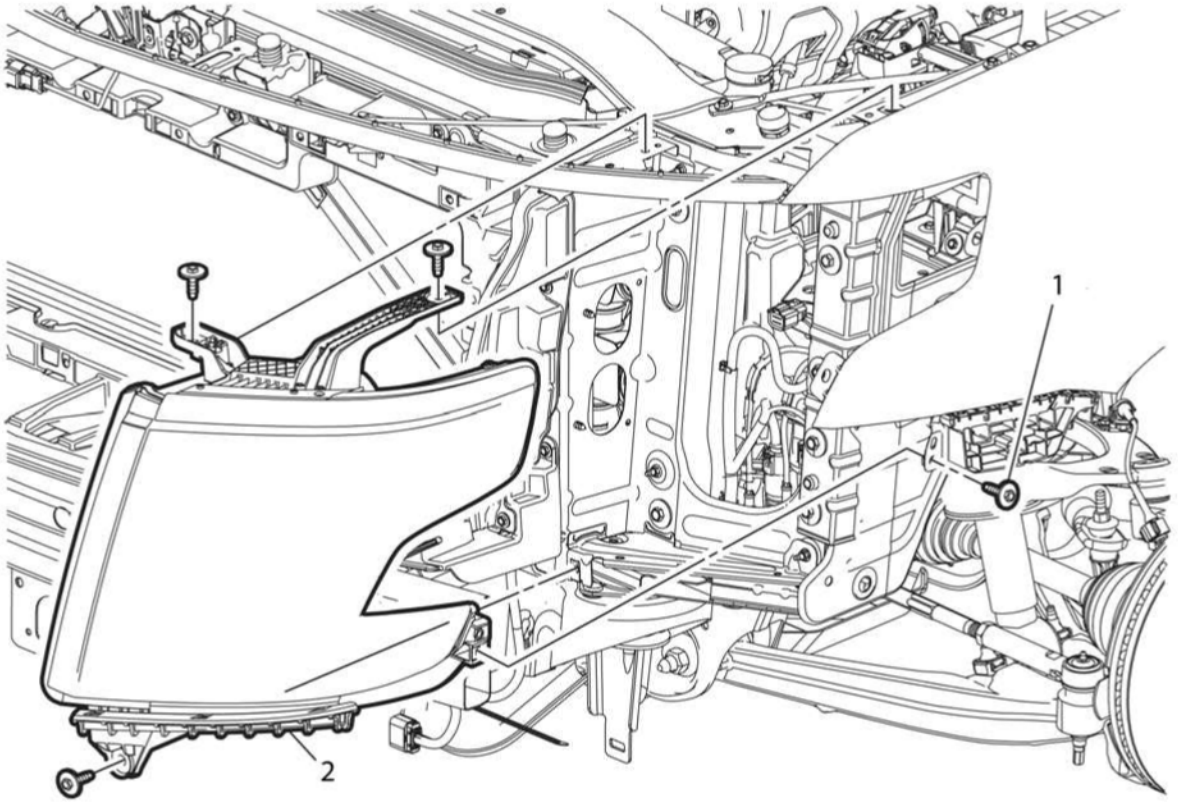
Fig. 37: Headlamp (GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front bumper fascia. Refer to **Front Bumper Fascia Replacement (GMC)** .	
1	Headlamp Bolt (Qty: 4) **CAUTION:** **Refer to Fastener Caution** .

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Callout	Component Name
	Tighten 7 N.m (62 lb in)
2	Headlamp **Procedure** 1. Disconnect the electrical connector. 2. Pull straight out to disengage locating tab. 3. Aim the headlamp after replacement. Refer to **Headlamp Aiming**.

HEADLAMP REPLACEMENT (CHEVROLET)



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Fig. 38: Headlamp (Chevrolet)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front bumper fascia. Refer to **Front Bumper Fascia Replacement (Chevrolet)** .	
1	Headlamp Bolt (Qty: 4) **CAUTION:** **Refer to** **Fastener** **Caution** . **Tighten** 7 N.m (62 lb in)
2	Headlamp **Procedure** 1. Disconnect the electrical connector. 2. Pull straight out to disengage locating tab. 3. Aim the headlamp after replacement. Refer to **Headlamp Aiming**.

HEADLAMP REPLACEMENT (CADILLAC)

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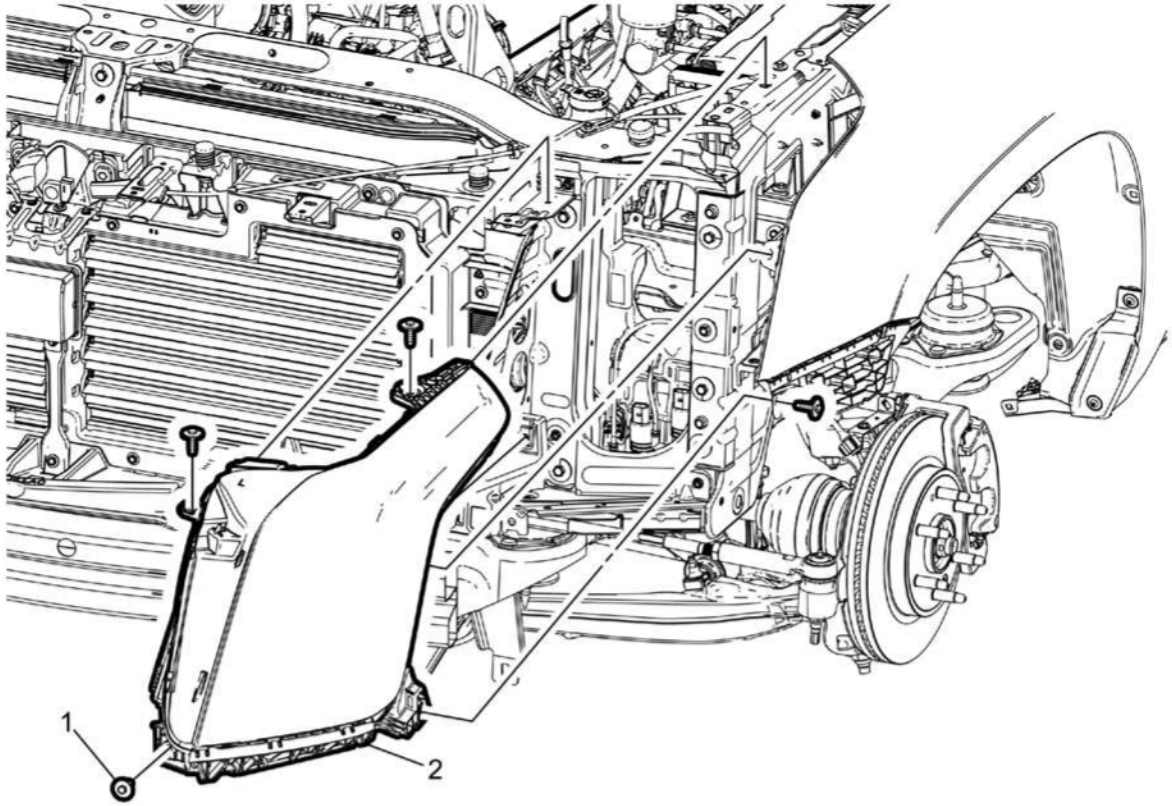


Fig. 39: Headlamp (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove front bumper fascia. Refer to **Front Bumper Fascia Replacement (Cadillac)** .	
1	Headlamp Bolt (Qty: 4) **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
	Tighten 6 N.m (53 lb in)
2	Headlamp **WARNING:** **Refer to** **Halogen** **Bulb** **Warning .** **Procedure** Disconnect the electrical connector and remove the headlamp from the vehicle.

HEADLAMP BALLAST REPLACEMENT (GMC)

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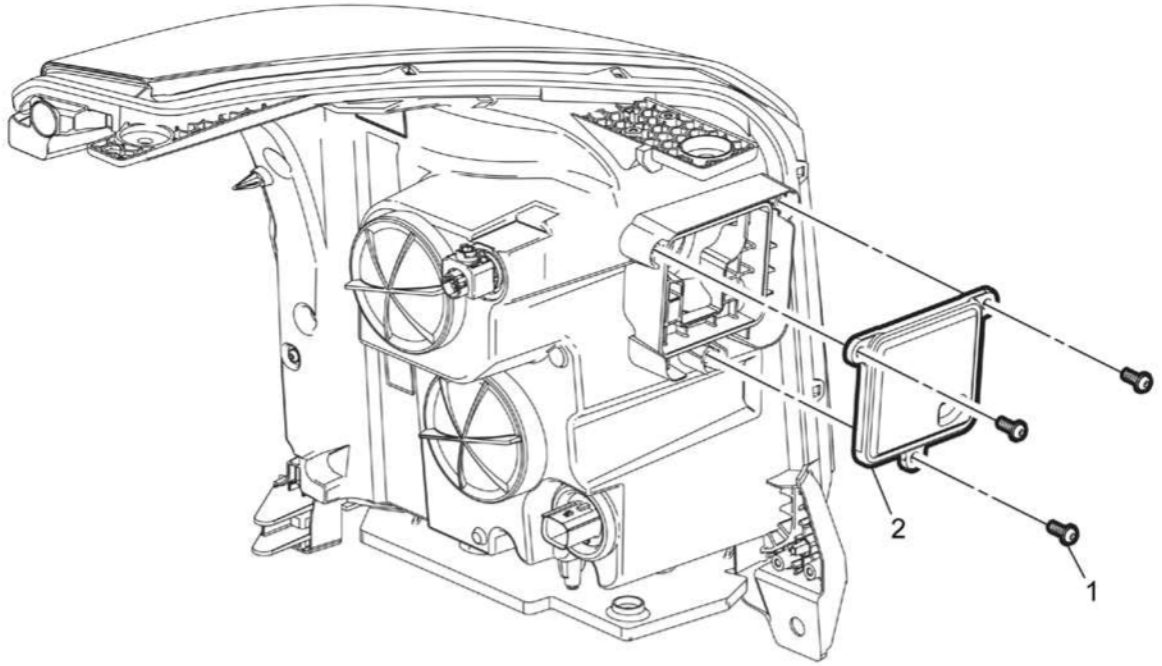


Fig. 40: Headlamp Ballast (GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **The high intensity discharge system produces high voltage and current. In order to reduce the**	

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Callout	Component Name
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	

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Callout	Component Name
	intensity discharge system ballast or the arc tube assembly starter. • **Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.**
	Preliminary Procedure Remove the headlamp. Refer to **Headlamp Replacement (GMC)**.
1	Headlamp Ballast Bolts (Qty: 3) **CAUTION:** **Refer to Fastener Caution .**
2	Headlamp Ballast **Procedure** Disconnect the electrical connector.

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HEADLAMP BALLAST REPLACEMENT (CHEVROLET)

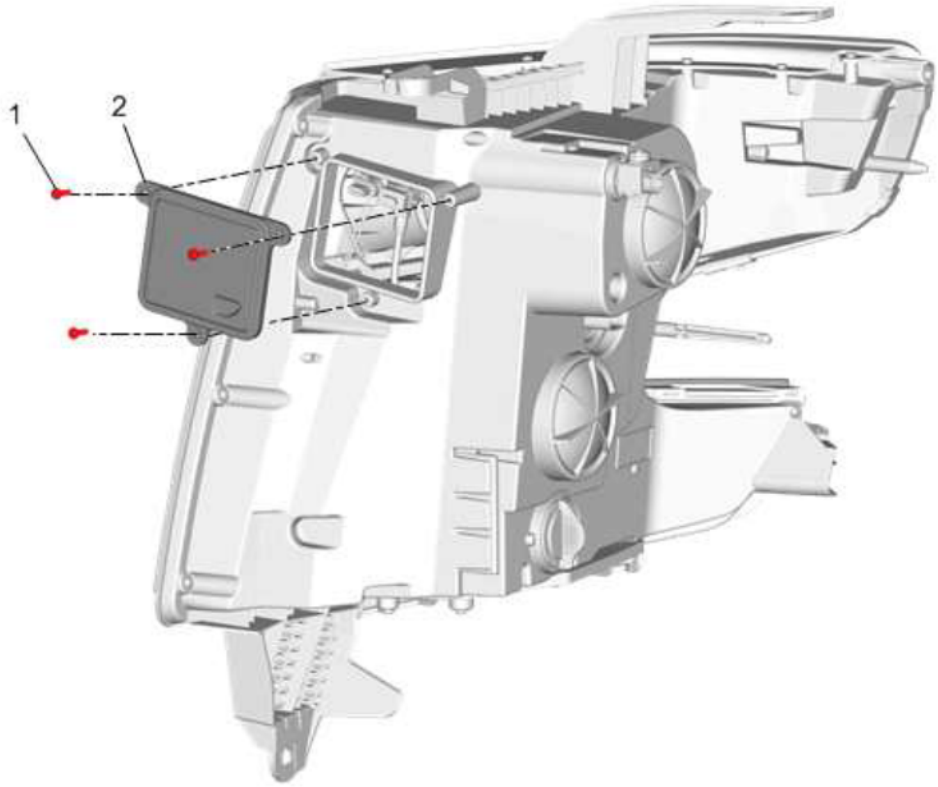


Fig. 41: Headlamp Ballast (Chevrolet)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **The high intensity discharge system produces high voltage and current.**	

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Callout	Component Name
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	

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Callout	Component Name
	open the high intensity discharge system ballast or the arc tube assembly starter. • **Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.**
Preliminary Procedure Remove the headlamp. Refer to **Headlamp Replacement (Chevrolet)**.	
1	Headlamp Ballast Bolt (Qty: 3) **CAUTION:** **Refer to Fastener Caution .**
2	Headlamp Ballast **Procedure**

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Callout	Component Name
	Disconnect the electrical connector.

HEADLAMP BULB REPLACEMENT (GMC, HID, LEFT SIDE)

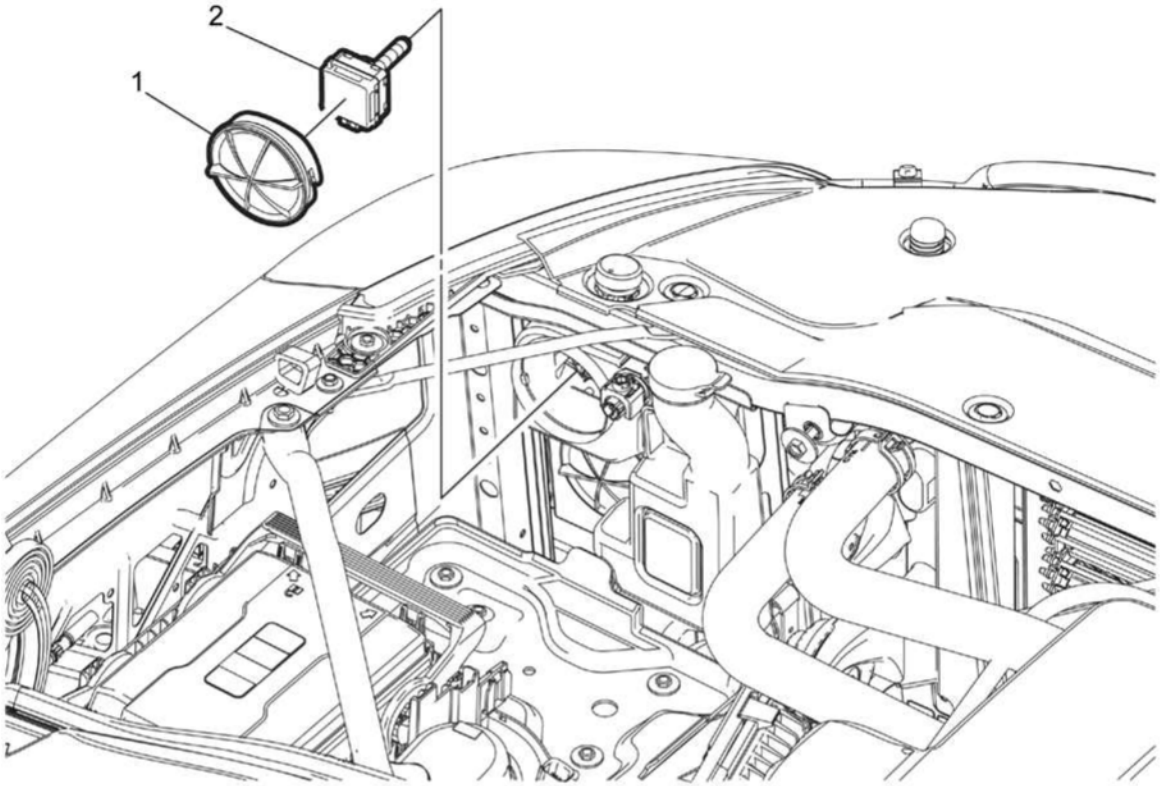


Fig. 42: Headlamp Bulb (GMC, HID, Left Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **The high intensity discharge system**	

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Callout	Component Name
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	

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Callout	Component Name
burns: • **Never open the high intensity discharge system ballast or the arc tube assembly starter.** • **Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.** **Preliminary Procedure** 1. Open and support the hood. 2. Remove the auxiliary battery if equipped. Refer to **Auxiliary Battery Replacement (9C1)** .	
1	Headlamp Bulb Access Cover **Procedure**

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Callout	Component Name
	Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb **Procedure** 1. Disconnect the electrical connector. 2. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP BULB REPLACEMENT (CHEVROLET, HID, LEFT SIDE)

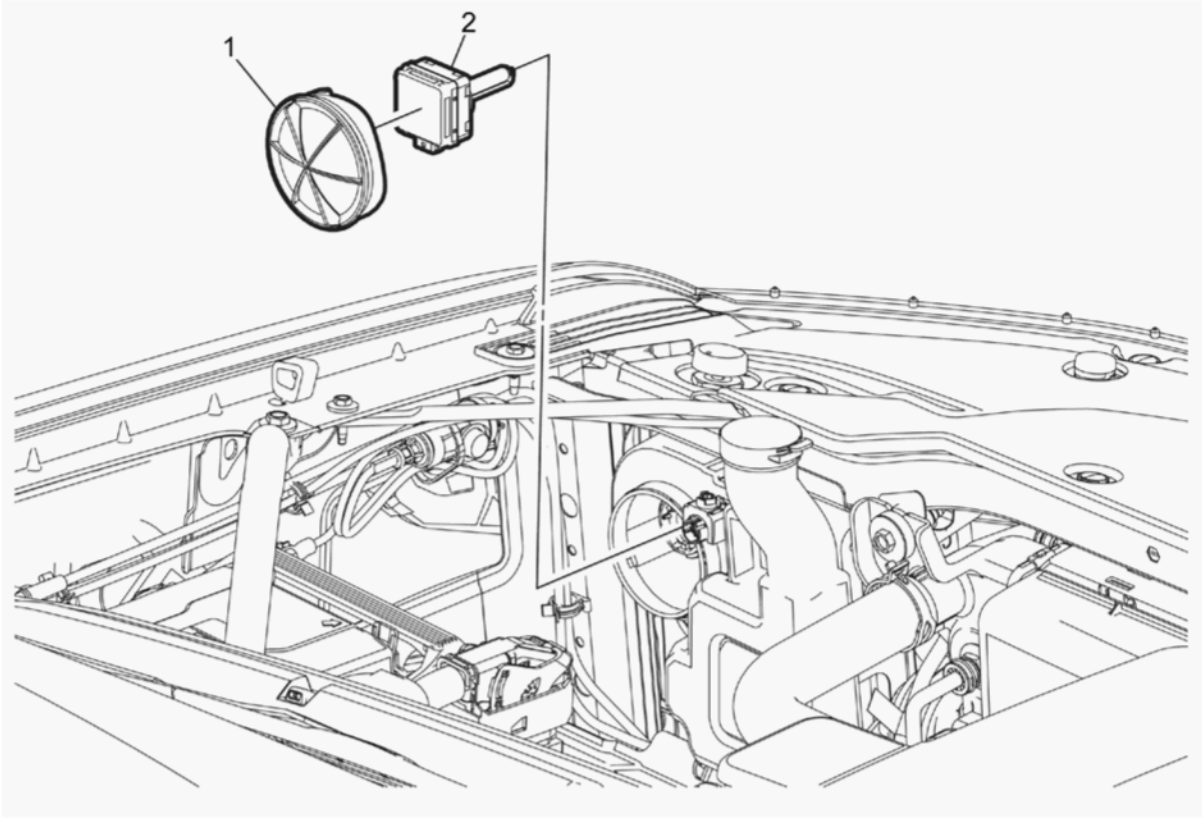


Fig. 43: Headlamp Bulb (Chevrolet, HID, Left Side)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
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**	

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Callout	Component Name
produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.	

Preliminary Procedure

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Callout	Component Name
1. Open and support the hood. 2. Remove the auxiliary battery if equipped. Refer to **Auxiliary Battery Replacement (9C1)** .	
1	Headlamp Bulb Access Cover **Procedure** Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb **Procedure** 1. Disconnect the electrical connector. 2. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP BULB REPLACEMENT (GMC, HALOGEN, LEFT SIDE)

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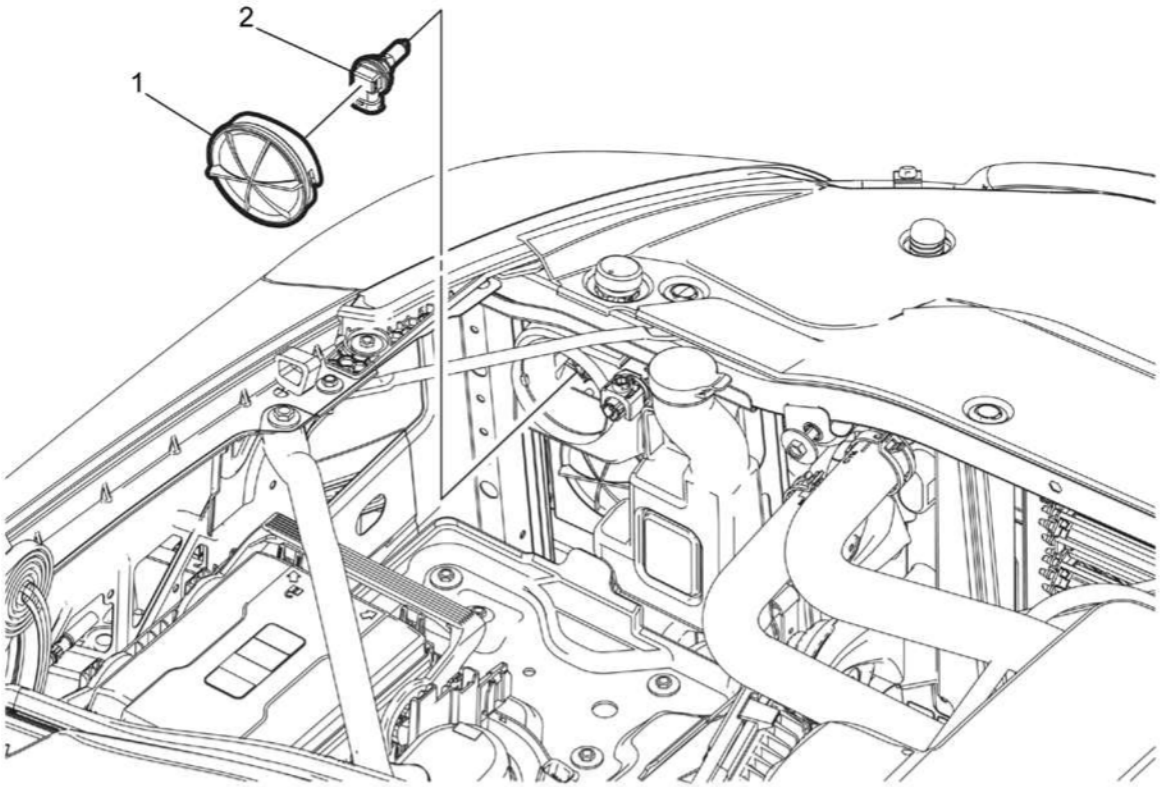


Fig. 44: Headlamp Bulb (GMC, Halogen, Left Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Open and support the hood. 2. Remove the auxiliary battery if equipped. Refer to **Auxiliary Battery Replacement (9C1)** .	
1	Headlamp Bulb Access Cover **Procedure** Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb

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Callout	Component Name
	WARNING: **Refer to Halogen Bulb Warning Procedure.** 1. Disconnect the electrical connector. 2. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP BULB REPLACEMENT (CHEVROLET, HALOGEN, LEFT SIDE)

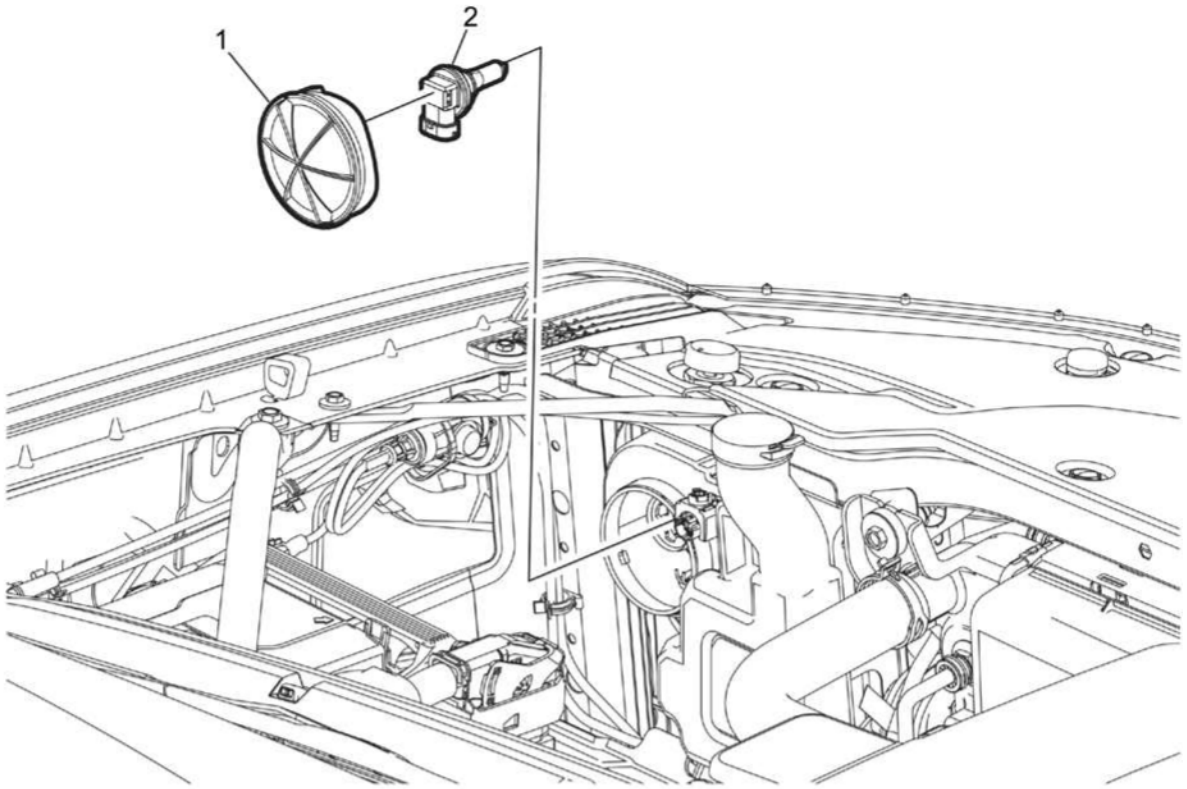


Fig. 45: Headlamp Bulb (Chevrolet, Halogen, Left Side)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
Preliminary Procedure 1. Open and support the hood. 2. Remove the auxiliary battery if equipped. Refer to **Auxiliary Battery Replacement (9C1)** .	
1	Headlamp Bulb Access Cover **Procedure** Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb **WARNING:** **Refer to Halogen Bulb Warning .** **Procedure** 1. Disconnect the electrical connector. 2. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP BULB REPLACEMENT (GMC, HIGH-BEAM, LEFT SIDE)

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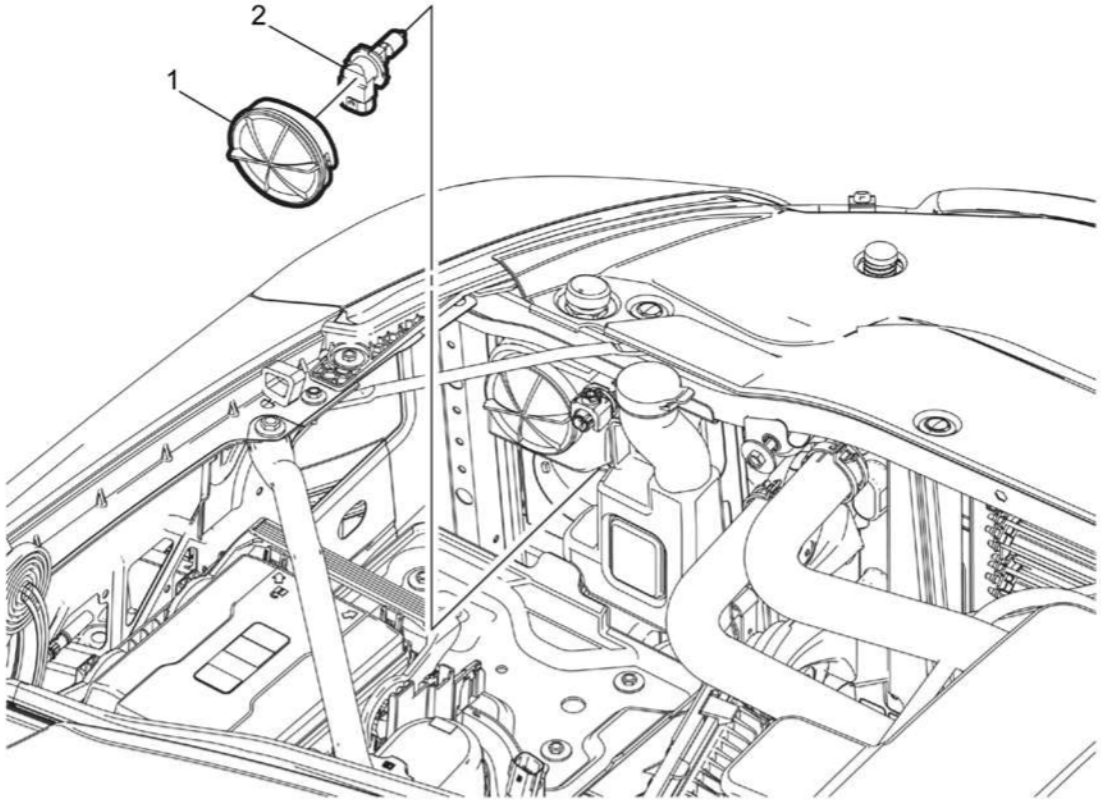


Fig. 46: Headlamp Bulb (GMC, High-Beam, Left Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Open and support the hood. 2. Remove the auxiliary battery if equipped. Refer to **Auxiliary Battery Replacement (9C1)** .	
1	Headlamp Bulb Access Cover **Procedure** Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb

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Callout	Component Name
	WARNING: **Refer to** **Procedure** **Halogen** **Bulb** **Warning**. 1. Disconnect the electrical connector. 2. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP BULB REPLACEMENT (CHEVROLET, HIGH-BEAM, LEFT SIDE)

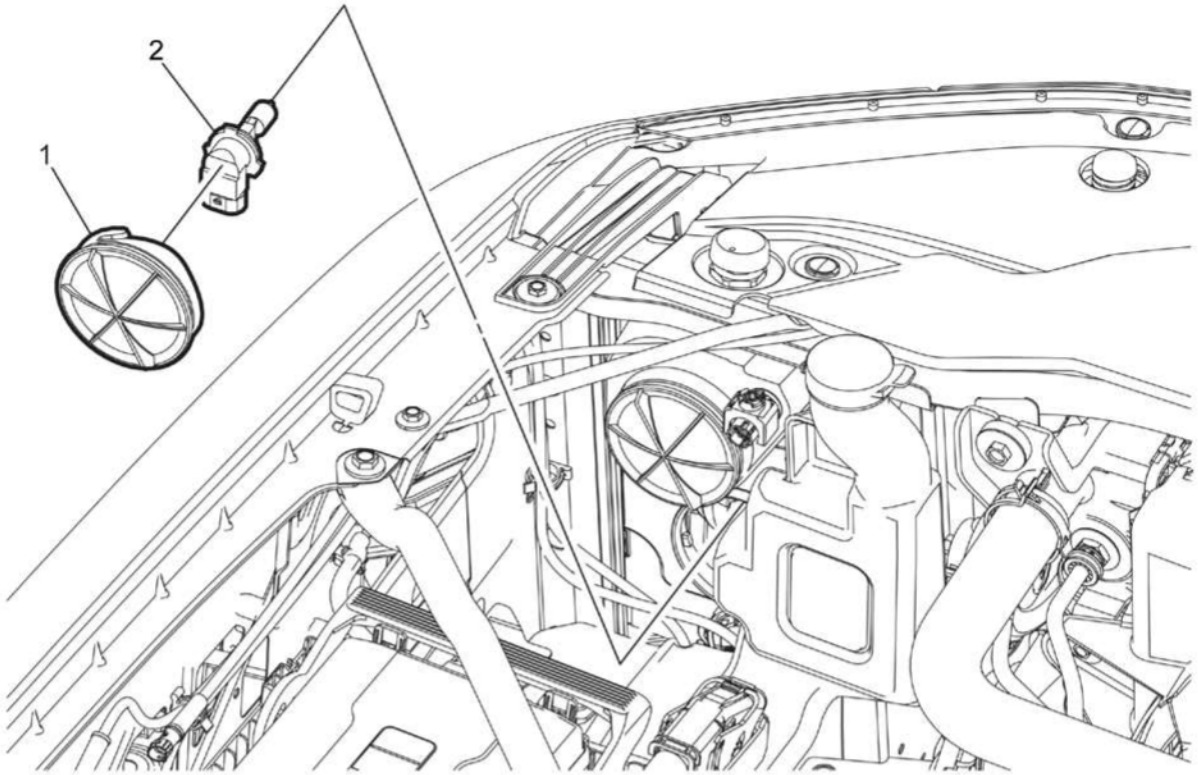


Fig. 47: Headlamp Bulb (Chevrolet, High-Beam, Left Side)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
Preliminary Procedure 1. Open and support the hood. 2. Remove the auxiliary battery if equipped. Refer to **Auxiliary Battery Replacement (9C1)** .	
1	Headlamp Bulb Access Cover **Procedure** Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb **WARNING:** **Refer to Halogen Bulb Warning .** **Procedure** 1. Disconnect the electrical connector. 2. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP BULB REPLACEMENT (GMC, HID, RIGHT SIDE)

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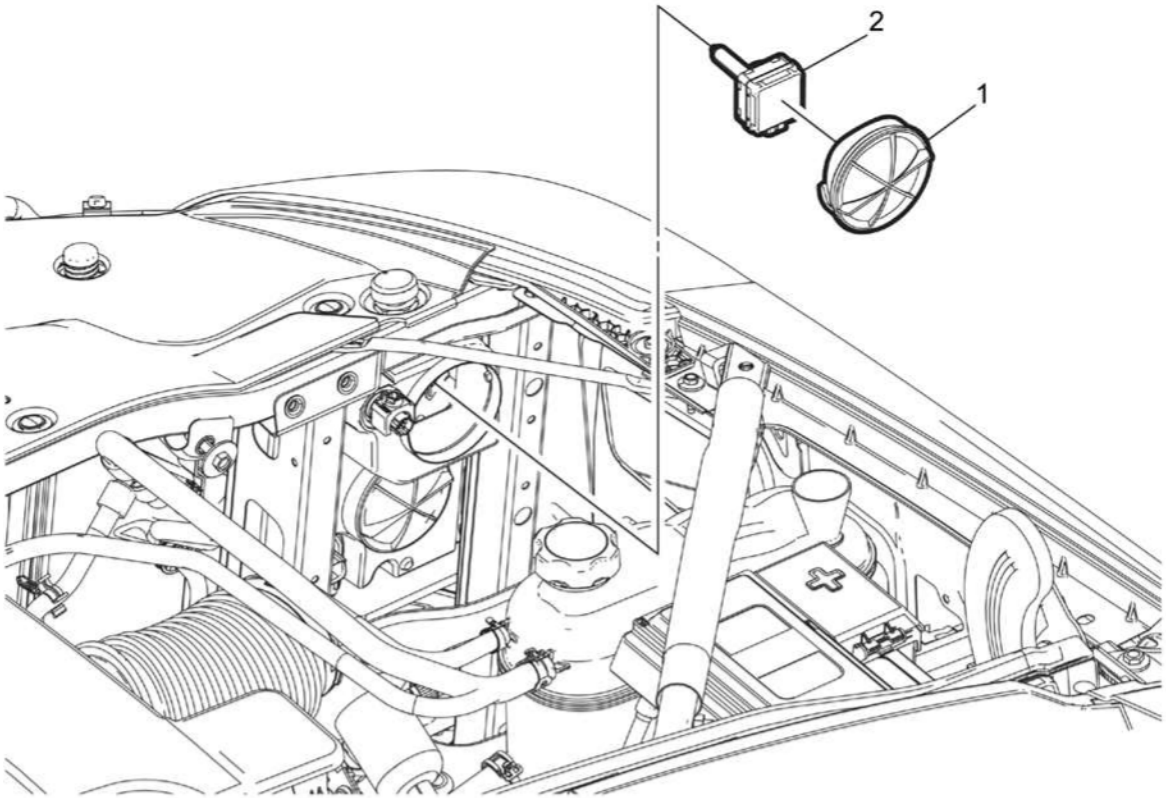


Fig. 48: Headlamp Bulb (GMC, HID, Right Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **The high intensity discharge system produces high voltage and current. In order to reduce the**	

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Callout	Component Name
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	

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Callout	Component Name
	intensity discharge system ballast or the arc tube assembly starter. • **Never probe between the high intensity discharge system ballast output connector and the arc tube assembly.**
Preliminary Procedure Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .	
1	Headlamp Bulb Access Cover **Procedure** 1. Pull back the flaps on the radiator support baffle to access the headlamp bulb access cover. 2. Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb **Procedure**

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Callout	Component Name
	1. Pull back the flaps on the radiator support baffle to access the headlamp bulb. 2. Disconnect the electrical connector. 3. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP BULB REPLACEMENT (GMC, HALOGEN, RIGHT SIDE)

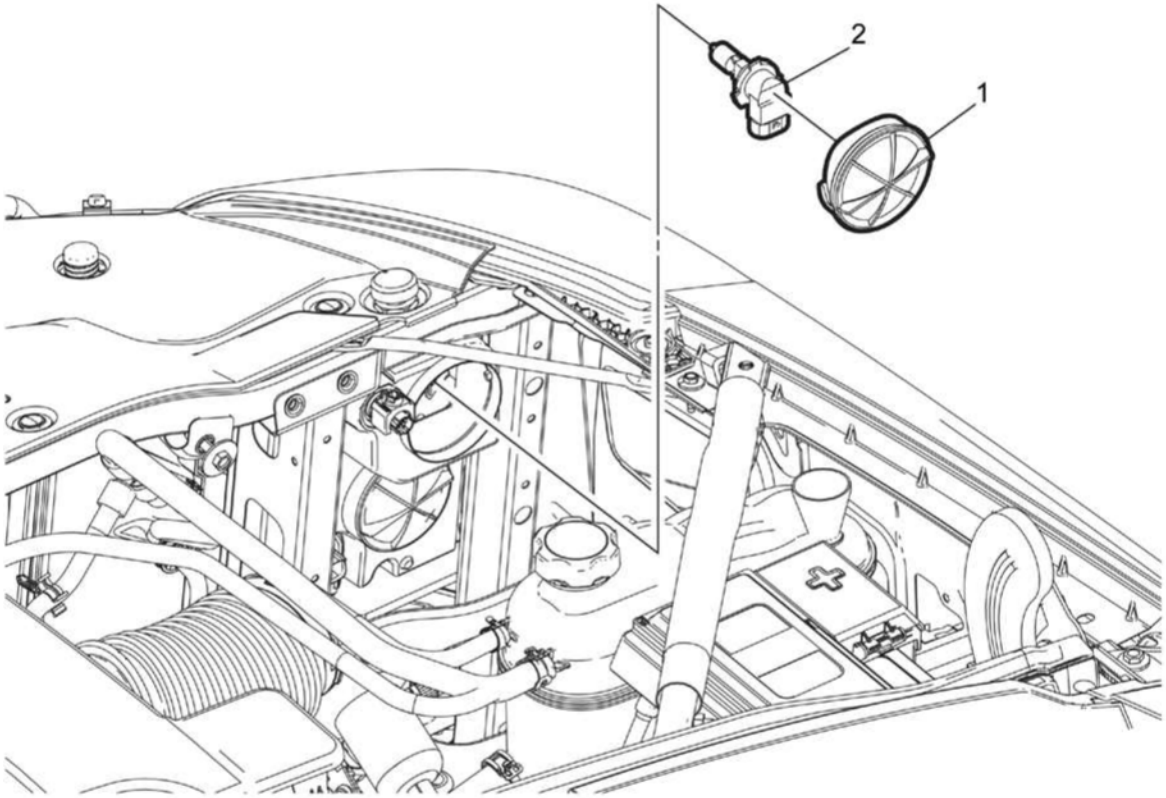


Fig. 49: Headlamp Bulb (GMC, Halogen, Right Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .	

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Callout	Component Name
1	Headlamp Bulb Access Cover **Procedure** 1. Pull back the flaps on the radiator support baffle to access the headlamp bulb access cover. 2. Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb **WARNING:** **Refer to Halogen Bulb Warning .** **Procedure** 1. Pull back the flaps on the radiator support baffle to access the headlamp bulb. 2. Disconnect the electrical connector. 3. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP BULB REPLACEMENT (GMC, HIGH-BEAM, RIGHT SIDE)

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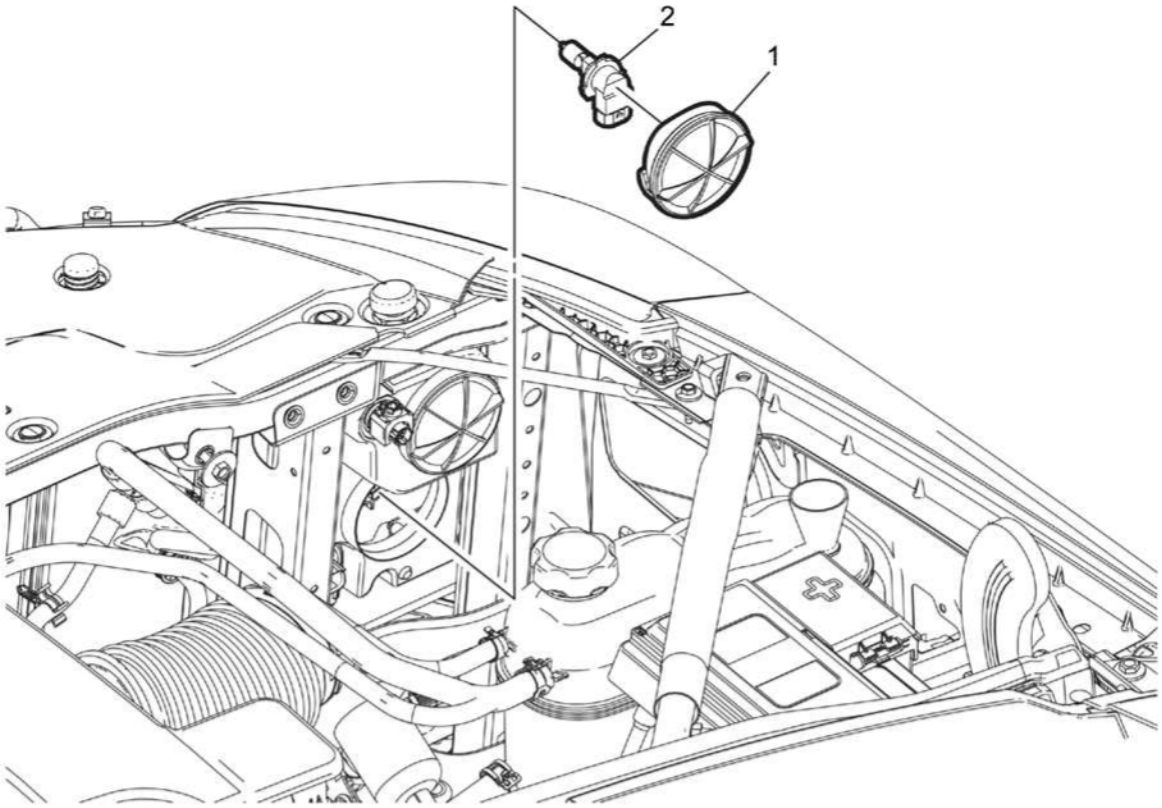


Fig. 50: Headlamp Bulb (GMC, High-Beam, Right Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** . 2. Reposition the radiator air upper baffle and deflector. Refer to **Radiator Air Upper Baffle and Deflector Replacement (Top of Radiator L83 L86)** **Radiator Air Upper Baffle and Deflector Replacement (Right of Radiator L83 L86)** .	
1	Headlamp Bulb Access Cover **Procedure** Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.

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Callout	Component Name
2	Headlamp Bulb-High Beam **WARNING:** **Refer to** **Halogen** **Bulb** **Warning** . **Procedure** 1. Disconnect the electrical connector. 2. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP BULB REPLACEMENT (CHEVROLET, HID, RIGHT SIDE)

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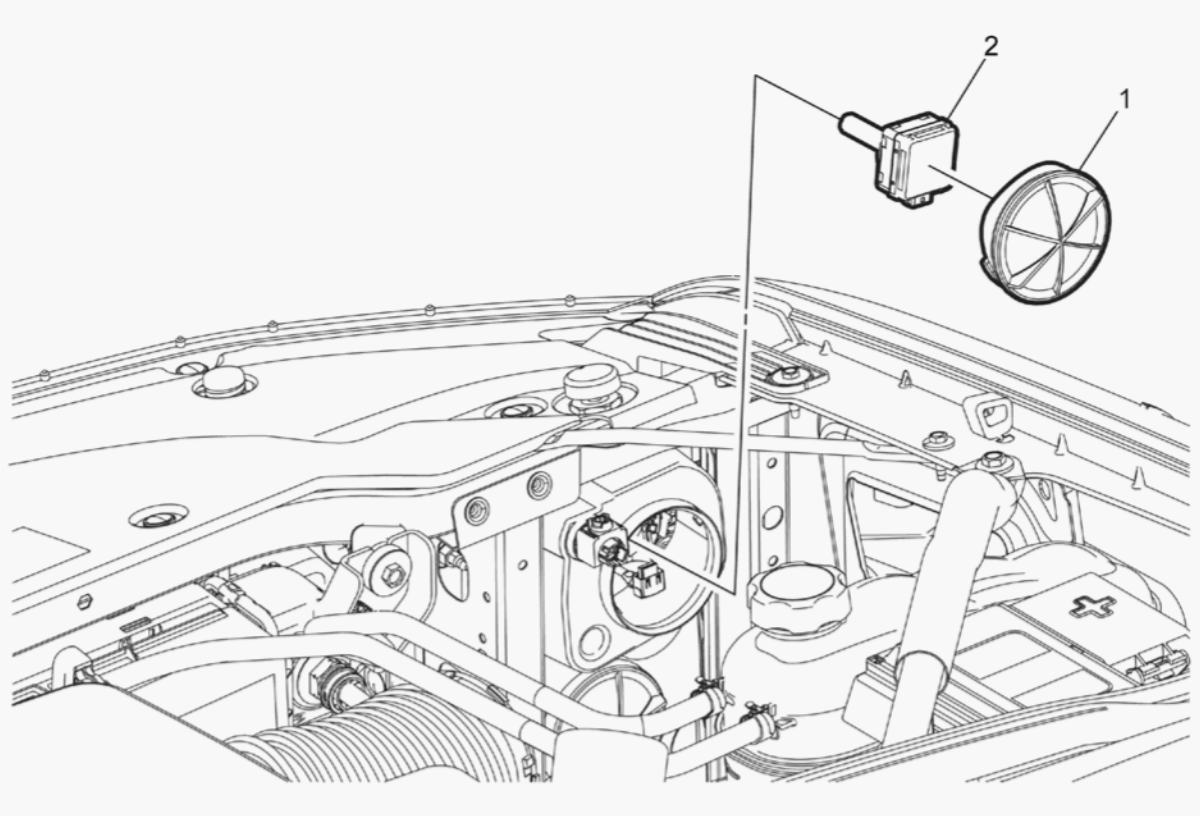


Fig. 51: Headlamp Bulb (Chevrolet, HID, Right Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **The high intensity discharge system produces high voltage and current. In order to reduce the**	

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Callout	Component Name
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	

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Callout	Component Name
	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. CAUTION: Avoid touching the bulb or letting the bulb come in contact with anything damp. Oil from your skin or moisture on

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Callout	Component Name
the bulb can cause the bulb to explode when the bulb is turned on. If either comes in contact with the bulb, clean the bulb with alcohol or a suitable degreaser and wipe the bulb dry. **Preliminary Procedure** Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .	
1	Headlamp Bulb Access Cover **Procedure** 1. Pull back the flaps on the radiator support baffle to access the headlamp bulb access cover. 2. Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb **Procedure** 1. Pull back the flaps on the radiator support baffle to access the headlamp bulb. 2. Disconnect the electrical connector. 3. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

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HEADLAMP BULB REPLACEMENT (CHEVROLET, HALOGEN, RIGHT SIDE)

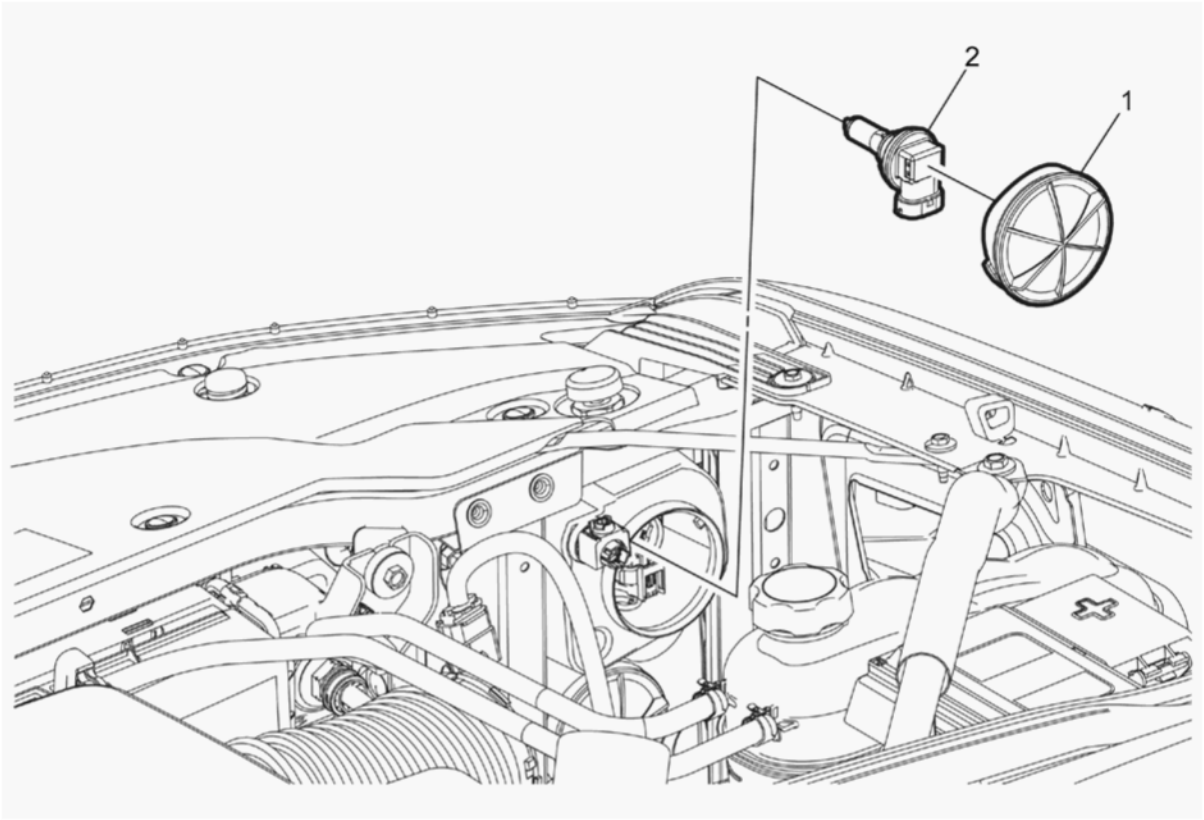


Fig. 52: Headlamp Bulb (Chevrolet, Halogen, Right Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .	
1	Headlamp Bulb Access Cover **Procedure** 1. Pull back the flaps on the radiator support baffle to access the headlamp bulb access cover. 2. Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.

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HEADLAMP BULB REPLACEMENT (CHEVROLET, HIGH-BEAM, RIGHT SIDE)

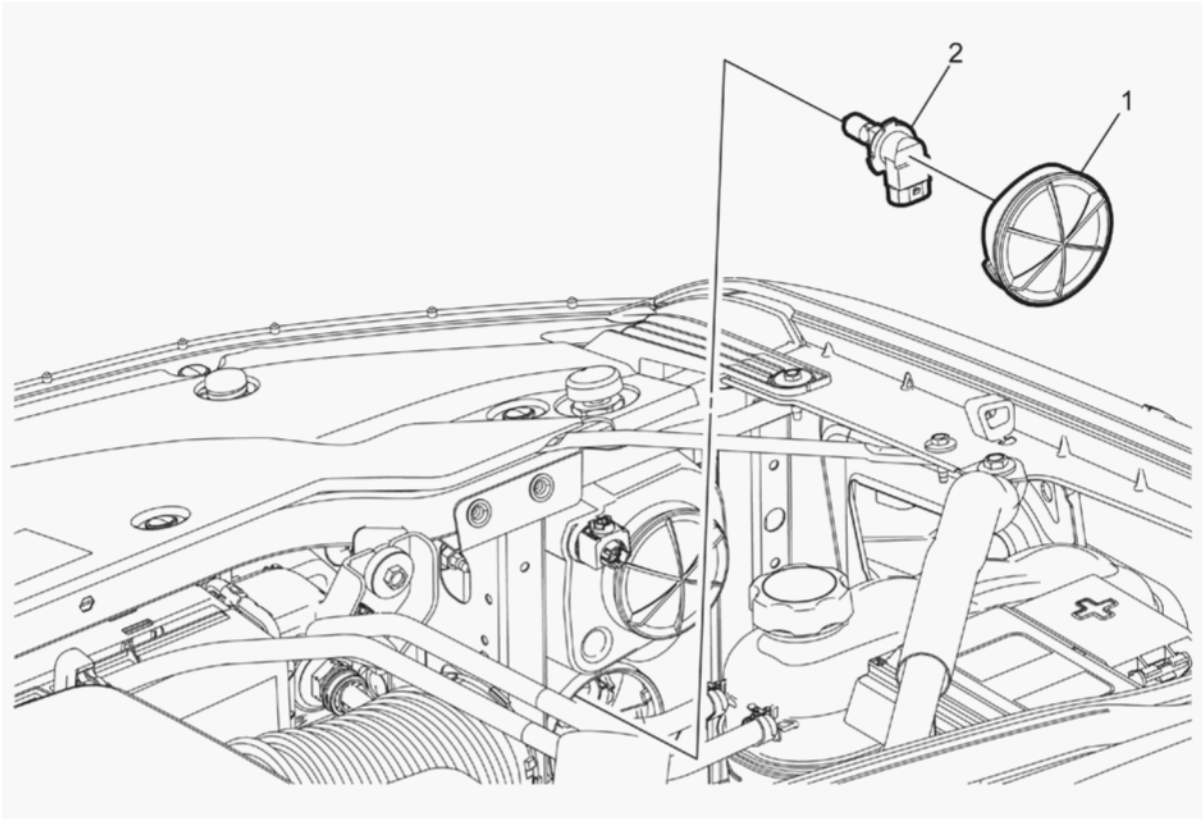


Fig. 53: Headlamp Bulb (Chevrolet, High-Beam, Right Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** . 2. Reposition the radiator air upper baffle and deflector. Refer to **Radiator Air Upper Baffle and Deflector Replacement (Top of Radiator L83 L86)** **Radiator Air Upper Baffle and Deflector Replacement (Right of Radiator L83 L86)** .	
1	Headlamp Bulb Access Cover **Procedure**

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Callout	Component Name
	Rotate the headlamp bulb access cover counterclockwise and pull from the headlamp.
2	Headlamp Bulb-High Beam **WARNING:** **Refer to** **Halogen** **Bulb** **Warning** . **Procedure** 1. Disconnect the electrical connector. 2. Rotate the headlamp bulb counterclockwise and pull from the headlamp.

HEADLAMP AND FRONT BUMPER FASCIA MOUNT PANEL BRACKET REPLACEMENT (GMC)

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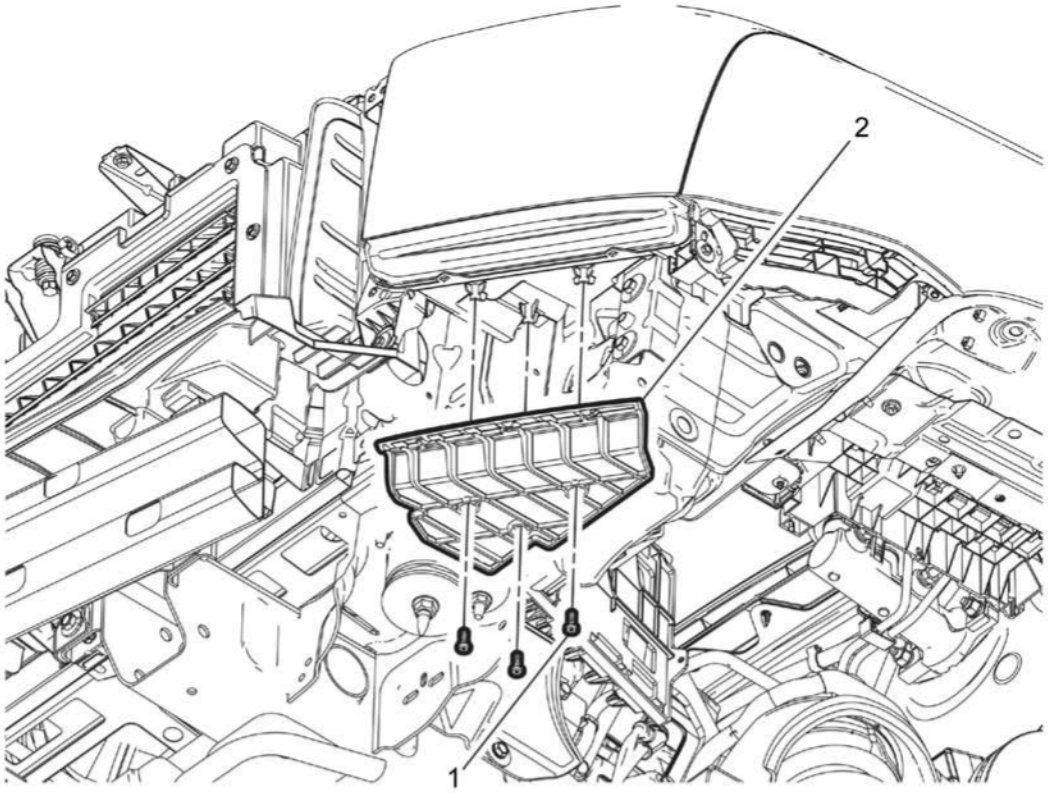


Fig. 54: Headlamp and Front Bumper Fascia Mount Panel Bracket (GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front bumper fascia. Refer to **Front Bumper Fascia Replacement (GMC)** .	
1	Headlamp and Front Bumper Fascia Mount Panel Bracket Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener** **Caution** .
2	Headlamp and Front Bumper Fascia Mount Panel Bracket

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HEADLAMP AND FRONT BUMPER FASCIA MOUNT PANEL BRACKET REPLACEMENT (CHEVROLET)

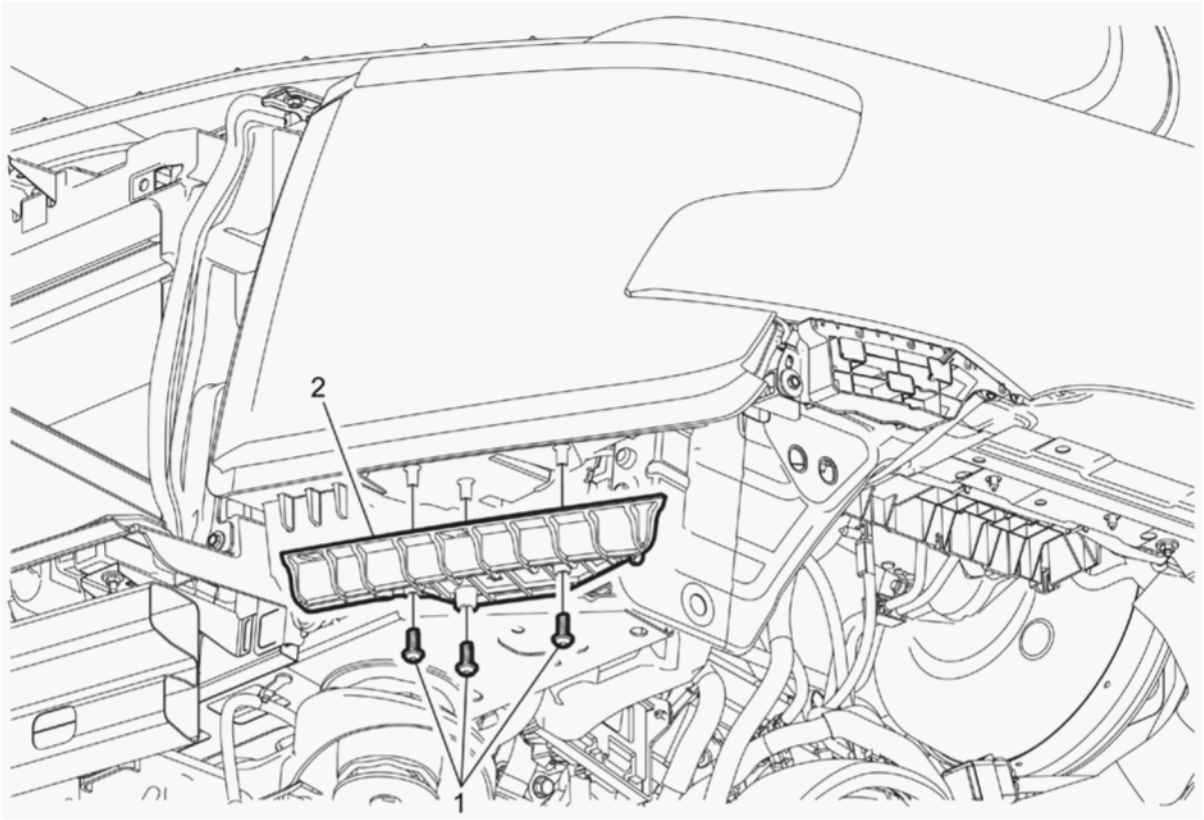


Fig. 55: Headlamp and Front Bumper Fascia Mount Panel Bracket (Chevrolet)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front bumper fascia. Refer to **Front Bumper Fascia Replacement (Chevrolet)** .	
1	Headlamp and Front Bumper Fascia Mount Panel Bracket Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
2	Headlamp and Front Bumper Fascia Mount Panel Bracket

HEADLAMP AND FRONT BUMPER FASCIA MOUNT PANEL BRACKET REPLACEMENT (CADILLAC)

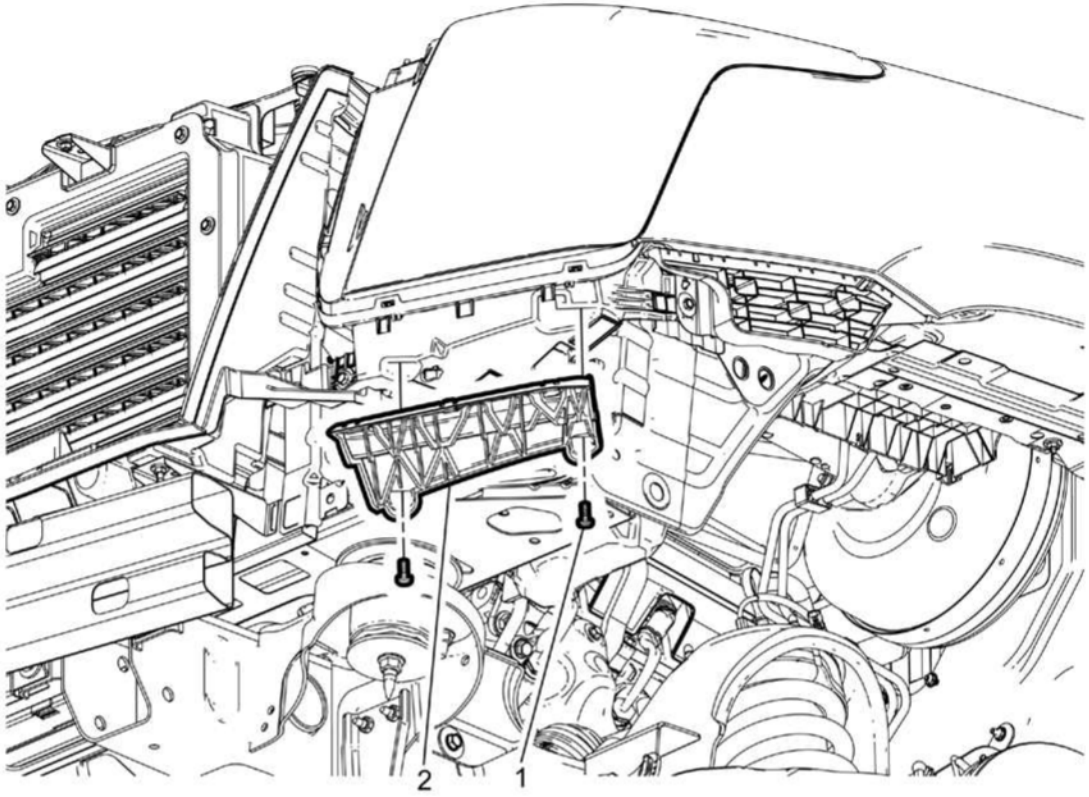


Fig. 56: Headlamp and Front Bumper Fascia Mount Panel Bracket (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front bumper fascia. Refer to **Front Bumper Fascia Replacement (Cadillac)** .	
1	Front Bumper Fascia Headlamp Opening Flange Support Bolt (Qty: 2) **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution .
2	Front Bumper Fascia Headlamp Opening Flange Support **Procedure** Pull the front bumper fascia headlamp opening flange support straight down to clear the headlamp locating tabs.

HEADLAMP AIMING

Headlamp aiming is done with the low beam lamps. The high beam lamps will be correctly aimed if the low beam lamps are aimed properly.

Screen Method for Headlamp Aiming (Visual Aim)

The screen method requires an area set up specifically for headlamp aim.

The area should consist of a level surface large enough to allow for a vehicle and an additional 7.62 m (25 ft) as measured from the face of the headlamps to the aiming screen.

The screen should be a wall or other flat surface at least 1.52 m (5 ft) high by 3.66 m (12 ft) wide with a matte white surface well shaded from extraneous light, and 90 degrees to the floor. The screen should be provided with a permanent vertical reference line 0.61 m (2 ft) from the left edge of the screen, 2 laterally adjustable vertical tapes, and one vertically adjustable horizontal tape.

After the aiming screen has been set up and located, paint or tape a reference line on the floor 15.24 m (50 ft) from the vertical reference line on the screen. This line should be perpendicular to the aiming screen and a mark placed at 7.62 m (25 ft) from the screen.

Headlamp Aiming Procedure

1. Align the left tires of the vehicle with the reference line extending from the screen with the headlamps aligned with the reference line.
2. Remove any snow, ice or mud from the vehicle.
3. The vehicle should be fully assembled and all other work stopped while the headlamp aiming is being done.
4. The vehicle should contain cargo or be loaded to represent normal vehicle use.
5. Tires should be properly inflated.
6. Rock the vehicle to stabilize the suspension.
7. Measure from the floor to the center of the lamp bulb on the vehicle. Some lamps have an aim dot marked on the lens.

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8. At the screen, measure from the floor and place the horizontal tape at the measured distance.

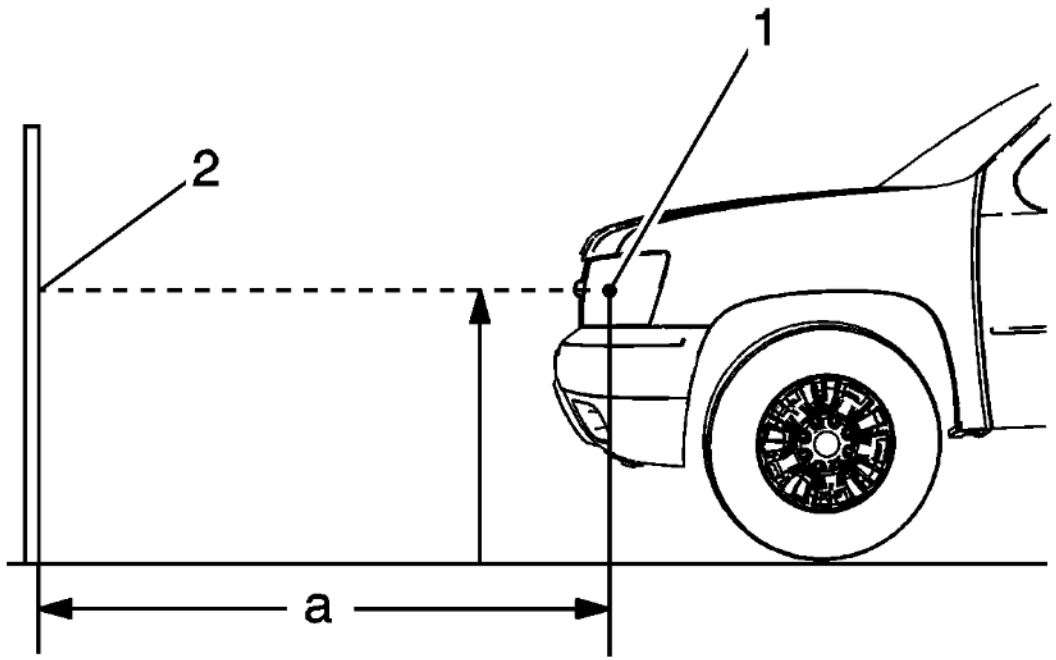


Fig. 57: Left Headlamp Bulb Centerline & Measured Distance
Courtesy of GENERAL MOTORS COMPANY

9. Measure from the reference line on the floor to the left headlamp bulb centerline (1).
10. At the screen, measure from the reference line and place the vertical tape at the measured distance (2).
11. Measure from the reference line on the floor to the right headlamp bulb centerline.

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12. At the screen, measure from the reference line and place the vertical tape at the measured distance.
13. Turn the headlamps ON.
14. Block the light from projecting onto the screen from the passenger side headlamp. This will allow the cutoff in the beam pattern from the drivers side to be more pronounced for easier aim verification.

    IMPORTANT: DO NOT cover the headlamp, this may cause excessive heat build up.

15. On this vehicle you will be verifying the aim of the vertical cutoff on the right side of the lamp vertical bulb centerline as it is projected onto the aim board.
16. If the location of the cutoff projected onto the board differs from the figure shown, then an adjustment to the beam pattern location is necessary.

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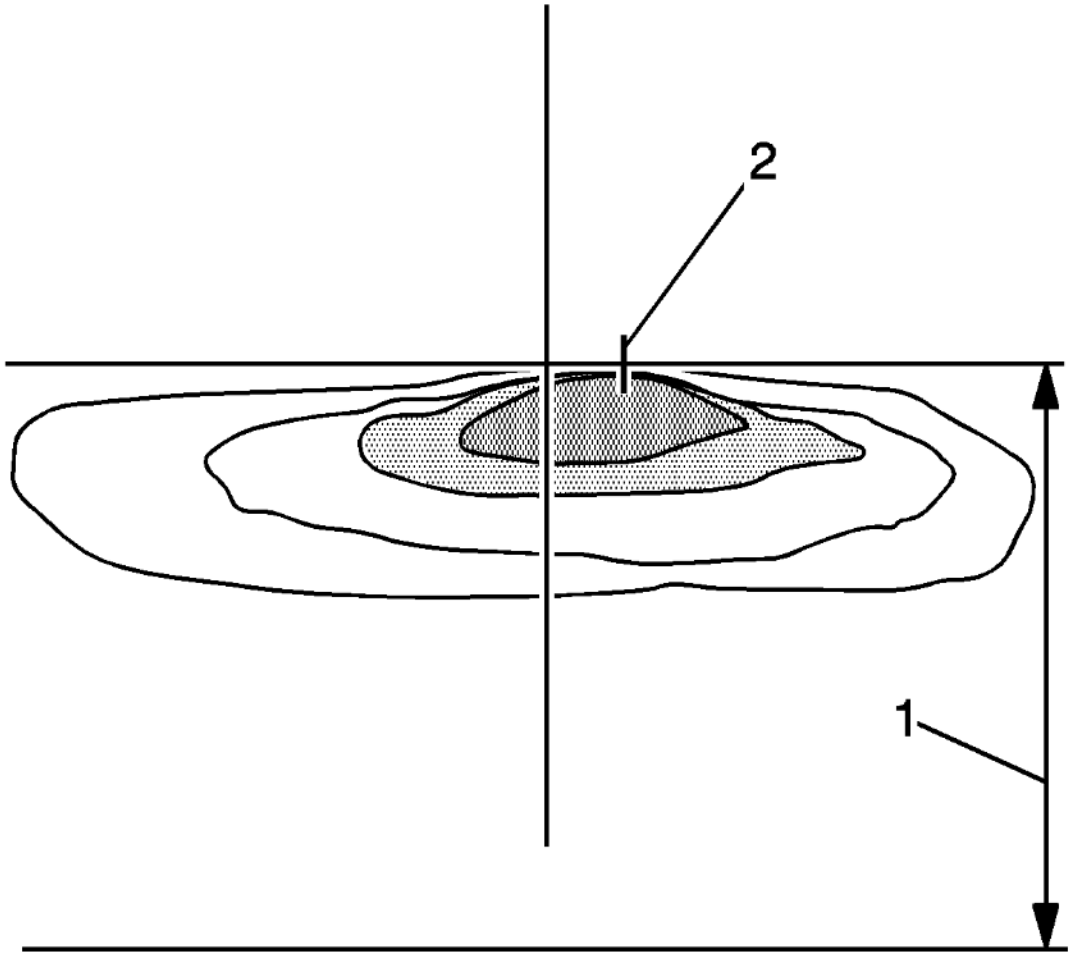


Fig. 58: Measuring Horizontal And Vertical Axis
Courtesy of GENERAL MOTORS COMPANY

17. Adjust the vertical headlamp adjustment screw until the Right Gradient Line (Cutoff Line) is set at the Horizontal Axis within +/- 2.0 inches (2) measured at 7.62 m (25 ft).
18. Verify proper aim location.
19. Repeat the aiming procedure for the passengers side headlamp while blocking the light from projecting onto the screen from the drivers side

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headlamp.

HEADLAMP CONTROL MODULE REPLACEMENT (MULTIFUNCTION LED)

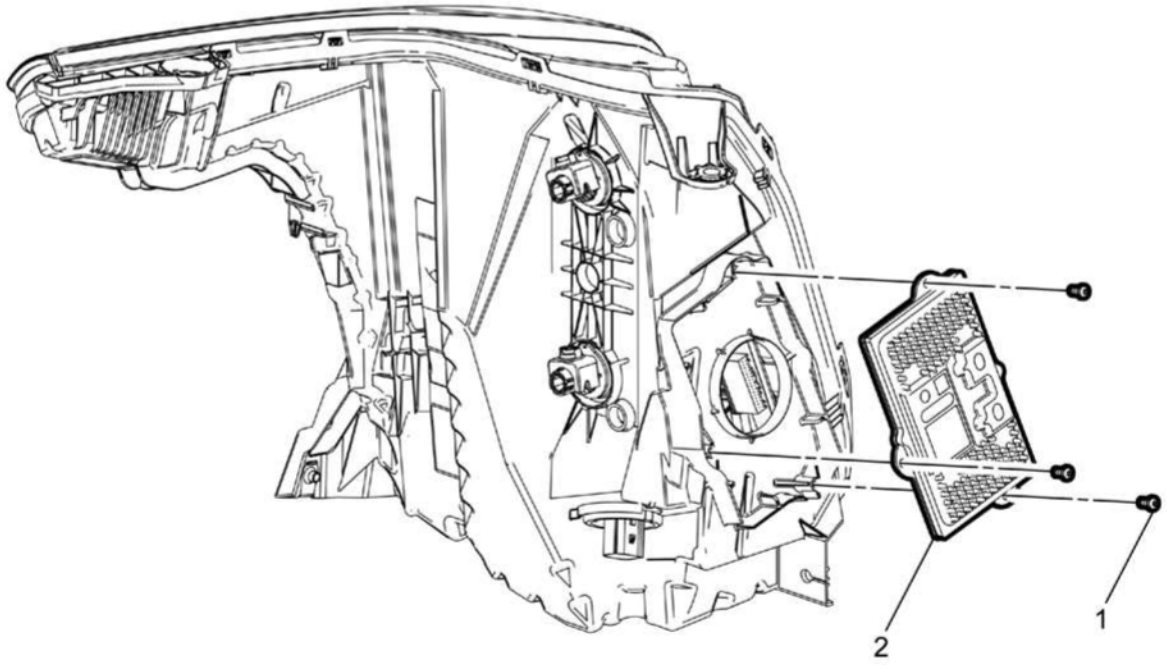


Fig. 59: Headlamp Control Module (Multifunction LED)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the headlamp. Refer to **Headlamp Replacement (GMC)Headlamp Replacement (Chevrolet)Headlamp Replacement (Cadillac)**.	
1	Headlamp Control Module Bolt (Qty: 3) **CAUTION:**

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Callout	Component Name
	Refer to **Fastener** **Caution** .
2	Headlamp Control Module **Procedure** Pull the headlamp control module straight out and disconnect the electrical connector to remove.

FRONT FOG LAMP REPLACEMENT

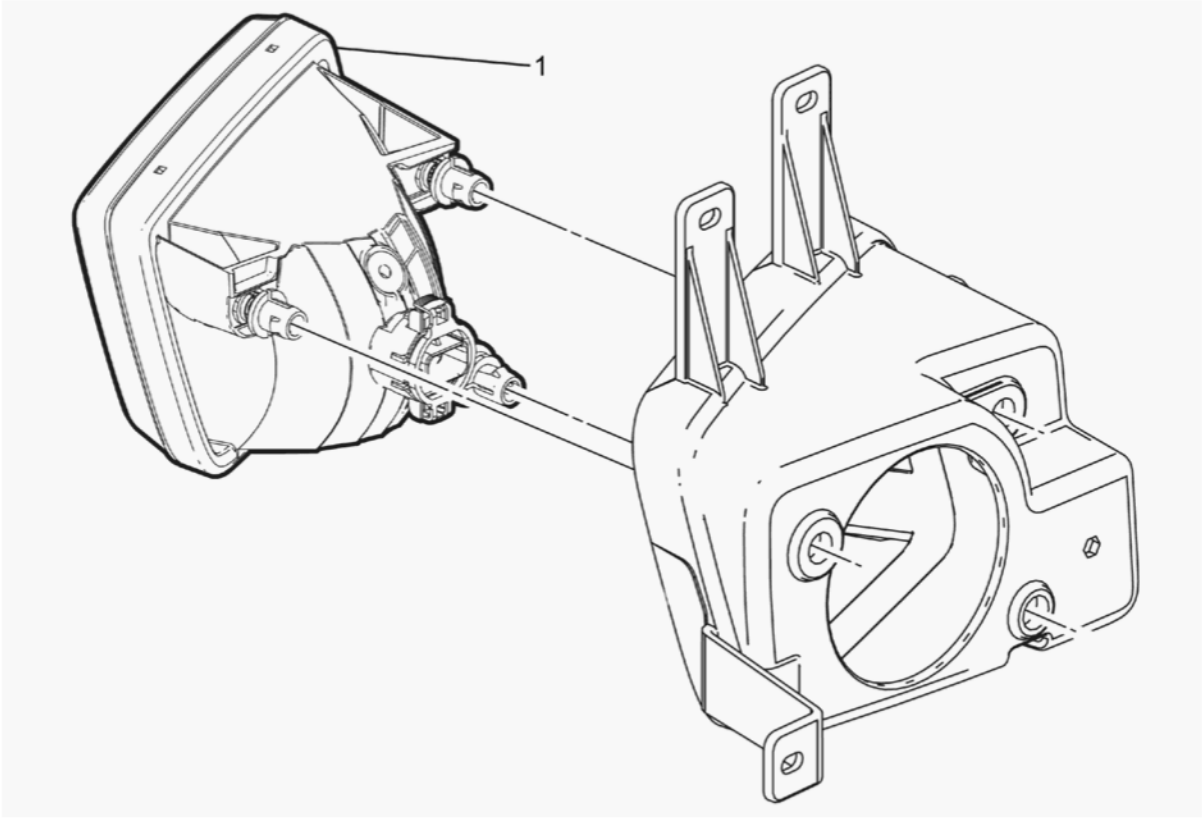


Fig. 60: Front Fog Lamp
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

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Callout	Component Name
Preliminary Procedure Remove the parking and front fog lamp bracket. Refer to **Parking and Front Fog Lamp Bracket Replacement (GMC)Parking and Front Fog Lamp Bracket Replacement (Chevrolet)**.	
1	Front Fog Lamp **Procedure** With a suitable tool release the locking tabs from the front fog lamp and pull from the front fog lamp bracket.

FRONT FOG LAMP BULB REPLACEMENT

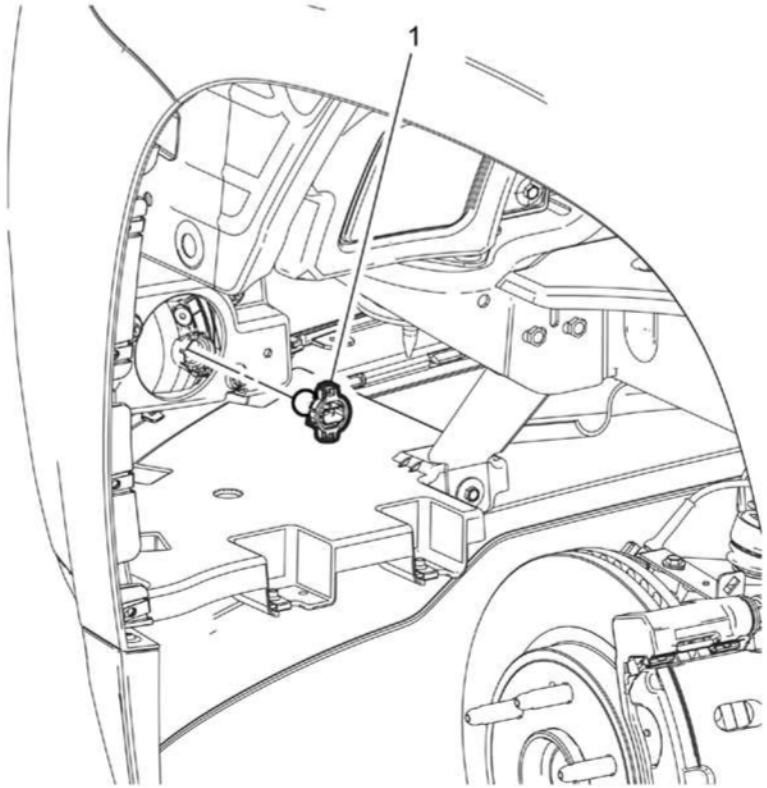


Fig. 61: Front Fog Lamp Bulb
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

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Callout	Component Name
Preliminary Procedure 1. Reposition the front wheelhouse liner-left side as necessary to gain access to the bulb. Refer to **Front Wheelhouse Liner Replacement - Left Side (Cadillac)** **Front Wheelhouse Liner Replacement - Left Side (GMC)** **Front Wheelhouse Liner Replacement - Left Side (Chevrolet)** . 2. Reposition the front wheelhouse liner-right side as necessary to gain access to the bulb. Refer to **Front Wheelhouse Liner Replacement - Right Side (Cadillac)** **Front Wheelhouse Liner Replacement - Right Side (Chevrolet)** **Front Wheelhouse Liner Replacement - Right Side (GMC)** .	
1	Front Fog Lamp Bulb **Procedure** 1. Disconnect the electrical connector. 2. Compress the front fog lamp bulbs locking tabs and pull straight back.

REAR FOG LAMP REPLACEMENT

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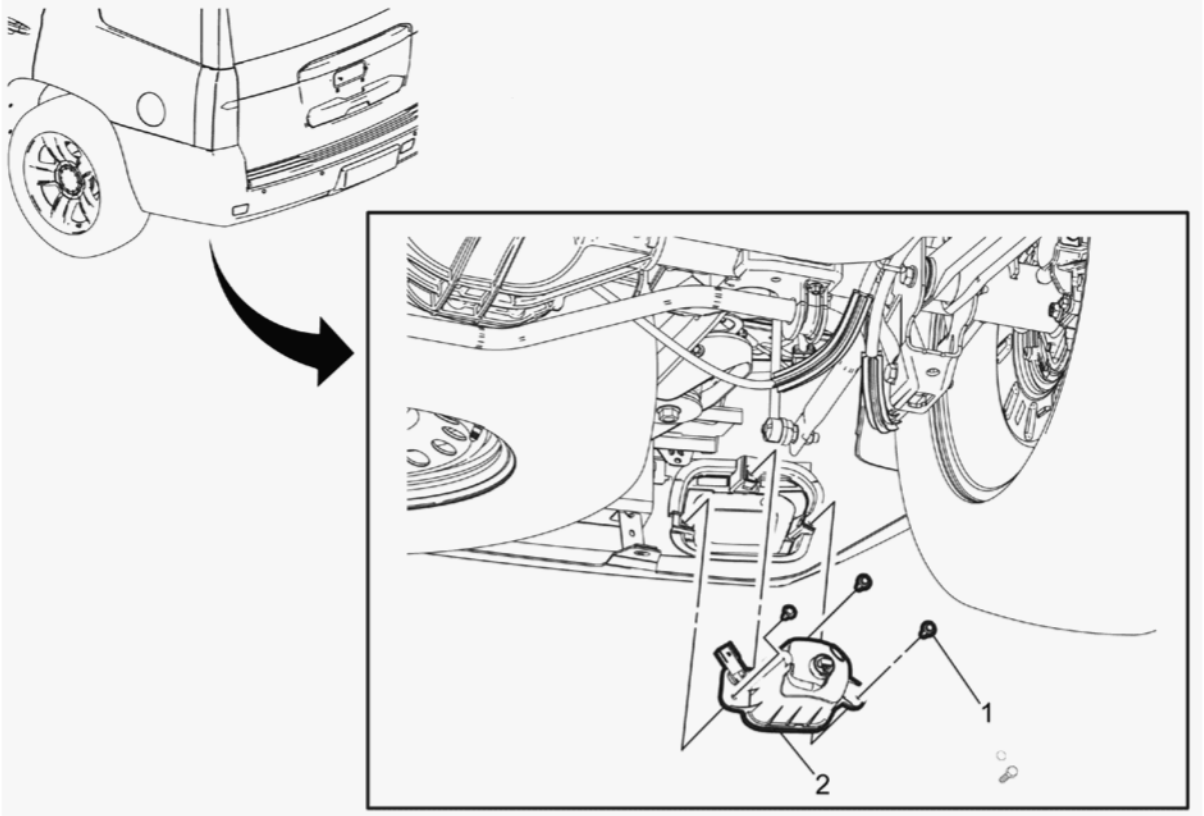


Fig. 62: Rear Fog Lamp
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Rear Fog Lamp Bolt (Qty: 3) **CAUTION:** **Refer to Fastener Caution .**
2	Rear Fog Lamp **Procedure**

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Callout	Component Name
	1. Disconnect the electrical connector. 2. Pull the rear fog lamp straight out and remove from vehicle.

REAR FOG LAMP REPLACEMENT (CADILLAC)

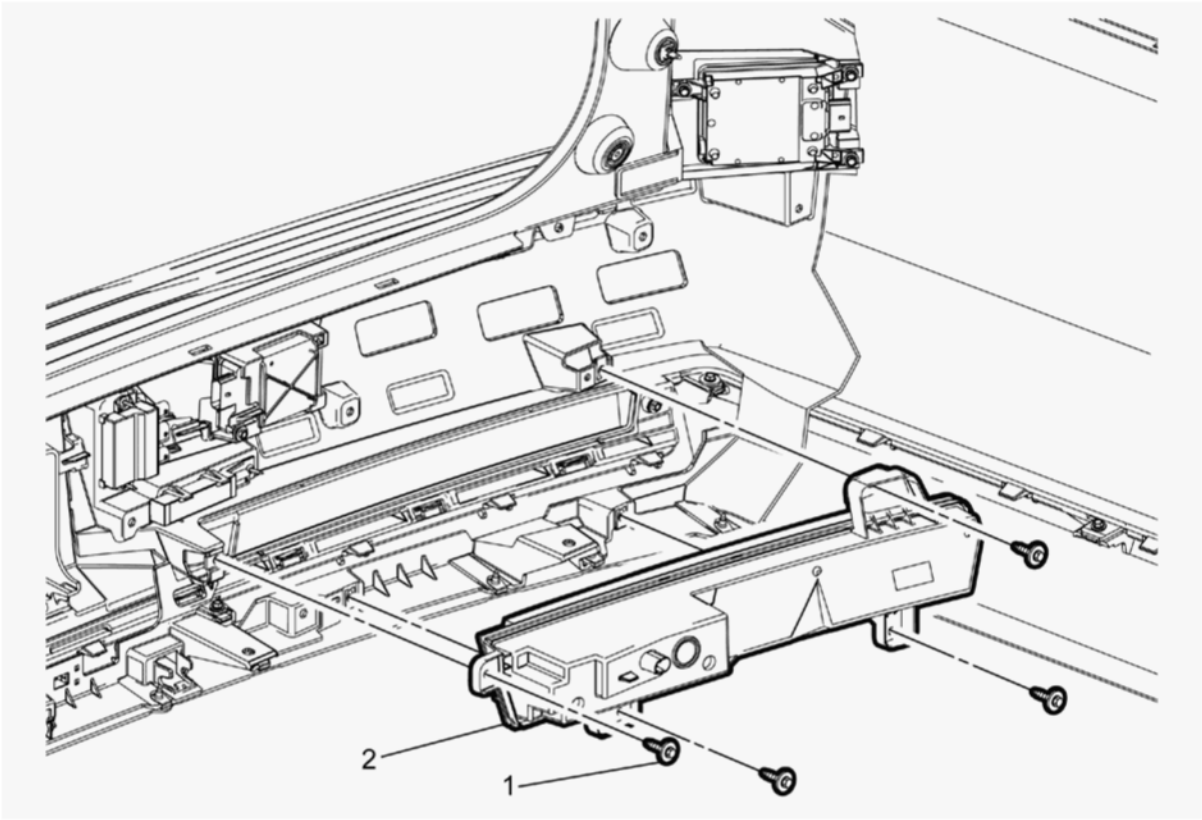


Fig. 63: Rear Fog Lamp (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the rear bumper fascia. Refer to **Rear Bumper Fascia Replacement (Cadillac)** .	

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Callout	Component Name
1	Rear Fog Lamp Bolt (Qty: 4) **CAUTION:** **Refer to** **Fastener Caution .**
2	Rear Fog Lamp **Procedure** 1. Disconnect the electrical connector, if equipped. 2. Pull the rear fog lamp straight out and remove from vehicle.

REAR FOG BULB REPLACEMENT

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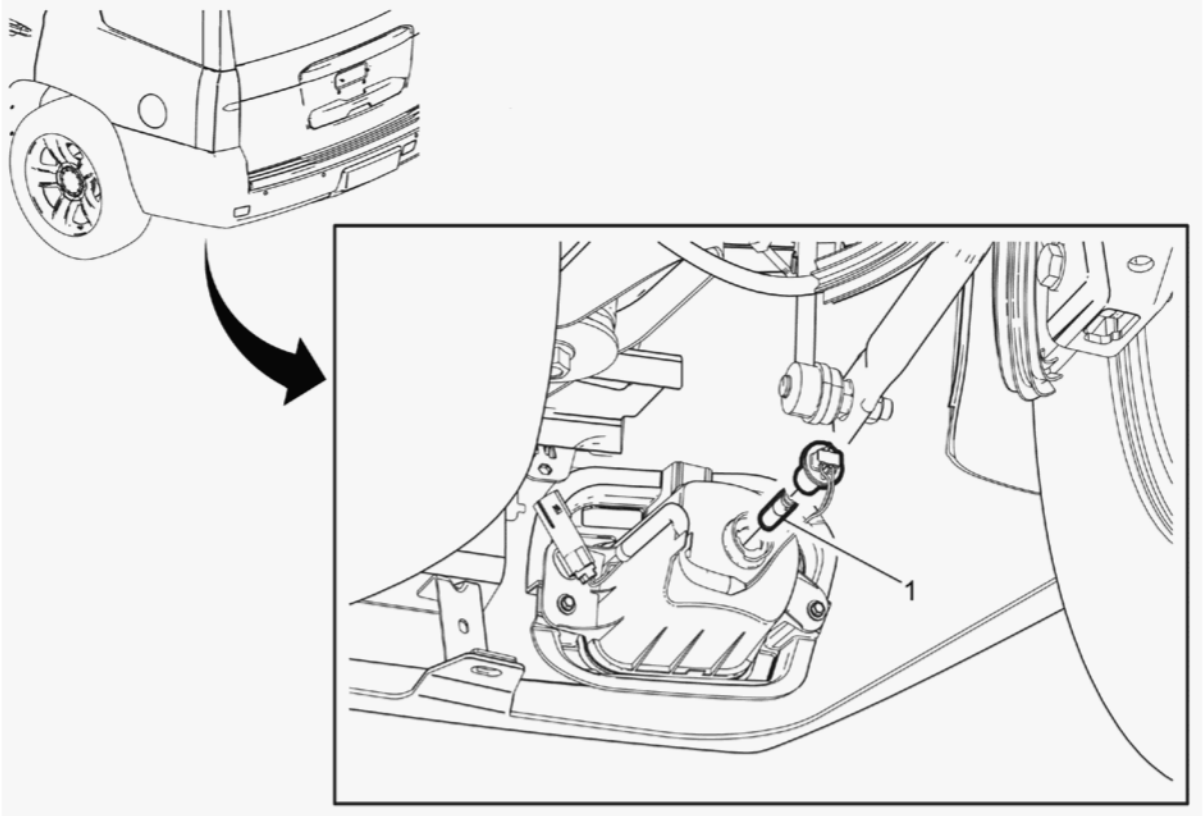


Fig. 64: Rear Fog Bulb
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Rear Fog Bulb **Procedure** 1. Rotate the bulb socket counterclockwise and pull from the rear fog lamp. 2. Pull the rear fog bulb straight out to remove from socket.

FRONT FOG LAMP OPENING COVER REPLACEMENT

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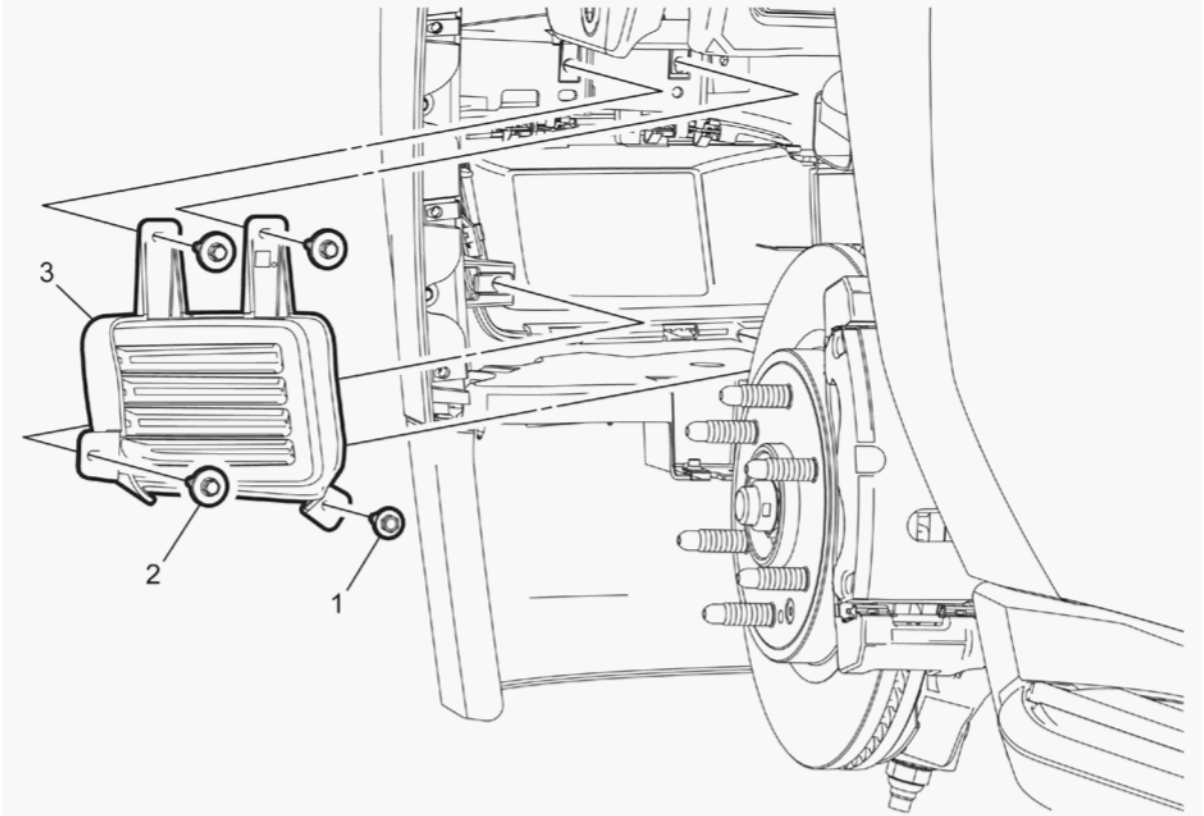


Fig. 65: Front Fog Lamp Opening Cover
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Reposition the front of the wheelhouse liner as needed to gain access to the part. Refer to **Front Wheelhouse Liner Replacement - Left Side (Cadillac)** **Front Wheelhouse Liner Replacement - Left Side (GMC)** **Front Wheelhouse Liner Replacement - Left Side (Chevrolet)** , or **Front Wheelhouse Liner Replacement - Right Side (Cadillac)** **Front Wheelhouse Liner Replacement - Right Side (Chevrolet)** **Front Wheelhouse Liner Replacement - Right Side (GMC)** .	
1	Front Fog Lamp Opening Cover Bolt **CAUTION:** **Refer to** **Fastener**

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Callout	Component Name
	Caution .
2	Front Fog Lamp Opening Cover Bolt (Qty: 3) CAUTION: Refer to Fastener Caution .
3	Front Fog Lamp Opening Cover

FOG LAMP AIMING

The front fog lamps must be aimed for proper illumination of the road. The front fog lamp aim should be checked when a new front fog lamp assembly is installed, or if service or repairs in the front end area may have disturbed the front fog lamp mounting.

Preparation Procedure

IMPORTANT: Horizontal aim is not adjustable on this vehicle. Vertical aim is adjusted by an adjusting screw located on the bottom rear of the fog lamp. Prior to aiming the fog lamps, perform the following steps:

1. Completely assemble all of the components on the vehicle.
2. Park the vehicle on a level surface.
3. Stop all unnecessary operations or work on the vehicle that affect the vehicle trim.
4. Close the doors and ensure that the vehicle has no load other than the driver.
5. Stabilize the suspension by rocking the vehicle sideways.
6. Ensure that the fuel level is 1/2 full.
7. Ensure that the tires are inflated to the proper pressure.
8. Ensure that the driver or a similar weight, approximately 75 kg (165 lb), is in the vehicle driver seat.

Aiming Procedure

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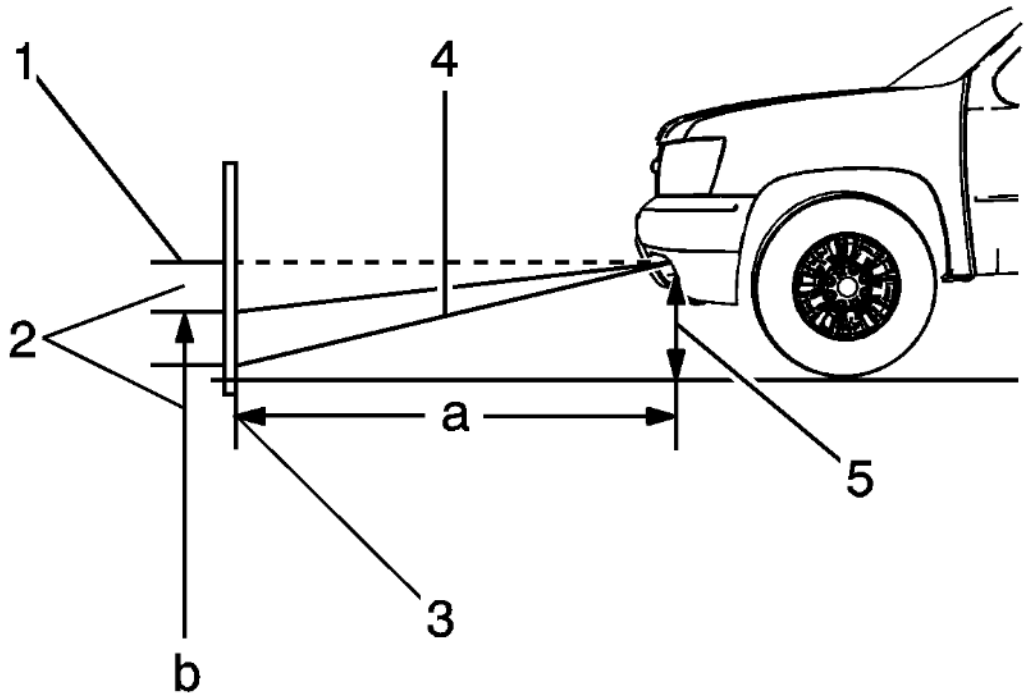


Fig. 66: Fog Lamp Aiming Procedure
Courtesy of GENERAL MOTORS COMPANY

1. Park the vehicle on a level surface 7.6 m (25 ft) (3) away from a wall or other flat surface.
2. Measure the distance from the floor to the center of the fog lamp (5).
3. Using this measurement, mark the horizontal centerline of the fog lamp (1) on the flat surface directly in front of the vehicle.
4. Remove the front portion of the front wheel liner in order to access the adjusting screw.

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5. Turn ON the fog lamps.
6. Reach inside of the front portion of the fender liner in order to access the fog lamp vertical adjustment screw on the bottom of the fog lamp.
7. Adjust the fog lamp so that the top edge of the fog lamp beam pattern is 100 mm (4 in) below the horizontal centerline (2).
8. Turn OFF the fog lamps.
9. Secure the forward edge of the front fender liner.

FRONT SIDE TURN SIGNAL LAMP REPLACEMENT

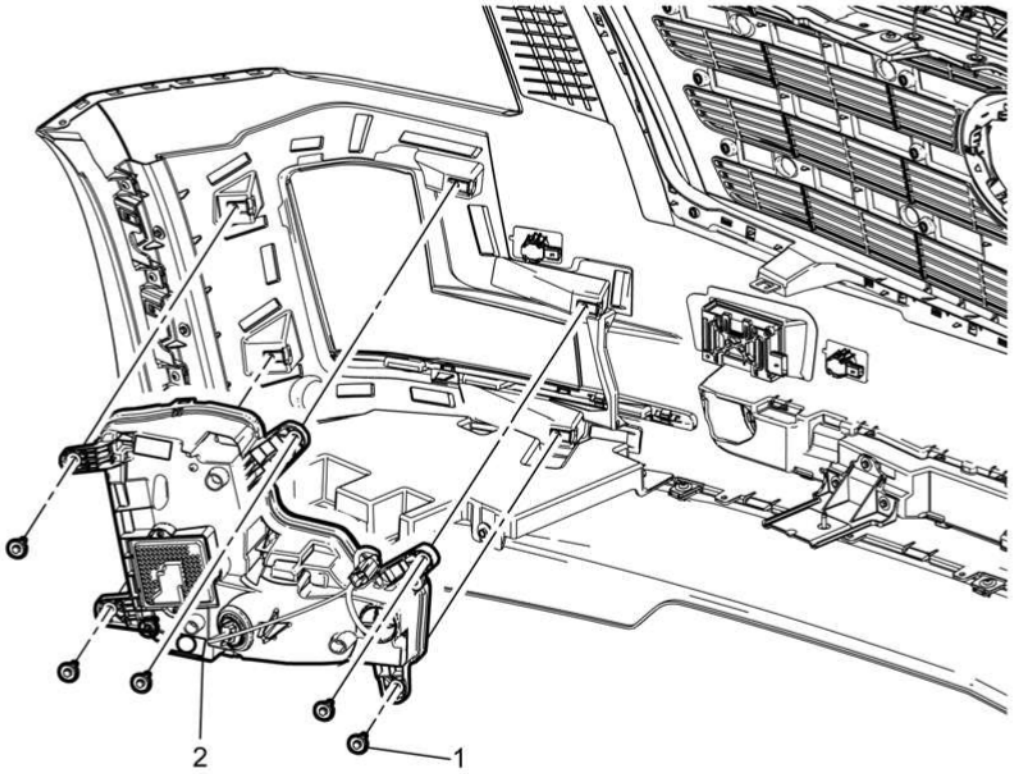


Fig. 67: Front Side Turn Signal Lamp
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	

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Callout	Component Name
1. Remove the auxiliary side front turn signal bulb replacement. Refer to **Auxiliary Side Front Turn Signal Lamp Bulb Replacement (Left Side)** **Auxiliary Side Front Turn Signal Lamp Bulb Replacement (Right Side)**. 2. Remove the front bumper fascia. Refer to **Front Bumper Fascia Replacement (GMC)** **Front Bumper Fascia Replacement (Chevrolet)** **Front Bumper Fascia Replacement (Cadillac)** .	
1	Front Side Turn Signal Lamp Bolt (Qty: 5) **CAUTION:** **Refer to Fastener Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Front Side Turn Signal Lamp **Procedure** Disconnect the electrical connector.

AUXILIARY SIDE FRONT TURN SIGNAL LAMP BULB REPLACEMENT (LEFT SIDE)

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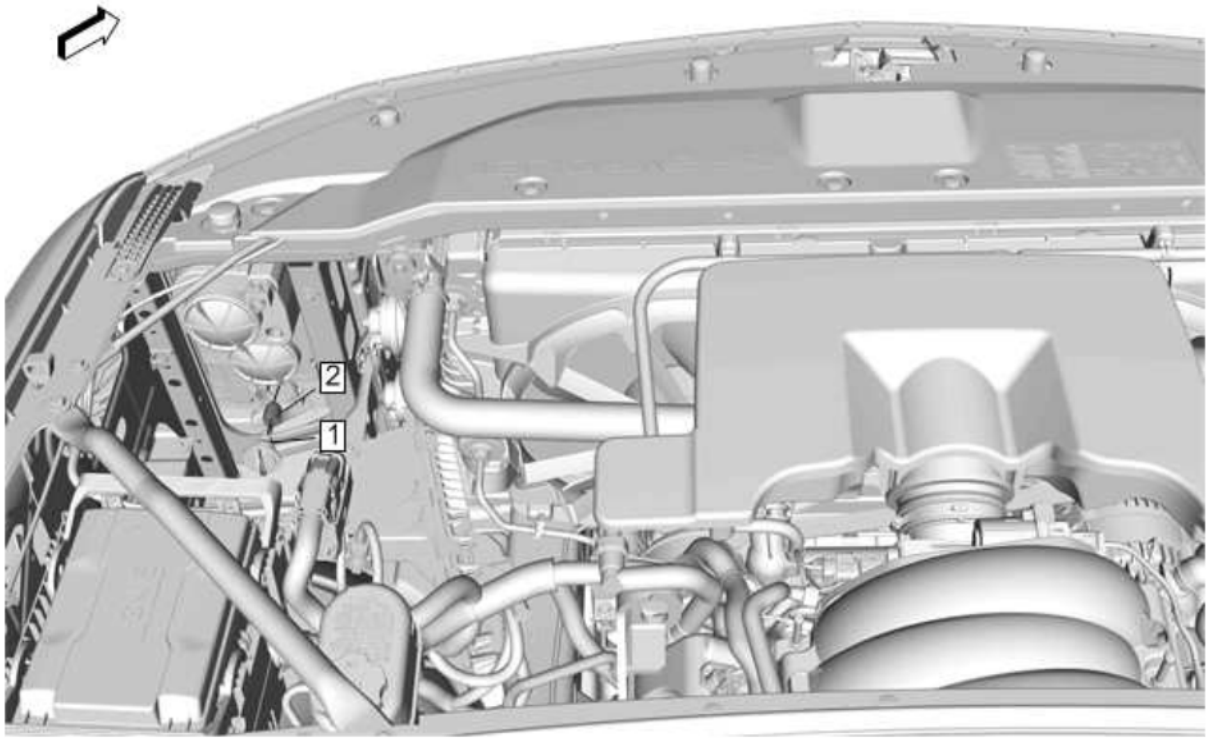


Fig. 68: Auxiliary Side Front Turn Signal Lamp Bulb (Left Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove Windshield Washer Solvent Container. Refer to **Windshield Washer Solvent Container Replacement (Chevrolet/GMC)** **Windshield Washer Solvent Container Replacement (Cadillac)**	
1	Auxiliary Side Front Turn Signal Lamp Socket **Procedure** Rotate the bulb socket counterclockwise and pull from the headlamp.
2	Auxiliary Side Front Turn Signal Lamp Bulb - Left Side **Procedure** Pull the bulb straight out from the socket.

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AUXILIARY SIDE FRONT TURN SIGNAL LAMP BULB REPLACEMENT (RIGHT SIDE)

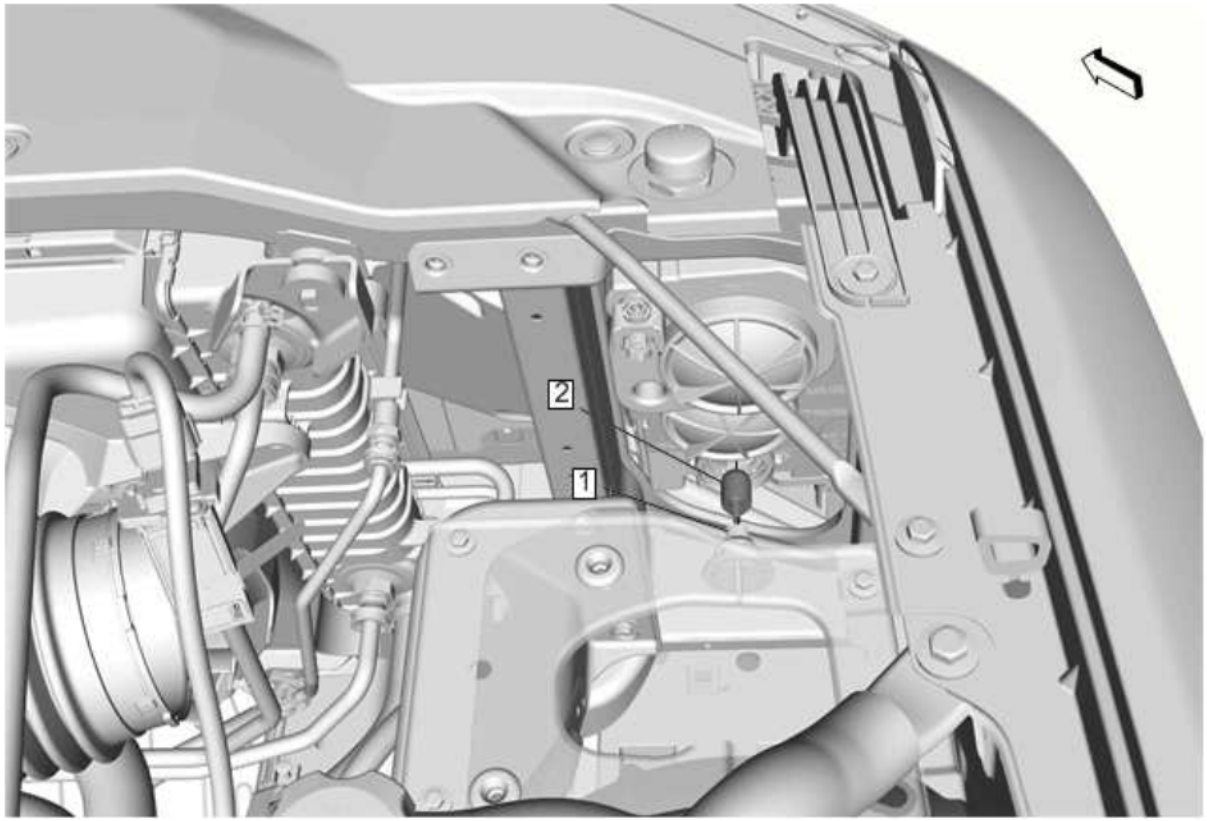


Fig. 69: Auxiliary Side Front Turn Signal Lamp Bulb (Right Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove Air Cleaner Assembly. Refer to **Air Cleaner Assembly Replacement** 2. Remove Radiator Air Upper Baffle and Deflector. Refer to **Radiator Air Upper Baffle and Deflector Replacement (Top of Radiator L83 L86)** **Radiator Air Upper Baffle and Deflector Replacement (Right of Radiator L83 L86)**	
1	Auxiliary Side Front Turn Signal Lamp Socket **Procedure**

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Callout	Component Name
	Rotate the bulb socket counterclockwise and pull from the headlamp.
2	Auxiliary Side Front Turn Signal Lamp Bulb - Right Side **Procedure** Pull the bulb straight out from the socket.

PARKING AND FRONT FOG LAMP BRACKET REPLACEMENT (GMC)

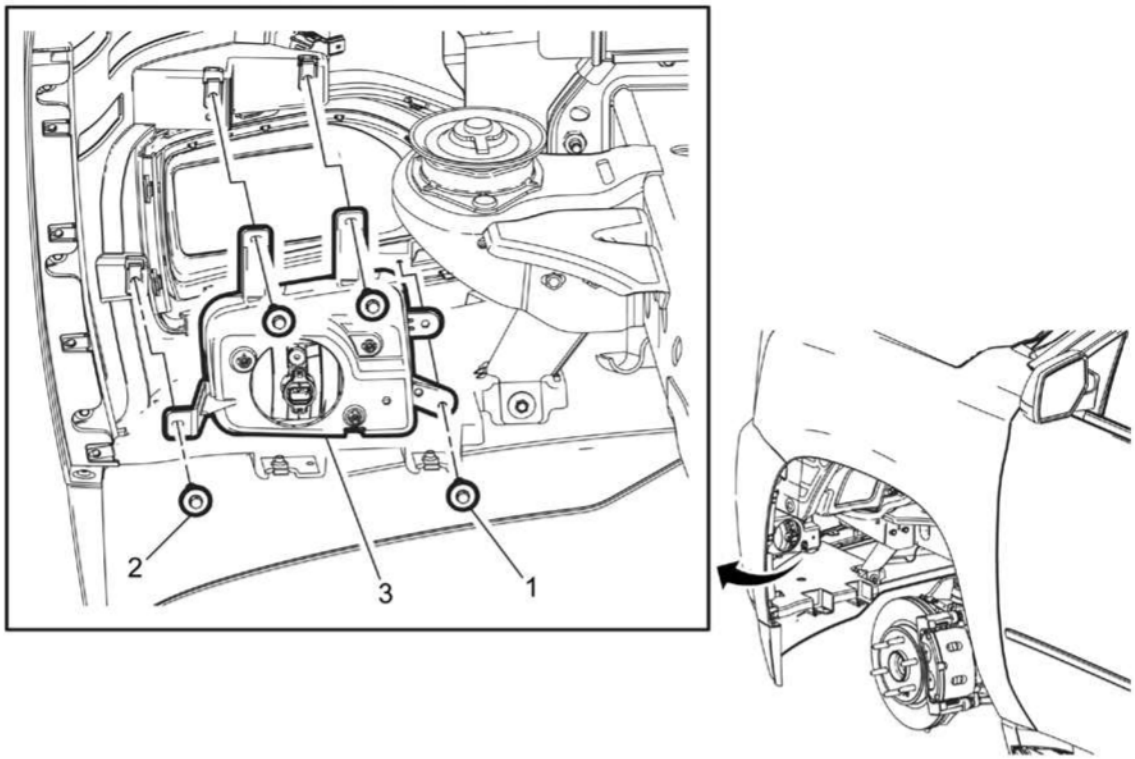


Fig. 70: Parking and Front Fog Lamp Bracket (GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Reposition the front of the front wheelhouse liner as needed to gain access to the part. Refer to **Front Wheelhouse Liner Replacement -**	

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Callout	Component Name
Left Side (Cadillac) Front Wheelhouse Liner Replacement - Left Side (GMC) Front Wheelhouse Liner Replacement - Left Side (Chevrolet) , or Front Wheelhouse Liner Replacement - Right Side (Cadillac) Front Wheelhouse Liner Replacement - Right Side (Chevrolet) Front Wheelhouse Liner Replacement - Right Side (GMC) .	
1	Front Fog Lamp Bracket Bolt **CAUTION:** **Refer to Fastener Caution .**
2	Front Fog Lamp Bracket Bolt (Qty: 3) **CAUTION:** **Refer to Fastener Caution .**
3	Front Fog Lamp **Procedure** 1. Disconnect the electrical connector. 2. Pull the front fog lamp bracket straight out and remove from vehicle.

PARKING AND FRONT FOG LAMP BRACKET REPLACEMENT (CHEVROLET)

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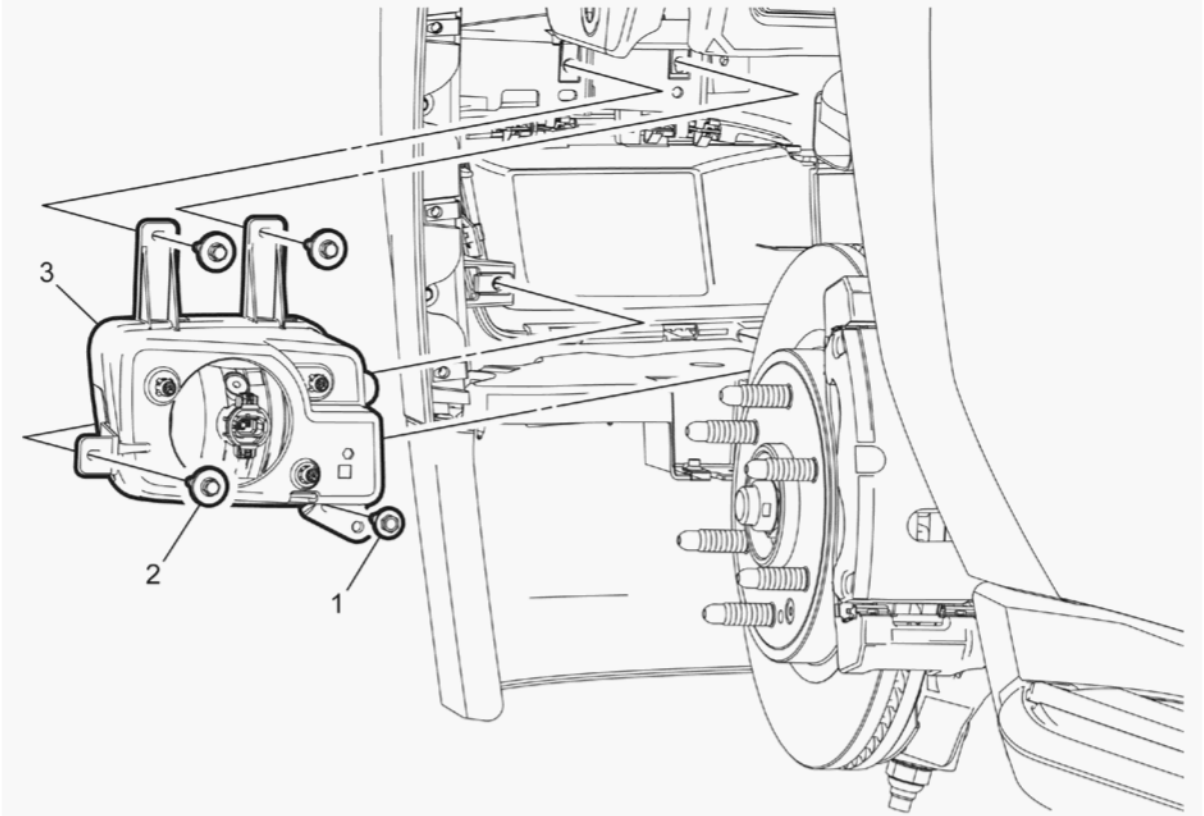


Fig. 71: Parking and Front Fog Lamp Bracket (Chevrolet)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Reposition the front of the front wheelhouse liner as needed to gain access to the part. Refer to **Front Wheelhouse Liner Replacement - Left Side (Chevrolet)** , or **Front Wheelhouse Liner Replacement - Right Side (Chevrolet)** .	
1	Front Fog Lamp Bracket Bolt **CAUTION:** **Refer to** **Fastener Caution** .

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Callout	Component Name
2	Front Fog Lamp Bracket Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener Caution .**
3	Front Fog Lamp **Procedure** 1. Disconnect the electrical connector. 2. Pull the front fog lamp bracket straight out and remove from vehicle.

HIGH MOUNT STOP LAMP REPLACEMENT

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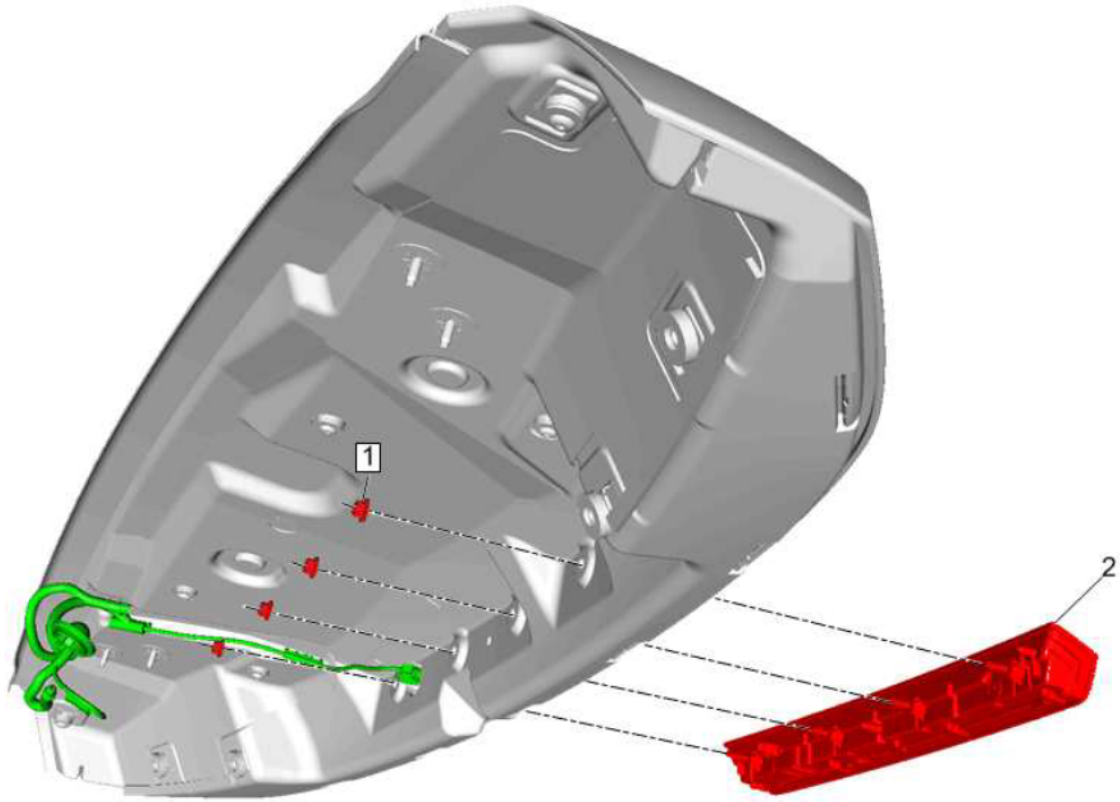


Fig. 72: High Mount Stop Lamp
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove Rear End Spoiler Retainer Cover. Refer to **Rear End Spoiler Retainer Cover Replacement (Rear End Spoiler)** **Rear End Spoiler Retainer Cover Replacement (Liftgate)**	
1	High Mount Stop Lamp Nut (Qty: 4) **CAUTION:** **Refer to** **Fastener Caution** .

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Callout	Component Name
	Tighten 2 N.m (18 lb in)
2	High Mount Stop Lamp **Procedure** 1. Disconnect the electrical connector. 2. Transfer components as necessary. **NOTE:** **The high mount stop lamp is (LED) light emitting diode and is replaced as an assembly.**

REAR BODY STRUCTURE STOP LAMP REPLACEMENT

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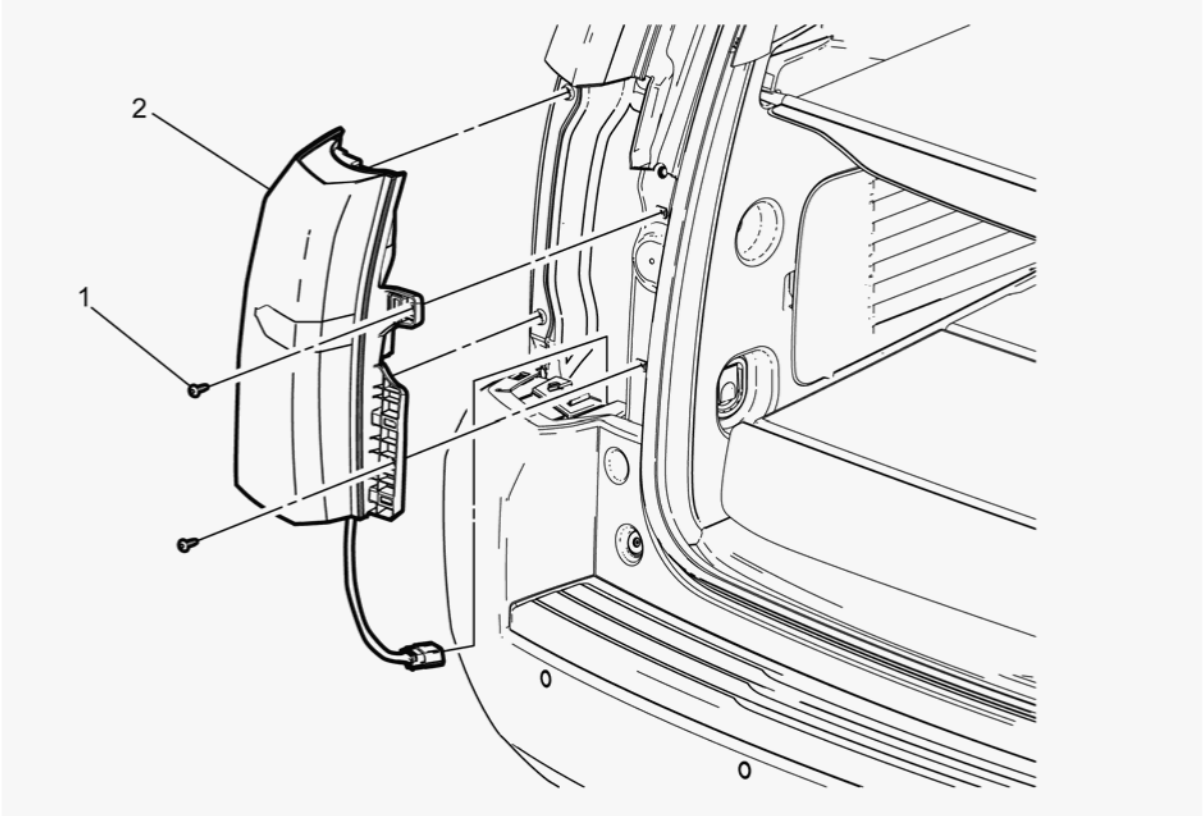


Fig. 73: Rear Body Structure Stop Lamp
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the back body opening side gutter-lower. Refer to **Back Body Opening Side Gutter Replacement - Lower (Chevrolet, GMC)** **Back Body Opening Side Gutter Replacement - Lower (Cadillac)** .	
1	Rear Body Structure Stop Lamp Bolt (Qty: 2) **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
	Tighten 2.5 N.m (25 lb in)
2	Rear Body Structure Stop Lamp **Procedure** 1. From underneath the rear bumper fascia disconnect the electrical connector. 2. Firmly grasp the rear body structure stop lamp and pull straight back to release from vehicle.

REAR BODY STRUCTURE STOP LAMP REPLACEMENT (ESCALADE)

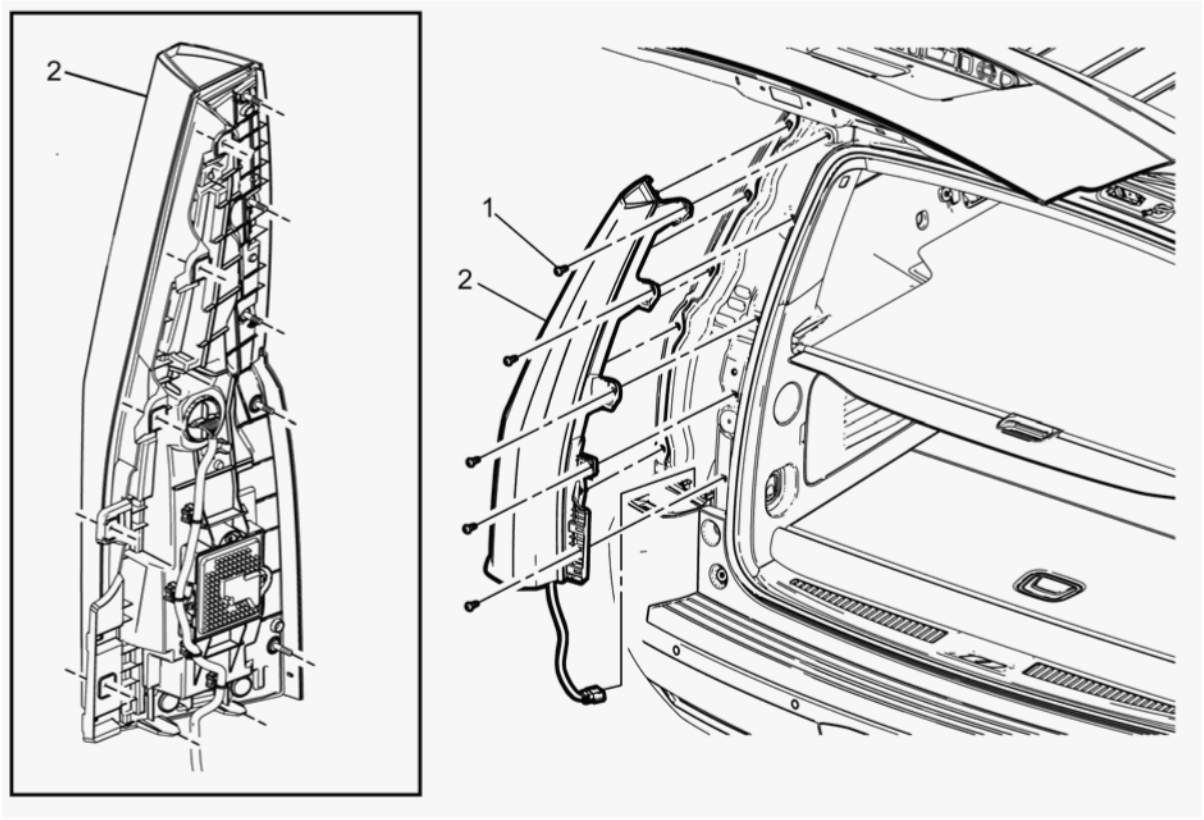


Fig. 74: Rear Body Structure Stop Lamp (Escalade)

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Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the back body opening side gutter-lower. Refer to **Back Body Opening Side Gutter Replacement - Lower (Cadillac)** . 2. Remove the back body opening side gutter-upper. Refer to **Back Body Opening Side Gutter Replacement - Upper (Cadillac)** .	
1	Rear Body Structure Stop Lamp Bolt (Qty: 5) **CAUTION:** **Refer to Fastener Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Rear Body Structure Stop Lamp **Procedure** 1. From underneath the rear bumper fascia disconnect the electrical connector. 2. Firmly grasp the rear body structure stop lamp and pull straight back to release from vehicle.

CARGO CENTER COURTESY LAMP REPLACEMENT

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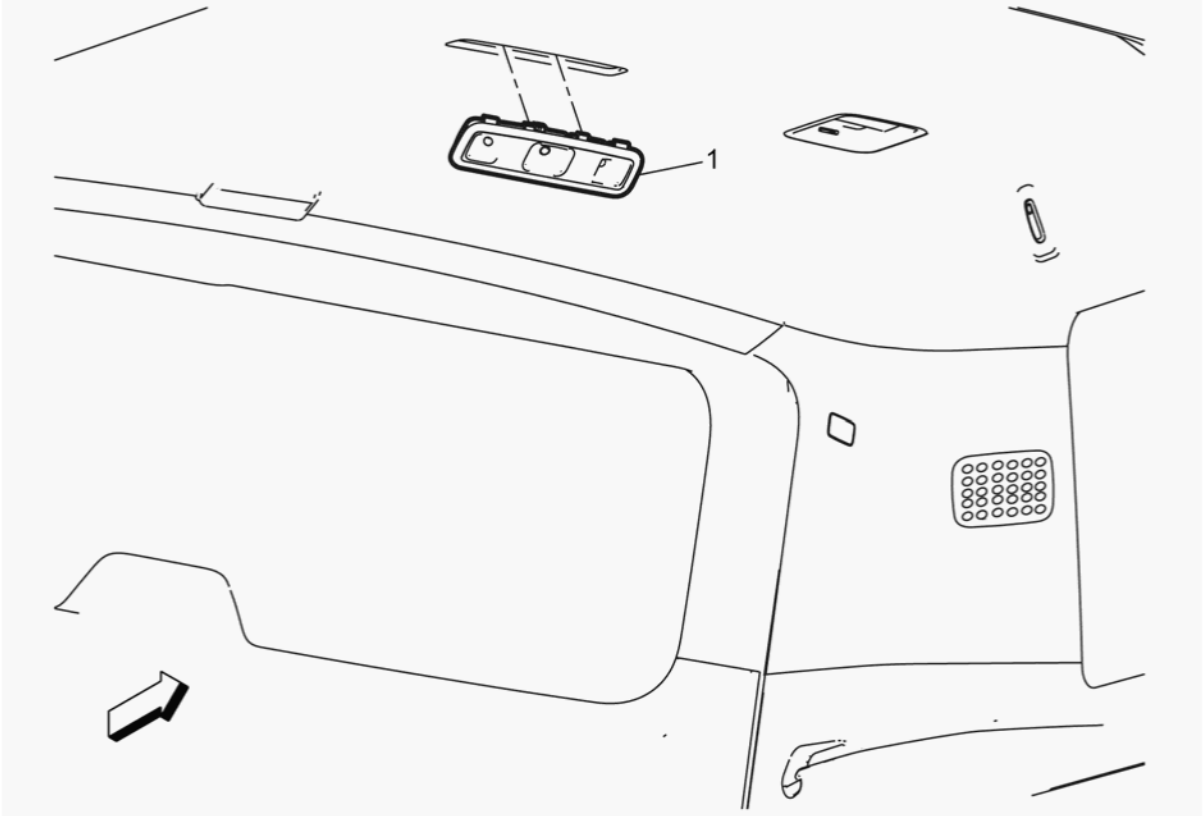


Fig. 75: Cargo Center Courtesy Lamp
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Cargo Center Courtesy Lamp **Procedures** 1. Grasp the courtesy lamp assembly and pull downward to release the retainer clips securing the assembly to the headliner. 2. Disconnect the electrical connections.

BACKUP BULB REPLACEMENT (GMC)

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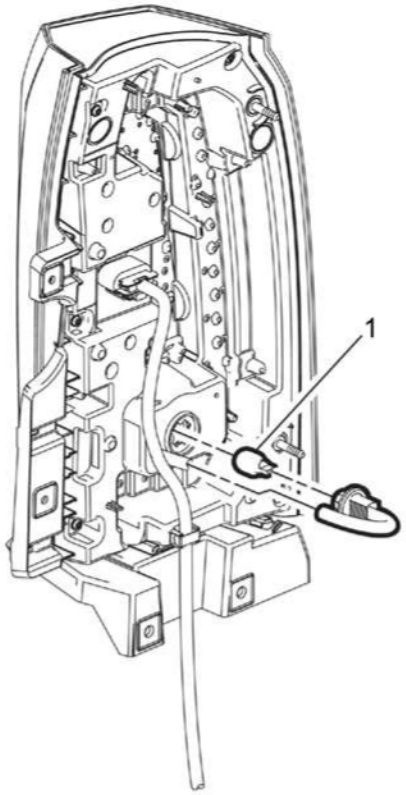


Fig. 76: Backup Bulb (GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the rear body structure stop lamp. Refer to **Rear Body Structure Stop Lamp Replacement**.	
1	Rear License Plate Lamp **Procedure** 1. Rotate the bulb socket counterclockwise and pull from the rear body structure stop lamp. 2. Pull backup bulb straight out from the rear lamp wiring harness.

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BACKUP BULB REPLACEMENT (CHEVROLET)

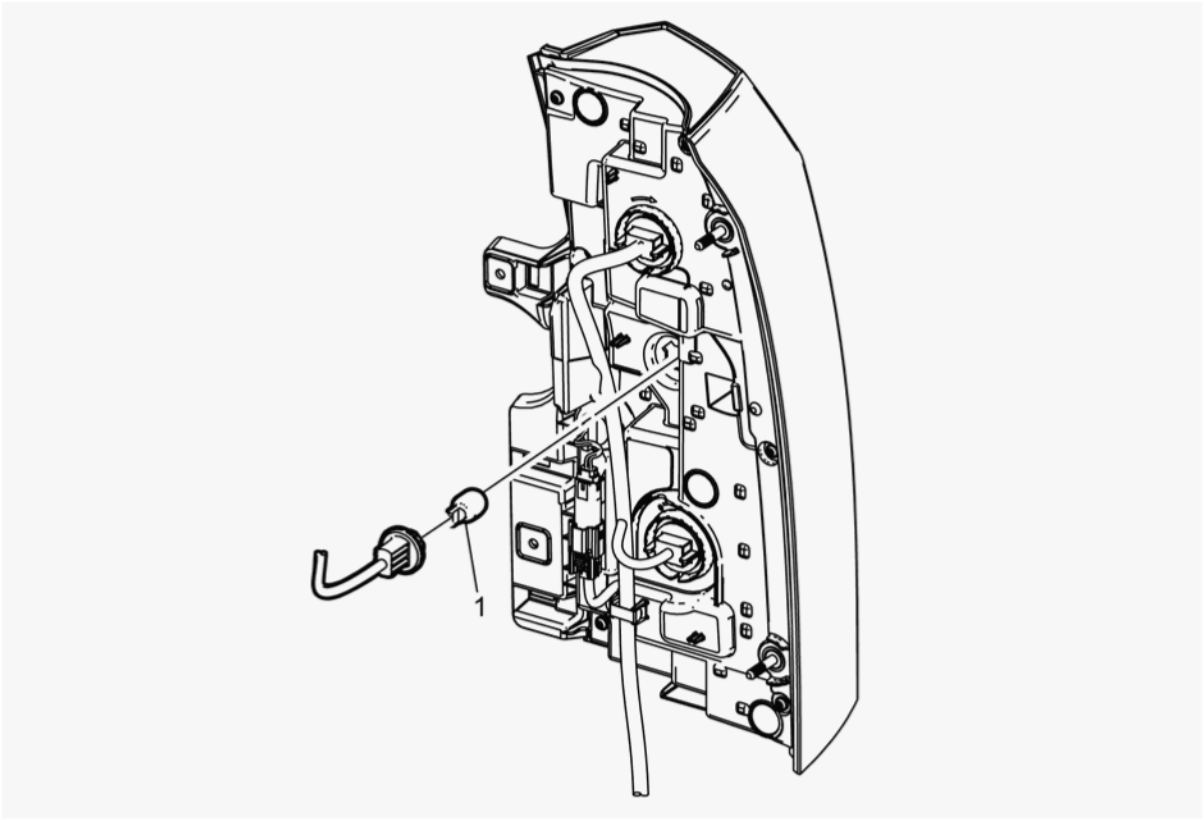


Fig. 77: Backup Bulb (Chevrolet)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the rear body structure stop lamp. Refer to **Rear Body Structure Stop Lamp Replacement**.	
1	Backup Bulb **Procedure** 1. Rotate the bulb socket counterclockwise and pull from the rear body structure stop lamp. 2. Pull backup bulb straight out from the rear lamp wiring harness socket.

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REAR LICENSE PLATE LAMP REPLACEMENT

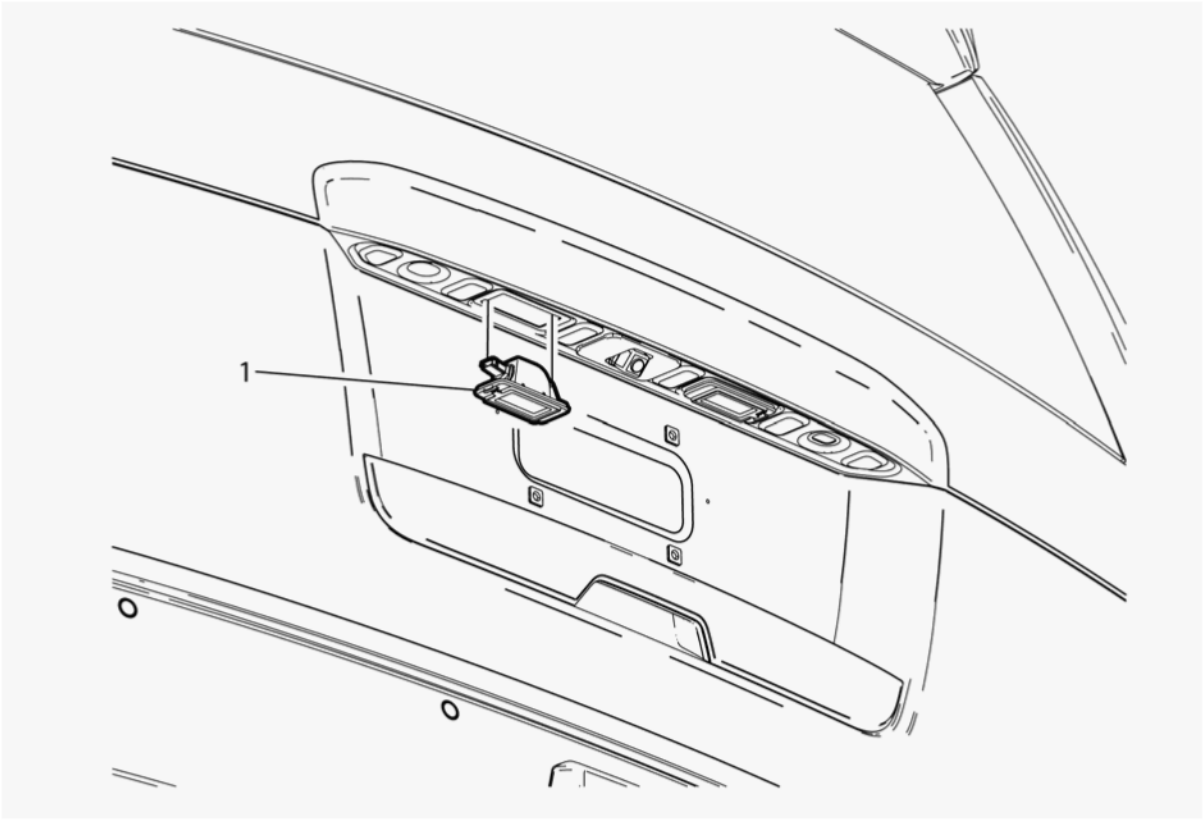


Fig. 78: Rear License Plate Lamp
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Rear License Plate Lamp **Procedure** 1. Use a flat bladed tool to compress the outboard end of the rear license plate lamp and release from the rear liftgate. 2. Disconnect electrical connector and remove from vehicle.

REAR LAMP WIRING HARNESS REPLACEMENT (GMC)

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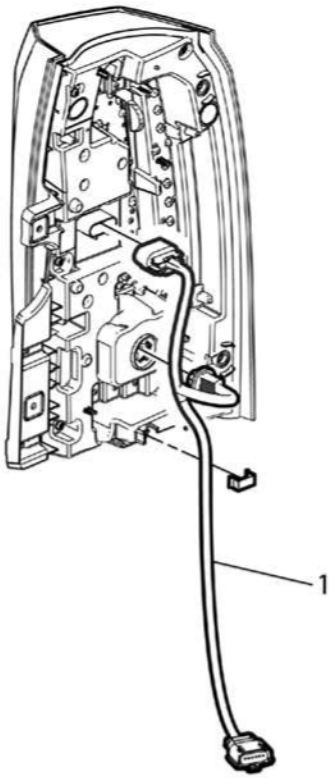


Fig. 79: Rear Lamp Wiring Harness (GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the rear body structure stop lamp. Refer to **Rear Body Structure Stop Lamp Replacement**.	
1	Rear Lamp Wiring Harness **Procedure** 1. Disconnect the electrical connector. 2. Compress the spring clip and remove from the rear body structure stop lamp. 3. Rotate the bulb socket counterclockwise and pull to remove the rear lamp wiring harness from the rear body structure stop lamp.

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REAR LAMP WIRING HARNESS REPLACEMENT (CHEVROLET)

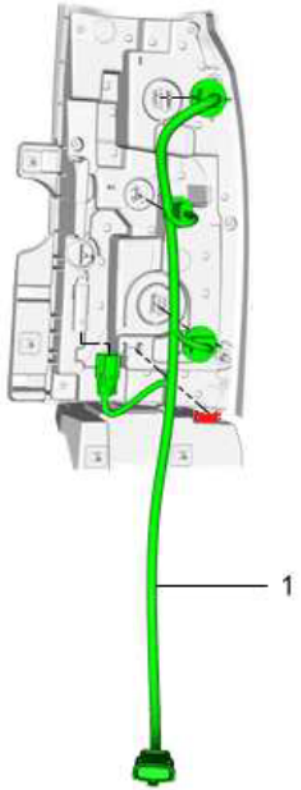


Fig. 80: Rear Lamp Wiring Harness (Chevrolet)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the rear body structure stop lamp. Refer to **Rear Body Structure Stop Lamp Replacement**.	
1	Rear Lamp Wiring Harness **Procedure** 1. Disconnect the electrical connectors. 2. Compress the spring clip and remove from the rear body structure stop lamp.

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Callout	Component Name
	3. Rotate the bulb socket counterclockwise and pull to remove the rear lamp wiring harness from the rear body structure stop lamp.

STOP AND TURN SIGNAL LAMP BULB REPLACEMENT

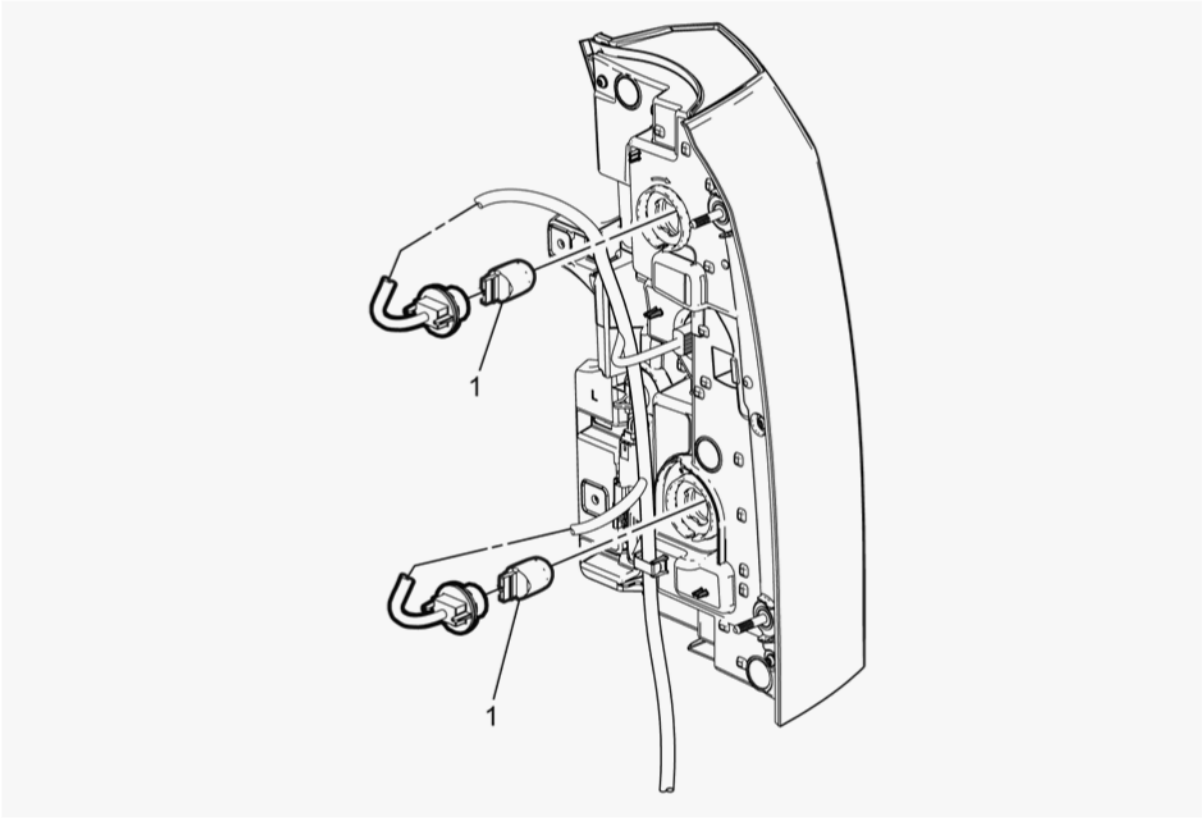


Fig. 81: Stop and Turn Signal Lamp Bulb
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	Remove the rear body structure stop lamp. Refer to **Rear Body Structure Stop Lamp ReplacementRear Body Structure Stop Lamp Replacement (Escalade)**.

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Callout	Component Name
1	Stop and Turn Signal Lamp Bulb **Procedure** 1. Rotate the bulb socket counterclockwise and pull from the rear body structure stop lamp. 2. Pull the stop and turn signal lamp bulb straight out from the socket.

SPOT LAMP REPLACEMENT

Removal Procedure

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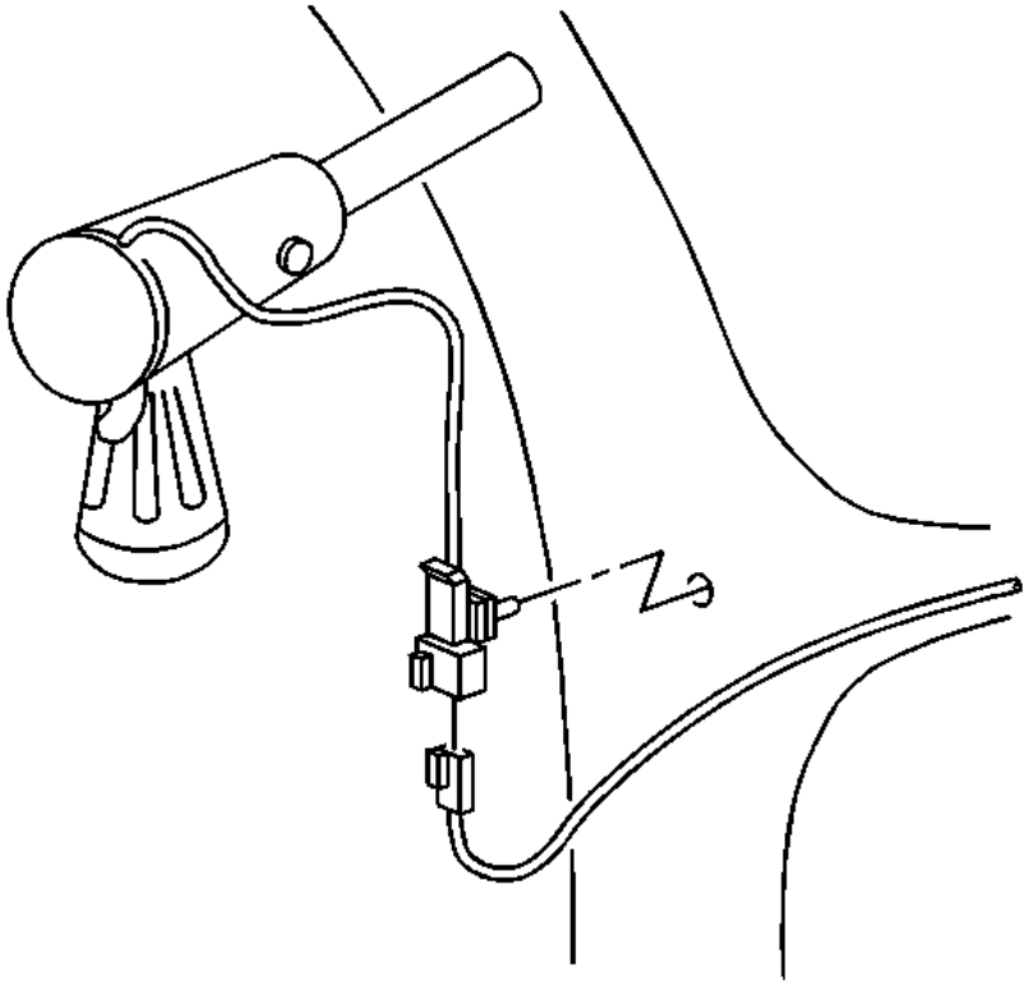


Fig. 82: Spot Lamp Wiring Harness Push-In Retainer & Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

1. Remove the spot lamp wiring harness push-in retainer from the windshield garnish molding, using a small flat bladed tool.
2. Disconnect the electrical connector.

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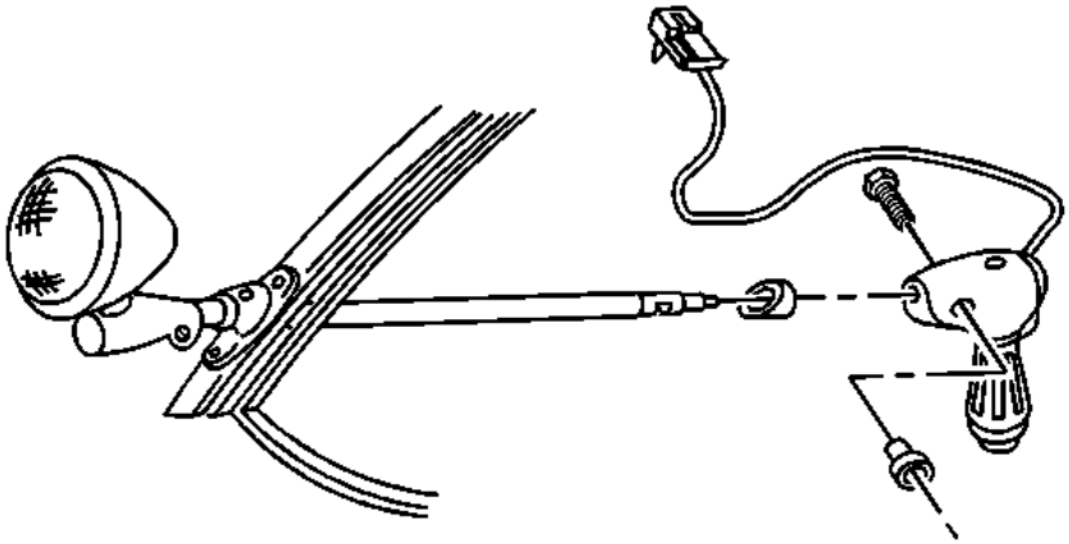


Fig. 83: Spot Lamp & Components
Courtesy of GENERAL MOTORS COMPANY

3. Remove the spot lamp handle wedge key screw from the spot lamp handle.

   Loosen the wedge key screw a few turns then with a light tap with a suitable hammer to the wedge key screw will loosen it from the spot lamp outer tube shaft.

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4. Remove the spot lamp handle from the outer tube shaft.
5. Remove the rubber grommet from the outer tube shaft.

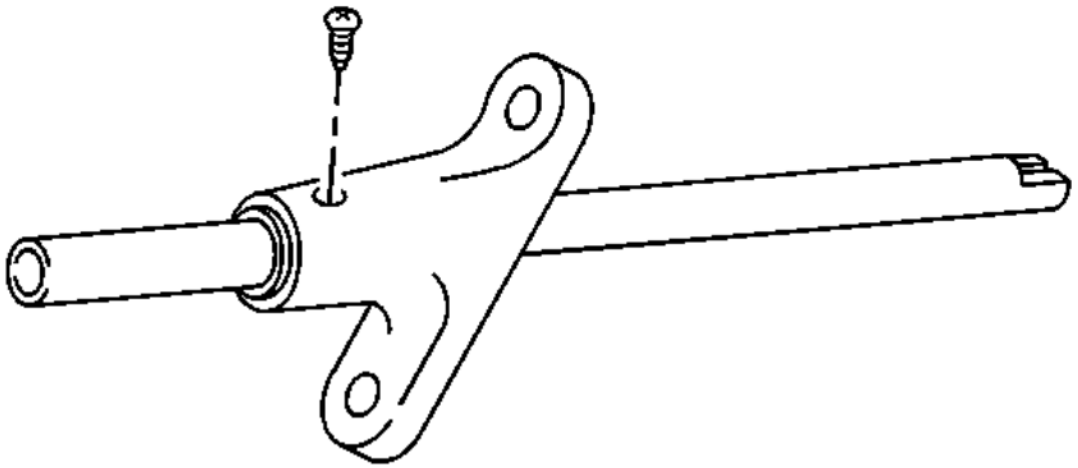


Fig. 84: Spot Lamp Bracket Set Screw
Courtesy of GENERAL MOTORS COMPANY

6. Loosen the spot lamp bracket set screw.

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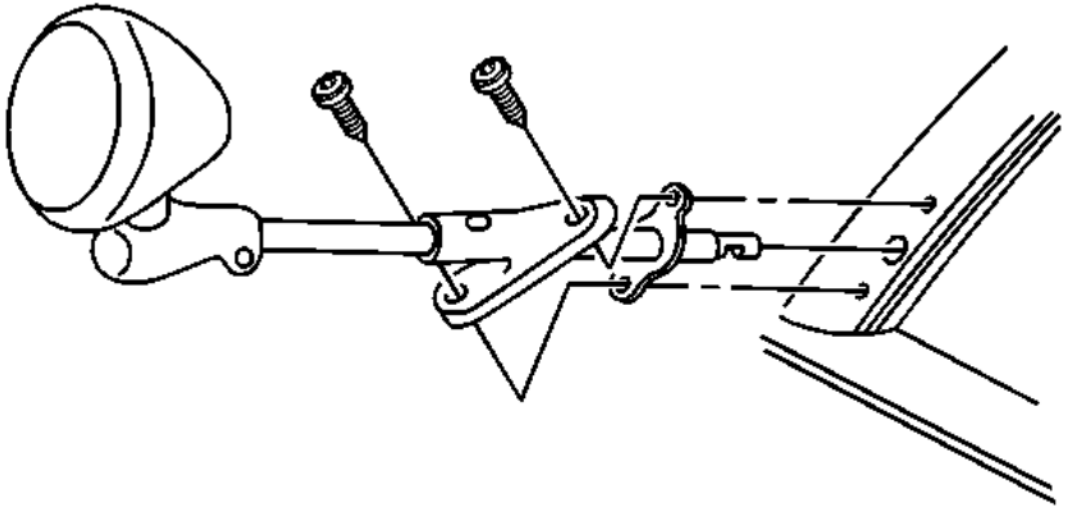


Fig. 85: Spot Lamp Mounting Bracket Screws
Courtesy of GENERAL MOTORS COMPANY

7. Pull the spot lamp with the outer tube shaft out of the spot lamp mounting bracket and set aside.
8. Remove the spot lamp mounting bracket screws.
9. Remove the mounting bracket and the gasket from the windshield pillar.
10. Clean the mounting surface of the windshield pillar.

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Installation Procedure

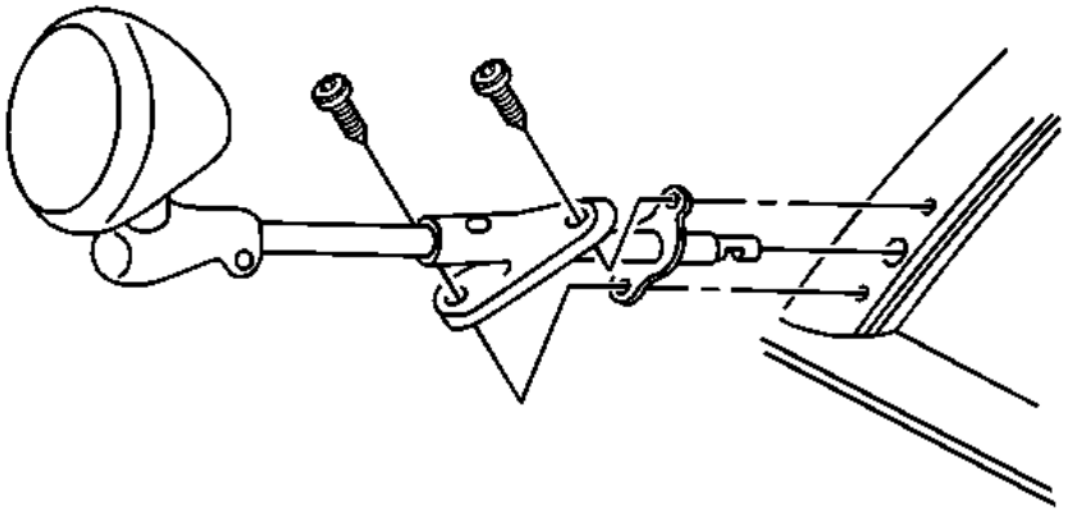


Fig. 86: Spot Lamp Mounting Bracket Screws
Courtesy of GENERAL MOTORS COMPANY

NOTE: **This method of installation will stop the chance of any alignment and binding problems.**

1. Install the mounting bracket and the gasket on to the spot lamp outer tube shaft.

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2. Apply a small amount of RTV sealer GM P/N 12345336 or Canadian P/N 12346286 or equivalent to the screw holes on the windshield pillar.
3. Install the mounting bracket, the gasket and the spot lamp outer tube shaft through the windshield pillar.

CAUTION: Refer to Fastener Caution .

4. Install the spot lamp mounting bracket screws and tighten to 3.5 N.m (31 lb in).

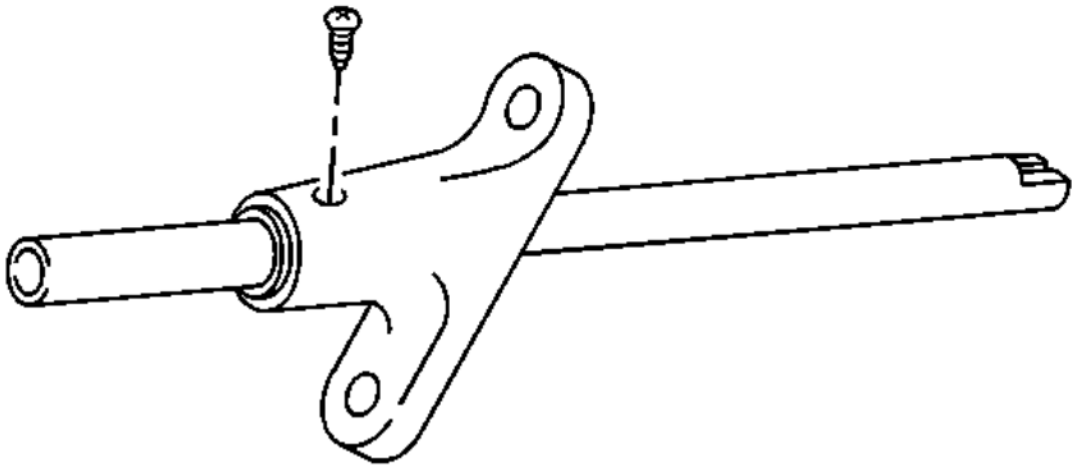


Fig. 87: Spot Lamp Bracket Set Screw

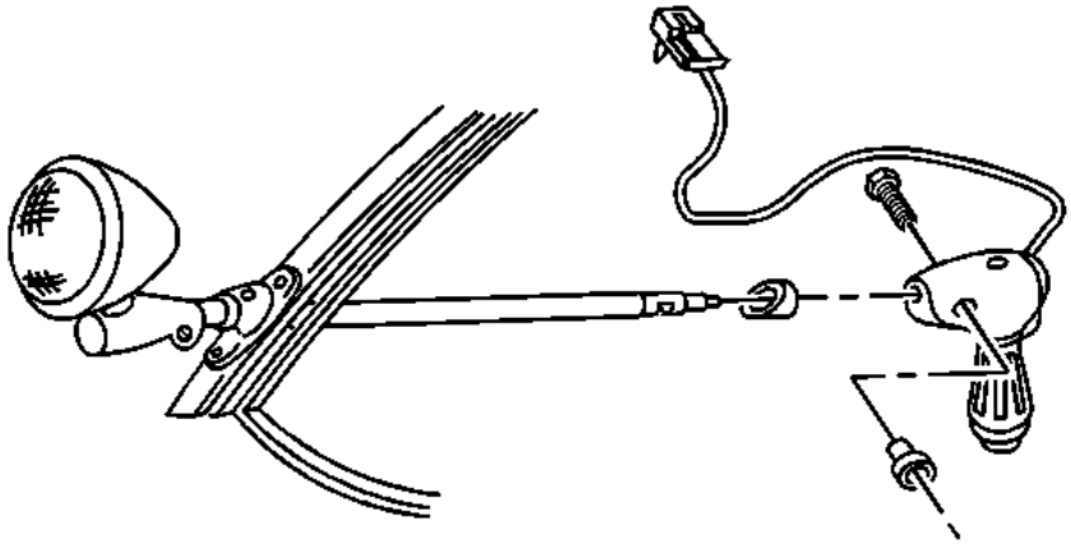
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Courtesy of GENERAL MOTORS COMPANY

5. Rotate the spot lamp to the upright position.

   Point the spot lamp forward.

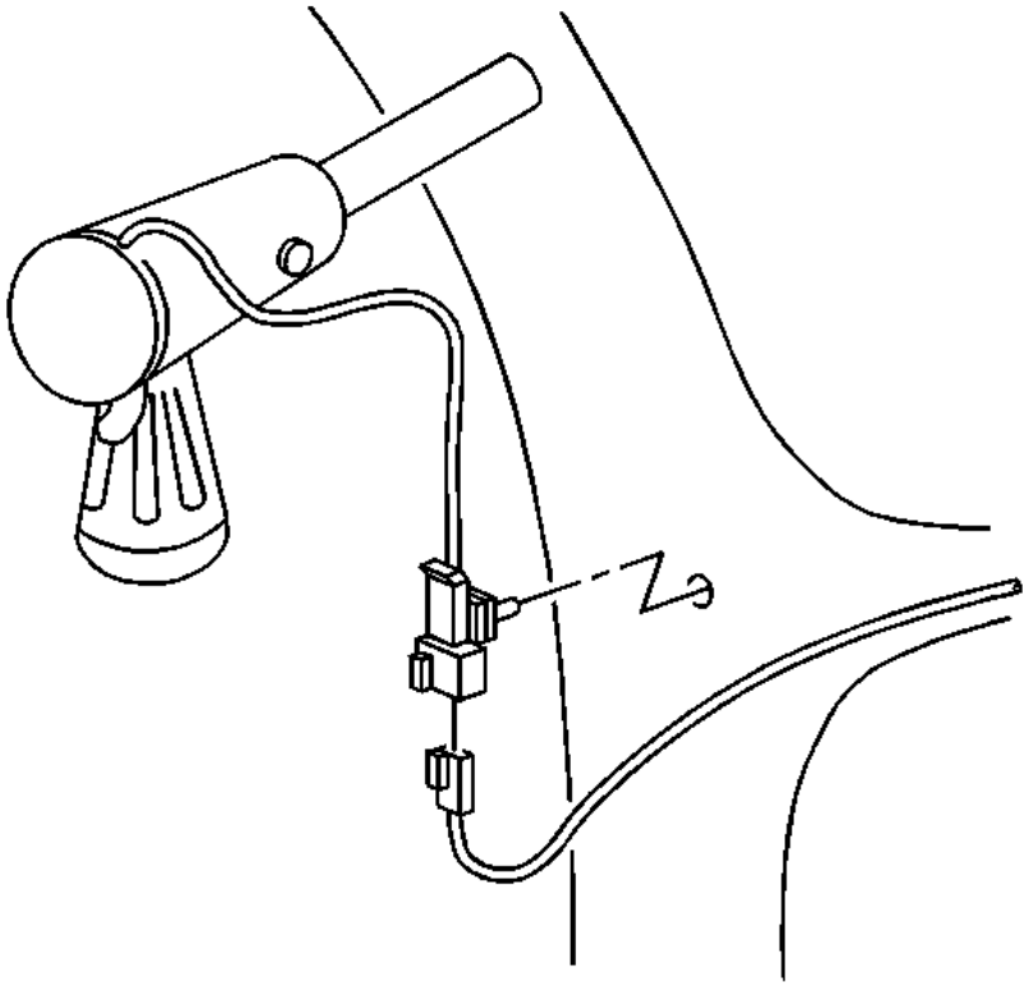
6. Tighten the spot lamp mounting bracket set screw just enough in order to firmly hold the spot lamp in the upright position.



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Fig. 88: Spot Lamp & Components
Courtesy of GENERAL MOTORS COMPANY

7. Install the rubber grommet to the outer tube shaft.
8. Install the spot lamp handle onto the outer tube shaft in the vertical down position until the handle bottoms out, and the flat detent on the outer tube shaft is exposed through the wedge key screw hole.
9. Install the spot lamp wedge key screw and tighten to 7.5 N.m (66 lb in).



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Fig. 89: Spot Lamp Wiring Harness Push-In Retainer & Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

10. Connect the electrical connector.
11. Install the spot lamp wiring harness push-in retainer to the windshield garnish molding, pressing in until fully seated.
12. Inspect the spot lamp for proper operation.
    - The handle must rotate the spotlamp approximately 90 degrees about the spot lamp shaft axis from the parked position to the vertical position.
    - The spot lamp head must rotate 360 degrees about its axis.
    - The spot lamp must able to be turned ON/OFF independent of the ignition switch.
13. If spot lamp adjustment and/or electrical diagnosis are required, refer to the following procedures.
    - For spot lamp travel adjustment, refer to **Spot Lamp Travel Adjustment**.
    - For electrical diagnosis, refer to **Power Distribution Schematics** .

SPOT LAMP BULB REPLACEMENT

Removal Procedure

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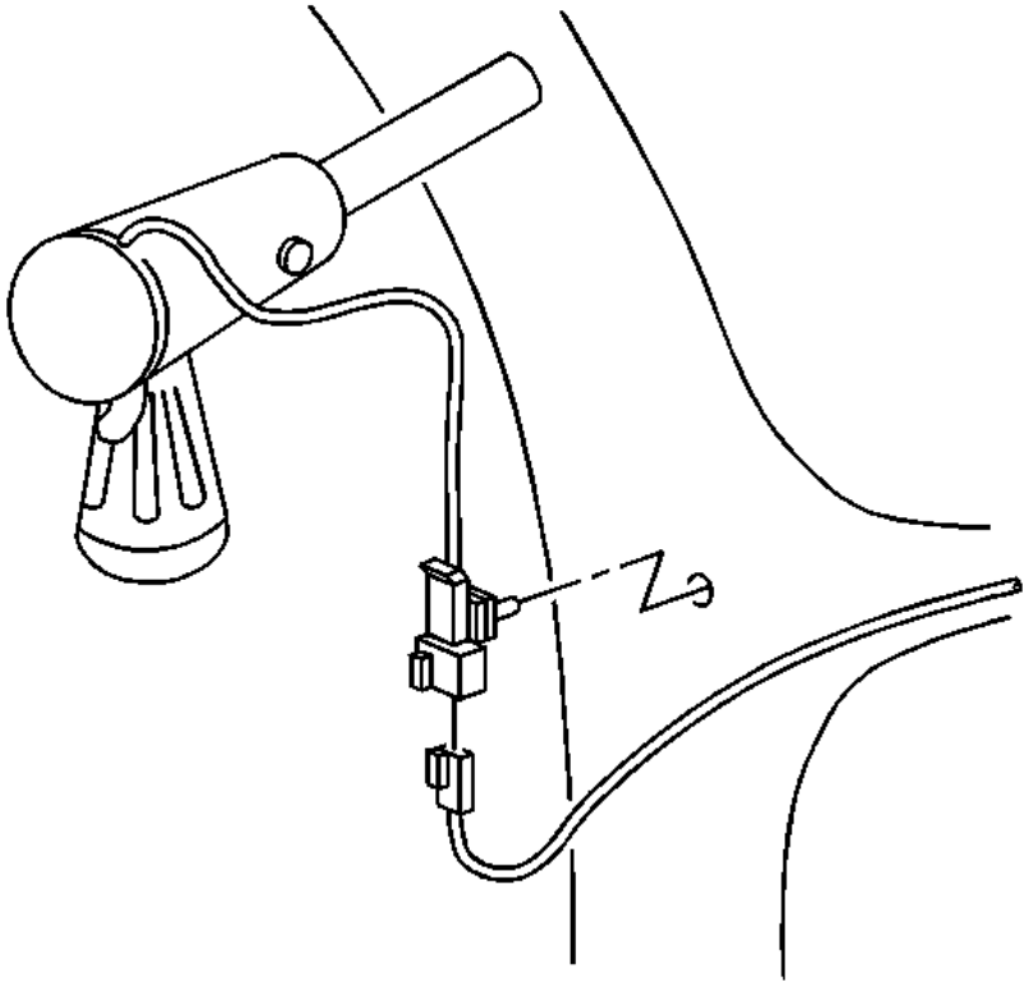


Fig. 90: Spot Lamp Wiring Harness Push-In Retainer & Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

1. Remove the spot lamp wiring harness push-in retainer from the windshield garnish molding, using a small flat bladed tool.
2. Disconnect the electrical connector.

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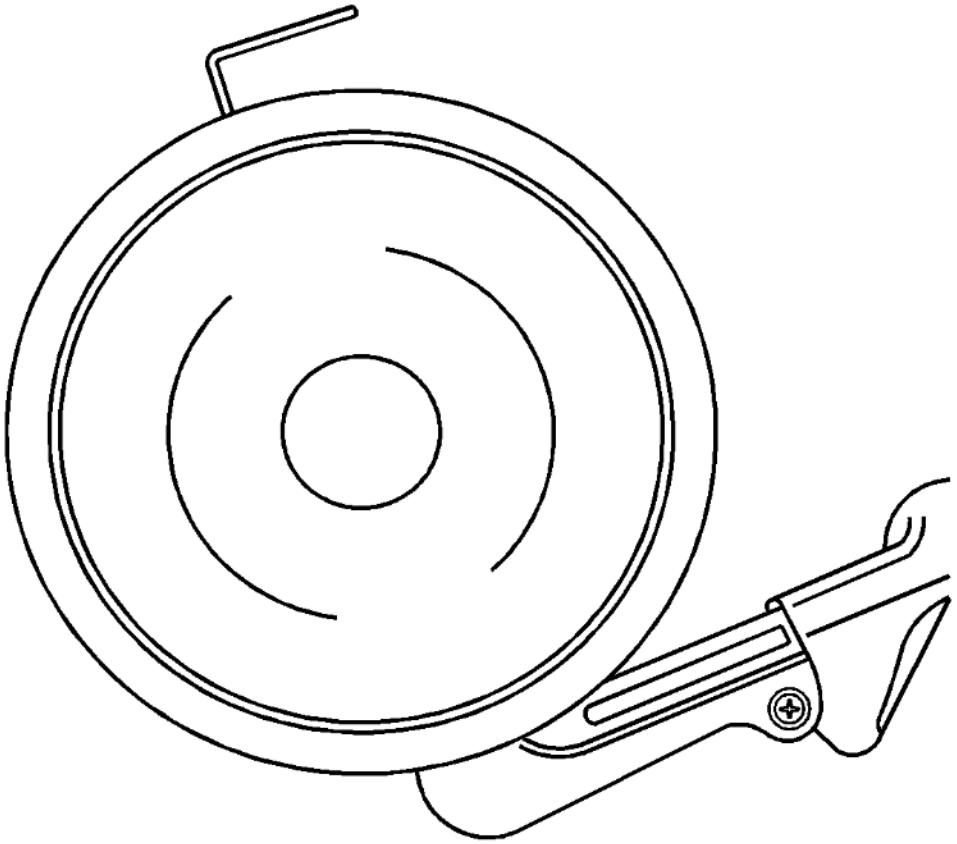


Fig. 91: Locating Spot Lamp Bezel Screw
Courtesy of GENERAL MOTORS COMPANY

3. Remove the screw from the spot lamp bezel.

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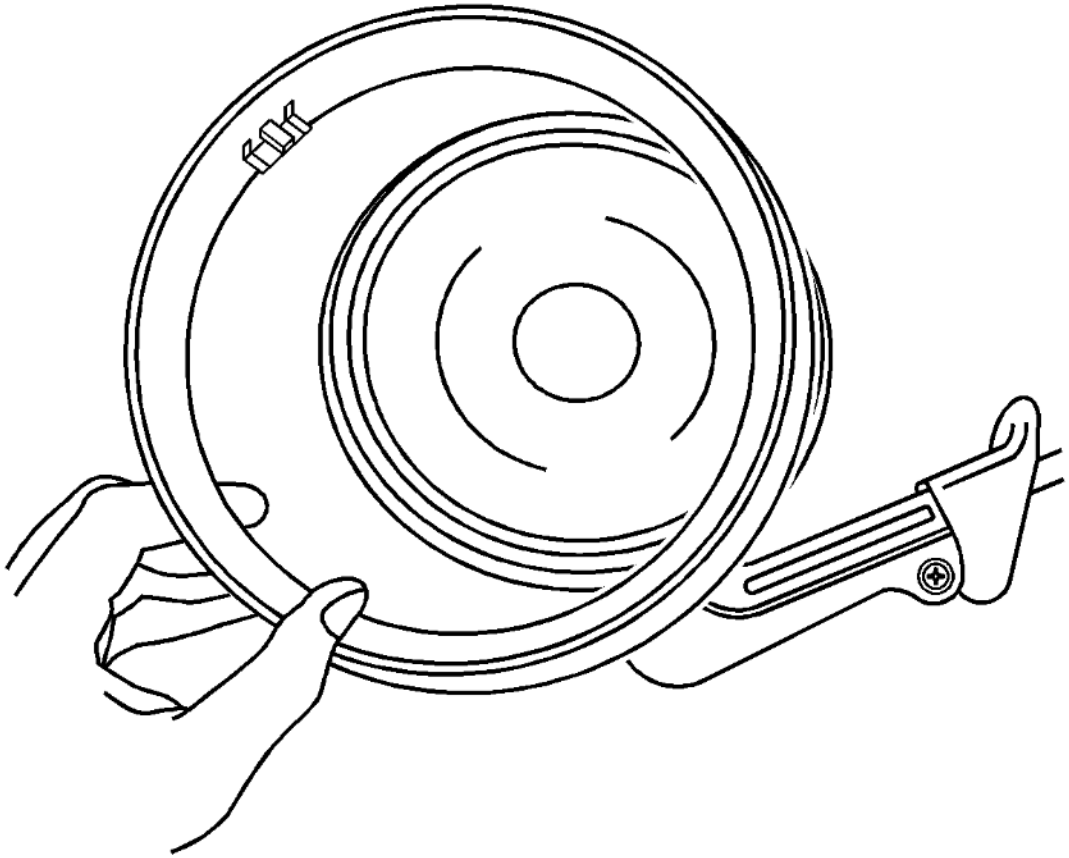


Fig. 92: Spot Lamp Bezel
Courtesy of GENERAL MOTORS COMPANY

4. Remove the spot lamp bezel from the spot lamp.

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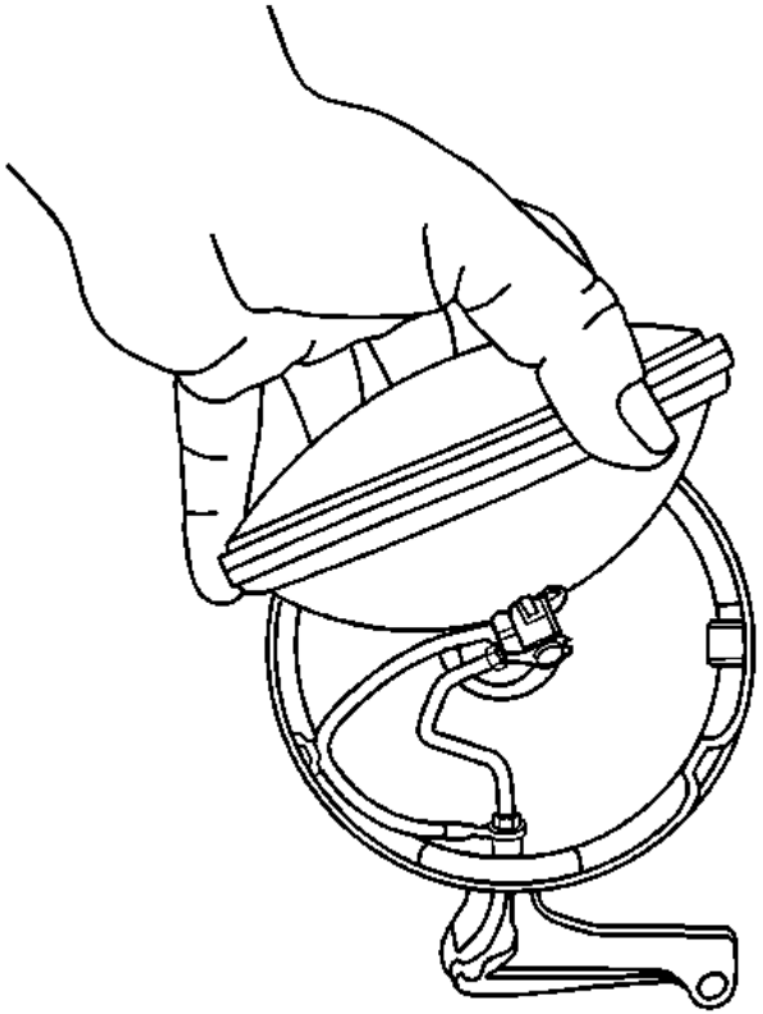


Fig. 93: Removing Lamp From Spot Lamp
Courtesy of GENERAL MOTORS COMPANY

5. Remove the lamp from the spot lamp.

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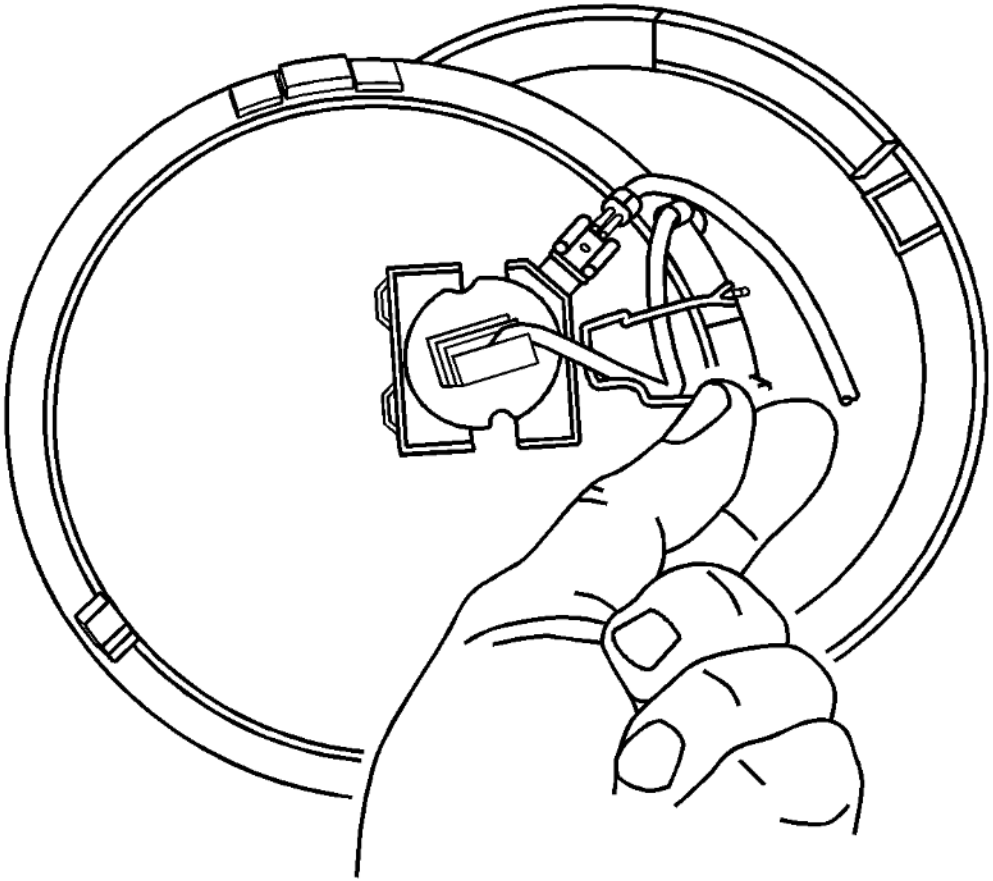


Fig. 94: Spot Lamp Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

6. Remove spot lamp bulb retaining clip.

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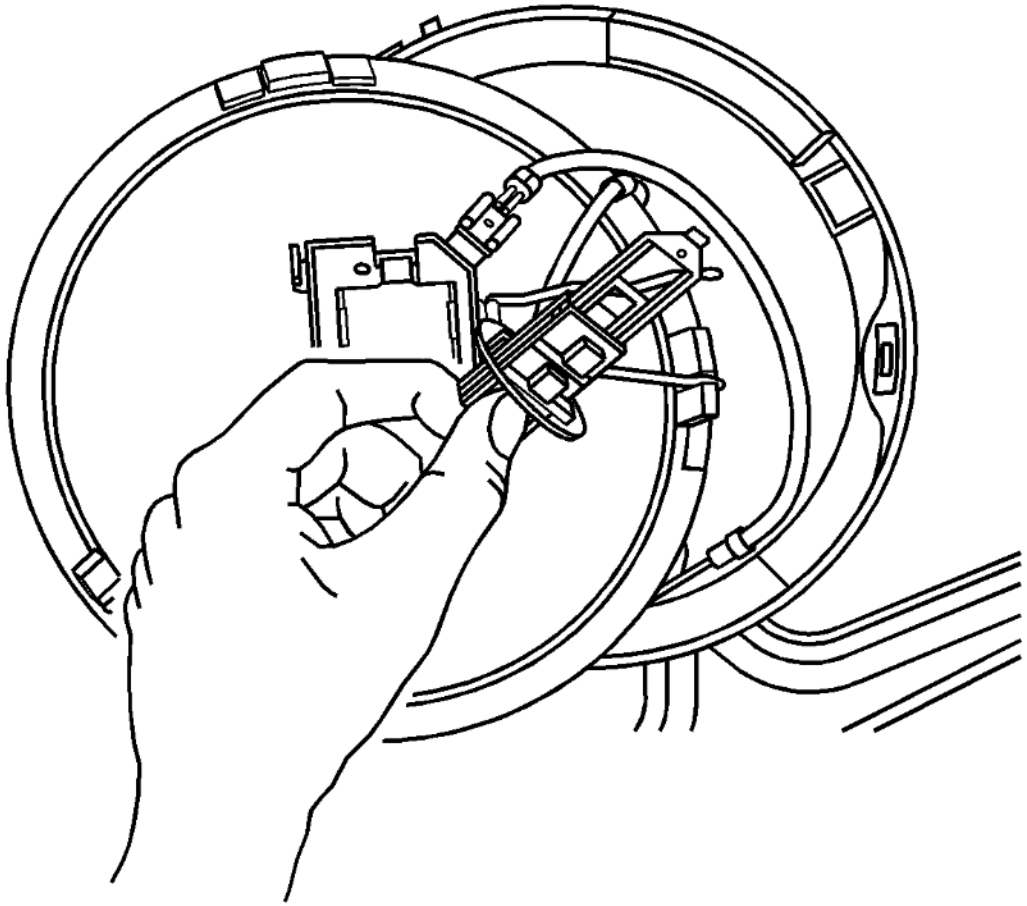


Fig. 95: Spot Lamp Bulb & Spot Lamp
Courtesy of GENERAL MOTORS COMPANY

7. Remove the spot lamp bulb from the spot lamp.

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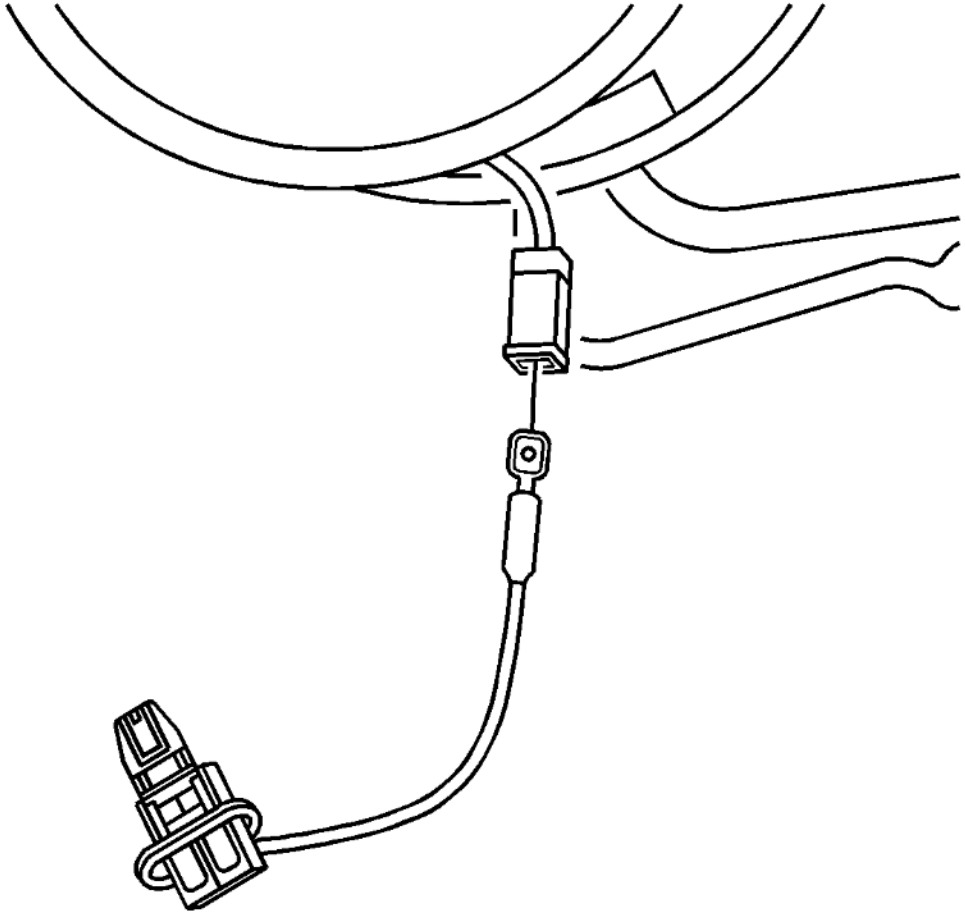


Fig. 96: Spot Lamp Bulb Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

8. Disconnect the spot lamp bulb electrical connector.

Installation Procedure

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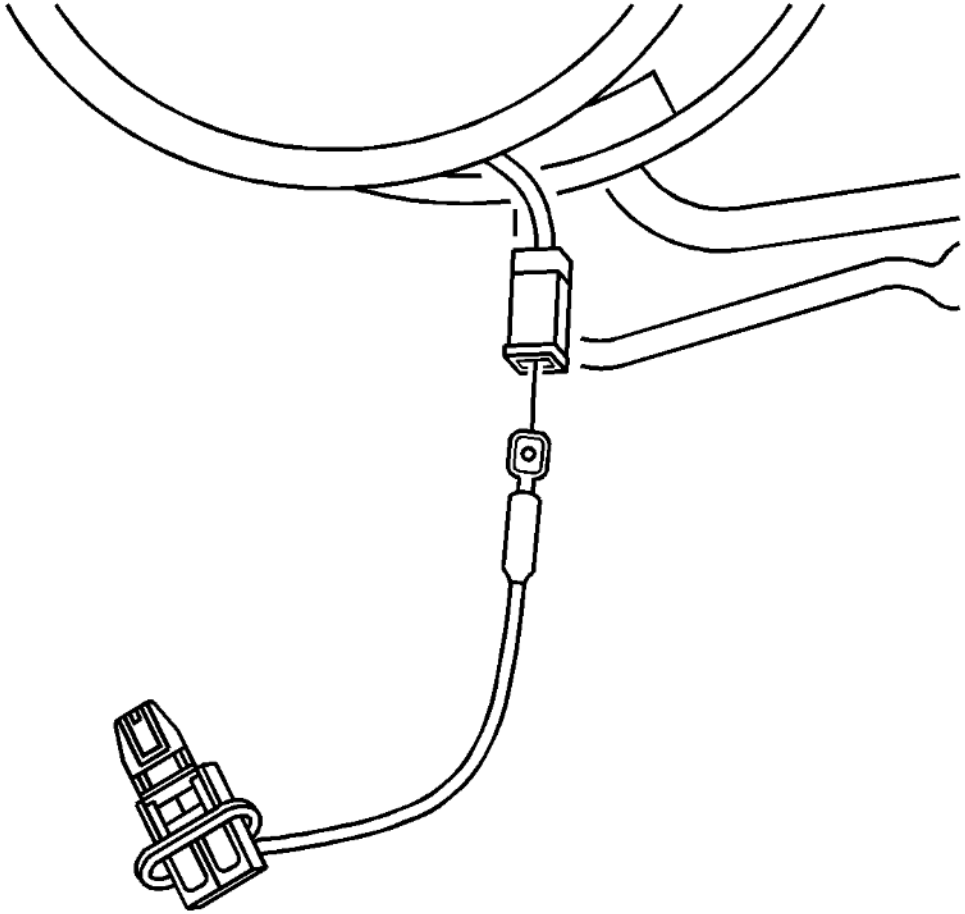


Fig. 97: Spot Lamp Bulb Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

1. Connect the spot lamp bulb electrical connector.

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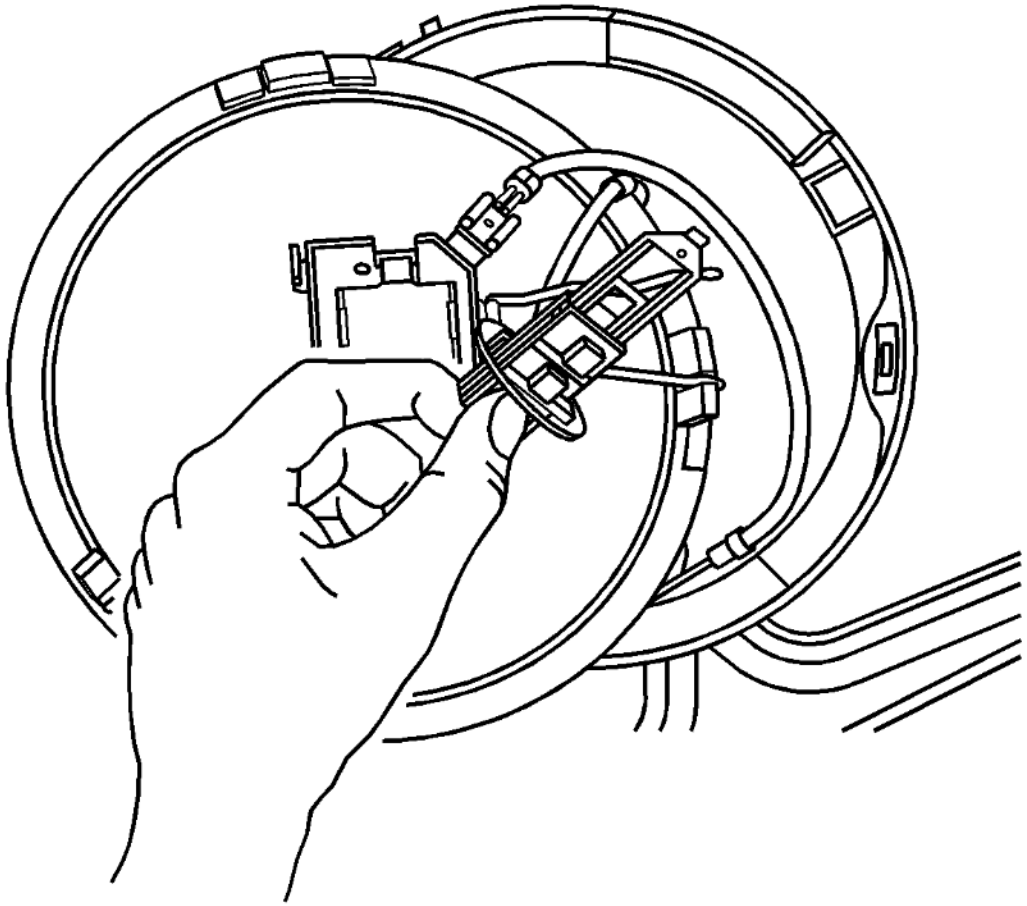


Fig. 98: Spot Lamp Bulb & Spot Lamp
Courtesy of GENERAL MOTORS COMPANY

2. Install the spot lamp bulb to the spot lamp.

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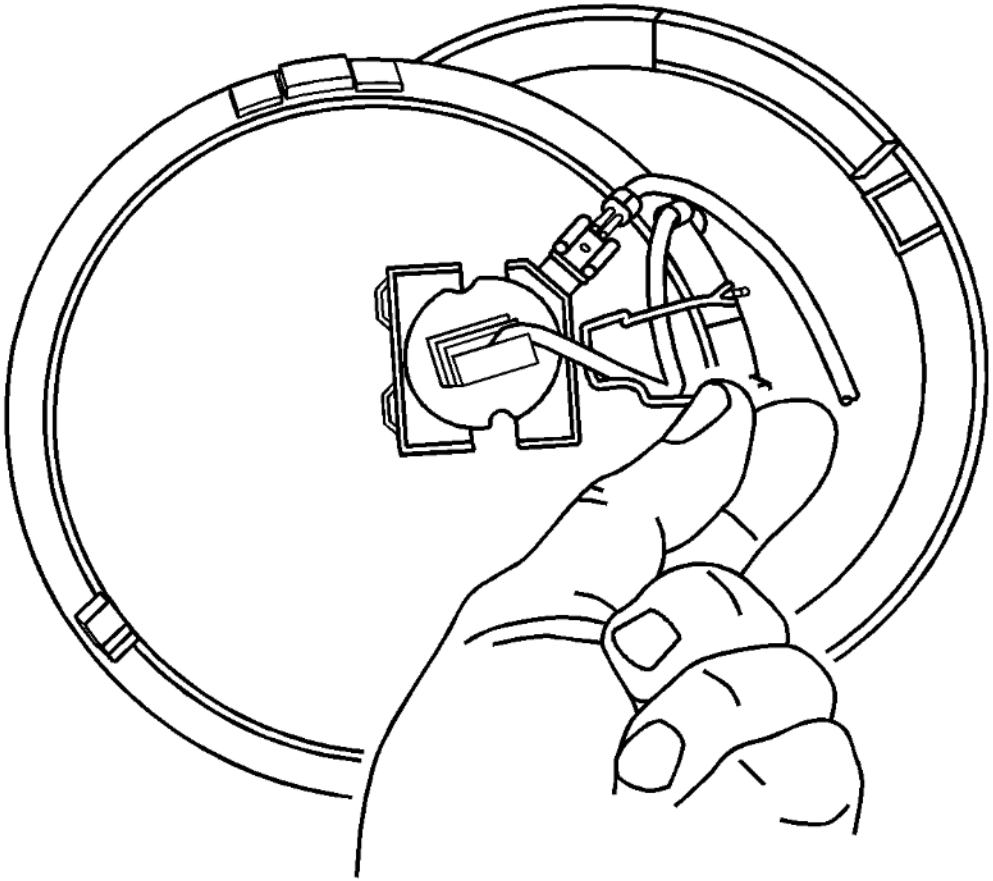


Fig. 99: Spot Lamp Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

3. Install the spot lamp bulb retaining clip.

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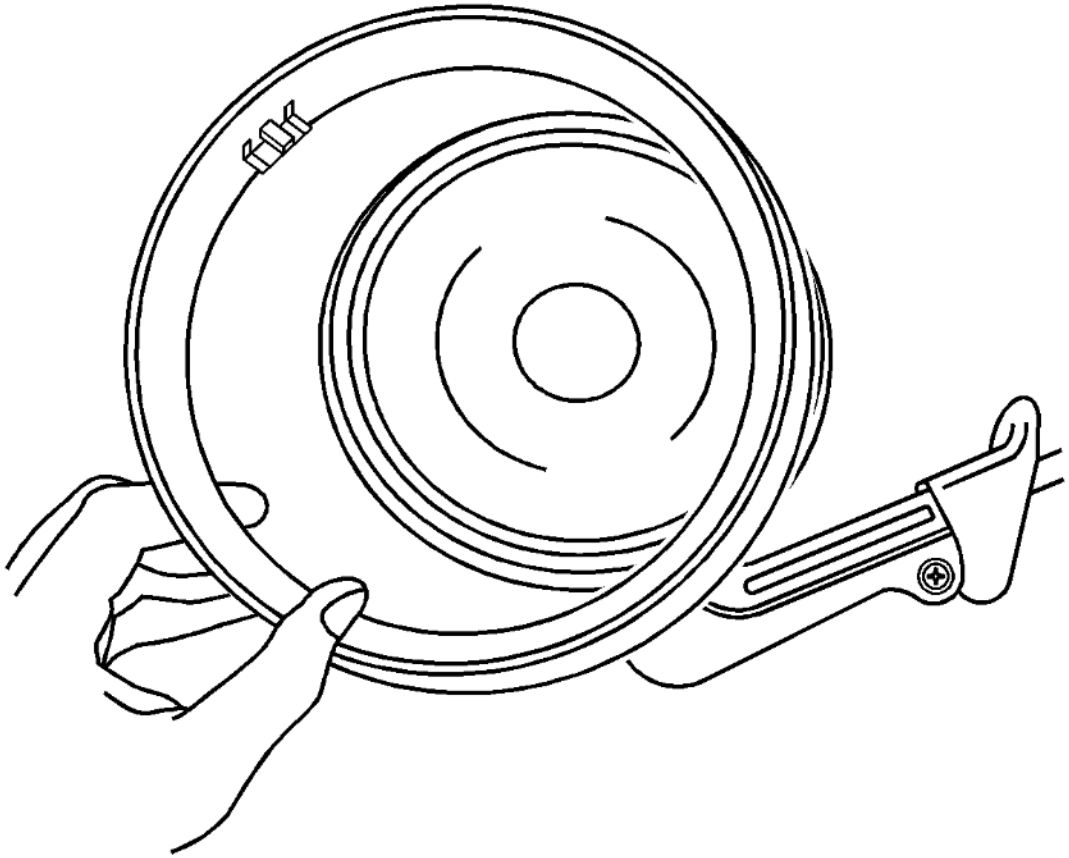


Fig. 100: Spot Lamp Bezel
Courtesy of GENERAL MOTORS COMPANY

NOTE: **The spot lamp assembly must be clocked in the UP position, refer to the emblem on the face of the lamp.**

4. Holding the spot lamp in position, install the spot lamp bezel to the spot lamp.

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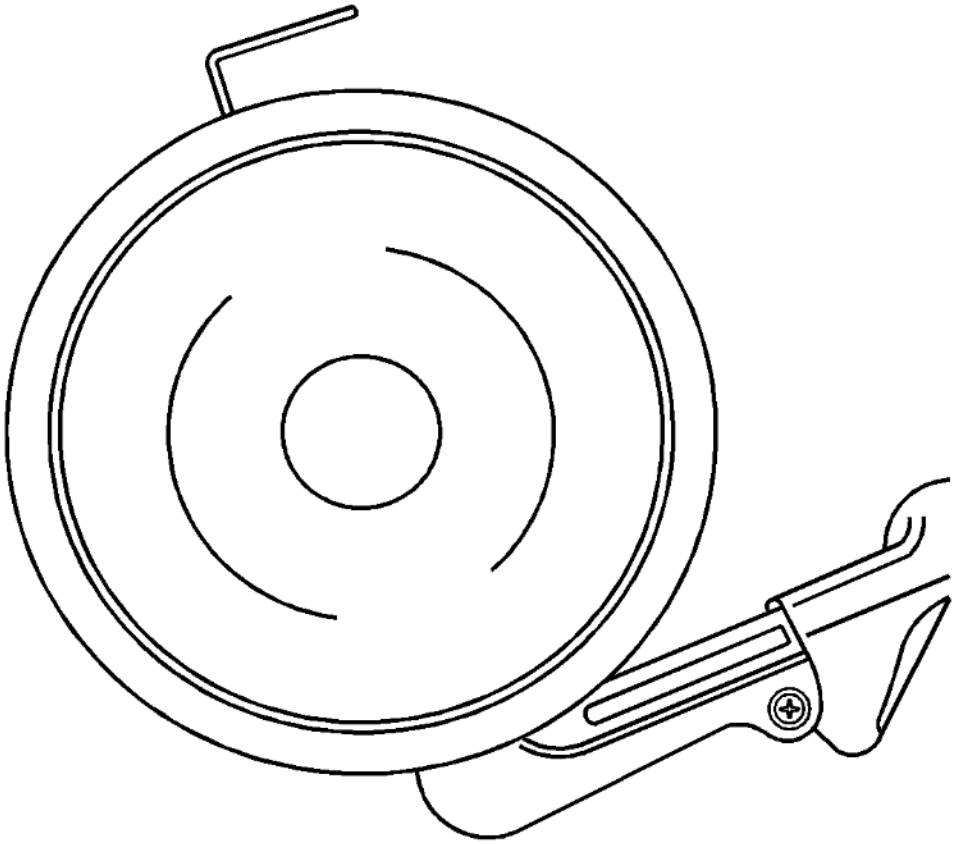


Fig. 101: Spot Lamp Bezel Screw
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

5. Install the spot lamp bezel screws and tighten to 2 N.m (18 lb in).

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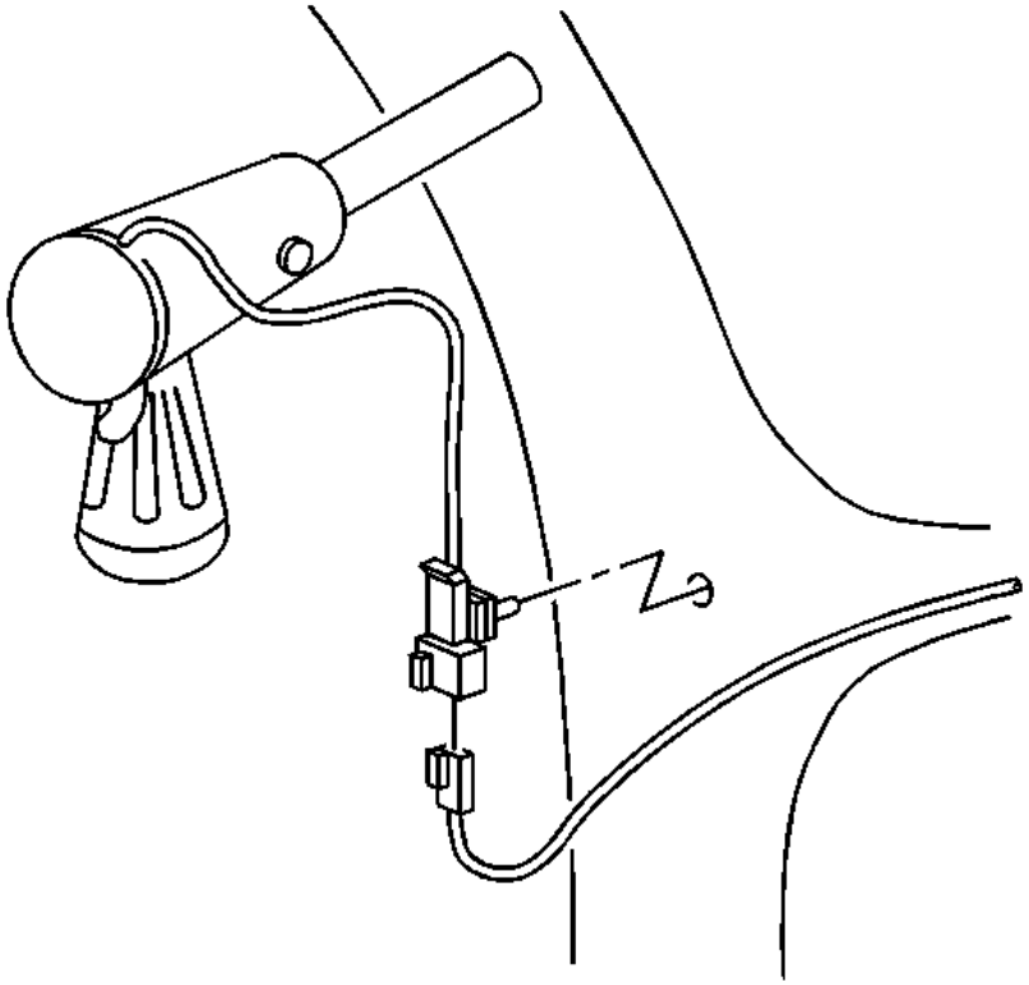


Fig. 102: Spot Lamp Wiring Harness Push-In Retainer & Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

6. Using a small flat-bladed tool, install the spot lamp wiring harness push-in retainer to the windshield garnish molding.
7. Connect the electrical connector.
8. Inspect the spot lamp for proper operation.

SPOT LAMP TRAVEL ADJUSTMENT

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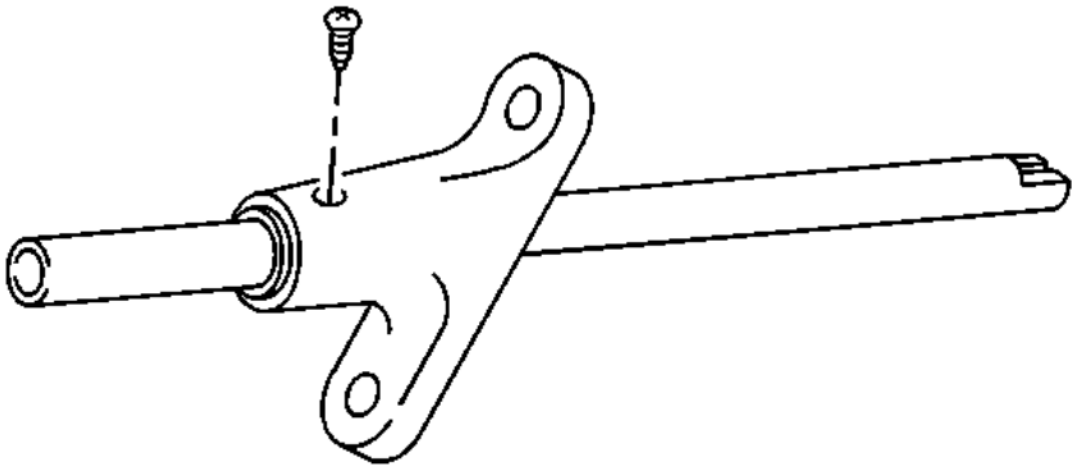


Fig. 103: Spot Lamp Bracket Set Screw
Courtesy of GENERAL MOTORS COMPANY

1. Loosen the spot lamp bracket clamp bolt.
2. Grasp the spot lamp.

Slowly rotate the spot lamp inboard until the shaft contacts the parkstop position.

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3. Rotate the spot lamp slowly outboard to 5 degrees past the vertical position in order for the backstop to be in motion and the outer tube shaft to rotate.
4. Tighten the bracket clamp bolt sufficiently, in order to prevent the outer shaft tube from rotating while the spotlamp is moving between the stop positions.
5. Rotate the spot lamp head inboard to the parkstop position in order to prevent the spot lamp from coming in contact with the body components.
6. Position the parkstop of the shaft in order to rotate the spot lamp on its axis, clearing the nearest body components by 13-0.5 mm (0.50-0.02 in).

CAUTION: **Refer to Fastener Caution .**

7. Tighten the bracket clamp screw when the parkstop has been set, in order to prevent rotation of the spot lamp shaft. Tighten the spot lamp bracket clamp bolt to 6 N.m (53 lb in).

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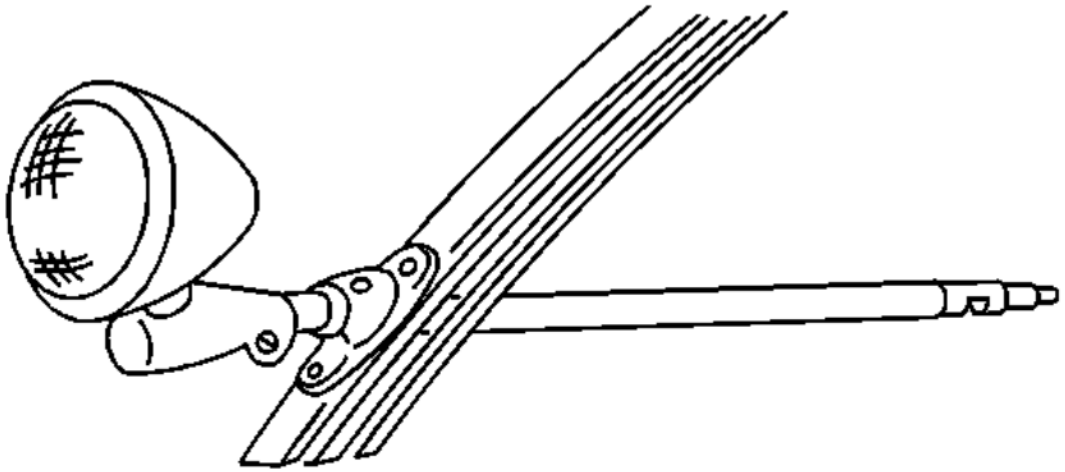


Fig. 104: Spot Lamp
Courtesy of GENERAL MOTORS COMPANY

8. Adjust the spot lamp head clamping bolt, in order to easily rotate the spot lamp (120 degrees) in any adjustable position between the parkstop and the backstop positions.

   The total motion of the spot lamp is approximately 90 degrees. Tighten the spot lamp head clamping bolt to 2.5 N.m (22 lb in).

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ACCESSORIES & EQUIPMENT

Lighting - Schematic and Routing Diagrams - Escalade, Suburban, Tahoe, Yukon

SCHEMATIC WIRING DIAGRAMS

HEADLIGHTS/DAYTIME RUNNING LIGHTS (DRL) WIRING SCHEMATICS (X88 OR Z88)

Controls and Indicator

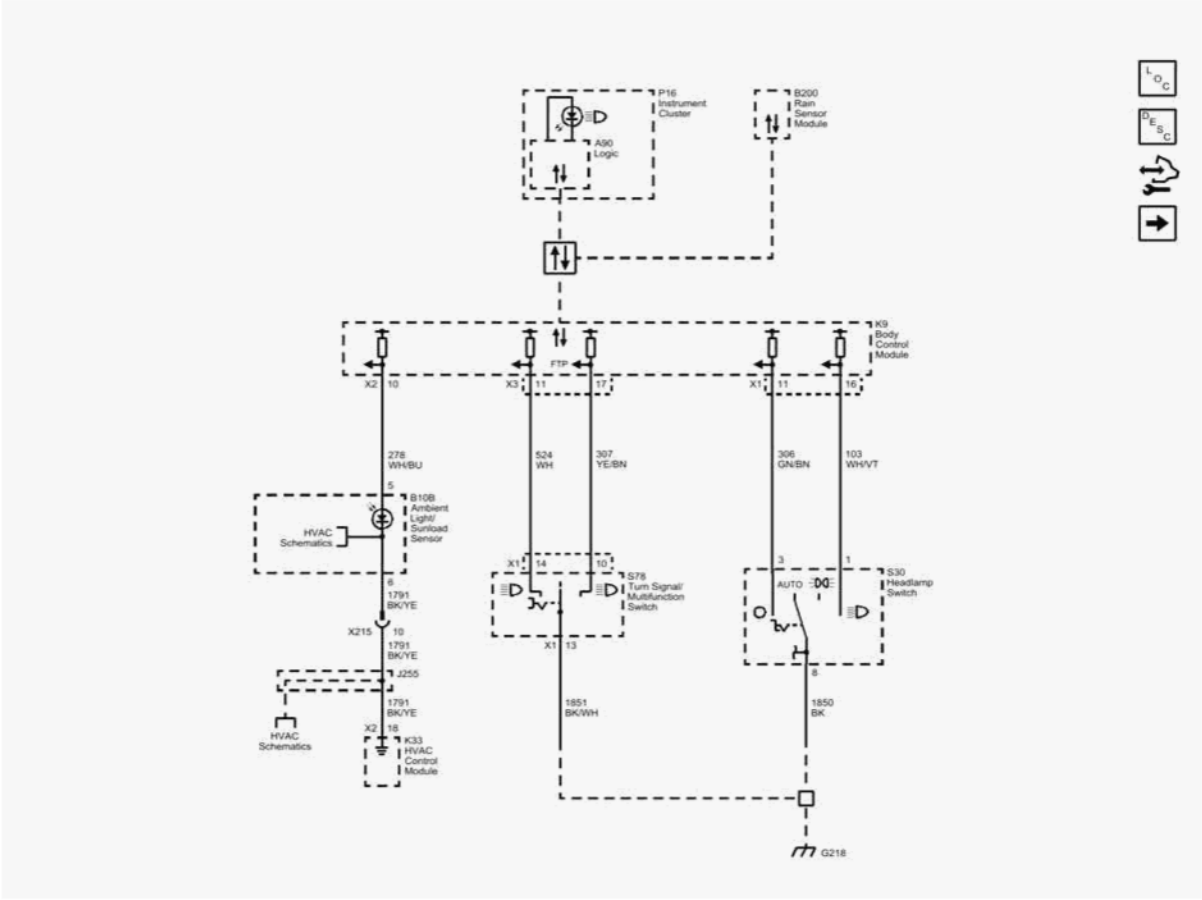


Fig. 1: Controls and Indicator

Courtesy of GENERAL MOTORS COMPANY

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Halogen (without T4F)

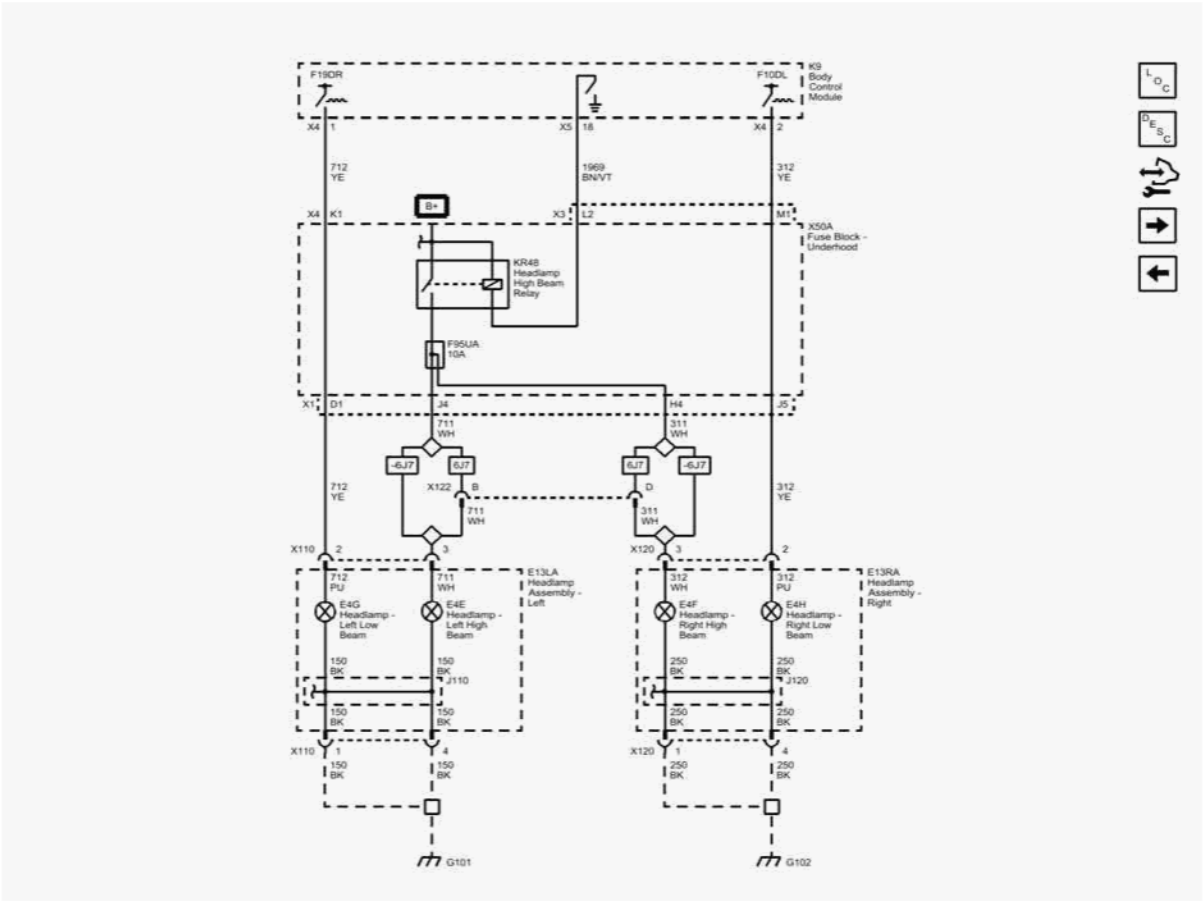


Fig. 2: Halogen (without T4F)
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High Intensity Discharge (T4F)

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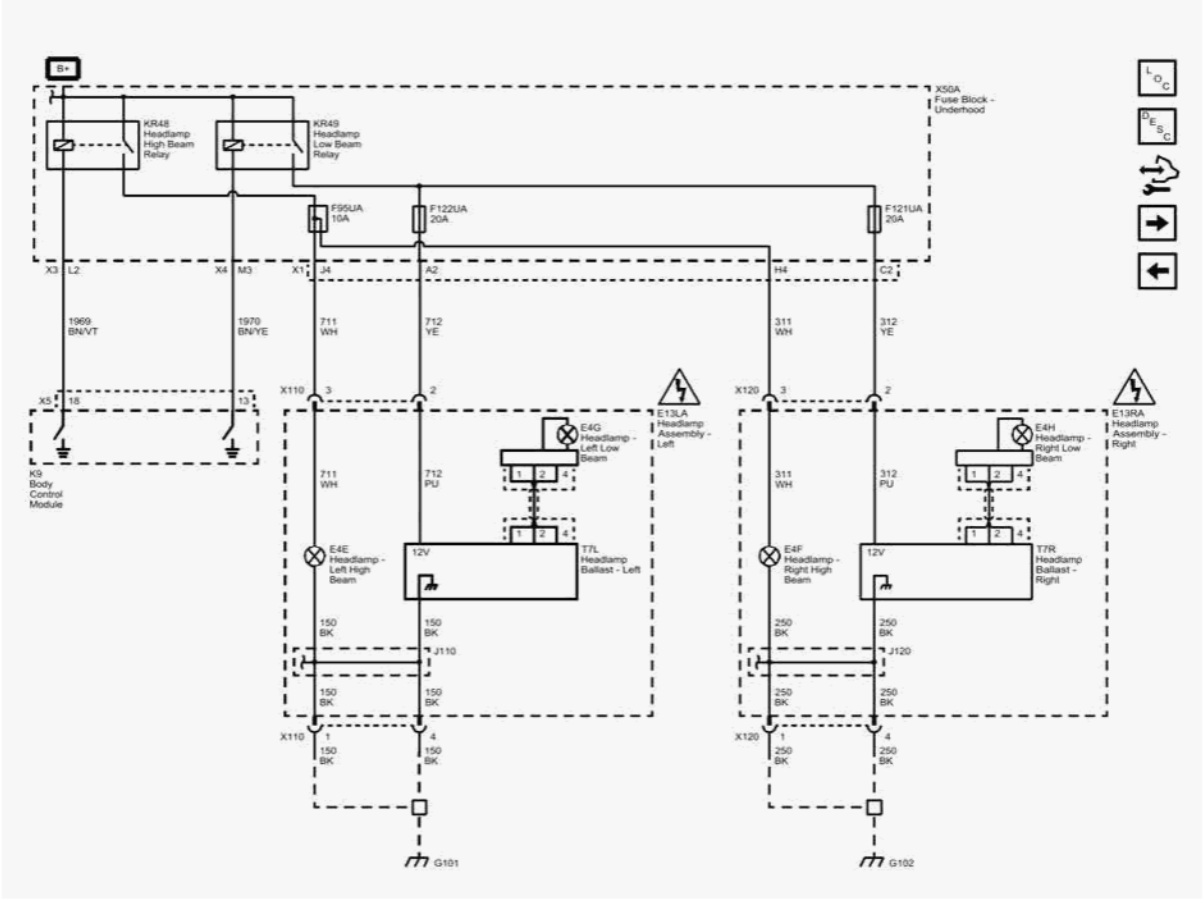


Fig. 3: High Intensity Discharge (T4F)
Courtesy of GENERAL MOTORS COMPANY

Daytime Running Lights (X88 with TB8 or T4F) or (Z88)

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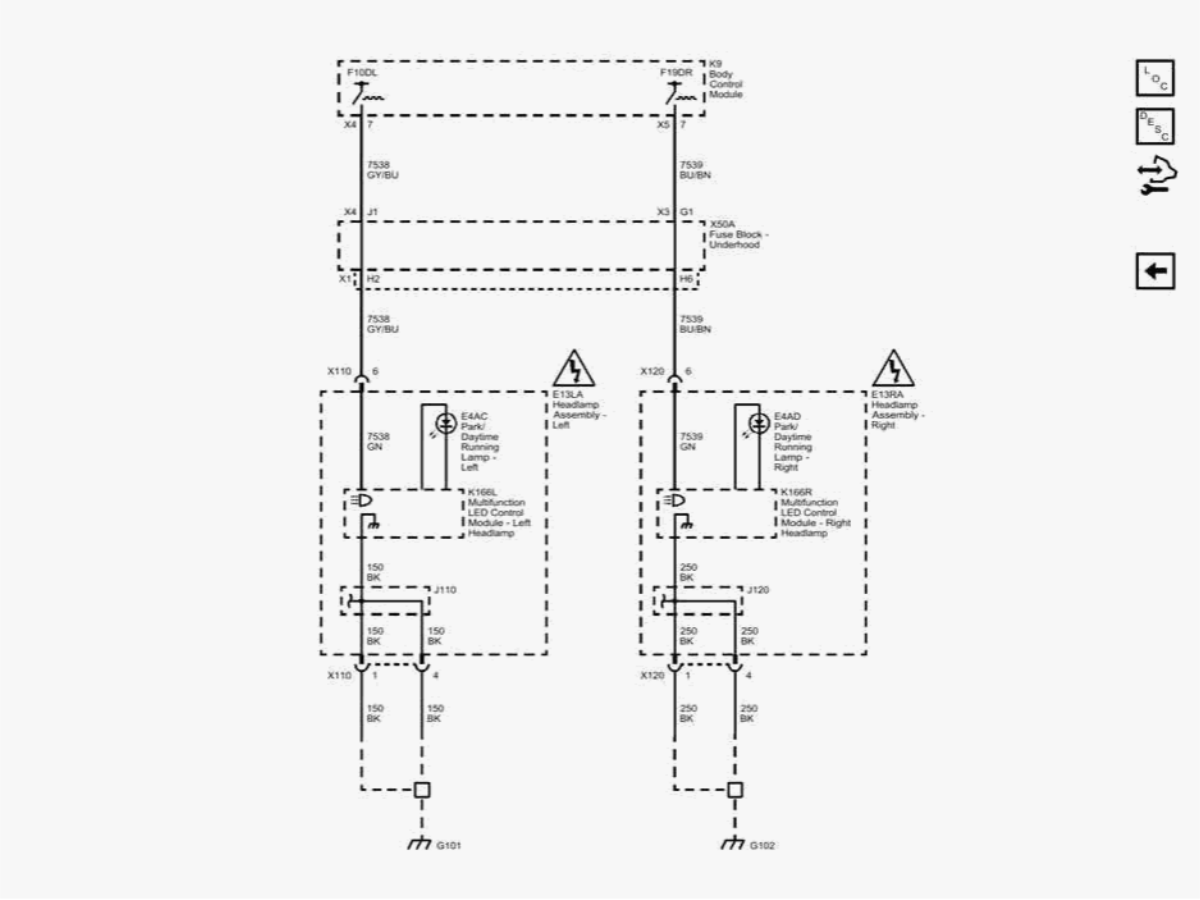


Fig. 4: Daytime Running Lights (X88 with TB8 or T4F) or (Z88)
Courtesy of GENERAL MOTORS COMPANY

HEADLIGHTS/DAYTIME RUNNING LIGHTS (DRL) WIRING SCHEMATICS (Z75)

Controls and Indicator

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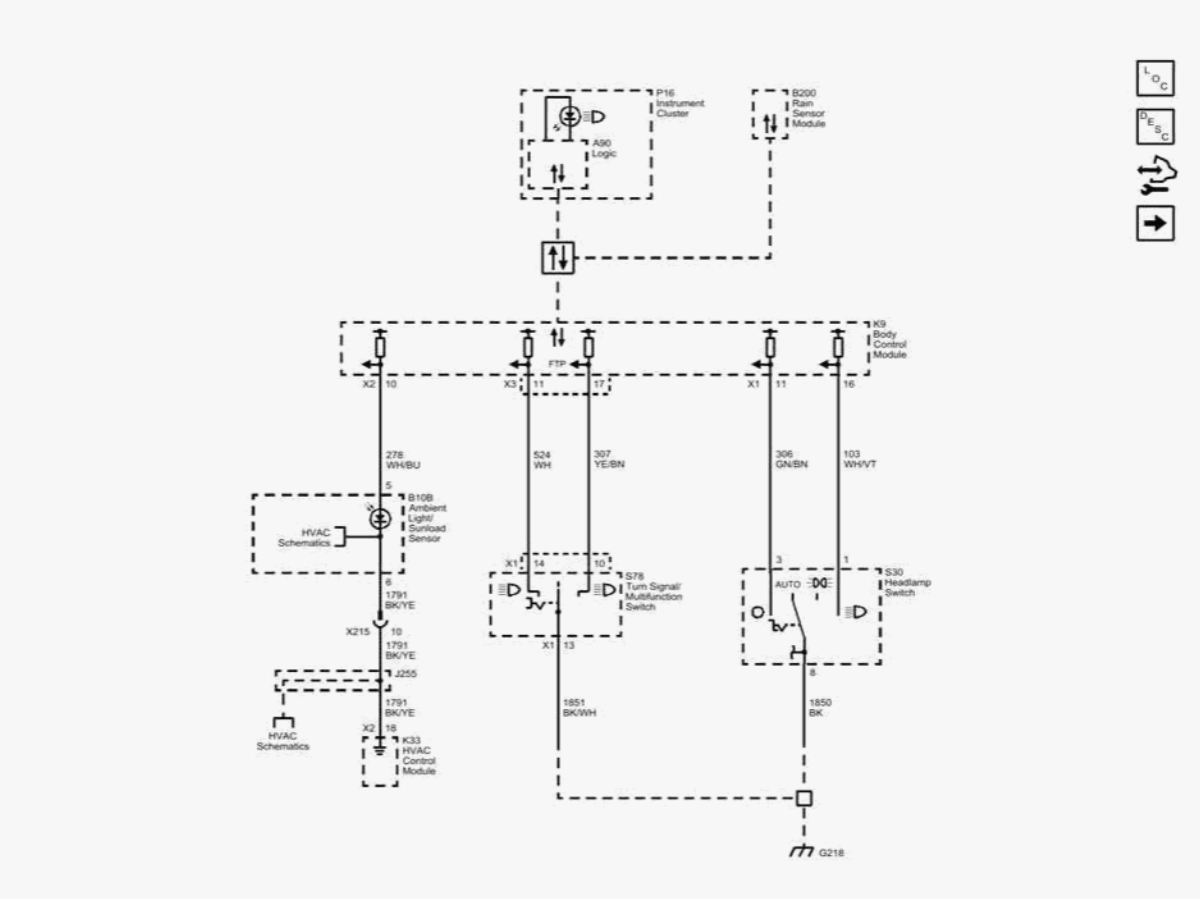


Fig. 5: Controls and Indicator

Courtesy of GENERAL MOTORS COMPANY

Headlights

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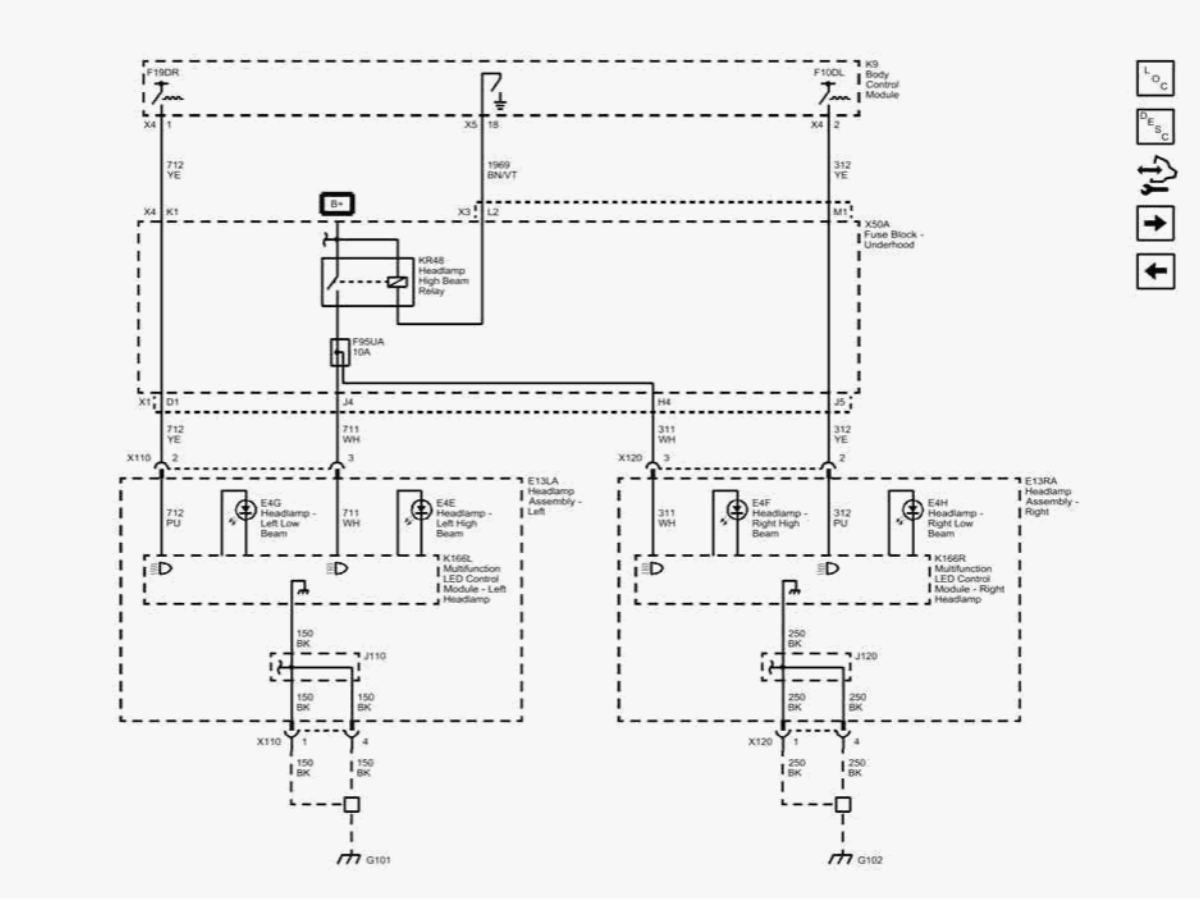


Fig. 6: Headlights

Courtesy of GENERAL MOTORS COMPANY

Daytime Running Lights

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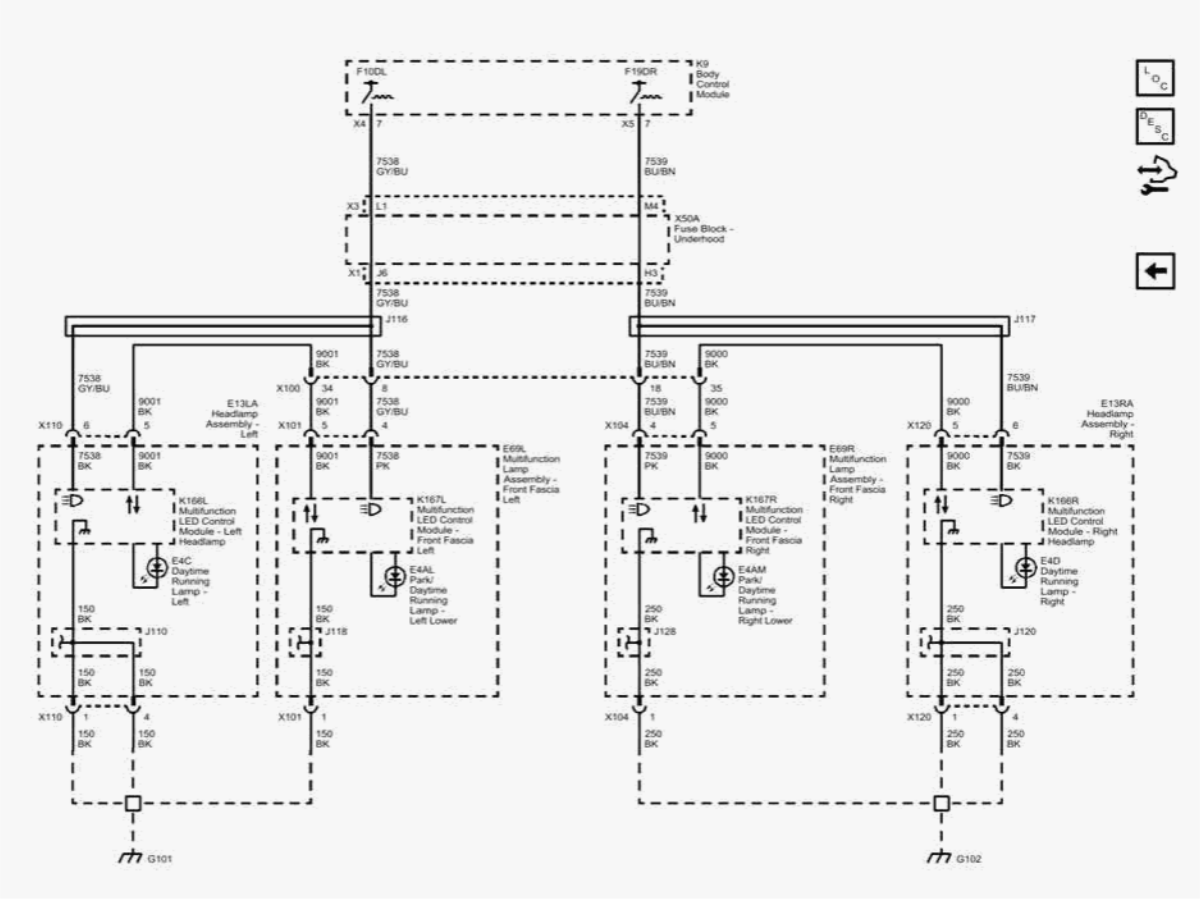


Fig. 7: Daytime Running Lights

Courtesy of GENERAL MOTORS COMPANY

FOG LIGHTS WIRING SCHEMATICS

Front Fog Lamps (T3U) and Rear Fog Lamps (T79)

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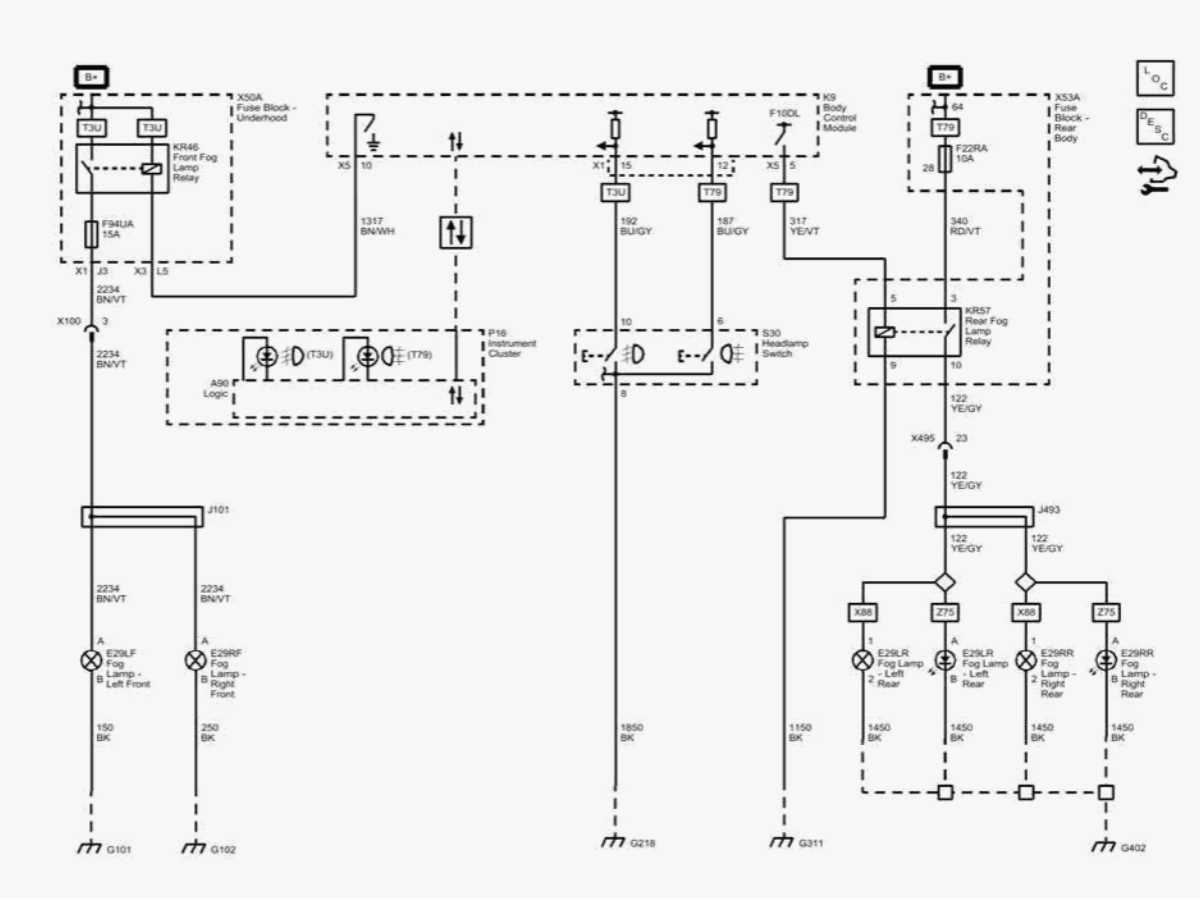


Fig. 8: Front Fog Lamps (T3U) and Rear Fog Lamps (T79)
Courtesy of GENERAL MOTORS COMPANY

EXTERIOR LIGHTS WIRING SCHEMATICS

Parklamps and Controls

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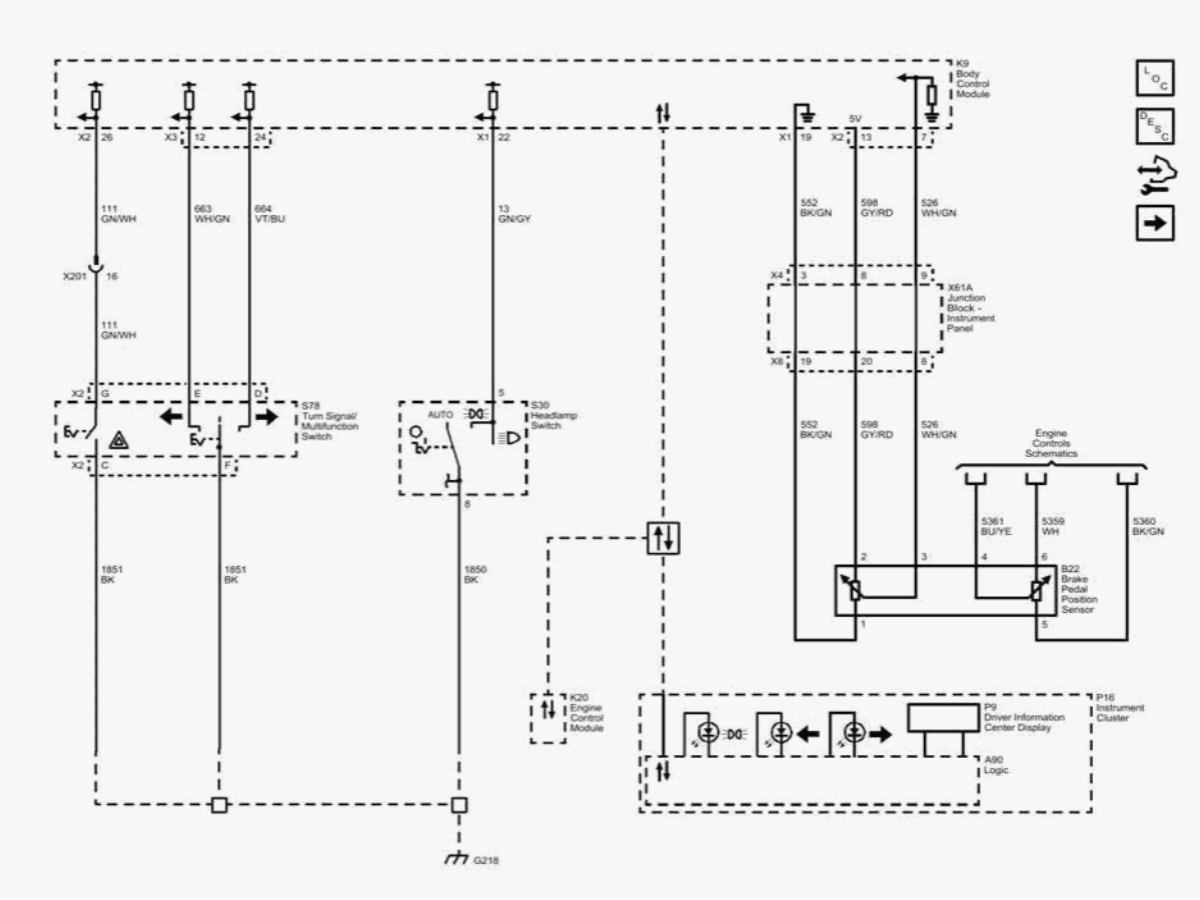


Fig. 9: Parklamps and Controls
Courtesy of GENERAL MOTORS COMPANY

Park Lamps (X88 and Z88)

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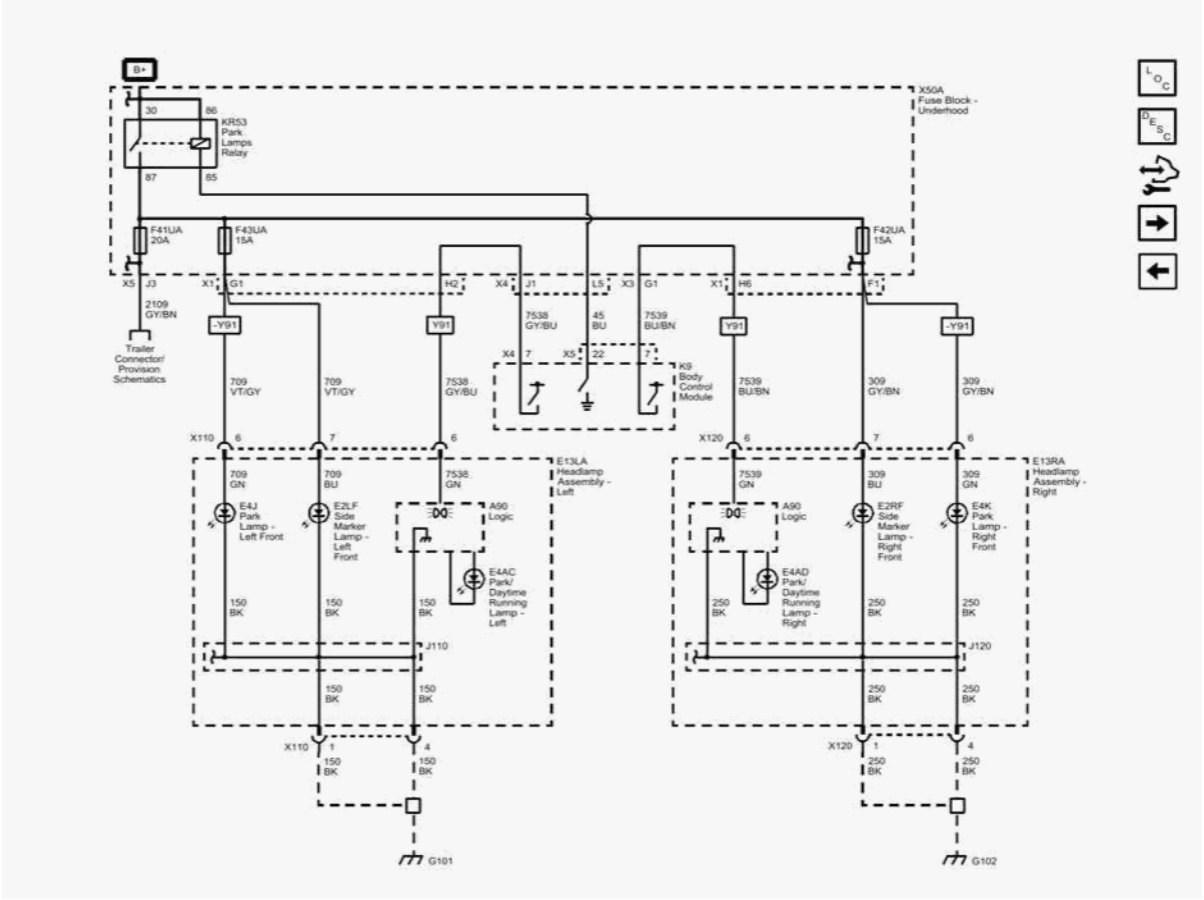


Fig. 10: Park Lamps (X88 and Z88)
Courtesy of GENERAL MOTORS COMPANY

Park Lamps (Z75)

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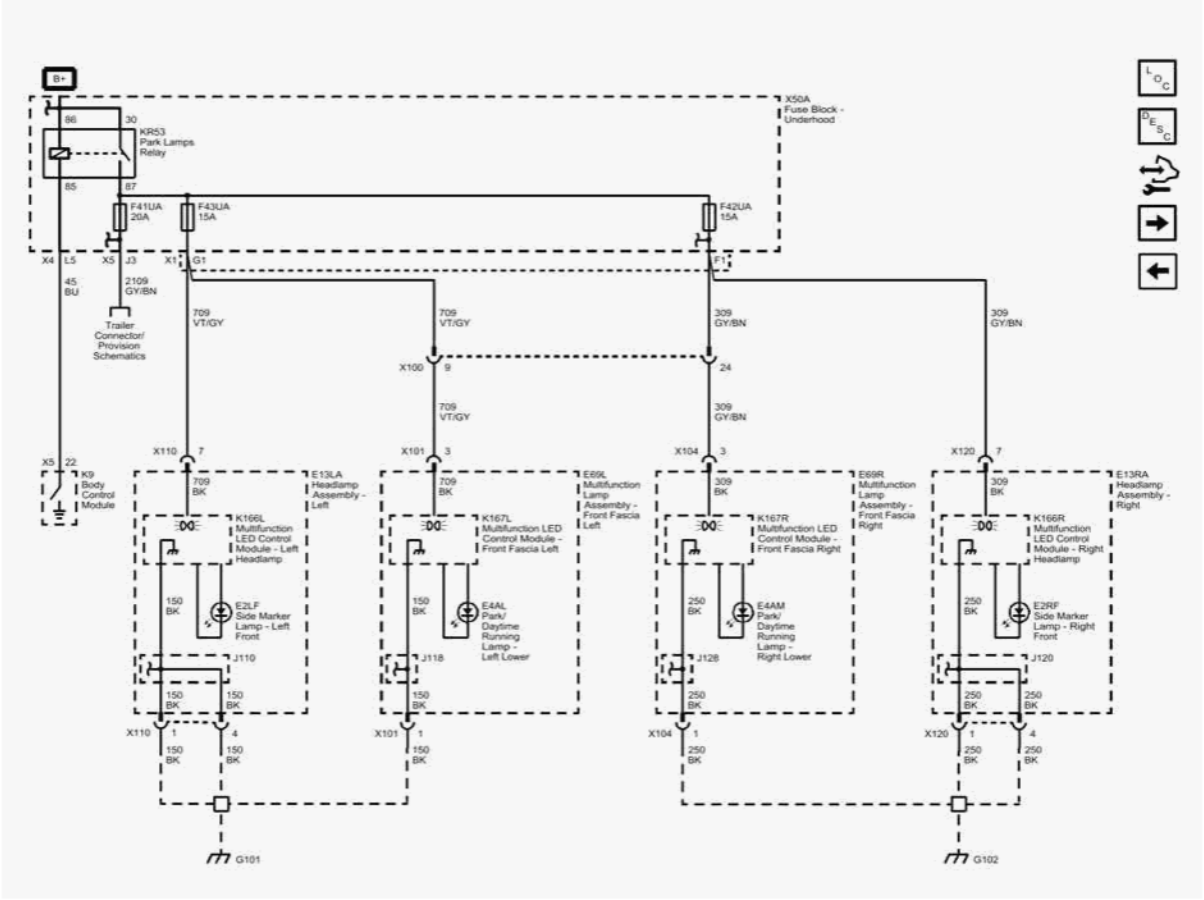


Fig. 11: Park Lamps (Z75)

Courtesy of GENERAL MOTORS COMPANY

Left Front Turn Signal Lamps

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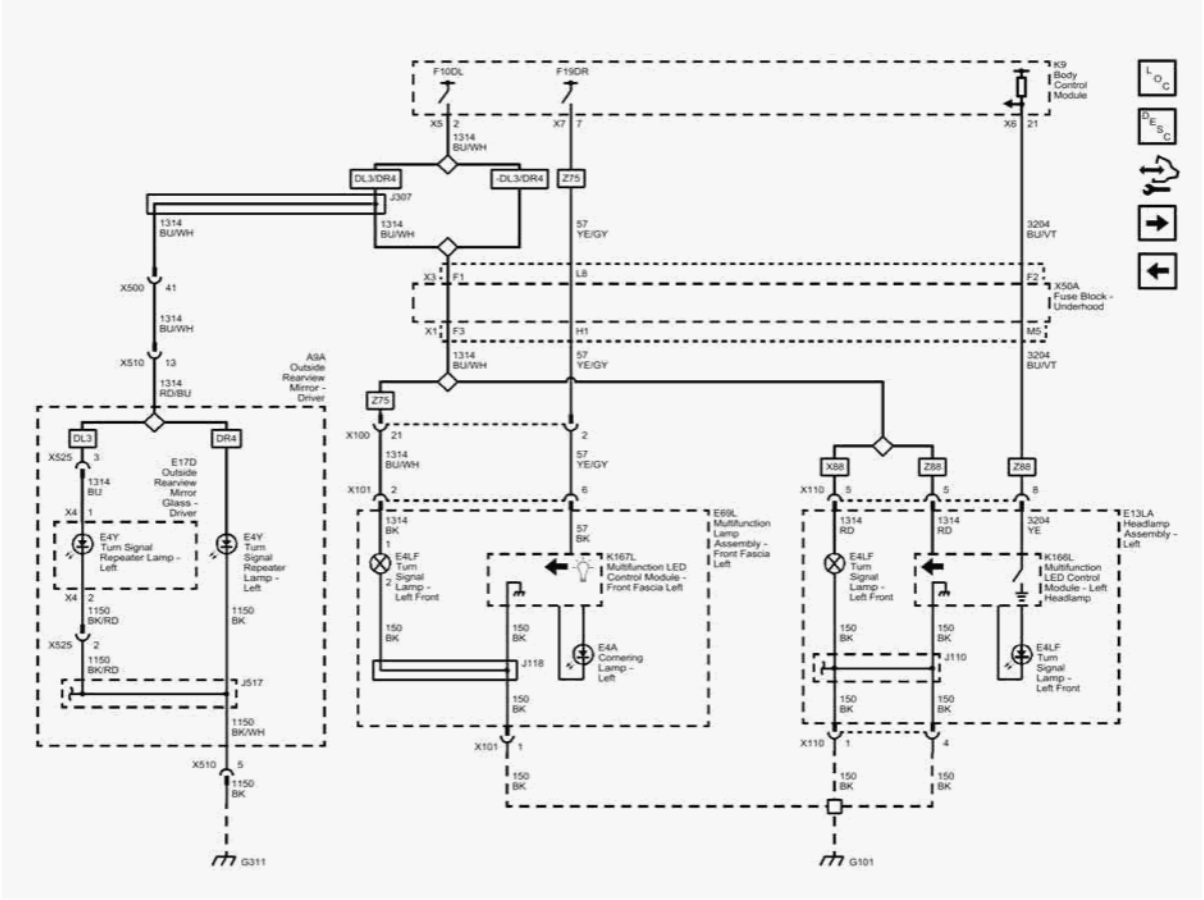


Fig. 12: Left Front Turn Signal Lamps
Courtesy of GENERAL MOTORS COMPANY

Right Front Turn Signal Lamps

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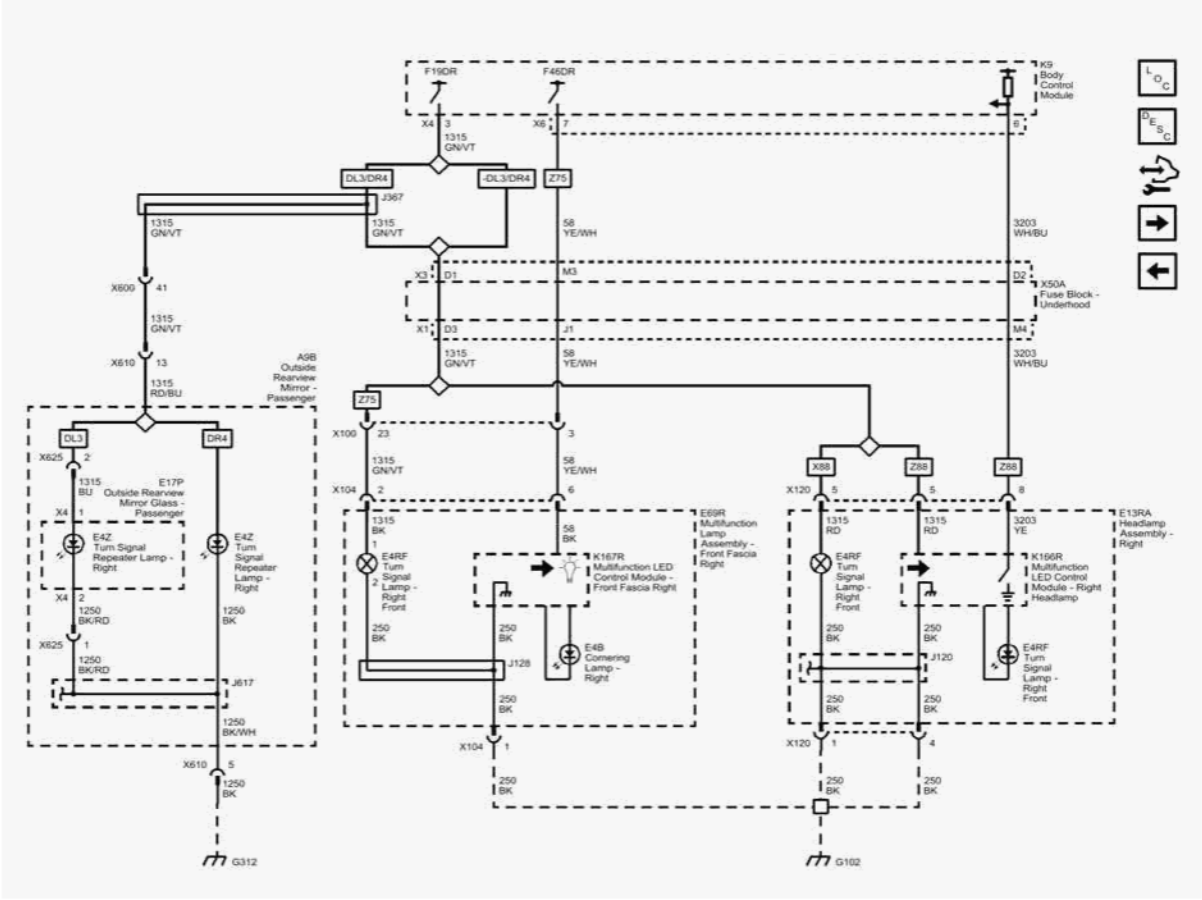


Fig. 13: Right Front Turn Signal Lamps
Courtesy of GENERAL MOTORS COMPANY

CHMSL and Tail Lamps (X88 with T89)

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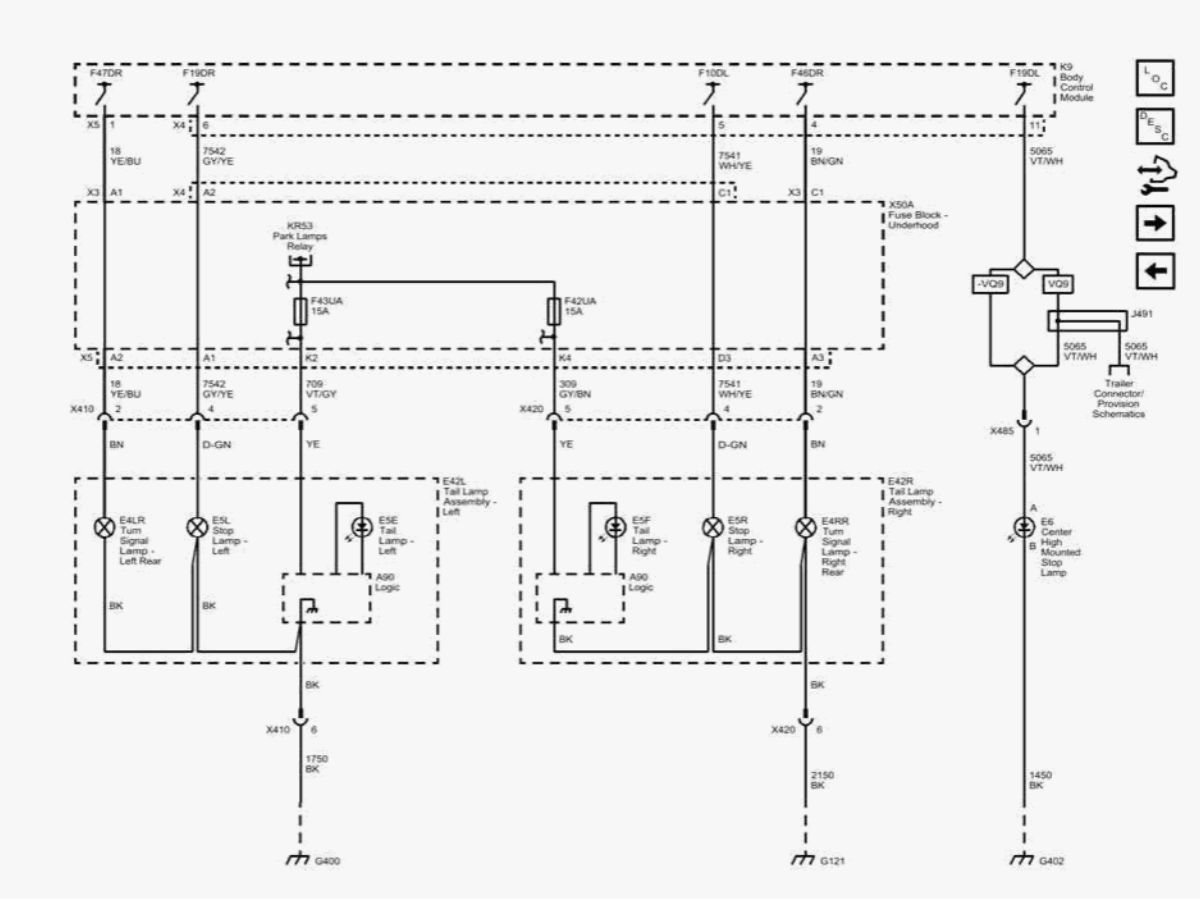


Fig. 14: CHMSL and Tail Lamps (X88 with T89)
Courtesy of GENERAL MOTORS COMPANY

CHMSL and Tail Lamps (X88 without T89)

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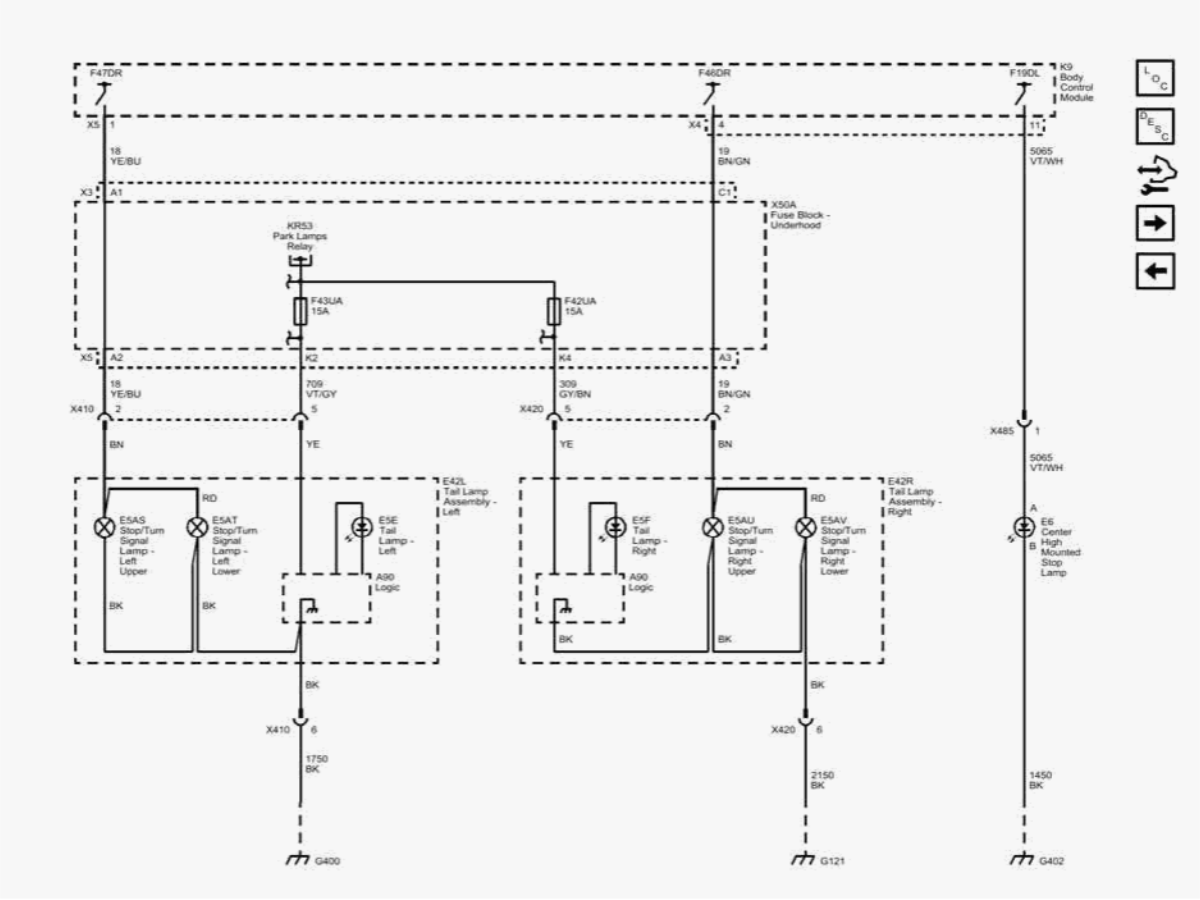


Fig. 15: CHMSL and Tail Lamps (X88 without T89)
Courtesy of GENERAL MOTORS COMPANY

CHMSL and Tail Lamps (Z88)

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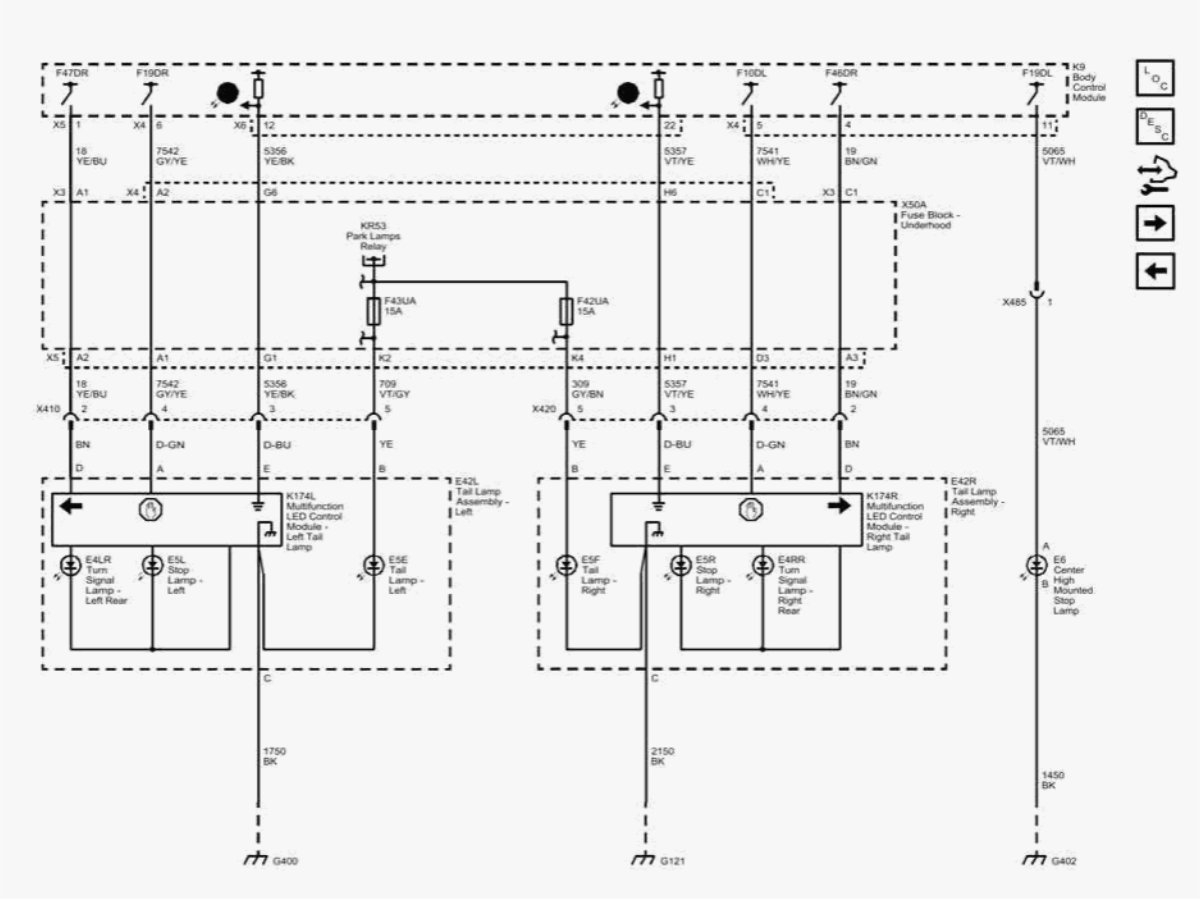


Fig. 16: CHMSL and Tail Lamps (Z88)
Courtesy of GENERAL MOTORS COMPANY

CHMSL and Tail Lamps (Z75)

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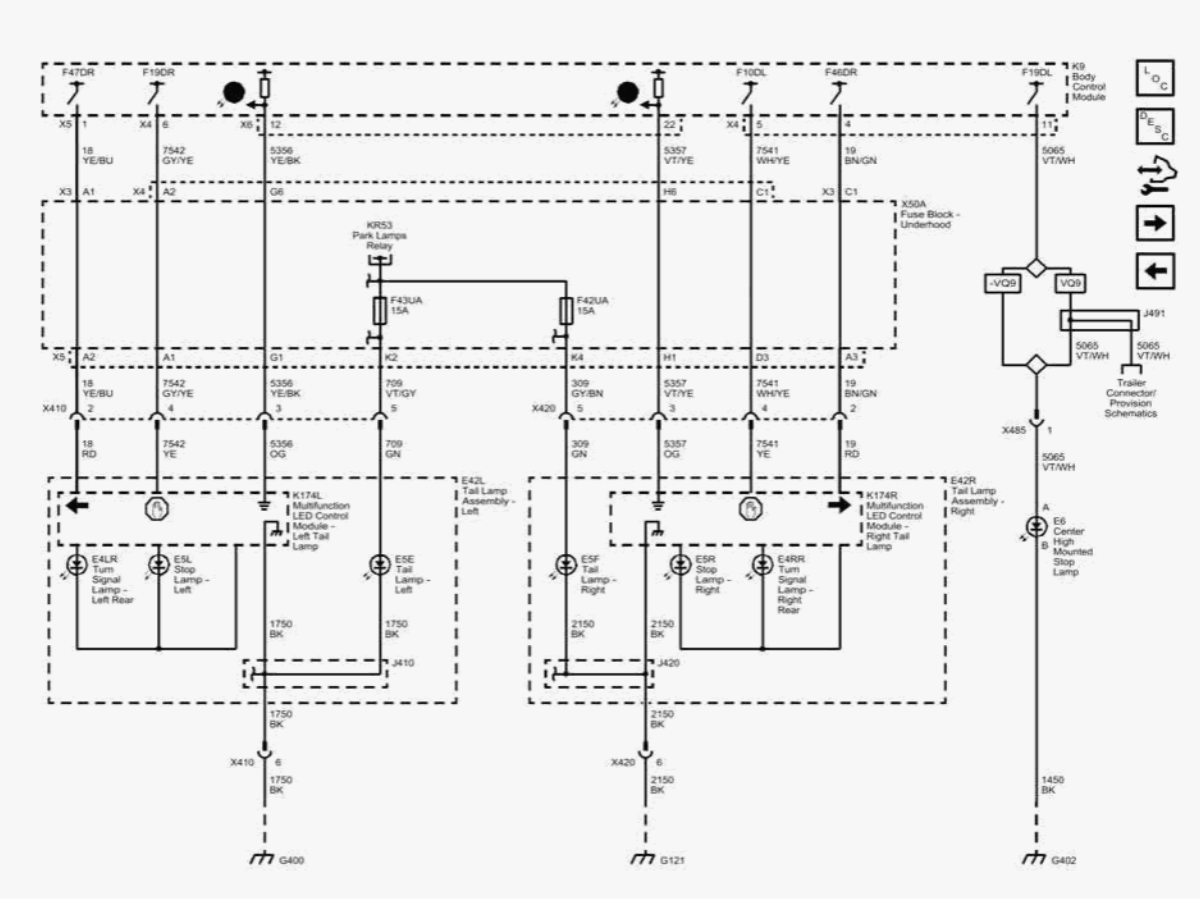


Fig. 17: CHMSL and Tail Lamps (Z75)
Courtesy of GENERAL MOTORS COMPANY

Backup and License Plate Lamps

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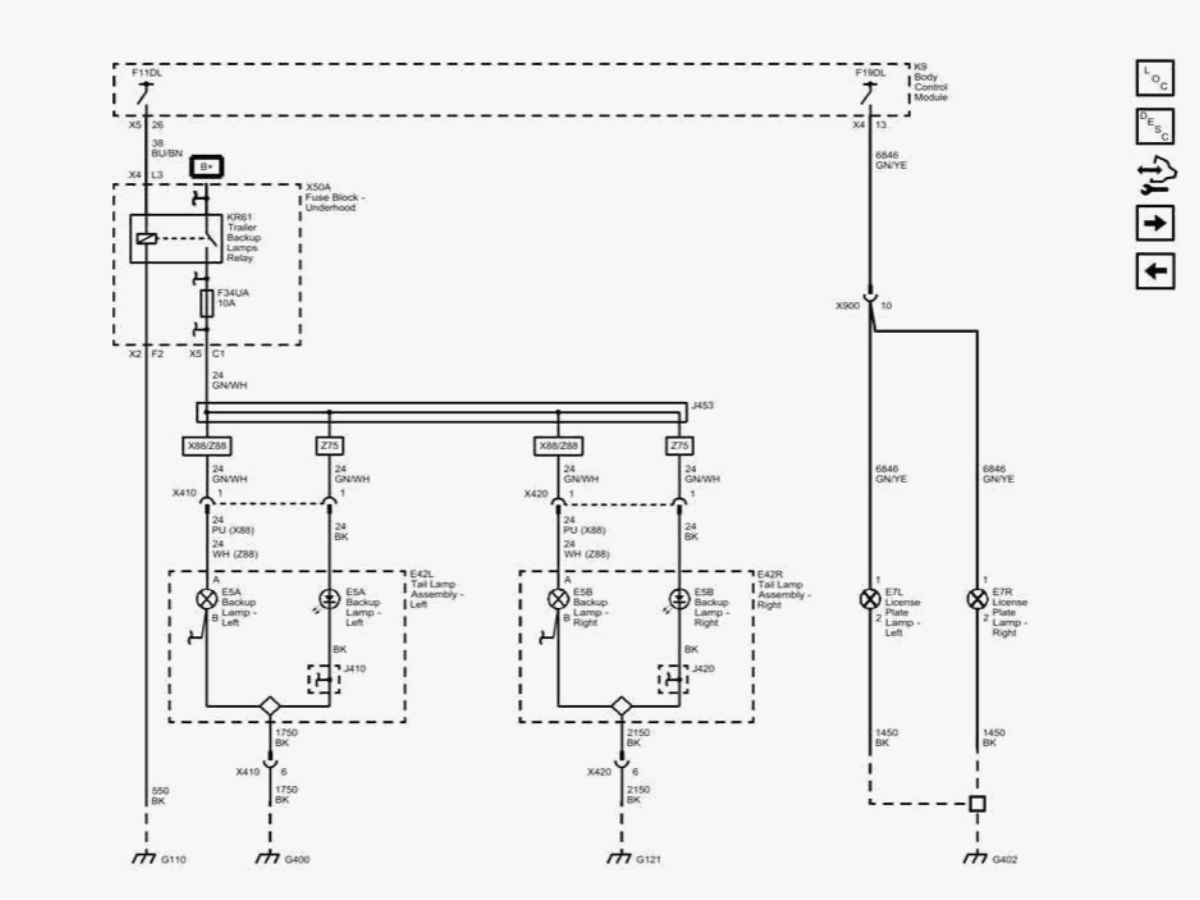


Fig. 18: Backup and License Plate Lamps
Courtesy of GENERAL MOTORS COMPANY

Courtesy Lamps

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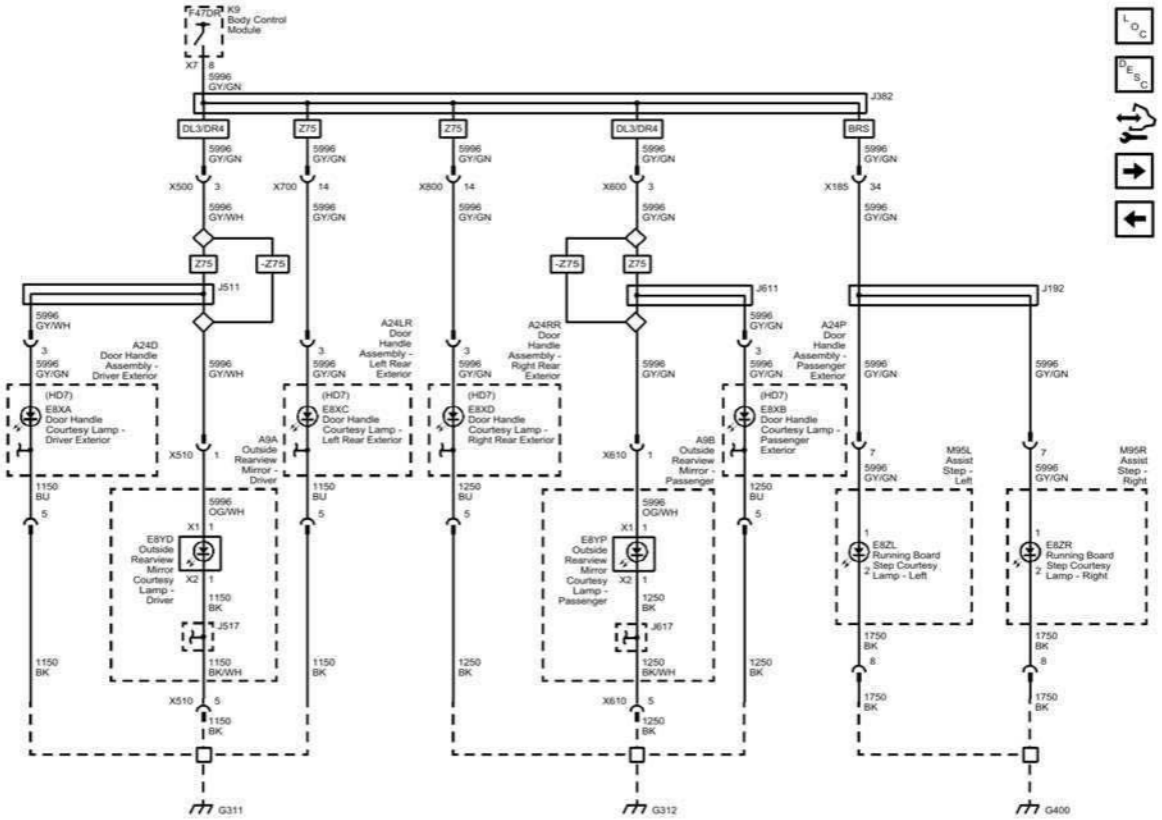


Fig. 19: Courtesy Lamps

Courtesy of GENERAL MOTORS COMPANY

Spot Light (7X6 and 7X7)

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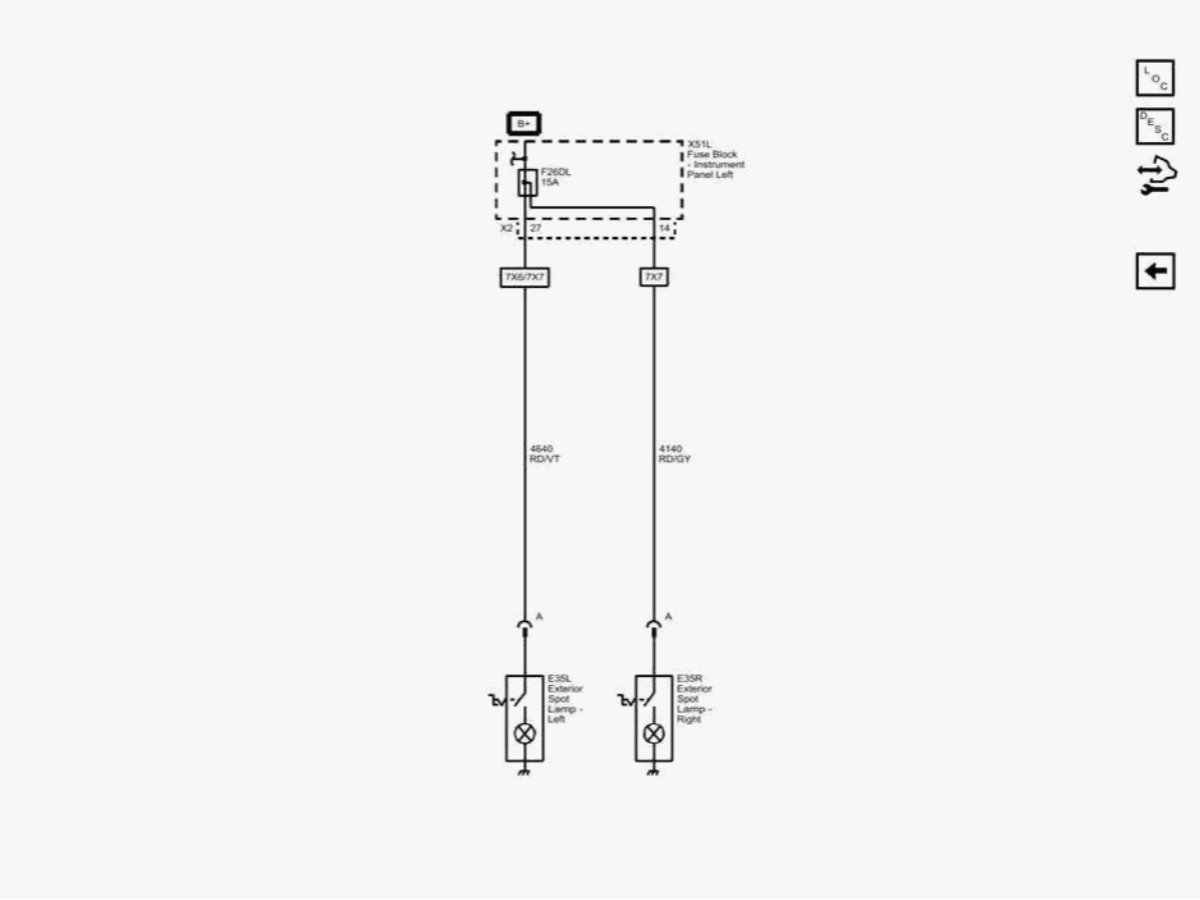


Fig. 20: Spot Light (7X6 and 7X7)
Courtesy of GENERAL MOTORS COMPANY

INTERIOR LIGHTS WIRING SCHEMATICS

Controls and Center Console Compartment Lamp

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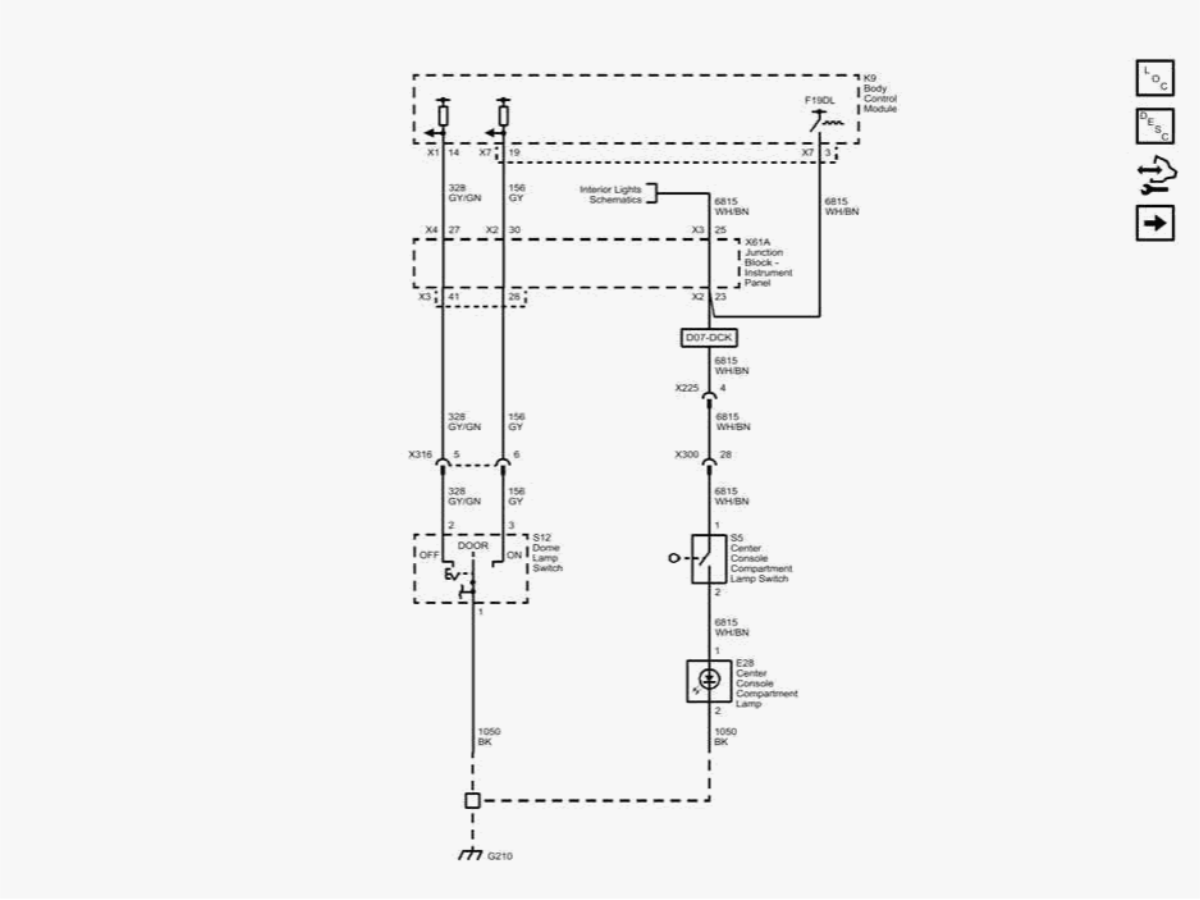


Fig. 21: Controls and Center Console Compartment Lamp
Courtesy of GENERAL MOTORS COMPANY

Door Sill and D-Pillar Dome Lamps

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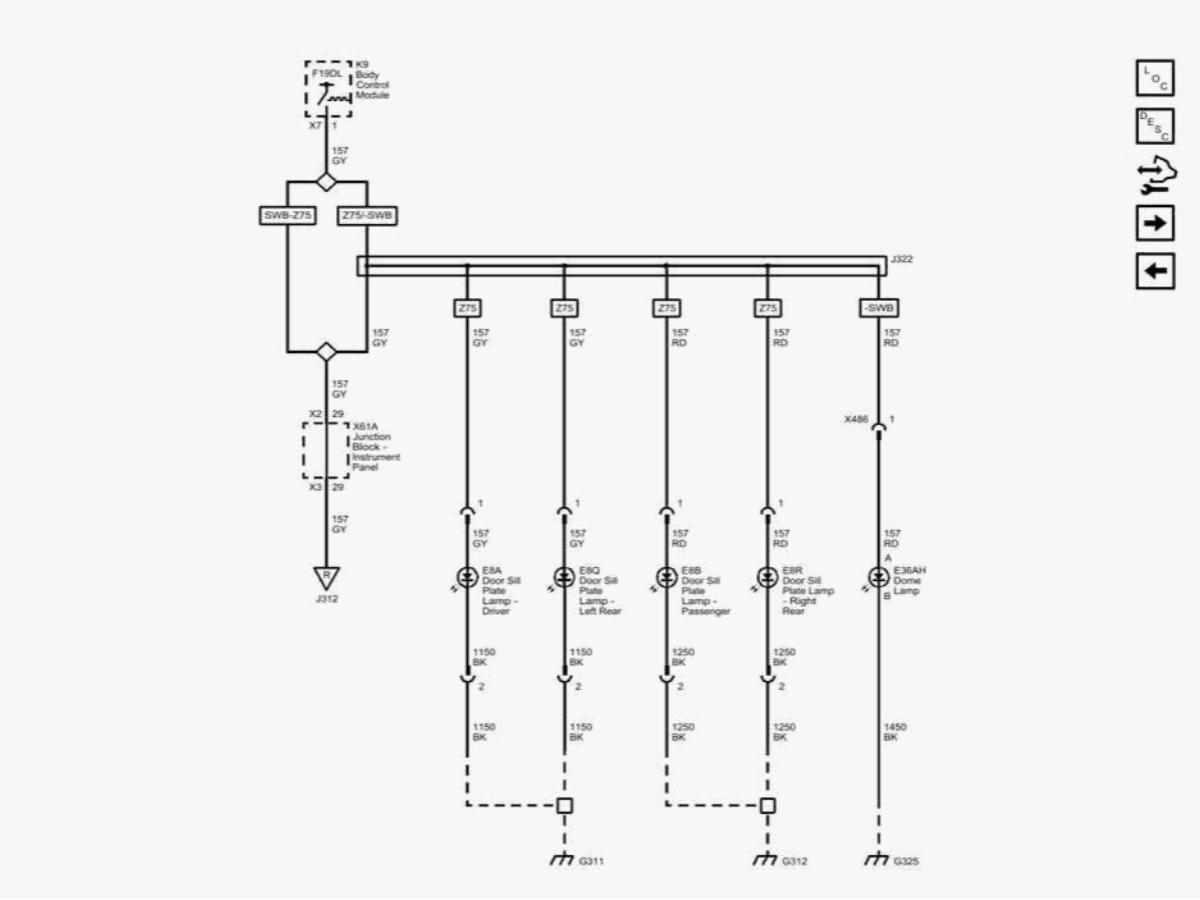


Fig. 22: Door Sill and D-Pillar Dome Lamps
Courtesy of GENERAL MOTORS COMPANY

Overhead Lamps (1 of 2)

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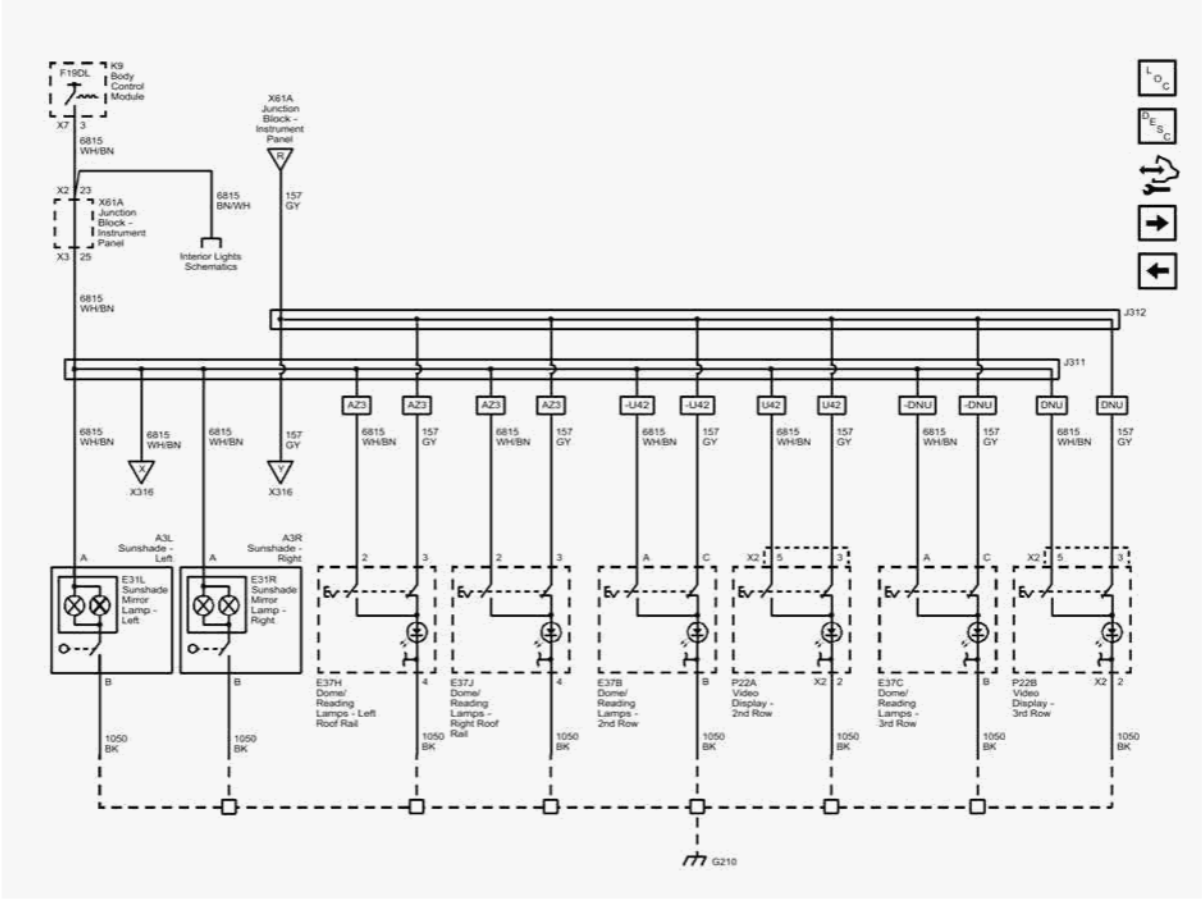


Fig. 23: Overhead Lamps (1 of 2)
Courtesy of GENERAL MOTORS COMPANY

Overhead Lamps (2 of 2)

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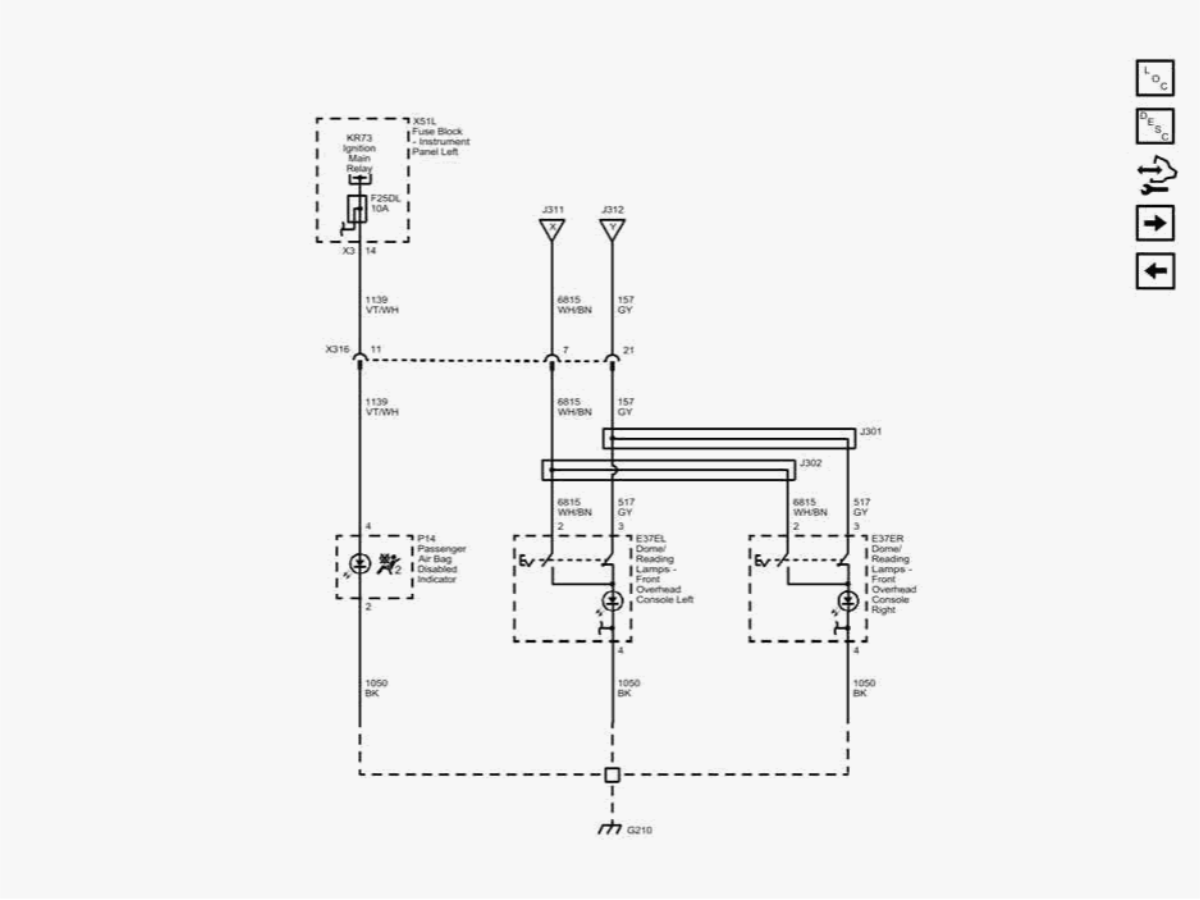


Fig. 24: Overhead Lamps (2 of 2)
Courtesy of GENERAL MOTORS COMPANY

Accent and Flood Lamps - Overhead Console and Video Displays (U42 and DNU)

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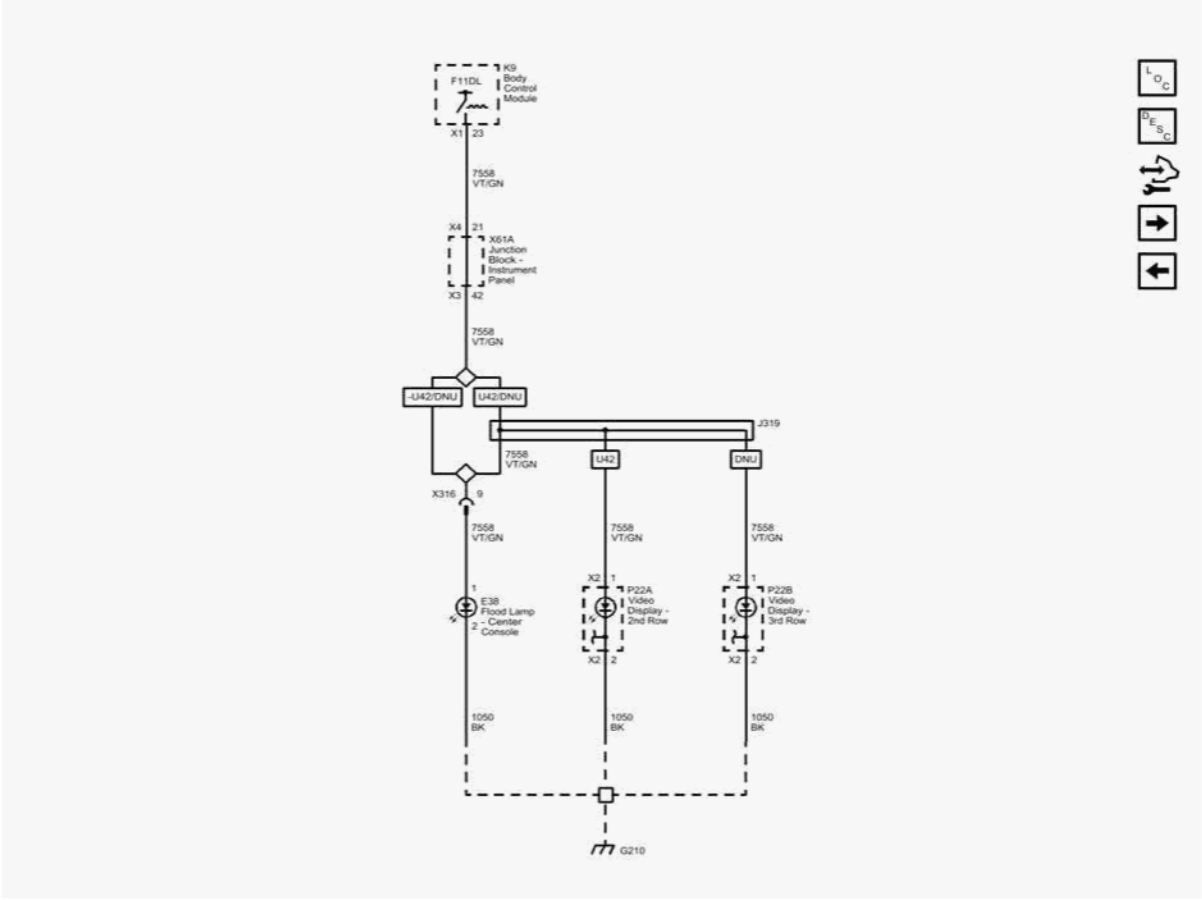


Fig. 25: Accent and Flood Lamps - Overhead Console and Video Displays (U42 and DNU)
Courtesy of GENERAL MOTORS COMPANY

Accent and Flood Lamps - Seats and Front Doors

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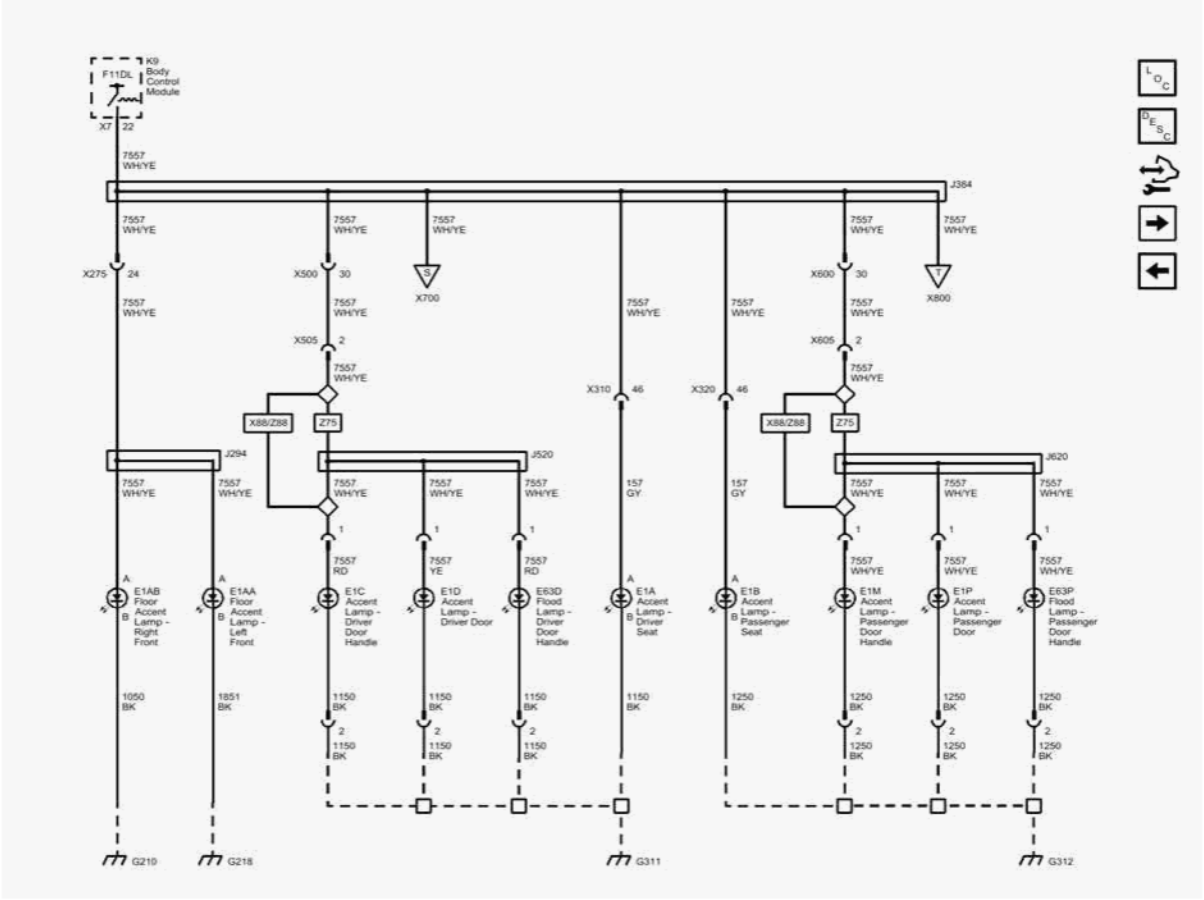


Fig. 26: Accent and Flood Lamps - Seats and Front Doors
Courtesy of GENERAL MOTORS COMPANY

Accent and Flood Lamps - Rear Doors

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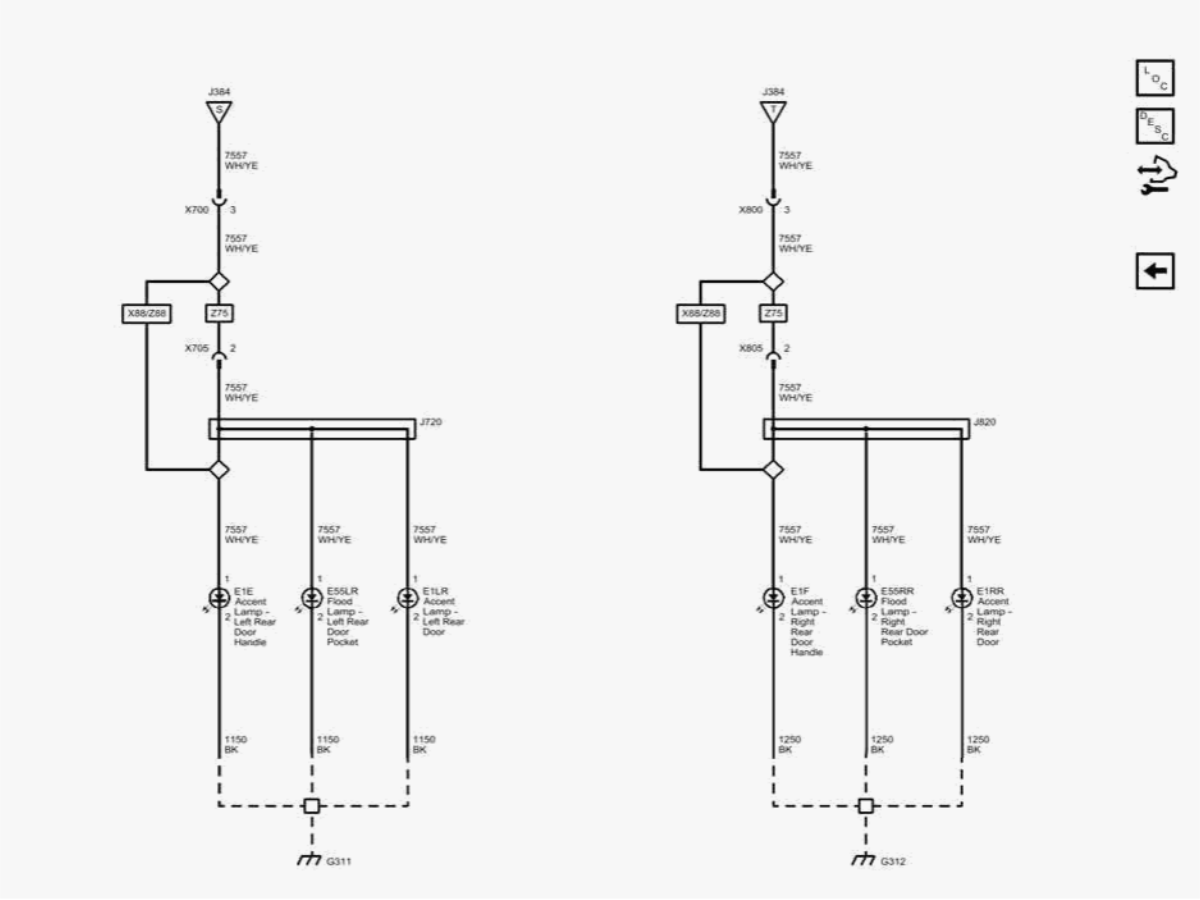


Fig. 27: Accent and Flood Lamps - Rear Doors
Courtesy of GENERAL MOTORS COMPANY

INTERIOR LIGHTS DIMMING WIRING SCHEMATICS

Instrument Panel and Floor Console Dimming

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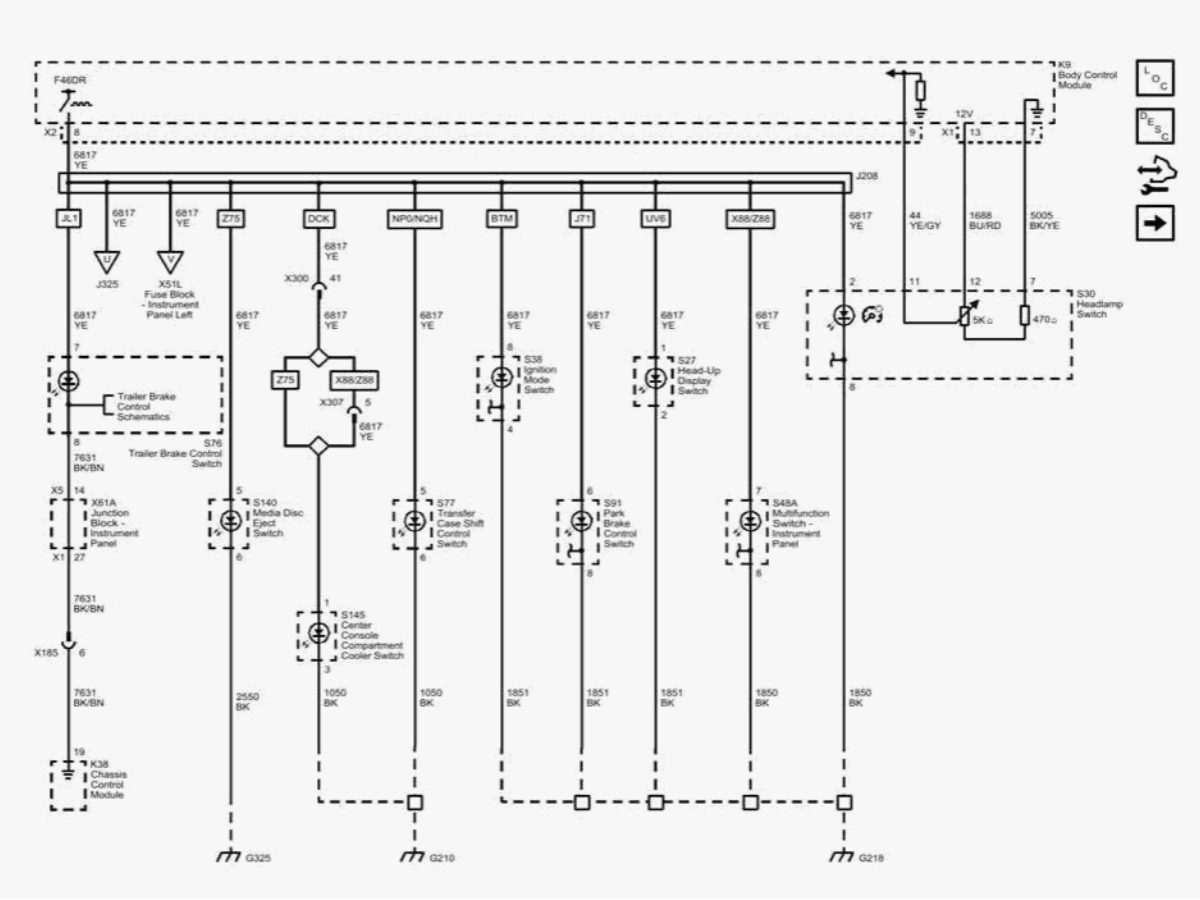


Fig. 28: Instrument Panel and Floor Console Dimming
Courtesy of GENERAL MOTORS COMPANY

Headliner and Overhead Console Dimming (1 of 2)

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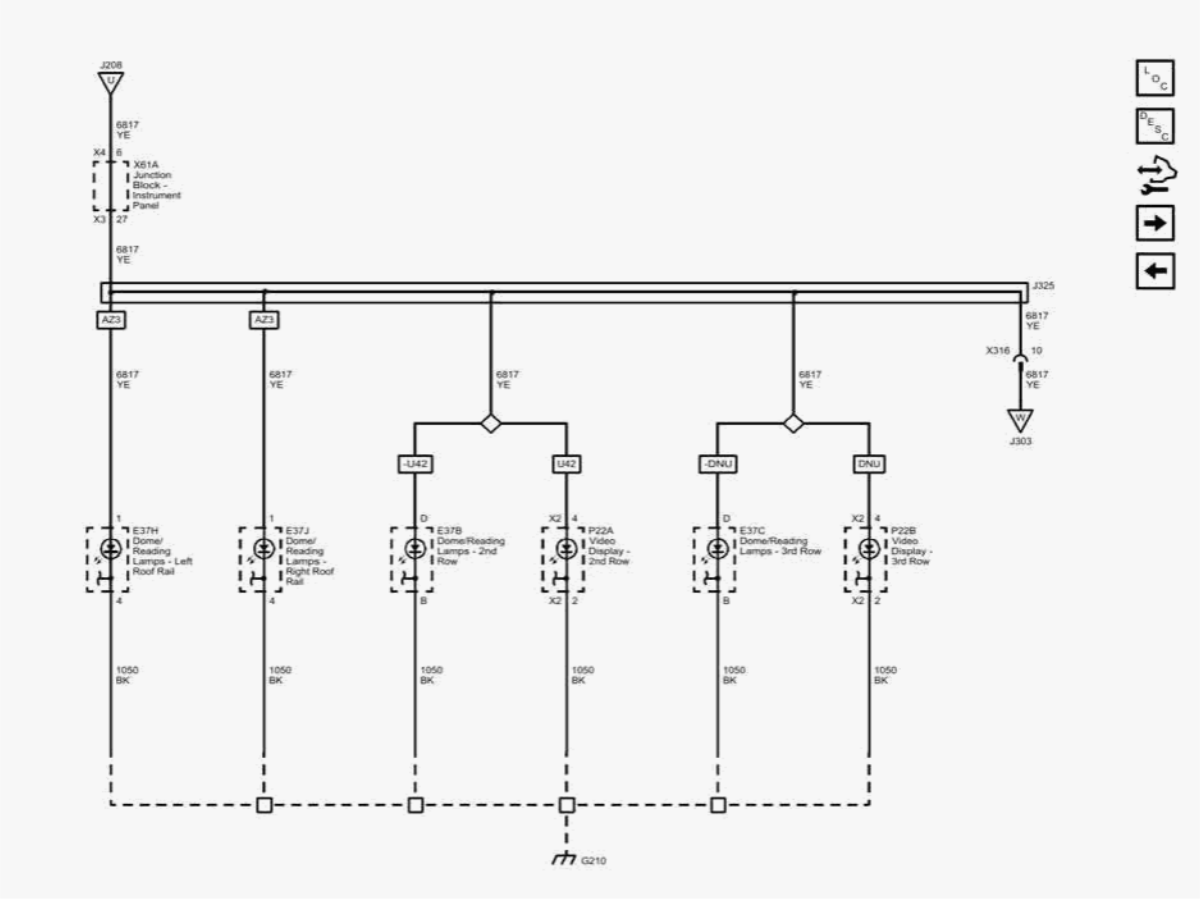


Fig. 29: Headliner and Overhead Console Dimming (1 of 2)
Courtesy of GENERAL MOTORS COMPANY

Headliner and Overhead Console Dimming (2 of 2)

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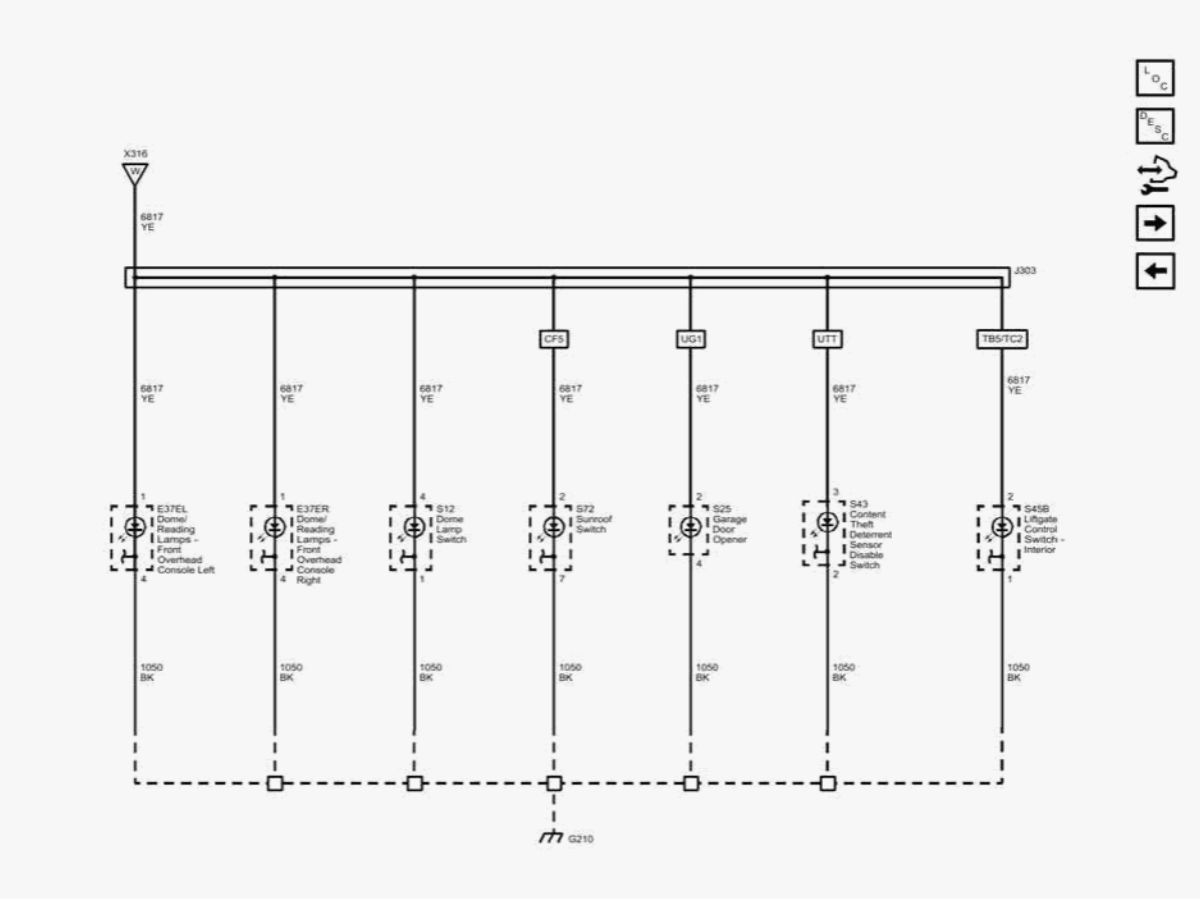


Fig. 30: Headliner and Overhead Console Dimming (2 of 2)
Courtesy of GENERAL MOTORS COMPANY

Steering Wheel and Control Dimming

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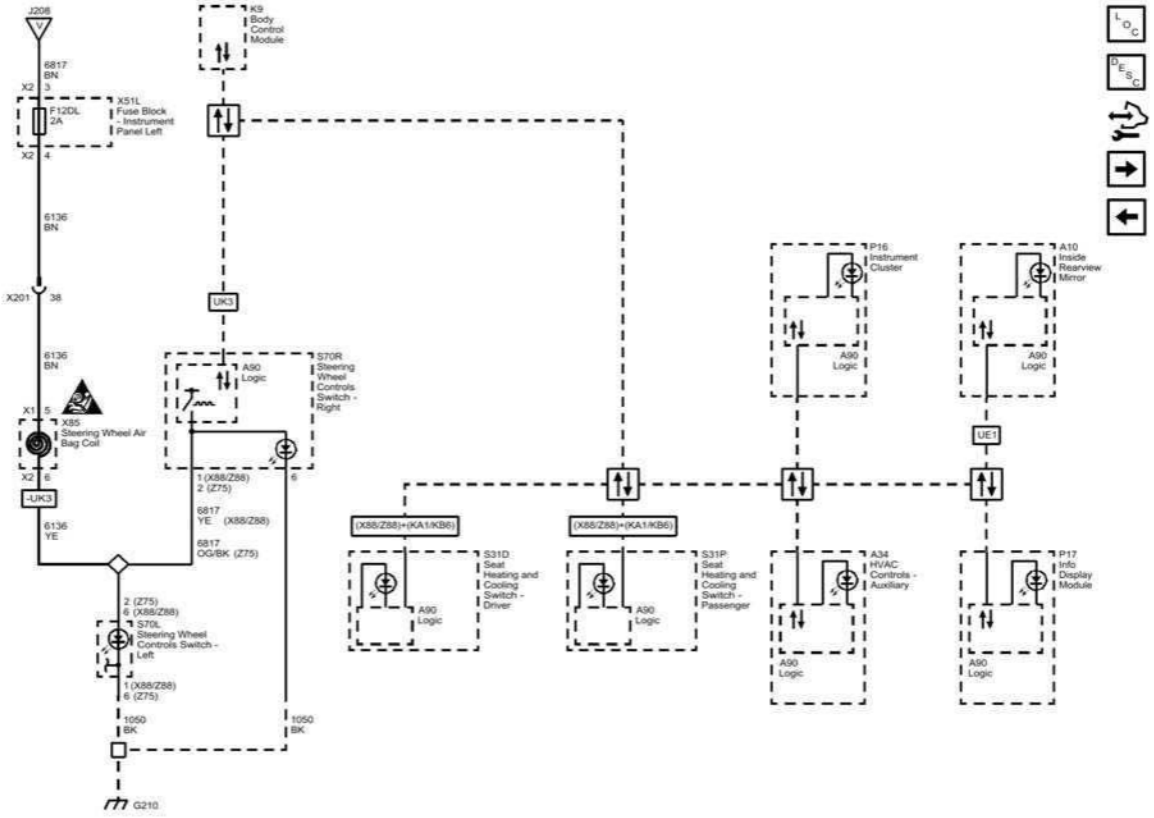


Fig. 31: Steering Wheel and Control Dimming

Courtesy of GENERAL MOTORS COMPANY

Door Locks, Windows and Mirror Switch Dimming

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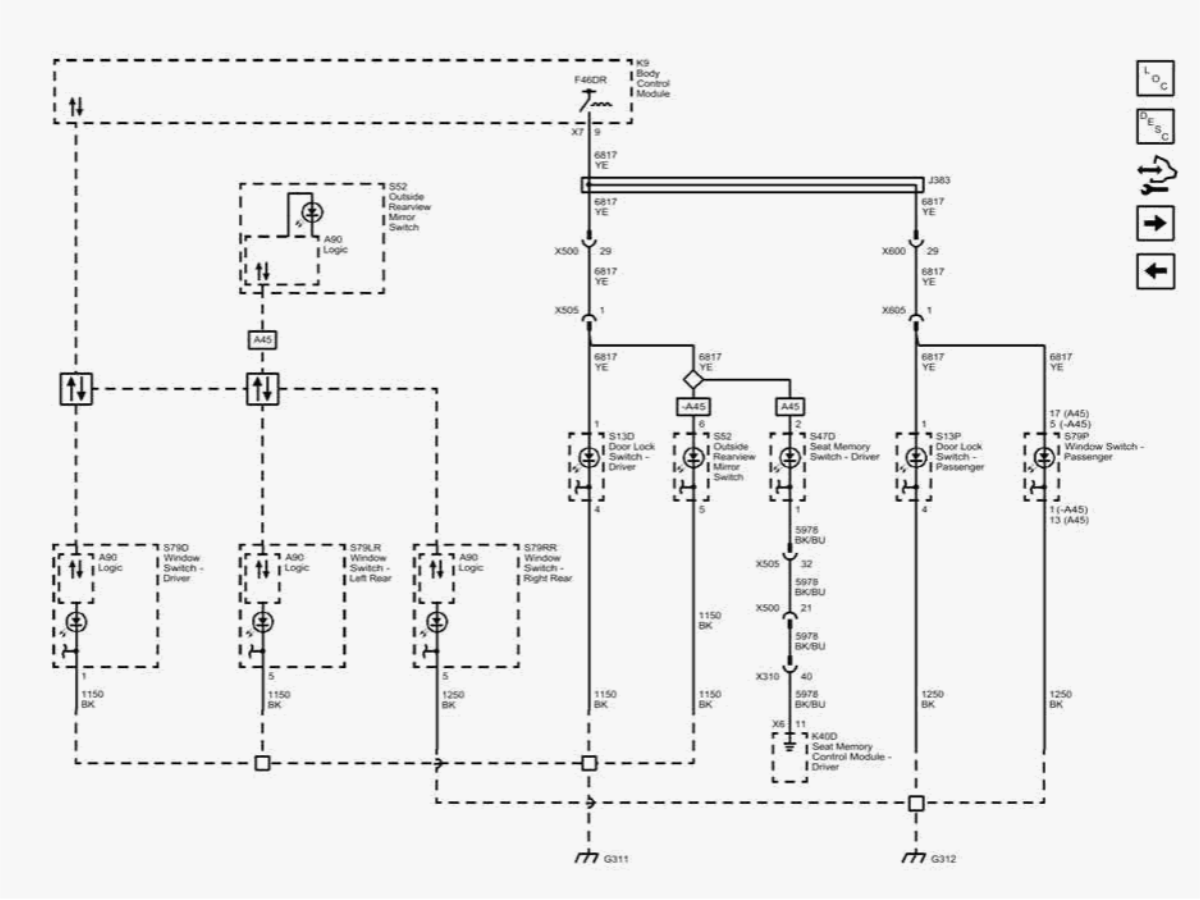


Fig. 32: Door Locks, Windows and Mirror Switch Dimming
Courtesy of GENERAL MOTORS COMPANY

Indicators Lamps (1 of 3)

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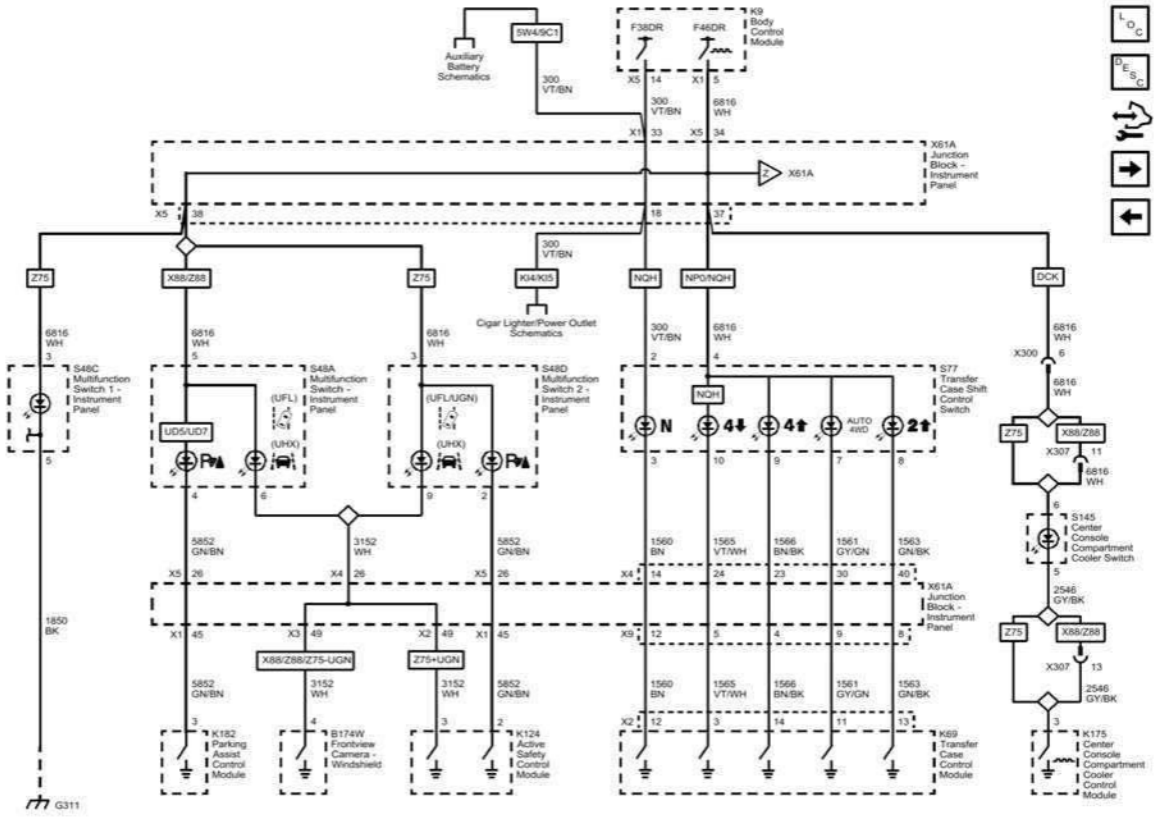


Fig. 33: Indicators Lamps (1 of 3)

Courtesy of GENERAL MOTORS COMPANY

Indicators Lamps (2 of 3) (X88 or Z88)

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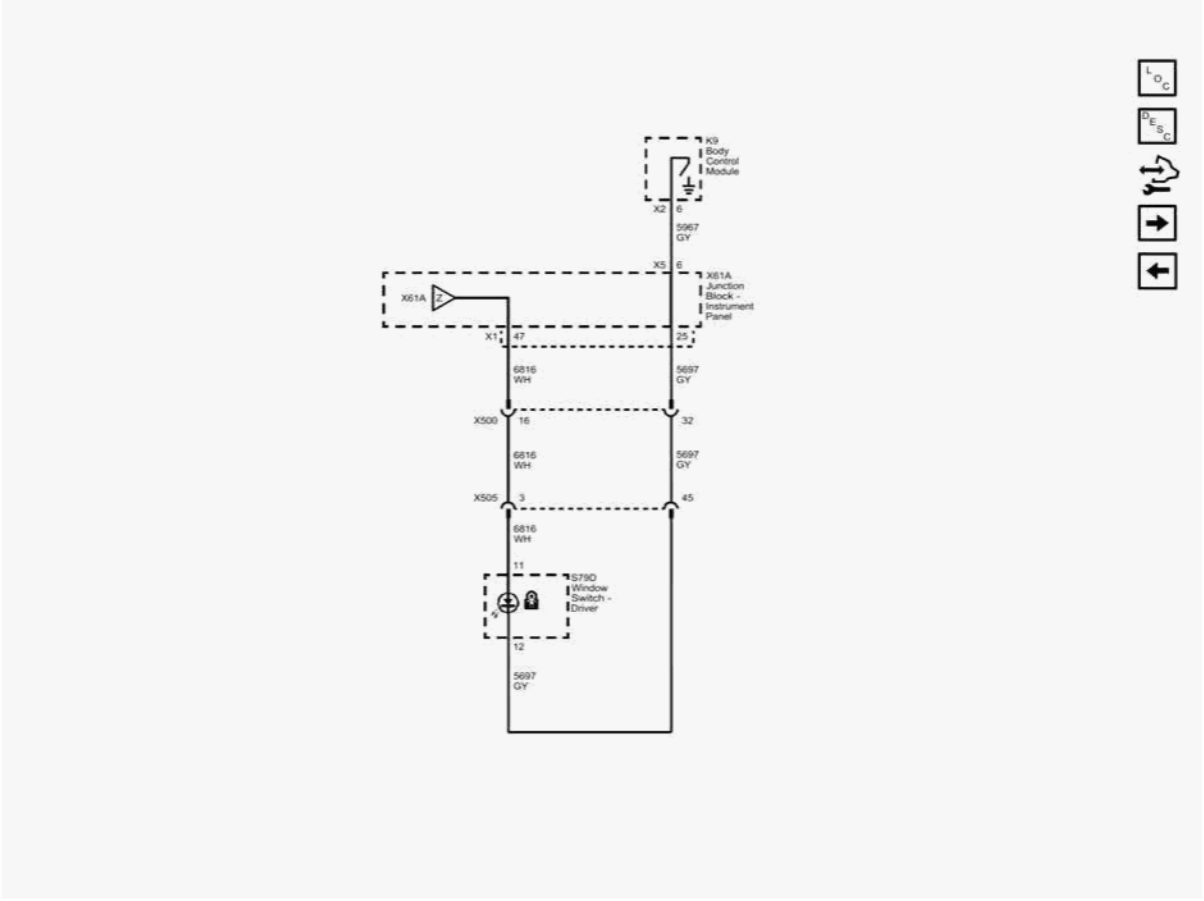


Fig. 34: Indicators Lamps (2 of 3) (X88 or Z88)
Courtesy of GENERAL MOTORS COMPANY

Indicators Lamps (2 of 3) (Z75)

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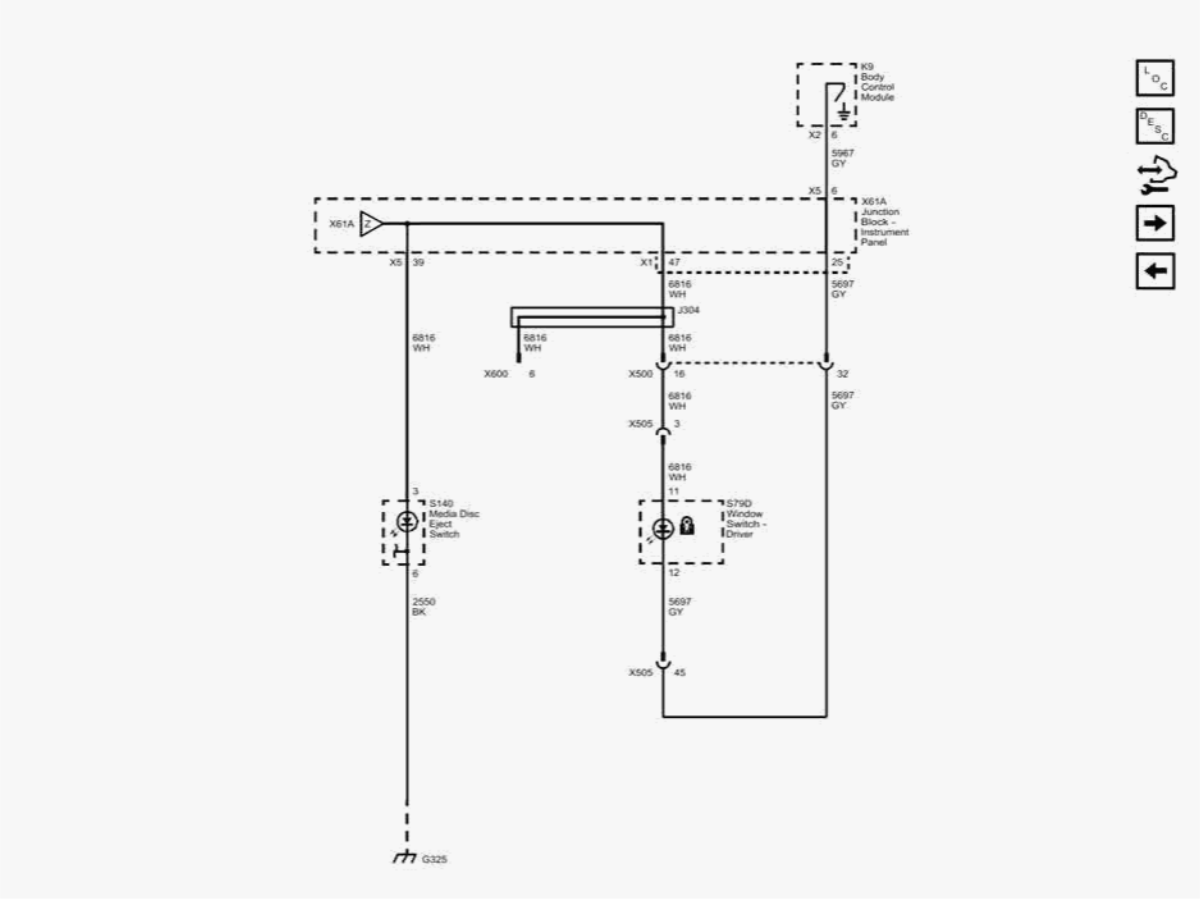


Fig. 35: Indicators Lamps (2 of 3) (Z75)
Courtesy of GENERAL MOTORS COMPANY

Indicators Lamps (3 of 3)

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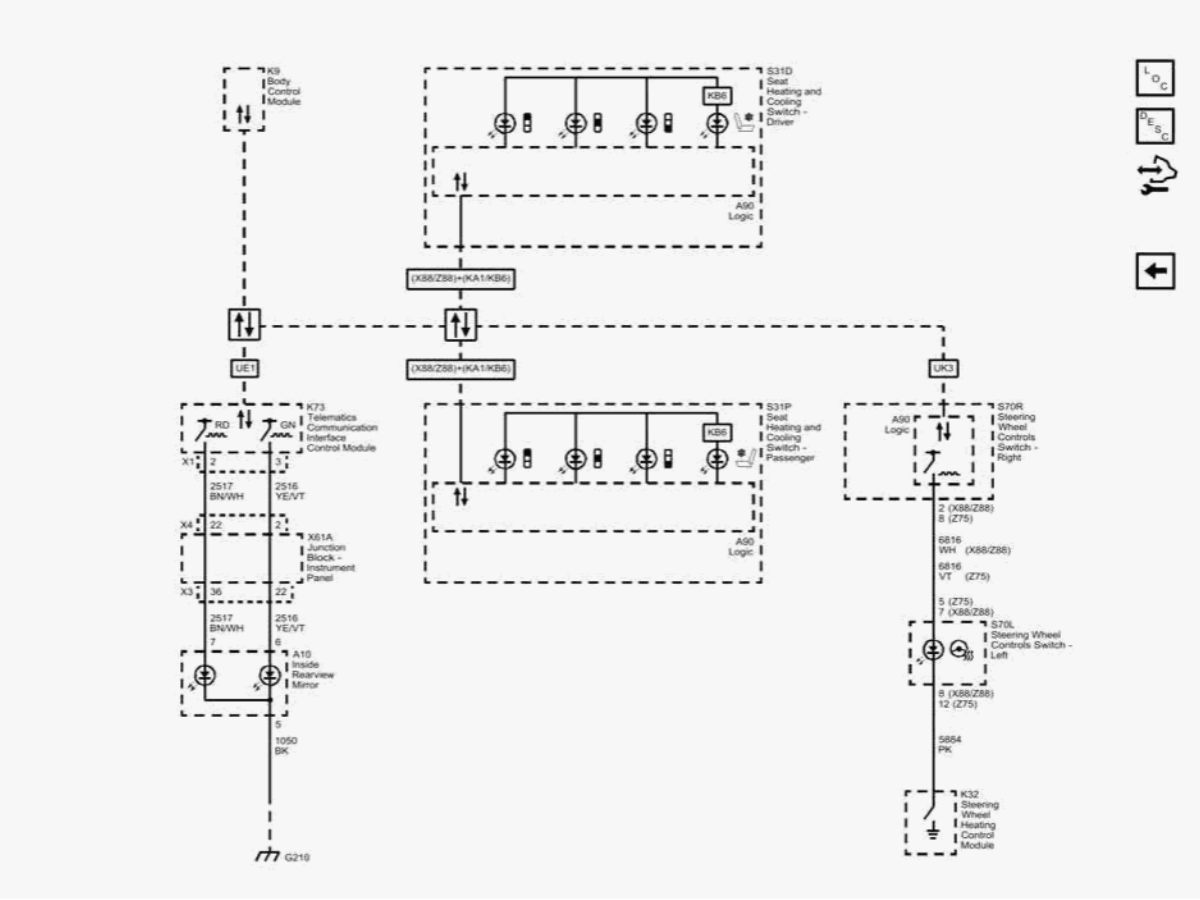


Fig. 36: Indicators Lamps (3 of 3)
Courtesy of GENERAL MOTORS COMPANY

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