2011 Chevrolet Equinox

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Exterior Lamps

The exterior lighting system consist of the following lamps:

- Automatic Headlamp Leveling
- Headlamps
- Adaptive Forward Lighting
- Daytime Running Lamps (DRL)
- Front Fog Lamps
- Rear Fog Lamps
- Park, Tail, License and Marker Lamps
- Turn Signal Lamps
- Hazard Warning Lamps
- Repeater Lamps
- Stop Lamps
- Backup Lamps
- Position Lamps

Low Beam Headlamps (Standard) RPO TT4

The headlamps consist of 2 interchangeable single filament bulbs or 2 high intensity discharge (HID) arc tubes and ballast on each side of the vehicle which provide high and low beams. The lower bulb in the headlamp is the high beam and the upper bulb is the low beam.

The headlamps may be turned ON in 3 different ways:

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

The body control module (BCM) controls the headlamps based on the inputs explained above. When a low beam request is received, the BCM supplies an B+ through the headlamp low beam relay for the left headlamp and through daytime running lamp relay - right for the right headlamp. This then applies B+ to the low beam headlamps, illuminating the low beam headlamps. When a high beam request is received, the BCM grounds the headlamp high beam relay control circuit. This energizes the coil in the headlamp high beam relay, causing the relay switch to close. This then applies B+ to both high beam headlamps through the left high beam and right high beam fuses, illuminating the high beam headlamps.

Adaptive Forward Lighting

The adaptive forward lighting consist of the following components:

- Headlamp control module
- Headlamp actuator – left
- Headlamp actuator – right

Dynamic Curve Light

Bend lighting is a function depending on the following signal input values:

- Steering angle
- Vehicle speed
- Yaw Rate

The appropriate swivel angle is calculated based on vehicle speed and the steering angle value.

Cornering Light

The cornering lamp is activated automatically at vehicle speeds below 40 km/h (25 MPH) when the direction indicator is switched ON and/or when the steering angle is changed from the straight-ahead position towards the side the vehicle is going to turn and passes a programmable angle threshold. The cornering lamp is deactivated automatically when the direction indicator is switched OFF and/or the steering angle has returned in the straight-ahead position. The cornering lamps are deactivated at vehicle speeds above 40 km/h (25 MPH). If reverse gear is active, the cornering lamps go into park function. Both lamps will be switched on. They will switch off 20 seconds after leaving reverse gear or if the vehicle speed exceeds 7 km/h (4 MPH). The cornering lamps also provide a protection against overheating. When having been continuously switched on for 2 minutes, adaptive forward lighting will deactivate the lamps for 2 minutes to enable cooling down.

Town Light

Town Light is activated while the vehicle speed is below 55 km/h (34 MPH) as well as the light sensor detects street lights and the town road category is detected. The light distribution is reduced to an area near the car due to low speeds.

Motorway Light

If vehicle speed is above 100 km/h (62 MPH) for at least 20 seconds (or once above 126 km/h (78 MPH) and the corresponding road category is identified, the headlamps will be switched to a motorway light distribution. During motorway light the light output of the HID bulb is increased to 38 W by electrical power management. This improves the visibility range at the far end of the road.

Country Light

Country light replaces the current low beam and will be controlled based on programmable vehicle thresholds as well as corresponding road detection. The vehicle speed has to be between 55 km/h (34 MPH) and 100 km/h (62 MPH). Country light is the default light distribution at 35 W. Light distribution is reduced on the left side to prevent oncoming traffic from being dazzled.

Tourist Mode

The tourist mode functionality switches the adaptive forward lighting headlamps into a non dazzling mode, if the traffic regulation moves from left hand traffic to right hand traffic and vice versa. The functionality is switched on/off with the same stalk/switch combination. The “flash to pass” stalk needs to be activated while ignition is switched on (System Power Mode = RUN). The “flash to pass” stalk remains activated until the warning indicator within the instrument panel cluster starts flashing (4 seconds) and an acoustic indication is sent. The activation period takes about 3 seconds. An activation flag must be set within the adaptive forward lighting ECM and stored in non-volatile memory. Each time the ignition is switched on and the tourist mode is active, the warning indicator is flashing about 4 seconds. The tourist mode is deactivated with the same procedure described above. The function is switched OFF, if an acoustic signal is sent (Warning indicator remains inactive).

Adverse Weather Light

Adverse weather light will be switched on while the vehicle speed is below 100 km/h (62 MPH) and the windscreen wipers are activated. The HID bulbs will be powered with different values:

- Left: 32 W
- Right: 38 W

The main advantage is that reflections on the wet floor are reduced to a minimum. This is noticeable as well for oncoming traffic as for the driver. In front of the car a less illuminated area is realized.

The following conditions must be met before the adaptive forward lighting will operate:

Automatic Lamp Control

Automatic Light is switched ON as default. It can be switched OFF by turning the light switch to OFF position. It will be switched ON again by doing so again. Automatic Light is only available if a rain sensor or rain/light sensor module in installed in the car. The rain/light sensor module will send the actual ambient light state (day/night) to the BCM. If Automatic Light is enabled, BCM will react on the message received from the rain/light sensor module by switching ON/OFF low beams.

Flash to Pass (Standard) RPO TT4

When the low beam headlamps are on and 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 BCM through the flash to pass switch signal circuit. The BCM then applies ground to the high beam relay control circuit. This energizes the high beam relay, closing the switch side contacts of the high beam relay, applying battery voltage to the left and right high beam fuses. Battery voltage is applied from the high beam fuses through the high beam voltage supply circuit to the high beam headlamp assemblies. This causes the high beam headlamps to illuminate at full brightness momentarily or until the flash to pass switch is released.

Flash to Pass (up level) RPO TT2/TT6

When the low beam headlamps are ON and 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 BCM through the flash to pass switch signal circuit. The BCM sends a message to the headlamp control module to lift the shutter from the Xenon lamp. This causes the Xenon lamp to illuminate the headlamp at full brightness momentarily or until the flash to pass switch is released.

Automatic Headlamp Leveling

The Automatic Headlamp Leveling Systems consist of the following components:

- Ballast module – left
- Ballast module – right
- Headlamp leveling actuator – left
- Headlamp leveling actuator – right
- Headlamp control module
- Headlamp leveling sensor – front
- Headlamp leveling sensor – rear

The automatic headlamp leveling system automatically maintains the vertical alignment of the headlamps when the vehicle load and driving conditions change. The headlamp control module receives inputs from the front and rear headlamp leveling sensors to determine vehicle pitch. The headlamp leveling sensors send an output to the headlamp control module as the vehicle suspension compresses and rebounds. The headlamp control module calculates the difference in vehicle pitch and sends a command to the (HID) ballast. The ballast then drive the headlamp leveling actuators to the position commanded by the headlamp control module. The headlamp leveling system also monitors the performance of the HID bulb and ballast. When the headlamp switch is placed in the ON position the headlamps will go down, and then back up to the center position.

Daytime Running Lamps (DRL) without HID RPO TT4

The DRL bulbs are combined with the park lamps. One filament is for the DRL and one for the park lamps. The DRL will operate when the following conditions are met:

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

By turning the headlamp switch in the OFF position the automatic light function and the DRL will be deactivated.

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2–4.9 V depending on outside lighting conditions. The HVAC control module provides a low reference ground and 5 V reference signals to the ambient light sensor. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either DRL or low beam when the headlamp switch is in the AUTOMATIC LIGHT position. In daylight conditions, the BCM will command the DRL ON by applying ground to the left and right DRL relays via separate left and right DRL relay control circuits. When the BCM applies ground to the relay control circuits, the left and right DRL relay coils energize causing both relay switch contacts to close. With the left and right DRL relay switch contacts closed, battery voltage flows to the left and right DRL lamps. Any function or condition that turns on the headlamps will cancel DRL operation.

Daytime Running Lamps (DRL) with HID RPO TT2/TT6

The DRL are LEDs which are continuously illuminated when:

- Ignition is switched ON.
- Engine is running.
- High and low beam headlamps are ON or OFF.
- Headlamp switch is in PARKING LIGHT, AUTOMATIC LIGHT or LOW BEAM position.

By turning the headlamp switch in the OFF position the automatic light function and the DRL will be deactivated.

The ambient light sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2–4.9 V depending on outside lighting conditions. The HVAC control module provides a low reference ground and 5 V reference to the ambient light sensor. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for only DRL or DRL and low beam when the headlamp switch is in the AUTOMATIC LIGHT position. In daylight conditions the BCM will command the DRL ON.

Front Fog Lamps

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

Rear Fog Lamps

When the rear fog lamp switch is placed in the ON position, battery voltage is applied from the BCM to the rear fog lamps. Ground for the rear fog lamps is applied at all times.

The BCM will send a message via GMLAN serial data to the instrument panel cluster to enable the rear fog lamp indicator.

Park, Tail, License and Marker Lamps

The park lamps, tail lamps/LEDs and number plate lights are turned ON when the headlamp switch is placed in the Parking lights or Low beam position or anytime the headlights are requested. When the BCM receives a request from the headlamp switch to turn ON the park lamps the BCM a sends out a PWM signal, which illuminates the park lamps, tail lamps and number plate lights.

Turn Signal Lamps

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

Repeater Lamps

The repeater lamps are located in the front fender. The repeater lamps are used as additional turn signal lamps, and operate as described in the Turn Signal/Hazard Flasher Lamps description.

Hazard Flasher 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 BCM supplies battery voltage to all turn signal lamps in an ON and OFF duty cycle. When the hazard switch is activated, the BCM sends a serial data message to the instrument cluster requesting both turn signal indicators to be cycled ON and OFF.

Stop Lamps

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

Backup Lamps

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

Battery Run Down Protection/Inadvertent Power

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