

## Interior Lighting - System Operation and Component Description

### System Operation

#### Overview

The interior lighting system consists of:

- Courtesy lamps
- Demand lamps
- Ambient lighting

The courtesy lamps subsystem consists of:

- Interior lamps
- Puddle lamps
- Door ajar switches (integrated into the door latches)
- Courtesy lamp switch (integrated into the overhead console)
- DDM
- PDM
- BCM

The courtesy lamps provide illumination to the vehicle interior and below the exterior mirrors when entering or exiting the vehicle or when requested using the courtesy lamp switch located on the front interior lamp assembly.

The demand lamps subsystem consists of:

- Interior lamps (map lamps)
- Vanity mirror lamps
- Cargo lamp
- BCM

The demand lamps provide illumination to specific areas within the vehicle when needed.

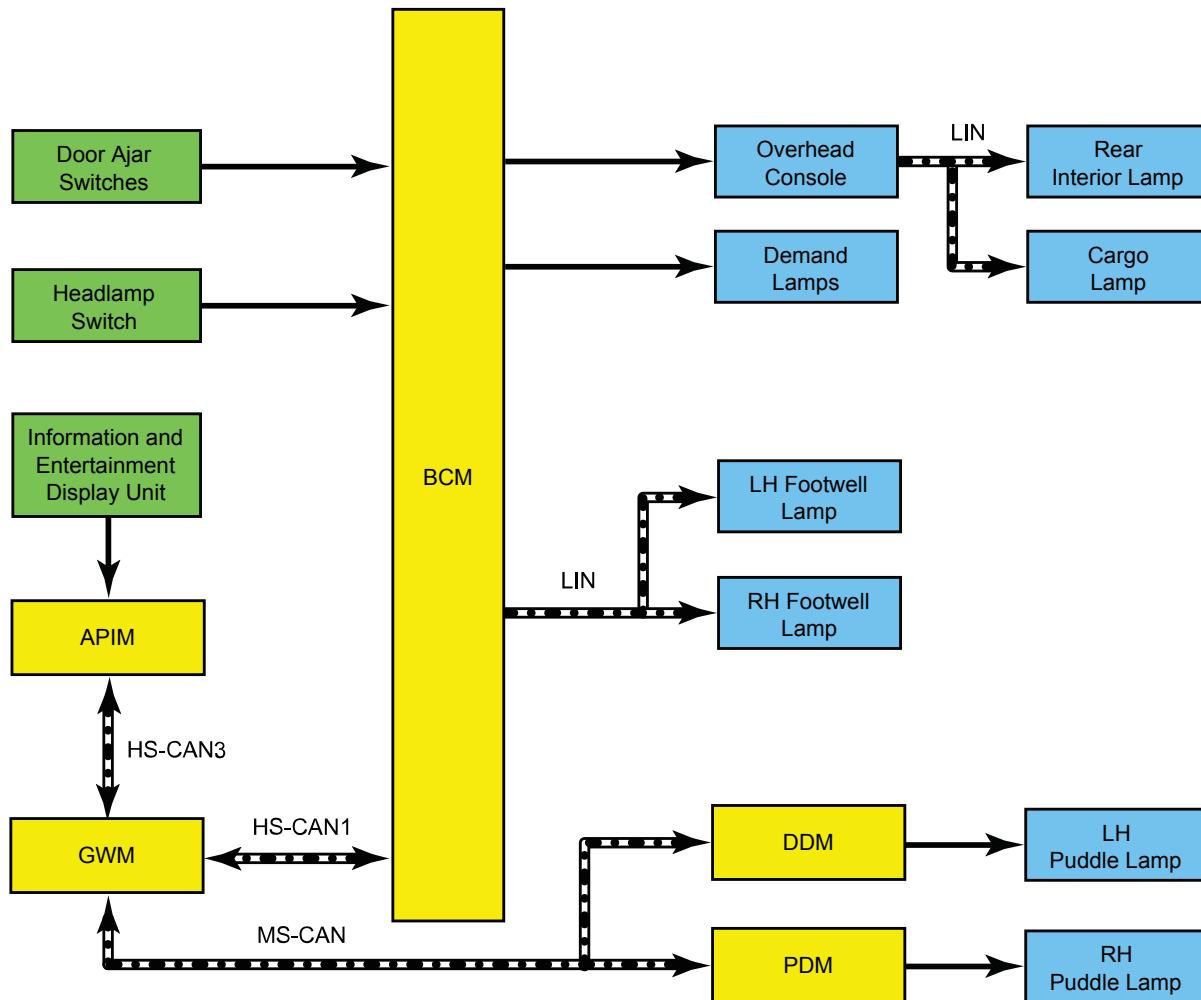
The BCM supplies voltage to the demand lamps when the battery saver feature is not active.

The ambient lighting subsystem consists of:

- Ambient lighting Light Emitting Diodes (LEDs)
- BCM

The ambient lighting provides illumination to the front footwell locations for illuminated entry or when the ignition is in RUN with the parking lamps on.

#### System Diagram



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**Network Message Chart**

**DDM and PDM Network Input Messages**

Broadcast Message	Originating Module	Message Purpose
Puddle lamp activation	<u>GWM</u>	Provides puddle lamp request from the <u>GWM</u> to activate the exterior mirror puddle lamps.

## **GWM Network Input Messages**

<b>Broadcast Message</b>	<b>Originating Module</b>	<b>Message Purpose</b>
Puddle lamp activation	<u>BCM</u>	Provides puddle lamp request from the <u>BCM</u> to activate the exterior mirror puddle lamps.

## **Battery Saver**

**NOTE:** *Time-out is 10 seconds if the vehicle is in factory mode or 1 minute if the vehicle is in transport mode.*

The BCM provides automatic shut-off of the courtesy and demand lamps after a time-out period when the ignition is OFF. When 10 minutes (30 minutes for demand lamps) have elapsed, the BCM automatically shuts off voltage to the lamps. A timer in the BCM starts/restarts (voltage is restored if the BCM is in battery save mode) when:

- the ignition transitions to OFF.
- the front or rear interior lamp was switched ON.
- any door becomes ajar.
- any button of a RKE transmitter is pressed.
- a door is unlocked using the passive entry feature.
- a valid code was entered on the keyless entry keypad.

## **Courtesy Lamps**

The BCM controls the courtesy lighting functions and timing by monitoring inputs from the following:

- Ignition state
- Courtesy lamp switch (integrated into the front interior lamp assembly)
- Door ajar switches
- RKE system

The BCM sends a voltage signal to each door ajar switch. When the doors are closed, the circuit is switched to ground and the voltage is pulled low, indicating closed doors.

The BCM monitors the ignition state and inputs from the RKE system to determine when to energize the interior light relay. The BCM controls the voltage side of the courtesy lamps for the illuminated entry and exit features.

For keyless entry, the BCM monitors input from the RKE transmitter (directly from the integrated keyhead transmitters (IKTs) on vehicles without push button start) or from the RFA module (on vehicles with push button start) to determine when to activate/deactivate the illuminated entry and exit functions.

When the puddle lamps are requested, the BCM sends a message over the HS-CAN1 to the GWM then the GWM sends the message to the DDM and the PDM over the MS-CAN.

The DDM and the PDM provide voltage to the left and right puddle lamps based on messaged input from the BCM.

The interior courtesy lamps can also be activated from the courtesy lamp switch mounted on the overhead console. The overhead console controls the courtesy lamp function of the rear interior lamps. When the courtesy lamp button is pressed on the overhead console, the courtesy lamp function for all the lamps is turned on/off. If any door is open, the BCM command overrides the function of the overhead console switch and activates the courtesy lamps.

There are three control switches on the overhead console:

- Global On
- Global Off
- Door Defeat

The global on and off buttons activate or de-activate the courtesy lamps while the doors are closed.

The door defeat button deactivates the courtesy lamps so when the doors are opened the courtesy lamps remain off. When the door defeat function is activated, the door defeat button illuminates amber in color and when de-activated, the button illuminates blue and the courtesy lamps return to normal operation.

If any door is open and the door defeat function is activated, the global on and off buttons will continue to function and activate or de-activate the courtesy lamps.

### **Illuminated Entry and Exit**

The illuminated entry and exit features provide temporary illumination of the parking lamps, the dimmable backlighting, the ambient backlighting and the courtesy lamps. Refer to the table for additional information.

**NOTE:** An arbitrator (software programming) within the BCM determines which actions take precedence over others (for example, an open door keeps the courtesy lamps on even when a command to lock the doors is received).

<b>Action</b>	<b>Parking Lamps</b>	<b>Courtesy Lamps</b>	<b>Dimmable Backlighting</b>	<b>Ambient Lighting</b>
<u>RKE</u> transmitter or mechanical unlocking of the doors	On for 25 seconds	On for 25 seconds	On for 25 seconds	Off
<u>RKE</u> transmitter or mechanical locking of the doors	Off	Off	Off	Off 3 seconds after courtesy lamps turned off
Open a closed door after previously unlocking (no ignition state change since unlock)	Off (on for remaining time if unlocked from transmitter or mechanical unlocking of the doors)	On	Off	On
Close all doors	Off	On for 25 seconds	On for 25 seconds	On for 25 seconds
Ignition changed to ON	Off	On for 25 seconds	Off	On
Ignition changed out of ON	Off	On for 25 seconds	On for 25 seconds	On for 25 seconds
Open a door after the ignition is changed to OFF	Off	On	Off	On
Ignition is OFF and doors are unlocked from the door lock switch	Off	On for 25 seconds	Off	Off
Ignition is OFF and doors are locked from the door lock switch	Off	Off	Off	Off

## Demand Lamps

When the BCM is in not in battery saver mode, the interior light output is energized to provide voltage to the demand lamps.

## Ambient Lighting

The ambient lighting subsystem consists of the BCM and the Light Emitting Diodes (LEDs) located within the front footwell areas. The ambient lighting is operational when the ignition is in any state other than OFF (the exception is when it is used in conjunction with the illuminated entry/exit features), the headlamps are on and the outside ambient light level is low. The BCM provides the voltage to the ambient lighting system. A LIN circuit is routed from the BCM to the Light Emitting Diodes (LEDs).

## Component Description

### Door Ajar Switch

The door ajar switches (ground switches) each receive a voltage signal from the BCM on independent circuits. When the door is closed, the door ajar switch is closed, routing the signal to ground. When the door is opened, the door ajar switch opens.

### Interior Lamp

All of the interior demand lamps receive voltage from the BCM when the battery saver feature is not active. This is used by each interior lamp to power the demand lamp within it.

All of the interior courtesy lamps receive voltage from the interior lighting output of the BCM. This is used by each interior lamp to power the courtesy incandescent bulb or LED within it.

The front interior lamp sends a message to the rear lamp and cargo lamp to activate/deactivate them through a LIN circuit.

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