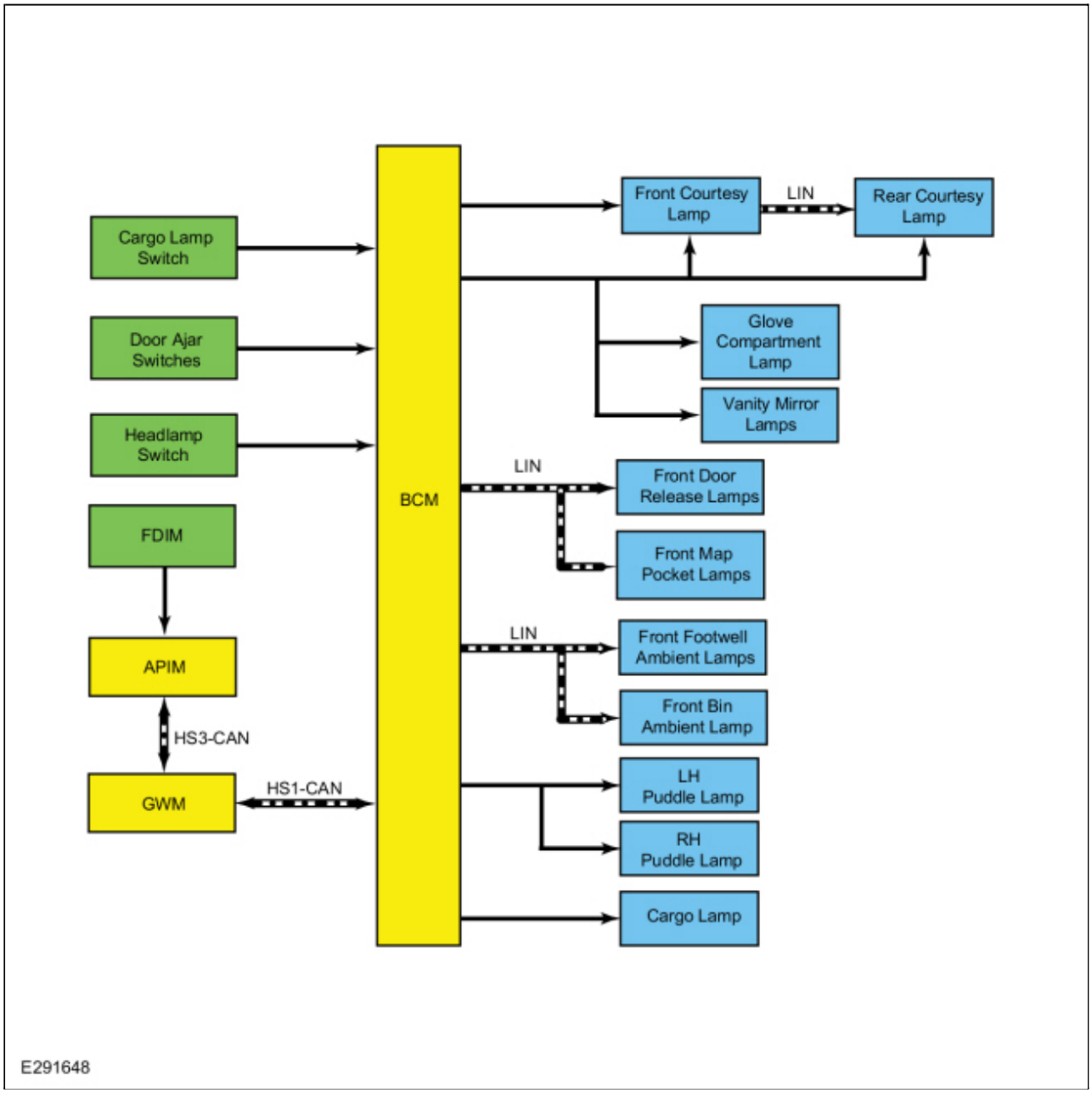
Interior Lighting - System Operation and Component Description

System Operation

System Diagram



Network Message Chart

GWM Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Ambient light color/intensity request	APIM	Indicates the color and brightness setting selected from the display interface. This commands the ambient color and brightness setting as requested by the operator.

BCM Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Ambient light color/intensity request	GWM	Indicates the color and brightness setting selected from the display interface. This commands the ambient color and brightness setting as requested by the operator.

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. A timer in the BCM starts 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.

When 10 minutes (30 minutes for demand lamps) have elapsed, the BCM automatically shuts off voltage to the lamps. The timer restarts (voltage is restored if the BCM is in battery saver mode) when:

- the ignition transitions out of 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.

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. When the interior light relay is energized, voltage is provided to the interior lamps. 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) to determine when to activate/deactivate the illuminated entry and exit functions.

When the puddle lamps are requested, the BCM provides voltage to the left and right puddle lamps.

The interior courtesy lamps can also be activated from the courtesy lamp switch mounted on the front interior lamp. The front interior lamp controls the courtesy lamp function of the rear interior lamps. When the courtesy lamp button is pressed on the front interior lamp, 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 front courtesy lamp switch and activates the courtesy lamps.

There are three control switches on the front row lamp:

- 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).*

Action	Parking Lamps	Courtesy Lamps	Dimmable Backlighting	Ambient Lighting
RKE transmitter or mechanical unlocking of the doors	On for 25 seconds	On for 25 seconds	On for 25 seconds	Off
RKE transmitter or mechanical locking of the doors	Off	Off	Off	Off 3 seconds after courtesy lamps turned off
Open a closed door after	Off (on for remaining time if	On	Off	On

previously unlocking (no ignition state change since unlock)	unlocked from transmitter or mechanical unlocking of the doors)			
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 (color is red on the open door)
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.

The cargo lamps illuminate with the courtesy lamps. They can also be illuminated by using the cargo lamp switch.

Ambient Lighting

The ambient lighting subsystem consists of the BCM, and the Light Emitting Diodes (LEDs) located within the front door panels, front bin and 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, while the touchscreen (FDIM) is used to cycle through the different color variations or turn the ambient lighting feature on or off. A LIN circuit is routed from the BCM to all of the Light Emitting Diodes (LEDs). There are 3 Light Emitting Diodes (LEDs) (red, blue and green) housed within each LED assembly. By illuminating various color combinations, the Light Emitting Diodes (LEDs) are able to produce different colors of ambient light.

The APIM uses software to monitor the user interface from the touchscreen. Based on the ambient lighting system selections made using the touchscreen, the APIM sends ambient light color request and ambient light intensity request messages over the communication network for color and brightness settings. The BCM retains the last color and brightness setting between uses.

Dark Car Feature

The dark car feature disables activation of courtesy lamps due to a door unlock, door ajar or removing the key from the ignition cylinder. The courtesy lamps may still be activated by the dome lamp switch, post crash alert, and perimeter and panic alarms.

The dark car feature is enabled/disabled through programmable parameters in the BCM.

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 demand lamp relay (integrated into the BCM) when the battery saver feature is not active. This is used by each interior lamp to power the demand LED 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 LED within it.

For vehicles without an overhead console, the front interior lamp provides ground to the rear lamp to activate/deactivate the rear lamp.

For vehicles with an overhead console, the front interior lamp sends a message to the rear lamps to activate/deactivate them through a LIN circuit.