

Module Controlled Functions - System Operation and Component Description

System Operation

BCM

The BCM controls various systems by monitoring inputs from switches, sensors and network messages from other modules and components on the HS-CAN1 and LIN. Based on these inputs, the BCM activates outputs. For example, the BCM monitors the HCM input. Based on this input, the BCM may provide voltage to the exterior lamps.

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Battery Load Shed

The BCM monitors the battery state of charge and when necessary shuts off accessories to save the remaining battery charge. For additional information, Refer to: Charging System - System Operation and Component Description (414-00 Charging System - General Information, Description and Operation).

Battery Management

The battery saver feature is used to conserve battery voltage. The BCM provides automatic shut-off of the interior lamps after a time-out period when the ignition is off. For additional information, Refer to: Charging System - System Operation and Component Description (414-00 Charging System - General Information, Description and Operation).

Car Configuration Parameters

The parameters are set in the BCM. The parameters are also set in the IPC as backup data for service, in case online As-Built data is not available. For additional information, Refer to: Module Configuration - System Operation and Component Description (418-01 Module Configuration, Description and Operation).

Factory-Transport Mode

During vehicle build, some modules such as the IPC and the BCM are set to factory mode. When the vehicle build is complete, the vehicle is set to transport mode.

Transport mode reduces the drain on the battery during longer periods when the vehicle is not in use. Various system functions can be altered or disabled when in the transport mode. While in transport mode, the IPC displays TRANSPORT MODE in the message center. Transport mode can be disabled and placed into normal operation mode.

Field Effect Transistor (FET) Protection

The BCM utilizes an Field Effect Transistor (FET) protective circuit strategy for many of its outputs, for example, lamp output circuits. Output loads (current level) are monitored for excessive current (typically short circuits) and are shut down (turns off the voltage or ground provided by the module) when a fault event is detected.

A FET is a type of transistor the control module software uses to control and monitor current flow on module outputs. The FET protection strategy prevents module damage in the event of excessive current flow.

Output loads (current level) are monitored for excessive current draw (typically short circuits). When a fault event is detected the FET turns off and a short circuit DTC sets. The module resets the FET protection and allows the circuit to function when the fault is corrected or the ignition state is cycled off and then back on.

When excessive circuit loads occur often enough, the module shuts down the output until a repair procedure is carried out. Each FET protected circuit has 3 predefined levels of short circuit tolerance based on a module lifetime level of fault events and upon the durability of the FET. If the total tolerance level is determined to be 600 fault events, the 3 predefined levels would be 200, 400 and 600 fault events.

When each level is reached, the DTC associated with the short circuit sets along with DTC U1000:00. These Diagnostic Trouble Codes (DTCs) can be cleared using the module on-demand self-test, then the Clear DTC operation on the scan tool (if the on-demand test shows the fault corrected). The module never resets the fault event counter to zero and continues to advance the fault event counter as short circuit fault events occur.

If the number of short circuit fault events reach the third level, then Diagnostic Trouble Codes (DTCs) U1000:00 and U3000:49 set along with the associated short circuit DTC. DTC **U3000:49 cannot be cleared** and the module **must** be replaced after the repair.

Post-Crash Alert Function

The post-crash alert is a function controlled by the BCM. If the RCM determines an impact of enough severity has occurred (the airbags may or may not be deployed), the post-crash alert function activates.

The post-crash alert function:

- sounds the horn.
- turns on the hazard lights.
- turns on the interior lights.
- unlocks the doors.

The post-crash alert function can be turned off by:

- pressing the hazard flasher lamp switch (which may need to be pressed twice).
- pressing the transmitter unlock button.
- pressing the RKE transmitter PANIC button.
- cycling the ignition (RUN-OFF-RUN-OFF-RUN).
- opening the driver door.

Component Description

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The BCM is a multifunction module that requires PMI when replaced. For additional information, Refer to: Module Programming (418-01 Module Configuration, General Procedures).

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DDM

The DDM receives power window commands from the driver door window control switch through a LIN. The DDM supplies voltage and ground to operate the driver door window regulator motor. The DDM also communicates driver door window control switch requests to the PDM through the MS-CAN.

For the power mirror functions, the DDM operates as follows:

- LH exterior mirror glass position by supplying voltage and ground to the exterior mirror motors based on inputs from the master window control switch.
- Forwards the RH exterior mirror movement requests to the PDM through the MS-CAN.
- When the heated mirror function is selected, it supplies voltage and ground to the LH exterior mirror glass heating element based on messages received from the FCIM.
- When the memory mirror function is selected, it supplies the voltage and ground to the LH mirror motor and monitors the potentiometers to determine the mirror glass position. Memory mirror positions are stored in the DDM memory.

For additional information:

- Refer to: Handles, Locks, Latches and Entry Systems - Overview (501-14 Handles, Locks, Latches and Entry Systems, Description and Operation).
- Refer to: Glass, Frames and Mechanisms - Overview (501-11 Glass, Frames and Mechanisms, Description and Operation).
- Refer to: Rear View Mirrors - System Operation and Component Description (501-09 Rear View Mirrors, Description and Operation).

The DDM requires PMI when replaced.

For additional information,