

battery is more effectively charged with a higher voltage when the battery is cold and a lower voltage when the battery is warm.

The PCM turns off the generator during cranking to reduce the generator load and improve cranking speed. Once the engine starts, the PCM slowly increases generator output to the desired voltage.

The PCM reports any charging system faults and sends a message through the HS-CAN1 to the BCM. The BCM controls the charging system warning indicator by sending a message through the GWM to the IPC. The status of the PCM charging system warning indicator and/or message is confirmed by viewing PCM PID generator fault indicator lamp (GENFIL). Any charging system fault detected by the PCM results in 1 or more Diagnostic Trouble Codes (DTCs) being set and the PID GENFIL having a status of On. If equipped with a charging system warning indicator, the IPC turns the indicator on or off. If equipped with a message center, the IPC displays a CHECK CHARGING SYSTEM message. In some instances, the CHECK CHARGING SYSTEM message may not display if the ignition is on and the engine is off.

Under certain circumstances, the charging system may have a concern but will still keep the battery charged and the vehicle running. GENCMD normally initiates charging but with a fault in this circuit, the generator can self-excite and start charging on its own. The charging system warning indicator is illuminated and/or the CHECK CHARGING SYSTEM message is displayed, and the generator operates in a default mode (approximately 13.5 volts).

DESCRIPTION AND OPERATION > CHARGING SYSTEM - 2.7L ECOBOOST (238KW/324PS) - SYSTEM OPERATION AND COMPONENT DESCRIPTION > ELECTRICAL ENERGY MANAGEMENT SYSTEM



NOTE: When any vehicle module is being programmed, connect an external battery charger to make sure the module programming is completed without interruption due to the load shedding feature becoming active. The external battery charger must maintain a system voltage above 13 volts. This may require a charger setting higher than the lowest charge setting. The external battery charger negative connection must be made to an engine or vehicle chassis ground and not the negative battery terminal. If the connection is to the negative battery terminal, load shedding may begin and module programming may be corrupted. After charging has begun, start the engine to clear any load shed states and then turn the engine off and proceed with programming.

This vehicle is equipped with an Electrical Energy Management system which manages battery charging and monitors the battery state of charge. The Electrical Energy Management system software is housed in the BCM. It has the algorithms and control structure for the Smart Regenerative Charging, and Load Shed Control Strategy. The Electrical Energy Management system is equipped with a battery monitoring sensor and generator current sensor to monitor the battery. These sensors serve as input to the Electrical Energy Management system software. If the sensors malfunction due to wiring issues or failure, a DTC will be set. In most cases the Electrical Energy Management system functions will be turned off until the sensor operation is restored.

DESCRIPTION AND OPERATION > CHARGING SYSTEM - 2.7L ECOBOOST (238KW/324PS) - SYSTEM OPERATION AND COMPONENT DESCRIPTION > BATTERY STATE OF CHARGE