

Cold Start System

Overview

The cold start system uses fuel injector heaters to warm the fuel supplied to the engine during low ambient temperatures. This enables a vehicle with a high percentage of ethanol in the fuel to start the engine easier with reduced emissions. The cold start system consists of the fuel injector heaters, the fuel injector heater control module, the wait to start indicator on the instrument panel and the PCM.

If the ambient temperature is low and the fuel in the fuel tank has a high ethanol content, then fuel heating before and after cranking significantly reduces the time required to achieve combustion in the cylinders. The heaters may be activated at any time before cranking the engine and during engine running to increase drivability performance and reduce emissions.

The cold start system is initially activated when the body control module (BCM) detects the drivers door is opened. The BCM will send a signal over the controller area network (CAN) to the PCM to activate the fuel injector control module and the fuel injector heaters. The PCM determines the amount of fuel heating time by calculating the amount of ethanol in the fuel, the ambient air temperature, the engine coolant temperature and the engine cold soak time. The PCM will not allow the engine to crank during initial fuel injector heating time. Once the wait to start indicator turns OFF the engine will crank and start. The fuel injector heaters are not active during engine cranking to reduce battery load.

The PCM monitors the fuel injector control module, the fuel injector heaters and related wiring for an open circuit, short circuit or out of range conditions. The PCM will set a DTC if the expected voltage value is out of range for the commanded state.

For additional information on the fuel injector heater, refer to the Fuel Injector Heater description in this section. For additional information on the wait to start indicator operation, refer to the Owners Literature.
