

Engine Control (EC) System

Overview

The EC system provides optimum control of the engine and transmission through the enhanced capability of the powertrain control module (PCM). The EC system also has an on board diagnostics (OBD) monitoring system with features and functions to meet federal regulations on exhaust emissions.

Some vehicle applications use a stand alone transmission control module (TCM). Even though it is still part of the EC system, the stand alone TCM communicates with the PCM, the antilock brake system (ABS) module, the instrument panel cluster (IPC), and the four wheel drive (4WD) control modules using the high speed controller area network (CAN) communications network. The stand alone TCM incorporates a stand alone OBD II system. The stand alone TCM independently processes and stores DTCs, freeze frame data, support parameter identifiers (PIDs) as well as J1979 Mode 09 CALID and calibration verification number. The stand alone TCM does not directly illuminate the malfunction indicator lamp (MIL), but requests the PCM to do so. The stand alone TCM is located inside the transmission assembly. It is not repairable, with the exception of reprogramming.

For additional information on TCM diagnostics, refer to the Workshop Manual Section 307-01, Automatic Transmission.

The EC system has hardware and software. The hardware includes the PCM, sensors, switches, actuators, solenoids, and interconnecting pins. The software in the PCM provides the strategy control for outputs (engine hardware) based on the values of the inputs to the PCM. The EC hardware and software are discussed in this section.

This section contains detailed descriptions of the operation of the EC system input sensors and switches, output actuators, solenoids, relays and connector pins (including other power ground signals). For additional information on the input sensors and output actuators, refer to [Engine Control Components](#) in this section.

The PCM receives information from a variety of sensor and switch inputs. Based on the strategy and calibration stored within the memory chip, the PCM generates the appropriate output. The system is designed to minimize emissions and optimize fuel economy and driveability. The software strategy controls the basic operation of the engine and transmission, provides the OBD strategy, controls the MIL, communicates to the scan tool via the data link connector (DLC), allows for flash electrically erasable programmable read only memory (EEPROM), provides idle air and fuel trim, and controls failure mode effects management (FMEM).

Modifications To OBD Vehicles

Modifications or additions to the vehicle may cause incorrect operation of the OBD system. Install anti-theft systems, remote starters, cellular telephones and aftermarket radios carefully. Do not install these devices by tapping into or running wires close to the powertrain control system wires or components.
