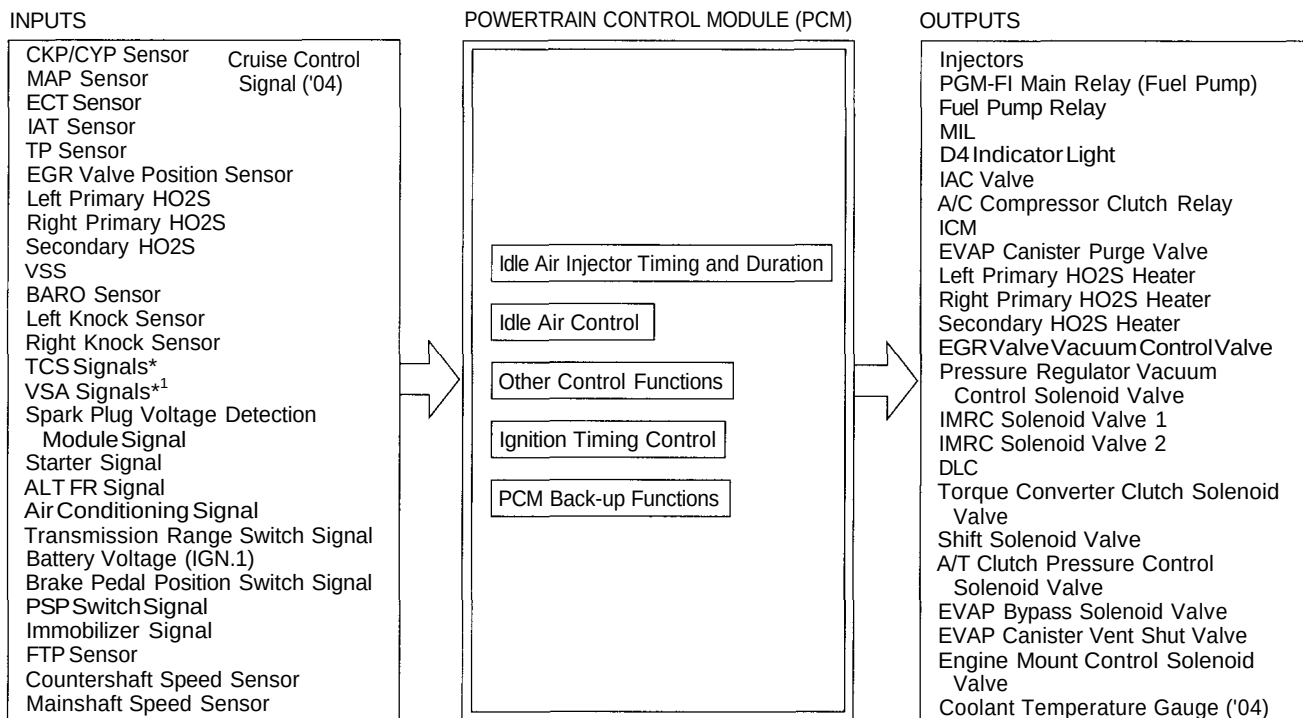




PGM-FI System

System Description



*: with TCS

*1: with VSA

PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Injector Timing and Duration

The PCM contains memories for the basic discharge durations at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

Idle Air Control

Idle Air Control Valve (IAC Valve)

When the engine is cold, the A/C compressor is on, the transmission is in gear, the brake pedal is depressed, the power steering load is high, or the alternator is charging, the PCM controls current to the IAC Valve to maintain the correct idle speed.

Ignition Timing Control

- The PCM contains memories for basic ignition timing at various engine speeds and manifold air flow rates. Ignition timing is also adjusted for engine coolant temperature.
- A knock control system is also used. When detonation is detected by a knock sensor, the ignition timing is retarded.

Other Control Functions

1. Starting Control

When the engine is started, the PCM provides a rich mixture by increasing injector duration.

2. Fuel Pump Control

- When the ignition switch is initially turned on, the PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump for 2 seconds to pressurize the fuel system.
- When the engine is running, the PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump.
- When the engine is not running and the ignition is on, the PCM cuts ground to the PGM-FI main relay which cuts current to the fuel pump.

(cont'd)

PGM-FI System

System Description (cont'd)

3. Fuel Cut-off Control

- During deceleration with the throttle valve closed, current to the injectors is cut off to improve fuel economy at speeds over 1,000 rpm.
- Fuel cut-off action also takes place when engine speed exceeds 5,900 rpm, regardless of the position of the throttle valve, to protect the engine from over-revving.

4. A/C Compressor Clutch Relay

When the PCM receives a demand for cooling from the air conditioning system, it delays the compressor from being energized, and enriches the mixture to assure a smooth transition to the A/C mode.

5. Evaporative Emission (EVAP) Control.

When the engine coolant temperature is above 99°F (37°C): '96 - 99 models, 140°F (60°C): '00 - 04 models, the PCM controls the EVAP canister purge valve which controls vacuum to the EVAP canister.

6. Intake Manifold Runner Control (IMRC)

When engine speed is below 3,200 rpm, the IMRC Solenoid Valve 1 and IMRC Solenoid Valve 2 are activated by a signal from the PCM. Intake air flows through a long chamber path, increasing torque at low RPM.

When engine speed is 3,200 - 3,800 rpm, the IMRC Solenoid Valve is deactivated by the PCM. Intake air flows through a short chamber path, increasing mid-range torque.

When the engine rpm is above 3,800 rpm, the IMRC Solenoid Valve 1 and IMRC Solenoid Valve 2 are deactivated by the PCM. This creates a very short intake path and increases high-speed torque.

7. Exhaust Gas Recirculation (EGR) Control

When the EGR is required for control of oxides of nitrogen (NOx) emissions, the PCM controls the EGR control valve vacuum solenoid valve which supplies regulated vacuum to the EGR valve.

ECM Fail-safe/Back-up Functions

1. Fail-safe Function

When an abnormality occurs in a signal from a sensor, the PCM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.

2. Back-up Function

When an abnormality occurs in the PCM itself, the fuel injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.

3. Self-diagnosis Function [Malfunction Indicator Lamp (MIL)]

When an abnormality occurs in a signal from a sensor, the PCM supplies ground for the MIL and stores the DTC in erasable memory. When the ignition is initially turned on, the PCM supplies ground for the MIL for 2 seconds to check the MIL bulb condition.

4. Two Trip Detection Method ('96 - 97 models)

To prevent false indications, the Two Trip Detection Method is used for the HO₂S, fuel metering-related, idle control system, ECT sensor, EGR system self-diagnostic functions and EVAP control system. When an abnormality occurs, the PCM stores it in its memory. When the same abnormality recurs after the ignition switch is turned OFF and ON (II) again, the PCM informs the driver by lighting the MIL.

However, to ease troubleshooting, this function is cancelled when you short the service check connector. The MIL will then blink immediately when an abnormality occurs.

5. Two Driving Cycle Detection Method ('96 - 97 models)

A "Driving Cycle" consists of starting the engine, beginning closed loop operation, and stopping the engine. If misfiring that increases emissions, EVAP control system malfunction or TWC deterioration is detected during two consecutive driving cycles, the PCM turns the MIL on.

However, to ease troubleshooting, this function is cancelled when you short the service check connector. The MIL will then blink immediately when an abnormality occurs.

6. Two Driving Cycle Detection Method ('98 - 04 models)

To prevent false indications, the "two driving cycle detection method" is used for the HO₂S, fuel metering-related, idle control system, ECT sensor, EGR system, TWC and EVAP control system and other self-diagnostic functions. When an abnormality occurs, the PCM stores it in its memory. When the same abnormality recurs after switch is turned OFF and ON (II) again, the PCM informs the driver by turning on the MIL.