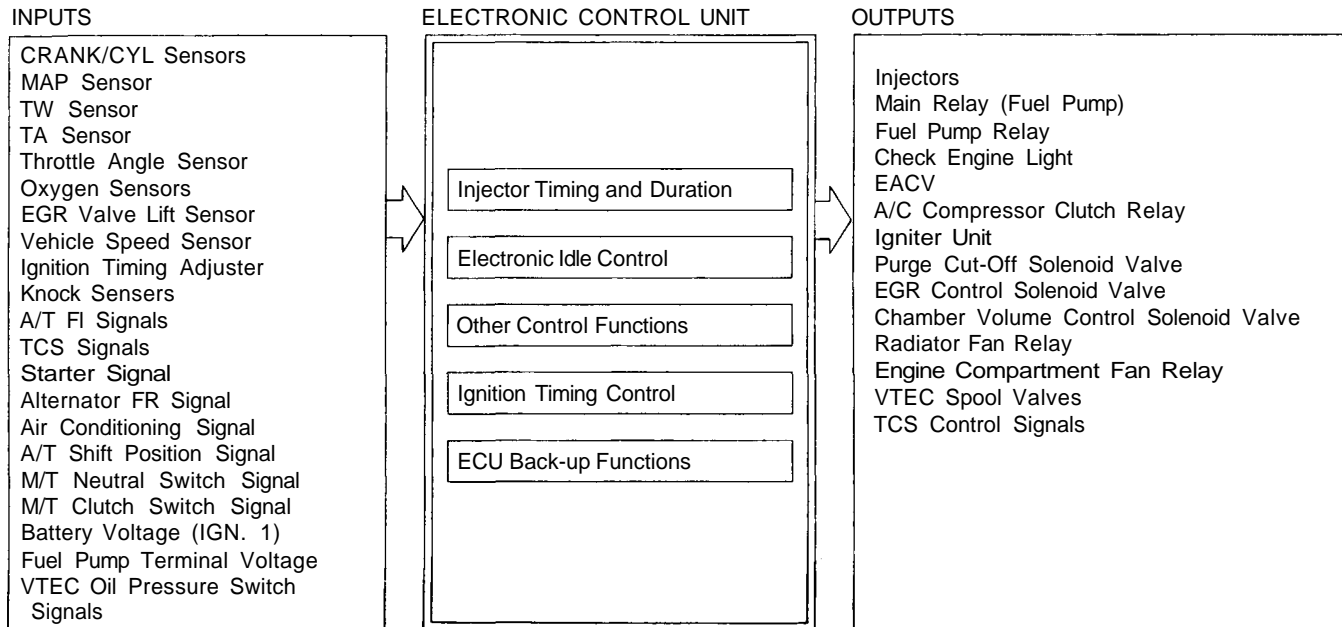


# PGM-FI Control System

## System Description



### Injector Timing and Duration

The ECU 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.

### Electronic Air Control

Electronic Air Control Valve (EACV)

When the engine is cold, the A/C compressor is on, the transmission is in gear (A/T only) or the alternator is charging, the ECU controls current to the EACV to maintain correct idle speed.

### Ignition Timing Control

- The ECU contains memories for basic ignition timing at various engine speeds and manifold pressures. Ignition timing is also adjusted for coolant temperature.
- A Knock Control System is also used. When detonation is detected by the knock sensor, the ignition timing is retarded.

### Other Control Functions

1. Starting Control  
When the engine is started, the ECU provides a rich mixture.
2. Fuel Pump Control
  - When the ignition switch is initially turned on, the ECU supplies ground to the main relay which supplies current to the fuel pump for two seconds to pressurize the fuel system.
  - When the engine is running, the ECU supplies ground to the main relay which supplies current to the fuel pump.
  - When the engine is not running and the ignition is on, the ECU cuts ground to the main relay which cuts current to the fuel pump.
  - Excellent engine performance is achieved through the use of VTEC (Variable Valve Timing and Lift Electronic Control System), intake manifold chamber control and discharge volume control of the fuel pump.
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 1,500 rpm.
  - Fuel cut-off action also takes place when engine speed exceeds, 8,300 rpm, regardless of the position of the throttle valve, to protect the engine from over-revving.



4. **A/C Compressor Clutch Relay**  
When the ECU receives a demand for cooling from the air conditioning system (compressor control unit), it delays the compressor from being energized, and enriches the mixture to assure smooth transition to the A/C mode.
5. **Purge Cut-off Solenoid Valve**  
When the coolant temperature is below 70°C (158°F), the ECU supplies a ground to the purge cut-off solenoid valve which cuts vacuum to the purge control valve.
6. **Chamber Volume Control Solenoid Valve (CVCSV)**  
When the engine rpm is below 4,800 rpm the CVCSV is activated by a signal from the ECU, intake air flows through a smaller chamber, then high torque is delivered. At speeds higher than 4,800 rpm, both solenoid valves are deactivated by the ECU, and intake air flows through the a larger chamber in order to increase airflow.
7. **EGR Control Solenoid Valve (EGR CSV)**  
When the EGR is required for control of oxides of nitrogen (NOx) emissions, the ECU supplies ground to the EGR CSV which supplies regulated vacuum to the EGR valve.

#### **ECU Back-up Functions**

1. **Fail-Safe Function**  
When an abnormality occurs in a signal from a sensor, the ECU ignores that signal and assumes a pre-programmed value that allows the engine to continue to run.
2. **Back-up Function**  
When an abnormality occurs in the ECU itself, the injectors are controlled by a back-up circuit independent of the system in order to permit minimal diving.
3. **Self-diagnosis Function (Check Engine light)**  
When an abnormality occurs in a signal from a sensor, the ECU lights the Check Engine light and stores the failure code in erasable memory. When the ignition is initially turned on, the ECU supplies ground for the Check Engine light for two seconds.