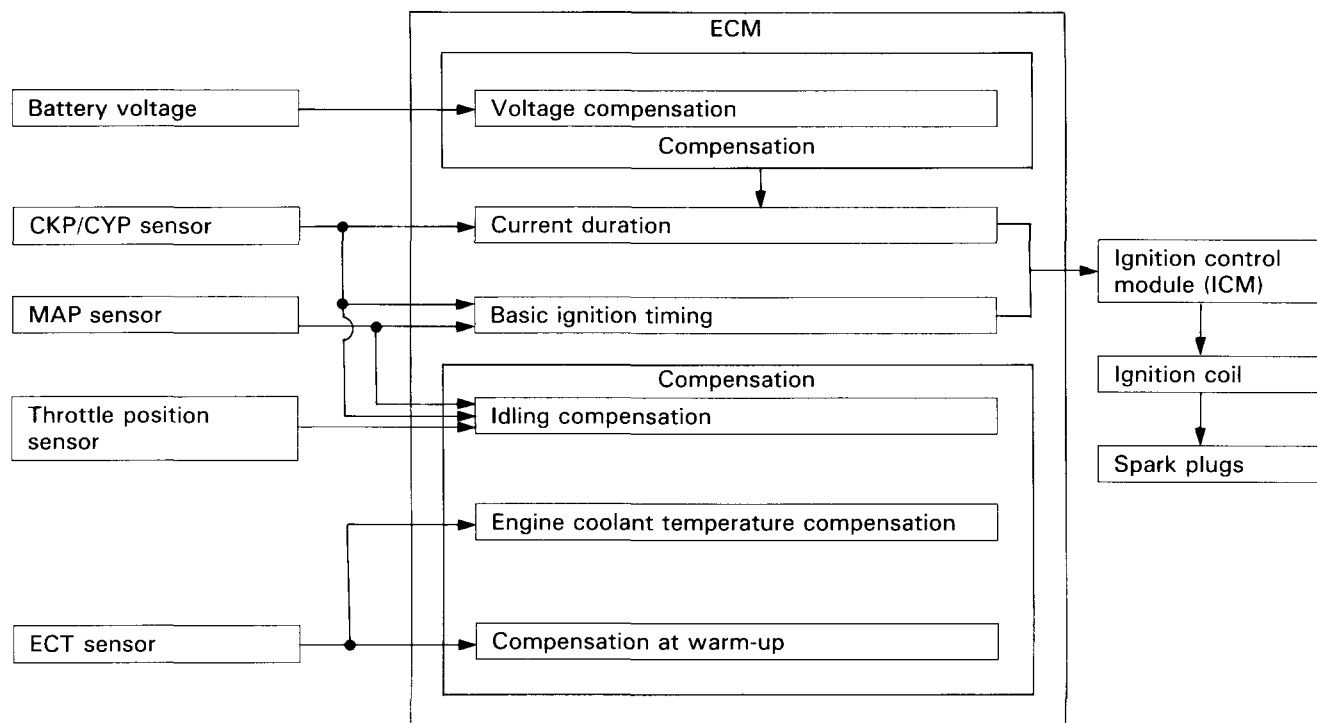




## Description

### Ignition Timing Control:

The programmed ignition used in this engine provides optimum control of ignition timing. A microcomputer determines the timing in response to engine speed and manifold vacuum pressure. The input signals are transmitted by the crankshaft position/cylinder position (CKP/CYP) sensor, throttle position (TP) sensor, ECT sensor, and MAP sensor. This system, not dependent on a governor or vacuum diaphragm, is capable of setting lead angles with complicated characteristics which cannot be provided by conventional governors or diaphragms.



### Basic Control

Determination of ignition timing/current duration:

The ECM has stored within it the optimum basic ignition timing for operating conditions based upon engine speed and intake manifold pressure. With compensation by signals from sensors, the system determines optimum timing for ambient conditions and sends voltage pulses to the ICM.

### Compensation of Ignition Timing:

Compensation Item	Related Sensor and Information	Description
Idling	CKP/CYP sensor, MAP sensor	Ignition timing is controlled to the target speed with compensation according to the idling speed.
Compensation at warm-up	Engine coolant temperature (ECT) sensor	Lag angle is adjusted according to warm-up conditions to bring about a good balance between operating performance and exhaust gas level.
Engine coolant temperature compensation	ECT sensor	Compensation for lead angle at low coolant temperature and lag angle at high coolant temperature.

### Control at Start

Ignition timing is fixed at 5° BTDC for cranking. The cranking is detected by the CYP sensor (cranking rpm) and starter signal.

### Misfiring Detection

As part of the OBD II misfiring detection system, each of the ignition coils has a built-in spark plug voltage sensor. This sensor detects the long duration high voltage which occurs in case of unfavorable combustion or misfiring. (For details, see [section 11](#).)