

Electronic Control Module (ECM)

ECM is installed to the underside of the instrument panel at the driver's seat side.

ECM is a precision unit consisting of microcomputer, A/D (Analog/Digital) converter, I/O (Input/Output) unit, etc..

It is an essential part of the electronic control system, for its functions include not only such a major function as to control fuel injector, ISC solenoid valve, fuel pump relay, etc. but also self-diagnosis function and fail-safe function as described in the following section.

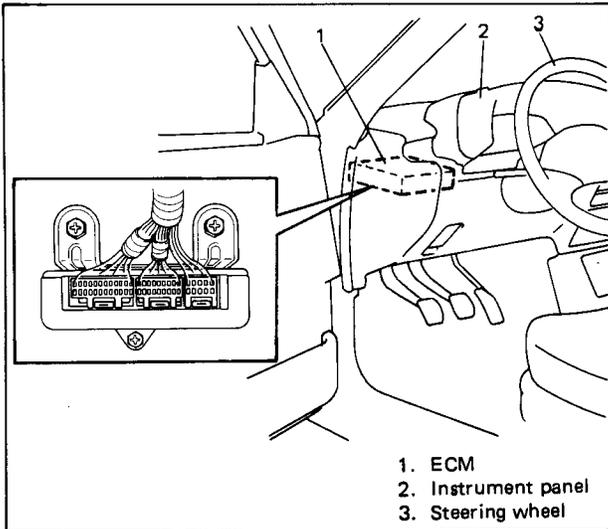


Fig. 6E-16 ECM location

Self-diagnosis function

ECM diagnoses troubles which may occur in the areas including the following parts when the ignition switch is ON or the engine is running, and indicates the result by turning on or flashing "CHECK ENGINE" light.

- Oxygen sensor
- Water temp. sensor
- Throttle position sensor
- Speed sensor
- Air flow sensor
- Ignition signal
- Crank angle sensor
- EGR system
- Fuel injector } (California spec. model only)
- CPU (Central Processing Unit) of ECM

ECM and "CHECK ENGINE" light operate as follows.

- "CHECK ENGINE" light lights when the ignition switch is turned ON (but the engine at stop) with the diagnosis switch terminal ungrounded regardless of the condition of Electronic Fuel Injection system. This is only to check the "CHECK ENGINE" light bulb and its circuit.
- If the above areas of Electronic Fuel Injection system is free from any trouble after the engine start (while engine is running), "CHECK ENGINE" light turns OFF.
- When ECM detects a trouble which has occurred in the above areas, it makes "CHECK ENGINE" light turn ON while the engine is running to warn the driver of such occurrence of trouble and at the same time it stores the exact trouble area in ECM back-up memory. (The memory is kept as it is even if the trouble was only temporary and disappeared immediately. And it is not erased unless the power to ECM is shut off for 30 seconds or longer.) ECM also indicates trouble area in memory by means of flashing of "CHECK ENGINE" light at the time of inspection (i.e. when diagnosis switch terminal is grounded and ignition switch is turned ON).

NOTE:

- Only ignition circuit trouble (code No. 41 among the above areas is not stored in back-up memory of ECM. (In other words, even if ECM has detected a trouble in ignition circuit, once ignition switch is turned OFF, code No. 41 will not be indicated even when diagnosis switch terminal is grounded and ignition switch is turned ON.)

Therefore, to check diagnostic code when engine fails to start, crank engine and then ground diagnostic switch terminal with ignition switch ON.

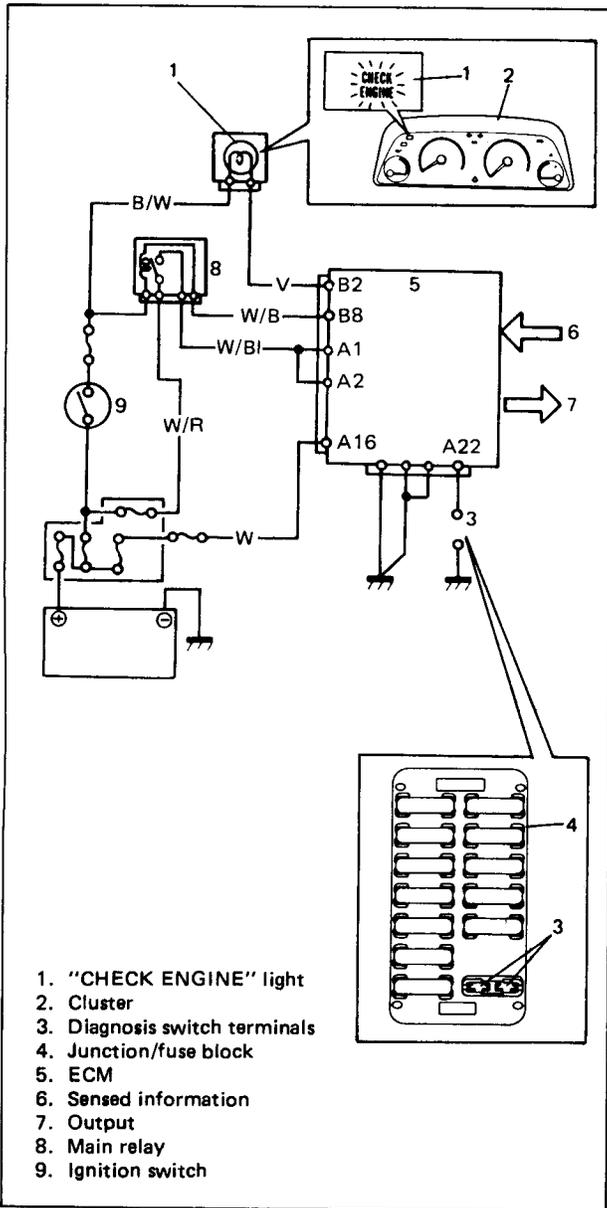


Fig. 6E-17 "CHECK ENGINE" Light Circuit

Fail-safe function

Even when a trouble has occurred in such areas of Electronic Fuel Injection system that include the following parts and a failure signal is sent to ECM, control over the injector, ISC solenoid valve and other is maintained on the basis of the standard signals and/or back-up program pre-stored in the ECM while ignoring that failure signal and/or CPU. This function is called "fail-safe function". Thus, with this function, a certain level of engine performance is available even when some failure occurs in such areas so that disability in running is avoided.

- Water temp. sensor
- Throttle position sensor
- Speed sensor
- Air flow sensor
- CPU in ECM

Diagnosis Switch Terminal

There are two diagnosis switch terminals; one included in the junction/fuse block and the other in the monitor coupler in the engine room. When either diagnosis switch terminal is grounded, a diagnosis signal is fed to ECM which then outputs self-diagnosis code and at the same time fixes the ON time of ISC solenoid valve constant.

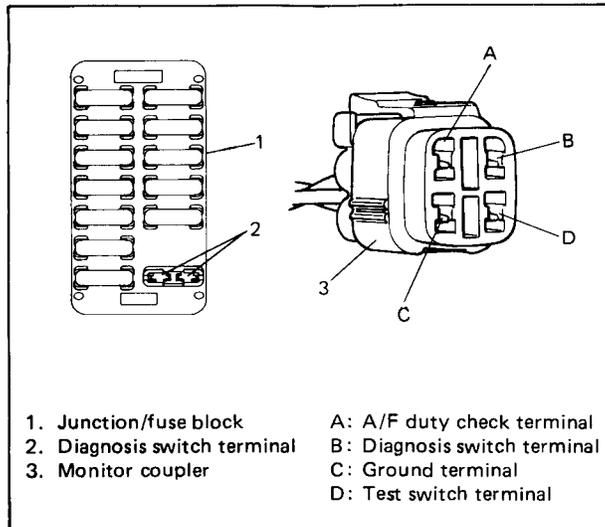


Fig. 6E-28 Diagnosis and Test Switch Terminals

Test Switch Terminal

The test switch terminal is included in the monitor coupler. When this terminal is grounded, ECM sets the ignition timing to the initial ignition timing.

When both test switch terminal and diagnosis switch terminal are grounded, ECM outputs A/F duty through the A/F duty check terminal. Also, "CHECK ENGINE" light stays ON at this time, but it is nothing abnormal.