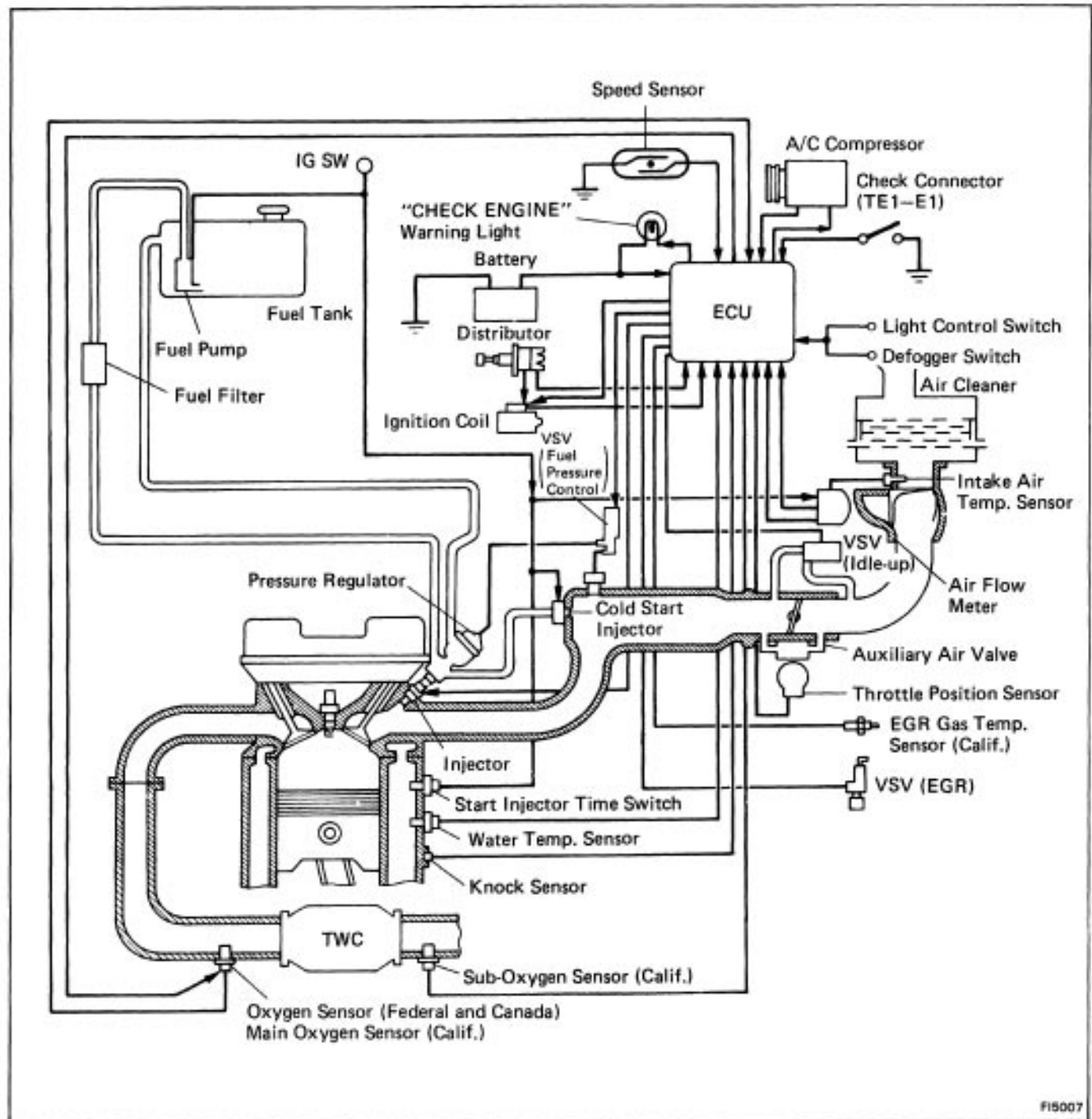


4A-GE ENGINE

DESCRIPTION



The EFI system is composed of 3 basic subsystems; Fuel, Air Induction and Electronic Control Systems.

FUEL SYSTEM

An electric fuel pump supplies sufficient fuel, under a constant pressure, to the injectors. These injectors inject a measured quantity of fuel into the intake manifold in accordance with signals from the ECU (Electronic Control Unit).

AIR INDUCTION SYSTEM

The air induction system provides sufficient air for engine operation.

ELECTRONIC CONTROL SYSTEM

The 4A-GE engine is equipped with a Toyota Computer Control System (TCCS) which centrally controls the EFI, ESA, Diagnosis systems, etc. by means of an Electronic Control Unit (ECU – formerly EFI computer) employing a microcomputer.

By the ECU, the TCCS controls the following functions:

1. Electronic Fuel Injection (EFI)

The ECU receives signals from various sensors indicating changing engine operating conditions such as:

- Exhaust oxygen content
- Intake air temperature
- Coolant temperature
- Engine rpm
- Acceleration/deceleration etc.

These signals are utilized by the ECU to determine the injection duration necessary for an optimum air-fuel ratio.

2. Electronic Spark Advance (ESA)

The ECU is programmed with data for optimum ignition timing under any and all operating conditions. Using data provided by sensors which monitor various engine functions (rpm, A/C signal, coolant temperature, etc.), the microcomputer (ECU) triggers the spark at precisely the right instant. (See IG section)

3. Diagnosis

The ECU detects any malfunctions or abnormalities in the sensor network and lights the "CHECK ENGINE" warning light on the instrument panel. At the same time, the trouble is identified and a diagnostic code is recorded by the ECU. The diagnostic code can be read by the number of blinks of the "CHECK ENGINE" warning light when both check engine terminals TE1 and E1 are connected. The diagnostic codes are referred later on page [FI-108](#).

4 Fail-Safe Function

In the event of computer malfunction, a backup circuit will take over to provide minimal driveability. Simultaneously, the "CHECK ENGINE" warning lamp will light up.