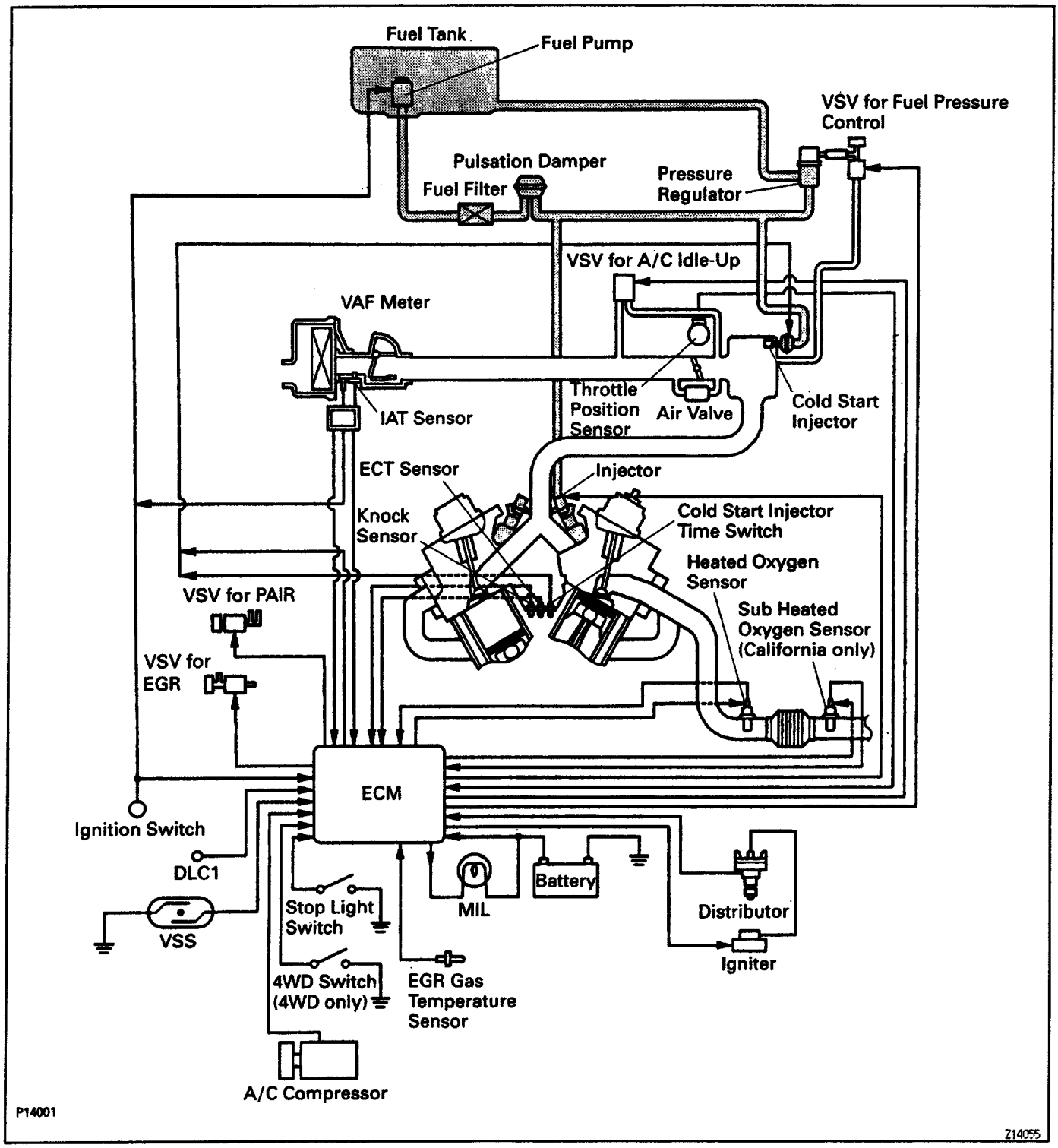
MFI SYSTEM

DESCRIPTION

SYSTEM CIRCUIT



The MFI system is composed of three basic systems: Fuel, Air Induction and Electronic Control Systems.

FUEL SYSTEM

An electric fuel pump supplies sufficient fuel, under a constant pressure, to the MFI injectors.
In accordance with signals from the ECM, these injectors inject the most appropriate quantity of fuel for the engine condition into the intake manifold.

AIR INDUCTION SYSTEM

The air induction system provides just the right amount of air for the engine operating condition.

ELECTRONIC CONTROL SYSTEM

The 3VZ–E engine is equipped with a Toyota Computer Controlled System (TCCS) which centrally controls the MR, ESA, Diagnosis system, etc. by means of an Engine Control Module (ECM, formerly the MFI computer) employing a microcomputer. By means of the ECM, the TCCS controls the following functions:

1. Multiport Fuel Injection (MFI)

The ECM receives signals from various sensors indicating changing engine operating conditions such as:
Intake air volume
Intake air temperature
Engine coolant temperature
Engine speed
Acceleration/deceleration
Exhaust oxygen content etc.
These signals are utilized by the ECM to determine the injection duration necessary for an optimum air–fuel ratio.

2. Electronic Spark Advance (ESA)

The ECM is programmed with data for optimum ignition timing under all operating conditions.
Using data provided by sensors which monitor various engine functions (RPM, intake air volume, engine coolant temperature, etc.), the microcomputer (ECM) triggers the spark at precisely the right instant.

3. Diagnosis Function

When the ECM detects malfunction or abnormalities in the sensor network, it lights the malfunction indicator lamp in the combination meter. At the same time, the trouble is identified and a diagnostic trouble code is recorded by the ECM. The diagnostic trouble code can be read by the number of blinks of the malfunction indicator lamp when terminals TE1 and E1 are connected.
The diagnostic trouble codes are explained on pages EG2–176 and 177.

4. Fail–Safe Function

In the event of a sensor malfunction, a backup circuit will take over to provide minimal driveability, and the malfunction indicator lamp will light up.