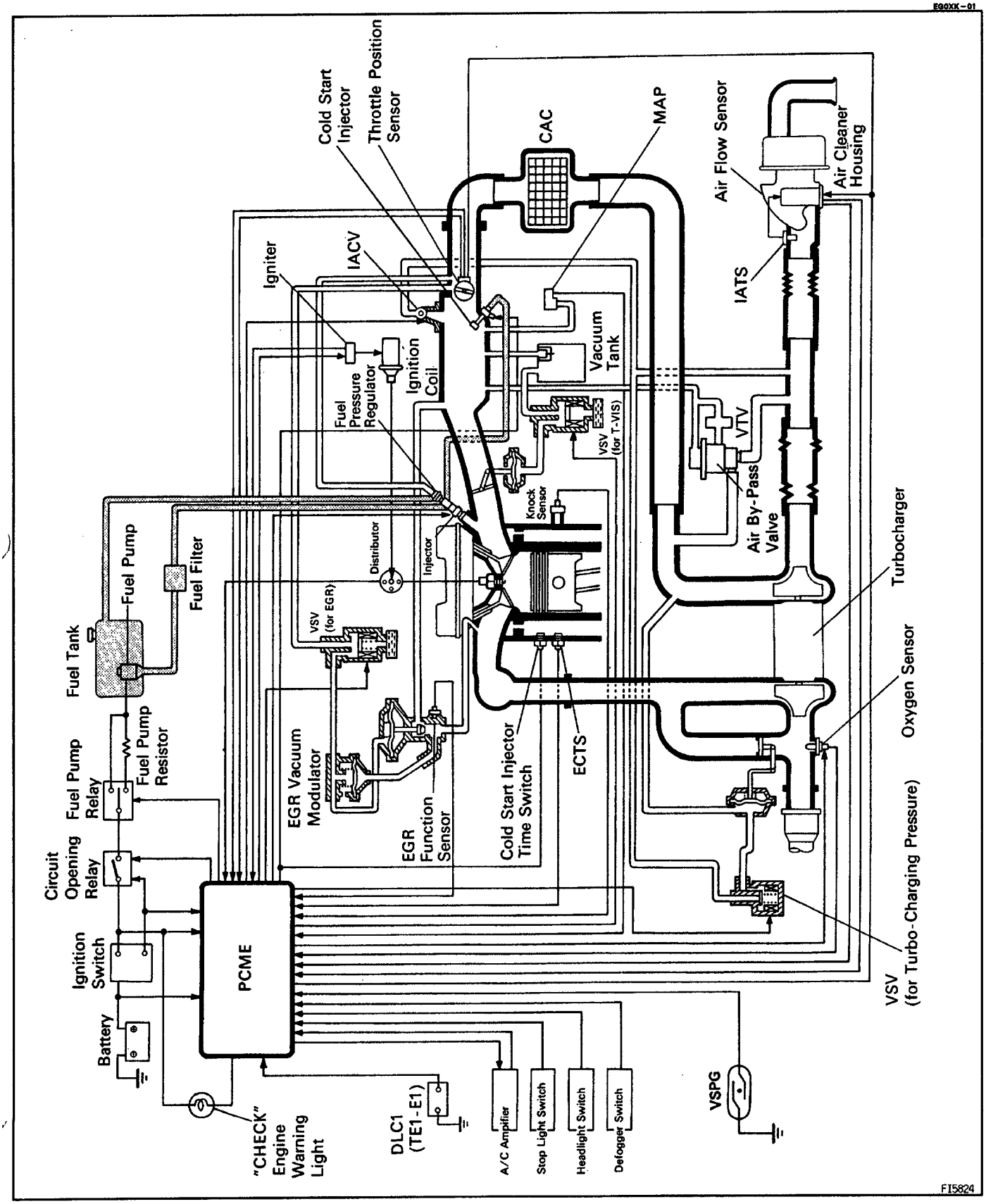
SMPI SYSTEM

DESCRIPTION



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

FUEL SYSTEM

Fuel is supplied under constant pressure to the SMPI injectors by an electric fuel pump. The injectors inject a metered quantity of fuel into the intake manifold in accordance with signals from the PCM E (Powertrain Control Module (Engine)).

AIR INDUCTION SYSTEM

The air induction system provides sufficient air for engine operation.

ELECTRONIC CONTROL SYSTEM

The MR2 3S–GTE engine is equipped with a TOYOTA Computer Controlled System (TCCS) which centrally controls the SMPI, El. IAC, Diagnosis systems etc. by means of a Powertrain Control Module (PCME–formerly SMPI computer) employing a microcomputer.

By means of the PCME, the controls the following functions:

1. Multipoint Electronic Fuel Injection

The PCM receives signals from various sensors indicating changing engine operation conditions such as:

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

The signals are utilized by the PCME to –determine the injection duration necessary for an optimum air–fuel ratio.

2. Electronic Ignition (EI)

The PCME is programmed with data for optimum ignition timing under any and a!! operating conditions.

Using data provided by sensors which monitor various engine functions (rpm, coolant tempera–ture, etc.), the microcomputer (PCME) triggers the spark at precisely the right instant. (See IG section)

3. Idle Air Control (IAC)

The PCME is programmed with target idling speed values to respond to different engine conditions (coolant temperature, air conditioner ON/OFF, etc.). Sensors transmit signals to the PCME which control the flow of air through the by–pass of the throttle valve and adjust idle speed to the target value.

4. Diagnosis

The PCME detects any malfunctions and abnormalities in the sensor network and lights a ” CHECK” engine warning light on the combination meter. At the same time, the trouble is identified and a diagnostic trouble code is recorded by the PCME. The diagnostic trouble code can be read by the number of blinks of the ”CHECK” engine warning light when terminals TE 1 and E 1 are connected. The diagnostic trouble codes are refer to the later page. (See page EG1–286)

5. Fail–Safe Function

In the event of the sensor malfunctioning, a back–up circuit will take over to provide minimal driveability, and the ”CHECK” engine warning light will illuminate.