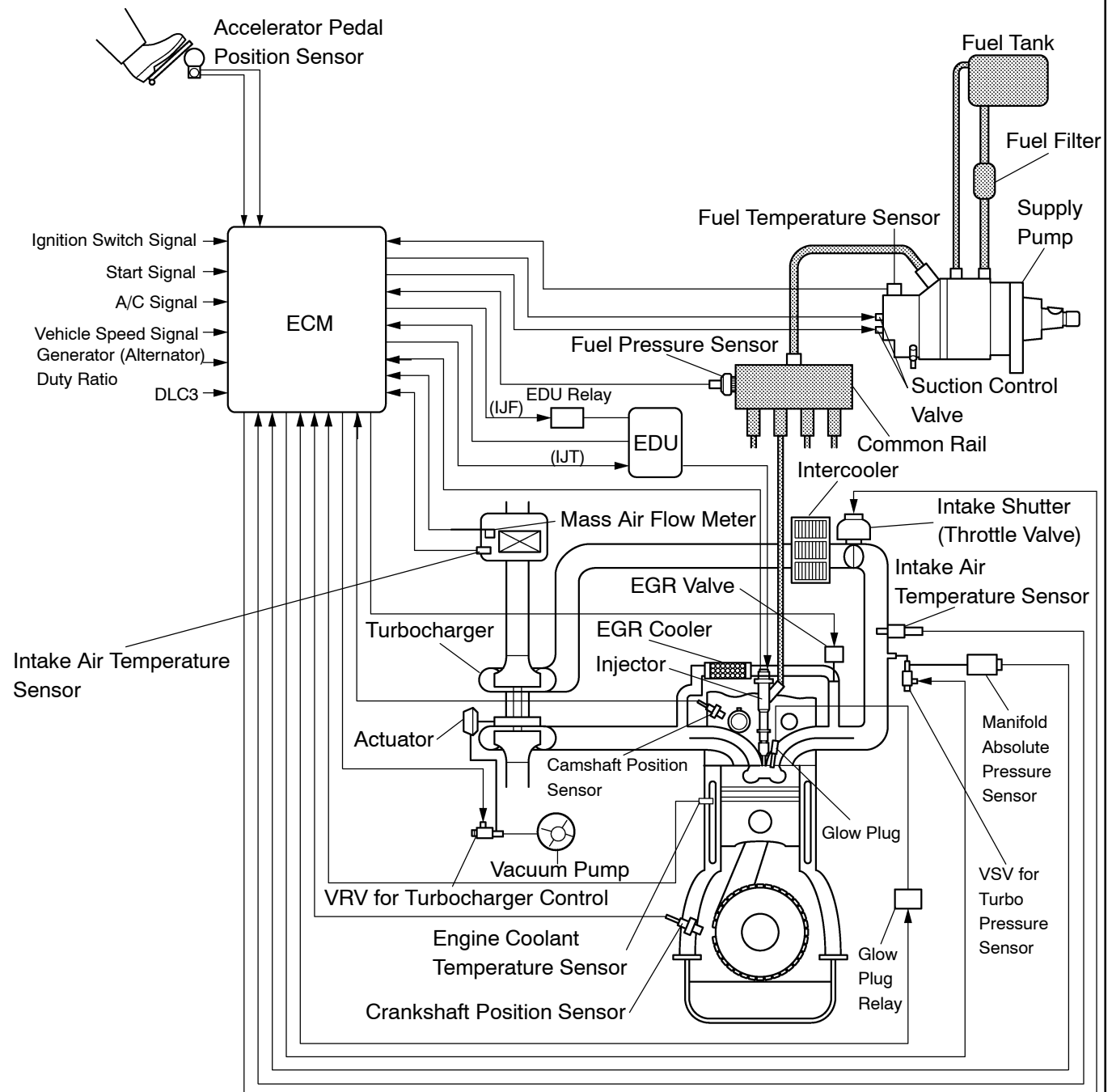


## SYSTEM DESCRIPTION

## 1. ENGINE CONTROL SYSTEM

### Engine Control System Diagram:



A94635

## 2. COMMON RAIL SYSTEM DESCRIPTION

### (a) COMMON RAIL SYSTEM:

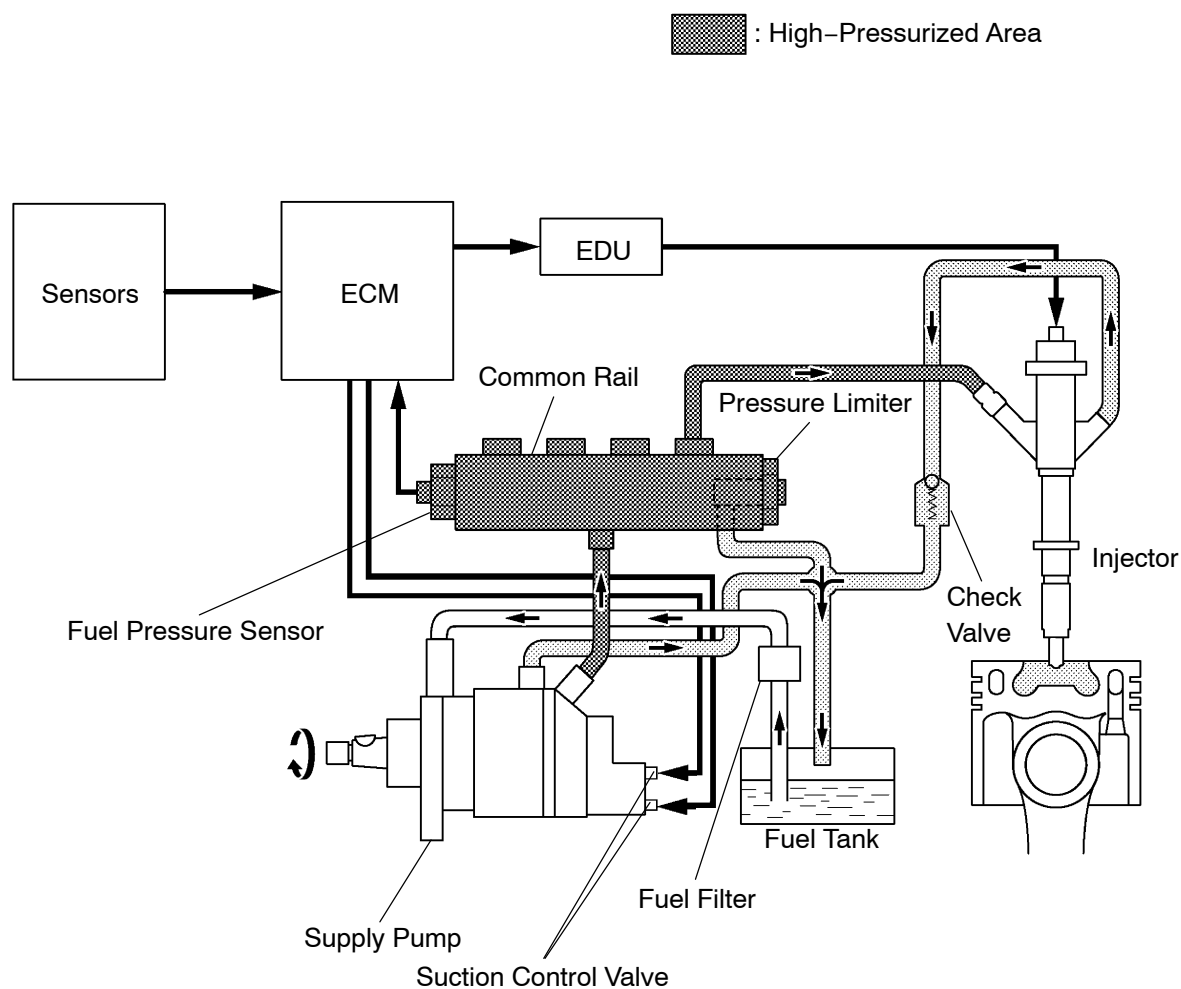
The common rail system uses a high-pressurized fuel for improving a good fuel economy, and providing robust engine power while suppressing engine vibrations and noises.

This system stores a high-pressurized fuel, which is pressurized and supplied by the supply pump, in the common rail. By storing the high-pressurized fuel, the common rail system can always offer stable fuel injection pressures regardless of engine speeds or engine loads.

The ECM provides an electric current to the solenoid valve in the injector using the EDU to regulate the fuel injection timing and volume, and also monitors the internal fuel pressure in the common rail using the fuel pressure sensor. The ECM commands the supply pump to supply the fuel to obtain a target fuel pressure, approximately 20 to 135 MPa (204 to 1,377 kgf/cm<sup>2</sup>, 2,901 to 19,580 psi). In addition, this system uses the injector that opens and closes the fuel passage with the Two-Way Valve (TWV), therefore both fuel injection time and volume can be precisely regulated by the ECM.

The common rail system provides two split fuel injections. In order to make combustion soft, this system performs "pilot-injection" as the subsidiary fuel injection prior to the main fuel injection. This helps to reduce the engine vibrations and noises.

**Common Rail System Diagram (1CD-FTV Fuel System):**



Y

A95546

**(b) COMMON RAIL SYSTEM COMPONENTS:**

Component	Description
Common rail	Stores high–pressurized fuel produced by the supply pump
Supply pump	Operated by the crankshaft, and supplies high–pressure fuel to the common rail
Injector	Injects fuel to the combustion chamber based on signals from the ECM
Fuel pressure sensor	Monitors internal fuel pressure of the common rail and sends signals to the ECM
Pressure limiter	Opens the pressure limiter valve to reduce the internal pressure in the common rail when the common rail pressure exceeds the specified level
Suction control valve	Based on signals from the ECM, adjusts fuel volume supplied to the common rail and regulates the internal fuel pressure

**(c) DIAGNOSTICS TROUBLE CODES (DTCS) TABLE FOR COMMON RAIL SYSTEM:**

HINT:

This table indicates typical DTC combinations for each malfunction occurrence.

( ): Potential DTC

DTC No.	A	B	C	D	E	F	G	H	I
P0087(See page 05-463)				●					
P0093(See page 05-467)	( ● )	●						( ● )	●
P0190(See page 05-463)				●					
P0200(See page 05-499)	●							( ● )	
P0627(See page 05-550)					( ● )		●		
P1229(See page 05-553)					( ● )	●			
P1238(See page 05-557)	●	●	●					( ● )	

Trouble Area	Malfunction	Refer To
Injector	Open or short in injector circuit	A
	Stuck open	B
	Stuck close	C
Fuel pressure sensor	Open or short in fuel pressure sensor circuit or pressure sensor output fixed	D
Suction control valve	Open or short in suction control valve circuit	E
	Stuck open	F
	Stuck close	G
EDU	Faulty EDU	H
Common rail system (Fuel system)	Fuel leaks in high–pressurized area	I

**(d) DIAGNOSTICS TROUBLE CODE DESCRIPTION FOR COMMON RAIL SYSTEM:**

DTC No.	Description
P0087	Fuel pressure sensor output does not change
P0093	Fuel leaks in high–pressurized area
P0190	Open or short in fuel pressure sensor circuit (low or high output)
P0200	Open or short in EDU or injector circuit
P0627	No fuel feed
P1229	Fuel over–feed
P1238	Injection malfunction, excluding open or short in injector circuit

### 3. INJECTION CONTROL SYSTEM DESCRIPTION

The ECM controls the fuel injection system by using the injectors and supply pump. The ECM determines the fuel injection volume and timing by controlling both duration and timing of energization to the solenoid valve in the injector, and determines the injection pressure by controlling the suction control valve located on the supply pump.

The feed pump is used to pump fuel from the fuel tank into the supply pump.

