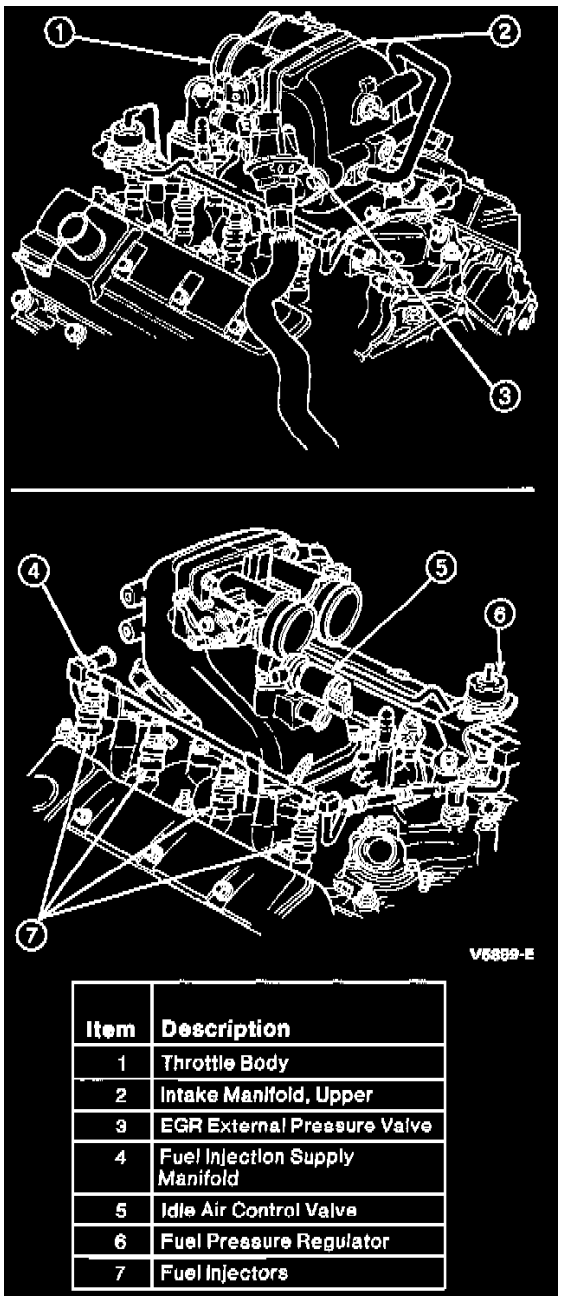
Fuel Delivery and Air Induction: Description and Operation
Fuel System

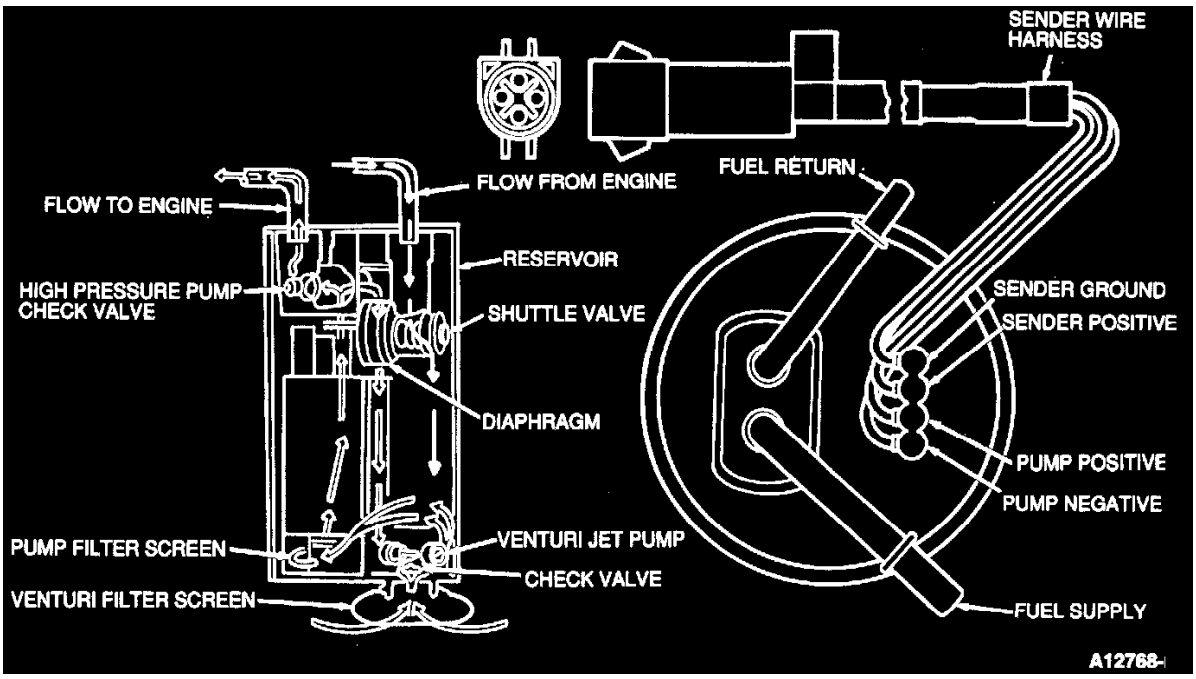


Item	Description
1	Throttle Body
2	Intake Manifold, Upper
3	EGR External Pressure Valve
4	Fuel Injection Supply Manifold
5	Idle Air Control Valve
6	Fuel Pressure Regulator
7	Fuel Injectors

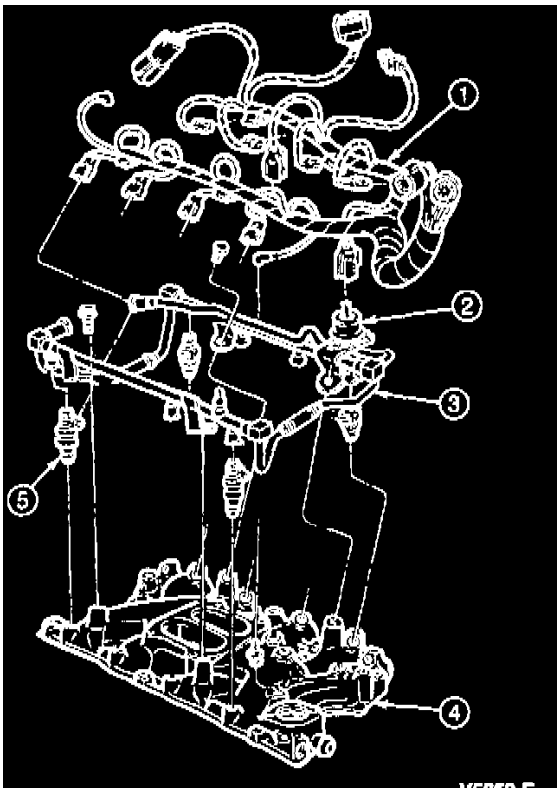
Simultaneous Multiport Fuel Injection (MFI) Engine

A powertrain control module (PCM) accepts input from various engine sensors to compute the required fuel flow rate necessary to maintain a prescribed air/fuel ratio throughout the entire engine operational range. The computer then outputs a command to the fuel injectors to meter the appropriate quantity of fuel.

The system will automatically sense and compensate for changes in altitude (i.e., from sea level to mountainous regions) and also permits push-starting the vehicle should it become necessary (manual transmission only).

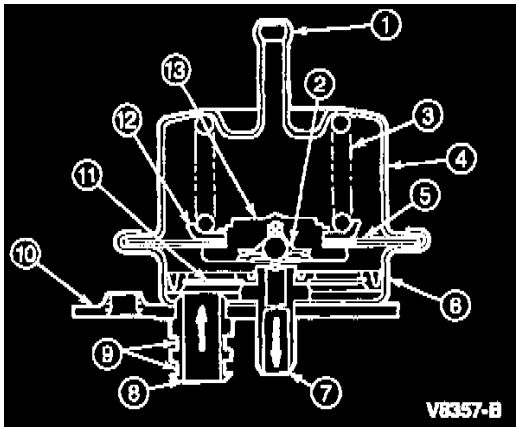


The fuel delivery subsystem consists of a high-pressure in-tank mounted fuel pump, and a fuel filter/reservoir delivering fuel from the fuel tank through a chassis-mounted 20-micron fuel filter to a fuel injection supply manifold.



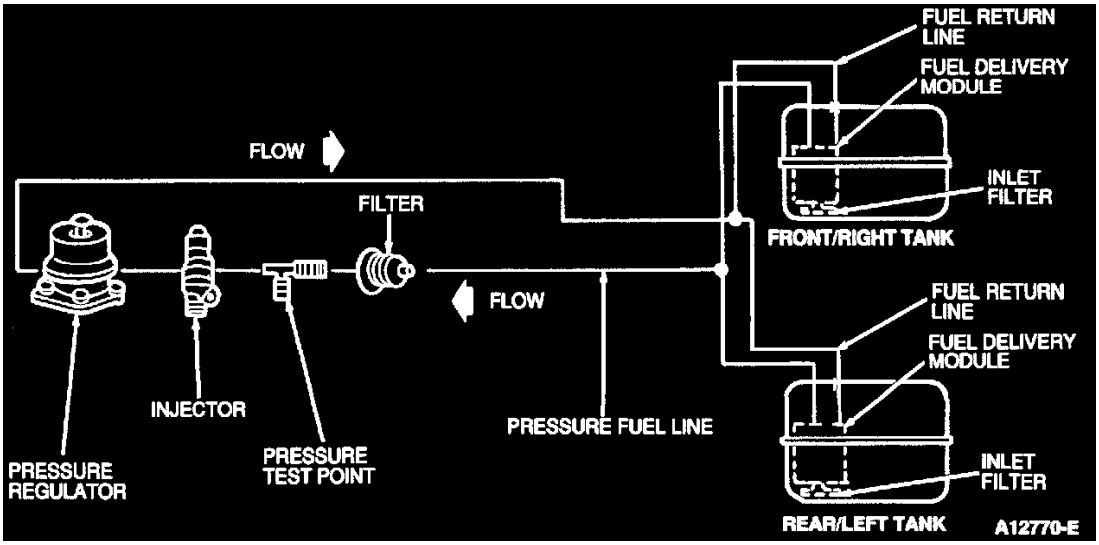
Item	Description
1	Fuel Charging Wiring
2	Fuel Pressure Regulator
3	Fuel Injection Supply Manifold
4	Intake Manifold, Lower
5	Fuel Injector

The fuel injection supply manifold incorporates electrically-actuated fuel injectors directly above each of the engine's eight intake ports. The fuel injectors, when energized, spray a metered quantity of fuel into the intake air stream.



Item	Description
1	Engine Vacuum Reference Tube
2	Ball Seat
3	Spring
4	Upper Housing
5	Diaphragm
6	Lower Housing
7	Fuel Outlet Tube (Return)
8	Fuel Inlet Tube (Supply)
9	O-Ring Groove
10	Mounting Plate
11	Fuel Filter Spring
12	Spring Seat
13	Valve Assembly

A constant fuel pressure drop is maintained across the fuel injectors by a fuel pressure regulator. The fuel pressure regulator is connected in series with the fuel injectors and is positioned downstream from them. Excess fuel supplied by the pump, but not required by the engine, passes through the regulator reservoir input and returns to the fuel tank through a fuel return line.



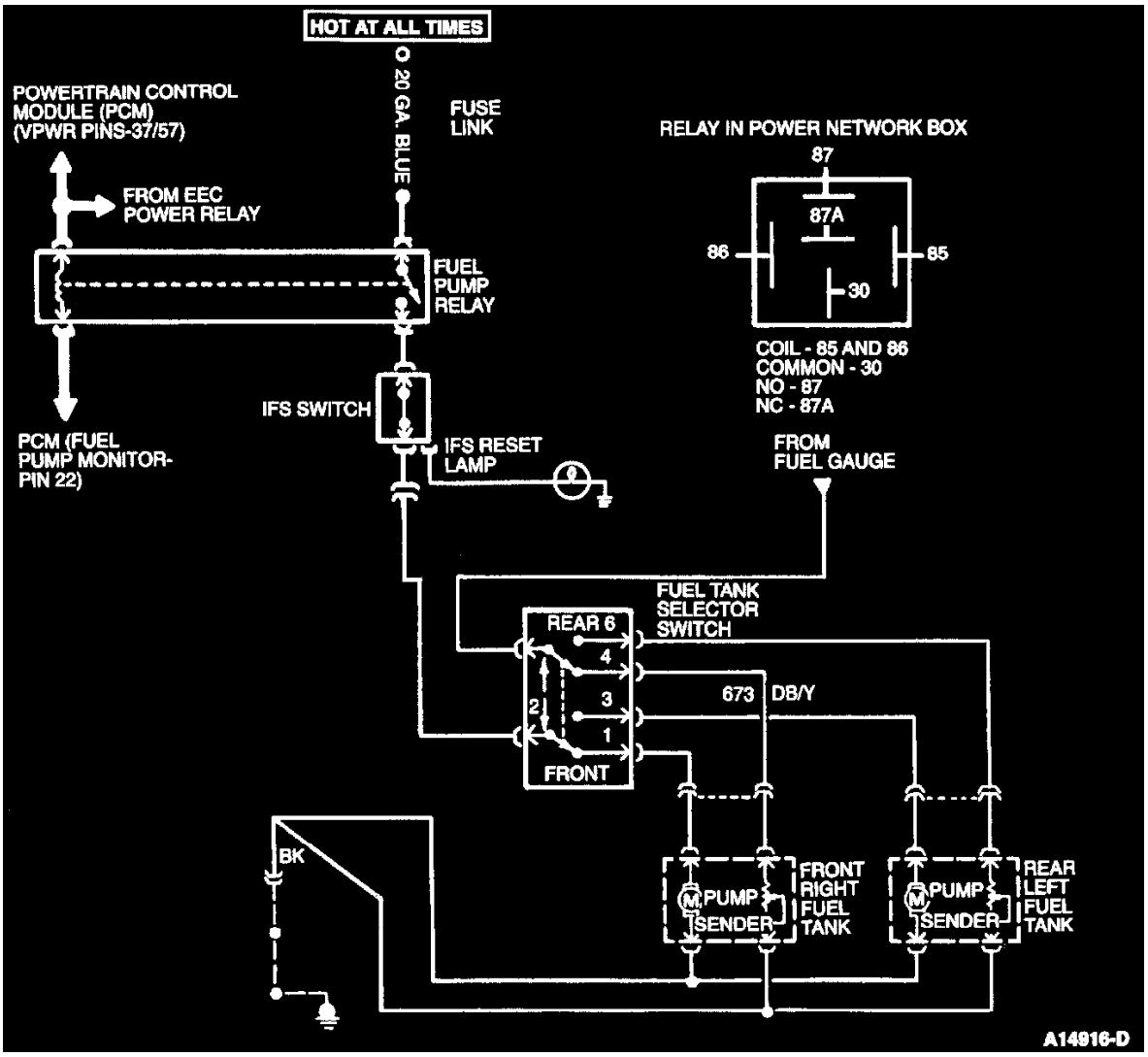
Fuel Injection Timing

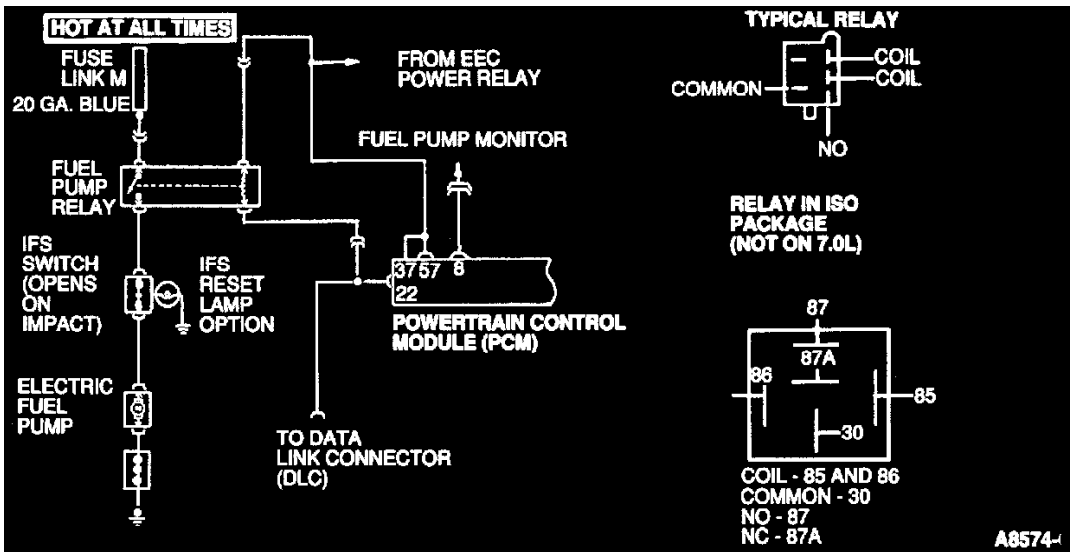
Each fuel injector is energized once every other crankshaft revolution in sequence with engine firing order. The period of time that the fuel injectors are energized (injector "on time" or pulse width) is controlled by the vehicle's powertrain control module (PCM). Air entering the engine is monitored by

flow, pressure and temperature sensors. The outputs of these electronic engine control sensors are processed by the powertrain control module. The powertrain control module determines the needed fuel injector pulse width and outputs a command to the fuel injector to meter the exact quantity of fuel.

Simultaneous Multiport Fuel Injection (MFI)

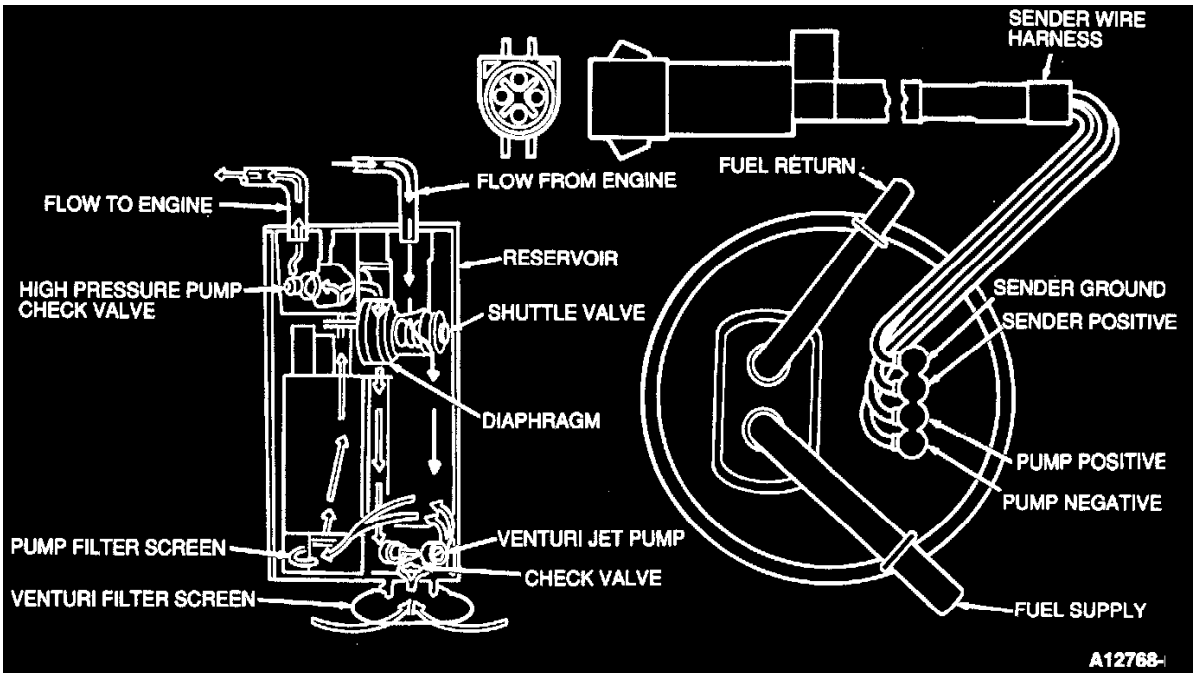
The multiport fuel injection system **(MFI)** is classified as a multi-point, pulse time, speed density control fuel injection system. Fuel is metered into each intake port in a sequential firing order. Fuel injectors pulse to follow engine firing order in accordance with engine demand through injectors mounted on a tuned intake manifold.





When the ignition is switched to the ON position, it turns the EEC Power Relay on. The EEC Power Relay provides power to the EEC-IV processor and the control side of the fuel pump relay. Power for the fuel pump is supplied through a fuse link or high current fuse attached to the starter solenoid (battery side). From the fuse link or high current fuse, current flow is through the fuel pump relay and Inertia Fuel Shutoff **(IFS)** switch to the fuel pump. The IFS switch is a safety device used to shut off the fuel pump in the event of a collision. If the IFS switch is "tripped," it must be reset by depressing the white or red button on the top of the switch. The fuel pump relay is controlled by the Powertrain Control Module (PCM).

When the ignition switch is turned to the ON position, the fuel pump will operate. If the ignition switch is not turned to the START position, the PCM will shut the fuel pump off after approximately one second. The PCM will operate the fuel pump when the ignition is in the START position to provide fuel while cranking.



After the engine starts, the PCM will continue to operate the fuel pump unless the engine stops, engine speed drops below 120 rpm, or the IFS switch is "tripped."