31

# Fuel-Injection Systems


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## 31 FUEL-INJECTION SYSTEMS

**FIGURE 31.1** Typical port fuel-injection system, indicating the location of various components. Note that the fuel-pressure regulator is located on the fuel return side of the system. The computer does not control fuel pressure but does control the operation of the electric fuel pump (on most systems) and the pulsing on and off of the injectors.

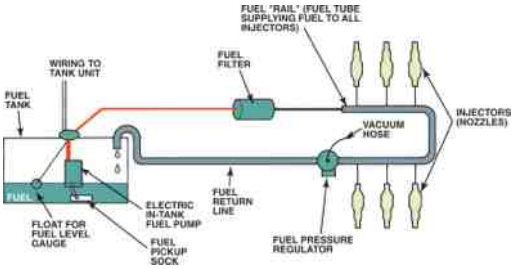



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**FIGURE 31.2** A dual-nozzle TBI unit on a Chevrolet 4.3-L V-6 engine. The fuel is squirted above the throttle plate, where the fuel mixes with air before entering the intake manifold.

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**FIGURE 31.3** A typical port fuel-injection system squirts fuel into the low pressure area (vacuum) of the intake manifold, about 2 to 3 in. (70–100 mm) from the intake valve.

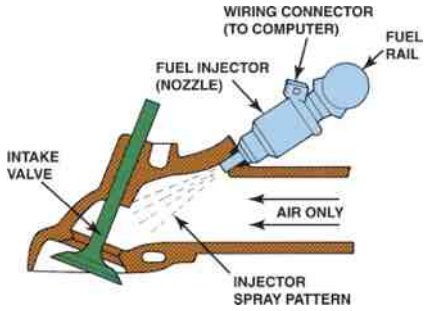



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**FIGURE 31.4** A typical direct-injection system uses two pumps—one low-pressure electric pump in the fuel tank and the other a high-pressure pump driven by the camshaft. The high pressure fuel system operates at a pressure as low as 500 PSI during light load conditions and as high as 2,900 PSI under heavy loads.

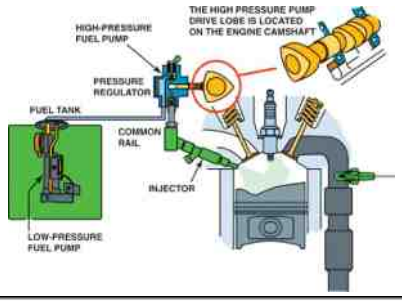



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**FIGURE 31.5** Cross-section of a typical port fuel-injection nozzle assembly. These injectors are serviced as an assembly only; no part replacement or service is possible except for replacement of external O-ring seals.

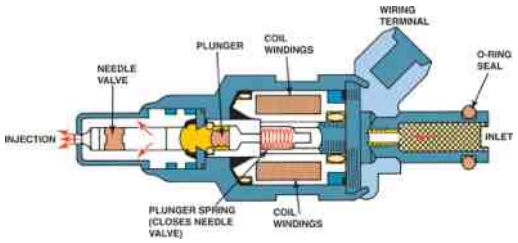



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**FIGURE 31.6** A typical port fuel-injected system showing a vacuum-controlled fuel-pressure regulator.

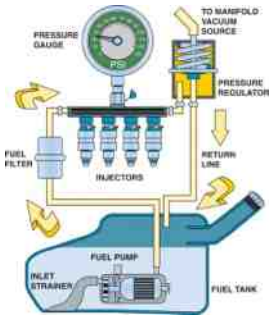



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**FIGURE 31.7** An idle control unit has four wires and it uses a reversible stepper motor to regulate the amount of air bypassing the throttle plate.

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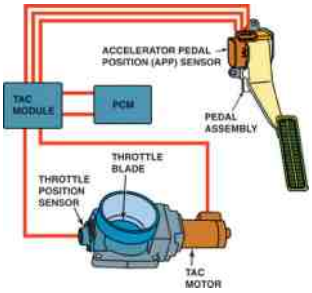
**FIGURE 31.8** The throttle pedal is connected to the accelerator pedal position (APP) sensor. The electronic throttle body includes a throttle position sensor to provide throttle angle feedback to the vehicle computer. Some systems use a throttle actuator control (TAC) module to operate the throttle blade (plate).





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