Chapter 42

Emission Control Devices

FIGURE 42.1 Nitrogen oxides (NOx) create a red-brown haze that often hangs over major cities.

FIGURE 42.2 Typical vacuum-operated EGR valve. The operation of the valve is controlled by the PCM by pulsing the EGR control solenoid on and off.

FIGURE 42.3 A General Motors electronic EGR valve.

FIGURE 42.4 A PCV valve and hose on a Ford 5.0-liter V-8.Many are hard to see as they are hidden from view under plastic covers.

FIGURE 42.5 Spring force, crankcase pressure, and intake manifold vacuum work together to regulate the flow rate through the PCV valve.

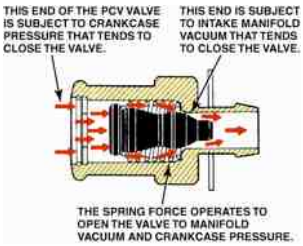

FIGURE 42.6 A typical belt-driven AIR pump. Air enters through the revolving fins behind the drive pulley. The fins act as an air filter because dirt is heavier than air, and therefore the dirt is deflected off of the fins at the same time air is being drawn into the pump.

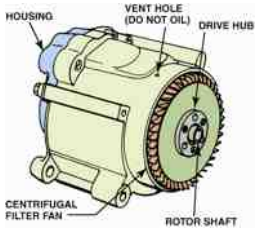

FIGURE 42.7 The external air manifold and exhaust check valve on a restored muscle car engine.

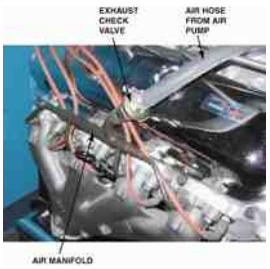

FIGURE 42.8 A typical electric motor-driven SAI pump.This unit is on a Chevrolet Corvette and only works when the engine is cold.

FIGURE 42.9 Most catalytic converters are located as close to the exhaust manifold as possible, as seen in this display of a Chevrolet Corvette.

FIGURE 42.10 The three-way catalytic converter first separates the NOx into nitrogen and oxygen and then converts the HC and CO into harmless water (H2O) and carbon dioxide (CO2). The nitrogen (N) passes through the converter, exits the tailpipe,and enters the atmosphere, which is about 78% nitrogen.

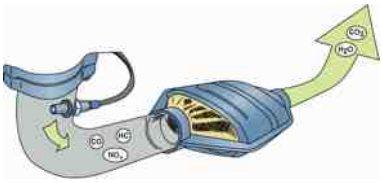

FIGURE 42.11 A charcoal canister can be located under the hood or underneath the vehicle.

FIGURE 42.12 An enhanced EVAP system is able to perform system and leak detection diagnosis.

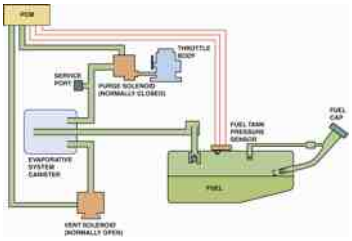

FIGURE 42.13 Some vehicles will display a message if an evaporative control system leak is detected that could be the result of a loose gas cap.