32

Emission Control Devices

FIGURE 32.1 Nitrogen oxides (NOx) create a red-brown haze that often hangs over major cities.

FIGURE 32.2 Typical vacuum-operated EGR valve. The operation of the valve is controlled by the PCM by pulsing the EGR control solenoid on and off.

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FIGURE 32.3 A General Motors electronic EGR valve.

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FIGURE 32.4 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.

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FIGURE 32.5 Spring force, crankcase pressure, and intake manifold vacuum work together to regulate the flow rate through the PCV valve.

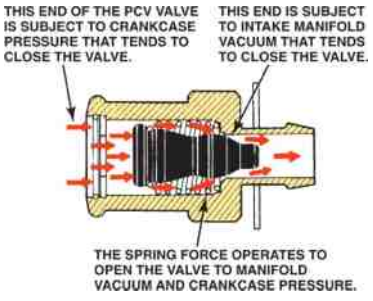

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FIGURE 32.6 A typical belt-driven AIR pump. Air enters through the revolving fins behind the drive pulley. The fins act as an air filter because dirt is heavier than air, and therefore the dirt is deflected off of the fins at the same time air is being drawn into the pump.

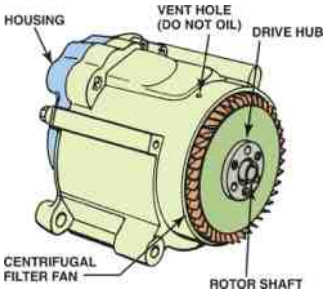

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FIGURE 32.7 The external air manifold and exhaust check valve on a restored muscle car engine.

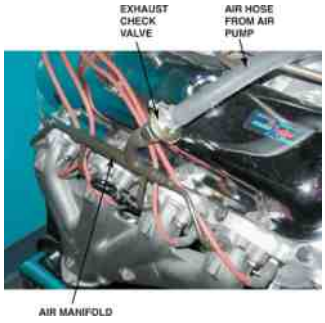

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FIGURE 32.8 A typical electric motor–driven SAI pump. This unit is on a Chevrolet Corvette and only works when the engine is cold.

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FIGURE 32.9 Most catalytic converters are located as close to the exhaust manifold as possible, as seen in this display of a Chevrolet Corvette.

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FIGURE 32.10 The three-way catalytic converter first separates the NOx into nitrogen and oxygen and then converts the HC and CO into harmless water (H_2O) and carbon dioxide (CO_2). The nitrogen (N) passes through the converter, exits the tailpipe, and enters the atmosphere, which is about 78% nitrogen.

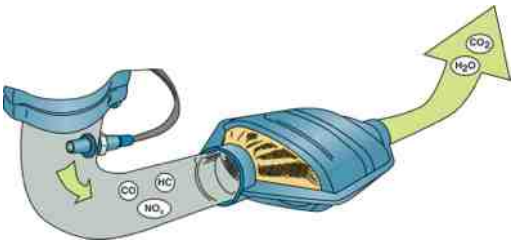

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FIGURE 32.11 A charcoal canister can be located under the hood or underneath the vehicle.

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FIGURE 32.12 An enhanced EVAP system is able to perform system and leak detection diagnosis.

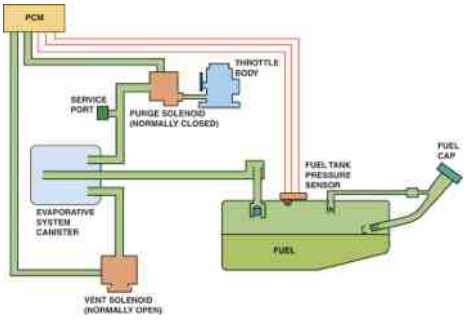

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FIGURE 32.13 Some vehicles will display a message if an evaporative control system leak is detected that could be the result of a loose gas cap.