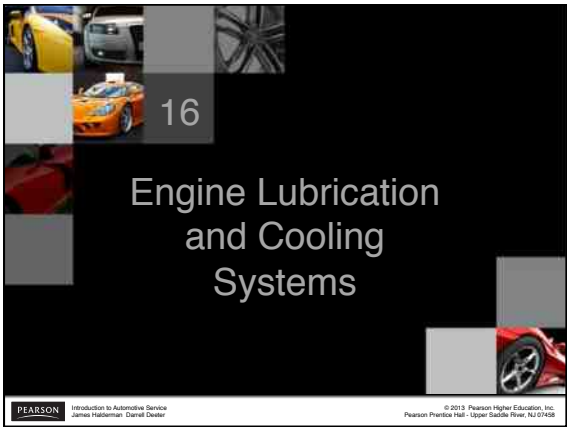

16

Engine Lubrication and Cooling Systems

FIGURE 16.1 Oil molecules cling to metal surfaces but easily slide against each other.

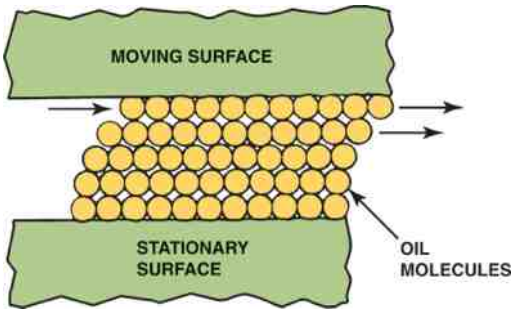

FIGURE 16.2 The dash oil pressure gauge may be a good indicator of engine oil pressure. If there is any concern about the oil pressure, always use a mechanical gauge to be sure.

FIGURE 16.3 In an external gear-type oil pump, the oil flows through the pump around the outside of each gear. This is an example of a positive displacement pump, wherein everything entering the pump must leave the pump.

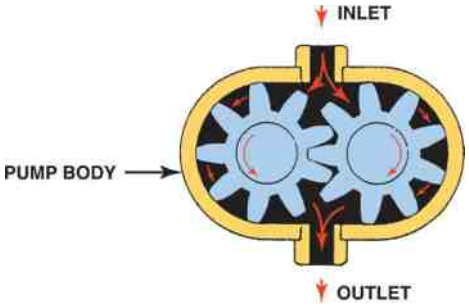

FIGURE 16.4 A typical engine design uses both pressure and splash lubrication. Oil travels under pressure through the galleries (passages) to reach the top of the engine. Other parts are lubricated as the oil flows back down into the oil pan or is splashed onto parts.

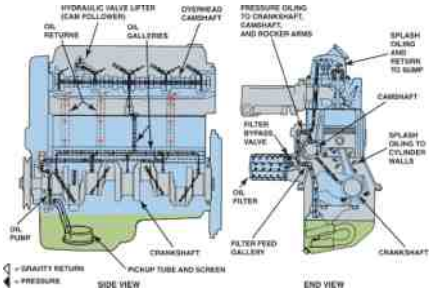

FIGURE 16.5 An intermediate shaft drives the oil pump on this overhead camshaft engine. Note the main gallery and other drilled passages in the block and cylinder head.

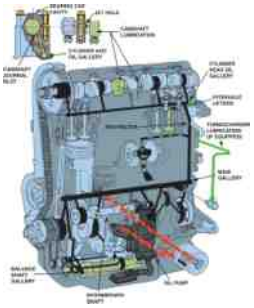

FIGURE 16.6 Oil is sent to the rocker arms on this Chevrolet V-8 engine through the hollow pushrods. The oil returns to the oil pan through the oil drain back holes in the cylinder head.

FIGURE 16.7 A typical oil pan with a built-in windage tray used to keep oil from being churned up by the rotating crankshaft.

FIGURE 16.8 Oil is cooled by the flow of coolant through the oil filter adaptor.

FIGURE 16.9 Typical combustion and exhaust temperatures.

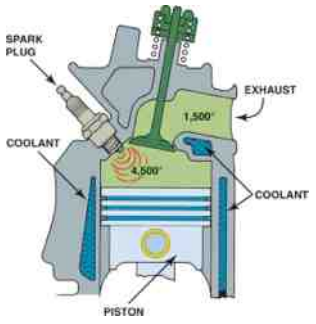

FIGURE 16.10 The engine cooling system includes the water jackets (passages) in the engine, plus the water pump and radiator. Hoses are used to move the coolant to and from the radiator and to and from the heater core inside the vehicle. The thermostat is used to control coolant temperature.

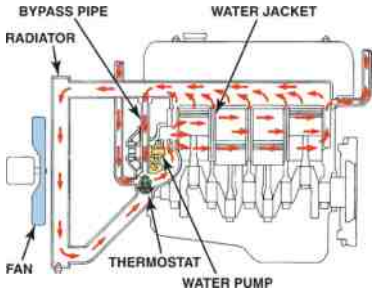

FIGURE 16.11 Havoline was the first company to make and market OAT coolants. General Motors uses the term "DEX-COOL."

FIGURE 16.12 Coolant used in Fords that use Mazda engines and in Mazda vehicles. It requires the use of an HOAT coolant, which is dark green and is premixed 55% antifreeze and 45% water in this example.

FIGURE 16.13 Not all embittered coolants are labeled "embittered." Many states now require that all coolants sold in the state be embittered.