

Three Vital Oil System Valves

In any automotive engine lubrication system there must be a constant flow of oil under pressure to the engine. If that flow fails, the bearings may burn out due to oil starvation, and other moving engine parts may rub together, causing excessive wear.

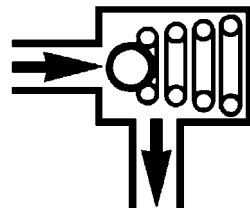
Three separate valves in engine lubrication systems keep the engine supplied with the oil it needs. These valves are

often mistaken for one another when questions regarding oil systems are raised. This section defines each valve and its specific function. You will find additional information on these valves elsewhere in the general information section of this catalog.

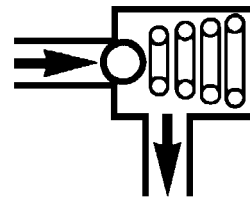
Oil Pump Pressure Regulating Valve

This valve is usually built into the oil pump and is necessary in both full flow and by-pass oil systems. Its function is to control the operating pressure of the lubrication system. The regulating valve is set by the manufacturer to maintain the correct pressure (usually between 40 and 60 PSI).

The valve utilizes a ball (or plunger) and spring mechanism. When the operating pressure is below the preset PSI level, the spring holds the ball in the closed position so that oil flows to the bearings under pressure. When the desired amount of pressure is reached, the valve opens enough to maintain this



Pressure Regulating Valve in Open Position



Pressure Regulating Valve Stuck in Closed Position

pressure. Once the valve is open, the pressure remains fairly constant, with only small changes as the engine speed varies.

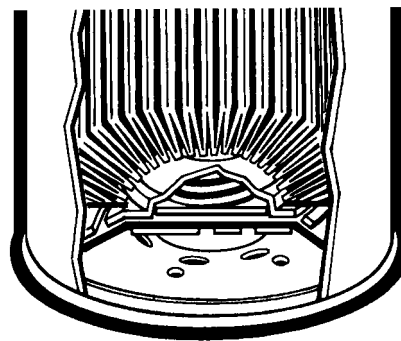
If the oil pressure regulating valve becomes stuck in the closed position or slow to move to the open position after the engine has started, the pressure in the system will exceed the regulating valve setting. This may cause an over-pressurized oil filter. If a deformed oil filter is observed, the oil pressure regulating valve must be serviced immediately. (Also see section on over-pressurized lube oil filters in this catalog.)

Relief (By-pass) Valve

In a full oil flow system, *all* the oil passes through the filter to reach the engine. If the filter clogs, an alternative route to the engine must be provided for the oil, or the bearings and other internal parts may fail, due to oil starvation.

A relief, or by-pass, valve is used to allow unfiltered oil to lubricate the engine. Unfiltered oil is far better than no oil at all.

This relief valve is built into the engine block in some cars. Otherwise, the



relief valve is a component of the oil filter itself. Under normal conditions, the valve remains closed. When there is sufficient contaminant in the oil filter to reach a preset level of restriction to oil flow (around 8 PSI in most passenger cars), pressure on the relief valve causes it to open. This condition can occur when the oil filter has become clogged or when the weather is cold and the oil is thick and flows slowly.

Anti-drain Valve

Some oil filter mountings may allow oil to drain out of the filter when the engine is stopped. When the engine is next started, oil must refill the filter before full oil pressure reaches the engine. The anti-drain valve, included in the filter when required, prevents oil from draining out of the filter.

Some filter designs incorporate a combination anti-drain and relief valve with an integrated unit construction.

