

On the Line

By-Passing the Oil Filter

It's Sometimes Necessary to Ensure Sufficient Lubrication

Oil filter by-pass valves come in many different arrangements. Some are buried out-of-sight within the oil filter and others may be mounted in the filter housing or oil filter cap and are clearly visible. For those applications, inspect and replace any damaged components or assemblies, as required. Damaged by-pass valves are a major concern and will be covered later in this article. Regardless of the location of the valves, they share the same responsibility and provide protection for the engine in the event of a filter restriction or during periods of high oil pressure or pressure surges. Consider the following:

Contamination... the by-pass valve is calibrated to open at a given filter restriction/differential pressure. The differential pressure is the difference in fluid pressure between the filter's inlet and the outlet side of the filter. Once the filter becomes heavily contaminated/restricted, the by-pass valve opens, allowing the engine lubricant to continue to flow to the internal engine components. Unfiltered lubricant is better than no lubricant.

Cold Engine/Cold Ambient Temperatures... During cold ambient weather conditions, it is not uncommon for the filter by-pass valve to open, allowing lubricant to flow to the vital engine components. When the lubricant warms and the pressure differential across the filter drops below the setting of the by-pass valve, the valve closes and filtered oil flows through the system. The by-pass valve can also open during periods of high rpm or snap throttle conditions, especially during cold ambient conditions.

A by-pass valve stuck in the open position could result in engine damage due to unfiltered lubricant flowing to the bearings, etc., and there would not be any symptoms until it was too late. A valve stuck in the closed position could cause the filter or center tube to collapse when the filter encountered heavy contamination and the valve was unable to relieve the differential pressure. A sticking oil pressure regulating valve in the oil pump can result in the same over pressurization and collapse of the filter and center tube. Often, spin-on filters bulge or split from the excessive pressure created due to a stuck pressure regulating valve.

CHRYSLER'S 3.6L PENTASTAR ENGINE

A high failure rate of broken by-pass valves continues to be reported on the 3.6L Pentastar engine. Vehicles have been serviced and the customer allowed to leave with a broken by-pass valve and missing springs. Lube service technicians have seen the loose components, heard the springs when they dislodged during a filter change, but failed to identify the damaged components as a part of the by-pass valve. The by-pass valve on the 3.6L Pentastar engine may be positioned in one of two locations:

1) 2011–2013 vehicles will incorporate a by-pass valve mounted in the oil filter housing. If the valve is damaged, the complete oil filter housing must be replaced.

2) 2014–2016 vehicles will contain a by-pass valve mounted in the oil filter cap. When removing the oil filter from the cap, pull the filter straight from the cap. DO NOT rock the filter back and forth to release it from the cap, as damage to the by-pass valve can occur, requiring a cap replacement.

It is imperative that the vehicle does not leave the service facility with a damaged or non-functional by-pass valve, as engine damage can result.

EXTENDED SERVICE INTERVALS

Vehicle manufacturers are promoting extended service intervals, as it helps sell vehicles. With today's powertrain technology, synthetic lubricants can last 12-15K miles. Conventional oil filters are not designed to provide protection for that length of service. Vehicles driven for those service intervals should be equipped with an extended life oil filter. Operating a vehicle under an extended service interval with a conventional oil filter is playing Russian roulette with the engine. A lot of attention is given to the lubricant with little consideration as to how long the filter will last without by-passing.

Will your filter provide protection for the engine during an extended service interval? You may not know until it's too late to save the engine from extensive damage.



By Larry Hammer
Technical Services



"OH, BOY!!! WHEN I MENTIONED 'BY-PASSING THE OIL FILTER,' I FORGOT THAT HE USED TO BE A DARN PLUMBER!!!"