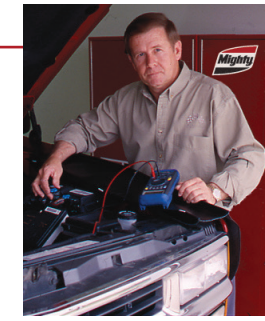
Mighty On the Line

Oil Pressure…Filtration…and Viscosity

Vehicle Manufacturer Specifications Really Matter



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With an oil pressure reading of 5 PSI at idle, the customer was certain that some major engine repairs would be necessary. Fortunately, some research prevented a lot of unnecessary repairs, as that was normal oil pressure for the vehicle at idle. Today's engines have different lubrication and filtration requirements and adhering to those specifications are critical for the life of the engine. Many vehicles are operating at extended drain intervals with a filter that is allowing by-pass and that is like not having a filter on the engine. Some assume that any viscosity lubricant will do and that can spell disaster for engine components. Let's consider some of the changes in engine lubrication:

FILTERING THE LUBRICANT

The selection of a filter for a specific application varies depending on the media, porosity of the media, surface area and its total capacity, plus the by-pass valve setting. Filters of equal size often share different efficiency, capacity ratings and by-pass valve settings, all of which are critical specifications. Efficiency is a measure of the percentage of particles of a determined size that the filter can capture. The capacity is the amount of debris the oil filter can hold before a differential pressure results in the by-pass valve opening, allowing unfiltered oil to flow through the engine. Changes in engine and lubrication technology have resulted in an increase in the oil flow rate, resulting in a higher engine pressure differential across the filter media. This requires an increase in the by-pass valve setting to prevent unfiltered oil from flowing to the engine components. The proper filter for the application is critical, prompting some vehicle manufacturers to claim that engine warranties will not be covered when non-compatible oil filters have been installed. Engine technology has made many changes in the way today's vehicles operate and must be serviced. Does your filter supplier comply with the original equipment specifications?

ROSCOE STILL INSISTS THAT OIL FILTERS ARE GOOD FOR **20,000** MILES.

THE HEART OF THE ENGINE

Downstream from the oil filter lies the heart of the engine and that would be the oil pump. Much has changed in the way lubricant is supplied to the engine components, including volume and pressure. Advancements in oil pump technology have also been introduced to improve lubrication and fuel economy. Were you aware that some oil pumps are now computer controlled?

Fixed Displacement Pumps... These pumps are driven by the camshaft at half the engine speed or the crankshaft at engine speed. With this design pump the supply of lubricant has almost been an overkill during idle or low RPMs just to be certain the engine has adequate lubrication in the higher RPM ranges. Excessive pressure from the oil pump is controlled by a pressure regulating valve mounted internally in the oil pump or the engine block on some applications.

Variable Displacement/Two Stage Pumps... The engineers have long recognized the oil pump as a consumer of energy, especially during high flow conditions. Variable displacement pumps can reduce the parasitic load on the engine by providing the proper oil pressure and volume based on a series of factors such as oil and coolant temperature and engine RPMs. The engineers claim a 3-6 percent improvement in fuel economy by reducing this parasitic power loss. This technology reduces the load on the engine by providing the proper oil pressure and volume for the varying engine demands, unlike the fixed displacement pump that may require an oversupply of lubricant at low RPMs to insure the engine has sufficient lubricant in the higher RPM range. To achieve this, a solenoid in the oil pump controlled by the powertrain control module (PCM) regulates the output of the oil pump based on a series of conditions and demands. On some applications, the PCM can put the system in a Power Loss or Reduced Power mode when certain conditions occur, such as the incorrect oil viscosity installed. Most vehicle manufacturers have an engine group that utilizes variable displacement oil pump technology.

When checking oil pressure, consult the factory specs. Some vehicle manufacturers call for as little as 5 PSI pressure at idle. Check the application data for the proper filter for the application and verify the required viscosity lubricant.

For additional information, review Mighty Tech Tip #192 CHANGES IN ENGINE LUBRICATION.