



## High Volume Pumps: Advantages, Myths & Fables

Most of the stock automobile engines are designed to operate from idle to 4500 RPM. The original volume and pressure oil pump will work fine in this type of application. As the demands on the engine increase so does the demands on the oiling system and pump.

The oil pump's most difficult task is to supply oil to the connecting rod bearing that is the farthest from the pump. To reach this bearing, the oil travels from three to four feet, turns numerous square corners thru small holes in the crankshaft to the rod bearing. The rod bearing doesn't help matters. It is traveling in a circle which means centrifugal force is pulling the oil out of the bearing.

A 350 Chevy has a 3.4811 stroke and a 2.111 rod journal. The outer edge of the journal travels 17.5311 every revolution. At 1000 RPM, the outer edge is traveling at 16.6 MPH and 74.7 MPH at 4500 RPM. If we take this engine to 6500 the outer edge is up to 107.9 and at 8500 it is 141.1 MPH. Now imagine driving a car around a curve at those speeds and you can feel the centrifugal force. Now imagine doing it around a circle with a 5.581, diameter.

The size of the gears or rotors determines the amount of oil a pump can move at any given RPM. Resistance to this movement creates the pressure. If a pump is not large enough to meet the demands of the engine, there will not be any pressure. Or if the demands of the engine are increased beyond the pumps capabilities there will be a loss of oil pressure. This is where high volume pumps come in; they take care of any increased demands of the engine.

Increases in the engine's oil requirements come from higher RPM, being able to rev faster, increased bearing clearances, remote oil cooler and/or filter and any combination of these. Most high volume pumps also have a increase in pressure to help get the oil out to the bearings faster.

That is what a high volume pump will do. Now let us consider what it will not do.

1. It will not replace a rebuild in a worn-out engine. It may increase pressure but the engine is still worn-out.
2. It will not pump the oil pan dry. Both solid and hydraulic lifters have metering valves to limit flow of the oil to the top of the engine. If a pan is pumped dry, it is because the holes that drain oil back to the pan are plugged. If the high volume pump is also higher pressure, there will be a slight increase in flow to the top.
3. It will not wear out distributor gears. The load on the gear is directly related to the resistance to flow. Oil pressure is the measure of resistance to flow. The Ford 427 FE "side oiler" used a pump with relief valve set at 125 psi and it used a standard distributor gear. Distributor gear failures are usually caused by a worn gear on a new cam gear and/or worn bearings allowing misalignment.