

SB042

Engine Oil Pressure

Engine oil pressure is a measure of the resistance of the oil to flow through the engine. Large oil galleries, elevated oil temperature, excessive oil pump or bearing clearances, excessive conrod side clearance, missing oil gallery restrictors, faulty oil pressure relief valves, damaged or missing oil gallery plugs and low oil viscosity are all factors that allow engine oil to flow freely and result in low oil pressure. If an engine is assembled with double the specified maximum bearing oil clearance, five times the designed amount of oil will flow out past the bearings. In some engines this increase would result in the oil flow exceeding the design parameters of the oil pump and the engines would experience low or no oil pressure.

Alternatively, restricted or blocked oil galleries, cold oil, insufficient oil pump or bearing clearances, blocked oil filters, faulty oil pressure relief valves, thickened or sludged oil and high oil viscosity are all factors that restrict engine oil flow and result in high oil pressure. Ongoing high oil pressure is never good for an engine, as it clearly indicates the oil is being restricted in its flow around the engine. It can mean those components at the end of the oil flow around the engine are being starved of oil - e.g. the rockers, overhead camshafts, conrod bearings and gudgeon pin bushes. High oil pressure can result in oil leaks, blow-out of oil gallery core plugs and burst oil filters.

Stable oil pressure - not too low and not too high - is a critical factor for engine longevity and reliable operation. Any abnormal increase or decrease in oil pressure should be immediately investigated. When an engine is first started, the engine oil is cold and the oil galleries and passages low on oil, with most of the oil in the oil pan. Assuming the lubricating system is operating correctly, the oil is drawn from the oil pan, up the oil pick-up tube to the oil pump and then on through the engine. (A short and wide oil pick-up tube will promote good cold start lubrication.) The oil pressure typically rises quickly initially, but as the oil starts to circulate and warm up, the oil pressure drops and then stabilises. It is at this point that the engine is being lubricated correctly. Until the oil pressure stabilises and good hydrodynamic lubrication is achieved, oil ring, piston skirt and bearing wear rates are elevated. This is why it is imperative for drivers to allow the oil pressure to stabilise when they first start their engine and before loading the engine - especially in winter.

It is important that the correct grade of engine oil be used in the engine - as specified by the manufacturer. With most manufacturers recommending extended oil change intervals, it is imperative the oil pressure gauge be checked daily (usually on initial start-up) and the engine oil level be checked between services to ensure the oil condition and level are acceptable. With most new diesel engines now using Exhaust Gas Recirculation and High Pressure Common Fuel Rail systems, it is not uncommon to see engines fail due to insufficient oil or oil 'sludging'.

Stable and correct oil pressure are two good indicators of the 'condition' of the lubrication system and ultimately the general 'condition' of the engine. More care should be taken in monitoring oil pressure to help understand what is happening inside an engine.