

TURBOCHARGER “OIL LEAKS” ARE NOT WARRANTY TROUBLESHOOTING GUIDE

A common problem encountered with turbocharger installations is the “turbocharger oil leak”. Often the assumption is made that the turbocharger seals are at fault. In most cases, the “oil leak” is not a turbo problem-rather it is caused by either improper turbo installation or other underlying engine issues.

SEALS

Oil seals (rings) will ***NOT*** prevent oil from entering the turbine or compressor if the pressure in the center section is greater than the compressor or turbine. (eg. Excessive oil pressure with a blocked or inadequate size drain, excessive crankcase pressure, etc.) The main purpose of the seal is to prevent exhaust gasses or intake air from entering ***INTO*** the center housing (CHRA). To this end, the center section must always have less pressure. Oil entering the turbine or compressor housing is generally a result from another underlying problem.

OIL INSIDE THE TURBOCHARGER

Pressurized engine oil enters the center housing from the oil feed line. This oil passes between the bearing and wheel journal surfaces where, as a result of turbulence, air is mixed with the oil and is de-pressurized. This oil then flows either by gravity (in most cases) or scavenger pump through the oil drain line and back to the engine oil pan. Anything which prevents this draining will cause the oil to build up in the bearing housing to a height above the oil seals and ultimately the oil will leak out into the compressor housing and/or the turbine housing - past the seals.

CHECK VALVES

Check valves are sometimes installed into supply and drain lines of turbocharger oil systems to prevent oil from seeping by gravity (after engine shutdown) into the bearing housing. If the inlet or outlet check valves are faulty, all the oil that remains in the line will flow back into the bearing housing which can fill up to a point past the seals and cause the turbo to leak oil. The inlet check valve is usually the spring loaded ball and seat type. “Cracking pressures vary between 5-20 lbs”. If air flows immediately the valve is probably faulty. The outlet check valves are usually have a spring loaded tensioned valve which will close with the absence of flowing oil. Sometimes the spring will break and allow the valve to remain open at all times. Check to see the valve will open and close by depressing the valve.

OIL AT THE COMPRESSOR OUTLET

The air filter, as it accumulates dirt, offers an increasing restriction, causing a pressure drop across it. A partial vacuum at the compressor inlet will result. If this condition continues for any length of time, it will cause oil to be drawn from the bearing housing and into the compressor housing and induction system. Service the air filter regularly to prevent this condition.

OIL AT THE TURBINE OUTLET

Problems with the oil drain system can cause leaks to the turbocharger. The majority of turbocharger oil leaks are recognized at the turbine (exhaust) outlet. You may get an indication of oil burning at the tailpipe or leaking out the parting lines of the center housing and turbine housing. If the center housing does not drain back to the oil pan properly, the level of oil in the bearing housing will exceed the height of the seals and subsequently leak. Check the following conditions and correct them to eliminate the problem. Make certain that the turbo oil drain is pointing **down** or at no more than a 35 degree angle on either side of a vertical centerline. On gravity drain systems (no scavenge pump) ensure the drain lines slope downwards with no loops, sharp bends or angles. Ensure the return to the oil pan is **ABOVE** the oil level as it needs to gravity feed back to the pan. The oil drain line should be a **minimum** of 5/8" I.D. Finally, check the condition of the drain lines. Those made from a rubber-lined fabric covered hose may not cause any problems at all after running several years in one position. Even though the exterior of the hose looks fine, the rubber interior lining may have become brittle. When replacing a turbocharger, it is possible that such a drain line could be disturbed and bent, causing pieces of brittle rubber to break off inside the drain line and partially obstruct the flow of oil. To prevent this from happening, always inspect drain lines when the turbocharger has been removed.

ENGINE BREATHERS/CRANKCASE PRESSURE

Oil leaks in the turbocharger may also be the result of problems in the crankcase ventilation system. The vent or breather line may sometimes become clogged or restricted through engine operation. These conditions can allow positive pressure to build in the crankcase resulting in poor oil drainage back into the crankcase and ultimately pressure inside the turbocharger center section. Some engines (especially Chevrolet LS) are prone to high crankcase pressure so steps must be taken to correct this issue. All the above will cause oil to back up into the bearing housing and leak past the seals.