



## Turbo Failure: Oil Starvation

Turbocharger rotor operates at high speed on very thin film of oil. Loss of this oil film for a repetitive short duration of 2+ seconds can lead to metal-to-metal contact, wheel-to-housing rub and turbocharger failure.

The bearing system in 95% of turbochargers are floating bearing systems. This system differs quite substantially from conventional roller/ ball/ race bearings. The floating bearing system depends on a constant supply of clean oil between the inner face of the turbo's bearing and the rotating shaft. This film of oil is vital to prevent wear of both components. Loss of efficient lubrication between these surfaces for more than 2 seconds will cause wear on both surfaces, resulting in bearing failure.

The manufactured tolerance between the bearing and shaft is no more than 0.2mm. The 8 oil feed holes on the bearing (which supply the oil film) have a diameter of no greater than 0.7mm. It's therefore easy to see why a clean, effective oil supply is vital to avoid premature turbo failure.

### Symptoms:

- Turbo screeching or whining during operation
- Loss of performance
- Whistling turbo
- Excessive play in shaft
- Blade tips rubbing off their housings
- Excessive oil consumption
- Oil leak through the turbo
- Smokey exhaust

### Causes:

- Poor oil quality.
- Infrequent servicing.
- Engine wear.
- Dry startup
- Poor quality oil filtering
- Cheaper/ counterfeit oil filters (bypass spring can give way too quickly, restricting oil flow)
- Poor combustion process leading to carbonization of oil
- Internal engine leaks (Coolant, Fuel etc)
- Silicone gaskets blocking oil feed holes
- Kinked/ restricted/ broken oil feed lines

*It is common for the turbo to suffer oil starvation from the first time it turns over after being fitted to the engine. This can be avoided by 'priming' the new turbo with new clean oil and rotating the shaft a few times by hand. Never rotate the shaft unless there is an adequate oil supply.*

*Oil pumps that are of poor quality/ or have intermittent faults/ broken teeth can also cause the turbo to be starved of an inefficient oil supply.*

*During turbo installation the engines oil supply to the turbo should be checked and tested for constant flow and pressure. Failure to have a good pressurized constant supply will result in bearing/shaft overheat causing turbo failure. It is common for poor oil/ infrequently changed oil to carbonize and clog oil feed/ return lines. All these pipes should be cleaned or replaced as necessary.*

*It is also very important not to use 'silicon' type sealant on the oil feed/ return line attachments. These can break away and clog the oil feed to the smaller oil galleries in the turbo. Only use gaskets supplied by API or OE manufacturer*

### **Remember:**

Your turbo may spin at up to 150,000 RPM.

That's the equivalent of the wheel completing 4 complete revolutions every millisecond!! It requires excellent lubrication!

**Insist on using only a good quality oil grade as specified by your vehicle manufacturer.**



**A clean oil supply is vitally important to ensuring the long life of your turbocharger.**