Turbocharger
Troubleshooting Guidelines

Impact damage

Foreign object damage to impeller

Foreign object damage to turbine wheel

Never continue to operate an engine with a suspect or noisy turbocharger as this could result in total engine failure.

Impact damage caused by foreign material entering the turbine housing or compressor housing is clearly visible on the turbine wheel or impeller.

Never continue to operate a turbocharger with damaged blades as the rotor balance will be affected and this could impact its service life.

Insufficient oil supply

Effects of using silicone sealants

Insufficient lubrication oil

Insufficient oil supply can be attributed to the following:

- Re-fitting a turbocharger without adequate priming
- Long periods of non-use
- Broken or restricted oil feed pipe
- Low engine oil pressure due to malfunctioning lubrication system
- Low or no oil in sump
- The use of sealants, which can restrict the oil flow
- Not priming a replacement oil filter with new oil. If this cannot be done then crank the engine with no fuel to establish oil pressure
- Do not exceed idle conditions until oil pressure is established.

Dirt in oil

Dirt scored shaft

Dirt scored bearing

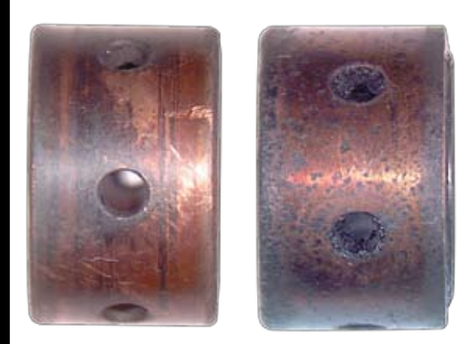
Dirty oil damages the turbocharger by causing heavy scoring of critical bearing surfaces. To avoid damage, oil and filters should be of a quality recommended by the engine manufacturer. These should be changed when a new turbocharger is fitted and at regular intervals according to the vehicle/engine manufacturer's specification.

Dirty oil damage could result from:

- Blocked, damaged or poor quality oil filter
- Dirt introduced during servicing
- Engine wear or manufacturing debris
- Malfunctioning oil filter by-pass valve
- Degraded lubrication oil.

Carbon build-up

Bearing damage due to hot shutdown



Carbon build-up on shaft

Failure from excessive exhaust temperatures or hot shutdown of engine results in carbon build-up. It is recommended that you idle the engine for two to three minutes to cool the bearing system before shutting down. Turbine end heat soak into the bearing housing results in oil carbonisation and corrosion of the bearing system. The main damage occurs to the shaft seal ring and grooves, turbine end bearing and bearing housing oil drain cavity blockage.

Carbon build-up can be caused by:

- Hot shutdown of engine
- Degraded oil quality carbonising in service
- Infrequent oil change intervals causing oil breakdown in service
- Air and gas leaks
- Faulty fuel injector pump/injectors.

Before changing your turbocharger, please make sure that you have correctly identified the cause of the fault.

Excess smoke	Engine lacks power	Noisy/Whistling	Seized/Sluggish	Worn/Excessive clearance
Caused by: • Dirty air cleaner • Air intake system restriction • Cracked mounting flange/gasket missing • Fuel pump/injectors/valve timing incorrectly set • Wastegate mechanism set incorrectly • Turbocharger damaged.	Caused by: • Dirty air cleaner • Air intake system restriction • Cracked mounting flange/gasket missing • Exhaust for foreign object restriction • Fuel pump/injectors/valve timing incorrectly set • Burnt valves and/or pistons • Turbocharger damaged.	Often the noise comes from air/gas leakage due to pre-turbine exhaust gas or air/boost leaks. Check all joints. If noise continues, check turbocharger clearances and wheels for housing contact.	If the turbocharger rotor assembly has seized or is tight to rotate, this is often due to lubricating oil degregation, which can cause a high build up of carbon in the bearing housing interior, restricting rotation. Insufficient or an intermittent drop in oil pressure can cause the rotor to seize, as can introducing dirt into the lubricating oil.	A turbocharger has specific axial and radial rotor clearances. These are sometimes mis-diagnosed as 'worn bearings' (See engine manual or nearest authorised Holset distributor). If the clearances are out of specification the cause could be attributed to a lubricating oil problem, i.e. insufficient oil, dirt ingress, oil contamination with coolant.

Remember, if the root cause of the problem is not identified and corrected, your problem will remain!

For more information visit:

www.holsetaftermarket.com

HOLSET® TURBOCHARGERS

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