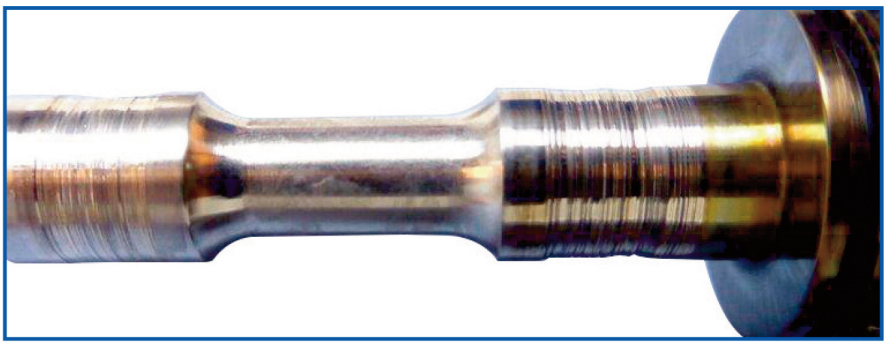
Diagnosing turbo damage from oil contamination

Common turbo failure modes create much discussion between Melett's technical department and their customers. To help identify common failures in warranty situations, and to provide advice on how to prevent future failures occurring, Melett have created a series of help guides. Here, oil contamination and damage that it can cause to a turbocharger are explained.

Turbochargers are manufactured to very high precision tolerances, within 4 microns (0.004mm), and rotate at speeds of up to 360,000rpm. If oil within the turbocharger becomes contaminated, this can have severe consequences.

Oil is very often overlooked as a critical component. However, clean filtered engine oil, and of the correct specification, is a major requirement and a necessity for all turbochargers. Contamination will cause rapid wear to various components and eventually cause catastrophic failure.



Scoring to journal bearing diameter of shaft wheel

Signs of oil contamination

- Scoring to thrust parts
- Scoring to journal bearings
- Scoring to journal bearing diameter of shaft and wheel
- Smell of fuel in the oil

Alternatively, if oil levels are too low or if the wrong grade of oil is used, the turbocharger will also fail.

If the original cause of failure is not identified, it is likely the same type of failure will occur to the remanufactured turbo. Catastrophic damage to the bearing systems can occur within seconds of the turbocharger commencing operation.

What causes contaminated oil?

- If the oil filter is blocked/damaged or a poor/improper quality oil filter is used
- Excess moisture can lead to premature oil degradation, increased corrosion and increased wear
- High carbon build up present in the engine can quickly contaminate new oil
- Contamination of new oil during servicing (accidental)
- Unchanged oil containing detergent deposits can become very abrasive to the turbo's precision components
- Engine wear, which can leave swarf deposits in the oil
- Degrading oil caused by excessive temperatures or extended service intervals
- Internal engine leaks, such as fuel or coolant mixing with the oil supply

Turbo failure prevention

- Using new oil and filters helps to reduce the risk. Melett advise that filters recommended by the engine manufacturer are used when refitting the turbo
- Replacement oil must be the correct grade/specification for the engine
- Replacing or cleaning the oil inlet pipes and in-line micro filters helps to prevent carbon deposits or sludge restricting oil flow to the bearings

For further information on this or other topics, please contact Melett Technical Support at sales@melett.com.

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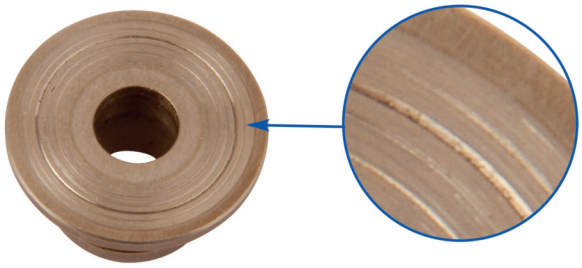
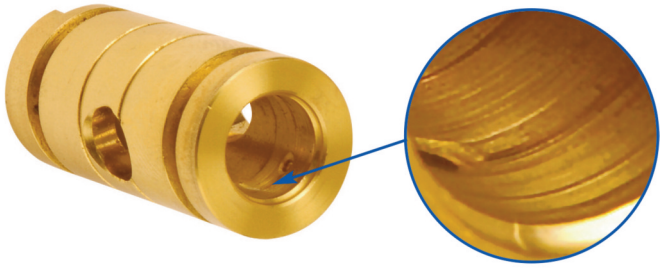
QUALITY REPLACEMENT TURBOCHARGER PARTS



Scoring to thrust parts



Scoring to journal bearings