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PRECISION ENGINEERED TURBOCHARGERS & PARTS

1 OVERSPEEDING

Common turbo failure modes create much discussion between our customers and technical department. To help identify common failures in warranty situations and to provide advice on how to prevent future failures occurring, we have created a series of help guides.

Overspeeding is a term used when a turbo is operating well above its normal operating limits.

So, what causes overspeeding?

- Engine modifications including 'chipping' or 'over-fuelling'
- Inconsistent flow of air into the turbo - this can be caused by a tear in the air hose or it becoming completely detached, or by restrictions in the air intake filter or pipe work
- The wastegate or VNT mechanism has been set incorrectly
- Worn injectors
- Installing an incorrect turbo
- Loss of signal to the SREA (Simple Rotary Electronic Actuator) for the wastegate or VNT control

Visual effects of overspeeding

- The 'orange peel' effect
- Inducer blade damage can be a consequence of housing rub
- Staining due to oxidation
- Partial loss of blades
- Burst wheel

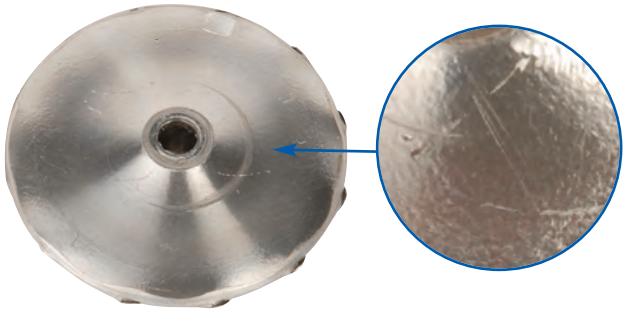
The 'orange peel' effect explained:

'Orange peel' effect on the back face of the compressor wheel is created by expansion and contraction. When the compressor wheel overspeeds it grows in size. This expansion causes cracks between the grain boundaries of the material, in mild cases this returns back to its original state (like elastic) but in most cases these cracks begin to grow and eventually part of the hub can break away.

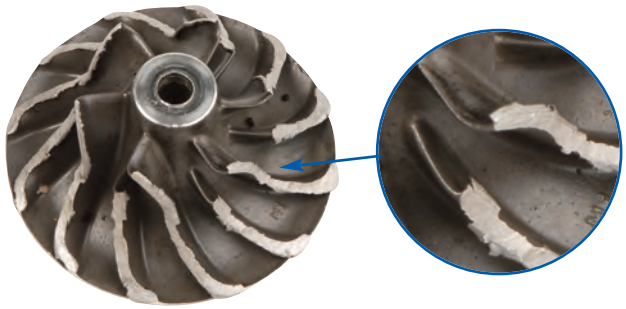
Quite often overspeeding is overlooked as a cause of the turbo failure. This is because symptoms of other failures can occur as a result of this overspeeding. Material transfer and discolouration of parts may indicate a lack of lubrication. Scoring to parts could indicate oil contamination, however the particles that have caused the scoring could have broken away from the bearings as a result of the overspeeding and imbalance caused by this. This imbalance can also cause compressor rub and turbine wheel rub in the housings, which in turn can lead to the shaft snapping and loss to part of the inducer blades.

All in all overspeeding causes a lot of damage and is often the primary failure mode! Recognising these features when diagnosing a warranty return can save time and money.

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



The 'orange peel' effect on compressor wheels



Compressor wheel rub

Complete component failure