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GENUINE SUPPLIER

HAVE YOU IDENTIFIED THE ORIGINAL CAUSE OF FAILURE?



**OIL LEAKAGE, FRACTURED ROTOR ASSEMBLY OR LOOSENED SHAFT NUT
ARE NOT CAUSE OF FAILURE FOR THE TURBOCHARGER. FAILURE TO
IDENTIFY THE ROOT CAUSE WILL RESULT IN RECURRING FAILURES.**

**CAREFULLY READ THE INFORMATION CONTAINED WITHIN THIS TECH BULLETIN
AND REFER TO THE COMMON FAILURE FAULTS & CAUSES SECTION**

RECURRING TURBOCHARGER FAILURES FOR HYUNDAI ILOAD & IMAX

Prior to fitment of the replacement genuine turbocharger it is important to determine the original cause of failure to prevent recurring turbocharger failures. As per Hyundai technical service bulletin SE07812 the following must be inspected to assist with the diagnosis of the root cause.

- A. Inspect turbocharger for any damage
- Excessive shaft radial & axial play or damage to the rotor assembly blades
 - Bent and/or broken shaft
 - Carbon build up within the nozzle ring assembly (inside VTG system)

- B. Inspect intercooler assembly
 - Inspect for split fins with oil contamination
- C. Inspect oil pick-up screen
 - Inspect screen for carbon blockage
- D. Inspect injectors
 - Inspect for evidence of leaking washers and carbon build-up around outside of the injector body
- E. Inspect the injector seat in cylinder head for damage

The above conditions may result in combustion gases entering the engines crankcase resulting in excessive blow-by and carbonising/thickening of engine oil.

Note: *Poor vehicle servicing or incorrect engine oil specifications can also result in the above failures and should not be confused with poor injector sealing as the root cause.*

SERVICE REQUIREMENTS WHEN SERVICING INJECTORS

If the injectors have been leaking compression past the sealing washer, resulting in carbon contamination to the oil and consequently creating restriction to the oil pick-up, the injector holes within the cylinder head will need to be cleaned of any carbon build-up to ensure sealing integrity and the injector washers will need to be replaced. Failure to remove all carbon deposits from the injector holes will result in repeat blow-by. Injector clamp bolts need to be replaced with new bolts and ensure the torque is set to specification.

Note: *Engine oil and oil filter must be replaced if compression has leaked past the injectors.*

COMMON RECURRING FAILURE FAULTS & CAUSES

Hyundai have identified combustion gases can enter the engine crankcase as a direct result of the injector seat washer no longer maintaining its sealing properties. Through the resulting excessive blow-by and increased carbon particulates within the engine oil, the oil pick up becomes restricted and/or blocked which directly impacts oil pressure and thereby lubrication of the critical bearing system within the turbocharger.

BACKGROUND INFORMATION

The turbocharger bush bearings, rotating assembly and thrust components are by design floated in a thin film of oil, centralised under oil pressure. During operation, the hydrodynamic oil film allows the journal bearings and shaft to rotate without contact or friction within the oil bearing cavity. If the hydrodynamic oil film is compromised through reduced or interrupted oil pressure, friction will occur between component parts resulting in reduced longevity and potentially leading to shaft fracture.

Subsequently common recurring turbocharger failures for the Hyundai I-Load & I-Max are typically a result of (but not limited to) insufficient and/or irregular supply of oil pressure to the rotor assembly, bush bearing and thrust component parts. Evidence of reduced oil lubrication to the turbocharger rotor assembly can be identified by heat discolouration to the shaft journals, journal bearing and thrust components. Contact wear is also evident to the thrust bearing pads, thrust collar and contact metal transfer between the journal bush bearing and turbine shaft.

EXAMPLES



A complete vehicle inspection should be undertaken prior to fitment of a replacement turbocharger.

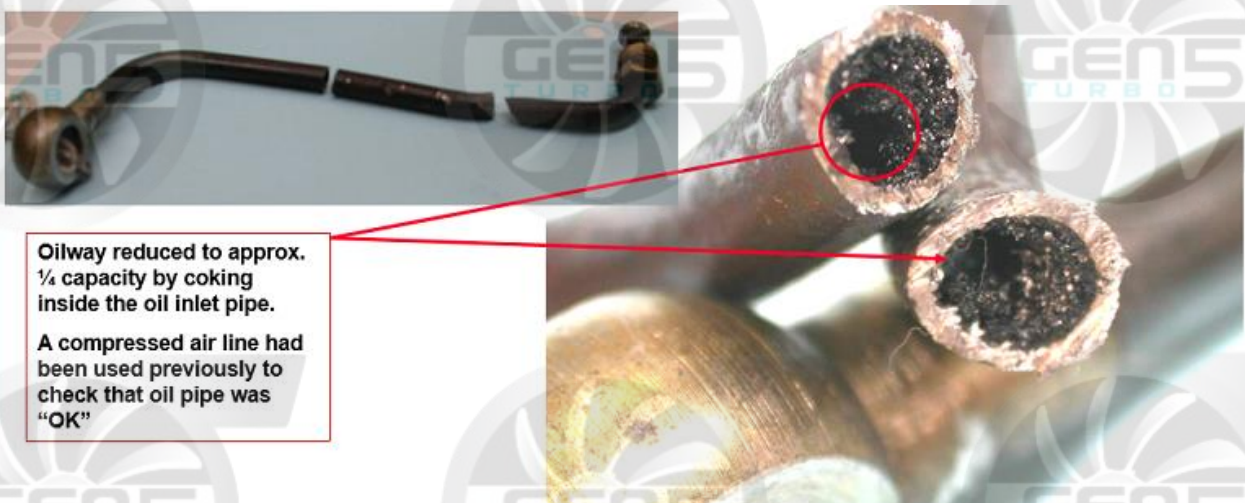
- i. Remove injectors, clean cylinder head injector ports and injectors of any carbon deposits prior to re-fitment. Replace all injector sealing washers.
- ii. Check for any oil sludge/carbon build up around the air inlet ports in the cylinder head. Clean if necessary.
- iii. Remove the sump, replace oil pickup strainer and replace oil pump.

EXAMPLE: [LEFT] CARBON RESTRICTION TO OIL PICKUP [RIGHT] NEW OIL PICKUP



- iv. Remove and replace the oil supply line and associated fittings from the block to the turbocharger. Do not try to clean the original fittings or the oil supply line only as any internal restriction will result in reduced oil flow to the turbocharger.

EXAMPLE



Oilway reduced to approx. ¼ capacity by coking inside the oil inlet pipe.

A compressed air line had been used previously to check that oil pipe was "OK"

- v. Remove and replace the oil drain return hose.
- vi. Remove & replace the oil, oil filter and air filter.

Please note: the above steps are to be used as a guide only and may not be all that is required in identifying engine related faults causing turbocharger failure to reoccur. Please refer to Gen 5 technical bulletin GTB001 for further information on identifying turbocharger failures and checklists prior to turbo installation:

<https://drive.google.com/file/d/13AIsAgOFh8J80dDnablD74Jzht83etG/view?usp=sharing>

Authorised Gen 5 dealers can also assist with turbocharger failure analysis (if the above diagnosis points are unable to be determined) by disassembling the original failed turbo for internal inspection. Although some turbocharger failures can be so catastrophic that the root cause can be difficult to ascertain, it can be helpful in finding the original fault or in the very least point you in the right direction.