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GENUINE SUPPLIER

## TURBOCHARGER REPLACEMENT: DIAGNOSING INITIAL FAILURE & INSTALLATION

**PRIOR TO FITMENT OF REPLACEMENT TURBOCHARGER THE FOLLOWING MUST BE OBSERVED**

### DIAGNOSING INITIAL TURBOCHARGER FAILURE

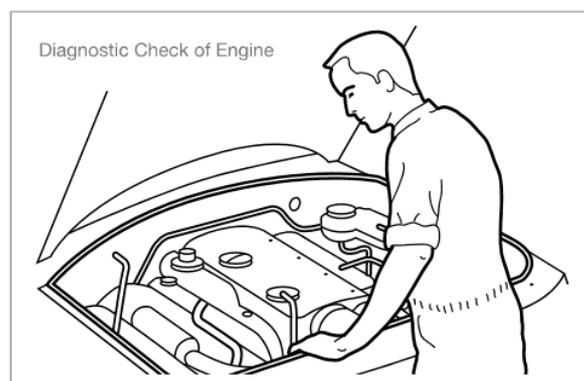
#### STEP 1

**It is important to carry out a comprehensive diagnostic check of the engine system to determine if the fault found is actually the turbocharger.**

The following vehicle complaints can all be the result of varying underlying issues found in the engine system rather than the fault of the turbocharger;

- Lack of power
- Noise under acceleration/load
- Excessive smoke
- Oil consumption

Causes of these underlying issues can be attributed to (but not limited to) the fuel injection system, ECU, sensor or wiring problems, restriction to the crankcase ventilation, restrictions to the air intake/exhaust and damaged hose/gaskets to name a few.



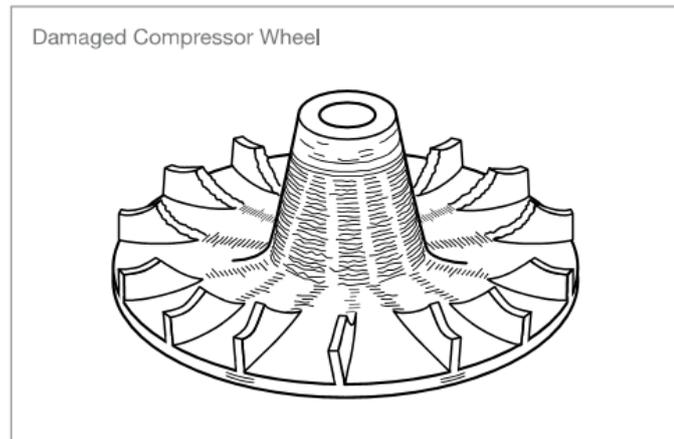
## STEP 2

**If the turbocharger has failed, or if a repeat turbocharger failure has occurred, extensive troubleshooting analysis must be carried out to determine cause of failure.**

The four main causes of turbocharger failure are due to foreign object damage, lack (or interrupted supply) of lubrication, oil contamination and turbocharger overspeed.

### 1. Foreign object damage

Check air cleaner assy to ensure the filter is sealing and is not blocked or restricted. Inspect all air induction piping ensuring the hoses are intact with no perforations.



### 2. Lack of lubrication

Confirm oil pressure both at the block and at the turbocharger are within manufacturers specifications. Check for any inline filters in the oil supply line and replace accordingly. Replace the oil supply line to ensure the integrity of oil pressure to the turbocharger. Inspect the oil pickup screen for restriction caused by carbon build up.

### 3. Oil contamination

Commonly occurs after an engine rebuild (e.g. metal fragments lodged in the oil galleries), if the engine has failed (e.g. big end bearing), if there is excessive heat (due to blocked exhaust or alteration of fuelling to fuel injection system) or if the vehicle has had poor service history.

### 4. Turbocharger overspeed

Overspeed occurs when the turbocharger continuously operates beyond its safe rotational speed due to a loss of boost pressure somewhere in the engine system. Inspect all hoses, gaskets and piping between the turbocharger to the inlet manifold. Pressure test the intercooler to ensure no leaks are found. Check gaskets between cylinder head, exhaust manifold and turbocharger.

*Note; Larger diameter exhaust systems can also lead to turbo overspeed by reducing the backpressure on the turbocharger.*

**If the cause of turbocharger failure cannot be ascertained it is strongly recommended sending the failed turbo (or multiple turbos in the case of repeat failure) to an authorised Gen 5 dealer who can assist with turbocharger failure analysis.**

## PRE TURBO INSTALLATION

### PLEASE NOTE

The bearing housing, compressor (intake) housing and turbine (exhaust) housing may be positioned in a differing orientation to your original turbocharger. This can be due to the turbocharger fitting multiple applications in alternate orientations or simply positioned for shipping purposes.

The following steps must be strictly followed in reorientating the housings prior to fitment.

- ✓ **Loosen off the v-band nut, circlip or bolts between the end housings and centre rotating assembly and carefully reposition to the correct orientation.**

Take care when repositioning the compressor (intake) housing to not pinch or damage the compressor housing o-ring. Ensure that the housings are firmly in place and not misaligned prior to refitment of the v-band clamp, circlip or locktabs.

- ✓ **Once the turbocharger has been mounted on to the engine and the housings set into their final positions, tighten the v-band nut or bolts to the recommended torque specifications.**

All fasteners must be visually clean and be lubricated prior to torque tightening. Please contact your authorised Gen 5 dealer for the correct torque specifications prior to fitment.

## TURBO INSTALLATION

The following steps must be strictly followed.

Refer to the workshop manual for instructions which are specific to your engine.

- ✓ **Ensure correct gaskets are used for installation.**

The centre hole in the oil supply gasket must be perfectly aligned with the centre hole on the mount flange.

*Note; Do NOT use liquid sealant with the gasket for either oil supply or drain. Sealants can enter the turbo oil supply and reduce or block oil flow causing turbocharger failure.*

- ✓ **Replace the air, oil and fuel filters with genuine parts. Remove and replace the engine oil with the correct oil grade as per manufacturers' specifications.**
- ✓ **Check all air hoses to the turbocharger are clean and are intact with no perforations.**
- ✓ **The air filter and air cleaner housing must be thoroughly checked and be clean of any foreign objects.**
- ✓ **Inspect and clean the engine breather. If the breather hose has collapsed internally replace accordingly.**
- ✓ **Remove any old gasket material from the exhaust manifold and oil drain flange fittings prior to installation of the turbocharger.**
- ✓ **The oil supply and drain pipes must be totally clean and have no damage to ensure unrestricted oil flow.**

Check oil drain hoses internally, if the hose has collapsed internally replace the hose. Check that the oil feed line is not damaged and not positioned too close to a source of heat which may damage the oil feed pipe internally (this is a common issue on various vehicles and without cutting the pipe to check internally it is difficult to detect).

We highly recommend replacing the oil supply pipe with installation of the replacement turbocharger as a result.