



DAMAGED TURBO?

If your turbocharger is damaged, it is essential that you find out the cause before you fit another one. If you don't, then it is quite likely that the replacement turbo will also become damaged.

Your GARRETT DEALER is a turbo specialist, and will help you in diagnosing the CAUSE of the failure.

However, this can sometimes be hard to believe.....

QUESTION: How can a turbo fail from contaminated oil when you have just changed the oil and used a top quality oil and filter?

ANSWER: The PCV (Positive Crankcase Ventilation) system or engine breather may well be contaminated with acids, emulsified oil and small particles, that have been building up over a long period, this may quickly degrade and contaminate even the best oils and filters. Acids and emulsions can often attack the paint or coatings on the inside of the rocker box or cambox covers, these are carried around with the oil or may be carried up into the breather system.

REMEDY: It is essential that the complete lubrication and engine breather system is clinically clean BEFORE refitting the turbo.

ALSO, on an older engine, with worn piston rings/bores, due to "blowby", products of combustion can accumulate in the oil and act as an abrasive.

REMEDY: Blowby or piston leakage test and correct the leakage.

QUESTION: The new turbo was smoking from the moment I refitted it, why?

ANSWER: The oil and gas sealing system in a turbo relies on the pressures within the turbo staying close to the designed specifications. As an engine wears, the pressures can change, for instance, there will be more "blowby" on an older engine, this is when some of the gases from combustion pass by the piston rings and create a higher pressure in the crankcase and sump. This higher pressure prevents the oil and gases from escaping from the turbo so they take the next easiest route, which is out through the seals of the turbo. Similarly, if the oil drain pipe from the turbo is blocked either by the oil level being too high or by the liner in the braided pipe having partially collapsed (common on some applications) this will have exactly the same effect. This can even happen with a brand new turbo with all parts to the tightest tolerances! Alternatively, the PCV valve could be blocked, which will have a similar effect

REMEDY: Have a blowby or piston leakage test performed on your engine and correct the leakage. A turbo cannot compensate for a badly worn engine!

QUESTION: The oil flow and pressure were checked and the turbo pre-oiled before it was fitted. Everything was OK. So how could it fail due to lack of lubrication?

ANSWER: Silicon gasket material is a regular cause of this type of failure. If it has been used anywhere where oil is present, any excess material can break away and block the oilways in the turbo causing rapid failure. Of course other gasket materials may cause similar effects. Also, conventional gaskets which partially mask the oil supply hole are a regular cause of turbo damage!

REMEDY: Great care must be taken to ensure that all EXCESS gasket materials are removed during an engine rebuild or when new parts are fitted. Similarly, care must be taken with thread locking compounds.

QUESTION: I have been told that the turbocharger has failed due to overspeeding, how can it overspeed?

ANSWER: Many vehicle owners choose to alter the "calibration" of the turbocharger's wastegate or change the wastegate actuator to give more boost. This means that the turbocharger will rotate at higher rpm. This *may* exceed the designed speed limit of the turbine or compressor and *may* eventually cause a fatigue failure of the blades. Similarly, a variable boost control *may* have the same effect. Upgrading or "re-chipping" engines to higher power outputs means that the turbocharger has to work harder to supply more air at higher pressure and speed, which *may* cause overspeeding. Even if changes have not been made, it is still possible for the turbo to overspeed; for instance, if an air inlet hose collapses due to softening of the material or tight routing. Also, a blocked air filter will often cause overspeeding on a wastegated turbo.

REMEDY: Stay with the standard settings of your turbocharger and systems or you must accept that any warranty offered would be void if changes are made. Signs of overspeeding are very easy to see during warranty assessments! Check the air filter for partial blockages and inlet hose(s) for softening/damage and tight routing.

QUESTION: The turbo has failed due to the exhaust temperature being too high, but I have never changed the settings of the ignition/carburettor/fuel injection. How can this happen?

ANSWER: A turbocharger is designed to operate up to the maximum temperature specified by the vehicle manufacturer and we use different materials for different temperature ranges, so operating the turbo outside of its designed limits may cause a failure. Even though you may not have changed the settings of your engine, all engines and components wear and the operating conditions can change leading to high exhaust temperature. Simple routine servicing may not be enough with a high mileage engine. Modern engines with computer engine management are less likely to go wrong, but faults *can* still occur.

REMEDY: When you have an engine service, occasionally opt for a full diagnostic check, which should pinpoint any potential problems before they cause real trouble. Preventative maintenance of this sort may cost a little more short term, but can save money in the long term.

IMPORTANT NOTE:

If one turbo fails on an engine, there *may* be a fault on the turbo and your GARRETT dealer will advise if you have a valid warranty claim.

If two turbos fail on the same engine it is almost certain that the cause of failure is outside of the turbo.

In the case of more than two turbochargers failing on the same engine it is our experience that the cause of failure will always be outside of the turbo.