



Turbochargers

Refer to the authorized original equipment service manual for detailed installation instructions. If you do not have the experience, proper tools or manuals, please seek the services of a qualified technician.



Replacement
TIME:

8 hrs

COMMON SYMPTOMS

- A decrease in engine power may be your first indication your turbocharger is damaged or has failed.
- Contact of either wheel resulting from excessive radial play indicates worn rotating components likely due to improper lubrication.
- Axial end play of the wheels and shaft in-and-out greater than the thickness of a sheet of paper indicates a worn thrust bearing due to excessive exhaust backpressure.
- Any nicks, scratches or chips on either wheel are evidence of foreign object damage caused by contaminants entering the airflow to or from the engine.

MYTH BUSTER

Myth: Boost control can be adjusted on the replacement turbo.

Myth Busted: Attempting to adjust or replace any mechanical or electrical turbocharger component will void warranty, cause premature failure of the turbocharger and possibly damage the engine.



SKILL
LEVEL:

Service Technician

B

or higher

TIPS

- Replace oil, oil filter and air filter when installing a new turbocharger using only manufacturer-recommended oil and filter types.
- Inspect the used oil for any contaminants such as metal particles and cross contamination from other fluids. If contamination is found, perform a thorough diagnosis to determine the root cause of the contamination. Contaminated oil may have caused the original unit to fail and will damage the replacement unit.
- Prime the Turbocharger with the supplied syringe before engine startup to ensure proper lubrication.
- Clean or replace oil inlet and return lines of any carbon deposits, sludge or debris that could restrict oil flow.
- Never use Teflon tape or sealant on gaskets or fittings in the oil system as this could lead to a potential oil supply blockage.
- Clean and inspect the entire air intake and exhaust systems, including the turbocharger intercooler, for residual fuel and debris.
- Identify any source of restriction in the exhaust and replace any damaged components.
- Allow engine to warm up at least 20 seconds after startup and up to 2 minutes in freezing temps to prevent oil starvation.
- Avoid hot shut downs by allowing the engine to idle for at least 1 minute before turning off to properly cool turbocharger.
- Clean the oil inlet and drain ports that connect to the engine side of the pedestal to assure adequate oil supply and drainage.
- Some turbo configurations have a filter in the oil supply line that may not have a bypass feature. This screen must be cleaned or replaced.

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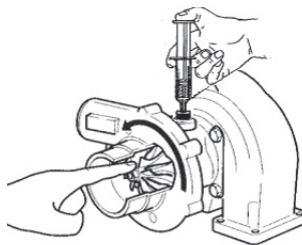
Turbocharger Pre-lube Critical to Successful Installation

Application All turbocharger equipped vehicles.

Problem Premature failure of turbocharger.

Solution Turbochargers are close-tolerance, high precision, high-speed, rotating units with speeds exceeding 100,000 RPMs. The center shaft, impeller and turbine wheels are centered on a film of pressurized engine oil. If these components are not prelubed before engine start-up the turbocharger will be destroyed. To avoid this damage follow the oiling procedure described below.

1. Make sure the oil drain line has been installed with the new supplied gasket and is completely clear of any obstructions.
2. Before the engine is started, lubricate the replacement unit with correct, clean, engine oil. Using the special syringe supplied with every CARDONE unit, inject 2 to 3 ounces (50 to 60 cc) of oil into the supply fitting while carefully rotating the turbine wheel by hand - **DO NOT use compressed air or air tools to turn the turbine.**



3. The engine oil and filter(s) must be changed before starting the engine. Use only a grade of oil approved by the OEM manufacturer for your specific vehicle/application. Some units have a micro screen filter inside the oil supply fitting that must be checked for contamination. Service or replace the screen as necessary.
4. Flush the oil supply line with clean engine oil to ensure unrestricted free flow of oil. If the application has a rigid oil supply line, it is recommended that a new line be used, as any flexing of the oil line may dislodge caked-on engine oil, debris or contamination. If this material is flushed from the line into the center cartridge, the unit will fail prematurely.
5. Refer to supplied installation instructions and the vehicle service manual to complete the installation.

Note

Please note this bulletin is provided for your technical reference and is not authorization for repair.

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Turbocharger Installation Tips and Hints

Application All Turbo equipped vehicles and applications.

90 percent of all turbocharger failures are caused by preventable problems or adverse operating conditions. Because of the close tolerances and clearances of these units, and the high speeds at which they operate, it is imperative that they are installed correctly and maintained properly. Clean air, fresh lubricating oil, along with proper operating procedures will ensure the longest possible service life. The procedures and maintenance tips described below will help prevent most causes of Turbo failure. As with any high-tech component or vehicle, always refer to the vehicle manufacturer's specific operating instructions and guidelines.

Proper Installation

- Some Turbo installations are a metal-to-metal fit requiring no mounting gaskets; therefore no additional gasket material should be used. The use of any RTV or similar gasket material will void unit warranty. At 100,000 + RPM, even a small amount of loose sealant will destroy the compressor wheel. If manifold surfaces are damaged, repair or replace as necessary.
- Clean all connecting hardware and fittings. Inspect and replace pipes, hoses or ducting as needed.
- Check for adequate oil supply (functioning oil pressure/filter system). Oil supply lines must be checked. Flexible lines can degrade from the inside-out, causing pieces to be flushed down to the new turbo, clogging the oil-feed ports. Hard lines should never be bent, as this causes the material from the inside of the pipe to loosen and be flushed down the pipe upon start-up, clogging the ports.
- Check filter elements and screens. Some systems have filter screens in the oil supply line. Unfortunately they may not have a bypass feature. If the line is blocked, the turbo will be starved of oil and quickly fail. Systems designed this way must be checked periodically.

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Maintenance & Service

- Prevent the penetration of foreign bodies into turbine or compressor. Make sure there is no debris in the air-box. Air cleaner elements should be replaced or thoroughly cleaned.
- Prevent dirt from contaminating the oil. Oil and oil filters must be changed regularly, and certainly upon new turbo installation.

Operation Cautions

- Avoid operating the vehicle for prolonged periods outside of the design performance parameters. Overheating the engine for prolonged periods generates excessive heat that breaks down oil and produces high exhaust gas temperatures, affecting the ignition system and injection system.
- Avoid hot shut down. If the engine temperature is high, allow it to idle until temperatures return to normal. This lets the engine, its systems, and oil to cool down. It prevents burning or caking of the oil, all of which leads to component failure or reduced performance.

Note

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