

Turbo Chargers

Turbocharger Installation and Starting procedure

TURBO ENERGY LIMITED

Company Overview:

- ✓ Turbo Energy Limited (TEL) incorporated in 1982.
- ✓ Turbo Energy Limited (TEL) is a technical & financial joint venture company between BorgWarner Turbo Systems (formerly KKK – Germany) Brakes India and Sundaram Finance.
- ✓ TEL manufacturing plants are located at Pulivalam village in vellore district, and at Paiyanoor (near Mahabalipuram), Tamilnadu.
- ✓ TEL manufactures turbocharger range from KP 35 to K 37 (from 60 hp to 400 hp)
- ✓ TEL exports turbochargers and turbocharger components to BorgWarner Turbo Systems GmbH.
- ✓ TEL is a TS 16949 : 2000 certified company.

TEL / BorgWarner Customers

- ✓ Ashok Leyland Ltd
- ✓ Bharat Earth Movers
- ✓ Eicher Volvo Motors Ltd
- ✓ Escorts JCB
- ✓ Fiat India Automobiles Ltd
- ✓ Ford India Ltd
- ✓ Force Motors Ltd
- ✓ General Motors India
- ✓ Greaves Cotton Limited
- ✓ International Cars & Motors Ltd
- ✓ Simpson & Co.
- ✓ SML Isuzu Ltd (Swaraj Mazda)
- ✓ TATA Motors Ltd
- ✓ Renault Nissan Automotive Ltd
- ✓ Volvo
- ✓ Volkswagen India
- ✓ Audi India
- ✓ Skoda India
- ✓ Hindustan Motors
- ✓ Kirloskar Oil Engines Ltd
- ✓ Mahindra & Mahindra
- ✓ Mahindra Navistar
- ✓ Premier Automobiles Ltd
- ✓ Maruti Suzuki



Company Overview:

- ✓ Service Centre for TEL turbochargers since 2003
- ✓ ISO 9001:2000 certified by TUV SUD, South Asia for all service centers
- ✓ Experience of servicing more than 10,000 turbochargers till date.
- ✓ Full fledged Service centers' in Palakkad , Kozhikode & Kochi
- ✓ Collection centers in Kannur and Trivandrum



Turbochargers

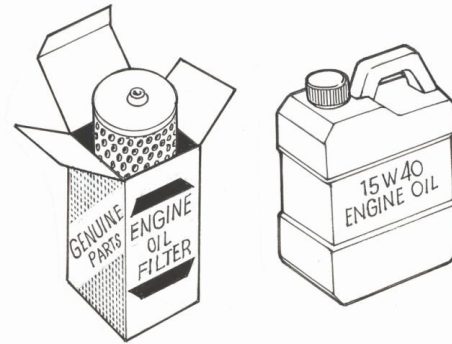
Turbocharger Installation and Starting procedure

NEEDS OF A TURBOCHARGER

Turbocharger components are made from special materials, processes and are precision built to work under extreme operating conditions.

However a turbocharger needs

- ❑ ADEQUATE CLEAN ENGINE OIL



- ❑ CLEAN AIR



for it's proper performance and extended life.

Why does a Turbocharger need them?

Why a Turbocharger needs them

- The clearances between the rotor and the journal are extremely small and the parts are machined to very close tolerances.
- Turbocharger rotor-assembly rotates at extremely high speeds.
- Turbocharger uses fully floating journals and will rotate at less than half the speed of the rotor.
- The turbocharger components are balanced to very fine balancing limits.
- The air / gas entering the compressor and turbine housing travels at very high speeds.
- Adequate clean oil supply to the journals is a must to stabilize, lubricate and cool.
- Oil supply to the turbocharger immediately after the start of the engine and minimum oil pressure during it's operation, ensures proper functioning of the journals.
- Oil contaminated with dirt or foreign material will wear the journals and journal seating area of the shaft.
- Dirt in the oil blocks the oil holes in the journals and central housing leading to oil starvation to the turbocharger.
- Dust, sand or any foreign particle entering into the turbocharger compressor housing will damage the aluminum compressor wheel blades, thus leading to turbocharger failure.

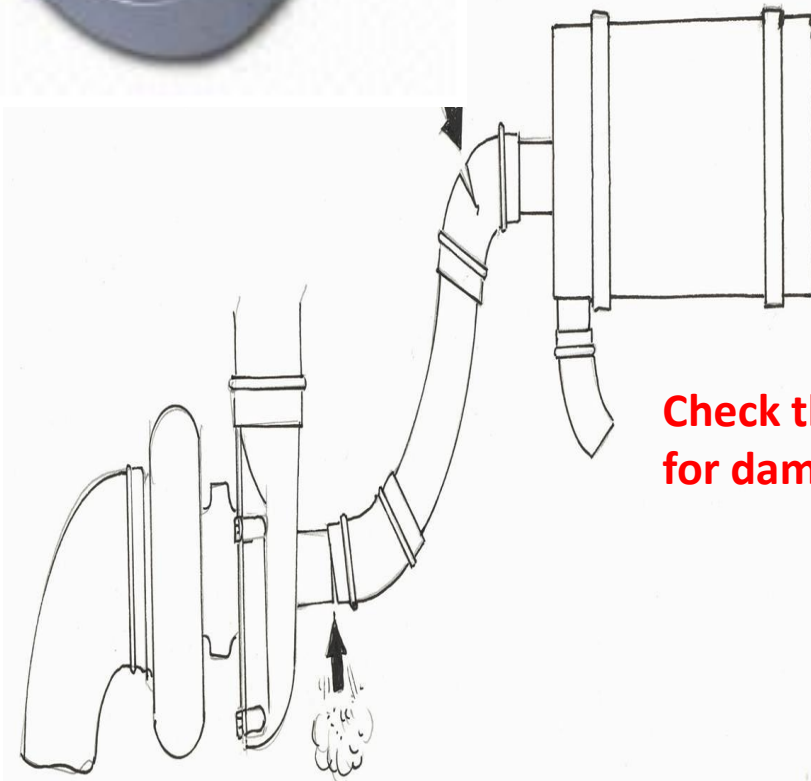
Guidelines for Turbocharger use

The engine manufacturer's recommendations for operation and maintenance shall be authoritative for the operation of turbocharged engines. Special attention should be paid to:



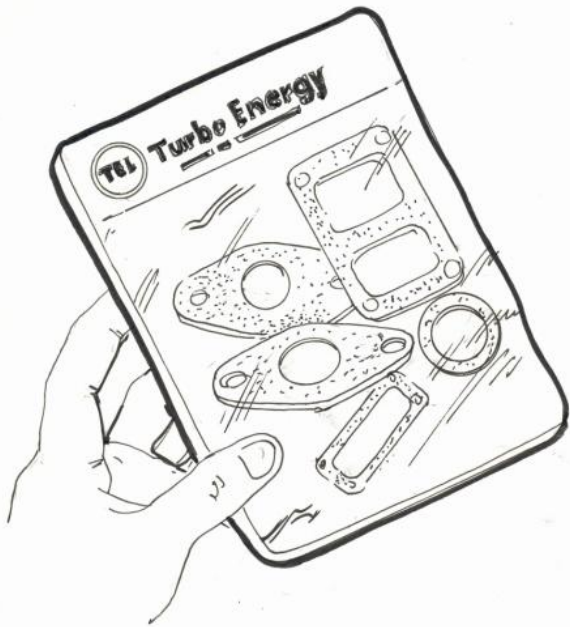
Turbocharger installation and starting procedure

- ✓ Check air filter element for blockage, distortion, cracks, damage, aging etc., and should be cleaned / replaced.



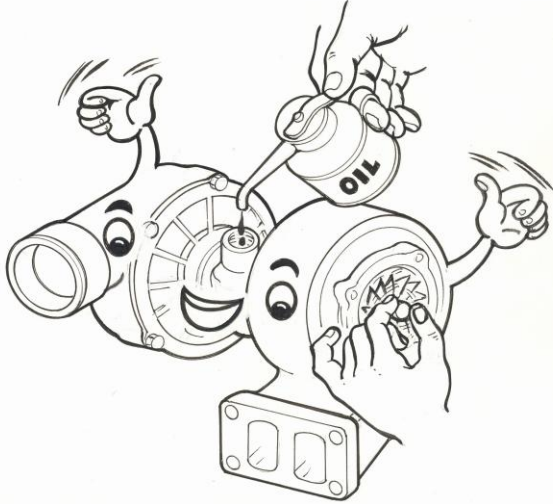
Check the air entry system to the turbocharger for damages or leakages

Turbocharger installation and starting procedure



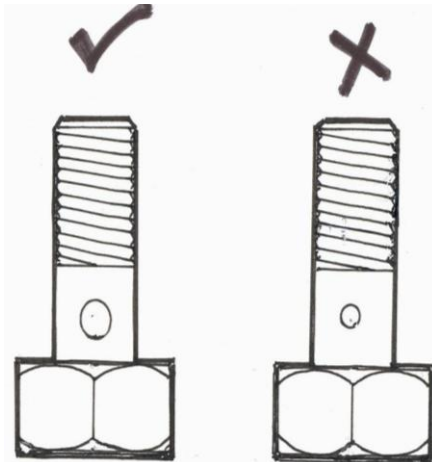
Do not apply gasket sealant pastes at oil inlet flange

- ✓ Use only the recommended gaskets for fitment of the turbocharger to the engine.

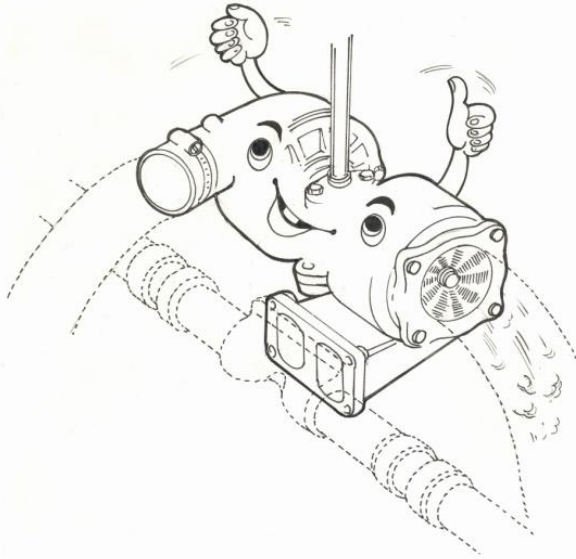


Turbocharger installation and starting procedure

- ✓ Purge air from the open supply lines. Disconnect at the oil drain connection between turbocharger and crankcase. Crank the engine without starting until oil flow is observed in the turbocharger oil drain line. A steady oil flow indicates that air pockets are out of the lube oil system. A funnel can be used to return oil to the crankcase. Reconnect the oil drain connection.

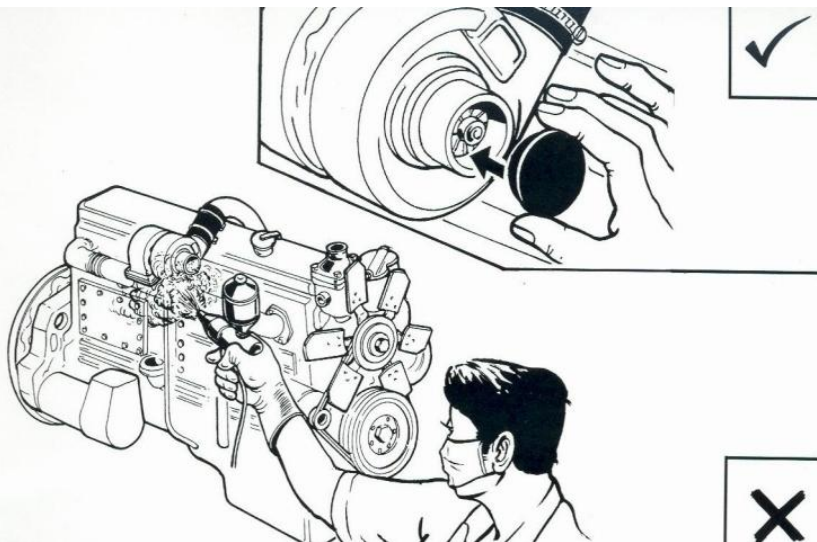


**Use the correct oil hole size
turbo oil inlet banjo**



Turbocharger installation and starting procedure

- ✓ Ensure correct fitment of the turbocharger to the engine (rotate the turbine shaft and check for its free rotation). Tilted fitment will cause turbocharger failure (do not attempt to change the turbocharger orientation on your own).

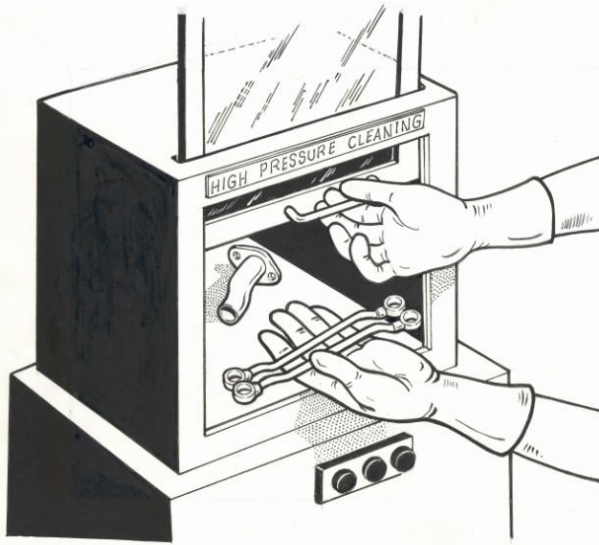


- ✓ Close the TC openings with proper protective plugs before cleaning the engine.



Turbocharger installation and starting procedure

- ✓ Check intercooler/after cooler for leaks & blockage.



- ✓ Oil feed and drainpipe connections to the turbocharger should be examined for carbon deposits, dirt, cracks, distortion, etc., pipes should be thoroughly cleaned before fitment. If found damaged it should be replaced. During replacement care should be taken to fit right banjo bolts and for proper routing and fitment to avoid excessive stress on the connections.

Service Recommendations for Turbocharger maintenance

- ✓ Check the engine breather system and oil separator. Blocked breather will restrict the free flow of oil from turbocharger. This will result in seepage of oil from the turbocharger into the air intake as well as exhaust system.
- ✓ Fill the oil inlet hole of the turbocharger with clean engine oil, when the engine is started after long storage. After the oil change, prime (dead crank) the engine before starting and before starting the engine in during cold ambient conditions.
- ✓ The turbocharger is designed such that it will usually last as long as the engine. It does not require any special maintenance.
- ✓ Checks have to be made on oil feed pipes, return pipes, air intake and exhaust piping for leakages & restriction. The connections & joints should be checked to ensure that they are still tight and no damage has occurred.
- ✓ Turbocharger and boost pressure control valve do not require any special maintenance. However check the boost pressure pipe for its proper fitment, damage, wither etc.



Do not open the turbocharger yourself



✓ **Contact PARAMOUNT AUTOZONE for Quality Service**

If the TC engine does not work as it should, check the engine first as you check for a naturally aspirate engine before suspecting the TC. After checking other parameters check the TC visually.

PREMATURE TURBOCHARGER FAILURES CAN BE AVOIDED BY INSTALLING IT CORRECTLY FIRST TIME, EVERY TIME.

Service Recommendations

- ❑ The turbocharger has to be serviced using overhaul kit and other parts at suitable intervals before any damage that can occur by rubbing of either the compressor or turbine wheel with the housings.
- ❑ This interval depends on proper maintenance of the engine as well as the nature of duty and the severity to which the engine is subjected. Recommendations regarding this will have to be given by the engine manufacturers.

Servicing turbocharger is a task for trained specialists and should only be done in TEL authorized service center.

Service Centers:

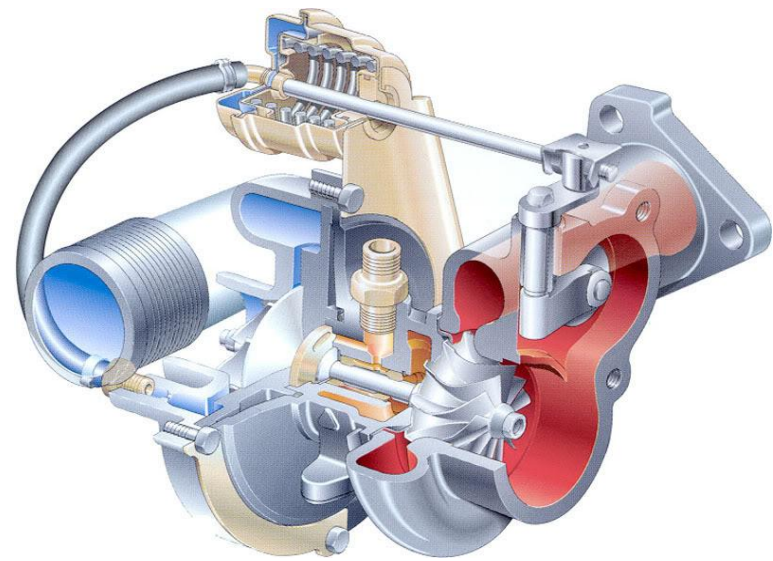
Palakkad
17/550(9),KTV Tower,
West Fort Road, Palakkad – 678 001
Phone : 0491 – 3260808, 3208000

Kochi
40/618, Bhagavathy Parambil Building,
Near Federal Bank, Palarivattom, Kochi – 682 025
Phone : 0848 -3114333

Kozhikode
3/165-A,Nano Building,
Major Santhosh Road, Behind Co-Op Urban Bank,
Vandipetta, West Nadakkavu, Kozhikode – 673 011
Phone : 0495 3104333

Service Helpline : +91 491 3208000
Technical Assistance : +91 93491 27136

Website : www.paramountautozone.com
www.paramountgrp.net



Collection Centers:

Kannur
EP III/178, EVES Arcade,
Opposite Technical High School, Thottada,
Kannur – 670 007
Phone : 0497 – 3268785

Thiruvananthapuram
TC 36/1090(9), Narayan Nilayam,
Eanchakkal Junction, Vallakadavu P.O.,
Thiruvananthapuram – 695 008
Phone : 0471 – 3198785



Marching Towards a Greener Future...