Billet X-HF 2.0 7/14 Compressor Wheels

Higher Efficiency
•Lower Inertia
•Faster Acceleration
•Extended Tip Technology to Maximize Efficiency at highest boost pressure

Comp Turbo X-HF billet compressor wheel

Comp Turbo is proud to announce the release of our new line of XHF 2.0 Billet compressor wheels.

After intense research and development the new X-HF 2.0 provide the following improvements: billet compressor wheel design flows 15-20% more air flow than prior X-HF impeller design. The

X-HF line is machined from high grade billet aluminum for durability and lower inertia. The Comp Turbo X-HF 2.0 line is the most advanced compressor wheel design and was engineered for maximum performance output.

Extended Tip Technology

- The improvement will add greater air flow.
- Faster boost response at lower engine speeds.
- Increased efficiency at higher boost pressures.
- 10% increased air flow over our prior X-HF 1.0

CT3B 3.0 Oil-less Turbochargers

We are proud to announce the availability of our New Patented CT Oil-Less Version 3
•Billet bearing housing with 50% more cooling capacity.
•Built in Zerk grease fitting for easy on site servicing.
•Available for application ranging in 150-1500 HP.

TRIPLEX CERAMIC™ Oil-Less Turbocharger Technology

Comp Turbo Technology Inc, continues to extend the boundaries of turbocharger technology by announcing the availability of what is believed to be the first commercial automotive turbocharger that does not require a lubricating oil supply from the engine. Lube oil supply and drain lines are no longer necessary and the Comp Turbo oil-less turbocharger can be mounted in a variety of positions and locations that were not possible when lube oil had to be gravity drained back into the engine crank case.

Historically, lube oil has been the source of a number of problems throughout the development of the small automotive turbocharger. The thick viscosity of lube oil in cold weather causes a significant time lag before oil reaches the turbocharger bearings. Repeated hot shutdowns of an engine can cause a buildup of hard carbon within the turbocharger's bearing housing. In addition, the piston ring oil seals used in commercial turbochargers have a small leak path that has caused a minor but persistent problem up to and including some current models. All these annoyances have been eliminated by removing the use of lube oil in the Comp Turbo oil-less turbocharger.

Designated the Model CT3B-OL, it employs the well proven, patented TRIPLEX CERAMIC™ bearing system with high temperature grease lubrication. Replacing lube oil with grease results in a lower friction loss in the bearing system allowing somewhat faster acceleration of the turbocharger rotor, which is quite advantageous in racing applications. Since the ball bearing carrier in the new oil-less turbo can be easily removed from the bearing housing as an assembly, the bearings can be re-greased at appropriate intervals, thereby extending their service life indefinitely.

Experience the acceleration of the new Comp Turbo oil-less turbocharger and compare its superior performance with competitive models. Contact Comp Turbo Technology, Inc. for more information of submit engine specifications so an experienced staff specialist can return a turbo model recommendation to meet your individual requirements.

COMP TURBO TECHNOLOGY, INC. OIL-LESS TURBO

A great deal of effort was expended in the early years of small turbocharger development to produce a bearing system that had sufficient durability to make them commercially viable. Research and development in the 1960's resulted in the perfection of shaft instability (oil-whirl) but had appreciable friction losses at their high speeds of operation.

Due to the friction losses in the floating sleeve systems that hamper the acceleration rate of the turbocharger rotating assembly, many attempts were made to use ball bearings in small turbochargers, all unsuccessful, until the TRIPLEX CERAMIC**™** ball bearing system was invented. This system consists of an elongated, rotatable steel cylinder with back-to-back angular contact ball bearings, mounted in the compressor end of the cylinder, that carry axial thrust in both directions, and a single angular contact bearing slidably mounted in the turbine end that carries no thrust. The turbine end bearing outer race bears against a preload spring that allows the bearing to move with axial expansion of the shaft. A small clearance between the outside diameter of the steel cylinder and the mounting bore in the bearing housing is supplied with the lube oil that protects the bearings from shock and vibration. This triple ball bearing system has been successfully used in commercial

production by Comp Turbo Technology for over three years, has out-performed competition in stringent racing applications and has produced a large number of very satisfied customers.

Historically, the use of engine oil to lubricate the floating sleeve and stationary thrust bearings in commercial turbochargers have rise to a number of operational problems. To prevent oil leakage into the compressor and turbine casings, piston ring seals are employed in commercial turbochargers. Since the piston ring seals are not positive contact seals, there is a small leak path around the piston rings and, during certain operating conditions of the engine, i.e. low idle or a vacuum in the air intake system, some oil leakage can occur. Any ail leakage into the turbocharger casings can result in the undesirable emissions in the engine exhaust.

In cold weather, there can be a significant lag in the flow of oil to the turbocharger bearings when the engine is initially started. If the lag is long, the sleeve bearings can fail on startup.

Another problem can occur when an engine is shut down quickly after being operated at high speed and load where the exhaust gas temperature is maximized. Heat transferred into the turbocharger casings can cause residual lube oil in the bearing system to carbonize. This carbonization can build up and eventually cause failure of the bearings.

Notwithstanding the fact that years of development has mitigated the above named problems, there remained a motivation to remove the use of engine oil to lubricate the bearing systems in small turbochargers. Comp Turbo Technology has responded to this challenge by developing what is believed to be the first commercial turbocharger that does not require a lubricating oil supply from the engine. Lube oil supply and drain lines are no longer necessary and the turbocharger can be mounted in a variety of positions that were not possible when lube oil had to be gravity drained back to the engine crank case.

The Comp Turbo Technology oil-less turbocharger, employs the well proven TRIPLEX CERAMIC™ ball bearing system, wherein the ball bearings are lubricated by high temperature grease. In the oil-less bearing system, the elongated steel cylinder is provided with axially spaces “O” rings in its outside diameter that engage the bore in the bearing housing. Cooling water is supplied from the engine to a water jacket in the bearing housing and to the space between the “O” rings. This cools the “O” rings and the bearing carrier, carrying away the heat generated in the bearings. Since the bearing system is easily removed as an assembly from the bearing housing, the bearings can be re-greased at appropriate intervals to extend their service life indefinitely.

Contact Comp Turbo Technology, Inc. for more information or submit engine specifications so an experienced staff specialist can return a turbocharger model recommendation to meet individual requirements.

TRIPLEX CERAMIC™ Ball Bearing Turbochargers

•Fully rebuildable and upgradable
•Complete aluminum center section
•High speed ceramic ball bearings
•Rapid acceleration
•Up to 99% mechanical efficiency
•Available in HP rating from 200-3000HP

The Comp Turbo CT3B turbocharger is now well established in the field and is dynamite in a small package. It has a bearing system that utilizes the latest in ball bearing technology. Racing applications need turbochargers that accelerate at the fastest possible rate and the CT3B bearing system will allow it to do just that.

Comp Turbo Technology can supply the CT3B turbocharger with various compressors and turbine wheel trims to tailor its performance so that it matches specific engine application requirements; whether they be racing, street or stationary.

In addition, the CT3B is now followed by other model sizes. These new models utilize the same proprietary technology that has been designed into the successful CT3B to complete a line of high performance turbochargers. They will also accelerate like greased lightning to produce the ultimate in engine and vehicle response.

Inside the TRIPLEX CERAMIC™

The Comp Turbo TRIPLEX CERAMIC™ Turbocharger

The Comp Turbo TRIPLEX CERAMIC™ is dynamite in a small package and has a bearing system that utilizes the latest in ball bearing technology. Racing applications need turbochargers that accelerate at the fastest possible rate and the TRIPLEX CERAMIC™ bearing system allows it to do just that.

The acceleration rate of a turbocharger is a function of the rotor inertia and the friction losses in the bearing system. Conventional bearing systems have floating sleeve bearings that have an inner and outer oil film fed by lube oil under pressure from the engine lubricating system. They also must employ a stationary thrust bearing that is also fed by lube oil under pressure from the engine. The friction loss attributed to a stationary thrust bearing is proportional to the fourth power of the radius and can amount to several horsepower at the high speed at which turbochargers operate. The oil films in conventional sleeve bearing systems have significant viscosity that produces appreciable friction losses due to oil film shear when the turbocharger rotor accelerated and running at high speed. The friction losses in the sleeve bearings and in the thrust bearing result in mechanical efficiencies in the middle 90% range in conventional turbochargers. There is little or no oil film

shear in ball bearings which operate with rolling friction only so that the TRIPLEX CERAMIC™ accelerates much faster than turbochargers using sleeve bearings systems.

The TRIPLEX CERAMIC™ bearing system is a proprietary design that is unique in the industry. It utilizes full compliment, angular contact ball bearings with ceramic balls. Compared with steel balls, ceramic balls in ball bearings have a number of advantages. Bearing service life is two to five times longer. They run at lower operating temperatures and allow running speeds to be as much as 50% higher. The surface finish of ceramic balls is almost smooth, producing lower friction losses and lower vibration levels. There is less heat buildup during high speed operation, they exhibit reduced ball skidding and have a longer fatigue life. All these characteristics make ceramic ball bearings ideal for use in turbochargers where they must operate at very high speeds and survive in a high temperature environment. The Full compliment bearings do now use a cage to position the balls and this additional feature, combined with the ceramic material provides a combination that has minimal friction losses. The mechanical efficiency of the TRIPLEX CERAMIC™ turbo can approach 99%, and this contributes to rotor acceleration rates that have been shown to be faster than competition.

The angular contact bearings are mounted in an elongated steel cylinder that is free to rotate in the bearing housing. The outside diameter of the cylinder is fed with lube oil and this outer oil film provides a cushion against shock and vibration. Two angular contact bearings are mounted in tandem on the compressor end of the cylinder in an arrangement that carries rotor thrust in both axial directions. A single angular contact bearing is slid ably mounted under pre- load on the turbine end of the cylinder and is free to move axially with shaft elongation when heat is conducted down the shaft from the hot turbine wheel. The elongated steel cylinder containing the angular contact bearings represents complete bearing system and can be inserted and/or removed as an assembly making the TRIPLEX CERAMIC™ turbocharger fully upgradeable, serviceable and re-buildable.

Racing Applications require a turbocharger that builds boost as rapidly as possible, thus allowing the engine develop high torque at low engine speeds and with boost capability that can produce very high maximum power output .The TRIPLEX CERAMIC™ turbocharger does exactly that. For example when mounted on one dragster, the TRIPLEX CERAMIC™ produced 1.7 bar boost in two tenths of a second and developed 650 HP ready for takeoff. Now that's phenomenal response and very impressive.

In street applications, the acceleration rate of a vehicle equipped with a TRIPLEX CERAMIC™ turbocharger is enhanced and moves the engine out of inefficient operating regimes more rapidly. An improvement in number of gallons of fuel used is the usual result when a vehicle is accelerated faster. Under steady-state operation, the lower HP losses in the TRIPLEX CERAMIC™ ball bearing system means power is available to the turbocharger compressor which results in higher intake manifold pressure. In most cases, higher boost can make an additional contribution to improving engine fuel consumption.

Comp Turbo can supply the TRIPLEX CERAMIC™ turbocharger with various compressors and turbine wheel trims to tailor its performance so that it matches specific engine application requirements; whether they be racing, street or stationary. In addition, the TRIPLEX CERAMIC™ will be followed in the near future by other model sized now under development at Comp Turbo. These new models will utilize the proprietary technology that has been designed into the successful TRIPLEX CERAMIC™ to complete a line of high performance turbochargers utilizing the many advantages of ceramic ball bearings. They will also accelerate like greased lightning to produce the ultimate in engine and vehicle response. For further information please contact our technical support department.