

Techno Solutions Ltd

Products:

- *Locomotive, Marine, & Power Generation Diesel Engine spares
- *Marine Propeller repair & servicing
- *Damper and Coupling overhaul
- *Non-Metallic Bearing design and supply
- *Pump and Generator supplier
- *Precision component manufacture
- *Consultancy & Project Management

Techno Solutions Ltd,

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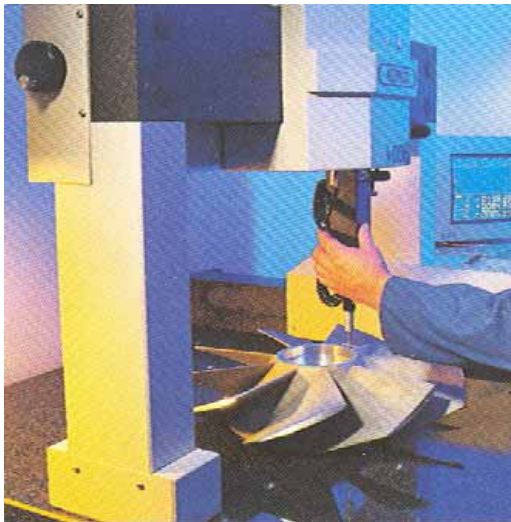
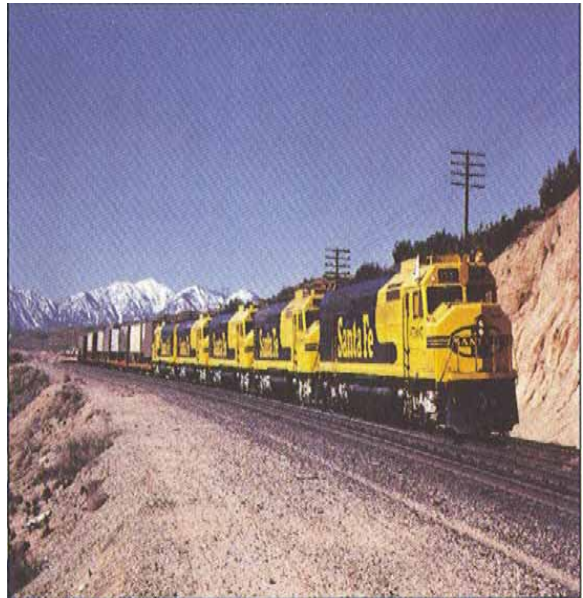
* Diesel Engine Spares

We have over 20 years experience in the manufacture and supply of high quality aftermarket spares for the medium and high speed diesel engines use in power generation, marine and rail traction industries.

During this time we have specialised in spares for, MAN B&W, Paxman, EMD, GE, Alco, and Cooper-Bessemer engines , but other types can also be provided.

All parts supplied are fully interchangeable with OEM components and provide 100% conformance to OEM standards. In the case of American Engines we have through our Associates, in close liaison with the end users ,redesigned components to provide improved performance.

This technique necessitates working as a team with the Railroad companies and involves in depth analysis of the "mode of failure" of troublesome components with the objective of reducing midlife failures by carefully targeted design changes, coupled to field trials.



This product development technique with the rail companies ,and overhaul shops has been welcomed by them, and in many cases has resulted in improved "in service" reliability, solving premature component failure problems which the OEM's were often reluctant to admit to as a design issue.

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* Diesel Engine Spares

Turbo-Chargers

For over 20 years we have been the principle supplier to Bombardier Transportation with high quality spares suitable for use in the Napier SA084 Turbo-Charger as fitted to the Paxman Valenta Engine Class 43 HST 125 High Speed Train. In addition to supporting the spares program for this exceptional Intercity 125 locomotive we have supplied spares for Class 56 and 47 power cars. Our expertise extends to a range of rail traction and marine diesel engines including EMD 567,645, 710, Alco 251, GE, and Cooper-Bessemer types



We can supply from Complete EMD turbo-chargers right through to turbine blade sets to suit your requirements.



Our Impellers are manufactured from high density aluminium alloy forgings fully heat-treated to withstand the arduous conditions found in high performance turbo-chargers. They are machined on state of the art 5 Axis CNC machines.

To ensure their integrity they are subjected to centrifugal testing by spinning them in an explosion proof vacuum chamber at speeds significantly in excess of the operating speed, before final balancing.



For the popular American EMD turbo-chargers we can provide complete new turbo-chargers, or if you prefer individual parts we are happy to supply cartridge assemblies right through to turbine blade sets. All components fitted meet or exceed OEM standards.

Just let us know your requirements

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*Non Metallic Bearings

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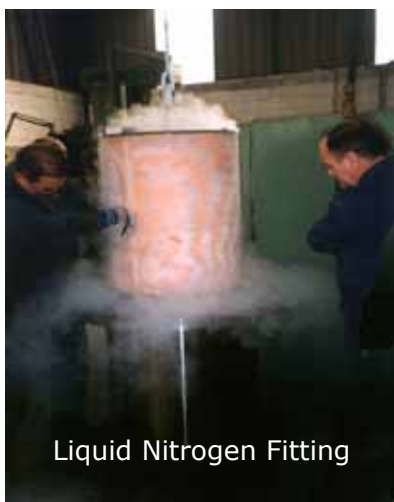
The Directors of the company have over 30 years experience in the design and manufacture of Plain Bearings. **TechnoSolutions** are UK agents for :

Non-Metallic Bearings

TENMAT



FERROFORM Bearings were principally developed for the marine Stern Tube, Rudder, and "A" Bracket Bearings. However such is the versatility of these bearing materials that applications are found in many industries including Rail Traction, Power Generation, Papermaking, and Water-Treatment. FERROFORM durability is substantially greater than conventional materials, with excellent abrasion resistance, resilience and elasticity. This tough stable material coupled to its low friction and minimal stick-slip characteristics make it an ideal choice for stern tube applications. At 20% of the weight of bronze metal it's a lot easier to handle !



Liquid Nitrogen Fitting

Whilst FERROFORM materials are normally run with water lubrication systems, they can be successfully run with conventional oil lubrication, or grease systems. Indeed where the application is suitable they can be run without external lubrication by selecting the appropriate self lubricating grade of FERROFORM.

Using our 30 years of experience of bearing manufacture, design & Tribology, **Techno Solutions** are able to advise on all applications. We can where required provide a design service as well as complete manufacture. Please contact us with your requirements — and ideas for new applications!

Conversion of existing White Metal Bearings to FERROFORM

The ability of FERROFORM to be able to run in conventional oil lubrication systems allows for the successful conversion of White Metal bearing applications such as stern tube bearings to FERROFORM. An added advantage is that should the vessel suffer stern seal leakage the bearing will continue operating with sea water for lubrication.

FERROFORM in a wide range of grades is available in tube 20mm to over 1000mm dia. and sheet 3-100mm thick.

Techno Solutions are able to supply some sizes from stock. Please enquire.



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*** Dampers & Couplings**

Geislinger Dampers & Couplings - Supply and Overhaul

Techno Solutions are approved by Geislinger GmbH. for the overhaul and repair of their couplings and dampers. Geislinger Couplings and Dampers are designed to protect large Diesel Engines and Gas Engines from torsional vibrations produced during the operation of these engines. Without effective protection these torsional vibrations can cause catastrophic failure of major engine components such as the crankshaft and camshafts.

Geislinger Couplings and Dampers are extremely high precision components, and although each have different applications, they have a common design principle. They consist of primary and secondary components between which groups of torsionally elastic leaf spring packs are clamped at their outer ends.



**Geislinger Damper during concentricity checking
On final assembly following servicing/overhaul**

These spring packs , together with the primary and secondary components form chambers which are filled with pressurised engine oil. When in service if the exterior component vibrates in relation to the inner one, the leaf springs are bent and force the pressurised oil from one chamber into another, retarding the relative movement of the two parts and thus damping the torsional vibration.

Geislinger during the design and production, tune each Coupling or Damper to its specific engine application. The required elasticity is determined by careful selection of the leaf springs, whilst the Damping Factor is determined by the gap between the primary and secondary sections

Geislinger Couplings and Dampers are designed to keep torsional vibrations to a minimum over a very long service life, however to ensure that the original design Damping is maintained, it is essential that the manufacturers service periods are not exceeded

Servicing of Geislinger Equipment

Techno Solutions are approved by Geislinger to carry out servicing and repair of all Geislinger Couplings and Dampers. As each Coupling and Damper is specifically tuned they can only remain effective if the oil sludge and other products of combustion are not allowed to build up within the unit. It is essential that these deposits are removed on a regular basis in accordance with the manufactures service schedules. For "**Details of Coupling and Damper Servicing**" see separate sheet.

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* **Damper and Coupling Overhaul** sales@technosolutions.co.uk

Servicing Couplings and Dampers – Geislinger Types

Geislinger Couplings and Dampers are tuned to each application, and will minimise damaging torsional vibrations that could so easily give rise to a catastrophic crankshaft or camshaft failure. To ensure they give the designed protection throughout the life of your engine they must be regularly serviced. During the operation of the engine pressurised engine oil is pumped through the Geislinger unit to provide the damping. This oil will of course contain carbon particles, and other products of combustion. During the operation of the engine these particles are centrifuged between the leaf springs to form hard sludge deposits. These deposits if not removed during the routine service can seriously compromise the damping characteristics of the unit as well as causing premature wear.

Damper awaiting stripping and cleaning during 30,000 hr inspection



Resealing on final assembly

Determining spring preloads during overhaul of small camshaft damper.

During servicing detailed "Health Checks" are carried out to ensure that the original damping performance will be achieved when returned to service. The results of these detailed checks are kept on file for future performance monitoring. Standard servicing can be achieved in 3 to 4 days, please contact us for further details.

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* Precision Component Manufacture

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Techno Solutions are able to offer a precision machining facility for all types of components in a wide range of materials. We are happy to work from your "free issue" materials. We can however offer a complete manufacturing service including procurement of materials to your specification or classification society.



Fitting and Assembly Facilities

If your requirement is for a complete "Turn Key" Manufacture, **Techno Solutions** are able to offer in house Fitting Shop facilities for the production of Sub-Assemblies or Assemblies, including any Painting, Electroplating, Electrical or Electronic work involved.

We are happy to provide on site Commissioning of the assembled equipment should that be required.

Assemblies up to 5 Tonnes in weight can be accommodated.



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*Propeller Repair and Servicing

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Techno Solutions are equipped to offer high quality propeller repairs and overhauls for both fixed pitch and variable pitch propellers, to all major Classification Society's requirements. Our "in house" facilities can handle propellers from around 400mm to 4500 mm Diameter. In both stainless steel and bronze, Propellers are manufactured in a wide range of Bronzes, for example Nickel aluminium Bronze, Manganese Bronze, Manganese Aluminium Bronze, as well as Phosphor Bronzes. The Approved repair techniques for each type of material vary dramatically ,and it is vital to identify the material from which the propeller was manufactured . Our facilities therefore include a Spectrometer which provides us with an instant material analysis of the propeller, to enable us to select the correct repair procedure.



When the blades are received they are assessed and measured on specialist equipment, this data is then compared with the known propeller data, and the damage categorised as follows:

***Missing blade pieces**

***Cracked blades**

***Reduced blade area**

***Reduced blade thickness**

***Cavitation damage**

***Pitch errors**



Weld Repairs—Building up Surfaces

To ensure the propeller is reinstated to its original design performance it is necessary to Replace all of the propeller material that has been eroded during service. This entails building up all of the eroded surfaces with weld material of the correct specification, ensuring that it is heat-treated to stress relieve the material. Where there are large areas of cavitation are present, this "build up" can be labour intensive, however it is essential to recover the original propeller performance, some repairers "**grind out**" cavitation damage and whilst this may be cosmetically acceptable it results in excessively thin blades that are prone to further impact damage and accelerated cavitation damage. Apart from the obvious shortening of the propeller life, such propellers are inefficient in service and give rise to increased noise and fuel consumption.

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* Propeller Repair

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Propeller Repair and Re-pitching Service

In addition to our propeller repair facility we offer a Re-Pitching Service , to modify your existing or stock replacement propeller. Given hull and engine data we can "tune" the propeller pitch to provide optimum performance.



Using a portable Spectroscope to determine the propeller material specification



Surfaces are built up using TIG, MIG, and Gas welding techniques. selected to suit the specific propeller material. Post welding stress relieving and heat-treatment is carried out as necessary.



All blades are balanced before final inspection to ensure low levels of vibration in service



High Quality repairs are offered on both Fixed Pitch and Variable Pitch Propeller Blades 24 hour x 7 day working can be arranged as necessary . With the work carried out to all major Classification Societies. Please contact us with your requirements and we will be happy to provide you with a quotation.

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*Pump and Generator Sales

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Techno Solutions are able to offer a range of Diesel Engine driven Pumps and Generators at competitive prices.

In addition to pumps and generators, we keep a range of:

- Suction Hoses
- Lay Flat Discharge Hoses
- Pipe Fittings & Filters

Please contact us whether your requirement is for one unit or 100 units . We will be happy to provide you with a competitive quotation.



The above photographs show a consignment of pumps that formed part of a Overseas Aid package, that was won against global competition.

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* Damper & Coupling Overhaul

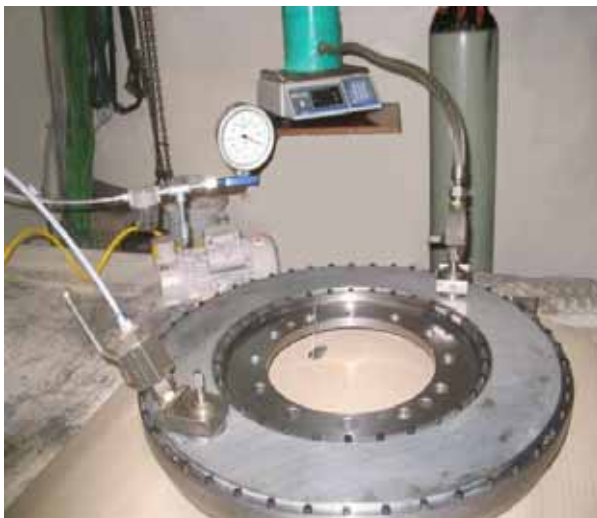
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Service and Repair of Viscous Crankshaft Dampers

Techno Solutions are able to offer repair and complete overhaul of Viscous type dampers of all major manufacturers: Holset, S.T.E., Hasse & Wrede, etc.

Viscous Dampers, provided by the engine manufacturer, are generally bolted to the front of the crankshaft and or camshaft and provide protection against failure of these components due to torsional vibrations emanating from the dynamic loads produced during the firing cycle.

Viscous dampers consist of two major components, a hub and outer ring, all within a containment casing. The hub and outer ring are arranged such that there is a small gap between the components. This gap is filled with a viscous fluid, normally Silicon Oil, Torsional vibrations cause relative movement between the two major components to occur. This in turn causes the viscous oil film within the small gap between the components to shear, damping out the damaging effects of the vibrations.



Silicon oil with its property of "long chain polymers" is an ideal damping media. However gradually over time, the shearing action and the heat produced within the damper, effects the molecular structure of the fluid, reducing the effectiveness of the damper.

It is therefore vitally important the fluid condition be monitored and the damper serviced before this process has reached a point where the degraded performance of the damper can no longer protect the, crankshaft, camshaft, or transmission from the risk of catastrophic damage.

Techo Solutions can provide oil monitoring as well as a repair and overhaul service for all leading makes of viscous dampers. Units Are stripped and surveyed. And where necessary working surfaces are remachined and new bearing inserts fitted to re-establish the original clearances. The unit is then filled under vacuum with silicon fluid of the correct viscosity and volume. Before releasing back to service the fully overhauled unit is pressure tested to ensure it is leak free.



Overhauled damper ready for despatch

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