

TRIVENI DEFENCE BUSINESS AT A GLANCE

Triveni's Defence business has emerged as a trusted and reliable supplier for the Indian Navy within a short span of our foray into this niche segment. Triveni is also an approved supplier for the Indian Coast Guard, underlining the sharp technological and innovation edge of our products.

Triveni is an OEM for a host of important products for the Indian Navy and Indian Coast Guard. The Indian Navy has chosen Triveni as its reliable supplier for propulsion shafting and turbopumps for its indigenous sub-surface project. As part of this relationship, we are providing reverse engineering and fully indigenous solutions for the motor & turbo driven auxiliaries for various projects.

Triveni offerings in this segment are backed by:

- Research & development expertise on critical turbo products
- Fully equipped design, engineering and analysis capability
- Best-in-class manufacturing infrastructure
- Compliance with the dynamic defence market demands in India
- Stringent adherence to quality requirements
- Vast experience in reverse engineering, retrofitting, and customisation

Triveni Defence business solutions include:

- Above and below the deck mechanical equipment
- Platform level support, propulsion systems equipment, gas turbine generator for auxiliary power generation and individual equipment such as pumps, etc.

Products

- Propulsion gearboxes and other critical gearboxes
- Gas turbine generators for auxiliary power
- Critical turbo and motor-driven pumps
- Propulsion shafting

State-of-the-art Infrastructure

Triveni manufactures quality products, benchmarked to the highest standards, in this segment at its state-of-the-art manufacturing facilities. The facilities have the most advanced world-class multi-axis CNC machinery and equipment-handling capacity of 80 tonnes, and are ideally suited to support the manufacturing of technologically superior products for the Indian Defence sector.

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Given the potential for further expansion and growth in this segment, Triveni is poised to establish a large dedicated multi-modal manufacturing, assembly and testing facility at Mysuru for defence products. This will have 80-100 tonnes handling capability and large-scale machining facility, in addition to dedicated test benches for a range of equipment and system integration capability.

OUR POWER TRANSMISSION BUSINESS PERFORMANCE

- PTB order booking stood at ₹ 263.88 crore, registering a growth of 5% & revenues stood at ₹ 225.25 crore, registering a growth of 22%.
- The Gears business registered a growth of 18% over FY 22, from ₹ 209 crore to ₹ 247 crore in terms of order booking.
- The Gears business registered a growth of 20% over FY 22, from ₹ 185 crore to ₹ 223 crore in terms of revenues.
- Within gears, Product stood at ₹ 147 crore in order booking registering a growth of 24%, and at ₹ 132 crore in terms of revenue, registering a growth of 36%.
- Aftermarket business stood at ₹ 100 crore in order booking, registering a growth of 10%, and at ₹ 91 crore in terms of revenue, registering a growth of 5%.
- Aftermarket contributes ~40% to overall revenue from the Power Transmission Business.
- In FY 23, the business added 18 new customers, driven by the Aftermarket.
- Repeat customers in the Aftermarket segment stood at 85% by value (₹ 77 crore) and 92% by numbers (301).
- Exports' share in order booking stood at ₹ 43 crore, registering a growth of 53%, and at ₹ 35 crore in terms of revenue, registering a growth of 10%.



Gears: Updates from FY 23

Achievements:

- Received the largest order from Latin America for gas turbine driven pump application for a gas pipeline project.
- Multiple orders received from OEMs for high-speed STG segment, to be installed in ethanol projects in India.
- Development of complete gearbox for Seal Gas Compressor as replacement to a European brand.
- Development of volute casing parts for Seal Gas and Cooling Gas compressors as replacement to a European brand, as a separate stream of business.
- Development of gear internals for Oxygen Turbo Compressor for a European brand.
- Development of 15MW gearbox as replacement to a European brand.
- Repair, refurbishment and supply of 9.2MW & 25MW gearboxes as replacement to a Chinese brand.
- Repair & refurbishing of extruder gearbox as replacement to an Italian brand.
- Repair & development of parts for Gas Turbine accessory gearboxes of a European brand.

New Developments

- Gearbox efficiency improvements for high-speed & high-power gearboxes are in progress.
- Capability built across all functions for the business to approach opportunities for global gas turbine accessory gearboxes.
- Providing solutions for complete Integrally Geared Compressor (IGC) gearbox units through reverse engineering and expanding the scope to compressor parts has opened new avenues of growth in refineries, fertilisers and petrochemical complexes.
- New avenue of growth identified for aftermarket repair of shafts using special coating technique, which reduces downtime of customers.
- Increase in shutdown tracking, coupled with site data management with clear correlation, has resulted in increased revenue over the years.

New References

- Entry into new series of Integrally Geared Compressor (IGC) internals with high precision accuracies for a renowned European customer to enhance market share in critical high-speed integrally geared market.
- Breakthrough order for a high-power compressor gearbox, which opens opportunities in domestic & global market to increase market share and installation base.



- Design, development, refurbishing & commissioning of high-speed Double Helical Planetary Gearbox as replacement to a European brand for a fertiliser complex through reverse engineering route has created a good reference, and can be used to secure similar business in the same industry or other industries with similar design configuration.
- Successful repair of gearbox of critical gas turbine application in situ at one of the largest refineries in India has created a distinguishing reference for horizontal deployment of this solution to other refineries.
- Entry into mud pump & draw-works gearbox used in onshore oil rigs through Built To Print.
- Providing maintenance support and troubleshooting through AMCs to multiple upstream & downstream refineries and gas complexes, enabling references and replication in different sectors.
- Overhauling of twin-screw extruder gearbox at one of the leading petrochemical complexes in India has provided valuable experience and expertise, which can be leveraged to other industries for similar applications not only for service but also for development of spares.
- Population of 12,000+ high speed gearbox installations globally.
- Enjoys majority domestic market share across OEMs, and patronised by global OEMs across the application spectrum, spanning STGs / GTGs / Compressors / Pumps / Blowers / ID-FD Fans.
- Products are supplied across industry segments like Steel / Sugar / Cement / Fertiliser / Refineries / Gas Complexes, etc.
- Capability to design and manufacture high-power, high PLV gearboxes for all high-speed applications.
- Triveni is one of the few companies globally catering to AGMA & API standards and supplying gearboxes for hazardous and sub-zero temperatures.
- Highly experienced team with exceptional troubleshooting capability and sound understanding of system dynamics, including vibration analysis expertise.

Defence: Updates of FY 23

- A new multi-modal facility is being set up, with large-scale infrastructure for testing of various naval marine equipment.
- PTB has ventured into a specialised vertical of propulsion shafting post winning an order for main propulsions shafting for sub-surface platform with in-house design & engineering. The technology developed will enable participation in various other shafting projects for Navy.
- Design, engineering, development & delivery of special application pump for Navy, which will pave way for similar requirements in future.
- Venturing into propulsion shafting, coupled with in-house capability to design & develop a wide range of rotary equipment and machinery and capability acquired through collaboration with Indian & overseas partners, will facilitate participation in shafting projects and machinery systems. This would be a pioneering initiative aligned to the Atmanirbhar Bharat policy of the Government of India

Power Transmission Business strengths

Product:

- Triveni Power Transmission Business (PTB) is one of the top five high-speed gear companies globally.
- 46 years of rich history of producing high-speed gearboxes.
- Triveni-PTB is one of the few companies operating globally in this segment, having replaced and refurbished 1200+ gearboxes of 80+ global brands across the application spectrum and across industry segments.
- It is highly responsive and is able to comprehend solutions (short-term & long-term) aligned to the demands of the industry.
- It has contributed immensely to energy conservation projects, which include power enhancements and speed change, which has a positive impact on plant production in some of the petro-chemical applications.
- It offers comprehensive solutions, including analysis, supply and services, in the aftermarket space, leading to drastic reduction in product lifecycle cost from the time of engagement.

Defence:

- Ab-initio design capability of critical machinery for marine application, leveraging existing expertise & experience in rotary engineering.
- In-house capability to design & develop a wide range of rotary equipment and machinery, coupled with capability acquired through collaboration with Indian & overseas partners.
- In-house precision manufacturing capability.
- A new multi-modal facility is being set up, with large-scale infrastructure for testing of various naval marine equipment.



CASE STUDIES - AFTERMARKET

Case Study 1:

Problem statement:

Damage to casing bore on barring and starting device idler shaft of 35MW gas turbine gearbox (combined load & accessory).

Site constraint:

The casing was grouted in concrete and removal would have caused destruction of the foundation.

Solution:

PTB provided a comprehensive in situ solution, where the gearbox casing bore was rectified in its original position by using special fixtures and in situ boring arrangement. Bore axis parallelism with existing bore was maintained within 0.05mm. New idler shaft with gears integrated with clutch arrangements and tooth contact with barring and starting shaft lines. Unit was put back into operation within three months.

Case Study 2:

Problem statement:

Diesel engine supplier has gone wrong in the direction of rotation and it would have been a costly affair to replace engines with reverse directions & that too in a short span of time.

Site constraint:

Fire pump bevel helical gearbox needed direction of rotation change without altering the foundation elevation and footprint to match the newly procured diesel engine in off-shore oil rig.

Solution:

PTB provided a solution of new gearbox casing, using existing parts of gearbox to maintain moment of inertia from the torsional compliance perspective of the system. PTB shifted mesh location of the input shaft to ensure direction change on output shaft. The bearing location in casing was suitably optimised to ensure mesh consistency during load operations.

