

RIGHT-ANGLE FIRE WATER PUMP GEARBOX



1 TECHNICAL DATA:

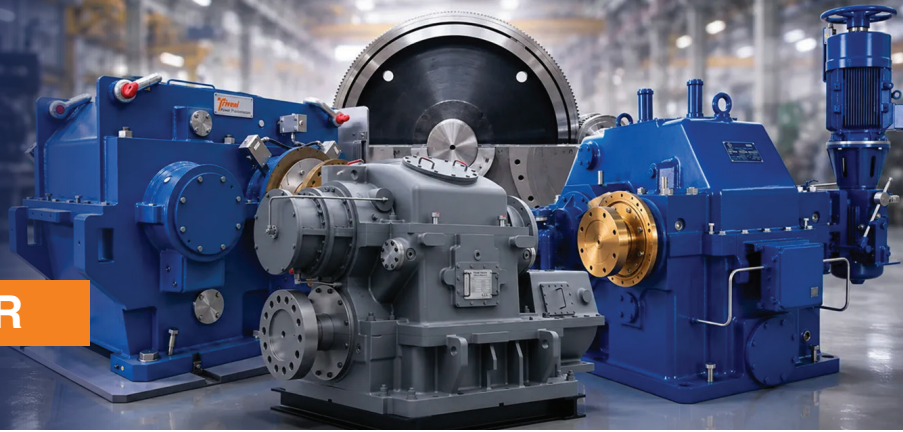
Equipment	Right-Angle Gearbox
Power	1300 KW
Type	Speed Maintainer (near constant)
Input/Output Speed	1518 / 1480 rpm
Ratio	1: 1.03
Driving Equipment	Japanese Diesel Engine
Driven Equipment	Fire Water Pump
Make	European
Gearbox Bearing	Redesigned casing & bearings

2 PREAMBLE / PROBLEM REPORTED

Newly supplied spare engine had a reverse direction of rotation (DOR), making it incompatible with the existing gearbox and fire water pump system. The customer approached Triveni PTB to modify the existing gearbox to accommodate the reverse DOR, while maintaining all existing boundary conditions and installation constraints.



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3 DIAGNOSTICS STEPS UNDERTAKEN / OBSERVATIONS MADE:

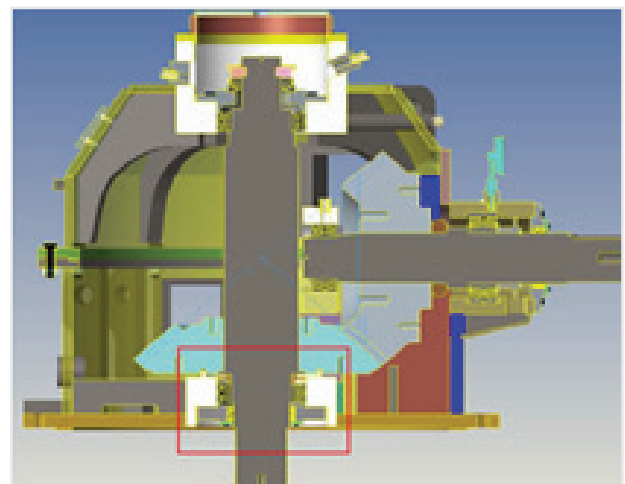
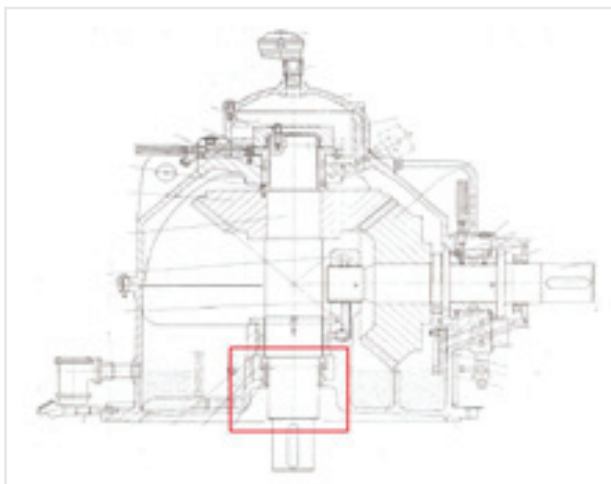
Detailed engineering assessment was carried out to evaluate the feasibility of reversing the direction of rotation within the existing system constraints:

- All critical boundary conditions were thoroughly reviewed to ensure alignment with customer requirements
- Conceptual design analysis indicated that the output bevel gear arrangement required repositioning to achieve the desired change in rotation
- It was determined that relocating the bevel gear from the top to the bottom position would enable reversal of rotation direction
- This modification required a comprehensive redesign of the gearbox casing and bearing arrangement to accommodate the new configuration

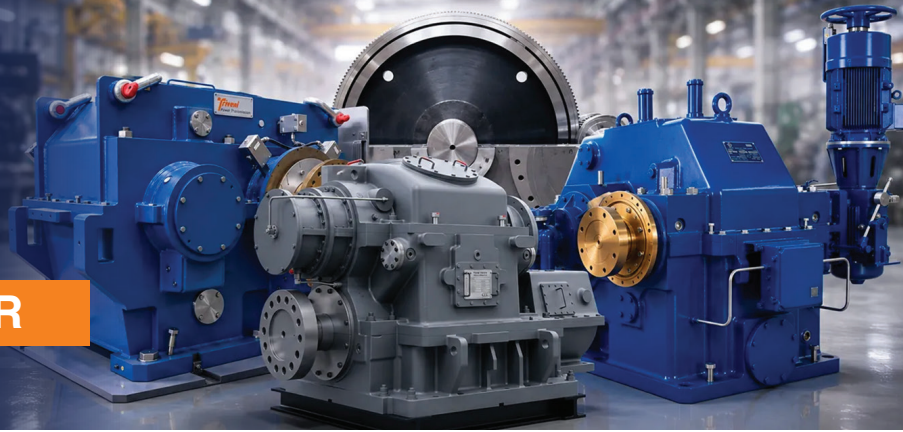


4 ANALYSIS:

- Repositioning of the bevel gear mesh significantly altered the load path within the gearbox
- The new configuration brought the bevel gear forces closer to the gearbox foundation, thereby reducing cantilever effects
- This design enhancement resulted in improved structural rigidity and load distribution
- Overall, the re-engineered configuration contributed to greater robustness and operational reliability



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5 CONCLUSION:

Triveni successfully re-engineered, manufactured, and commissioned the modified gearbox within a record time of 22 weeks in 2018. The implemented solution delivered:

- Full compatibility with the new engine's reverse direction of rotation
- Enhanced gearbox robustness and structural integrity
- Compliance with all existing installation and operational constraints
- Improved load transmission through optimized force alignment, minimizing cantilever effects

6 OUTCOME:

The gearbox has been operating reliably since commissioning, ensuring seamless integration with the modified system and enhanced operational performance.