

BLOWER GEARBOX (FERTILIZER – INDIA)



1 TECHNICAL DATA:

Power	2.25 MW
Type	Speed Increaser
Input / Output Speed	1488 / 5001 RPM
Application	Blower
Make	German
Year of Commissioning	2015

2 PREAMBLE / PROBLEM REPORTED

Failure of gears was reported in the blower gearbox, resulting in abnormal operation and plant shutdown.

To address the reliability concerns and restore operation, the customer approached Triveni for a comprehensive replacement solution.

3 DIAGNOSTICS STEPS UNDERTAKEN / OBSERVATIONS MADE

A detailed inspection and technical evaluation revealed the following:

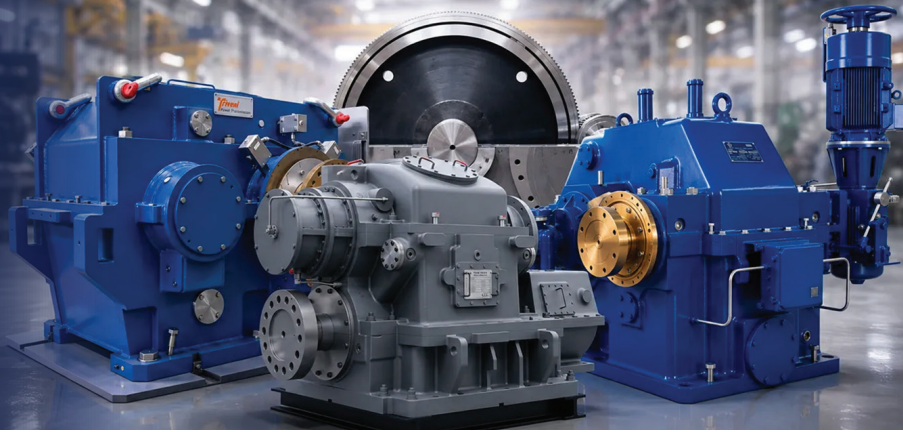
- Severe damage to gear and pinion, including the Hirth gear interface
- Critical Hirth gear dimensions on the blower impeller were captured using precision measurement techniques (CMM)
- Failure pattern indicated fatigue-induced damage of gear internals



4 ANALYSIS:

- The root cause was identified as fatigue failure of the gear system, resulting from cyclic loading over time
- Damage extended to the Hirth gear interface, a critical component for torque transmission to the blower impeller
- Restoration required accurate replication of gear geometry, including the Hirth interface, to ensure proper mating and performance
- Reverse engineering approach was essential due to the complexity and precision required.

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5 SOLUTION OFFERED / ACTION TAKEN:

Triveni implemented a fast-track engineering solution to restore gearbox reliability:

- Developed complete gear internals through reverse engineering, achieving delivery in approximately 50% of OEM lead time
- Precisely reproduced the Hirth gear interface to ensure accurate fitment with the blower impeller
- Manufactured a new gear set using case-hardened material to improve durability and fatigue resistance
- Assembled and commissioned the gearbox after thorough validation



6 CONCLUSION:

The gearbox was successfully refurbished and recommissioned, restoring reliable operation.

The implemented solution ensured:

- Elimination of gear and pinion failures
- Accurate reproduction of Hirth gear for precise impeller fitment
- Improved durability through enhanced material selection
- Stable operation with all parameters within permissible limits

7 OUTCOME:

The gearbox has been operating reliably since recommissioning, with improved performance and reduced downtime. The complete solution was delivered within 22 weeks, ensuring minimal disruption to plant operations.