

\$10,000 SAVINGS
plus elimination of unscheduled
downtime at \$50,000 per day.

Mullor Gearcase
Industry: Foundry
Case Study No. 81544

CASE STUDY

Analytical Ferrography Provides Early Warning of Mullor Gearcase Failure

*These are pictures of a failed
85B Mullor Gearcase.*

The Mullor Gearbox was installed in July 2002. After approximately 900 hours of operation, the unit developed a "klunking" noise.

An oil sample was sent to Trico on October 31, 2002 for analysis. This revealed the generation of extremely large gear and bearing wear particles.

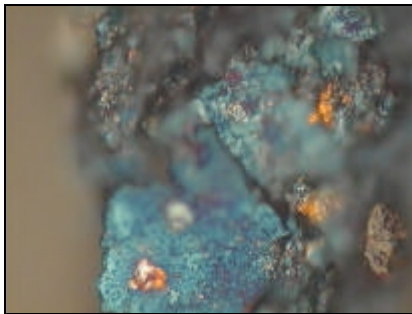


Figure 1. Low Alloy Steel Gear and Bearing Wear Particles by Analytical Ferrography

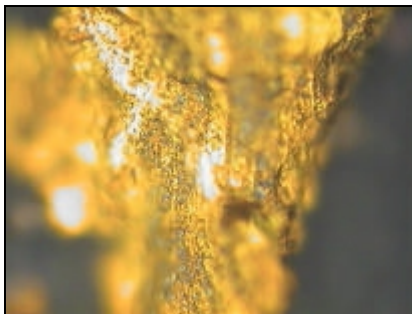


Figure 2. Copper Alloy Metal Bearing Wear Particles by Analytical Ferrography

The inspection of the unit revealed a pinion gear starting to disintegrate.

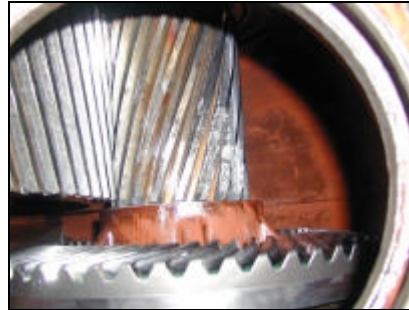


Figure 3. Pinion Gear

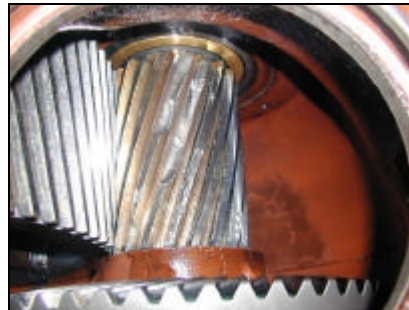


Figure 4. Disintegrating Gear

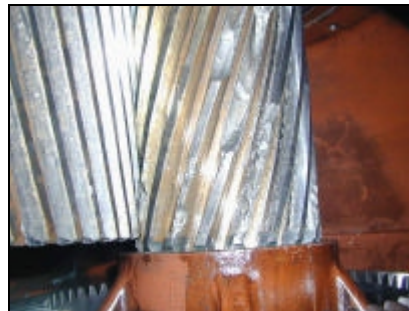


Figure 5. Close-up of Gear



Figure 6. Alternate Close-up

One tooth had completely detached from the gear.



Figure 7. Broken Tooth

The oil was drained from the unit and all the debris was thoroughly flushed from the gearcase. The unit was then filled with new oil. Operation resumed under close watch until a replacement gearcase was secured and installed.

This timely identification prevented the unexpected breakdown of the entire unit, by requiring the replacement of only the single gear. Without this analysis, the unit would have continued operation until total failure.

The cost of replacing the gear was \$1,500. If collateral damage had occurred, then the cost to replace the entire unit would have been \$10,000. Unscheduled downtime was estimated at \$50,000 per day. As a result, any down time during the two weeks needed to schedule repairs would have greatly affected production.

The customer has initiated monthly analysis of this unit to more closely monitor its operation.

