



The Doctor Is In

Inside Luftex's five-pillar approach to gearbox repair

Aaron Fagan, Senior Editor

Case crush and tooth fracture on a helical pinion is the kind of damage that demands engineering analysis before anyone starts cutting replacement gears. (Image: Luftex)

Most gearbox repair follows a familiar sequence. A unit shows up damaged, the shop measures what's worn, makes replacement parts, reassembles, and ships it back. Scott Franks, P.E., spent decades inside that world at Lufkin Industries and came to believe it wasn't enough.

In 2015, Franks and his partner, Albert Stokley, opened Luftex Gears in Lufkin, TX. They built the company around a structured four-pillar service model—Inspect, Analyze, Advise, and Produce—that put engineering analysis ahead of production. A gearbox that arrived at Luftex didn't go straight to the shop floor. It went through engineering first.

“Our time at Lufkin Industries is where we learned the value of customer relations through inspecting, analyzing, advising, and producing to ultimately complete the repair,” Franks says. What pushed them to go independent was the 2013 GE acquisition of Lufkin Industries. “The GE philosophy towards customer relations didn't align with ours, so we decided to provide an alternative choice to customers who value involvement through Luftex.”

Luftex had no OEM product line and no installed base. Everything depended on the expertise of its people. During those startup years, Franks took seven days off in five years. Operators became CNC technicians. Managers and engineers doubled as ground crews and janitors. Everyone learned to drive a fork truck.

Inspection in Two Modes

Luftex's inspection work splits into in-plant evaluation of running equipment and shop analysis of failed units. In-plant

inspections look for signs of proper lubrication supply, acceptable contact across tooth flanks, and any evidence of metal distress. Scheduled periodic inspections add a trending layer: has the contact pattern shifted? Has noise increased? Have bearing clearances changed?

“If caught early enough, mitigation processes can be successfully implemented,” Franks says.

When a failed unit arrives at the facility, inspection starts with what Franks calls a “30,000-foot evaluation,” associating major damage with probable causes. Then the unit goes through an engineering analysis to verify the design against AGMA or ISO standards before root cause work begins.

For gearboxes that arrive without original documentation—common in older steel, mining, and sugar operations—reverse engineering starts in conversation with the customer, not at the measurement table. “The name plate on the gearbox doesn't affect how the components react when in operation,” Franks says. “What's important is how a gearbox reacts to the conditions it sees while running at the required service load, speeds, and operating environment.” The analysis may lead to recommended changes in bearing design, gear geometry, or lubrication—well beyond like-for-like replacement.

“There are numerous facilities with gear cutting machines that can offer to manufacture a gear but with little ability to analyze the validity of a design,” Franks says. “It is this service that Luftex can provide that many companies offering gear or gearbox repair cannot support.”

Adding a Pillar: Educate

During the startup years, Luftex operated under four pillars but didn't have the bandwidth to formalize training as a service. The 2019 acquisition by Sumitomo Drive Technologies changed that. Sumitomo absorbed the administrative overhead and freed Luftex's people to focus on production, continuous improvement, and formal customer education.

Today, Luftex hosts several two-day gear schools each year and offers customized on-site training. The curriculum starts with the foundation—checking that it's solid, flat, free of burrs, and making full contact with the bottom of the gearbox housing. From there, it moves to verifying proper alignment between mating rotating elements to ensure load distribution, coupling setup (different methods for different gear designs), and unit startup checks covering lube pumps, oil flow, temperatures, and recommended inspection and documentation frequency. Franks describes attendees having “ah ha” moments when a discussion topic connects to a recurring problem back at their plant—root causes that turn out to be alignment issues, foundation problems, or lubrication regimes that were wrong from the start.

“A company's culture has a tremendous effect on how open the communications are between a supplier and owner when trying to establish what caused a failure,” Franks says. “Sumitomo intends to engage customers who value an honest relationship that leads to a partnership that benefits both parties.”

Analyze, Advise, and the Honesty Question

Having Sumitomo behind Luftex gives the analysis stage a depth most independent shops can't match. Franks describes cases where a customer installed a competitor's gearbox and immediately had reliability issues. Luftex's analysis revealed the units were originally undersized for the application and the original housing wasn't large enough to make the necessary modifications required for a reliable design. In extreme cases like this, the only fix is a properly rated Sumitomo OEM replacement.

The advise stage is where that analytical depth pays off in practice. Luftex presents options with the strengths and weaknesses of each: a temporary repair that buys time while a permanent solution is planned, a long-term repair with investment in spare critical components, or a new unit if repair costs exceed replacement. Sometimes a repair wins even when a new unit is cheaper, because delivery lead times on new equipment may not fit the customer's downtime window.

“Sumitomo Drive Technologies has the means to offer multiple options to a customer and help them decide what best fits their needs,” Franks says.

The Bearing Arrangement Nobody Caught

One case shows the full model at work. A steel plant customer had recurring low-speed gear tooth failure at roughly eighteen-month intervals. About a third of the tooth was broken out in several locations around the gear, and the pattern repeated across multiple units at different plant locations.

Luftex ran gear ratings on every pinion and gear. Each reduction carried a significant service factor—the gears should not have been failing. Because the damage was limited to a

third of the tooth length, something was causing misalignment in the mesh and poor load distribution. Deflection calculations came back well within acceptable limits. Housing bores measured parallel. Multiple locations ruled out bad foundations.

The root cause: the tapered roller bearings on the low-speed gear were oriented in the same direction, an atypical arrangement. Under axial thrust loading, the bearings unseated, creating additional clearance that let the shafts drift out of parallel. The load migrated to one end of the mesh and fractured the teeth.

Luftex redesigned the housing for a new bearing arrangement. More than ten years later, the units are still running.

Better Gears Coming Back

Luftex's gear grinders do more than restore worn surfaces. Profile and lead modifications improve the misalignment factor in gear rating formulas, increasing the service factor over non-modified sets. Improved surface finish raises the probability of developing a full elastohydrodynamic oil film between mating teeth.

On materials, Luftex limits its steel suppliers to a small number of partners with a track record of producing clean steel that hardens to greater depths. “We base our ratings and repairs on high AGMA grades of steel, so by developing partnerships with only a few quality suppliers who understand our specifications, we eliminate the risk of having inferior steel end up in our repairs,” Franks says. Today's grades support higher allowable stresses than what was available when many of these gearboxes were built. A repair using current materials can transmit more horsepower or operate at a larger service factor than the original unit.

The Workforce and the Future

Franks doesn't dodge the industry's long-term problem: fewer people want to do this work. He compares the aftermarket gearbox business to auto repair—there are dealership shops that service one brand, and independent shops that fix whatever rolls in. Luftex was built as an independent shop, where the learning curve is steeper, and experience matters more.

“The gear business has gotten labeled as a ‘dirty’ business that isn't as glamorous or high tech as other careers,” he says. “I don't think that's a totally fair assessment.” Luftex trains its engineers and technicians on the engineering and mechanics of gearbox operation, but Franks is direct about the limits of formal instruction. “Even with that engagement, experience plays a huge role in becoming competent,” he says.

Since the acquisition, Luftex's new office building in Lufkin has added 1,200 square feet dedicated to learning and development. The installed base of Hansen and Paramax gearboxes gives the aftermarket business a foundation of OEM service work. The general repair heritage gives it range.

The five pillars, in the order Franks now lists them: Inspect, Analyze, Educate, Advise, and Manufacture. “Six years into the Sumitomo acquisition of Luftex,” he says, “the support to continue these pillars in our daily offerings only gets stronger.”

us.sumitomodrive.com/en-us/luftex-lufkin-industrial-gearbox-repair-rebuild-services

