Opening The Operator’s Eyes: Internal Inspections For Overhead Lifting Equipment

Konecranes

Anyone who works with overhead lifting equipment will tell you that safety is absolutely crucial. From machine shop owners to warehouse floor managers, professionals who work in these environments understand how important it is to invest in the reliability and lifecycle of their heavy-duty equipment. Compliance and maintenance inspections form an essential part of this investment, but companies often don’t know what to look for in an inspections provider.

Many companies think that an annual visual inspection suffices to identify any large-scale issues, but the gear case, load block, and hoist coupling are just as likely as external factors to cause catastrophic failure in certain cranes. Internal inspections can unveil unforeseen weaknesses and issues with an otherwise functional crane, and a reliable service provider should know when to provide these inspections.

“Every crane is different,” explained Mike Brown, Technical Advisor at Konecranes, “A qualified crane service provider will develop a customized inspection plan depending on the equipment’s age, use, and model. For older or more rigorously used cranes, a comprehensive internal inspection can prove crucial in maintaining the safety of the workplace.”

A Change Of Pace

This was certainly true for the equipment at Toyota-Lift of Minnesota (TLM), a fast-growing forklift dealership offering a full line of high-quality lift trucks, aerial equipment, personnel and burden carriers as well as warehouse and material handling systems.

“It’s a cliché to say that safety is job number one,” said Kyle Thill, Director of Service at Toyota, “but it’s a valuable cliché. Even in a small shop with 24 technicians, the consequences of something going wrong with a machine that’s lifting that much weight are going to be severe. When it comes to our cranes and our employees, we can’t be too cautious. Safety is wildly important to us.”

Accordingly, TLM had their equipment inspected yearly to keep it in working order. The company uses one five-ton bridge crane, which has been in service for nearly 15 years. “It's a workhorse for us,” explained Thill, “and with the weight it carries, we certainly want to be sure that it is up to the task.” TLM’s original crane service provider, which had conducted these annual inspections for 14 years, had concentrated on visual observations and measurements during their visits. They made occasional light changes, such as replacing a hook or cable, but they had never opened up the gear case.

Until last year, this relationship had worked out well for both parties. The inspections had proceeded smoothly and consistently, and TLM had never experienced an incident with the crane. However, in the fall of 2011, TLM could not get a hold of their crane service provider. "We were trying to get that annual maintenance scheduled, and we were having a great deal of difficulty getting that to happen," explained Thill. "We were almost two months behind, and so I went on the web and found an alternative."

A New Type Of Inspection

The alternative that Thill found was Konecranes, a global leader in manufacturing and servicing of overhead cranes and lifting equipment, serving a broad range of customers in various industries.

After an initial crane inspection, Konecranes was able to make recommendations to TLM to help ensure continued crane performance. Based on the equipment's use, environment, and age of the hoist, the technicians advised TLM to perform internal inspections on the gear case, load block, and hoist coupling. "The inside of that crane had not been looked at for 15 years," said Thill, "Our previous provider had seemed quite satisfied with doing just the external inspection, but Konecranes was insistent on having a look inside it after hearing the history of the crane. The fact that they even wanted to look at it let us know that they were performing a different kind of inspection."

It is important to inspect within the gear case, because often the gears begin to develop faults that are not evident in an external inspection. These faults, caused by "cumulative fatigue," can be cracks in the gears themselves, pitting corrosion on the surface of the gear, or spalling of the gear. Gear fatigue is particularly common on older cranes that have not been regularly serviced; cranes that are being used beyond their expected life-cycles; or cranes that have seen a significant increase in operating duty cycles.

These types of gear faults can have catastrophic consequences, both in terms of safety and expense. If left unfixed, these faults can cause unexpected system failure, which is particularly dangerous if it happens while the crane is lifting a several-ton load. However, it is possible to detect gear fatigue well before a system failure, as long as the gear case is fully inspected on a regular basis. During these inspections, Konecranes utilizes non-destructive testing techniques to ensure that there are no defects in any of the crane's critical components.

The internal inspection at TLM revealed that the needle bearing in the gear case had started to fail. Without this inspection, the tear could have led to a sudden and catastrophic failure. "Not all defects can be seen with the naked eye," explained Brown. "Some may occur within components that are not normally disassembled for inspection. We highly recommend these inspections for equipment that is involved in process duty applications, is being used beyond the original design duty, may have been overloaded, has seen 10 plus years of service, or is recommended for such an inspection by the OEM."

"It was a real value to us that Konecranes opened our eyes to the maintenance concerns inside our gear case," said Thill. "Our comfort level is really where it needs to be. We know that the crane is operationally stable, which allows us to get on with our work confident that we won't have any failures."

Continued Operation

A truly reliable crane inspection will encompass the whole crane, inside and out. "If your crane service provider hasn't asked you about opening the gear case, it's time for you to ask them," said Brown. "Your machine may not require that sort of inspection, but if it's been in use for more than 10 years, it's definitely a good idea to take a look inside."

These inspections also help workers and managers to feel safe. "As I'm sure is true in many operations," summarized Thill, "Our crane is called on very often. We need to feel confident that it will continue to operate safely.

"We feel good knowing that we're doing all we can to ensure our employees are as safe as possible using our supplied equipment. At the end of the day, that's the biggest benefit."

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