GÜDEL

Simmons, Güdel Make Trains Safer

Simmons Machine Tool Corporation and Güdel Take the Worry Out of Railcar Wheel Maintenance

Industry

Rail and Transportation

Processes

Automated railway wheel machining and boring as part of railway wheel maintenance program

Key Data

- Traditional wheel turning used forklifts to feed ad hoc machining cells, reducing safety and throughput.
- Reliability, capability and trust of every component are primary drivers behind Simmons' component selections, including the ZP-6

Simmons Machine Tool Corporation chose the ZP-6 overhead gantry with a two-axis robot to provide most of the material-handling capability for its new Wheel Turning Center, a vertical CNC lathe for machining railway wheels.

Figure 1: Wheel sets requiring machining are placed onto a conveyor and transported into the machine cell. To accomplish this task, each individual wheel is picked by a vertical lift system from Güdel. The system consists of a ZP-6 overhead gantry with a two-axis robot that has a Simmons specialized gripper to handle the heavy wheels. The system transfers the wheels to the Wheel Turning Center.

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If you have ever ridden a train, or even driven near any of the 140,000 miles of track in the United States, you are probably familiar with several sounds that are important to Simmons Machine Tool Corporation. The first is the repetitive "thud" of a flat spot on a 900-pound railcar wheel. The next is the "squeal" of an out-of-round wheel. There is one sound that no ever wants to hear: the crash of derailment from a worn wheel going off the rails.

Since 1910, Simmons Machine Tool Corporation has manufactured innovative machine tools, measuring machines and automation systems, with the last several decades focused on railway wheel set maintenance and production. So when Simmons started the design for it's new Wheel Turning Center (WTC), a vertical CNC lathe for the boring and machining of railway wheels, it had two goals in mind: design a system that maximizes safety of both the railway and machine operators, and boost the productivity that can cause delays in railway wheel repair.

The Wheel Goes Round

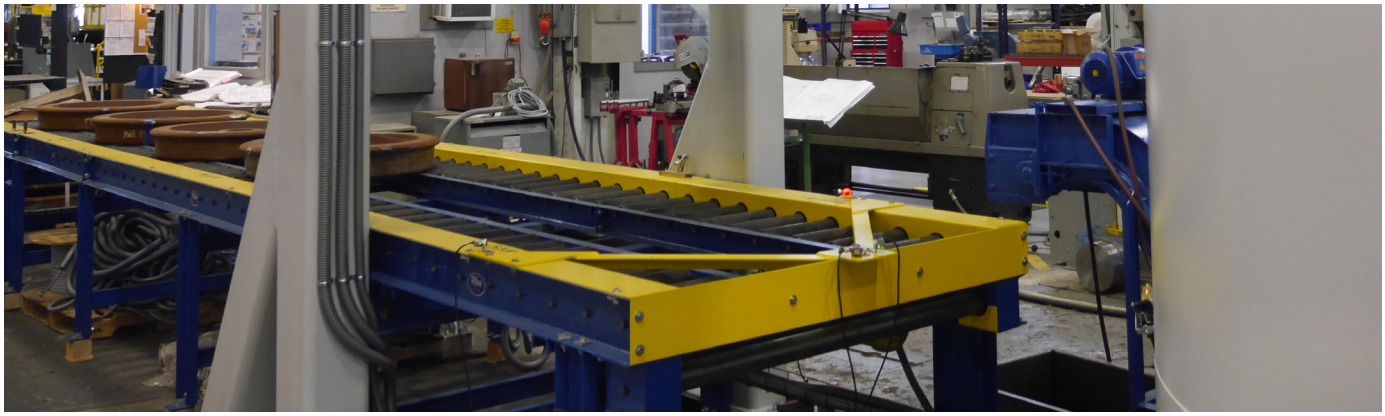
Maintenance of railway wheel sets represents a significant cost faced by train operators, since when the wheels of railway cars have been used for extended periods, they are subject to wear, most noticeably in the flange and tread areas. This wear can make for less efficient operation and can even result in derailments. Automation thus plays a critical role in both the measurement and maintenance of railway wheel sets.

As worn wheel sets enter a railway wheel maintenance facility, the end caps and bearings are first manually inspected and removed. Serial numbers for each wheel set component are then entered into a supervisory control and data acquisition (SCADA) system. A measurement machine qualifies the parameters of the worn wheel set, and based on that data, the wheel set is either reprofiled or condemned.

If the wheel is beyond the tolerances set by the Association of American Railroads, the wheels is removed from the axle and then scrapped. A new wheel will then be required. To ensure a precise interference fit with the wheel and axle, the wheel's center hole must be machined (bored) to

Güdel Technology

- ZP-6 Overhead Gantry with Two-axis Robot
- High-Performance Planetary Gearboxes



match the axle wheel seat. Traditionally, each wheel was placed on a machining center using a forklift, crane or other manual material-handling system. The process was slow and inconsistent, and worker safety was a concern. Today, the Simmons WTC machine cell automates most of the process.

Workers load wheels onto a feeder conveyor, which transports the wheels into an automated material-handling system from Güdel (Langenthal, Switzerland; gudel.com). The system consists of a ZP-6 overhead gantry with a two-axis robot that has a Simmons specialized gripper to handle the heavy wheels. The system transfers a wheel to the WTC (Figure 1). This machine bores the center hole of the wheel, with additional machining capabilities as required by the customer. After boring and/or machining, the wheels is then placed back onto the outbound conveyor for pressing onto an axle.

"Simmons chose Güdel's ZP-6 gantry system for this application primarily for its reliability and capability, because equipment availability is critical for our customers," said Jason Steven Murphy, marketing specialist at Simmons Machine Tool Corporation. "Simmons has a long history of successful projects working with Gudel, and there is a level of trust and understanding of each other's capabilities that makes the projects run smoother."

This level of automated material handling creates a more consistent process while protecting workers from the dangers of moving heavy wheels into tight spaces. Access to pre- and postmachining measurement data is very important to railway customers, as they are more and more analyzing that data to extend the lives of not just wheels but also maintenance machines and automation systems. Automated systems like this can be deployed throughout a wheel set maintenance or production facility. They can additionally be networked together to create a closed-loop system, increasing productivity and decreasing the chance of operator error.

About Güdel Inc.

Güdel Inc. is the US subsidiary of Güdel Group, a global manufacturer of robotic automation products, systems and services. Güdel supplies linear-motion modules, robot track motion units, gantry robots and components to OEMs, systems integrators and machine builders serving the automotive, aerospace, logistics, heavy industrial and power-generation industries. Güdel Inc. is located in Ann Arbor, Michigan, in a dedicated 45,000-square-foot facility, providing North American customers with engineering, design, production and customer service support.

Güdel Group was founded in 1954. Headquartered in Langenthal, Switzerland, today Güdel operates in more than 30 locations worldwide.

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