CASE STUDY

Automated Track Shoe Assembly System Transforms Production, Safety, and Cost Control

AUTOMATED SOLUTIONS TRANSFORM MANUFACTURING PROCESSES

INTRODUCTION

Manufacturers of track shoe assemblies face persistent challenges: quality inconsistencies, rising costs, supply chain disruptions, and labor shortages. These issues impact production timelines and profitability, making it difficult to maintain efficiency and meet customer demands.

To address these challenges, Lincoln Electric Automation developed the Track Shoe Assembly System, an advanced robotic automation solution that transforms track shoe manufacturing. This system enhances precision, minimizes defects, and optimizes production workflows, allowing manufacturers to scale operations with confidence.

Delivering higher quality, increased efficiency, improved safety, and cost control, this system helps manufacturers take control of their operations while reducing reliance on external suppliers and mitigating industry challenges.

THE CHALLENGE

- **Quality Control:** Inconsistencies in manual production can lead to quality issues.
- **Shipping Problems:** Delays and high costs associated with shipping components
- **Cost Increases:** Rising costs of materials and labor impact profitability
- **Manual Labor:** The traditional manual process is time-consuming and labor-intensive.

What is a Track Shoe?

In the context of heavy machinery, a track shoe is a critical component of the track system used in equipment such as excavators, bulldozers, and tanks. These track shoes are metal plates that form the continuous track, providing stability and traction on various terrains. They are designed to give the equipment better traction, protect the tracks themselves, and help machines navigate difficult terrains. Key components of a track shoe include the shoe plate, bolts that fasten it to the steel crawler belt, and raised ridges on the shoe that dig into the ground to give the machine grip.

LINCOLN ELECTRIC

WHY CHOOSE LINCOLN ELECTRIC AUTOMATION?

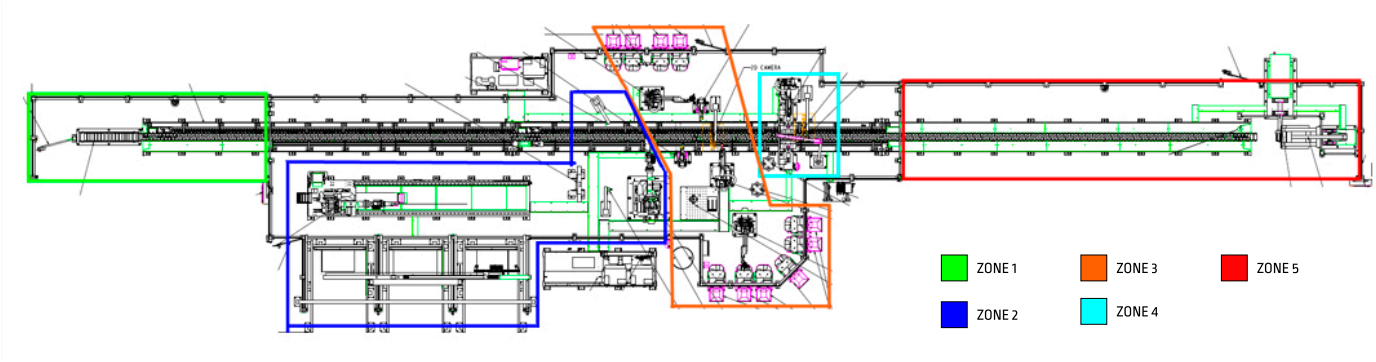
Manufacturers of track shoe assemblies face increasing pressures to enhance efficiency, maintain quality, and control costs while navigating supply chain uncertainties. Traditional manufacturing processes often struggle to keep up with growing demand and changing industry requirements, leading to operational bottlenecks and rising production expenses. To stay competitive, businesses need a solution that offers automation, reliability, and scalability without compromising performance. Lincoln Electric Automation's Track Shoe Assembly System offers a comprehensive solution to these challenges:

- **Cost and Inventory Control:** By manufacturing track shoe assemblies in-house, companies can eliminate middlemen, resolve quality issues, and reduce inventory and shipping costs.
- **Increased Production:** The system can produce an assembly in 30 minutes with three workers, compared to three hours with eight workers manually—a 500% increase in productivity.
- **Consistent Quality:** Robotic manufacturing ensures each assembly meets exact specifications, eliminating inconsistencies.
- **Improved Safety:** Automation reduces manual labor, enhancing worker safety with advanced features like scanners and light curtains.

ENGINEERED FOR EFFICIENCY

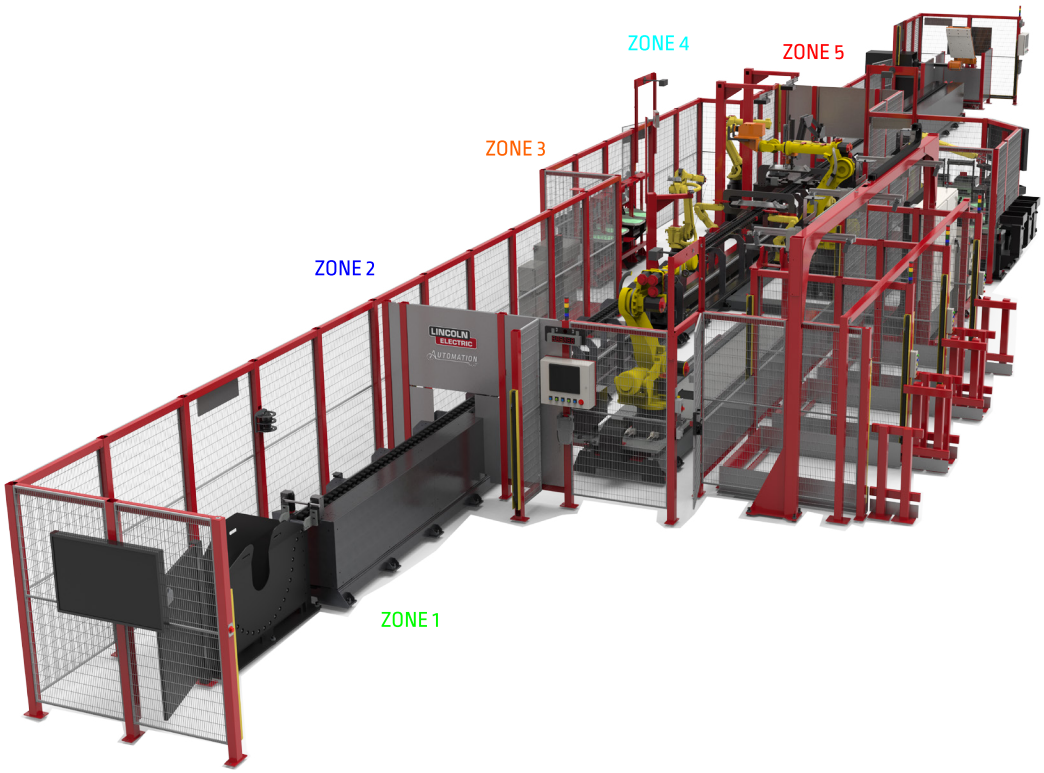
The Track Shoe Assembly System is designed to optimize every aspect of the manufacturing process:

- **Zone 1: Link Assembly In-Feed:** The incoming link chain is unrolled from a coil and pulled onto the precision conveyor.
- **Zone 2: Track Shoe Placement:** The robot picks track shoes from a pallet using vision technology, then places them on the link chain.
- **Zone 3: Track Shoe Fastener Install:** Robots use vision technology to pick the hardware from vibratory tables and position and tighten the nuts and bolts.
- **Zone 4: Final Torque:** A customized robot torques the bolts to the correct high torque value, ensuring precise assembly.
- **Zone 5: Track Shoe Assembly Coiling:** The finished track shoe assembly is coiled for packaging.



ADVANCED FEATURES

- **Ease of Operation:** Simplifies the process to ensure parts are available and the system is operational with minimal effort.
- **High-Performance Automation:** Customized robots achieve high torque values for fastening.
- **Flexibility:** Patent-pending method for automated socket change allows for different hardware sizes.
- **Space-Saving Design:** Compact footprint of 120 feet by 30 feet, matching the output of eight production lines and 64 manual workers



THE RESULTS

Lincoln Electric Automation's Track Shoe Assembly System has delivered remarkable results:

Increase in Productivity

Reduced assembly time from three hours to 30 minutes.

Improved Safety

Reduced manual labor and enhanced worker safety.

Enhanced Quality Control

Consistent, high-quality assemblies meeting exact specifications.

Cost Savings

Lowered costs by eliminating middlemen and reducing shipping and inventory expenses.

CONCLUSION

Lincoln Electric Automation's Track Shoe Assembly System exemplifies the future of manufacturing, offering unparalleled efficiency, quality, and cost control. By automating the production of track shoe assemblies, manufacturers can achieve significant competitive advantages, ensuring consistent quality, improved safety, and substantial cost savings.

If you are looking for a similar solution, submit a request to connect with a custom solutions representative.

About Lincoln Electric

Lincoln Electric is the world leader in the engineering, design, and manufacturing of advanced arc welding solutions, automated joining, assembly and cutting systems, plasma and oxy-fuel cutting equipment, and has a leading global position in brazing and soldering alloys. Lincoln is recognized as the Welding Expert™ for its leading materials science, software development, automation engineering, and application expertise, which advance customers' fabrication capabilities to help them build a better world. Headquartered in Cleveland, Ohio, Lincoln has 71 manufacturing locations in 21 countries and a worldwide network of distributors and sales offices serving customers in over 160 countries. For more information about Lincoln Electric and its products and services, visit the Company's website at www.lincolnelectric.com.

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