

Track Shield

Collision Detection
and Mitigation System
Product Overview





Joy Global is continually investing in research and development to deliver technology products that will revolutionize mining.

Joy Global is proud of its investments in advanced technology. Our resources are committed to developing methods and solutions focused on higher productivity and reliability and safer operations.

Joy Global offers an array of technology products that address health monitoring, production and machine performance, such as the **PreVail RHM** and **Vibration Monitoring** systems, along with equipment upgrades such as the **Centurion** electrical control system platform.

Along with these products, our JoySmart Solutions team delivers substantial value to our customers' operations by constantly engaging with the mines in order to potentially predict down-time or issues that could cost time and resources.

Joy Global is committed to delivering solutions that will create value through safer, more productive and reliable products.

Technology solutions for smarter, more productive digging

The Track Shield collision detection and mitigation system was developed with extensive shovel operator input and is the only automated operator-assist technology on an electric mining shovel that will detect and help prevent a dipper from striking the crawler.

Operator environment

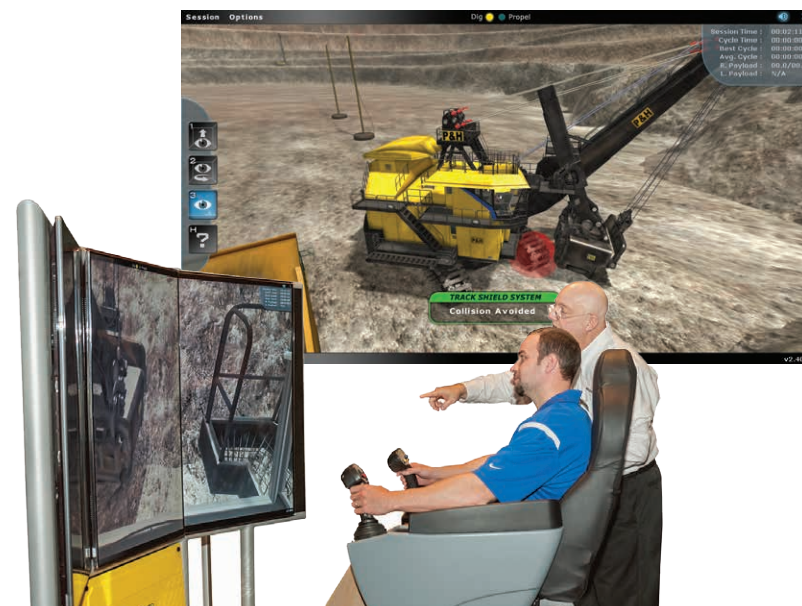
Operators are often challenged by working in varying conditions that can lead to dipper/track collision. The Track Shield system:

- **Elevates operator confidence and minimizes operator hesitation** to avoid compromising equipment.
- **Reinforces best digging practices:** helps shovel operators optimize the dig cycle by generating an alternate path to reduce disruption.
- **Provides a valuable learning tool for new operators** by reducing the learning curve on proper placement of the dipper to the digging face for optimal fill factor.

Performance and productivity

The Track Shield system can help operators focus their efforts toward higher productivity levels:

- **Reduction in cycle time:** field studies have shown that with early detection and mitigation of collisions, operators can operate at full speed without losing the ability to dig close to the shovel.
- **Addresses the issue of deeper dippers and wider tracks:** the "blind" spot is increasing for operators as dippers continue to increase in depth. The Track Shield system also works well in mining operations that require larger crawler shoes for reduced ground bearing pressure.



Track Shield is designed into our Advanced Shovel Simulator. It can be switched on and off to assist operators in system feel and familiarity.



Dipper to crawler shoe contact can occur when digging in close proximity to the tracks and during the "return to tuck" part of the dig cycle.



The Track Shield system assists the operator by generating an alternate path.

Technology

In its technology roadmap, Joy Global continues to develop innovations focused on improving customer performance:

- **The Track Shield system was designed with best-in-class technologies** utilizing precise mathematical modeling and prediction
- **Simple set-up** for existing Centurion electrical control system architecture
- **Ready to connect to the PreVail remote health monitoring system** for early prediction and warning of equipment problems before they occur

Maintenance

The Track Shield system helps reduce the number and severity of dipper-crawler impacts, as well as the associated maintenance and repair costs for crawler shoe and structural damage:

- **Repeated strikes to crawler shoes can reduce crawler shoe life** by as much as 25%
- **Repeated dipper to crawler strikes can accelerate a reduction in shoe life** which can result in loss revenue
- **Unplanned, unscheduled and unbudgeted** shoe, pin and hardware replacements
- **Long term, more costly repairs** to crawler frames and carbody structures
- **Increased Total Cost of Ownership (TCO)** due to increased maintenance costs



Broken edges



Damaged pin bores



Bent shoes



Cracked or rounded

The Track Shield system helps increase shovel availability and productivity by helping to mitigate these types of damage.



The Track Shield system is the *only* product offering in its class that will detect and help prevent a dipper from striking the crawler shoe, minimizing structural damage that can occur due to dipper strikes.

Available on P&H 2800 and 4100 shovel models enabled with the Centurion electrical control system

Contact your Joy Global service representative for more information on the Track Shield system or visit www.joyglobal.com



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