

Metso

Bulk Materials Handling services

Railcar dumper system upgrades



Application

As your production goals evolve, so should your equipment. For the latest technology and efficiency, you don't have to look very far. Your existing assets have the potential to take on significant improvements.

Significantly improve reliability, maintenance efficiency and safety with our range of customized retrofit solutions. Our team of experts can support you throughout, from identifying retrofit options to implementation.

The Metso solution

Whether you want to improve maintenance efficiency, safety or equipment reliability, we have you covered. Discover our range of custom-engineered upgrades for your:

- Wheel grippers
- Dumper cage assembly clamps
- Trunnion assemblies
- Drive units
- Electrical, instrumentation and controls

What partner with Metso?

As an OEM, Metso has been designing equipment, parts and retrofit solutions for railcar dumpers since 1905. We've combined the best features from our industry-leading legacy brands with modern technology to bring innovative and reliable solutions.

With the use of advanced engineering tools, we ensure accurate and high-quality

manufacturing that meet Metso's strict standards and tolerances.

Brands we support

- Metso
- Svedala
- Dravo
- McNally Wellman
- McDowell Wellman
- Mukand McNally
- Strachan & Henshaw
- Stephens Adamson

*Also available for select non-Metso equipment

Read more at
metso.com/railcar-dumper-upgrades

Benefits

- Maximize equipment performance with a cost-efficient solution
- Gain new functionality with modern technology
- Ensure equipment reliability and longevity
- Improve ease and timeliness of maintenance activities
- Reduce safety risk and prevent major structural damage to your machine

Improve reliability, maintenance efficiency and safety

Metso railcar dumper system upgrades

Incorporating modern technology without major investment.



Dumper cage and clamps

Extend the life of your dumper by upgrading to rolled T end rings. Protect your equipment and rolling stock by converting to breakaway car clamps. UHMW wear strips on your blocking and buffer addition/upgrade for dumper rotation.



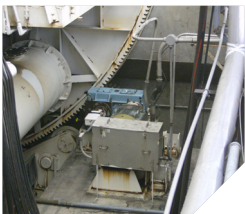
Trunnion assemblies

Upgrade to a dual, triple or quad trunnion design to increase your end ring, rail and trunnion wheel life. Innovative design minimizes downtime through quicker and safer maintenance.



Electrical instrumentation and controls

From upgrading individual sensors to a complete electrical, instrumentation and controls (EI&C) package, many upgrade options exist to maximize throughput and ensure smoother operation. Improve system diagnostics and/or make advanced controls more operator friendly.



Drive units and hydraulic systems

Improve your safety and availability with drive and hydraulic upgrades. Options include raising dumper drive units to track levels, converting to dual drives, installing a spindle-operated dumper latch, relocation hydraulic manifolds and checking valves to the rear side of the dumper and moving hydraulic power units off board

Metso premium components and parts		
For rotary car dumpers	For train holding devices	For railcar positioners
Cages	Grippers	Rails & racks
End rings	Gripper bars	Track
End ring rail	Truck locks	Arms
Hydraulic, gravity or chain clamps	Holding arms	Support & guide rollers
Gear racks & pinions	Retarders	Draft gear & buffers
Chain (drive or clamp)	Clicking stops	Haulage drums
Trunnion rollers	Hydraulic systems & components	Wire rope & sheaves
Drive train (motors/gearboxes)	EI&C systems & components	Drive train (motors/gearboxes)
Hydraulic system & components		Hydraulic system & components
EI&C systems & components		EI&C systems & components
		Festoon & power track

More for your railcar dumper system

Inspections: From quick visual and vitals to detailed custom inspections for your railcar dumper and its key components.

Optimization studies: Evaluate potential for capacity increases through time cycle optimization and retrofit components. Predict useful life and preventative maintenance requirements with life cycle analysis.

Field service support: 1500+ global service team experts to carry out installations and perform repairs.

Life Cycle Services: Custom, progressive service packages focusing on parts supply and inventory, maintenance, process optimization and more.

Read more at metso.com/railcar-dumper-upgrades

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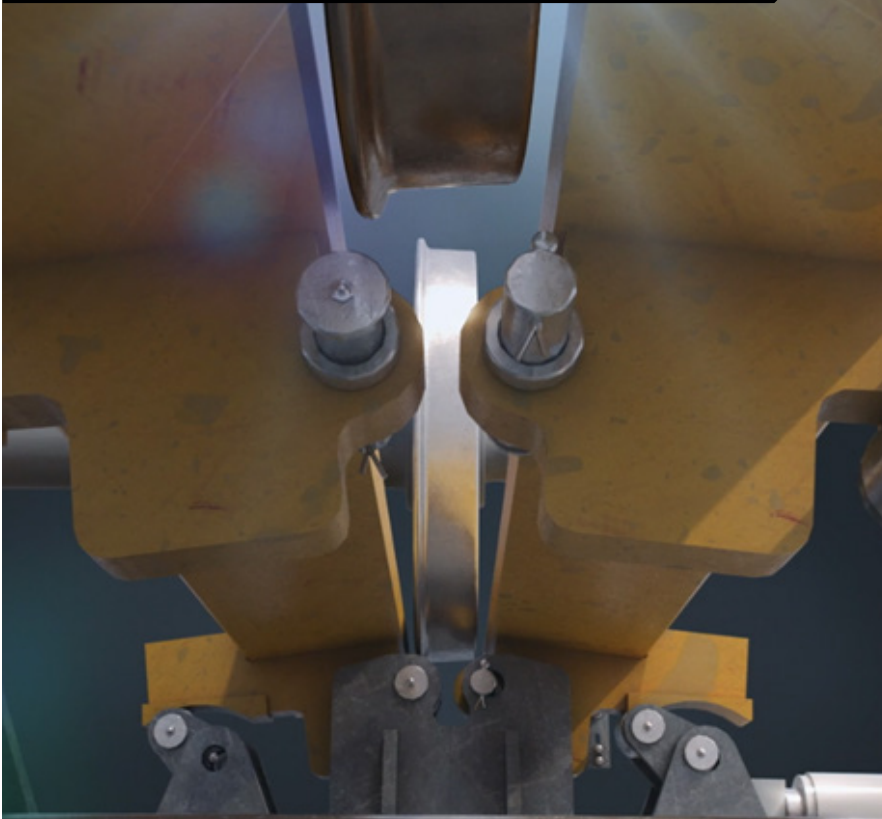
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Partner for positive change

Metso

Railcar dumper system upgrades

Low-profile wheel grippers



Application

Wheel grippers are safety devices located below the train rails. They feature two gripper bars that brace onto the railcar wheels to prevent uncontrolled wagon movement during the wagon tippler system operation.

Accurate wagon control is important to improve time cycles, increase production capacity and provide a safe working environment. The new Metso low-profile wheel gripper provides greater wagon control at lower cost for increased production.

Filling a basic need

Wheel grippers use a hydraulic clamp assembly installed beneath the rail track to secure a line of rail cars outside a dumper cell during wagon tippler operation. The grippers are mounted with gripper bars inside and outside the rail to apply balanced pressure on both sides of the wheel rim and prevent uneven loads. The grippers hold the wagons in position so they can be quickly located for the next tip. They also serve as a safety device to keep the car in place and prevent incidents that can be caused by car movement.

Reduce cost, increase control

Traditional gripper assemblies require deep excavation below the rail for installation. Metso has designed a new low-profile wheel gripper that requires minimal civil excavation and less downtime for installation. The design accommodates a wide variety of wagon sizes and wheelbases, and provides a tolerance for inaccurate wagon location.

The improved gripper assembly can be retrofitted to existing customer sites as well as new installations where lower gripping forces are required, such as sites where fewer rail cars are processed.

One solution, many advantages

The low-profile wheel gripper offers many advantages over traditional gripper assemblies. The new system is designed for ease of maintenance and enhanced safety

with operating cylinders located outside the track for greater part accessibility. The lower civil depth means simpler drainage with less risk of flooding the pit.

The solution also allows operators to support their sustainability targets. The new gripper design weighs nearly 35 percent less than conventional assemblies, enabling operators to lower their carbon footprint through reduced material consumption. The low-profile footprint also reduces installation downtime, operating cost and inventory holding while optimizing component service life.

Read more at
metso.com/portfolio/railcar-dumper-upgrades

Benefits

- Reduced civil depth
- Quick and easy installation
- Easier maintenance
- Lighter weight and less cost
- Reduced flooding

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Railcar dumper system upgrades

Dumper cage and clamps



Application

Extend the life of your railcar dumper by upgrading to rolled T end rings.

Protect your equipment and rolling stock by converting to breakaway dumper car clamps, UHMW wear strips in your blocking and adding/upgrading buffers for railcar dumper rotation.



Rollled T end rings

Traditional end rings are welded under the end ring rail and subject to high wheel loads. This critical weld often cracks prematurely, leading to end ring failure.

Metso constructs the flange and a portion of the web from a standard structural T shape, eliminating the critical weld. As a result, the high load zone has a rolled section with a large radius and the full penetration weld is removed to a low stress zone. This leads to a significantly longer end ring operating life.

UHMW wear strips for blocking system

UHMW wear strips are used to cushion the side of the railcar and eliminate scrubbing of the side walls. The UHMW material has a lower friction factor that reduces loads into the blocking structure and prolongs cage life. It also minimizes wear on the railcar siding. To make replacement simpler, the wear strips are bolted on in segments that improve maintenance efficiency.



If the existing blocking wall is not suitable or is worn out, a new blocking support structure can be provided to replace the existing one. Full length blocking can also be provided if required.

Breakaway car clamps

The breakaway clamp assembly uses a vertical pivot that allows the clamp head to rotate out of the way when struck on the side by a railcar or locomotive. Both the clamp and the dumper cage are protected. The clamp is held in place by a small shear pin designed to fail during a collision. After a failure, the clamp head is rotated back into place and the shear pin replaced.

Buffer for dumper rotation

The buffers are designed for an uncontrolled tip or high-speed dumper return. They absorb energy during unexpected stops due to a drive or brake failure. As a result, damage to the dumper and dumper drive equipment and components are minimized.

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Railcar dumper system upgrades

Trunnion assemblies



Application

Whether your railcar dumper is old or new, we can help take it to the next level.

Upgrade to a dual, triple or quad wheel trunnion design to increase your end ring, rail and trunnion wheel life.



Trunnion design

Metso's innovative trunnion design uses a self-contained, pre-assembled and pre-lubricated AP bearing design that reduces maintenance costs and increases reliability. A proven double sealing arrangement minimizes dust ingress and ensures correct lubrication to the wheel bearing.

Trunnion wheels are available in a range of materials to provide optimum wear life for the end ring rails. Individual wheels are housed in a dual wheel equalizer frame and can be independently replaced just by removing two screws.



The complete equalizer frame (dual or quad) slides to one side without having to pull a pin. Jacking pads can also be supplied to facilitate removal. This design significantly simplifies maintenance compared to alternative methods.

Enable trouble-free trunnion assembly adjustment and ensure correct alignment and proper dumper cage support by using a Metso designed dumper trunnion arrangement complete with base frames.



Dual, triple or quad wheel trunnions

Adding more trunnion wheels to your dumper system will better distribute the end ring load. This reduces the fatigue loading of each cycle, thus significantly extending dumper life. End ring rail and trunnion wheel surface wear life are also increased due to reduced stress.

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Railcar dumper system upgrades

Drive unit & hydraulic systems



Application

Options include raising dumper drive units to track level, converting to dual drives, installing a spindle operated dumper latch, relocating hydraulic manifolds, moving hydraulic power units off board and more.

Improve your safety and availability with drive and hydraulic upgrades.



Relocating drive to grade

Relocating drive units to upper floor (track level) avoids dirt and grime from the dumper pit area. This helps minimize material accumulation on the drives and promotes easier maintenance and service.

Conversion to dual drive

By converting to a dual drive, the material load is split approximately in half, which helps extend drive life. The second drive holds the cage during drive failures, preventing a cage runaway and can also be used to continue dumping until the train is completed.

Upgrades differ depending on the configuration of your machine. If driven from one end only, a second drive is added on the opposite end to eliminate the large torsional forces in the dumper cage. This lengthens cage life by minimizing shear stresses in front and rear girders and bolted connections.

If driven by a single drive with two pinions, the single drive is replaced adding drives at either end. This removes the requirement



for an extended cardan shaft and delivers a safer system with easier maintenance.

Off board HPU unit

One single main HPU unit designed to replace individual units per clamp cylinder. The unit is installed external from the dumper, away from the material being handled. This helps improve fluid cleanliness and eliminated leakage from rotary breathers. The upgraded unit also offers enhanced troubleshooting, better system reliability and simplified maintenance. A standby pump is recommended to ensure availability.

Hydraulic manifolds and check valves

Manifolds are relocated to the rear of the dumper to keep clear of dust from the dump side. Check valves are installed on the cylinders to protect the cylinder in case a hose breaks.

Dual hydraulic relief valve for car clamps

Enables clamping at low pressure and raising of clamps at high pressure. The valve also reduces the clamping load on the railcar sill and helps prevent damage.

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Railcar dumper system upgrades

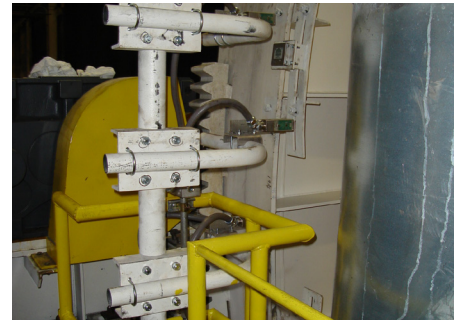
Electrical, instrumentation & controls



Application

From uploading individual sensors to a complete electrical instrumentation and controls (EI&C) package, many upgrade options exist to maximize throughput and ensure smoother operation.

Improve railcar dumper system diagnostics and/or make advanced controls more operator friendly.



Laser positioning system

Located at the end of the positioner track (off board), the laser distance measuring device is used to accurately determine positioner location. Its location eliminates its exposure to positioner movement shocks and stresses. It also eliminates slippage of fifth wheel during inclement weather conditions and does not require recalibration.

Limit switches

Traditional fork lever and arm actuated limit switches experience several problems ranging from corrosion to broken trip devices and arms. To avoid these issues, Metso has developed non-contact replacements for older type position sensors.

Resolver

Metso's resolver upgrade is a replacement for a dumper drive encoder and cam limit switches. It eliminates the need for a reduction gearbox and enables car clamps to be locked and released at specific points of the dumper rotation. This makes the resolver very easy to set and change.

Control system

Metso has many system upgrades for the



latest technology and functionality available, including:

- Latest version PLC processor upgrade
- Reuse existing or upgrade to latest version I/O modules or upgrade for system or machines in stages
- Upgrade PLC communication network to Ethernet/IP, ControlNet, and DeviceNet or wireless platforms
- Remote I/O upgrades to minimize wiring
- Replace analog and digital I/O interface to motor controllers. Replace existing field device I/O with distributed I/O or PLC platform communication ready devices

Variable speed drives

Replaces existing single-speed and two speed dumper controllers with a true four quadrant adjustable speed controlled torque driven system. It provides controlled acceleration and deceleration that softens the impacts that occur during speed changes and at the start and end of the dump return cycle. Brake wear is minimized as stopping of the dumper and positioner is accompanied by regenerative motor torque. Dumping cycle can also be decreased by increasing motor speed without changing gearing.