



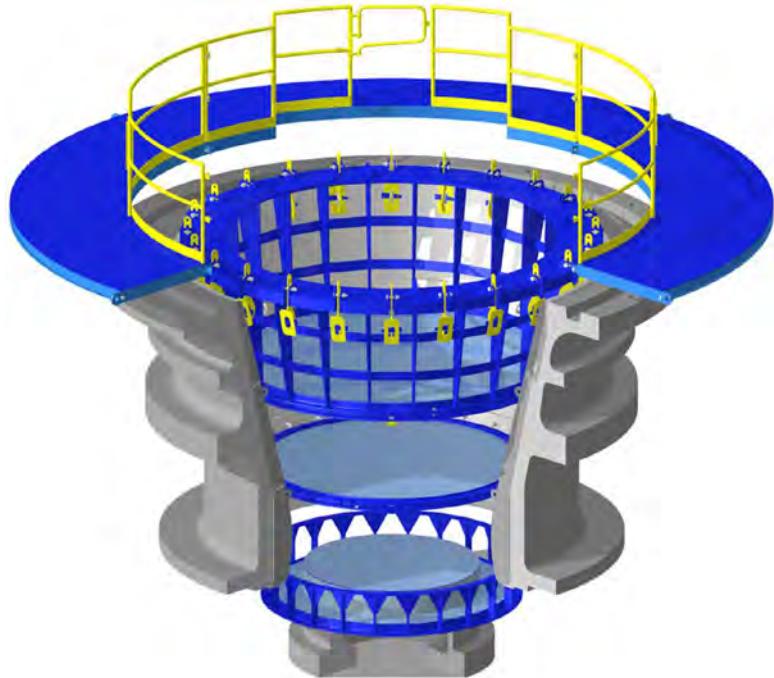
Tooling Powered By:
TRI STAR
DESIGN & MANUFACTURING, INC.

Crusher Maintenance

Safer – Faster – Smarter Crusher Maintenance



ME FIT CRUSHING



Power Shackle™

- Streamline your mainshaft and crusher maintenance
- Engage and disengage loads beyond personnel access
- Physically locates & positively locks onto lifting eye
- Remote controlled & powered with a rechargeable battery
- Up to 150T capacity
- Very low-profile design for crane height constraints (typically the same height as a screw-pin shackle)
- Use with all TSD Crusher Tools
- Certified to ASME B30.20-2013 “below-the hook” lifting



Sold as a kit containing:

Below-the-hook Power Shackle

Designed specifically for your crusher and crane, includes battery and remote control

Transport & Storage Stand

Store and transport shackle easily with crane or forklift

Replacement Mainshaft Lifting Eyes

Sold separately, if required.



Spider Lifters

Our Spider Lifters will lift out and replace the entire spider assembly, without placing a man in the dump pocket. No more time consuming and dangerous rigging operations. Crane operator can easily position the spider lifters to pick up the spider evenly and safely, from outside the dump pocket. Each device is PE stamped and certified to ASME B30.20 for "Below the Hook" lifting devices. We make this tool for all makes and models of gyratory crushers. This also works well with our Power Shackle and certified Sawhorses.



A safer way to remove the spider



Spider Hook™

- 10k – 20k pounds
- Great solution
- Swing from side
- Crusher specific

Z Hook™

- 8k – 16k pounds
- Most versatile
- Requires taglines
- Fits multiple crushers

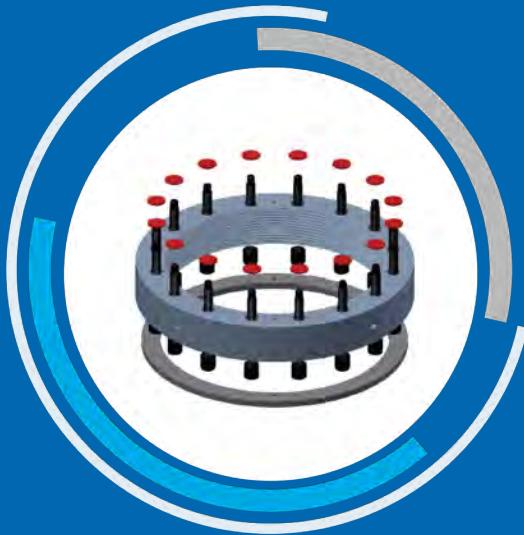
WASP™

- 10k – 20k pounds
- Safest solution
- Easiest to use
- Spider is "locked" in place
- Crusher specific

EZ Head Nut™

for gyratory crushers

Our EZ Head Nuts can easily be installed with just one person. No more ramming and banging to tighten. Simply screw nut in place, tighten the threaded push rods with an impact wrench, and you can achieve more torque than the old OEM models. These EZ Head Nuts are available for many sizes and brands of gyratory crushers. For a price comparable to that of an OEM nut... Why not upgrade?



- All parts are made “crusher duty”
- Most parts are held in stock
- All components are replaceable
- We guarantee the fit!

EZ Head Nut™

for cone crushers

Our EZ Head Nut can be installed with just one person. No more ramming and banging to tighten. Simply screw nut in place, tighten the threaded push rods with an impact wrench, and you can achieve more torque than the old OEM models. These crusher nuts are available for many sizes and brands of cone crushers such as MP, Raptor, Sandvik, etc. For a price comparable to that of an OEM nut... Why not upgrade?



- All parts are made “crusher duty”
- Most parts are held in stock
- Standard and short head use the same nut: minimal inventory
- All components are replaceable
- We guarantee the fit!

Mantle Clamp

for cone crushers

The Patent Pending Tri Star Mantle Clamp virtually eliminates metal on metal impact for installation & removal. The mantle clamp replaces the OEM head nut with a clamp. With a one-time retrofit (inner nut) the threads are eliminated, and the mantle clamp is easily set in place and installed with torque wrenches. With a controllable torque setting, the mantle is held in place accurately and securely every time. These Mantle Clamps are available for many sizes and brands of crushers.



EZ-Spider Nut™

Utilizes our proven torque bolt design to provide consistent and precise holding force with minimal effort! The split nut allows for easy assembly. It locks the nut in place to prevent loosening.

Mainshaft Work Platform

Our generous size work platforms allow the entire crew to easily maintain crusher mainshafts. The convenient height of the work deck and handrail system eliminate ladders and fall risks normally associated with this type of work. The portable rolling platforms securely wrap around your mainshaft when sitting in a staging pit. Built-in staircases allows for safe and easy access to the upper work deck.



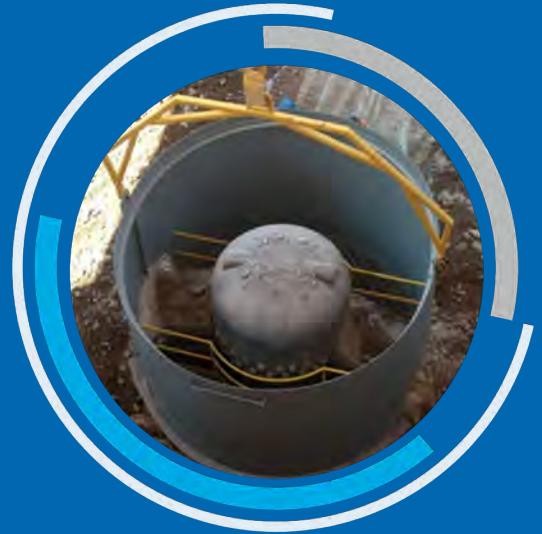
Crusher Access Workstation

Our Crusher Access Workstation provides safe and quick access inside your gyratory crusher. After minimal cleaning in the dump pocket, the Spider Access Deck, Chamber Walls & Access Stairs are placed in the crusher. These eliminate fall hazards and provide convenient, safe working for personnel.



Safety Chamber for gyratory crushers

Our Safety Chamber can be set in place in minutes, without cleaning out the dump pocket. This tooling is typically used to cut out tramp metal, replace wear liners or weekly inspections. With our Access Stairs, we provide safe access from the top of the dump pocket to the top rim of the Safety Chamber



Access Tooling for cone crushers

Our Cone Crusher Access Tooling provides safe and quick access inside your cone crusher. After the bowl is removed, Access Stairs and Platforms are placed in the crusher. These eliminate fall hazards and provide convenient, safe working surfaces for personnel.



Spider Access Deck

Our Spider Access Deck eliminates many of the risks associated with burning tramp metal. It sits in your crusher to give safe access to the spider. You can safely and easily perform maintenance without annoying lifelines. We make this tool for all sizes and models of gyratory crushers. Works in conjunction with the Crusher Access Workstation for a more complete maintenance solution.



Features:

- Safely and easily place into the crusher
- Provides complete fall protection in the dump pocket
- Rests on rim of crusher
- Provides access into the crusher
- Hinge-up flooring and permanent grating for increased protection during tramp removal

Uses:

- Safe access into crusher
- Weld wear blocks
- Inspect dump pocket
- Inspect bushings
- Rig the spider cap and spider for removal
- Heavy duty flooring provides protection while burning tramp
- Burning rods fit conveniently through grating

Primary Corral

This drop-in platform provides handrail and decking around the top opening of the crusher. It is to be used during crusher maintenance when the pocket is clean and the spider has been removed. With the Primary Corral in place, workers can be in the dump pocket without annoying lifelines. All of our other crusher rebuild tooling can be used while the Primary Corral is in place.



Safer and more efficient

- Easily assembled inside or outside of the dump pocket
- MSHA approved handrails
- Tie-off points can be used while working inside the crusher
- Four stackable sections for easy storage

Tramp Removal Equipment

Remove tramp from your crusher quickly and safely with our tramp removal tools.



Tramp Removal Metal Shield

A man can safely stand behind this protective shield and cut tramp in a safe and convenient position.

Hydraulic Tramp Puller

Safely remove tramp without introducing heat with our customized puller. Minimize danger and damage to liners. Up to 200 tons of pulling force

Robotic Cutting Arm

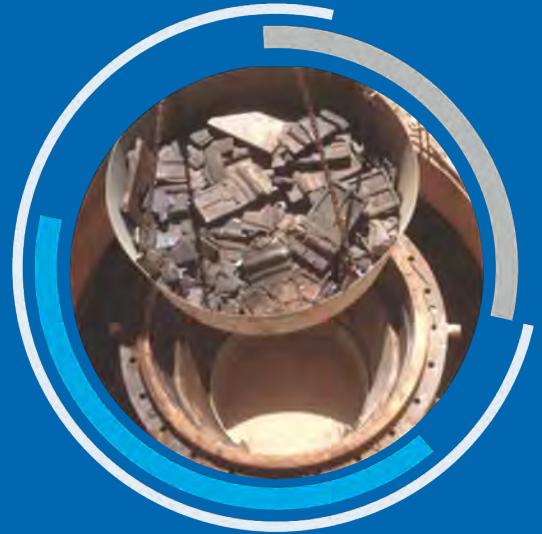
Tramp metal can be safely cut from outside the dump pocket with this remote-controlled robotic cutting arm.



Dump Pans

Our concave dump pans are especially designed to fit your requirements with many innovative features:

- Heavy duty construction ensures many years of service.
- Each Dump Pan will usually hold the entire row of concaves.
- Empty Dump Pans can double as a platform where workers can stand to help prepare the crusher shell before installing new concave liners.
- The first row Dump Pan sits over the air tower and protects it from dirt and damage while working.



Setting Fixtures

Our concave setting fixtures are the engineered tools you need to get the job done quickly and safely.

Save time and money by:

- Setting a complete row of concave liners in one crane pick
- Loading the fixtures in off peak hours will minimize crusher down time
- Detachable floor provides a safe work platform for the balance of work done by the installation team

Increase worker safety by:

- Eliminating single liner installation
- Eliminating overhead crane loads
- Reducing worker pinch points
- Eliminating manually moving heavy castings

Mainshaft Support Stand

Heavy structural frame will support the entire mainshaft assembly with wear metal. Plastic pads guide and protect the mainshaft stem.

Typical applications include short or long term mainshaft storage, shaft or seal inspection and replacement of the bottom brass. When properly anchored to your concrete slab, our stands are rated for seismic zone IV.



Heavy Duty Sawhorses

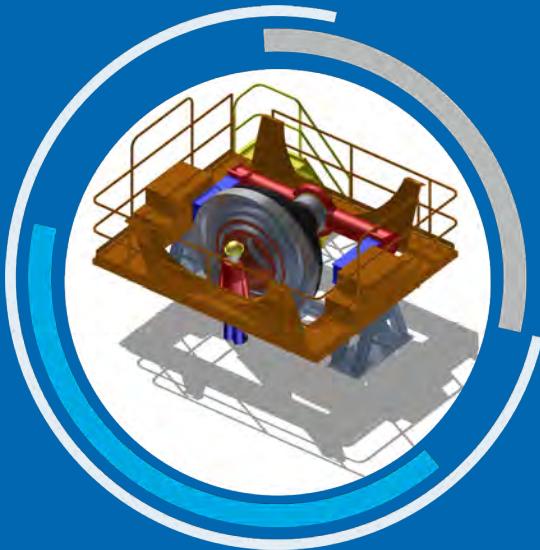
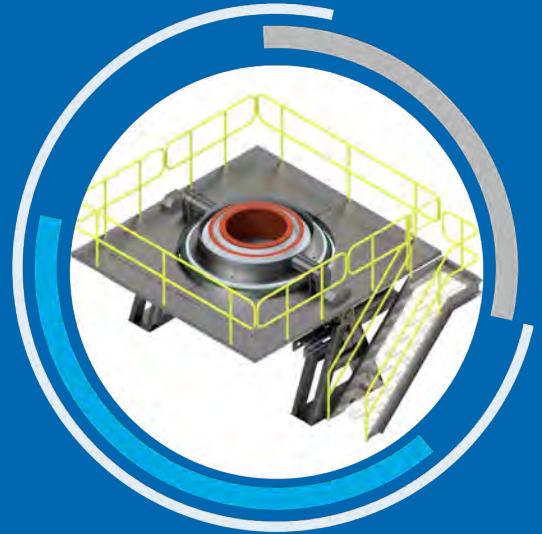
Our versatile sawhorses are built for the toughest applications and can be made to any height and length.



Head Rotator

for cone crushers

Our cone crusher head rotator provides a safe and efficient workstation for inspecting, rebuilding, and maintaining all makes & sizes of cone crushers. Rotation can be done with a hydraulic system or with an overhead crane. Each table is customized to meet your specific needs.



Features:

- Multi-positional rotation access platform
- Stand-alone electric powered hydraulic power unit or use of overhead crane
- MSHA approved handrails and platforms
- Multiple design configurations to choose from
- Integrated safety lock
-

Benefits:

- Eliminates work under a suspended load
- No need to re-position head for full inspection / maintenance
- Full 180° rotation allows full head access
- Designed to use in conjunction with other cone crusher tooling we offer



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