



# Vertical Shaft Impact (VSI) Crushers

Designed and Manufactured by:

Impact Service Corp.<sup>®</sup> (ISC<sup>®</sup>)

Spokane, Washington USA

Established 1984

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## ISC<sup>®</sup> display at CONEXPO 2008:

- ISC<sup>®</sup> Model 103  
with Dual 400HP
- ISC<sup>®</sup> Model 66  
with Dual 150HP  
on ISC<sup>®</sup> Support  
Frame with  
Discharge Conveyor

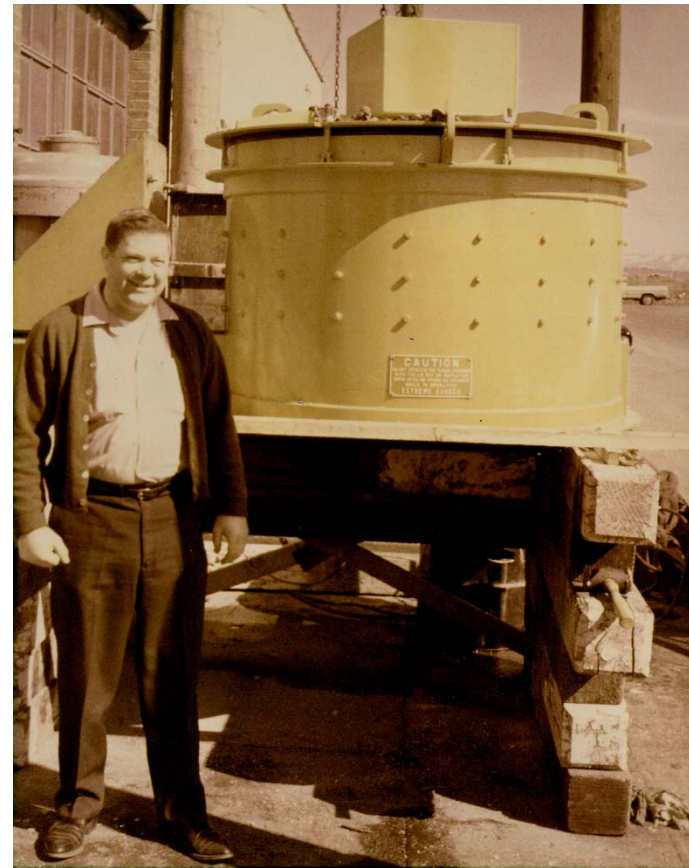


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## ISC® Background

- 1967 Don Warren Developed and Patented the CIMCO VSI
- 1970 Company sold to Spokane Steel Foundry
- 1973 Company name changed to Spokane Crusher
- 1983 Company sold to Pioneer moved to Minneapolis, MN



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## ISC<sup>®</sup> Established 1984 in Spokane, WA

- The Difference is...
- Service
- Expertise
- Product
- Quality
- The Difference is ...ISC<sup>®</sup>

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## More ISC<sup>®</sup> Background

- Developed Replacement Wear Parts for Spokane Crushers
- Repaired and Developed Components for Spokane Crushers
- Developed Lid Lifters, Externally Adjustable Feed Tubes, and Adjustable Feed Splash Plates to upgrade Spokane Crushers
- Bought, Refurbished, and Resold Used VSI Crushers
- Converted Competitive VSI Crushers
- Built first New ISC<sup>®</sup> Machine in early 1986, now over 400 worldwide
- Developed Larger Diameter Double Bolt Impeller Tables with More Shoes and Top Table Plate Assembly
- Developed Double Pocket Impeller Shoes
- Expanded VSI Product Line with more Model Sizes
- Continual Development of Improved Wear Parts Designs

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## Vertical Shaft Impact (VSI) Crusher

- Different VSI Chamber Types
  - Metal on Metal / Shoe and Anvil  
(Standard ISC®)
  - Metal on Rock / Shoes and Rock Shelf  
(Optional ISC®)
  - Rock on Metal / Rotor and Anvils
  - Rock on Rock / Rotor and Rock Shelf

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## Vertical Shaft Impact (VSI) Crusher

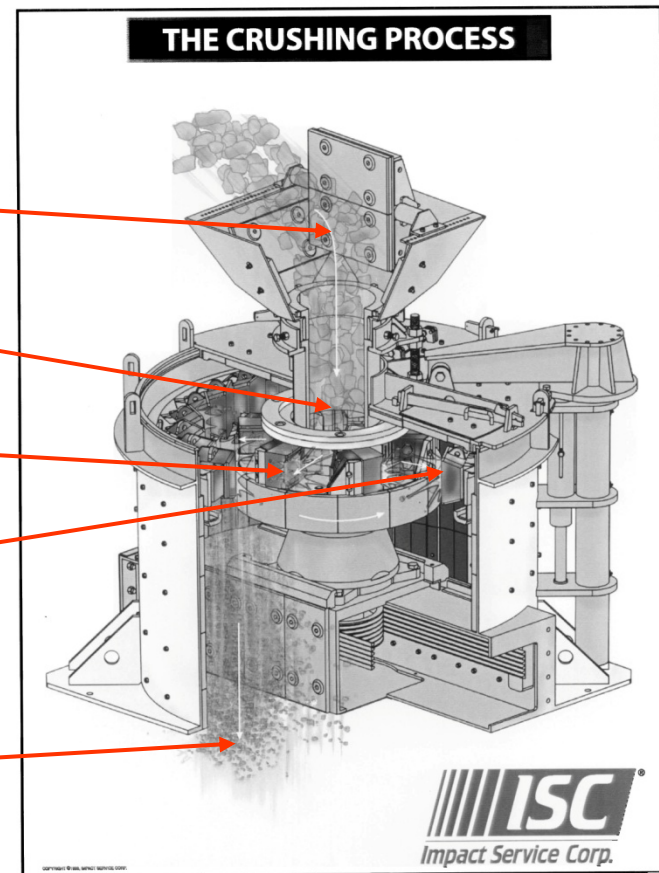
- Shoe and Anvil Type
  - How it Works – Mass versus Velocity
  - True Impact Crushing, no Sizing Zone
  - Impeller Table Speed
  - Quantity of Impeller Shoes
  - Shape of Impeller Shoes
  - Shoe to Anvil Throw Distance
  - Geometry for Maximum 90° Impact

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## How it works

- Feed enters Feed Box directed by Splash Plate down Feed Tube
- Material lands on Feed Disc and is picked up by Impeller Shoes
- Approximately 50% of crush resulted across Impeller Shoes
- Material is accelerated radially outward to Anvils striking at 90° impact
- On impact with Anvils material falls downward out from under machine



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### • Product Line

- Nine (9) VSI Model Sizes
- Model 41, 55, 66, 72, 77, 82, 92, 103, and 130 (Model size denotes Tub Diameter in Inches)
- Feed Size Ranges from 1-1/2" to 12" (longest dimension)
- Thruput Ranges from 75 to 1200 TPH
- Stationary Support Frames
- Portable Chassis Mounts
- Upgrade Conversions for ISC<sup>®</sup> and Competitive VSI Crushers

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## Vertical Shaft Impact (VSI) Crusher

- Model Size Selection
  - Feed Size
  - Thruput Tonnage
  - Product Requirement
  - HP Requirement, 1.2 to 1.4 HP per Ton Total Thruput is General Rule

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## Vertical Shaft Impact (VSI) Crusher

- Benefits:
  - Cubical Product Shape
  - High Capacity
  - High Reduction Ratios
  - High Fracture Count
  - High Product Yield
  - Circuit Simplicity
  - Low Capital Investment
  - Product Beneficiation
  - Consistent Gradation thru Wear Life Cycle

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# ISC<sup>®</sup> Model 77-VSI Crusher Assembly

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## ISC® Model 77-VSI Crusher

- Single Electric
- Lid Raised and Rotated

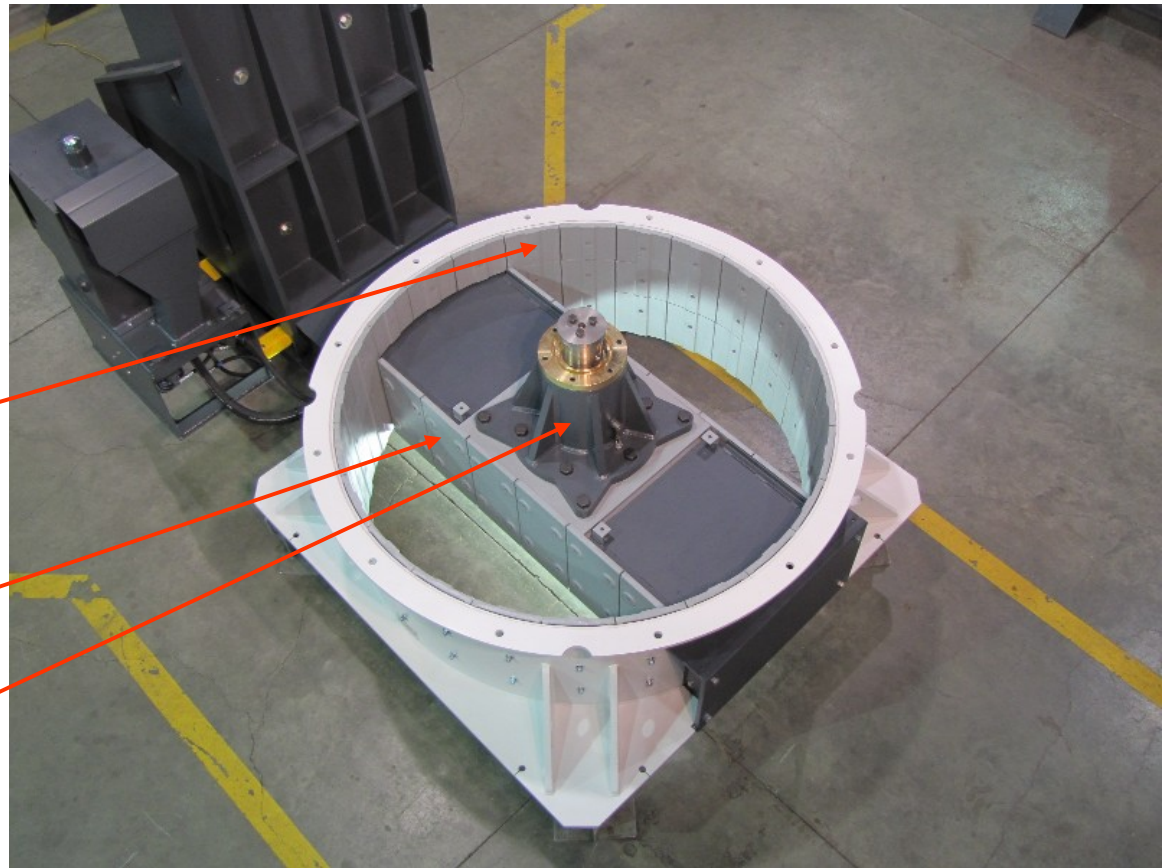


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## Lower Main Frame Assembly

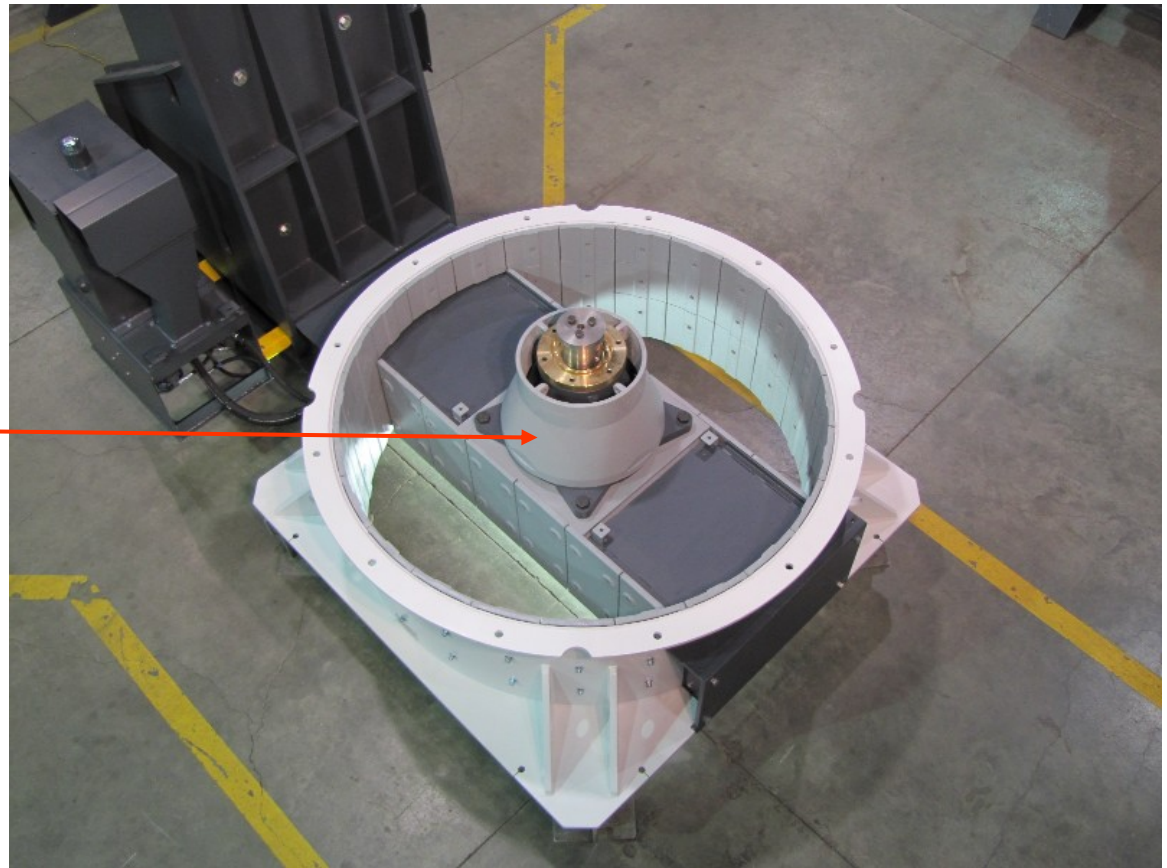
- Cast Segmented  
Tub Liners
- Cast Drive  
Tunnel Liners
- Bearing  
Assembly



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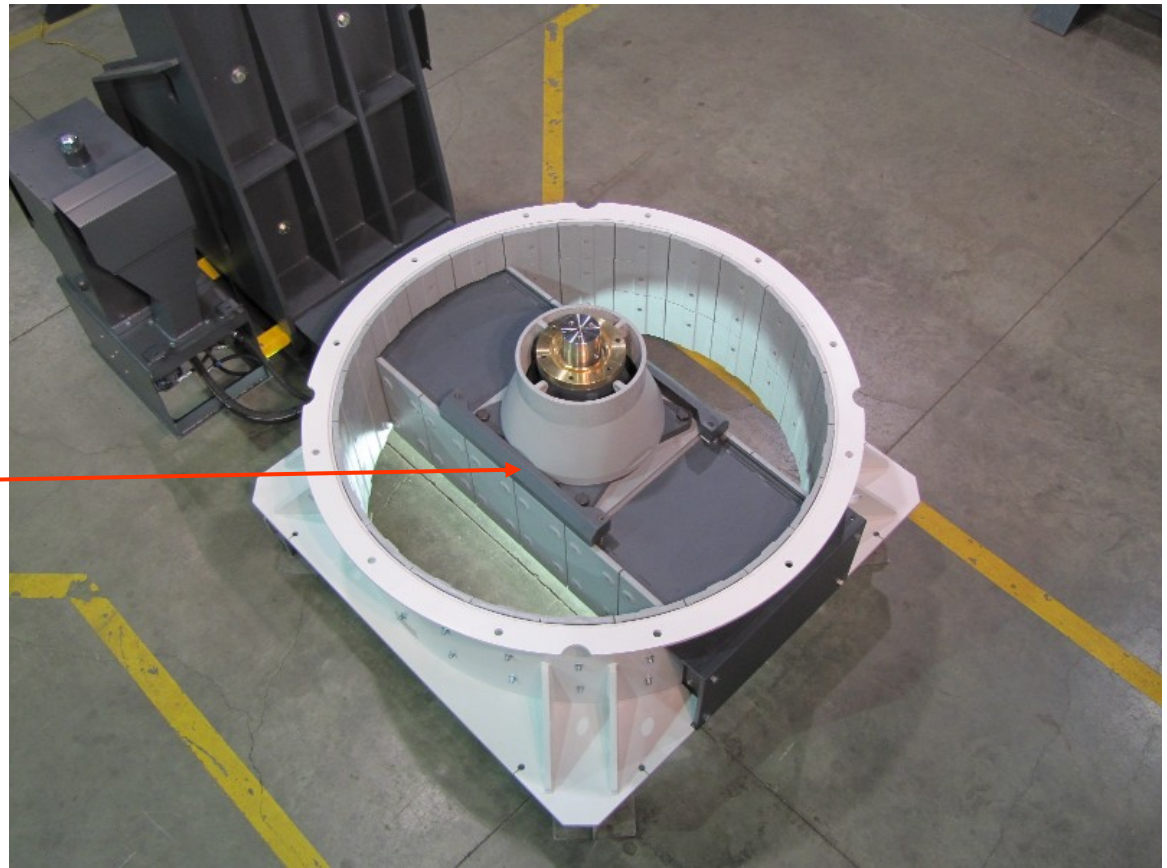
- Cast Pedestal Skirt Cone



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- Cast Pedestal Bolt Guards

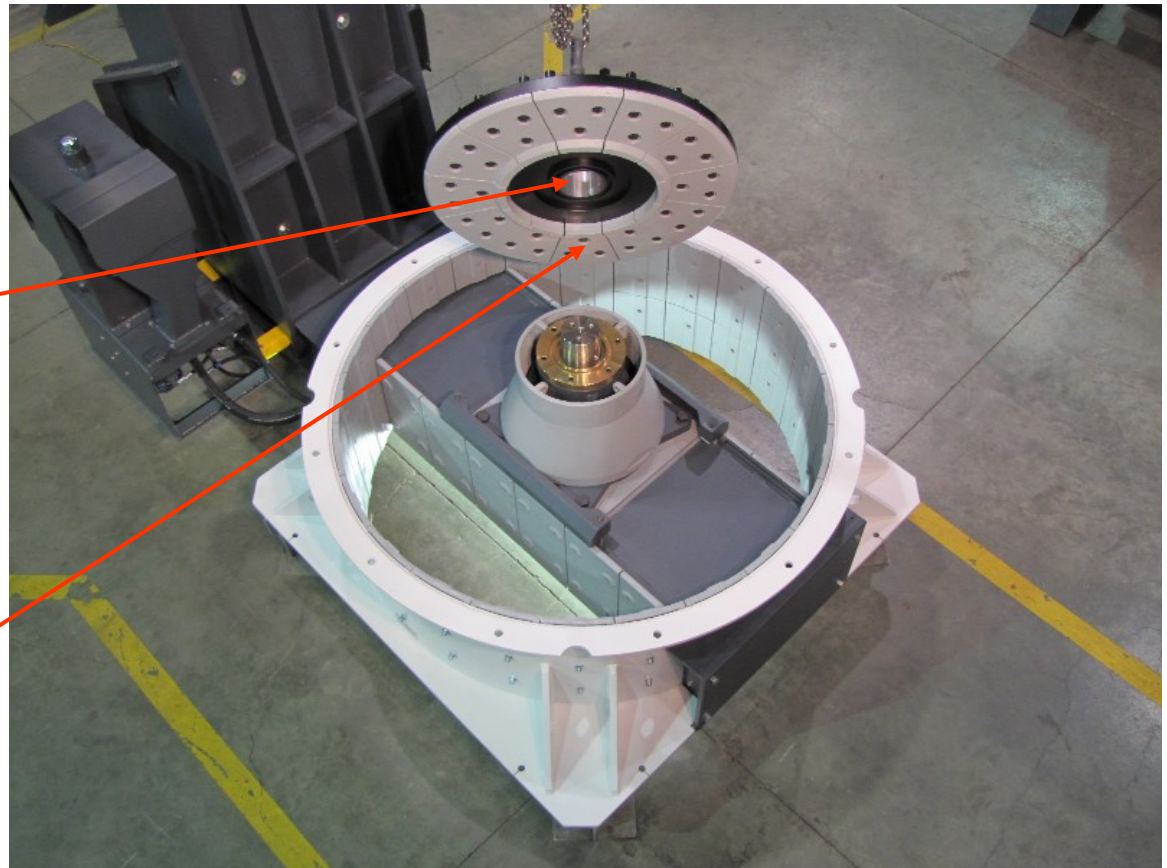


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- Flywheel  
Tapered Bore

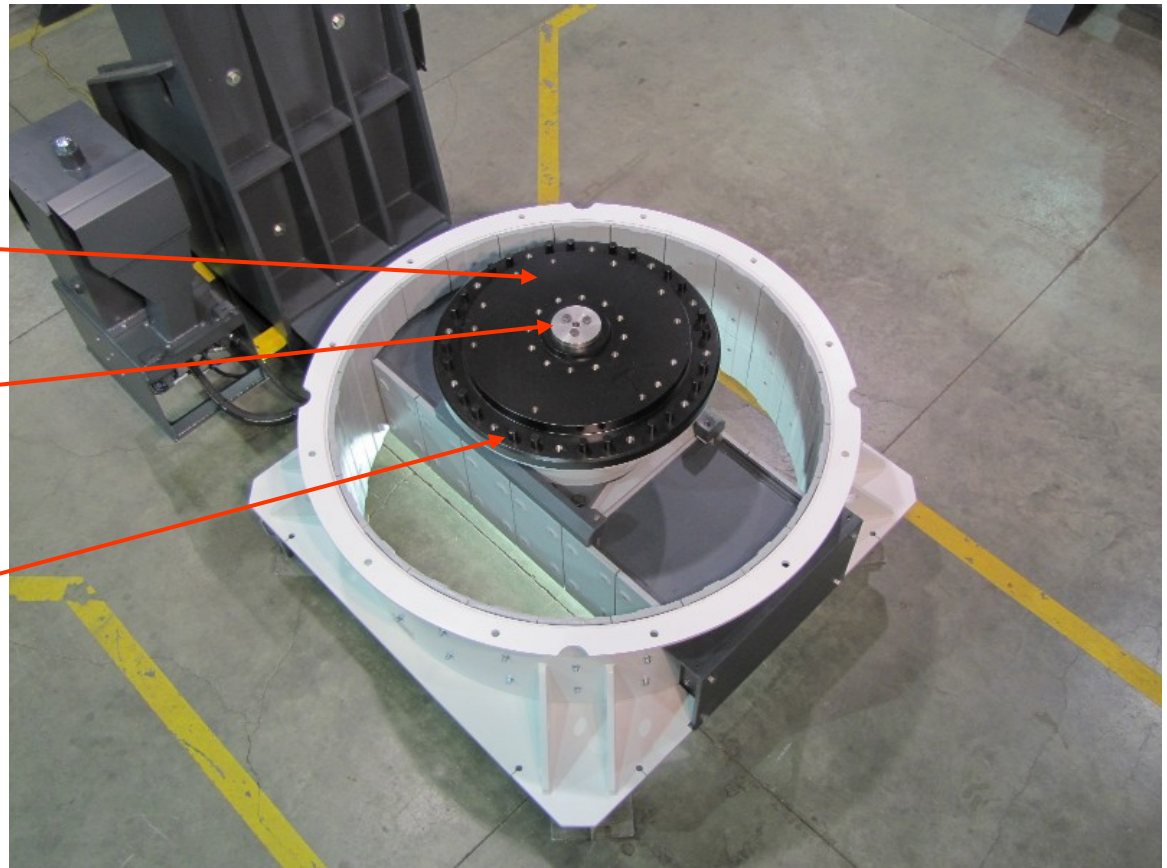
- Cast Segmented  
Bottom  
Flywheel Liners



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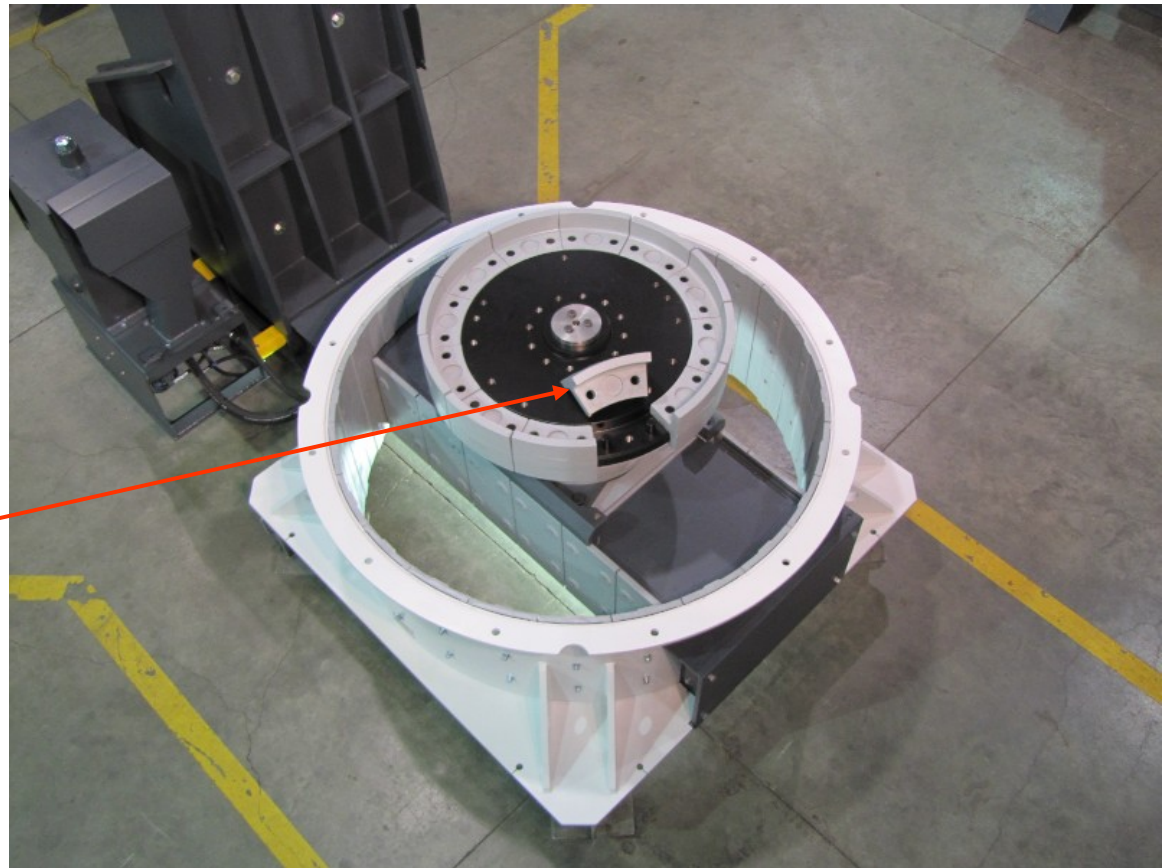
- Flywheel
- Bolt Cap with Hex Bolts
- Dowel Pins for Outer Table Liners



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- Cast Outer Table Liners, slip over Stress Proof Pins

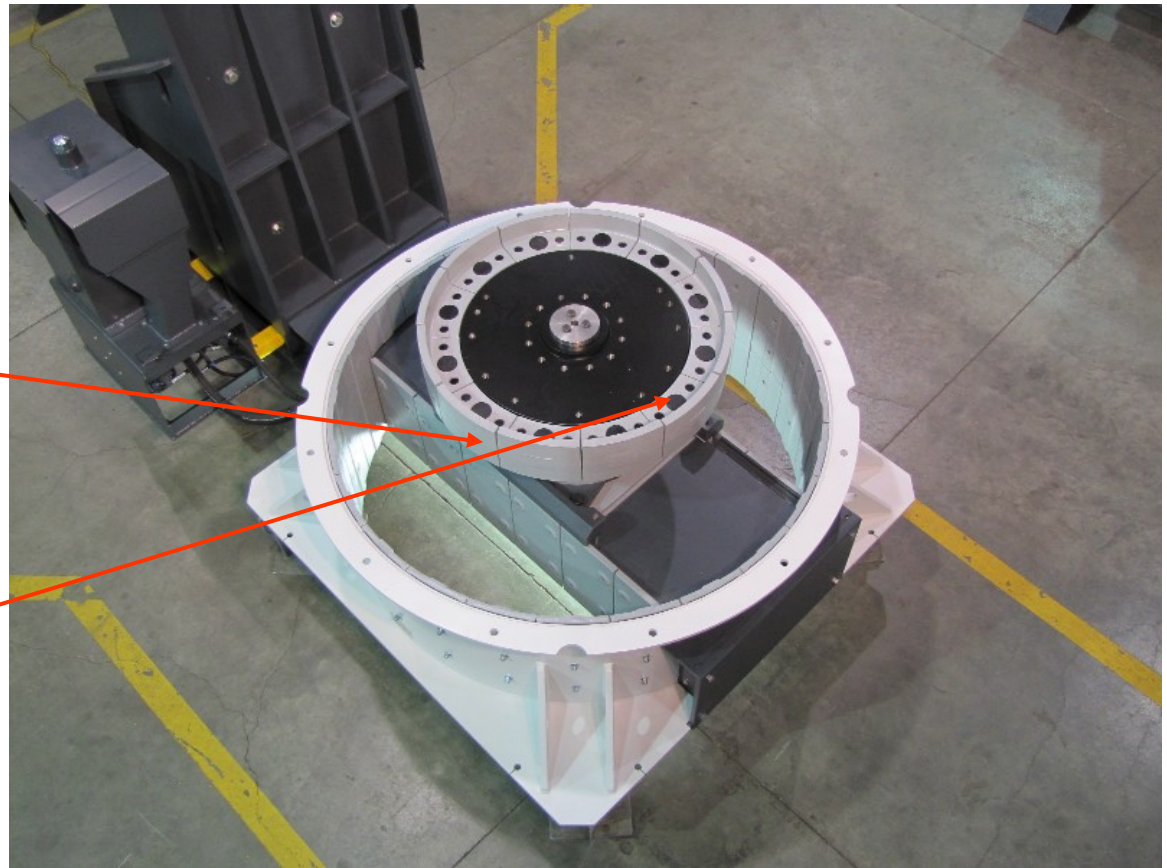


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- Cast Lined Flywheel Assembly

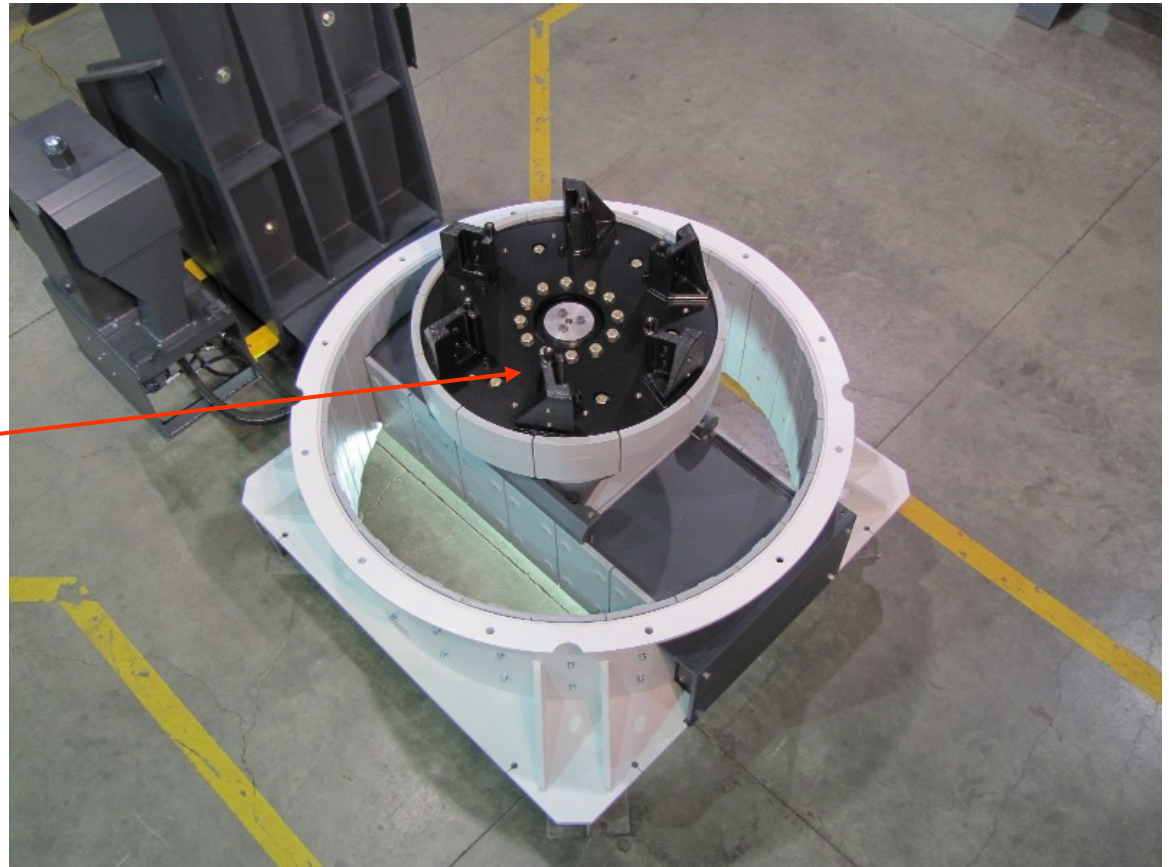
- Rubber Pad for Outer Table Liner



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- Impeller Table

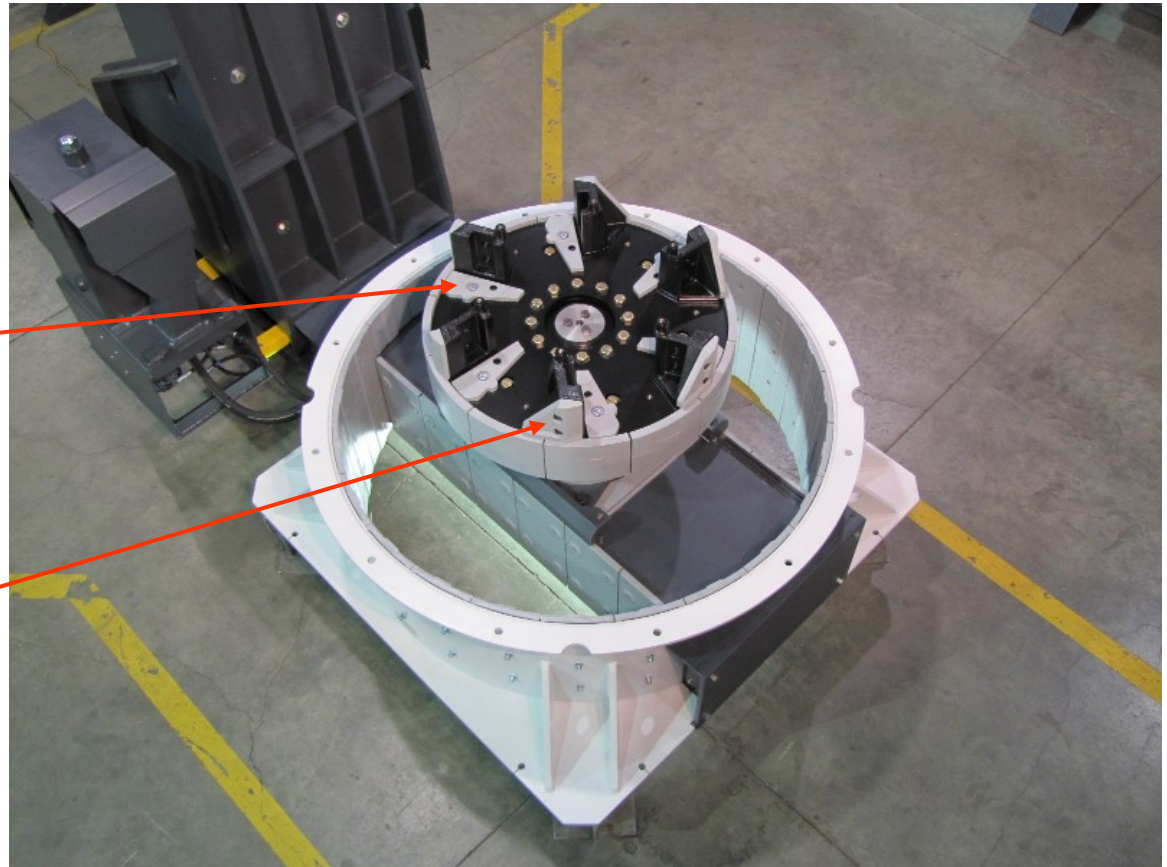


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- Cast Table  
Liner Insert

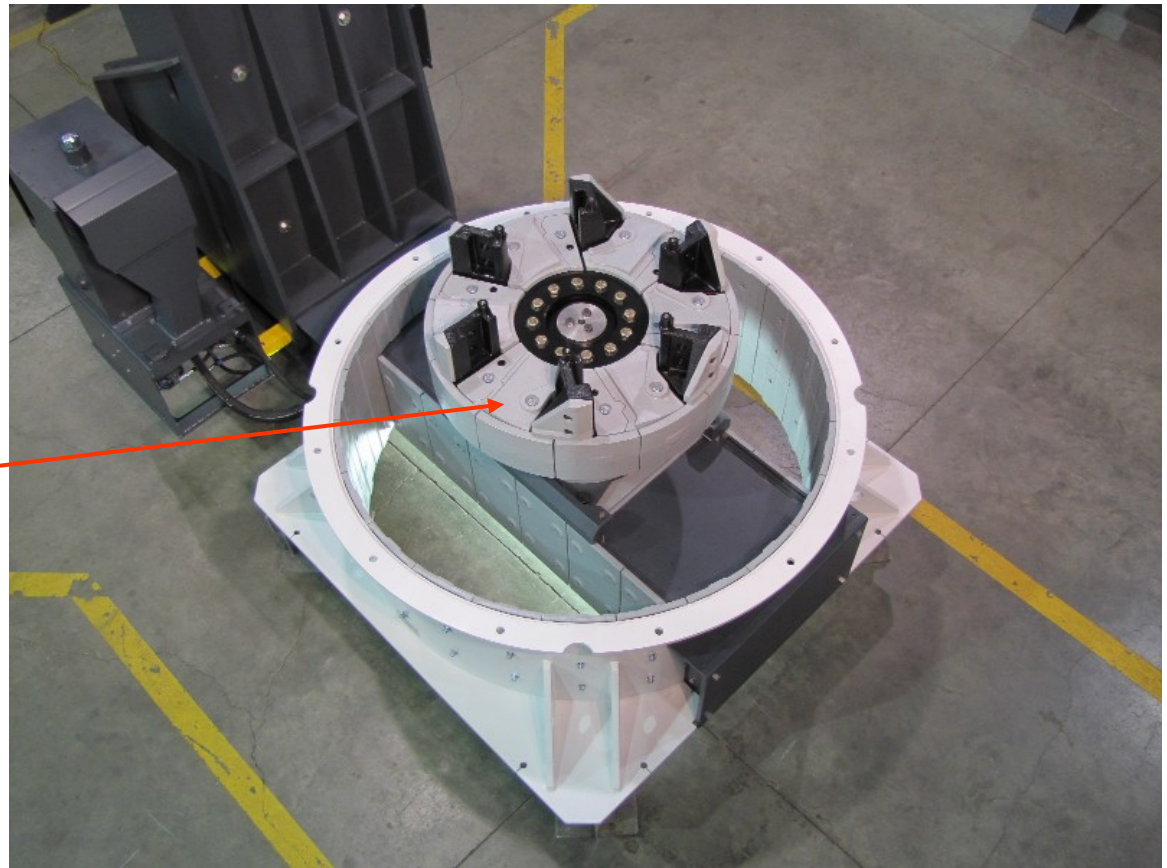
- Cast Shoe  
Bracket Liners



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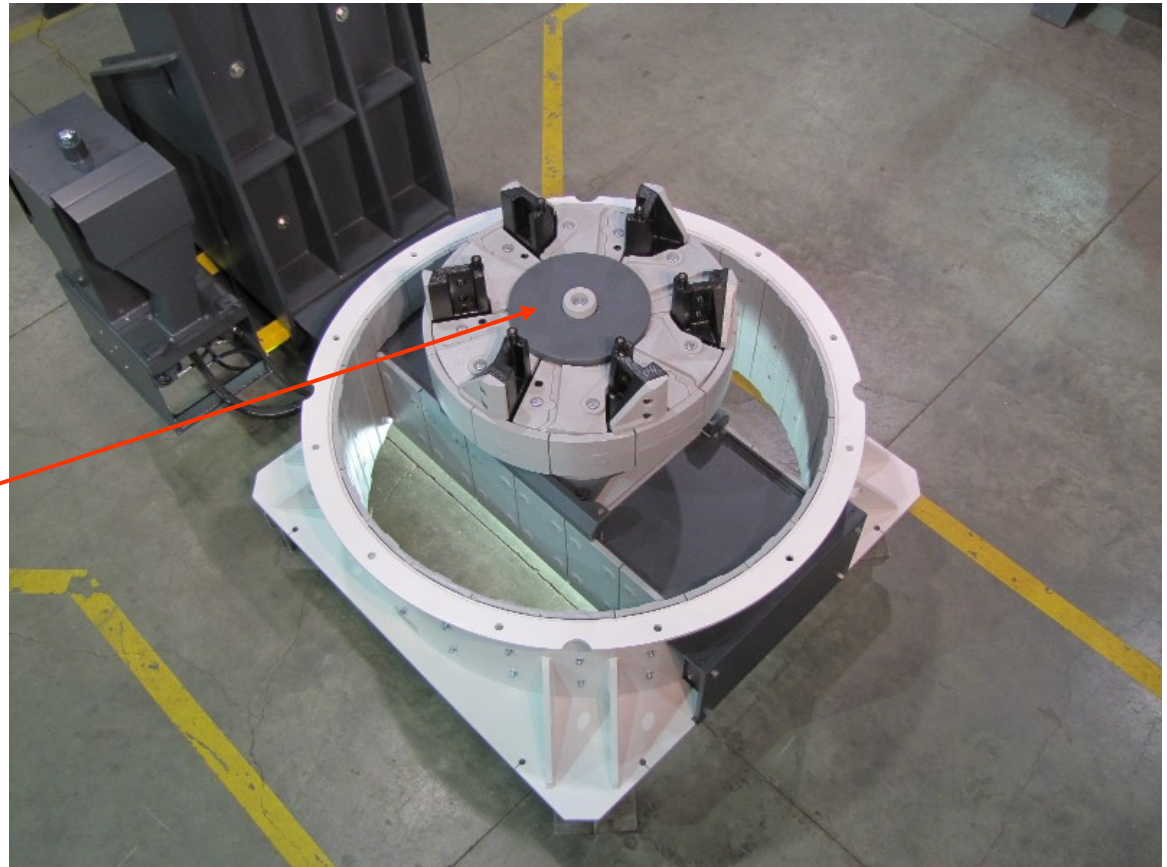
- Cast Ramped Table Liners



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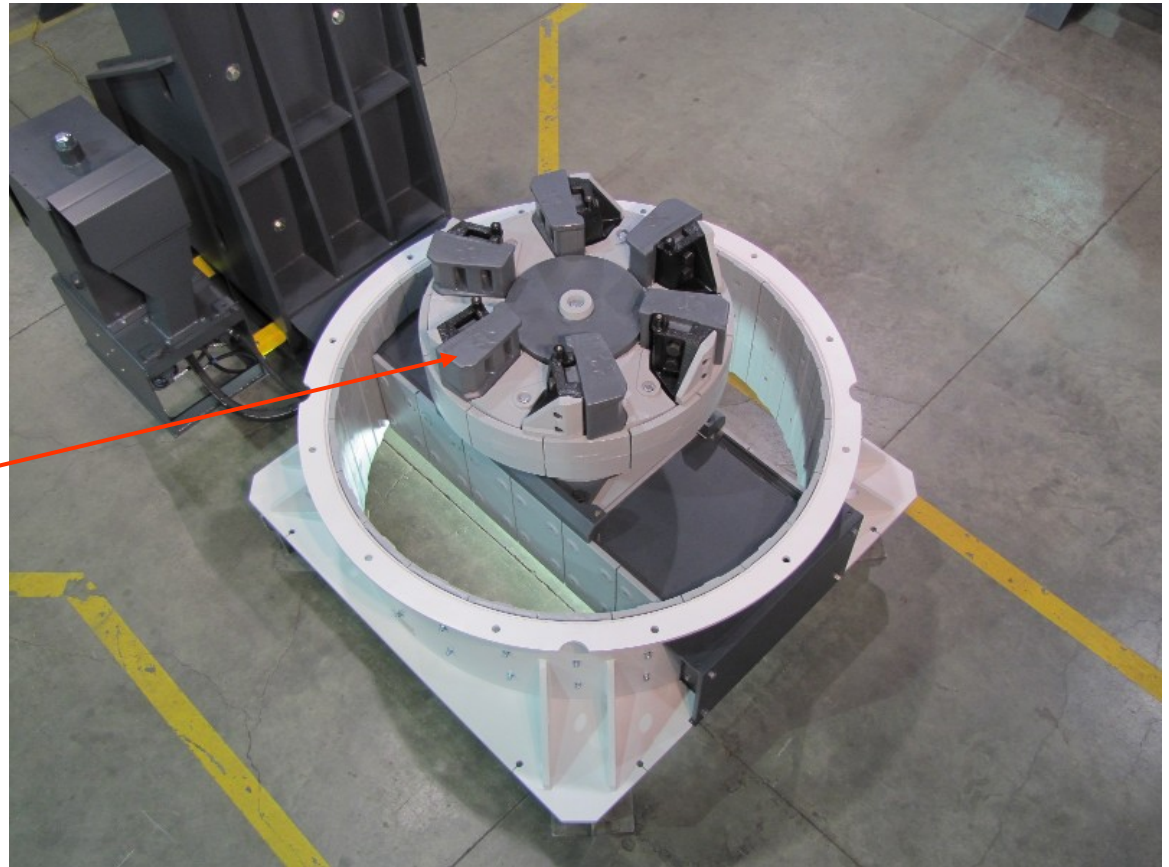
- Bolt-in Heat Treated Feed Disc with Cast Bolt Cap



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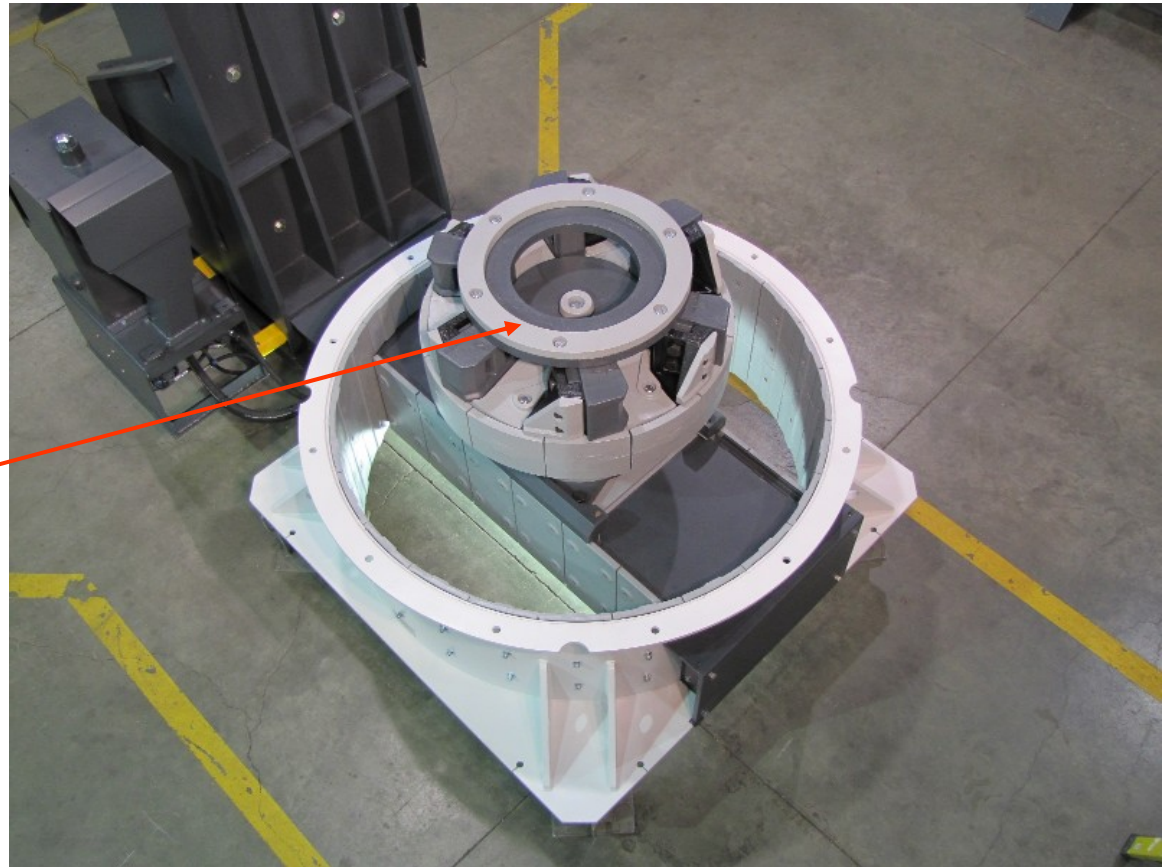
- Bolt-on Impeller Shoes



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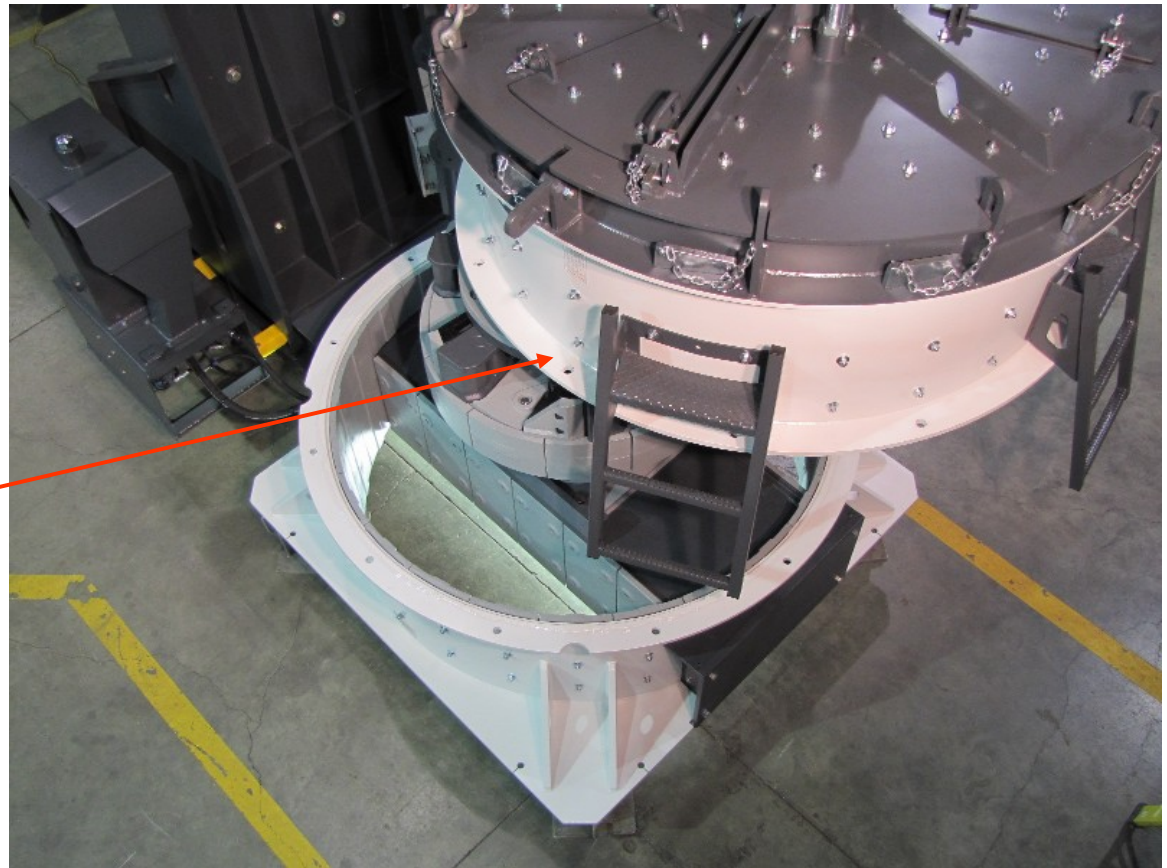
- Bolt-on Top Table Plate Assembly



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- Bolt-on Upper Tub Assembly lowered into place

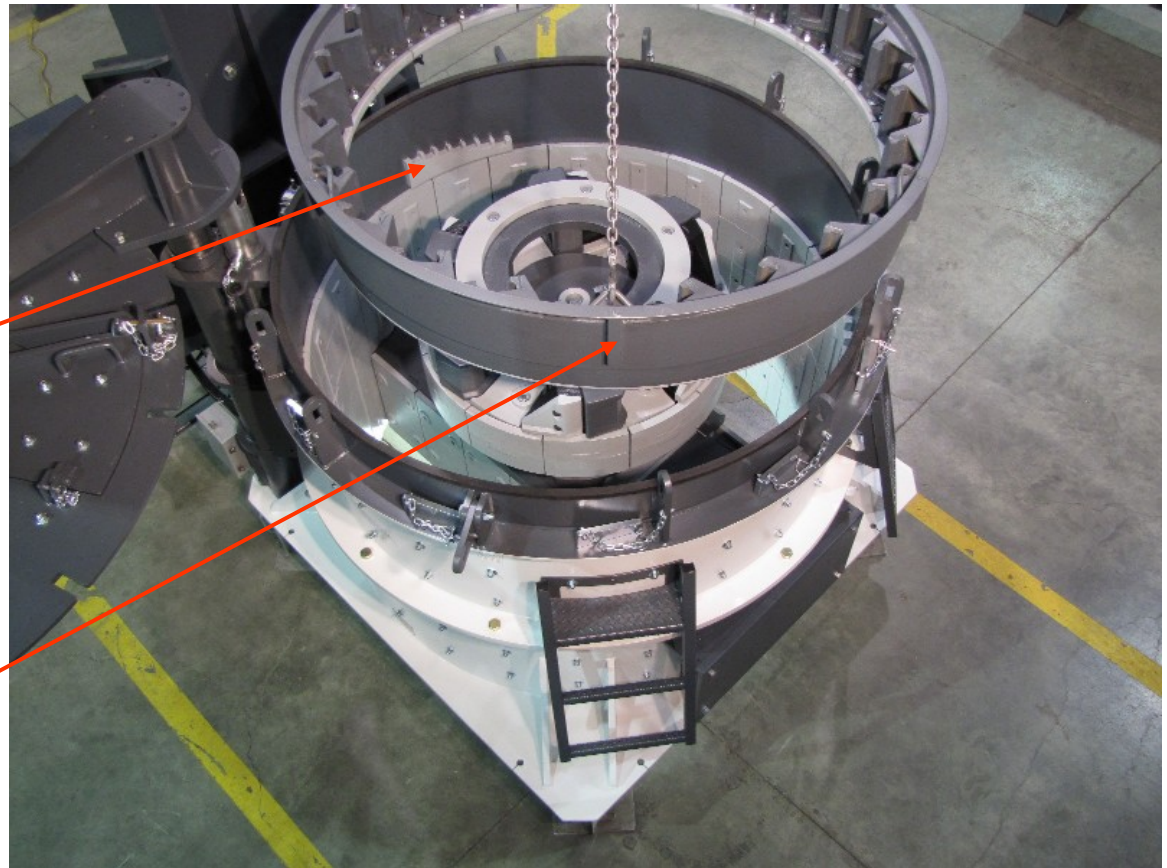


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- Anvil Ring  
Adjustable Step  
Brackets in  
Upper Tub

- Anvil Ring Lugs  
sit in Slot of  
Step Brackets

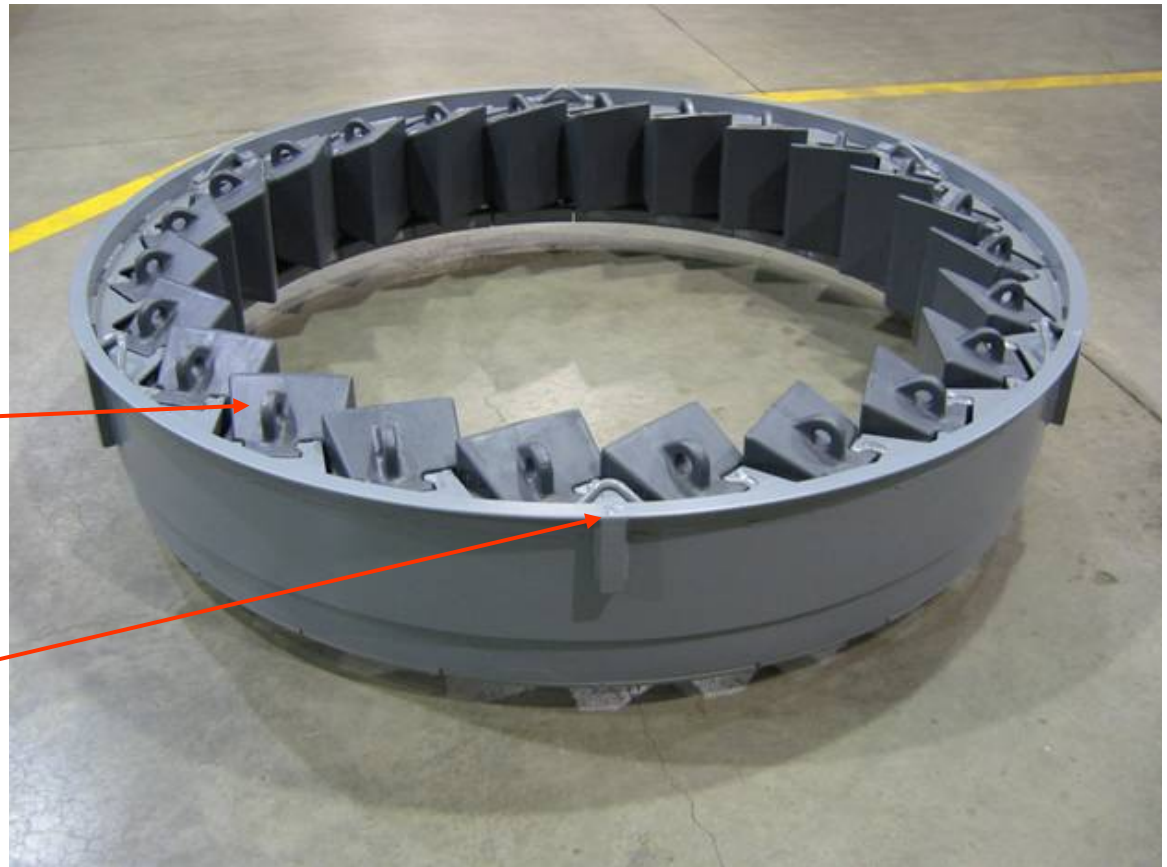


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- Anvil Ring Assembly with slip-in Dovetail Anvils

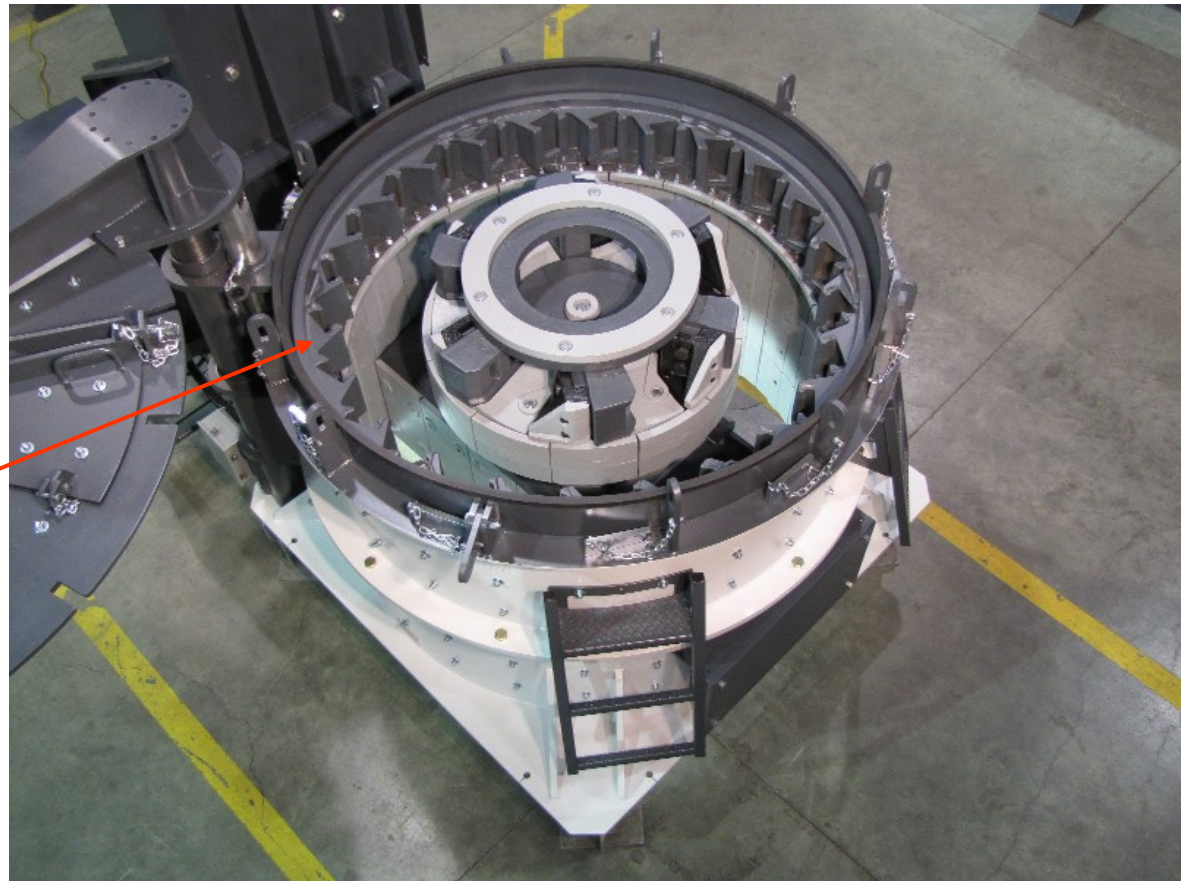
- Anvil Ring Lugs and Lift Eyes



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- Anvil Ring with tapered dovetail Brackets Installed

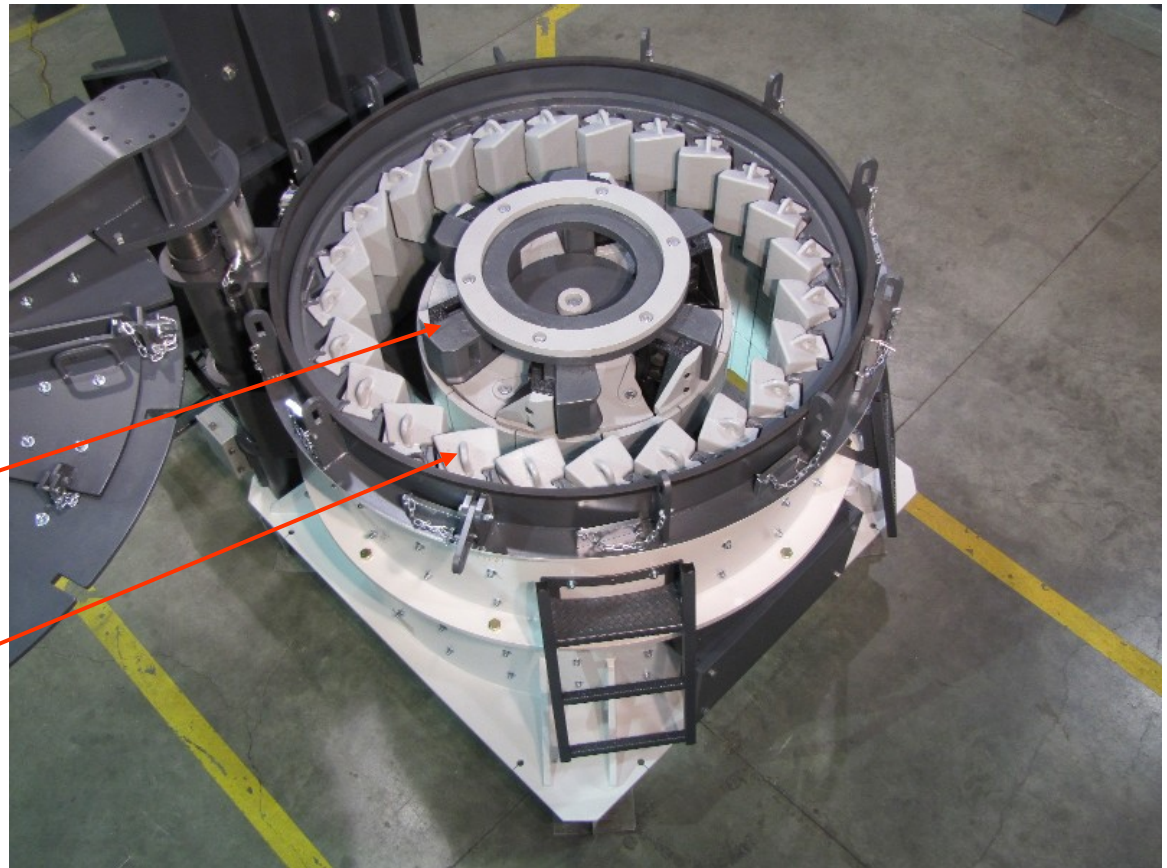


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## Complete Crushing Chamber

- Impeller Table  
Assembly
- Anvil Ring  
Assembly



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- Lid Lifter

- Pedestal Lubrication System



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## ISC® Model 77-VSI Crusher

- Single Electric Drive



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## ISC® Model 77-VSI Crusher

- Dual Electric Drive



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## ISC® Model 77-VSI Crusher

- Right Angle  
Gear Drive



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## ISC® VSI Crusher Features

- Standard
- Optional

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## Standard ISC® VSI Features

- Adjustable Feed Splash Plate with replaceable cast liners for directing and centering the feed
- Cast lined Rotatable Feed Box
- Externally Adjustable Feed Tube Assembly with Rubber Dust Seal and cast Feed Tubes
- Quick release Lid Wedges with Bolted Chain Tie Downs and Safety Hitch Pin Clip
- Hydraulic Lid Lifter with Limit Switch and Safety Lock Pin
- Lid with Hinged Rubber Sealed Inspection Doors with Wedge Lock Latch Bar and Safety Lock Pin
- Bolt-on Upper Tub Assembly for flexible 90° relocation of Lid Lifter Assembly

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## Standard ISC® VSI Crusher Features, Continued

- Lower Main Frame with Square Base Plates, Dual Opposing Drive Tunnel Bolt Plates, and Bolt-in Lube Block Plates
- Heavy Duty Pedestal with Timken Tapered Roller Bearings, Dual Double Lip Oil Seals, and Astralloy Shaft
- Cast segmented liners to protect Lid, Tub, Drive Tunnel, Flywheel, and Pedestal
- Gravity Flow Oil Lubrication System for positive oil flow and improved bearing protection
- Lubrication sensing devices for Oil Flow and Oil Temperature
- Flywheel fully lined and protected with cast segmented Liners on bottom and outside edge
- Heavy Duty multiple Bolt-on Shoe Impeller Tables

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## Standard ISC® VSI Crusher Features, Continued

- Variable design Impeller Shoes with Ramped Table Liners and Bolt-in Feed Disc
- Vertically Adjustable and Indexable Anvil Ring with Heavy Duty Slip-in Dovetail Anvils
- Variable sensitivity Vibration Switch
- Bolt-on Tub Access Ladders
- Bolt-on Motor Tunnel with single Tube in a Tube Adjustable Take-up and removable V-belt Safety Guard
- Drive Motor Mount with Motor Cover
- Drive Tunnel Cover for opposite Drive End
- Sheaves, Bushings, and V-Belts for required Table speed and proper service factor

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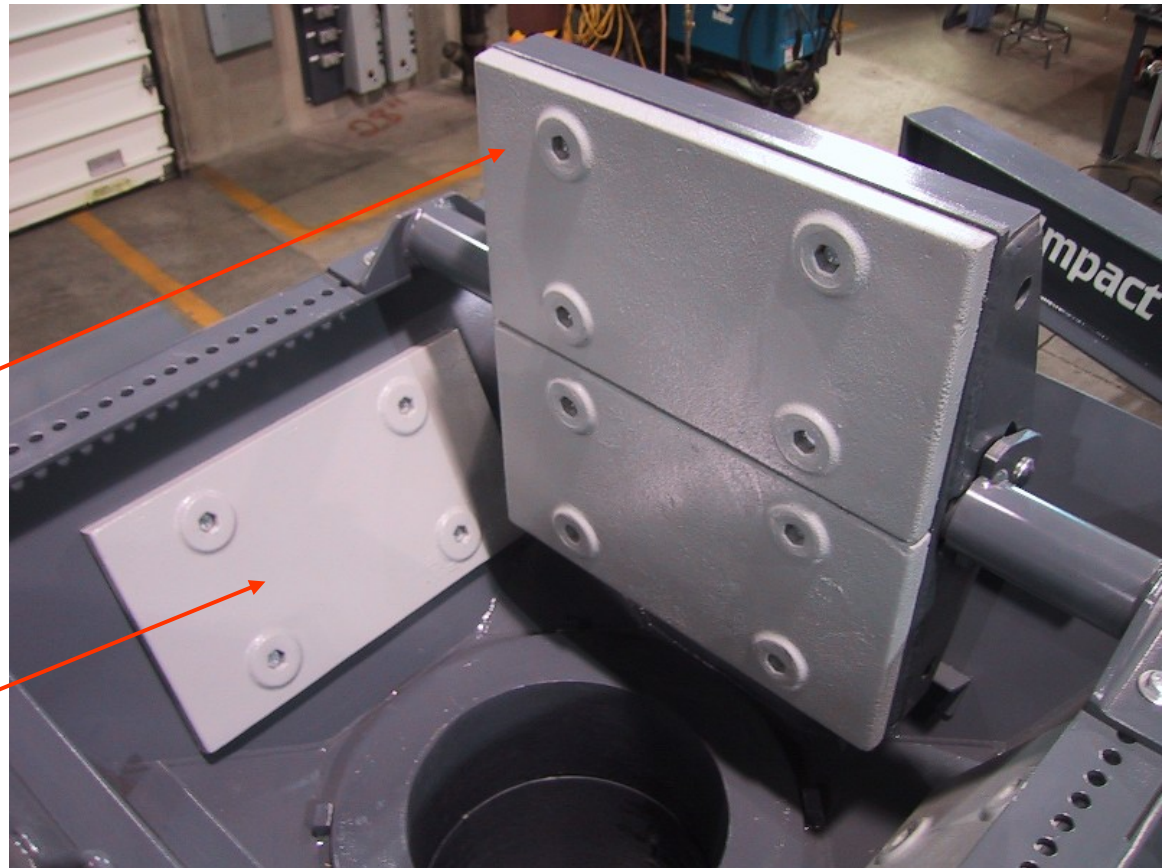
## Optional ISC® VSI Crusher Features

- Lube Wiring Package
- Lube Starter Control Panel
- Oil Tank Immersion Heater
- Rotatable Anvil Ring Lifter Beam
- Rotatable Parts Service Beam for Trolley with Hoist
- ISCCeramics® for Shoes, Anvils, and Feed Discs
- Dual Drive
- Right Angle Gear Drive
- Stationary Support Frames with Conveyor
- Portable Chassis Mounts with Conveyor
- Drive Motors and Starter Controls
- Diesel Engine Power Units

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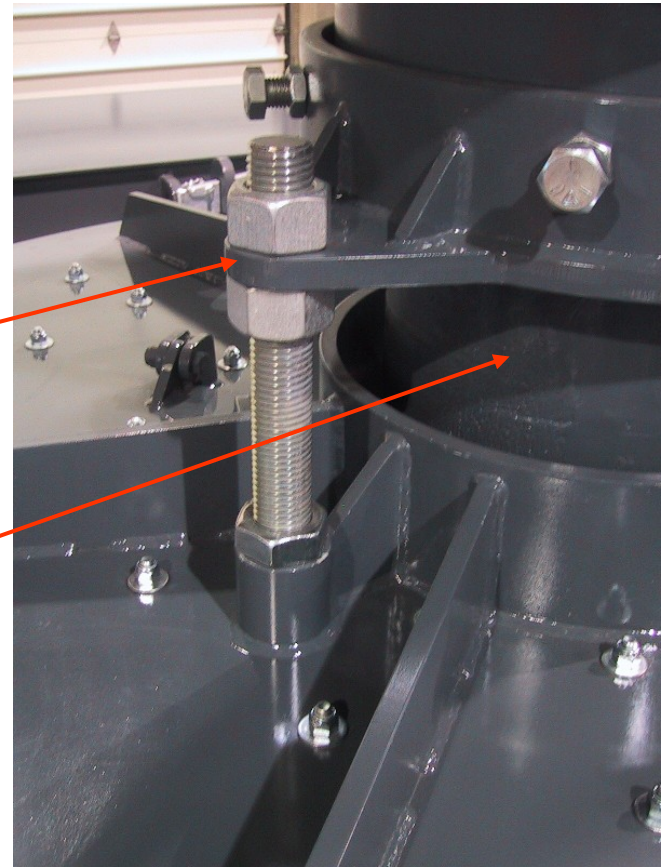
- Adjustable Feed Splash Plate Assembly
- Cast Feed Box Liners



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- Externally Adjustable Feed Tube Assembly
- Cast Lower Feed Tube



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- Adjustable Feed Splash Plate
- Adjustable Feed Tube Assembly
- Hinged Rubber Sealed Inspection Door



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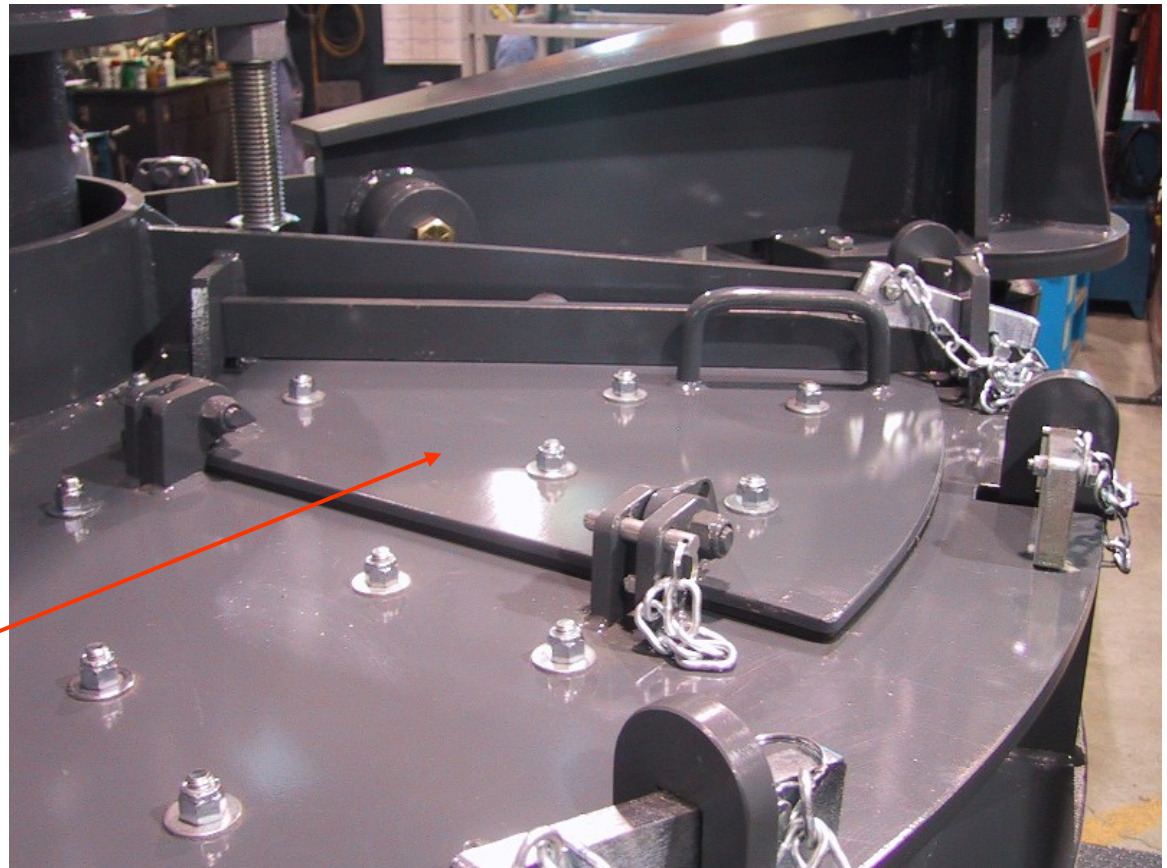
- Feed Centered for Maximum Efficiency with Adjustable Feed Splash Plate



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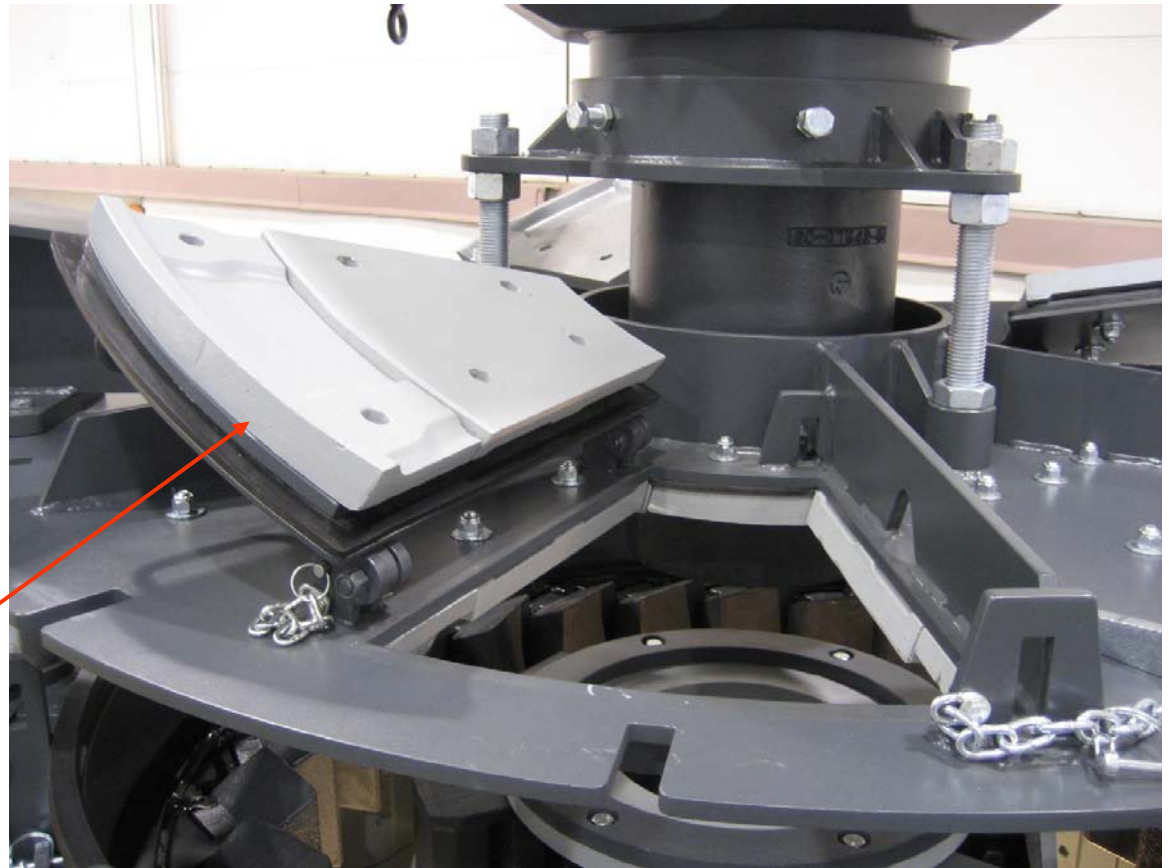
- Hinged Rubber Sealed Inspection Door, Closed and Locked



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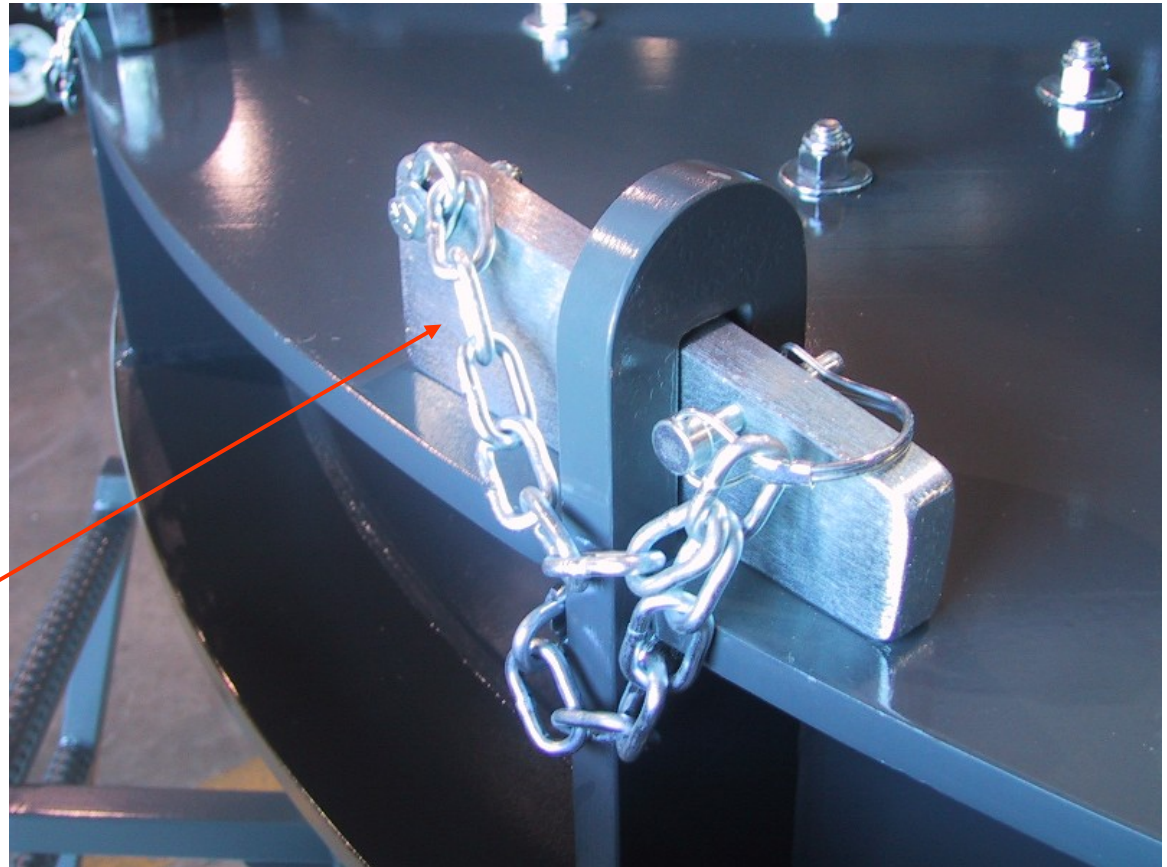
- Hinged Rubber Sealed Inspection Door, Open and Locked



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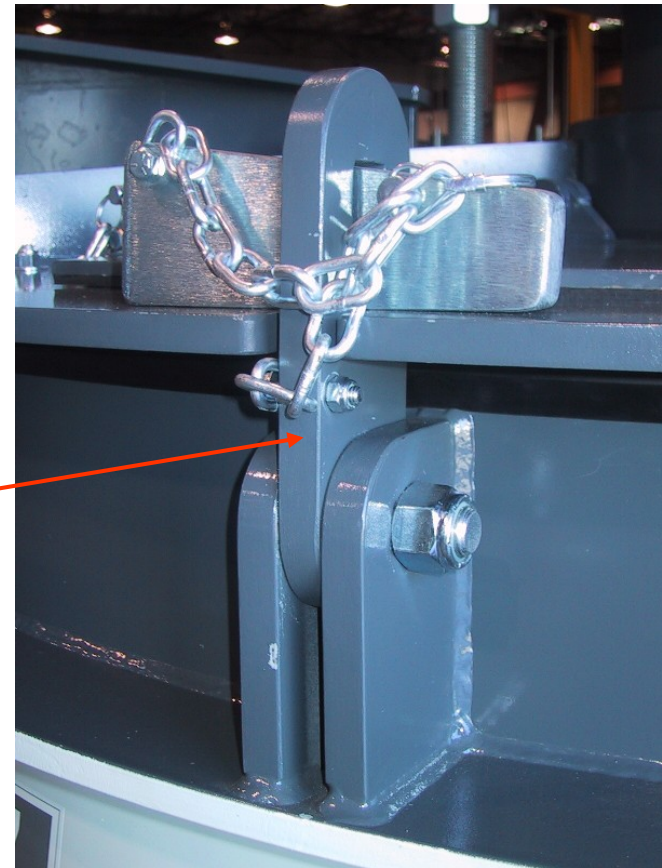
- Quick Release Lid Wedge with Bolted Chain and Hitch Pin



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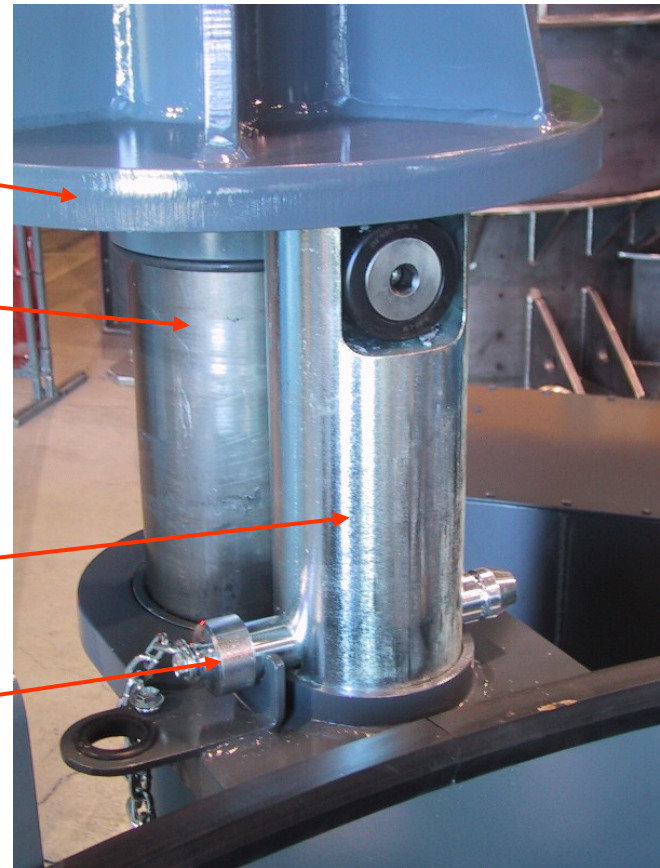
- (2) Hinged Wedge Brackets for minimal Lid Removal Clearance



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- Lid Lifter Roller Plate
- Lid Lifter Main Shaft
- Lid Lifter Ram Shaft with Cam Follower and Safety Lock Pin
- Lid Lifter Lock Pin



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- Line-up Lugs
- Rolled Stiffener
- Lid fully protected with Cast Segmented Lid Liners

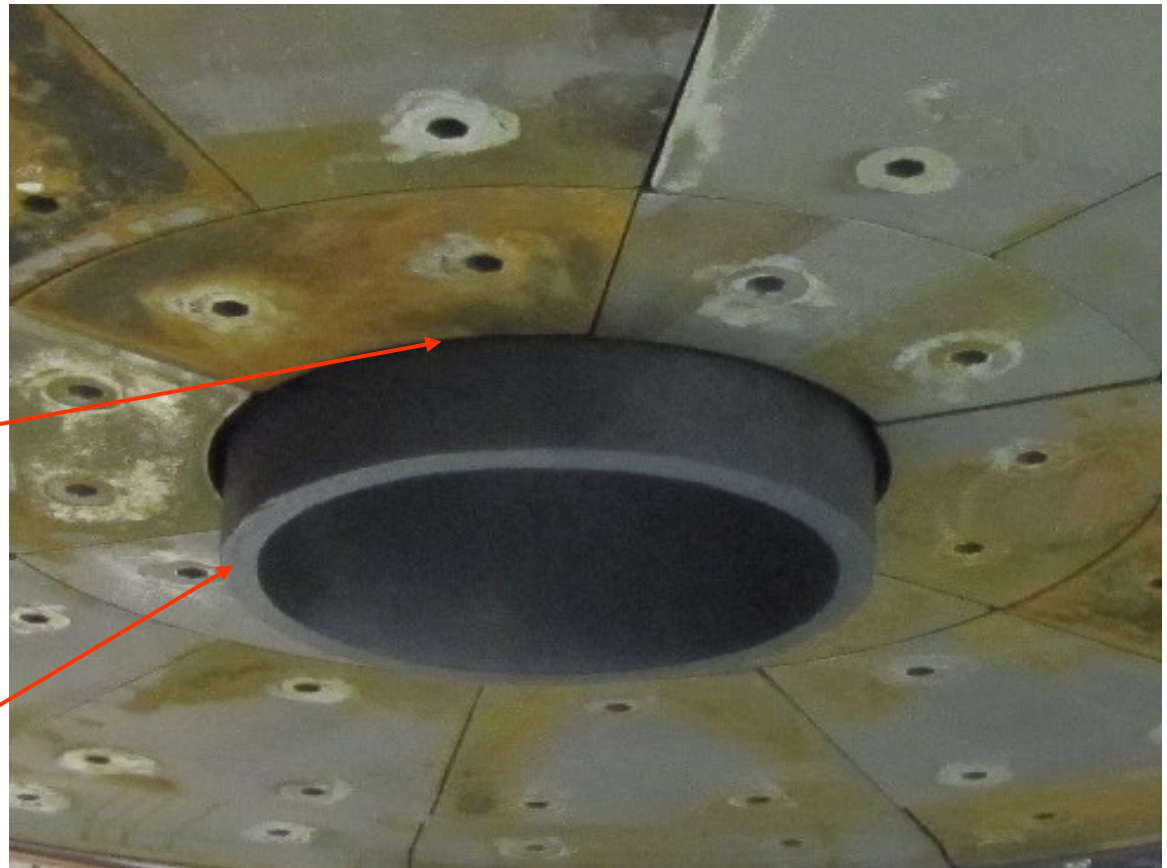


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- Rubber Feed Tube Seal located under Inner Lid Liner

- Cast Lower Feed Tube

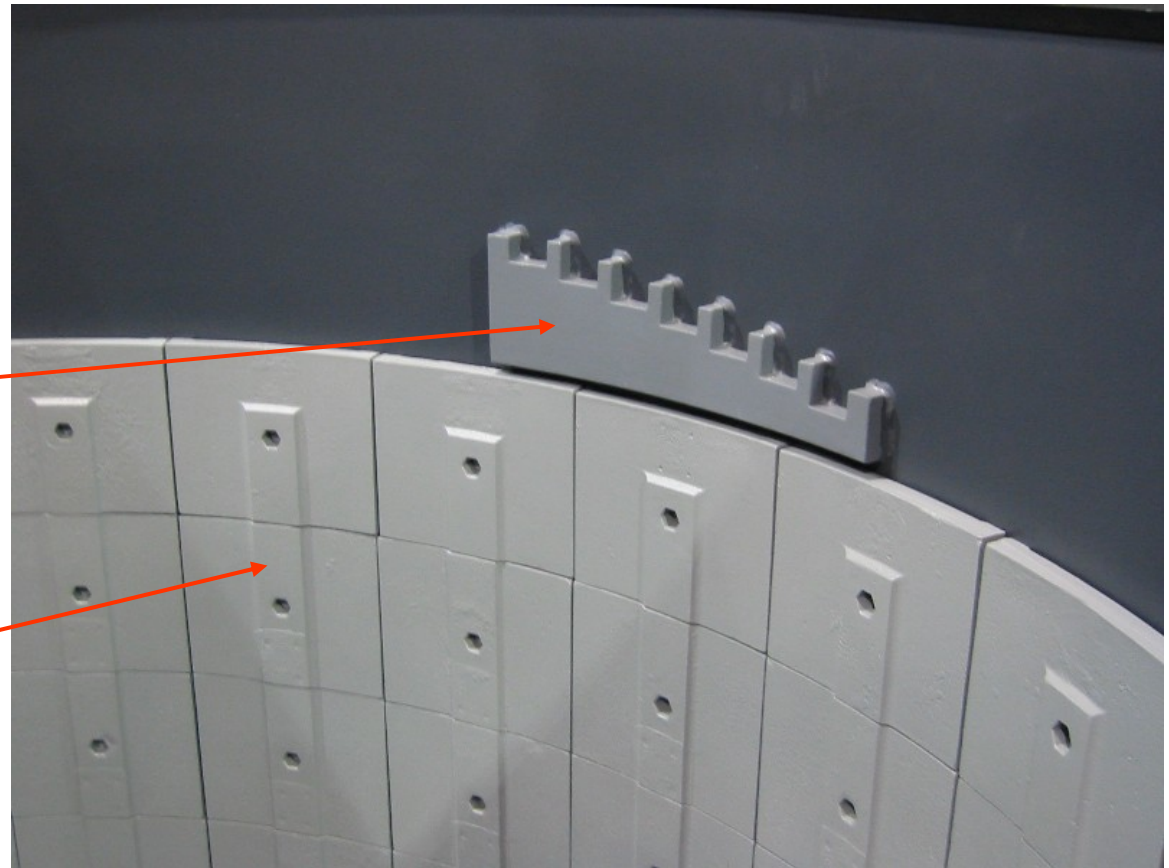


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- Anvil Ring  
Adjustable  
Step Bracket

- Cast Tub  
Liners



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- Cast Tub Liners

- Cast Drive Tunnel Liners



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- Outer Table Liners
- Bottom Flywheel Liners
- Pedestal Skirt Cone



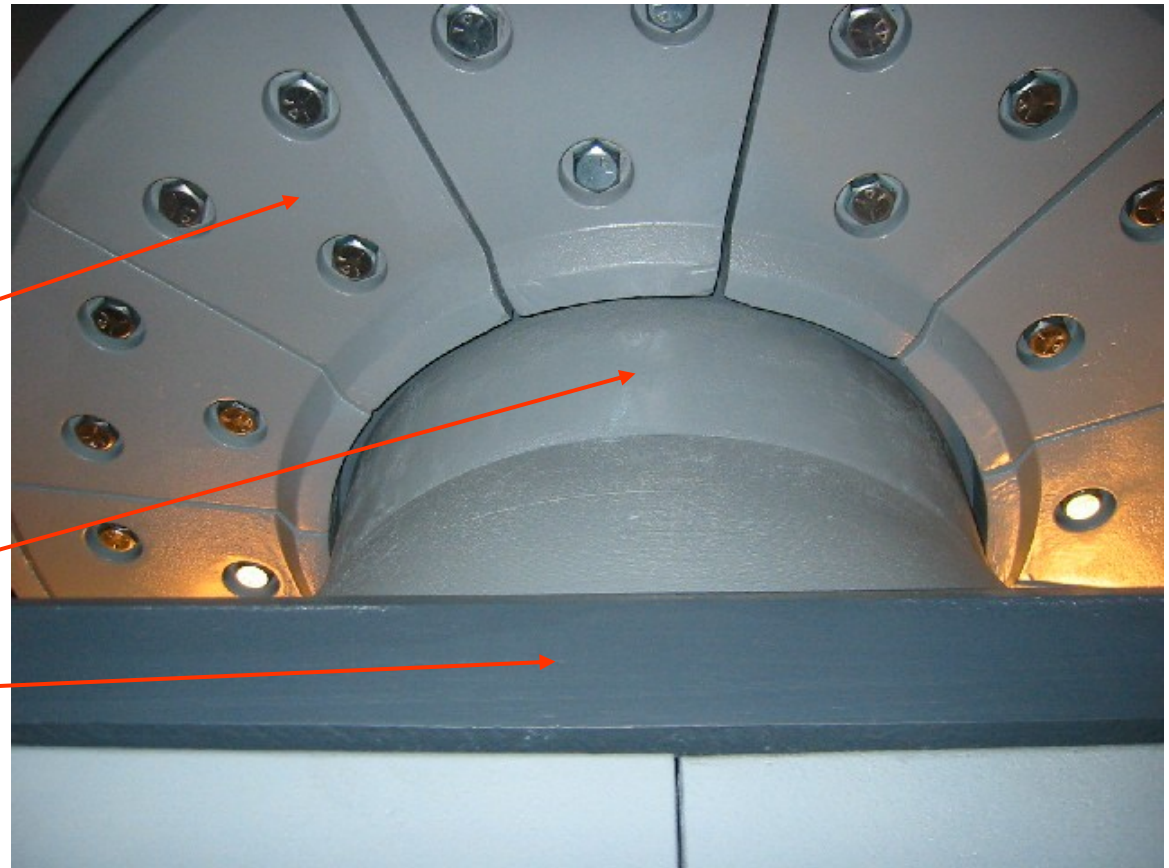
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- Bottom Flywheel Liners

- Pedestal Skirt Cone

- Bolt Guards



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- Bottom of Crushing Chamber Looking Upward



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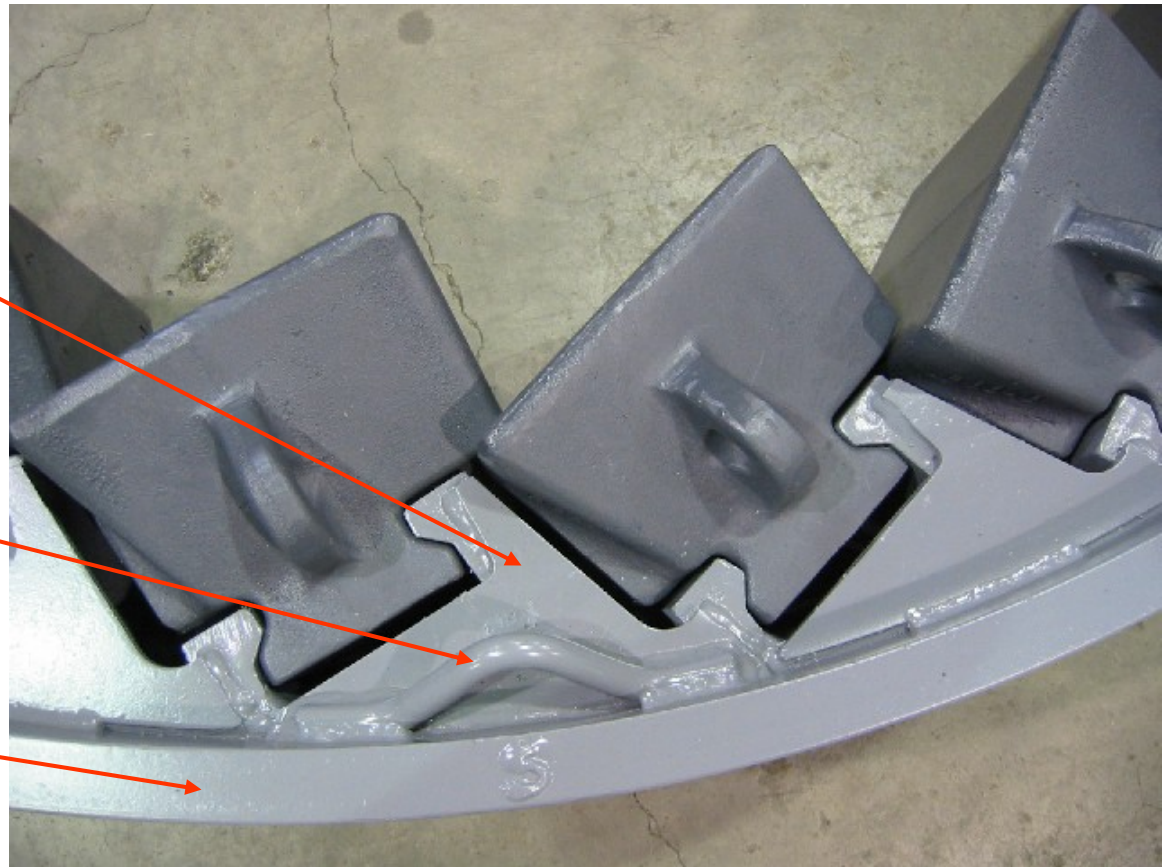
- Tapered  
Dovetail  
Anvil  
Brackets



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- Anvil Ring Gusset Caps
- Formed Lift Eye
- Rolled Outer Angle



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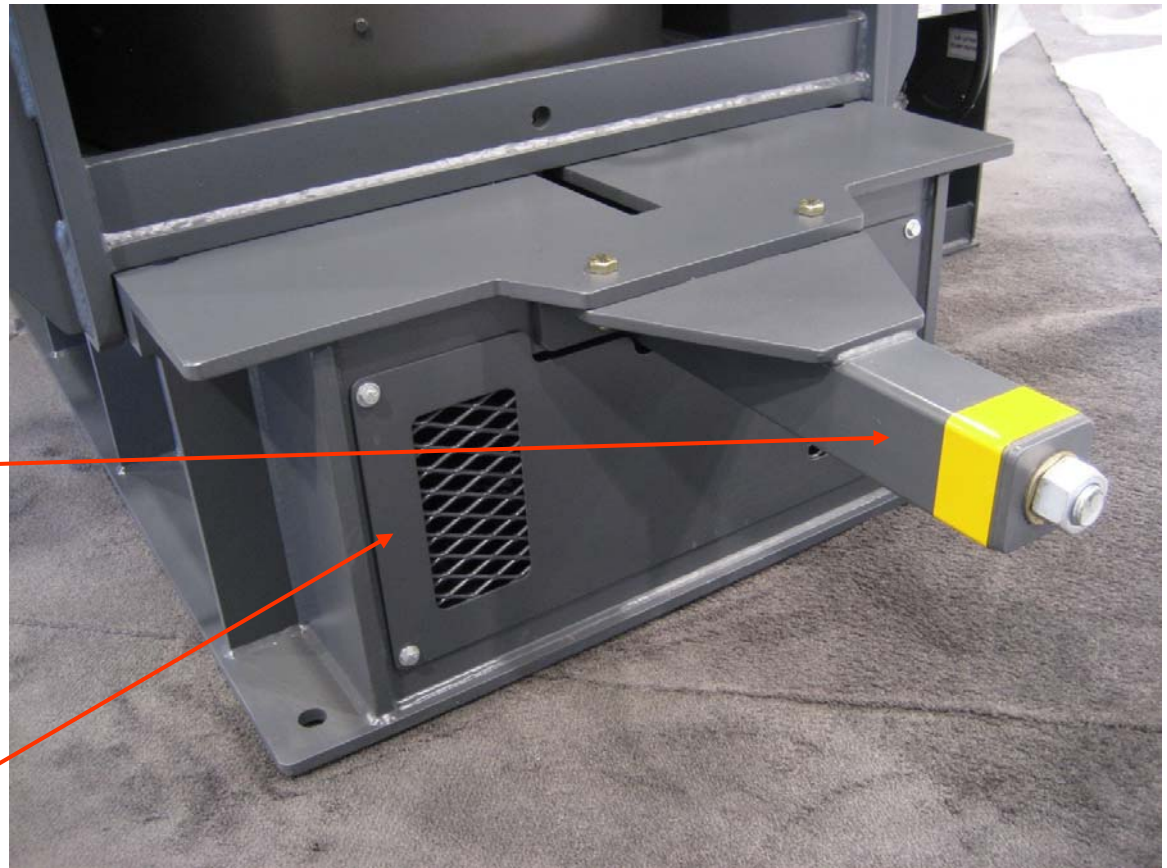
- Cast Segmented Lid Liners
- Anvils
- Cast Segmented Bolt-on Anvil Ring Liners
- Cast Segmented Tub Liners



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- Single Tube  
in a Tube  
Adjustable  
V-belt  
Take-up
- Bolt-on Drive  
Tunnel  
Safety Screen

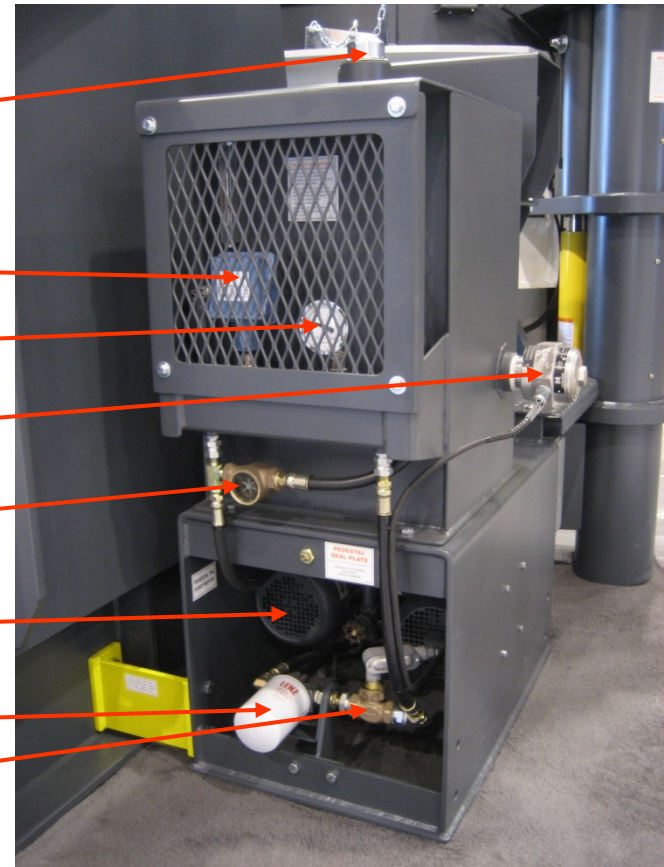


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## Oil Lube System

- Filler Cap
- High Oil Temp Switch
- Temp Gauge
- Immersion Heater
- Rotator Sight Glass
- Oil Pump Motor(s)
- Spin-on Oil Filter
- Oil Flow Switch



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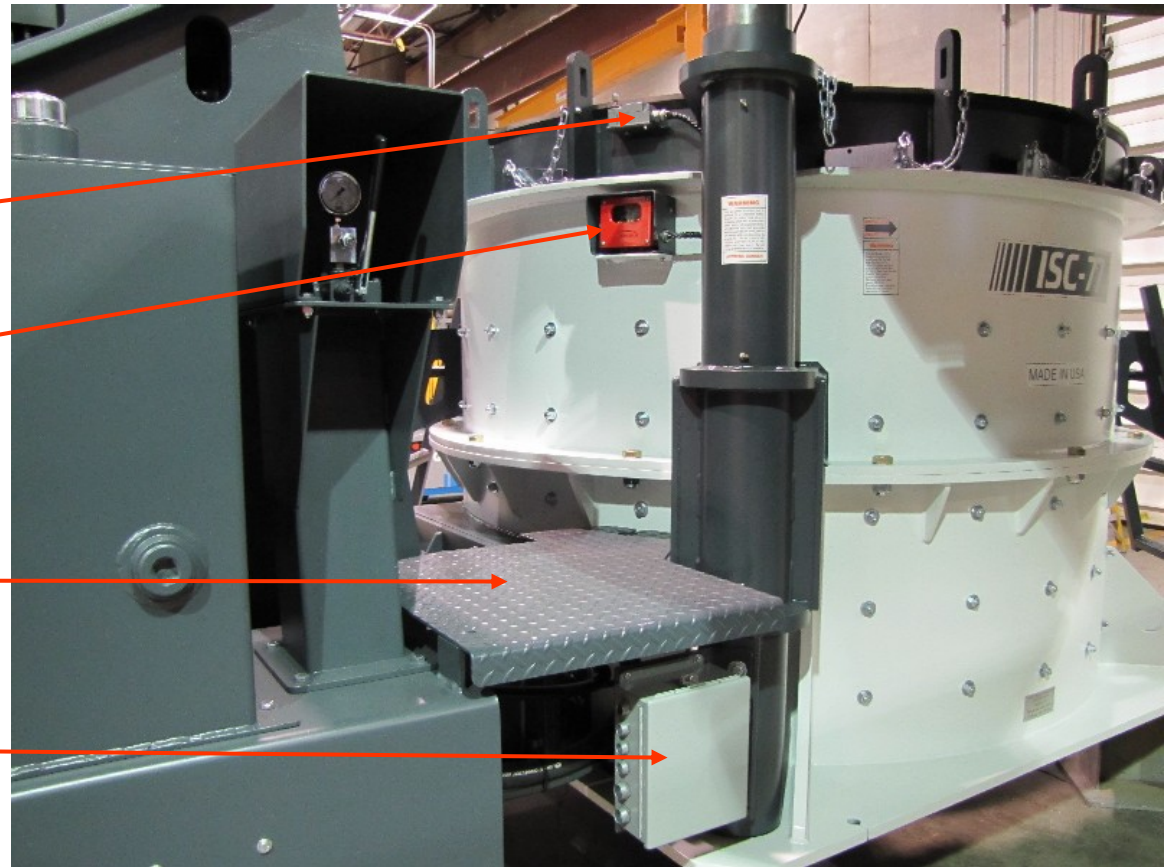
- Pedestal Seal Plate



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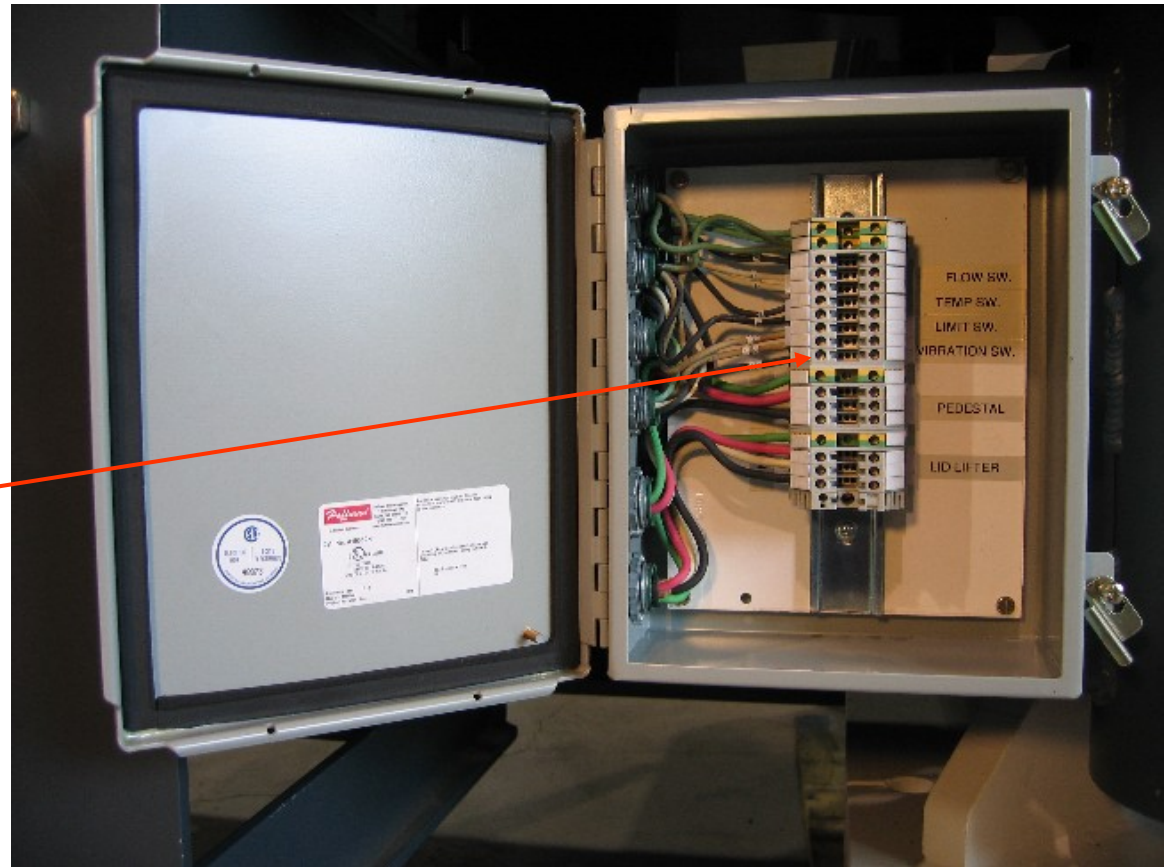
- Lid Limit switch
- Vibration Switch
- Formed Tread Plate to protect Lube Hoses
- Lube Wiring Package



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- Lube Wiring Terminal Strip



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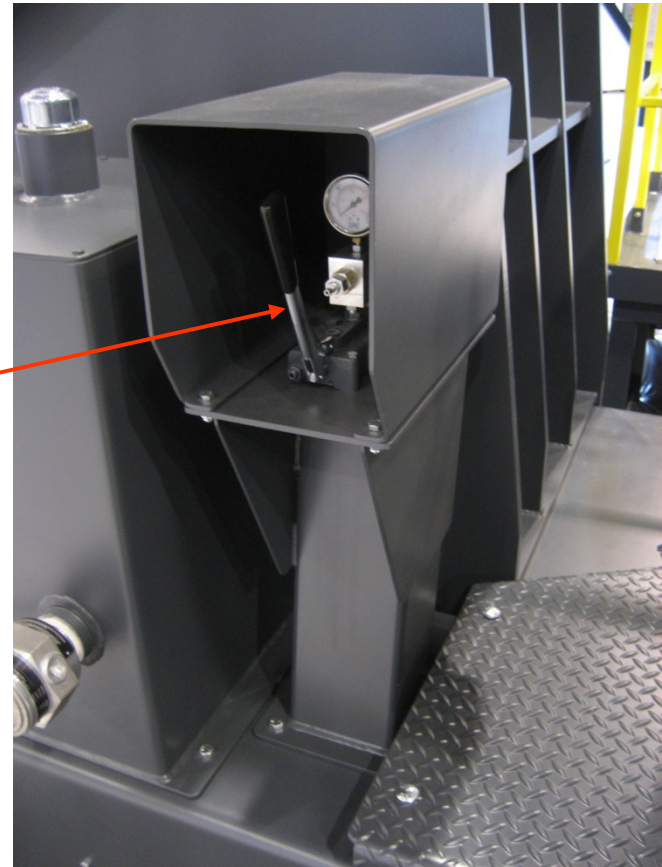
- Lid Lifter
- Lid Lifter Lock Pin
- Lid Lifter Ram Shaft with Cam Follower
- Hydraulic Cylinder



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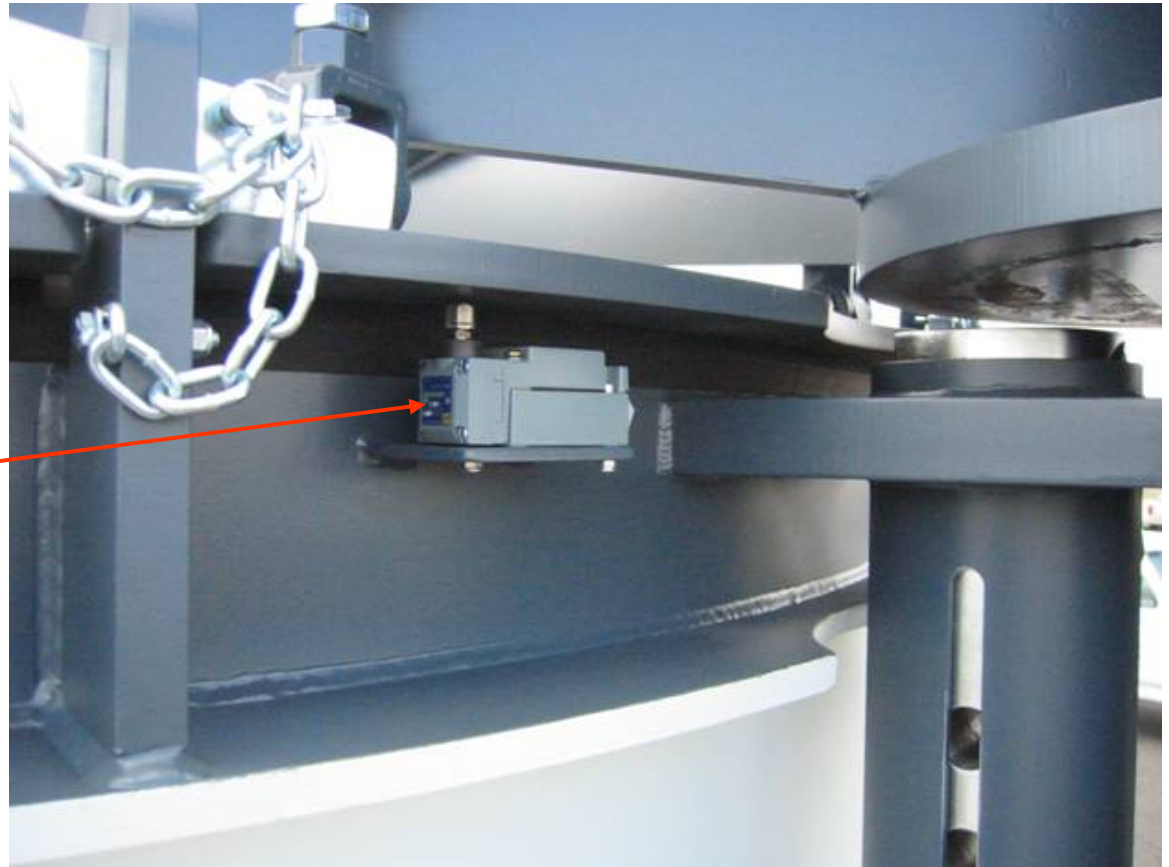
- Lid Lifter Controls



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- Lid Limit Switch



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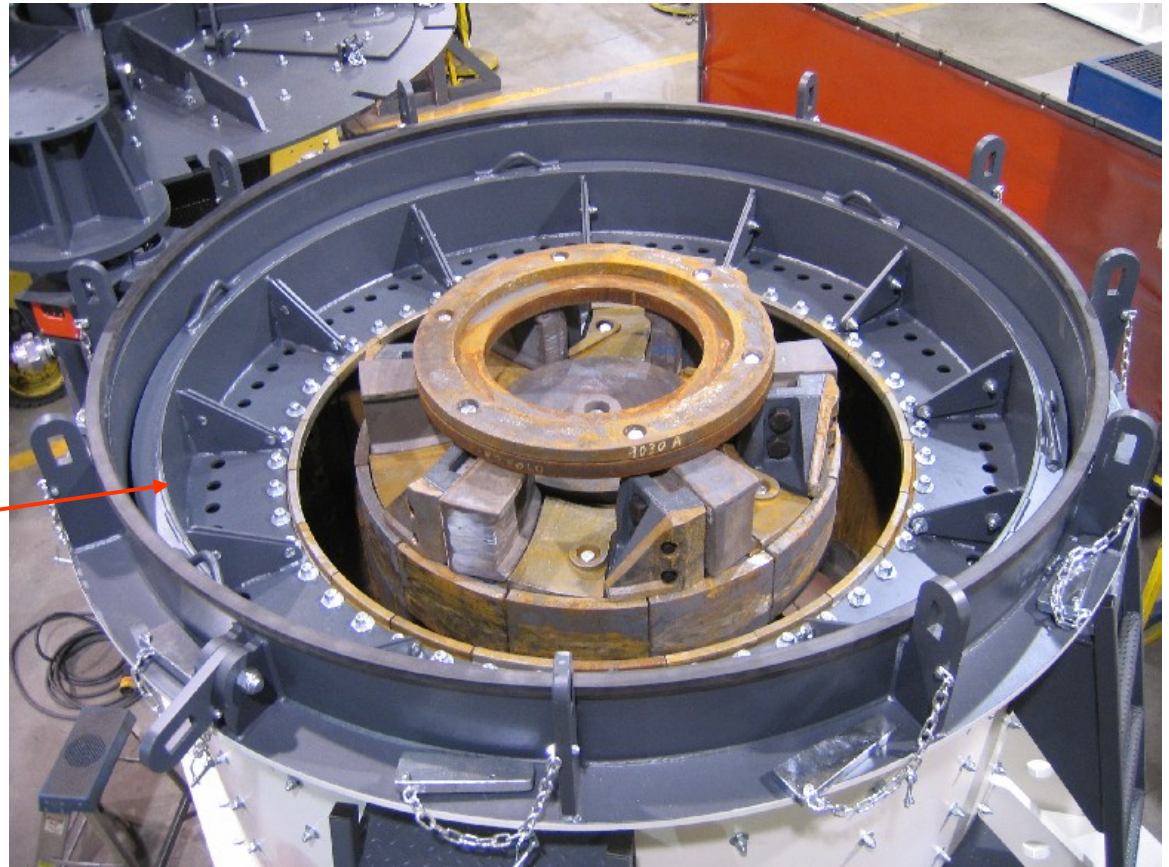
- Rotatable Anvil Ring
- Lifter Beam
- 3-Way Cable Sling



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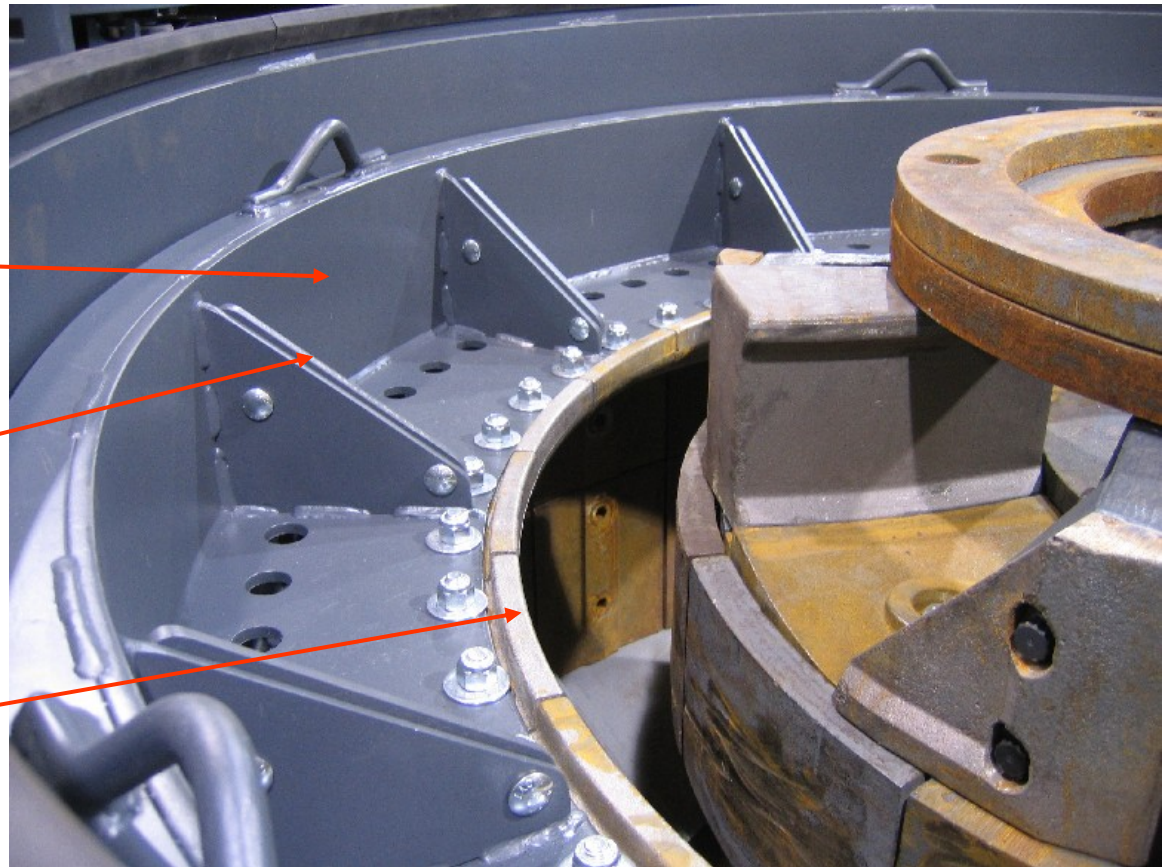
- Optional Rock Shelf Assembly



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- Optional Rock Shelf
- Adjustable Deflectors
- Cast Segmented Liners



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# ISC<sup>®</sup> Pedestal Assembly

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## Pedestal 1/4 Section

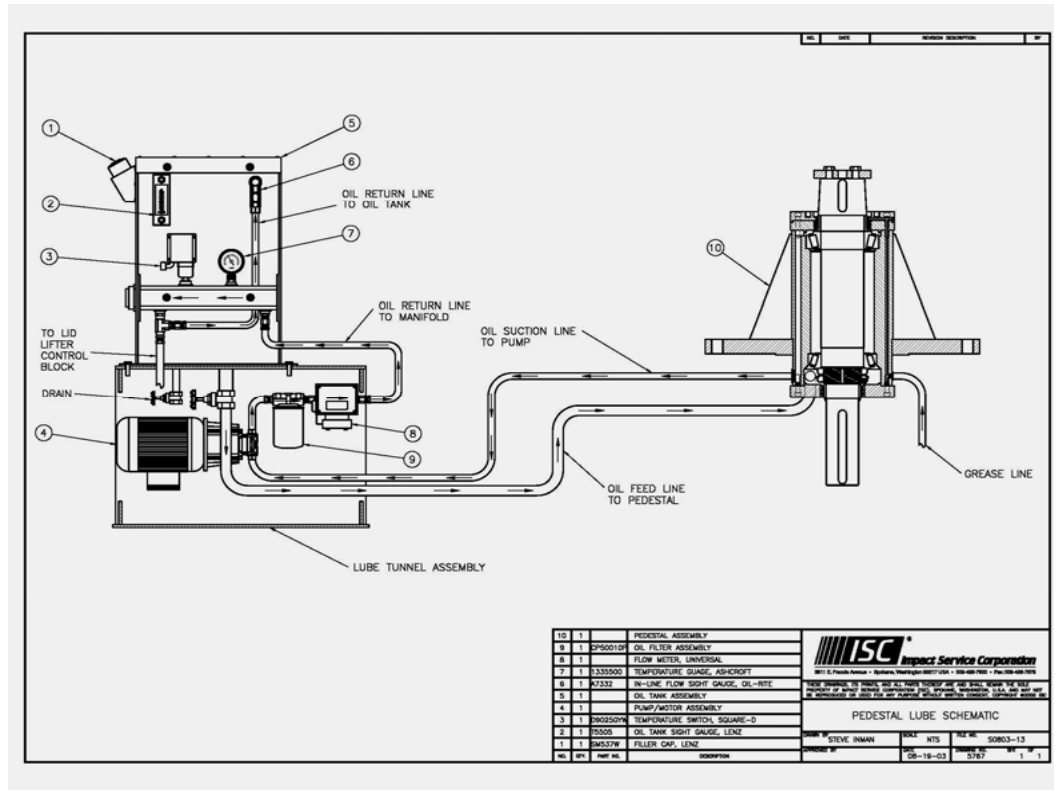
- Astralloy Shaft, Tapered with Bolted End Cap
- Grease Labyrinth Dust Seal
- Tapered Roller Bearings
- Dual Lower Lock Nuts
- Seal Wear Sleeves
- Dual Double Lip Oil Seals
- Gravity Feed Oil Bath
- Full Cast Liner Protection



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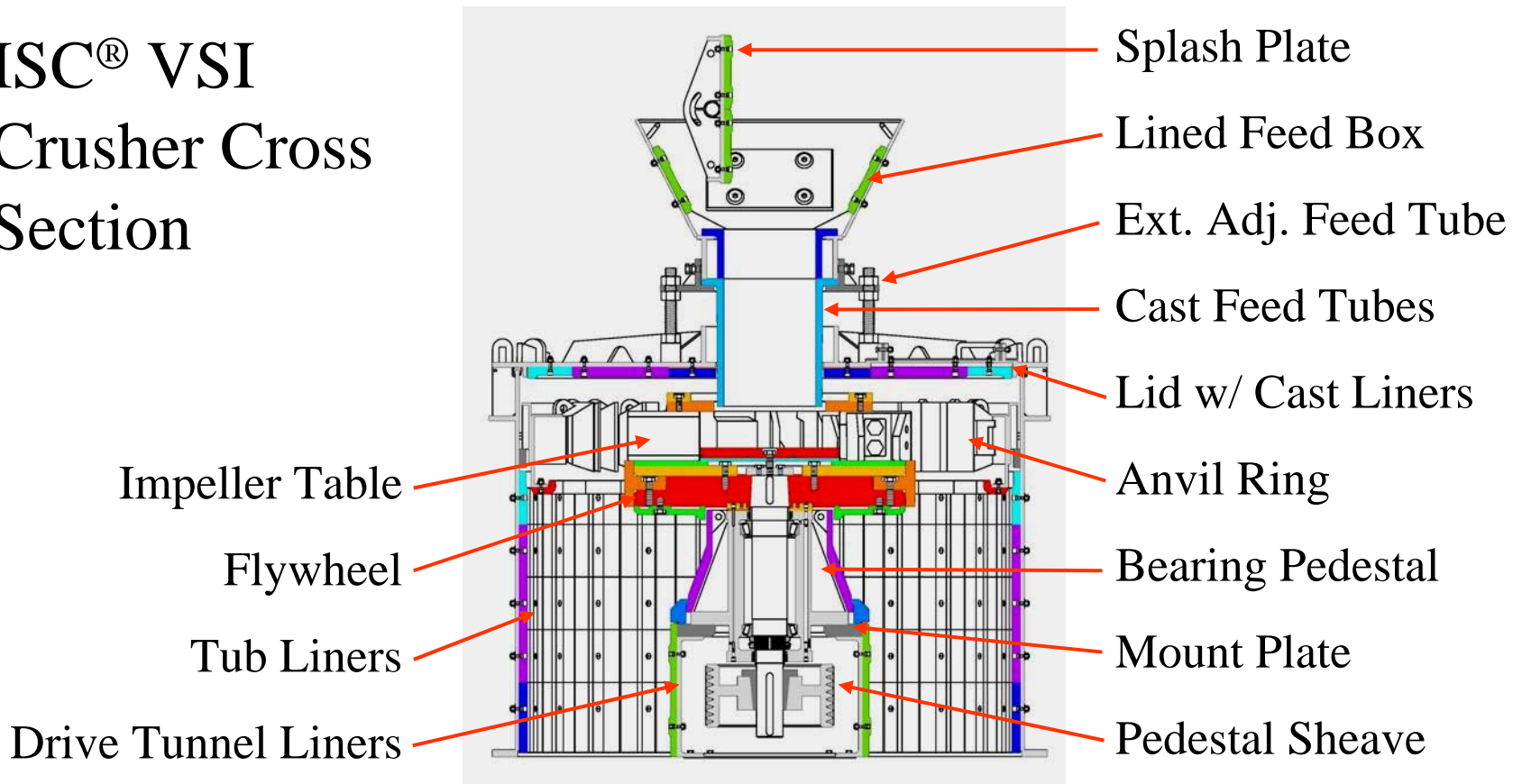
# Gravity Feed Oil System



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# ISC® VSI Crusher Cross Section



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ISC<sup>®</sup> WEAR PARTS MADE EXCLUSIVELY BY



**MAGOTTEAUX**

SHAPING A WORLD OF PERFORMANCE



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## Contact Info:

Impact Service Corp.®

3811 E. Francis Ave.

Spokane, WA 99217 USA

Phone: 509.468.7900

Fax: 509.468.7979

Hours 8:00am to 5:00pm PST

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