

Liner Change



CRITICAL PRACTICE



Liner change procedures vary from machine to machine. **Guidelines here are general safety considerations only.**

Refer to manufacturer's instructions for detailed procedures.

Pause for Safety

Hazards

- Tripping hazards
- Hazardous energy
- Inadequate lifting equipment
- Overloading lifting devices
- Inadequate training
- Worker being struck
- Worker being caught between load and equipment
- Weather
- Inadequate communication
- Ergonomics
- Inadequate work space
- Noise
- Hot work
- Pinch points
- Inadequate tools

PPE



Additional PPE



Controls

- Housekeeping, wide catwalks, folding handrails
- Lock out
- Training
- Proper communication (radios, hand signals, buddy system, etc.)
- PPE
- Medical monitoring
- Proper breaks
- Experience welders
- Inspection of equipment and tools before use

Liner Change

Preparation

- Ensure all components are locked out using the Lockout Code of Practice.
- Ensure all lifting devices are legislated, approved and inspected prior to use.
- Inspect all lifting and rigging equipment before use.
- Designate a signal person.
- Ensure your work area is clean and level.
- Know the weights of the affected components.
 - Refer to manufacturer's documentation
- Remove and/or fold appropriately the cone feed conveyors from the work area.
- Attach lifting lugs if required.



Use proper welding procedures when mounting lifting lugs onto the old manganese.

Refer to:
[SF-10 - Best Practices: Welding and Cutting](#)



Disassembly

Depressurize the clamping cylinders.

Swing the bowl lock arm away from the work area.

- Ensure it does not make contact with the bowl.

Connect a steel hoisting cable to one of the bowl's turning/lifting lugs.

- Attach the cable to the proper side of the bowl to obtain the desired rotation, typically counter-clockwise.
- Make several turns around the bowl with the cable in a counter-clockwise direction.

Connect the free end of the lifting cable to the lifting mechanism / loader.

- Be sure the loader has a straight *lateral* pull.



Use the loader to carefully pull the cable laterally to rotate the bowl.

- Stop when the turn cable has unwound.

Rewind cable and repeat steps 0 through 0 as many times as necessary to disengage the bowl.



Connect a four-way cable sling to the bowl.

- Attach sling to lifting lugs on bowl.

Use the loader to vertically lift the bowl from the assembly.



Relocate the bowl away from the assembly.

- Set the bowl off the ground on three wood blocks.

Bowl Liner Replacement

1. Use the loader to remove the feed hopper to expose the wedges.

Remove bolts and wedges.

- Strike the liner with a hammer as necessary to dislodge.

Use the loader to lift and set the new bowl liner on level wood blocks.

- Ensure the blocks do not extend outside the perimeter of the bowl.

Use the loader to lift the bowl.

- The old bowl liner should stay in place on the blocks.

Place bowl on plywood on the ground so that the sling lines are slack.

Unfasten two adjacent legs of the sling.

Using the loader, lift one side of the bowl and carefully flip the bowl, lowering it onto its topside.

- The bowl is now resting on adjustment ring, exposing the underside.
- Do not detach the loader.

Remove the old grease and clean the wire wheel seat.

Apply new grease or heavy oil above the seat.

Use the loader to flip the bowl back upright on the plywood.

Allow the sling lines to go slack.

Reattach all four sling lines.

Use the loader to lift the bowl and carefully place onto new bowl liner.

- Ensure the high point of the Helix is lined up in the middle of the bowl stop block (Wedge Pocket).

Center the liner and check the seat to ensure it is in place.

Install the wedges and tighten in a crisscross pattern.

- Clearance should be no more than 0.010".

Fill the entire cavity behind the bowl liner with backing.

Using the loader, reinstall feed hopper and basket.

Mantle Liner Replacement

1. Use the loader to remove the feed plate.

Use a cutting torch to cut the torch ring.

- Ensure one employee is on Fire Watch.
- The ring should be cut all the way through.
- Be extremely careful not to damage the head.
- Locking nut should be ready to unscrew turning it in a clockwise direction.

Connect a steel hoisting cable to either:

- the two-lifting eye hooks or
- the three casted lifting hooks.

Using the loader, lift out the worn mantle.

Clean the seat and the old grease above the seat.

Reapply a light film of grease or heavy oil on the head above the seat.

- This prevents backing material from sticking to the head.

Install the new liner center by installing torch rims and lock nuts.

Screw the liner center down tight.

- Compare the distance between the top of the torch ring and the bottom of the locking nut (equal distance all around).

Tighten the nut, then back it off slightly.

Pour backing material into the cavity behind the mantle.

Retighten the nut immediately and reinstall the feed plate.

- When tightening locking nut, always have a firm footing.

Reassembly

1. Connect a four-way cable sling to the bowl.

Using the loader, lift the bowl into place on the cone main frame. Then, line up the thread 3" apart from where threads start on adjustment ring and the main frame.

Install bowl back on to the cone.

Wind cable around bowl and begin threading bowl back in to the main frame.

Repeat as necessary until desired crushing clearance is reached.

Unfold or replace cone feed.

