USER MANUAL

CBT25, 50 & 100 DRIVESHAFT REPLACEMENT

Revision History

rev. level 01_03.13.2014

NOTE: due to the fact that a new machine (never exposed to seed treatment) was used to demonstrate replacing the Driveshaft procedures in this manual, chemical protective equipment was not used in the photos.

WARNING: always wear protective clothing, as described on the following page, whenever exposed to chemicals and chemical dust!

EXPOSURE CONTROL

Always use caution and common sense when working with chemicals. Read the product label and SDS carefully and follow their instructions exactly as described. The following Personal Protective Equipment (PPE) recommendations and best practices help promote safe use in seed treatment.

Wear protective clothing

Wear disposable or reusable coveralls with long sleeves.

Treatment products

Keep products in a locked room that has been approved for crop protection products.

Hand protection required

Wear chemical-resistant gloves.

Wear a mask

Wear respiratory protection.

Wear rubber boots

Wear chemical resistant rubber boots.

Eye protection required

Wear protective eyewear.

Labels

Label recommendations and directions for handling must be followed, including treatment procedure (use of sticker) as well as the safety requirements.

Calibration

Seed treatment equipment must be checked and calibrated regularly to ensure accurate and safe application.

Clean seed

Use well cleaned seed to avoid creation of polluted dust that will contaminate the treating facility, workers, farmers and the environment during sowing.

Empty containers

Non-returnable empty containers must be triple rinsed before they can be disposed. For others the recommendation of the producer must be followed.

Cleaning

Use a vacuum to clean machines and coveralls. Never use compressed air.

Spillage

Spillage must be avoided; it must be thoroughly cleaned up to avoid contaminating the environment and waterways.

Laundry

Wash soiled reusable clothing separately. Workers must take a shower after each shift.

Maintenance

Keep machinery clean between treating sessions.

CBT DRIVESHAFT REPLACEMENT

Remove the CBT Replacement Drive shaft Assembly from shipping carton. Inspect for damaged or missing parts.

- REPLACEMENT DRIVE SHAFT ASSEMBLY

Required assembly tools

- FORKLIFT OR LIFTING DEVICE
- TORQUE WRENCH
- RATCHET WRENCH
- DIE GRINDER (hand held)
- 7/16 STANDARD SOCKET HEAD
- 1/2 STANDARD SOCKET HEAD
- 9/16 STANDARD SOCKET HEAD
- 10mm SOCKET HEAD
- 13mm SOCKET HEAD
- SNAP RING PLIERS
- PLIERS
- PHILLIPS SCREWDRIVER
- SLOTTED SCREWDRIVER
- PUTTY SCRAPER
- ANTI-SEIZE (recommend SAF-T-EZE brand)
- LOCTITE (recommend LOCTITE 242 threadlocker brand)
- RTV SEALANT (recommend DOW CORNING 742 clear)
- CLEAN WIPES & DENATURED ALCOHOL
- TAPE MEASURE

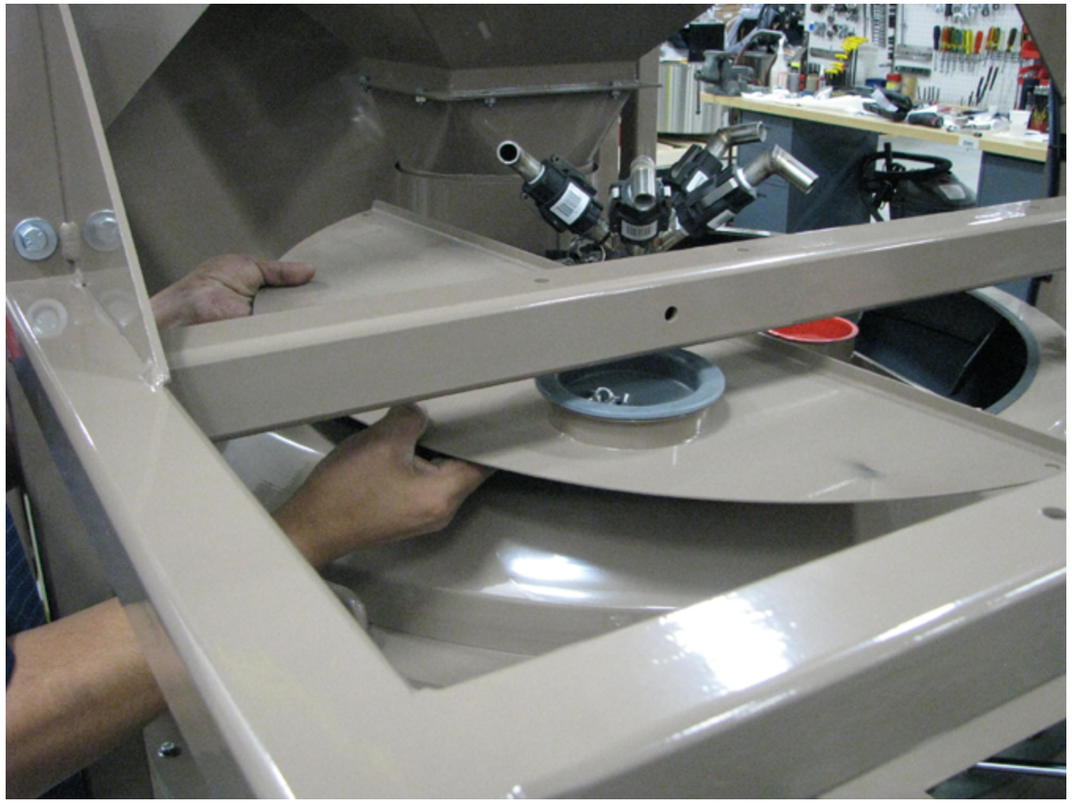
PART 1

Remove the existing Drive Shaft

This procedure requires two people and proper rigging/lifting equipment.

LID CLEAN OUT PANEL B

Step 1: Loosen the wing nuts holding the Lid Clean out Panel B and remove the panel from on top of the lid spinning.



LID CLEAN OUT PANEL A

Step 1: Loosen the wing nuts holding the Lid Clean out Panel A and remove the panel from on top of the lid spinning.

CHEMICAL INLET ASSEMBLY

Step 1: Remove the wing nuts holding the chemical inlet assembly onto the lid.

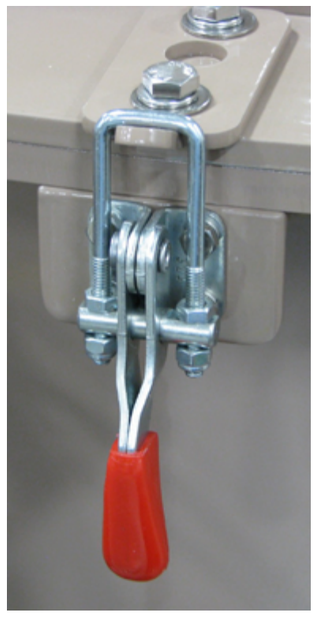
Step 2: Remove the chemical inlet assembly.

SEED INLET COLLAR

Step 1: Loosen the hold down latch and remove the seed inlet collar.

BOWL COVER CLAMPS

Step 1: Loosen the hold down clamps that hold the Bowl Cover onto the Bowl Mid Body Wrap.



BOWL COVER

Step 1: Use the grab handles on top of the cover to CAREFULLY lift the Bowl Cover over the Bowl Mid Body Wrap and set aside.

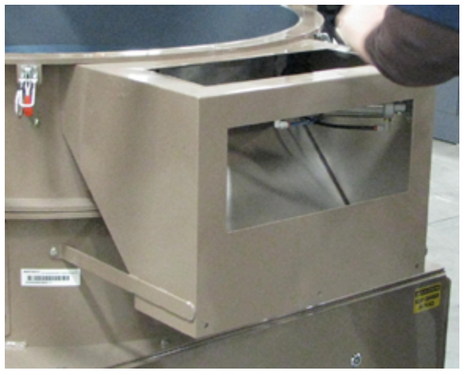
This step requires two people.

DUST EVACUATION

Step 1: Use a slotted screwdriver to disconnect and remove dust exhaust tube from the port on Discharge Assembly.

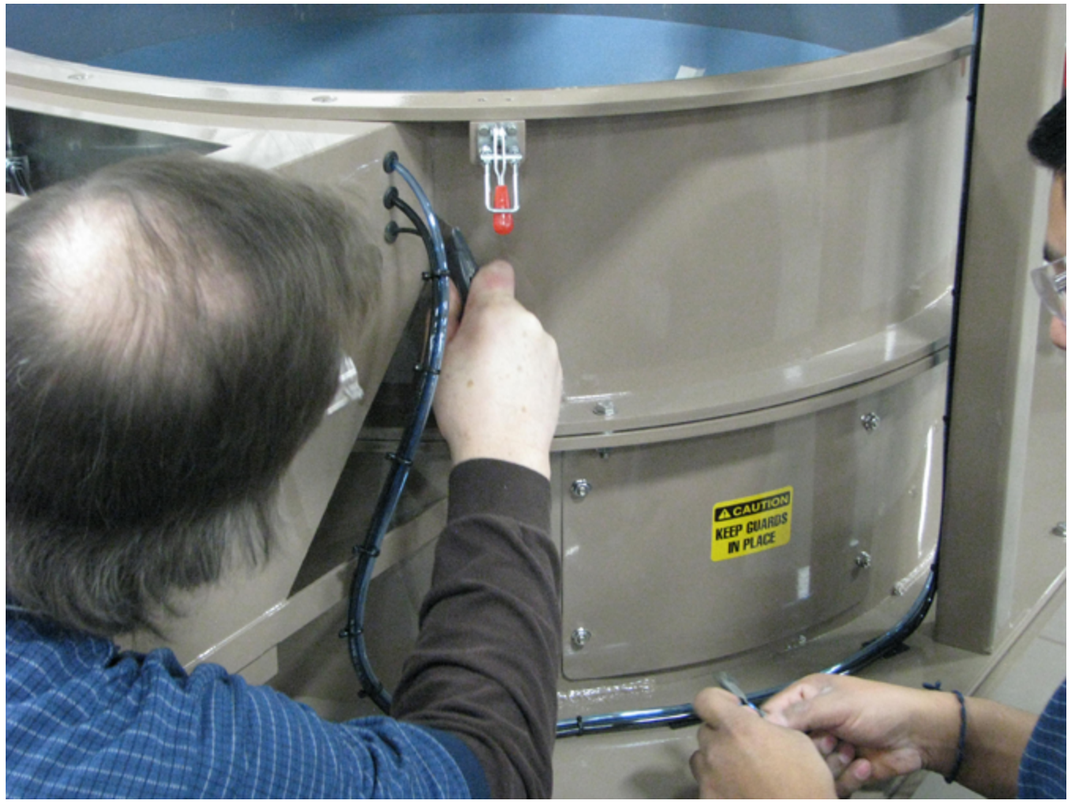
DISCHARGE COVERS

Step 1: Use the quarter turn key (shown below, left) to remove both the top and front covers from the seed discharge assembly.



AIRLINE TY WRAPS

Step 1: Use a side cutter to snip the ty wraps holding the airlines onto the mid body.

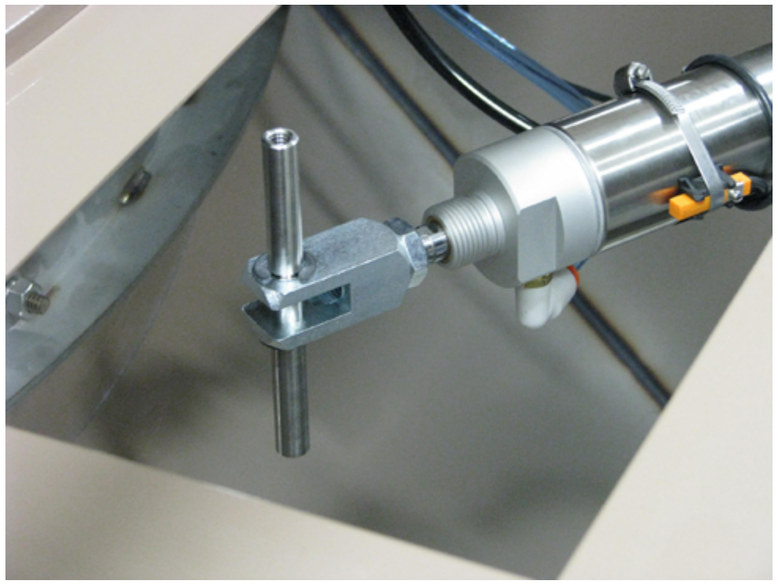


CUT RTV SEAL

Step 1: Use a utility knife to CAREFULLY cut the RTV seal around the outside and inside of the Discharge Assembly (see images below).

DISCHARGE DOOR AIR CYLINDER

Step 1: Use an Allen wrench and channel locks to hold the air cylinder clevis pin and loosen both the top and the bottom button head bolts. Set bolts aside. The air cylinder will remain connected to the inside of the discharge housing.



LOWER BODY ACCESS DOORS

Step 1: Remove both (R-L) Lower Body Wrap Access Panels & Gaskets on the front of the Lower Body Wrap. Use 7/16 socket head to remove four (4) 1/4-20 bolts, washers and lock washers.

DISCHARGE ASSEMBLY SUPPORT

Step 1: Remove both (R-L) Bowl Discharge Supports from the front of the Lower Body Wrap. Use 1/2 socket head to remove two (2) 5/16 bolts, washers and lock washers. Reach inside the Lower Body Wrap through the Lower Body Access Panel opening with one hand to catch the nut and with the other hand, use a ratchet wrench to loosen and remove the bolt, washer and lock washer.

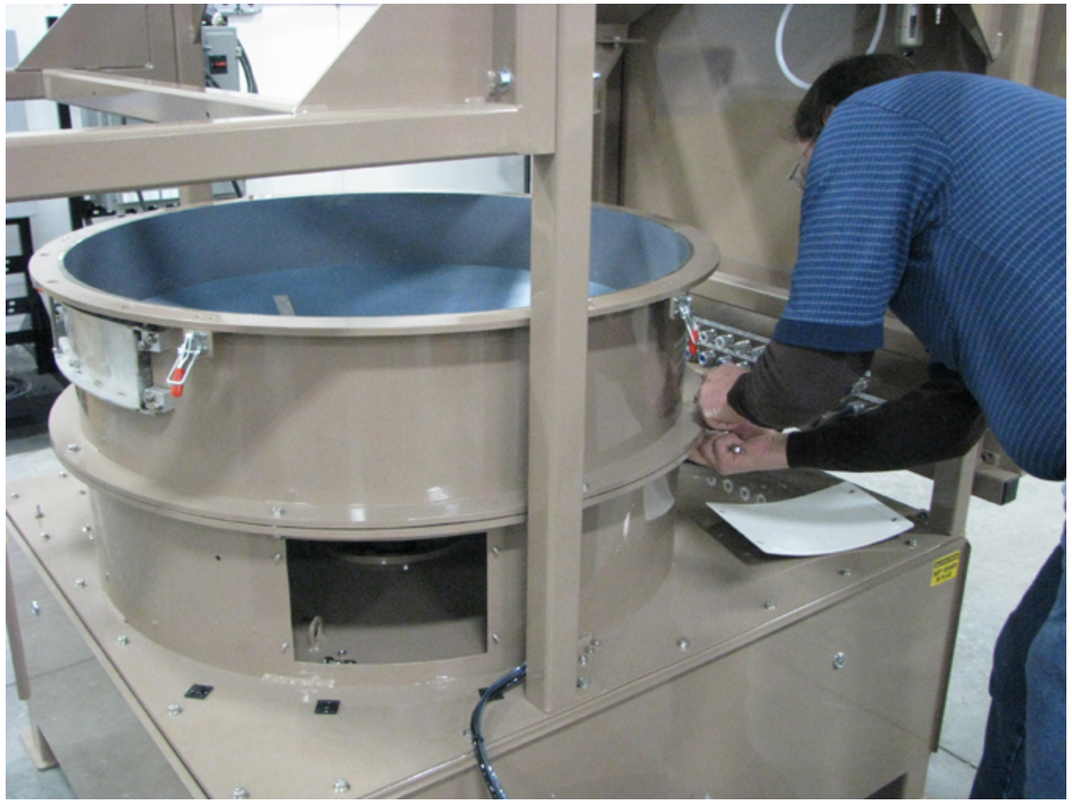
DISCHARGE HOUSING

Step 1: Use Phillips screwdriver to remove three (3) 5/16 pan head screws.

DISCHARGE HOUSING

Step 1: Remove the Discharge Assembly and set aside, as shown below.

> This step requires two people.

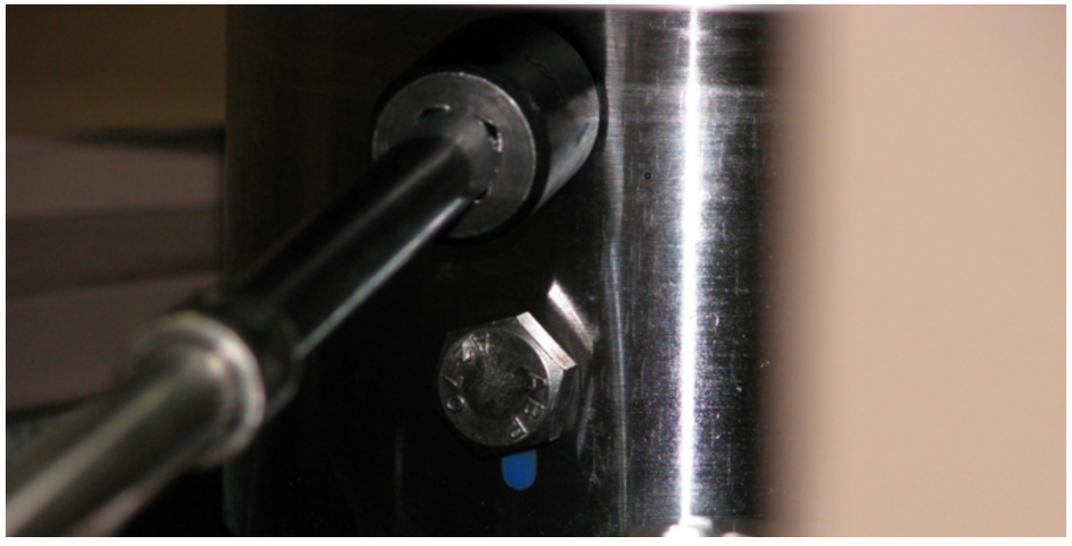


MID BODY BOLTS

Step 1: Use ratchet wrench with 1/2 socket head to remove eight (8) 5/16 bolts, washers and lock washers that connect the Bowl Mid Body to the Bowl Lower Body.

HUB SET SCREWS

Step 1: Reach under the Bowl through the Access Panel opening to loosen and remove the two (2) Hub set screws. Recommend using extensions on ratchet wrench, as shown. Use 9/16 socket head to remove the two (2) 3/8 Hub set screws.



MID BODY

Step 1: CAREFULLY lift up and remove the Bowl Mid Body Assembly from the Bowl Lower Body (refer to image below). Wrap weight = 150lbs.

This step requires two people.

ATOMIZER

Step 1: Use [Use 13mm socket head to remove the 8mm bolt] 7/16 socket head to remove the 1/4 bolt, washer and lock washer connecting the Atomizer to the Drive shaft.

Step 2: Remove the Atomizer from the Drive shaft.

INNER CONE COVER

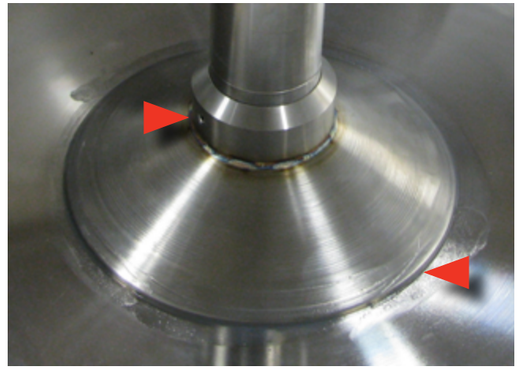
Step 1: Make certain the Drive shaft is completely cleaned of all chemical buildup! Use a putty scraper and emery cloth to make the drive shaft as clean as possible. The Cone Cover fits very snug on the Drive shaft.

Step 2: Use a [4mm Allen wrench to loosen the 8mm] 1/8 Allen wrench to loosen the 1/4 set screw on the Cone Cover.

Step 3: CAREFULLY use a utility knife to cut the seal around the bottom edge of the Inner Cone Cover and the Bowl. Use a flat screwdriver to pry the cone loose.

Step 4: Lift the Inner Cone Cover up over the Drive shaft.

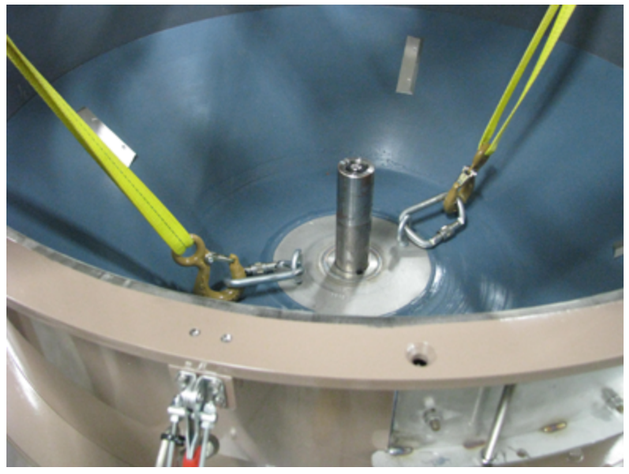
Step 5: Clean excess RTV off the Bowl and Inner Cone Cover.



BOWL SCREWS

Step 1: Thread the two eye bolts into the base of the bowl, as shown.

Step 2: Properly rig the bowl, in order to lift it up off the lower body, as shown below.



BOWL

Step 1: CAREFULLY lift up the Bowl from the Lower Body.

Step 2: Block with wood the drive shaft from the bottom of the bowl, as shown below.

i

This step requires two people.

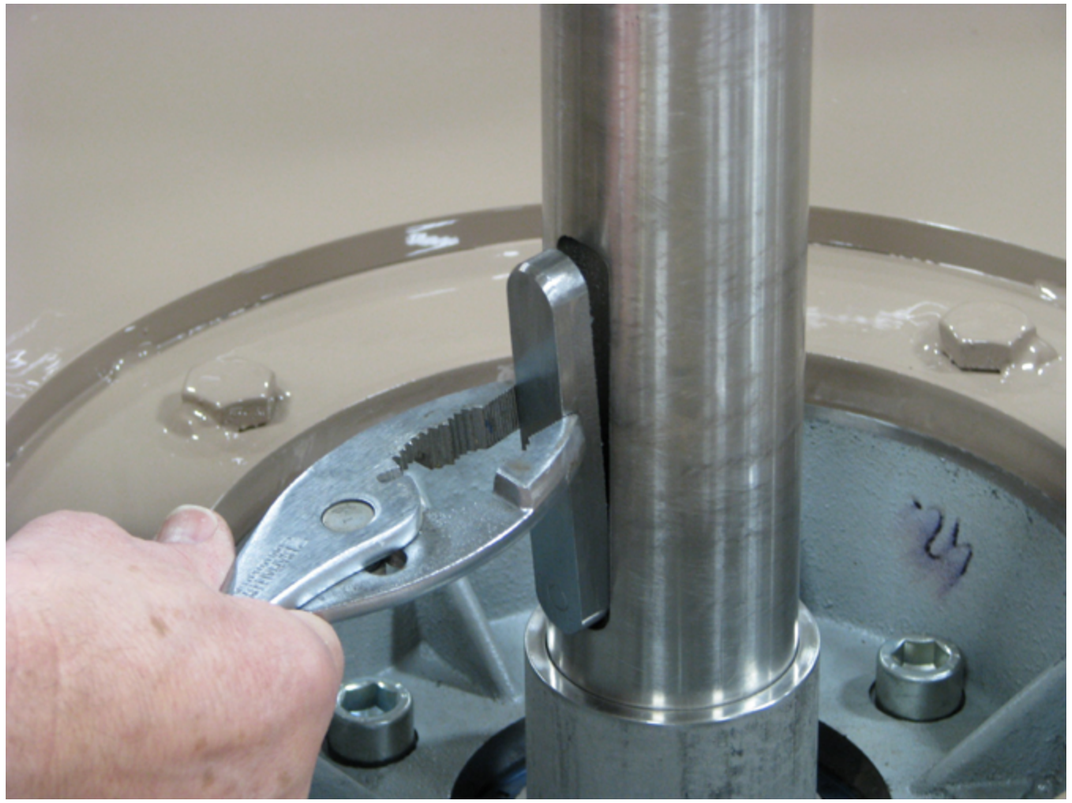
REMOVE BOWL

Step 1: Disconnect the rigging from the bowl.

Step 2: Carefully remove the bowl from the lower body and set aside.

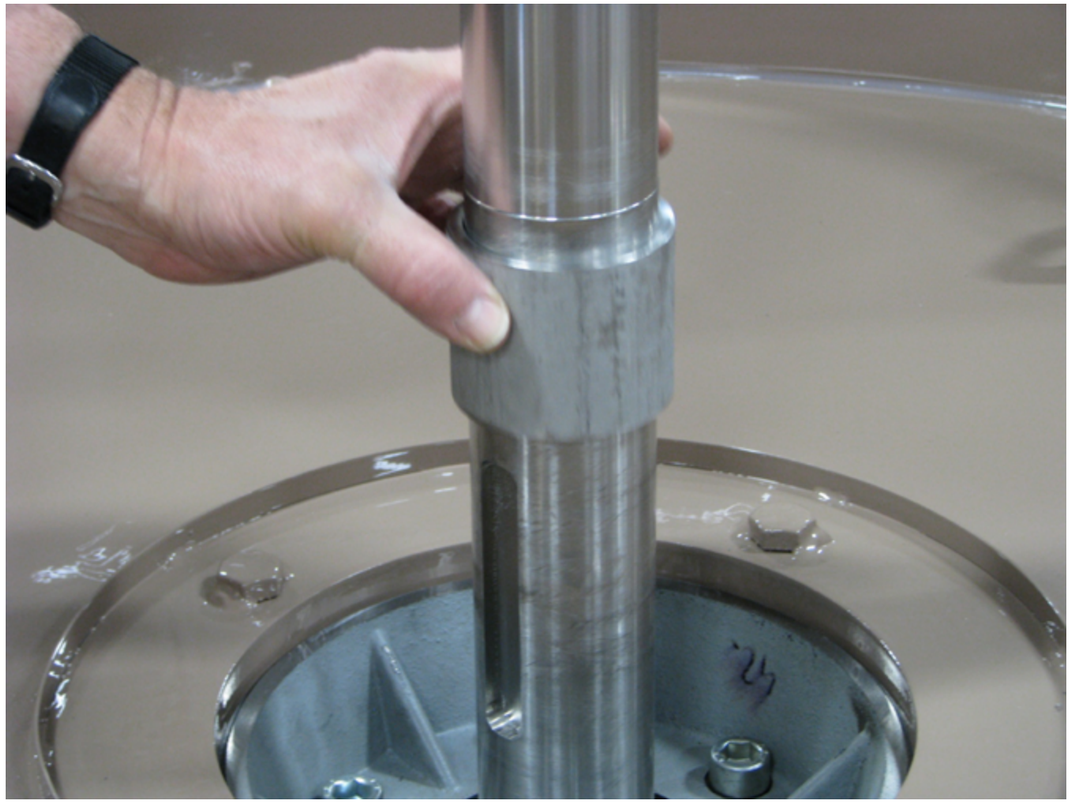
i

This step requires two people.



REMOVE KEYWAY

Step 1: Use a pair of pliars to grab and remove the Driveshaft Keyway. May need to use a screwdriver to pry the Keyway out of the Driveshaft groove if caked with chemical.



REMOVE SPACER

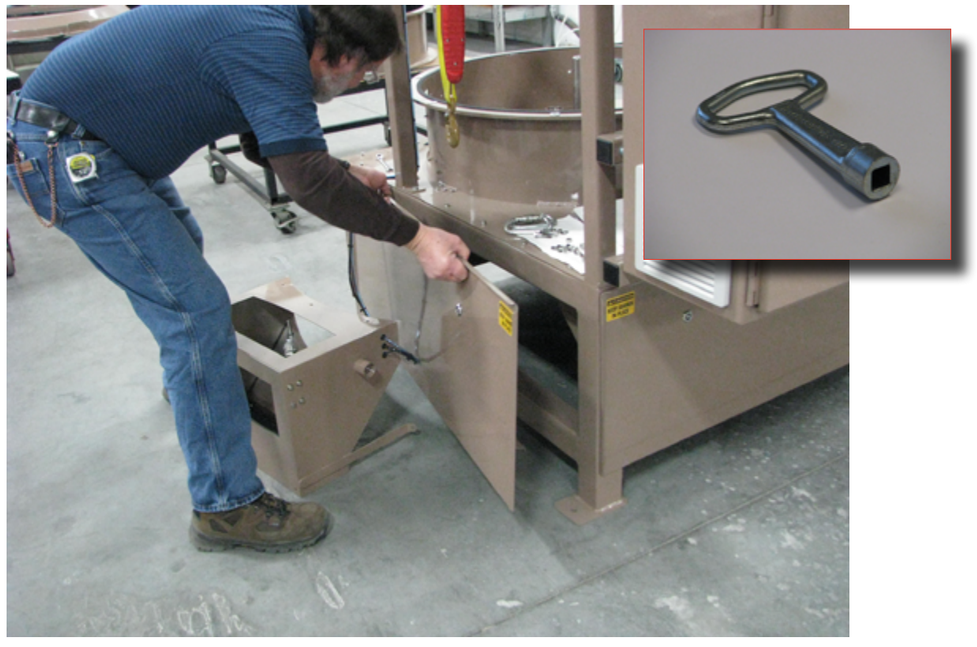
Step 1: Slide the Driveshaft Spacer up and off the driveshaft.

REMOVE SHIMS

Step 1: Slide the Driveshaft Shims up and off the driveshaft.

REMOVE PANEL DOORS

Step 1: Use the safety key to open and remove the front panel door (underneath the discharge) and side panel door.



REMOVE BACK PANEL DOOR

Step 1: Use the safety key to open and remove the back panel door (underneath the mounted control panel).

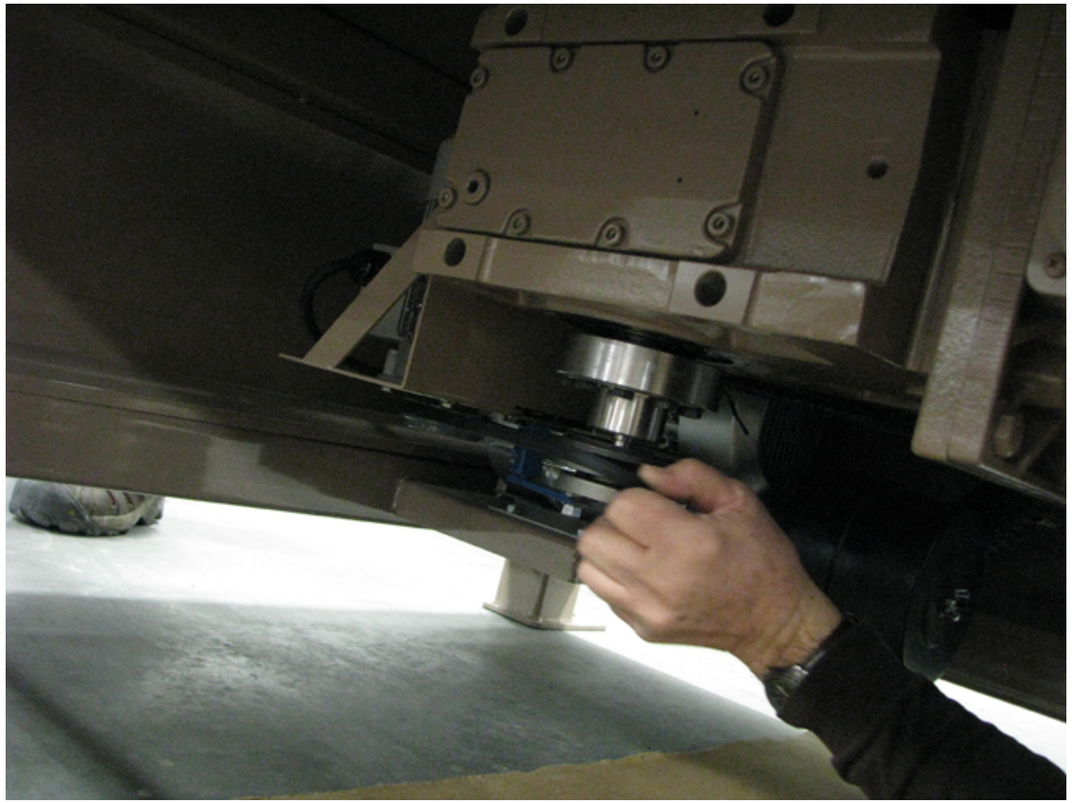
REMOVE FRAME BRACE

Step 1: Use ratchet wrench with 9/16 socket head to loosen and remove 3/8 hardware holding the frame brace underneath the control panel.

SECURE DRIVESHAFT

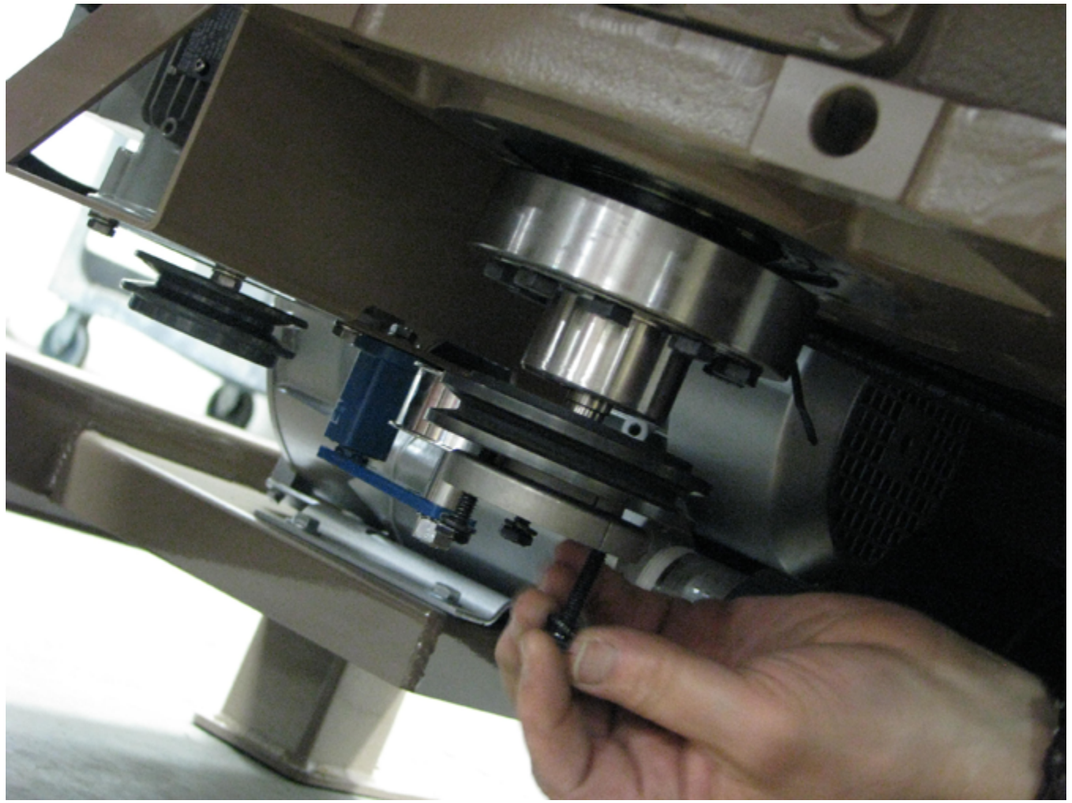
Step 1: Insert an eye bolt into the top of the drive shaft.

Step 2: Properly rig the drive shaft to hold it in place. If rigging is not available, have a second person hold onto the drive shaft above the lower body, preventing it from dropping onto the floor.



REMOVE PULLEY BELT

Step 1: Remove the pulley belt.



PULLEY BOLTS

Step 1: Use a 7/16 box end wrench to loosen and remove the 1/4-20 pulley bolts.

Step 2: Replace the bolts in each hole next to it and tighten each bolt, pushing the pulley off the drive shaft.

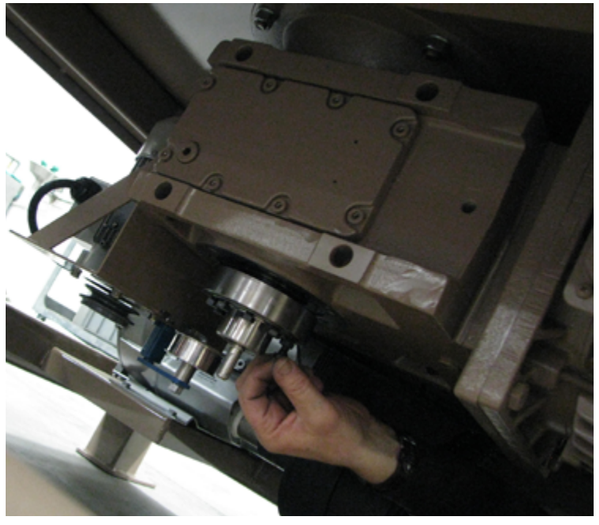
Step 3: Remove the pulley.

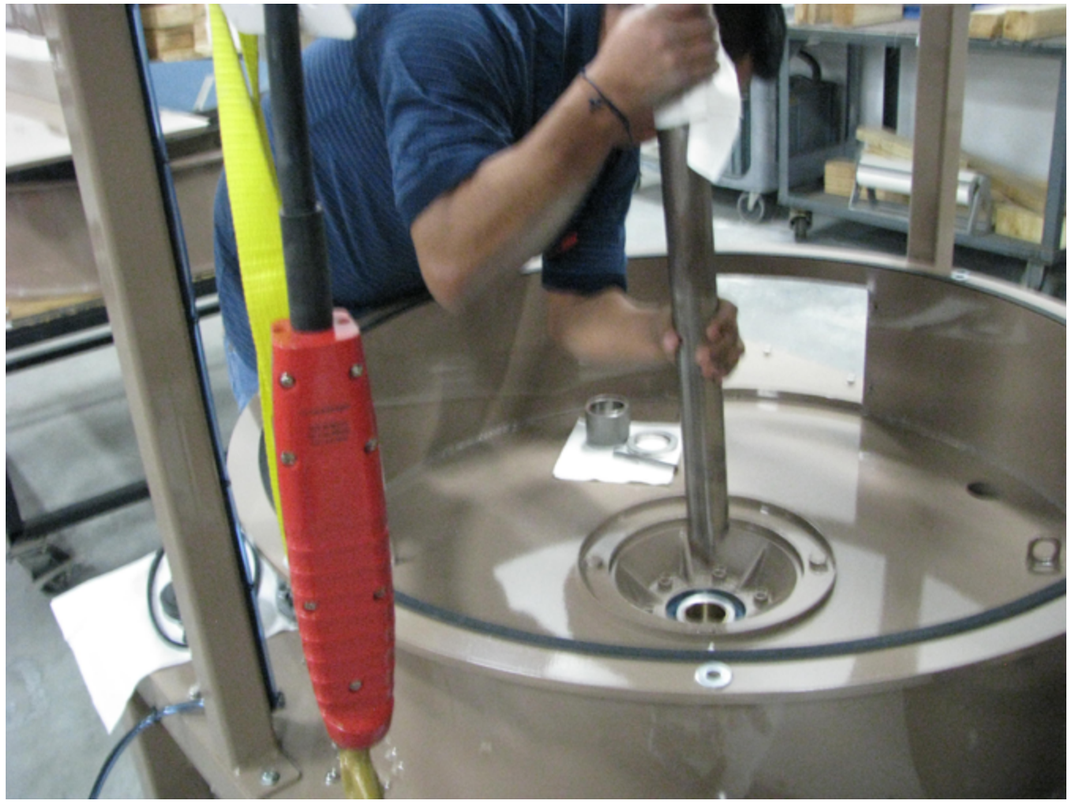
COLLAR BOLTS

Step 1: Use a ratchet with 13mm socket head to loosen and remove the 8mm collar bolts.

Step 2: Replace the bolts in each hole next to it and tighten each bolt, pushing the collar off the drive shaft.

Step 3: Remove the collar.





REMOVE DRIVESHAFT

Step 1: Once the collar is removed from the drive shaft, pull the drive shaft up through the hub and remove it from the lower body.

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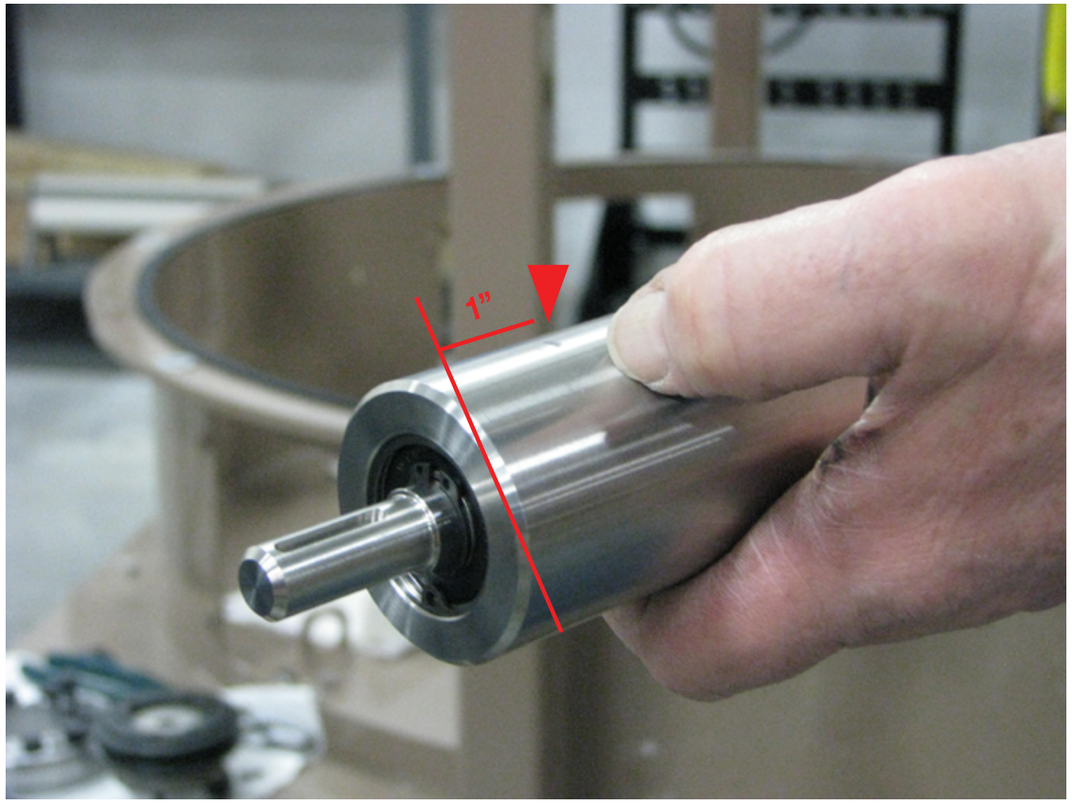
PART 2

Instal the new Drive shaft.

This process requires two people and proper rigging/lifting equipment.



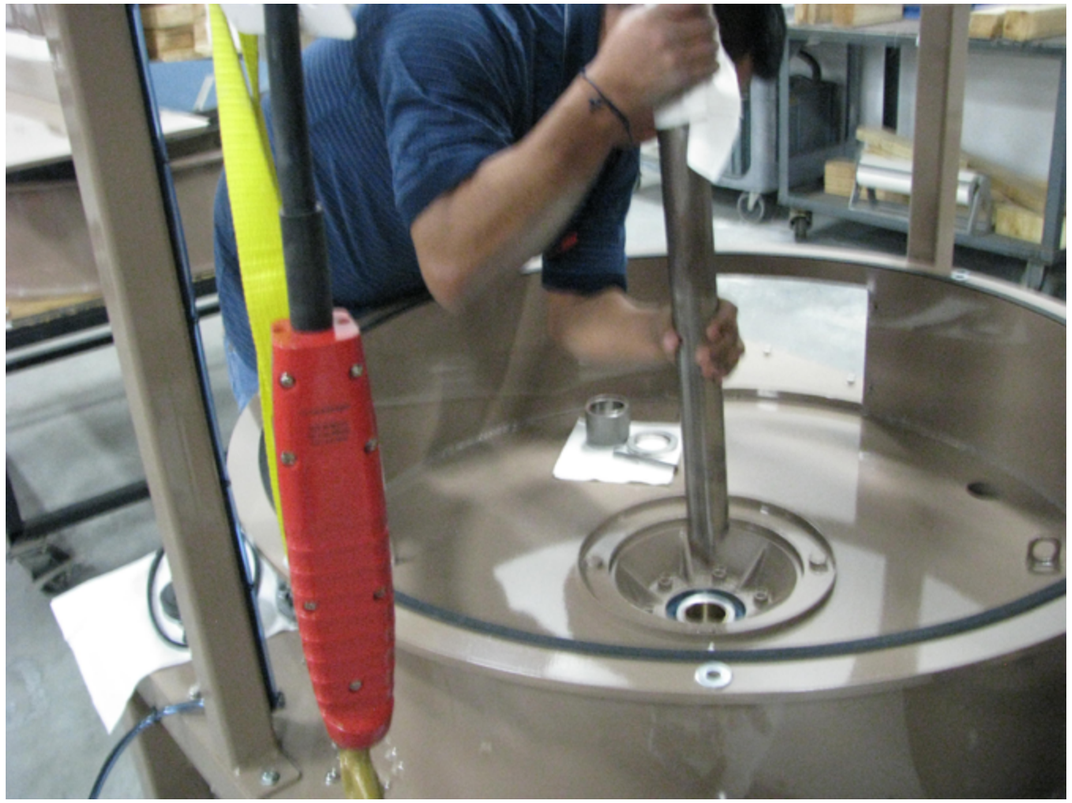
REPLACEMENT DRIVESHAFT

Step 1: Mark the new drive shaft approximately 1” from the end of the shaft, as shown above.

SECURE DRIVESHAFT

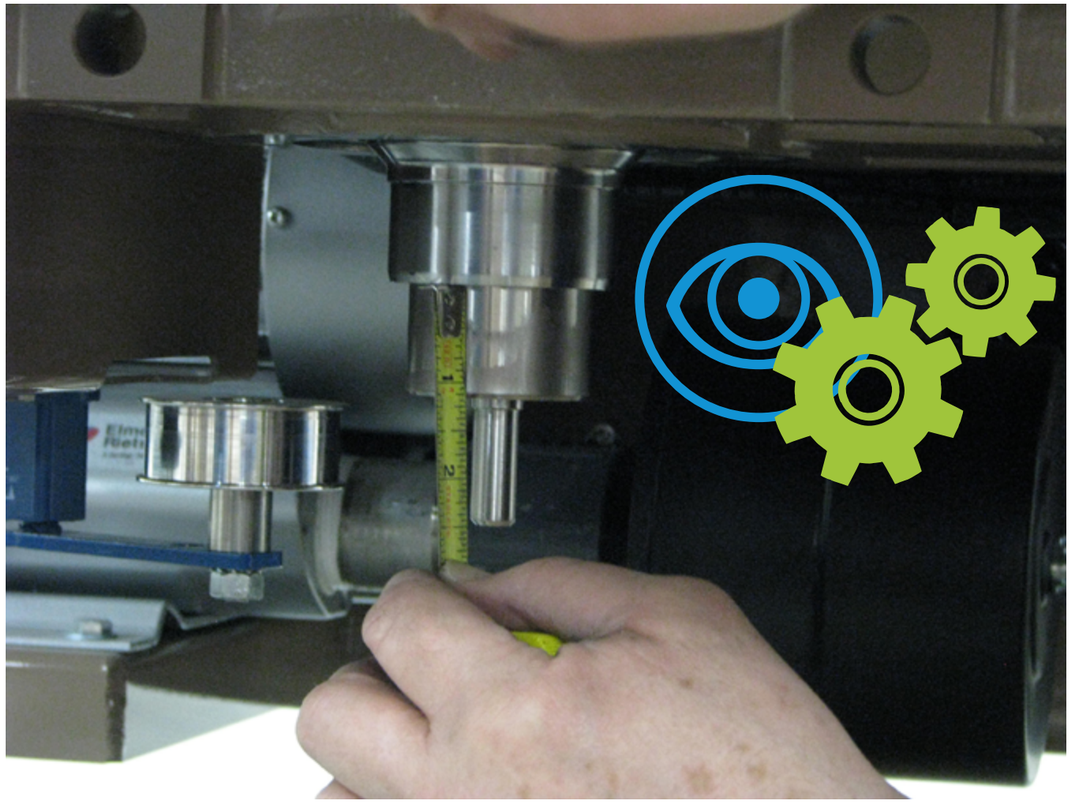
Step 1: Insert an eye bolt into the top of the drive shaft.

Step 2: Properly rig the drive shaft to hold it in place. If rigging is not available, have a second person hold onto the drive shaft above the lower body, preventing it from dropping onto the floor.



INSERT DRIVE SHAFT

Step 1: Insert the drive shaft down through the hub in the lower body.



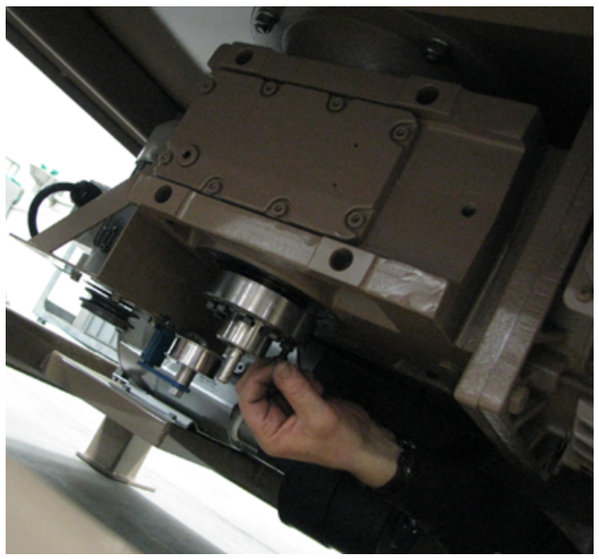
MEASURE DRIVESHAFT CLEARANCE

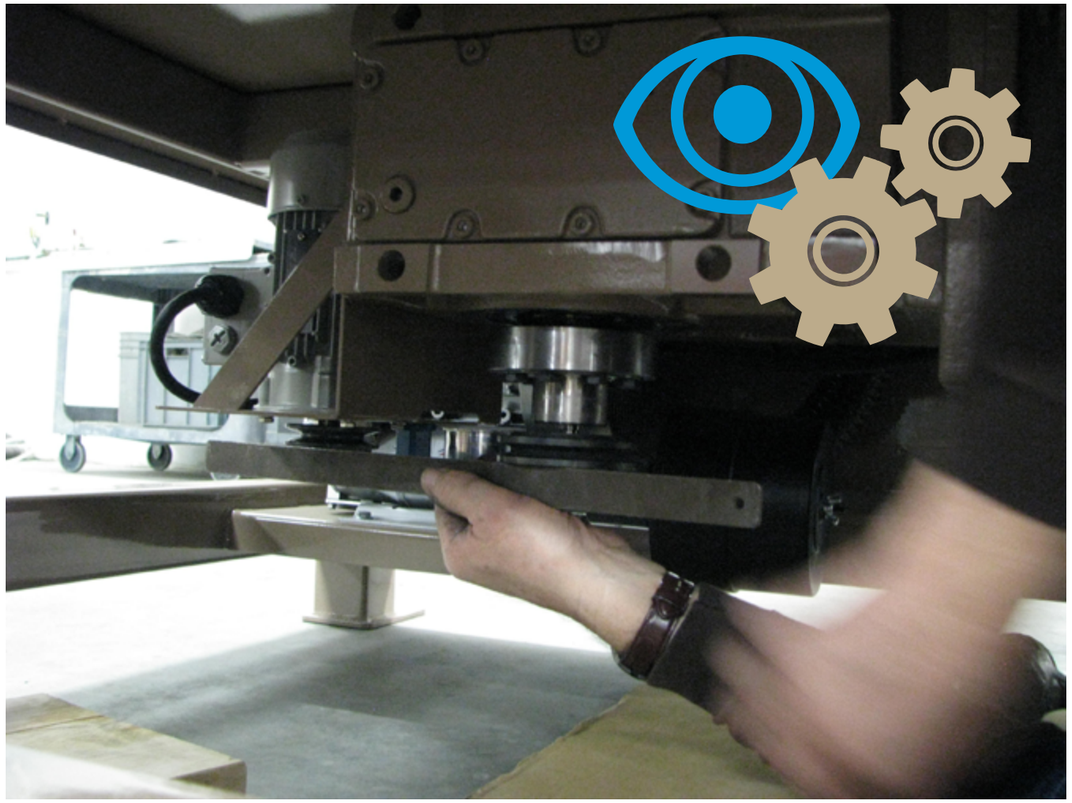
Step 1: Underneath the lower body, use a tape ruler to measure the distance the drive shaft protrudes past the bottom of the hub, as shown above. Lower the drive shaft until it protrudes 1” past the end of the hub. Have the second person or use the rigging device to hold the drive shaft in place.

COLLAR BOLTS

Step 1: Slide the collar onto the drive shaft.

Step 2: Use a ratchet with 13mm socket head to tighten the 8mm collar bolts. Set the torque wrench to 100 inch pounds and tighten each bolt evenly, until the torque wrench “clicks.”

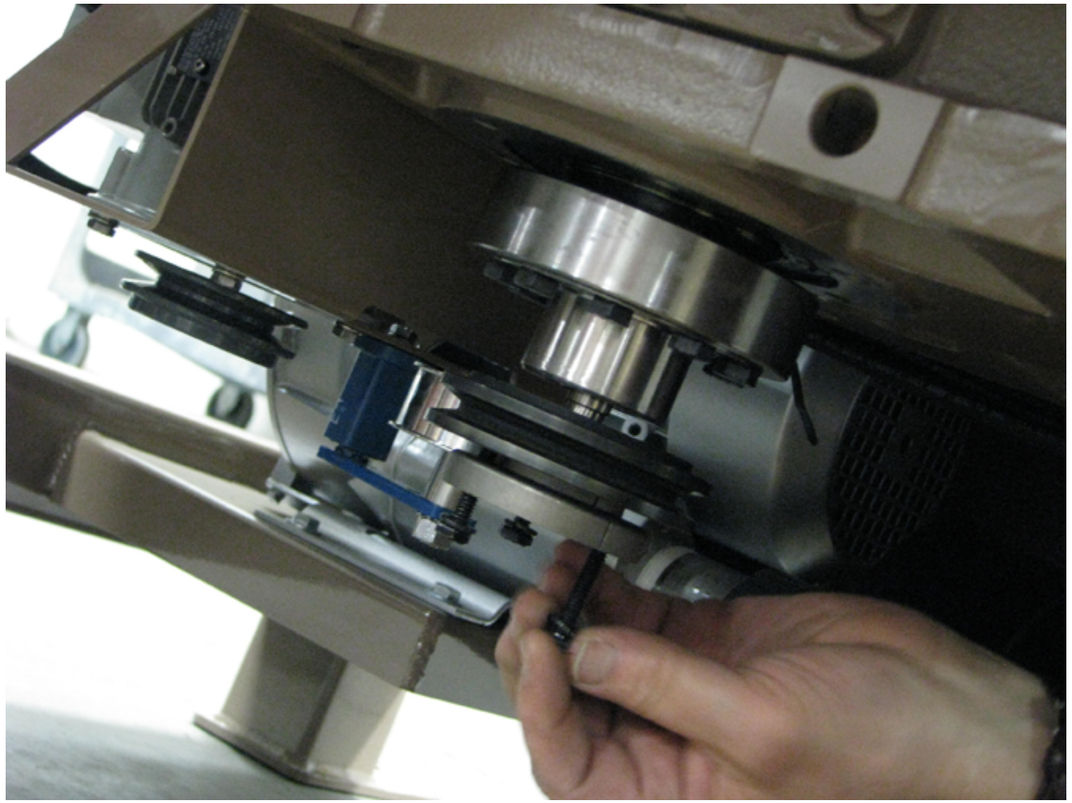




BOWL PULLEY

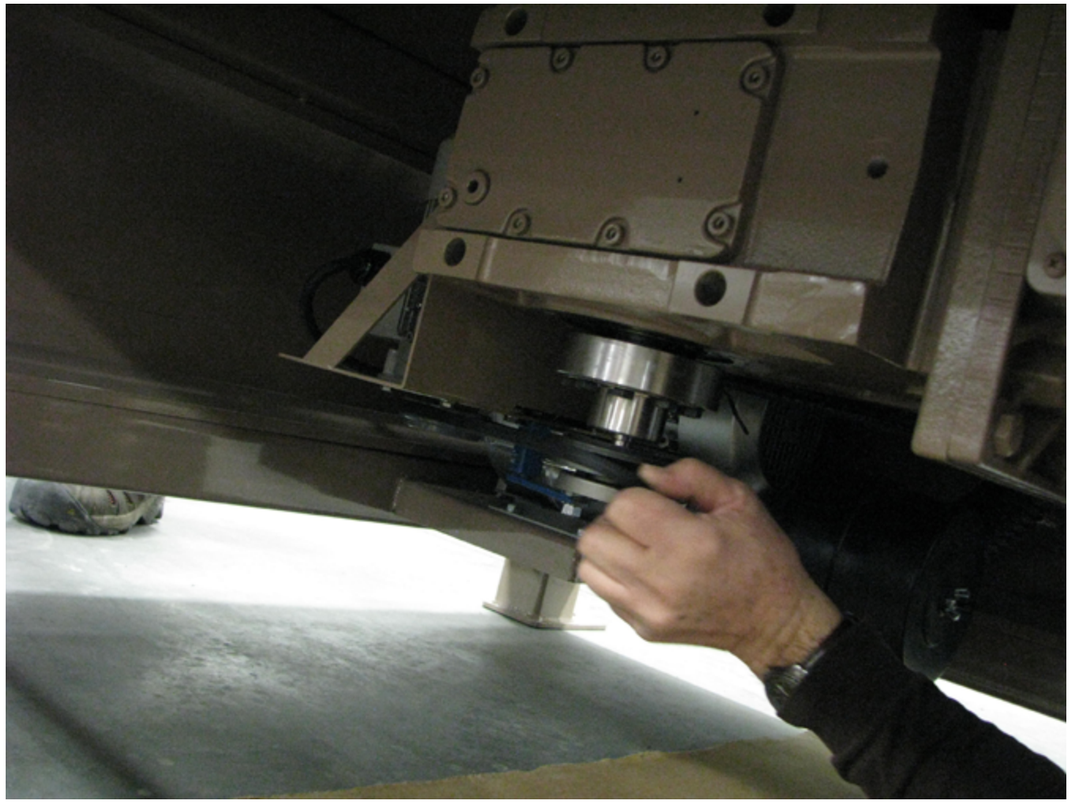
Step 1: Slide the bowl pulley onto the drive shaft and hand tighten a couple of bolts.

Step 2: Use a straight edge to adjust the placement of the bowl pulley in relation to the motor pulley, as shown. Nudge the bowl pulley up or down the drive shaft, until the two pulleys properly aligned, so that the belt will ride evenly



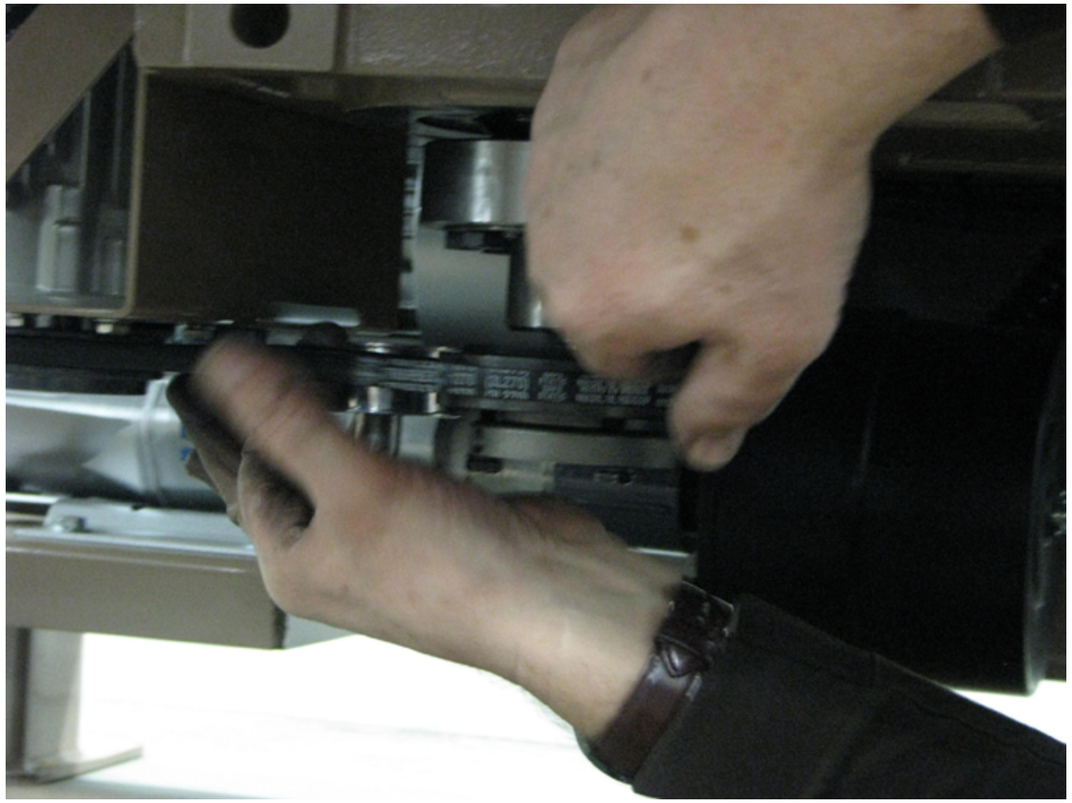
PULLEY BOLTS

Step 1: Once properly aligned, use a Use 7/16 box end wrench to tighten the 1/4-20 bowl pulley bolts. Tighten each bolt evenly.



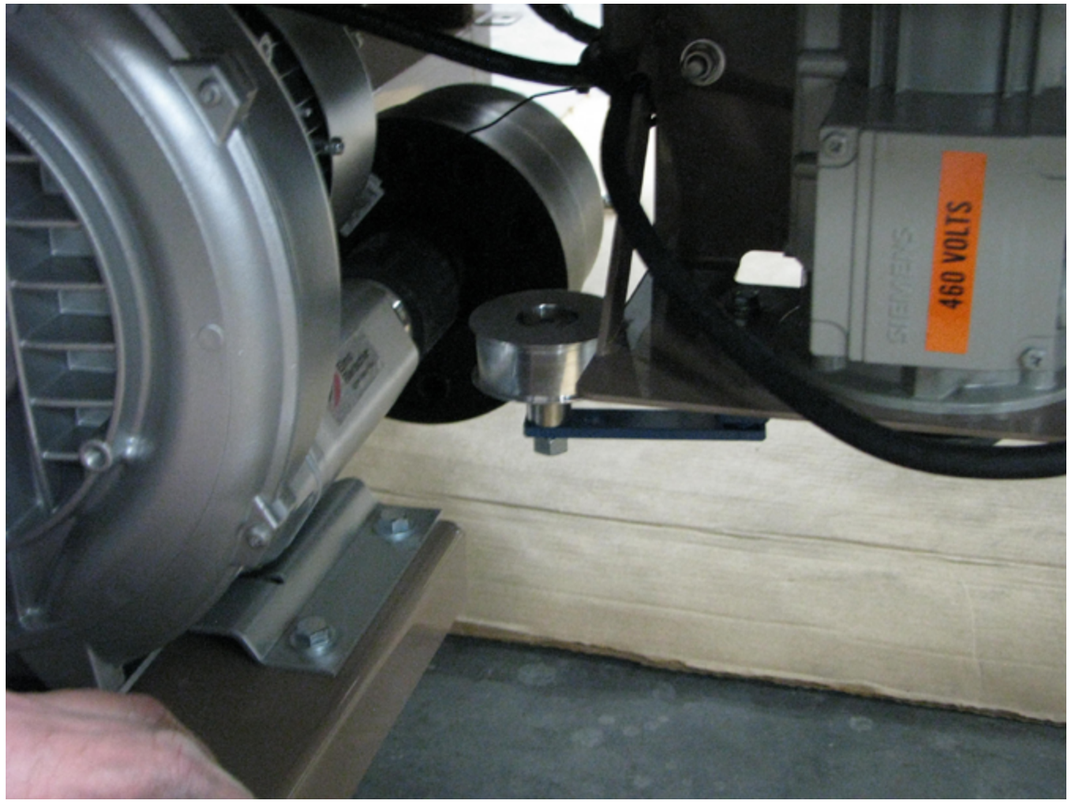
PULLEY BELT

Step 1: Replace the pulley belt.



PULLEY BELT TENSION

Step 1: Check the pulley belt tension. Should have approximately 1/2” movement. If too loose, tighten the tensioner.



BELT TENSIONER

Step 1: Use a crescent wrench to hold the tensioner.

Step 2: Use a 10mm wrench to tighten the 6mm bolt on top of the tensioner, as shown below.

Step 3: Hold the tensioner against the belt, until approximately 1/2” of play is achieved.

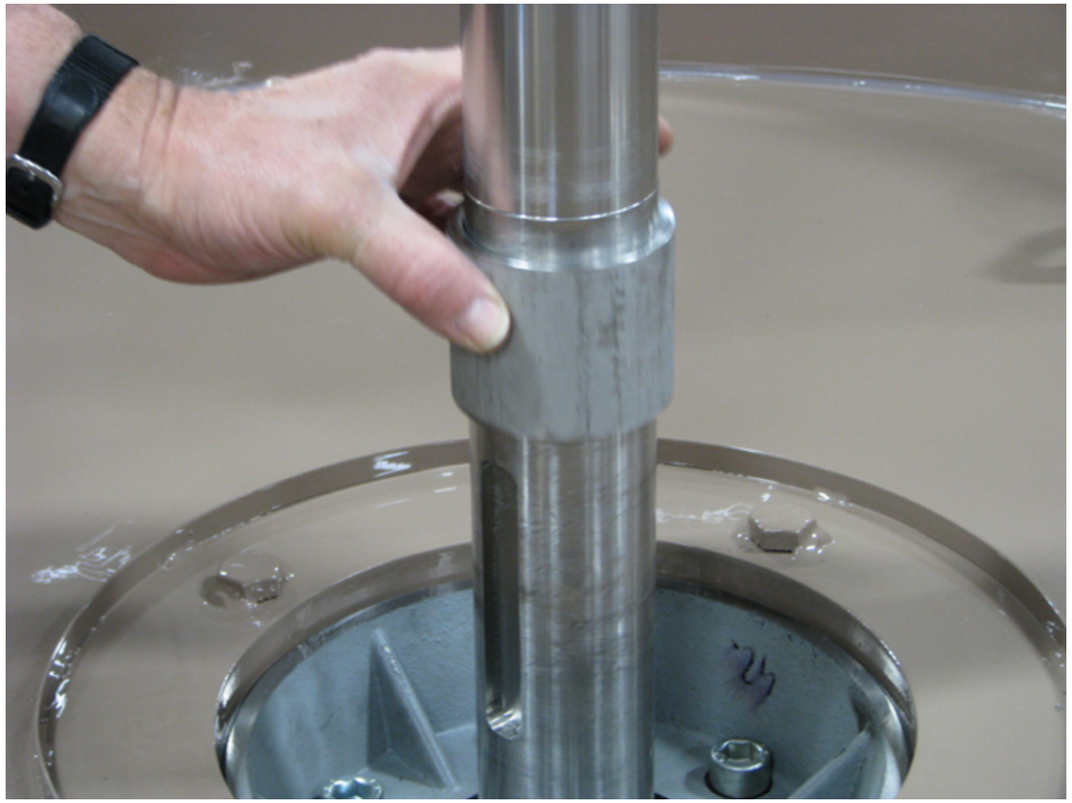
Step 4: Tighten the tensioner nut in place.

DRIVESHAFT

Step 1: If used, remove the eye bolt and rigging from the top of the drive shaft.

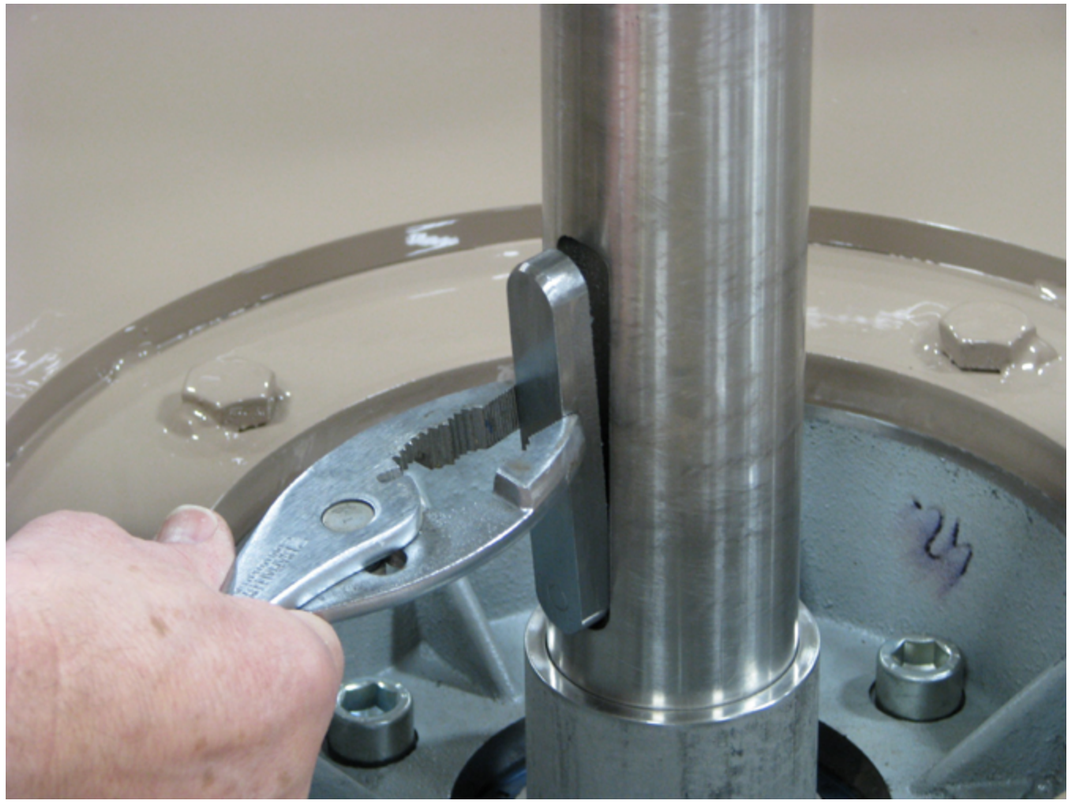
REPLACE SHIMS

Step 1: Slide drive shaft shims onto the drive shaft.



REPLACE SPACER

Step 1: Slide the drive shaft spacer onto the drive shaft.



REPLACE KEYWAY

Step 1: Use a pair pf pliers to insert the drive shaft keyway.

REPLACE BOWL

Step 1: Carefully move the bowl over to the lower body.

> i
>
> This step requires two people.

BOWL

Step 1: Properly rig the bowl in order to lift above the drive shaft.

Step 2: Block with wood the drive shaft from the bottom of the bowl, as shown below.

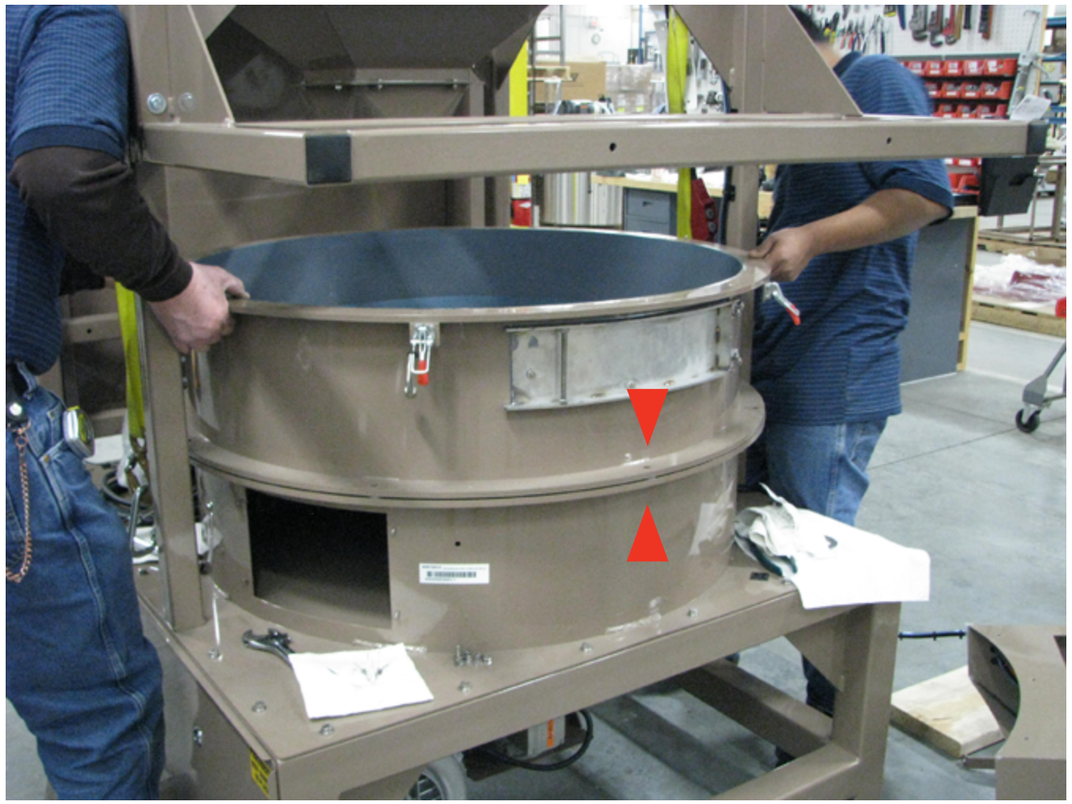
Step 3: CAREFULLY lift up the Bowl from the Lower Body, remove the block of wood and lower onto the drive shaft.

> i
>
> This step requires two people.

REPLACE MID BODY

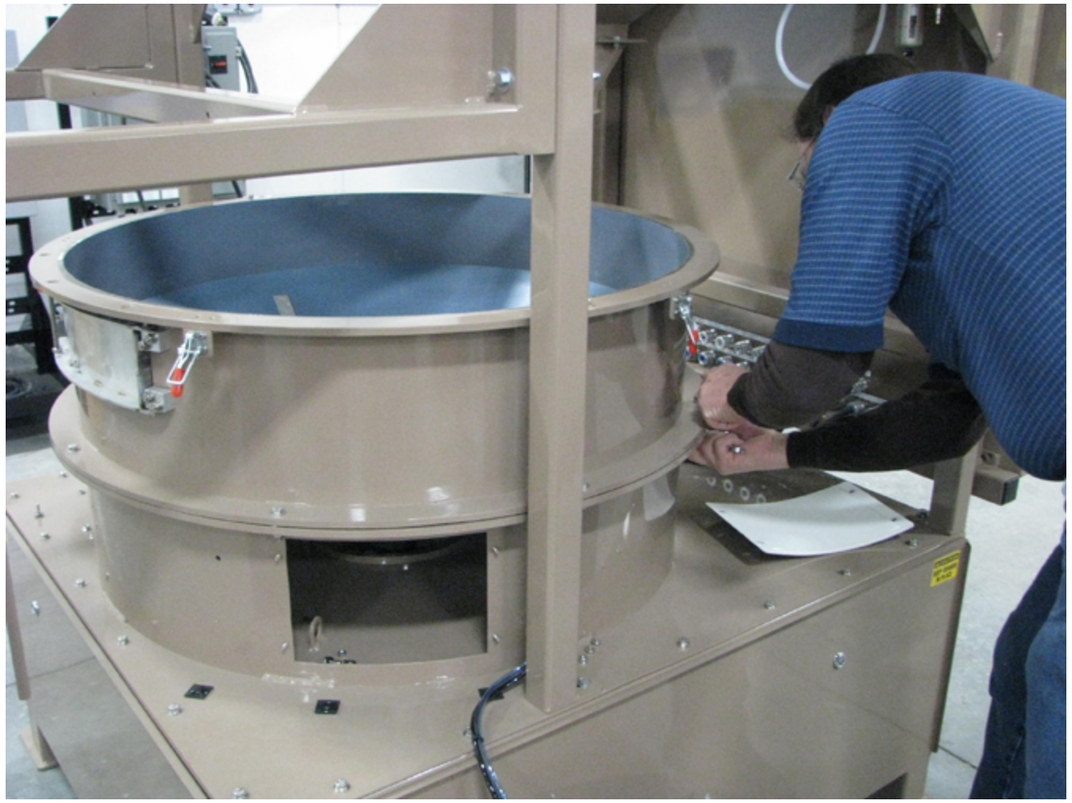
Step 1: CAREFULLY lift up and set the Bowl Mid Body Assembly onto the Bowl Lower Body.

> This step requires two people.



ALIGN MID BODY

Step 1: Properly align the Mid Body with the Lower Body, so that the discharge door opening is in the middle of the Lower Body. The bolt holes will line up exactly.

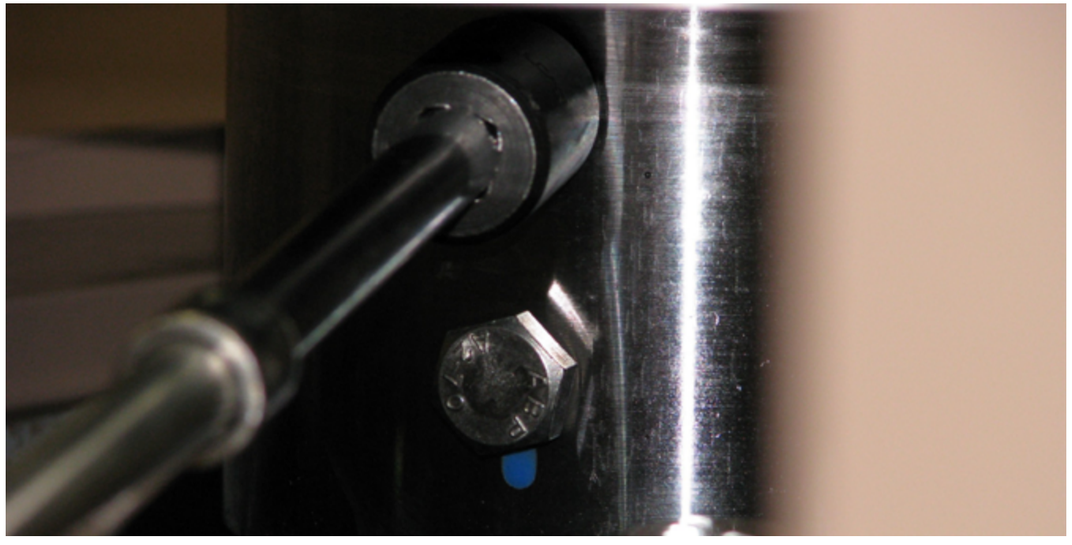


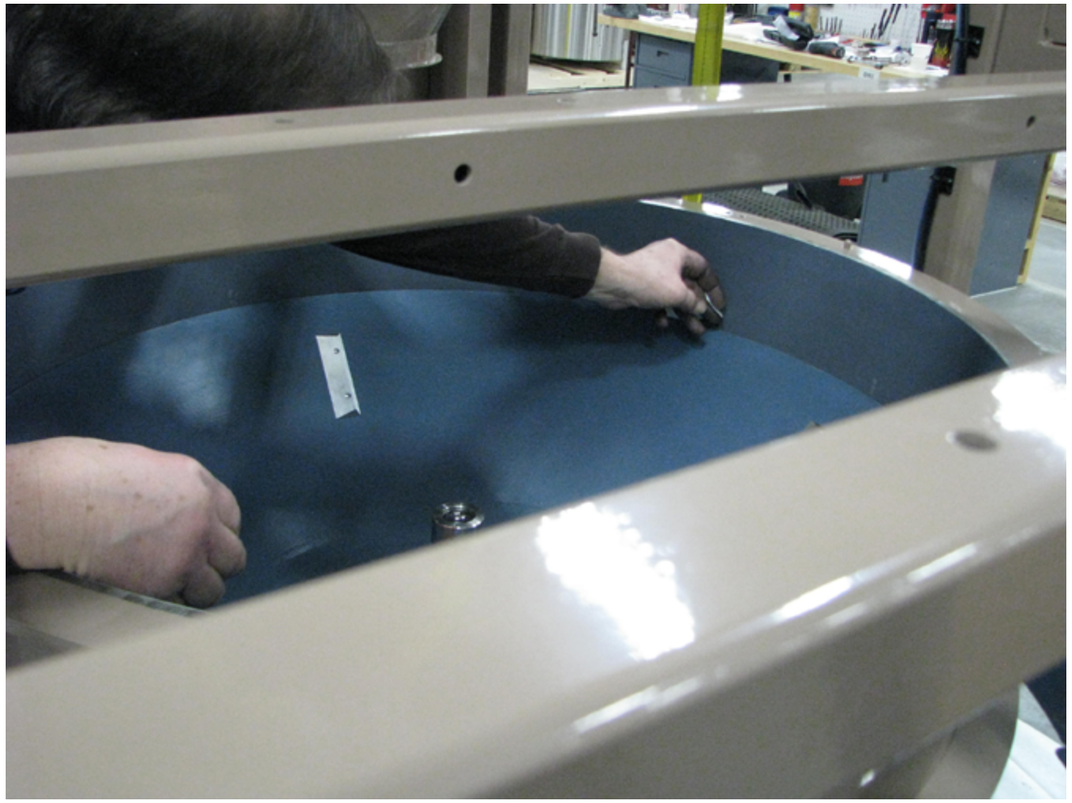
MID BODY BOLTS

Step 1: Replace the eight (8) Bowl Mid Body bolts that connect it to the Bowl Lower Body. Use a ratchet wrench with 1/2 socket head to tighten the bolt, washer and lock washers.

HUB SET SCREWS

Step 1: Reach under the Bowl through the Access Panel opening and tighten the two (2) Hub set screws with 9/16 socket head. Recommend using extensions on ratchet wrench, as shown.



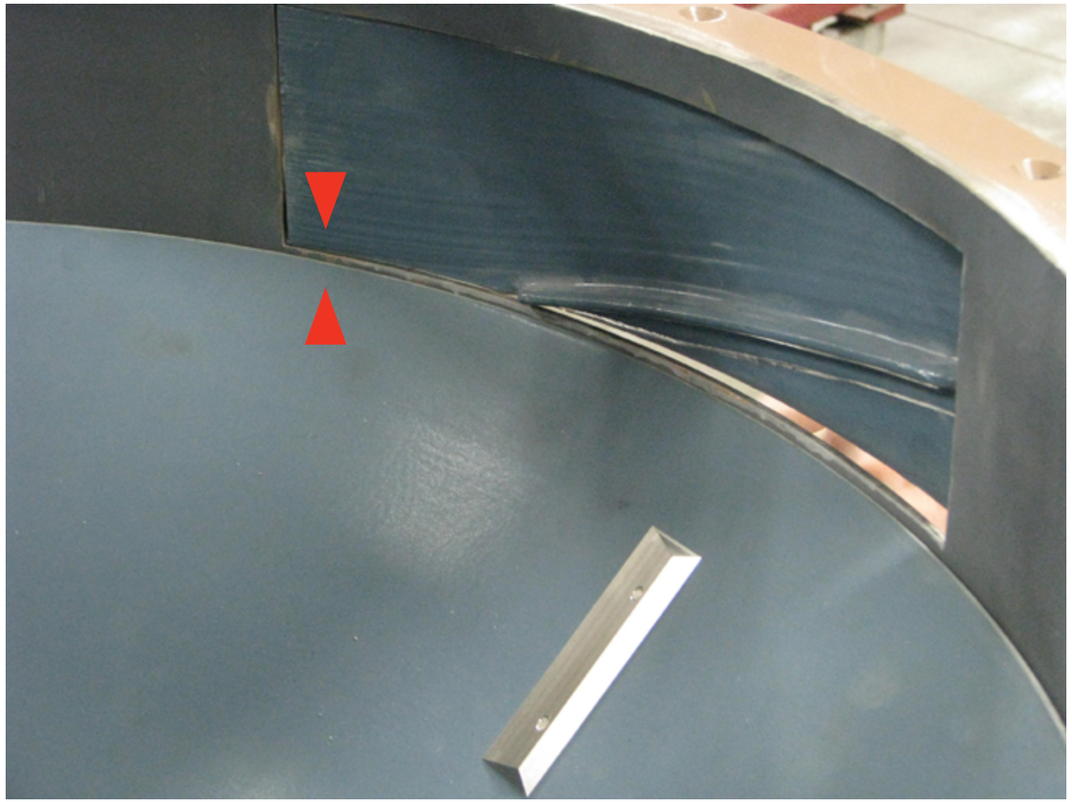


BOWL & WRAP GAP CHECK

Step 1: Ensure the gap between the Bowl and the inside of the Mid Body Wrap is the thickness of three (3) pieces of paper, as shown. Move the paper around the bowl and spin the Bowl by hand and check for any rubbing spots or catching noises.

Step 2: Loosen the mid body bolts, then use a rubber mallet to tap the mid body. The mid body will spring in/out to adjust for sticking spots.

Step 3: Retighten the mid body bolts after the bowl is adjusted.



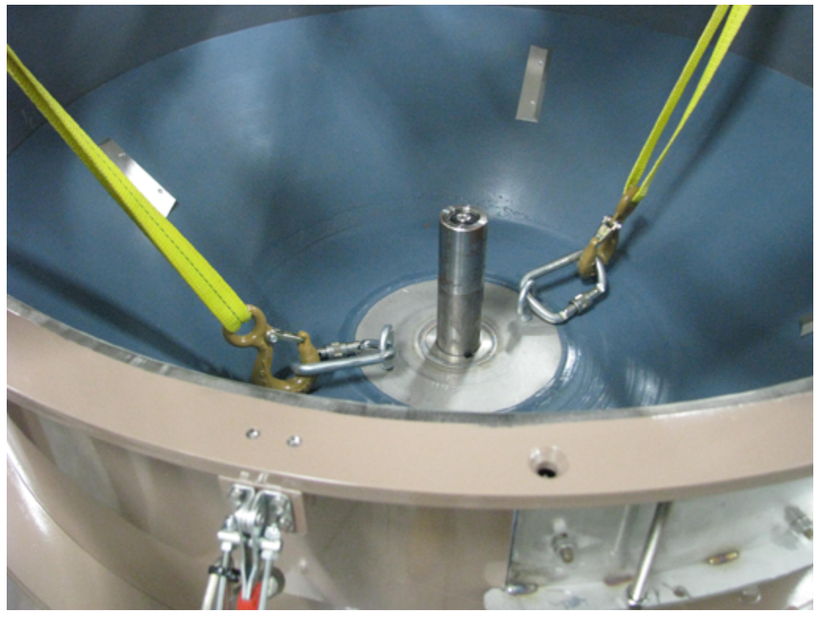
BOWL & DISCHARGE DOOR

Step 1: !Ensure the Bowl and the discharge door of the Mid Body Wrap is not too low or too high above the door! Adjustments with shims may need to be done, in order to raise or lower the bowl alignment with the discharge door.

Step 2: Repeat steps on pages 53-63 until alignment as shown above is achieved.

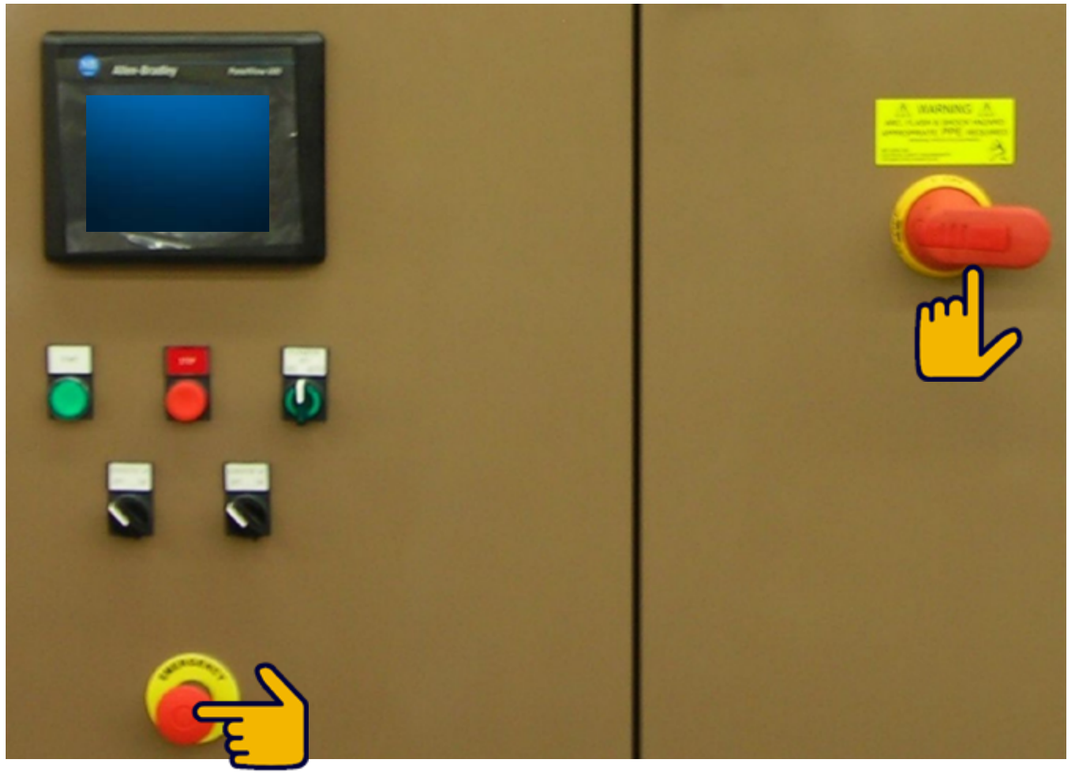
REMOVE BOWL SCREWS

Step 1: Remove the two eye bolts and rigging from the base of the bowl, as shown.



TEST BOX - WIRING THE CONTROLLER

Step 1: !CAUTION! Open the Main Control Panel and connect the power cord to 380 volts power source, as shown above.



MAIN CONTROL PANEL

Step 1: Turn the power lever ON. Pull OUT the Emergency Button. The HMI will boot up and the main screen will appear.

BOWL SPEED

Step 1: Touch the BOWL field and enter Hz speed on pop-up key pad (shown below). Enter a value of 55.

RUN BOWL

Step 1: Touch the BOWL M4 START button icon, to enable the device. Observe the bowl spinning inside the mid body. Listen for rubbing sounds or irregularities.

Step 2: If all clear, then touch the BOWL M4 RUNNING button icon to stop the bowl.

INNER CONE COVER

Step 1: Slide the Inner Cone Cover on the Drive shaft.

Step 2: Use a 1/8 Allen wrench to tighten the 1/4 set screw on the Cone Cover.

ATOMIZER

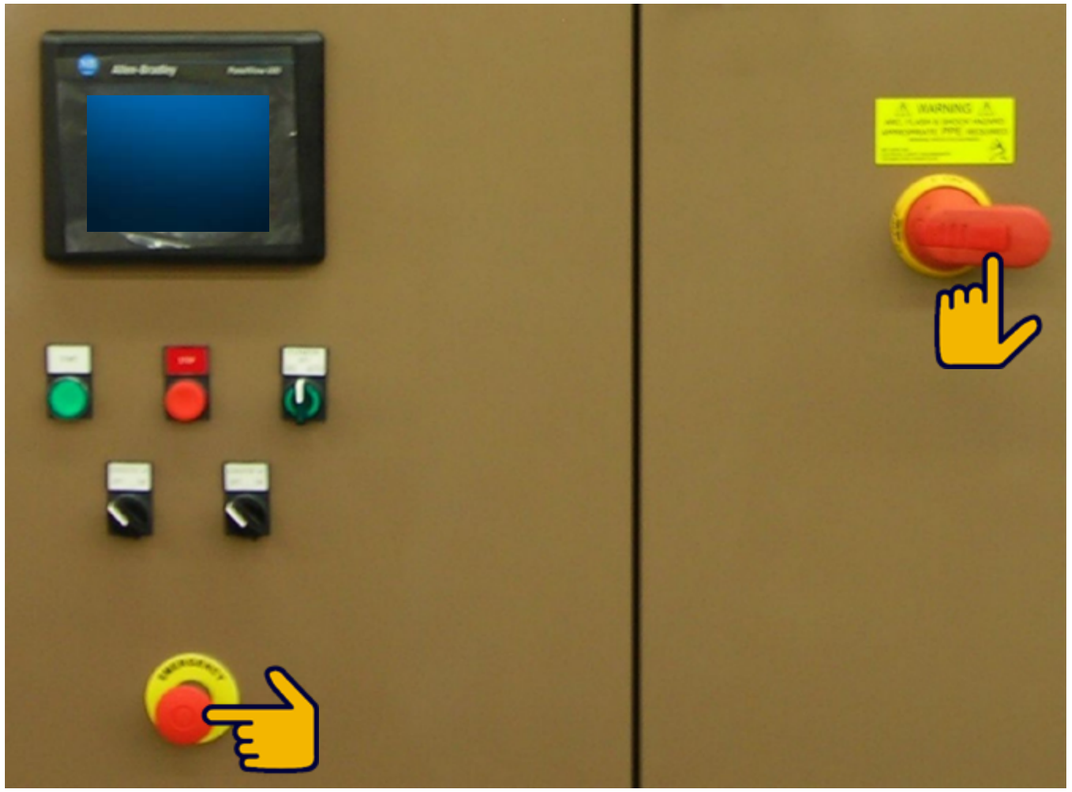
Step 1: Replace the Atomizer on the Drive shaft.

Step 2: Use a ratchet wrench with 7/16 socket head to tighten the bolt, washer and lock washers.

ATOMIZER

Step 1: Touch the ATOMIZER M3 START button icon, to enable the device. Observe the Atomizer spinning inside the Bowl for wobbles or irregularities.

Step 2: Touch the ATOMIZER M3 RUNNING button icon to stop the Atomizer.



MAIN CONTROL PANEL

Step 1: Turn the power lever OFF. The HMI will shut down.

Step 2: Disconnect the main power cord from the power source.

INNER CONE COVER

Step 1: Use RTV around the base of the Cone, sealing it to the Bowl.

Step 2: Use finger to remove excess.

DISCHARGE HOUSING

Step 1: Replace the Discharge Assembly onto the mid body.

This step requires two people.

DISCHARGE HOUSING

Step 1: Replace the pan head screws. Use Phillips screwdriver to replace three (3) 5/16 pan head screws.

DISCHARGE SUPPORT

Step 1: Connect both (R-L) Bowl Discharge Supports onto the front of the Lower Body Wrap. Reach inside the Lower Body Wrap through the Lower Body Access Panel opening with one hand to hold the nut and with the other hand.

Step 2: Use a ratchet wrench with 1/2 socket head to tighten two (2) 5/16 bolts, washers and lock washers.

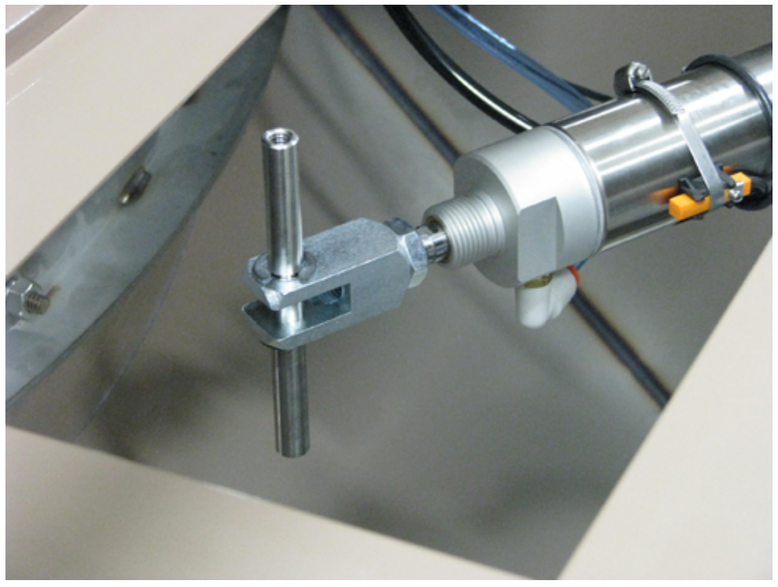
LOWER BODY ACCESS DOORS

Step 1: Replace both (R-L) Lower Body Wrap Access Panels & Gaskets onto the front of the Lower Body Wrap.

Step 2: Use 7/16 socket head to tighten four (4) 1/4-20 bolts, washers and lock washers.

DISCHARGE DOOR AIR CYLINDER

Step 1: Use an Allen wrench and channel locks to hold the air cylinder clevis pin and tighten both the top and the bottom button head bolts.



APPLY RTV

Step 1: RTV a seal around the outside and inside of the Discharge Assembly (see images below).

AIRLINE TY WRAPS

Step 1: Use ty wraps to hold the airlines onto the mid body. Use a side cutter to snip the excess.

DISCHARGE COVERS

Step 1: Replace both the top and front covers on the seed discharge assembly. Use the quarter turn key to lock in place.

DUST EVACUATION

Step 1: Use a slotted screwdriver to connect the dust exhaust tube to the port on Discharge Assembly.

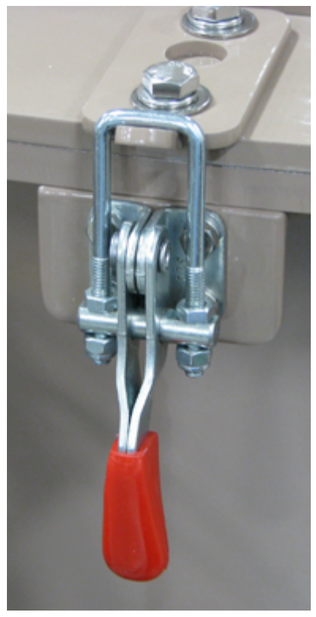
BOWL COVER

Step 1: Use the grab handles on top of the cover to CAREFULLY lift the Bowl Cover onto the Bowl Mid Body Wrap.

This step requires two people.

BOWL COVER CLAMPS

Step 1: Connect the hold down clamps that hold the Bowl Cover onto the Bowl Mid Body Wrap.



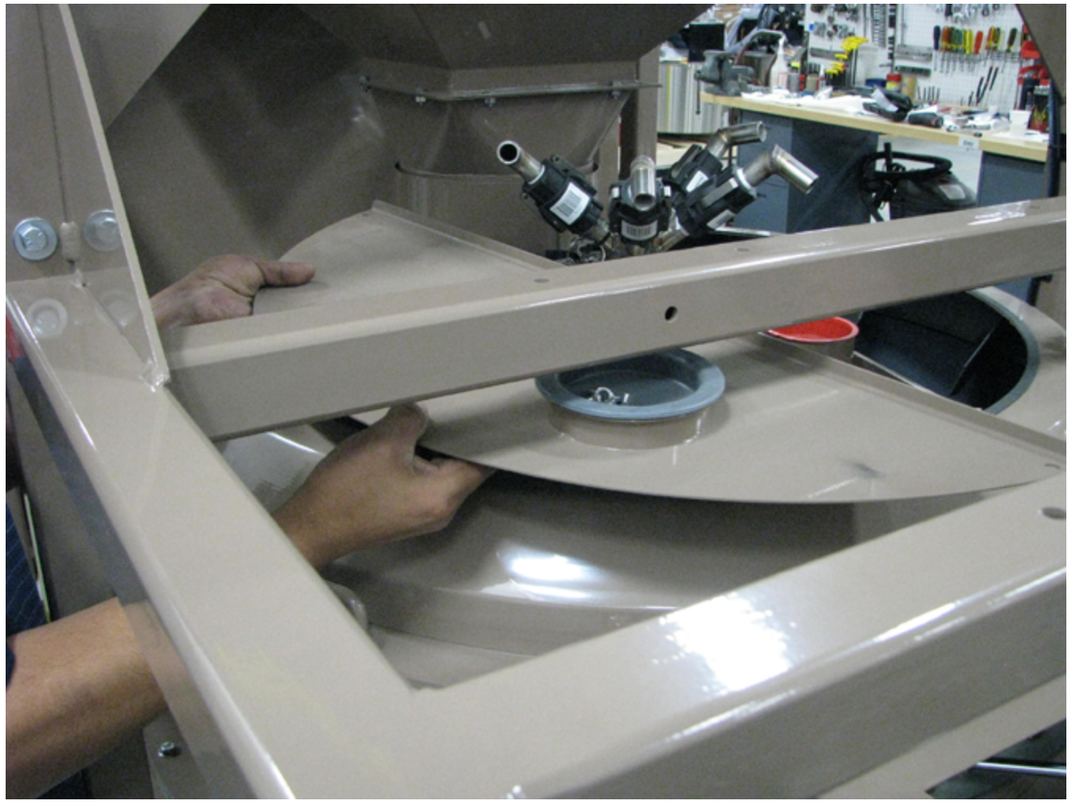
SEED INLET COLLAR

Step 1: Replace the seed inlet collar and connect the hold down latch.

CHEMICAL INLET ASSEMBLY

Step 1: Insert the chemical inlet assembly into the top of the bowl cover.

Step 2: Thread the wing nuts holding the chemical inlet assembly onto the lid.



LID CLEAN OUT PANEL A

Step 1: Replace Lid Clean out Panel A on top of the lid spinning.

Step 2: Thread the wing nuts holding the Lid Clean out Panel A.

LID CLEAN OUT PANEL B

Step 1: Replace Lid Clean out Panel B on top of the lid spinning.

Step 2: Thread the wing nuts holding the Lid Clean out Panel B.

REPLACE FRONT PANEL DOOR

Step 1: Replace the front panel door (underneath the discharge).

Step 2: Use the quarter turn key to lock in place.

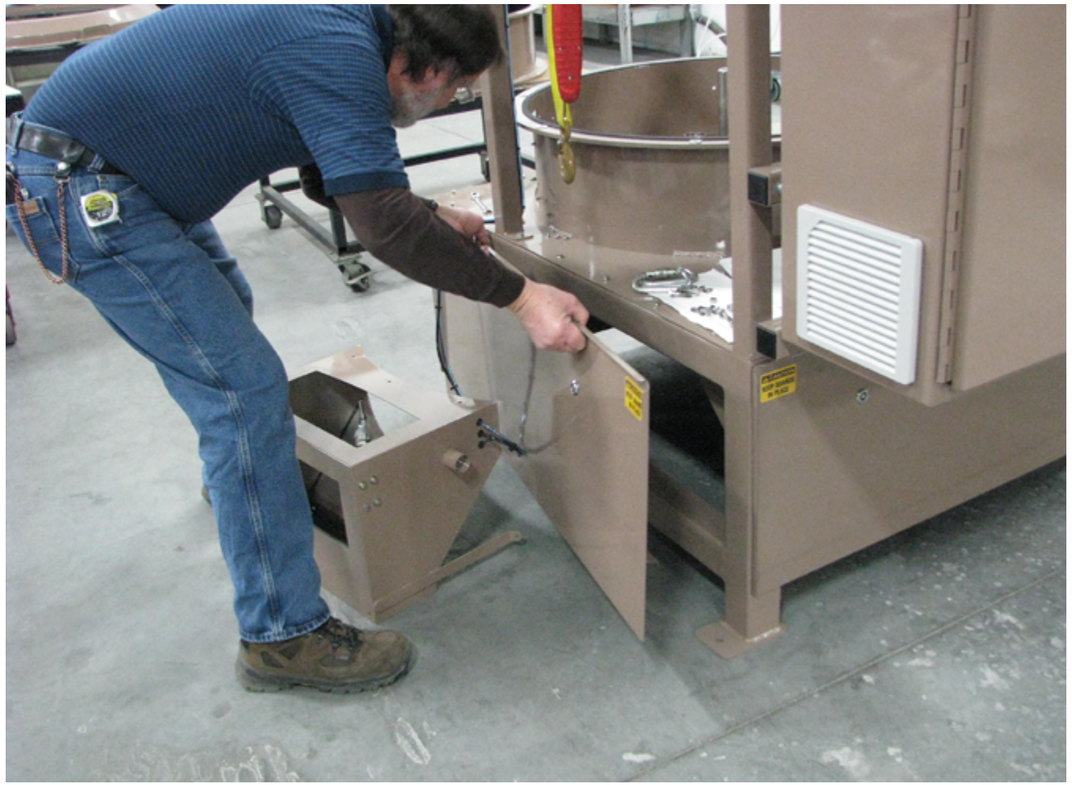
REPLACE FRAME BRACE

Step 1: Use ratchet wrench with 9/16 socket head to replace 3/8 hardware holding the frame brace underneath the control panel.

REPLACE BACK PANEL DOOR

Step 1: Replace the back panel door (underneath the mounted control panel).

Step 2: Use the quarter turn key to lock in place.



REPLACE SIDE PANEL DOOR

Step 1: Replace the side panel door.

Step 2: Use the quarter turn key to lock in place.

Installation of the new Drive shaft is complete

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