



User Manual for Powered Feed Roll

*Operating, Maintenance, Lubrication,
and Safety Instructions*

FS-HZF / HD-HZF / PM-HZF

Bulletin 23-72-22.1

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SAFETY PRECAUTIONS



ANY MALFUNCTION OR OPERATION PROBLEM NOT COVERED IN THIS MANUAL SHOULD BE REPORTED TO THE FACTORY. OUR TRAINED ENGINEERS ARE AVAILABLE TO ASSIST YOU.



READ AND FOLLOW ALL INSTRUCTIONS IN THIS MANUAL BEFORE USING THIS EQUIPMENT.

- ✓ Check insert spikes in feed roll drum monthly to make certain they are tight and haven't worn down. The threaded spikes have been screwed into place, as well as spot welded for additional hold. Prolonged operation may cause these parts to loosen. If not checked for wear on a timely basis, the parts may break loose and enter the hog, causing damage to the unit and possibly causing severe injury to personnel in the area. **It is the responsibility of the user to keep the insert spikes properly tightened at all times.**

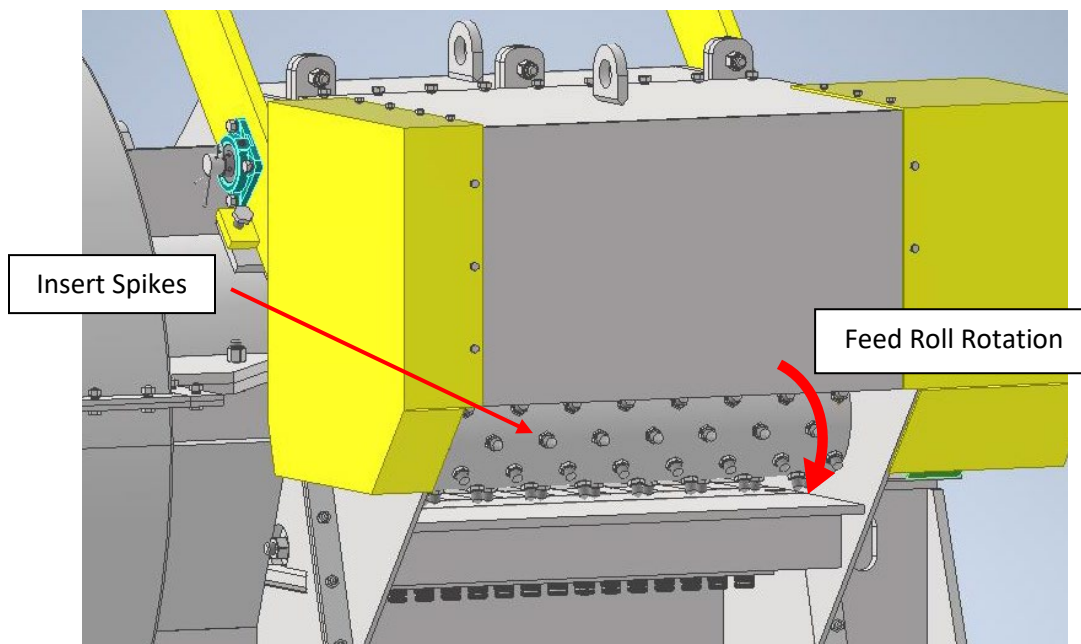


Figure 1.1: Insert Spikes

- ✓ **Do not perform any maintenance work or any other operations on this equipment unless it is completely stopped, and all electrical circuits are deactivated and locked out.** We recommend that the person performing the maintenance work keep the lockout key on their person to ensure that no one else engages power without knowledge of maintenance work being performed.



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- ✓ **Do not perform maintenance on the feed roll without locking the feed roll in the “up” position.** The locking padeyes on the rear of the hog should be used to secure the feed roll in place.

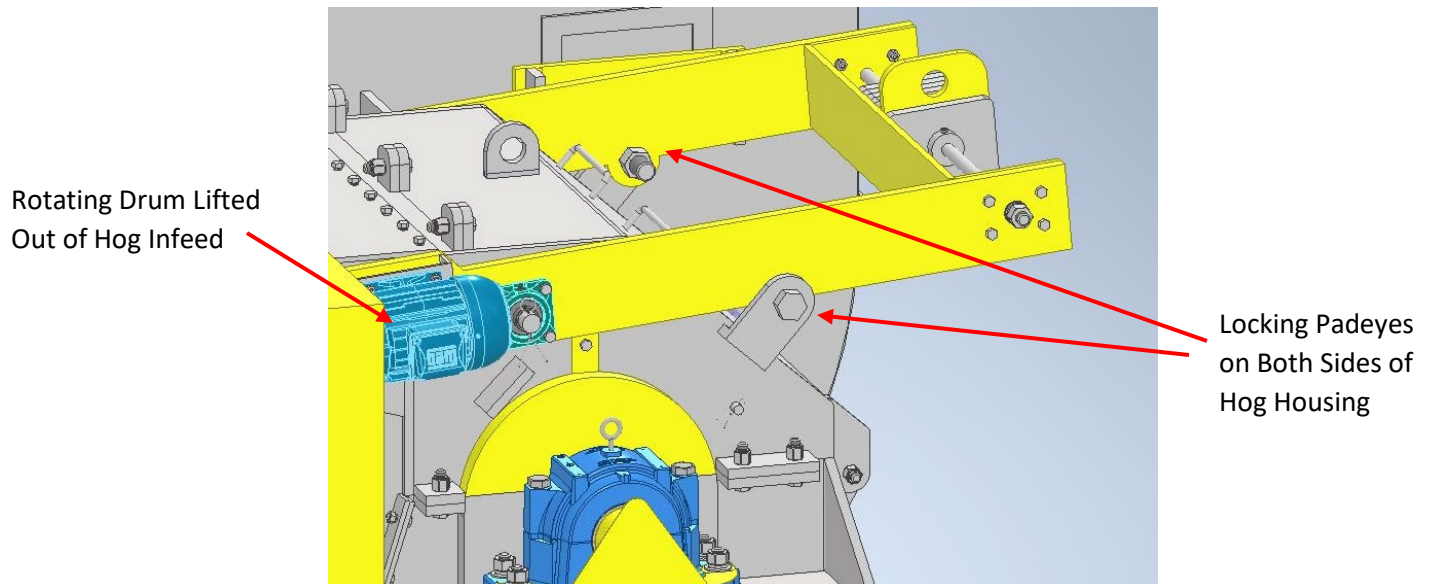


Figure 1.2: Feed Roll Locked in "Up" Position

- ✓ **Do not operate this or other machinery without proper training and complete understanding of all instructions contained in this manual.**
- ✓ **Guard covers are included with the feed roll unit for safety. Do not operate this or any other machinery without all guard covers being installed.**

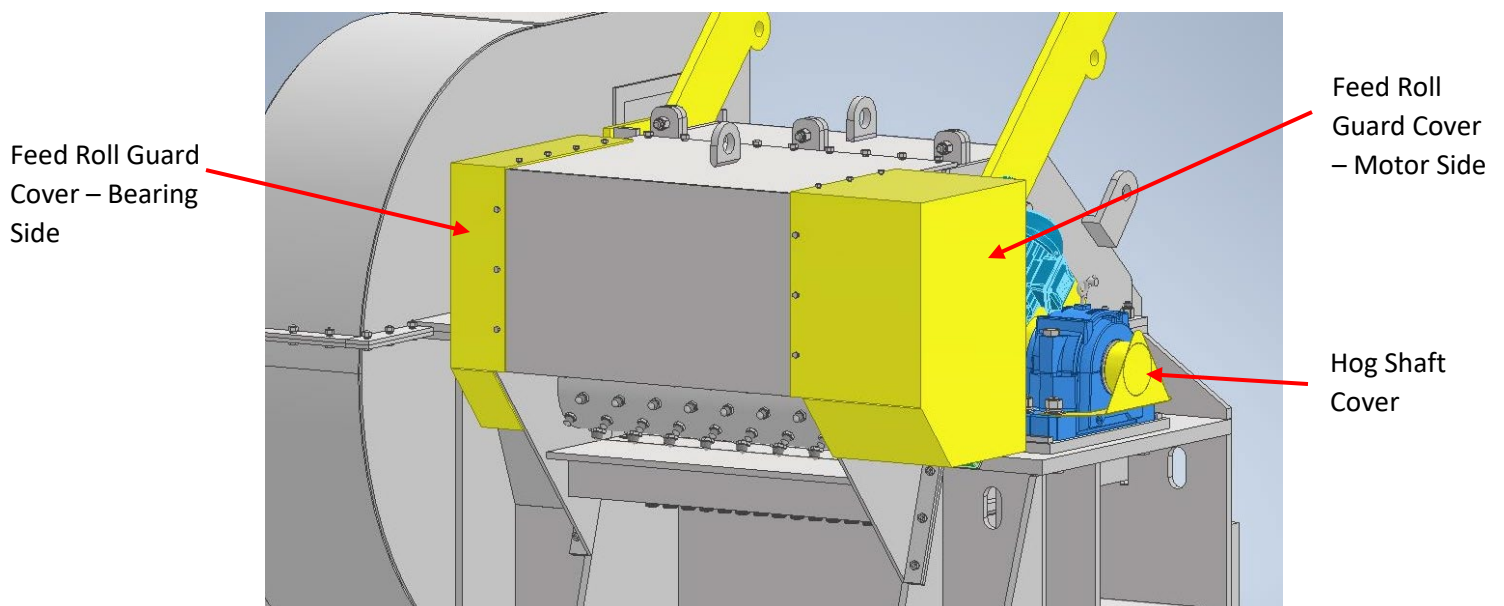


Figure 1.3: Guard Covers



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- ✓ **Do not turn rotor over by hand or power with any part of the body between the insert spikes and housing.** This is a high inertia rotor and cannot be stopped easily once in motion. **Even when barely moving, it has enough momentum to cut off a finger.**
- ✓ Do not look into the machine when rotor is turning. Wear safety glasses any time you are working on or in near proximity to operating equipment.
- ✓ Wear gloves any time you are working on this equipment.
- ✓ Be careful when installing new insert spikes on shaft as fingers are easily smashed.
- ✓ **Never wear loose clothing**, especially a necktie, which could get entangled in moving machinery. Similarly, long hair must be properly secured to avoid getting entangled in the machine.
- ✓ **Do not hand feed material directly into the feed roll.** If hand feeding is required, it should be onto a conveyor feeding into the hog.
- ✓ Do not poke sticks, poles, etc. into any access opening on the unit while it is operating. **Both the feed roll and hog should be completely stopped before attempting to clear any blockages.**
- ✓ **Do not allow steel to enter the grinding area.** Steel (or other materials of similar strength) creates a safety hazard for personnel in the area and may cause major damage to the unit.



INSTALLATION

► ELECTRICAL WIRING

Power wiring from the disconnect switch to the feed roll motor starter must be provided by the user. Power wiring from the Size 0 feed roll motor starter to the three-phase, 1.5 HP, 60 HZ, 230/460 VAC motor must also be provided by the user. The feed roll starter is shipped loose to allow the user to mount it next to other motor controls.

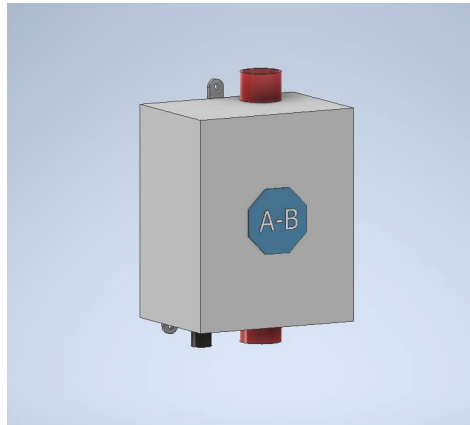


Figure 2.1: Feed Roll Starter

► INTERLOCK FEED ROLL WITH CURRENT SENSING UNIT



Figure 2.2: Current Sensing Unit

The current sensing unit is a control device which is designed to monitor the amperage load of the hog motor. It stops the feed roll and infeed conveyor when the hog motor reaches a field-



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adjusted preset amperage level. In addition, the current sensing unit automatically restarts the feed roll and infeed conveyor after the hog motor amperage falls below that preset level.

It is the customer's responsibility upon installation of the current sensing unit to determine the hog motor amperage level at which to stop the feed roll and infeed conveyor.

Refer to *Bulletin 23-70-13 (Installation and Operating Instructions for Current Sensing Unit)* for further details.

Follow the instructions for wiring the infeed conveyor starter relay to the current sensing unit and wire the feed roll starter relay in series to the interlock circuit. Verify that the starter coil voltages are compatible.



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➤ REMOVE THE LOCKING PADEYE BOLTS

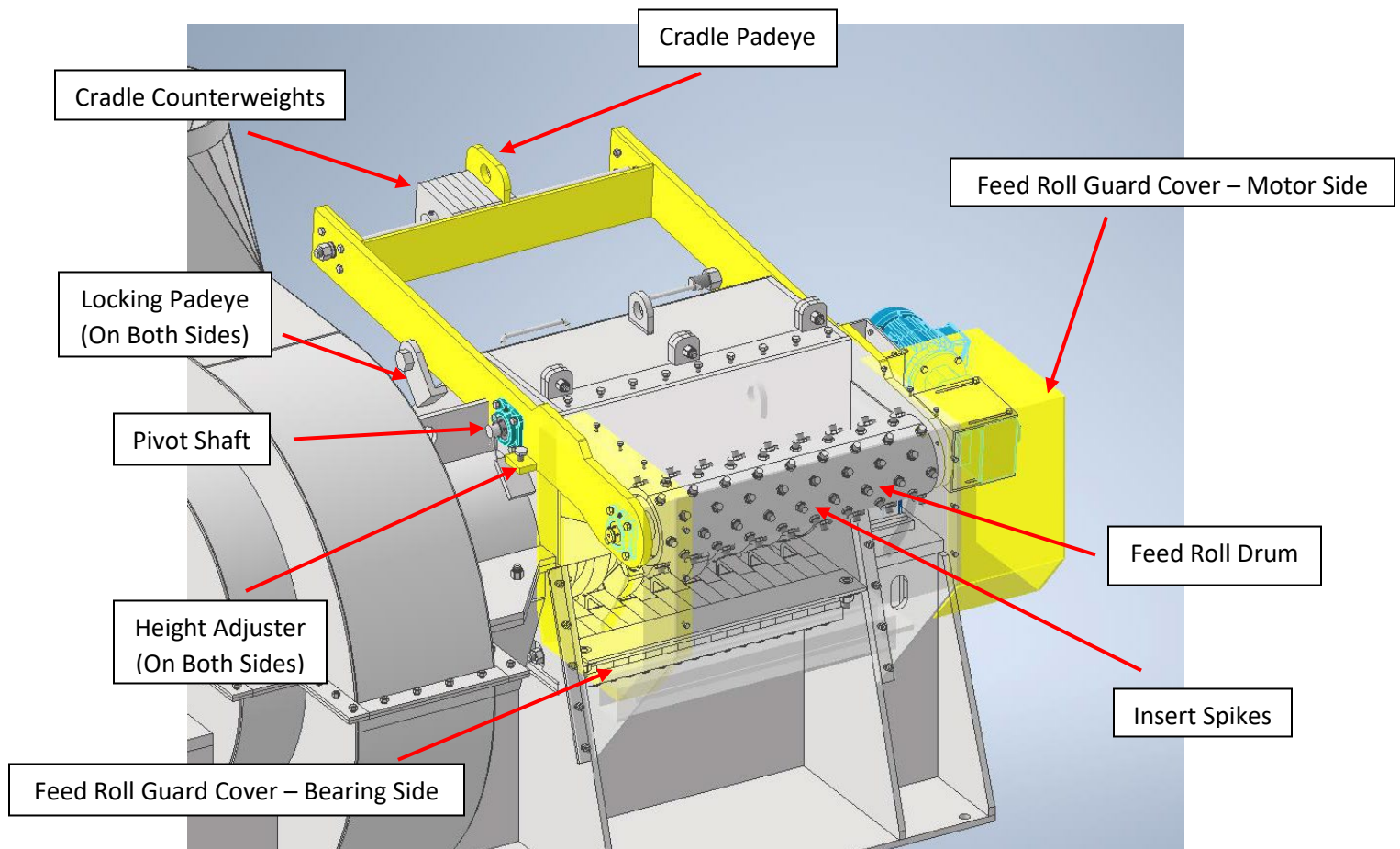


Figure 2.3: Feed Roll Components

The feed roll is shipped in its fully upright position at a maximum distance away from the infeed chute bed plate. The feed roll is secured in the “up” position with two 1.5” NC x 5” hex head cap screws, two 1.5” lock washers, and two 1.5” hex nuts (one on each side of the hog).

Secure the feed roll assembly to an external holding device using the cradle padeye. Remove the bolts from the locking padeyes and **gently** lower the feed roll to its “down” position.



ALLOWING THE FEED ROLL TO SLAM DOWN INTO OPERATING POSITION PLACES EXCESS WEAR ON COMPONENTS AND MAY CAUSE PARTS TO CRACK. THIS DAMAGE IS NOT COVERED BY THE WARRANTY.

If the feed height adjusters have not been utilized, the insert spikes should be approximately 1/8” above the feed chute bed plate when the feed roll is in the “down” position.



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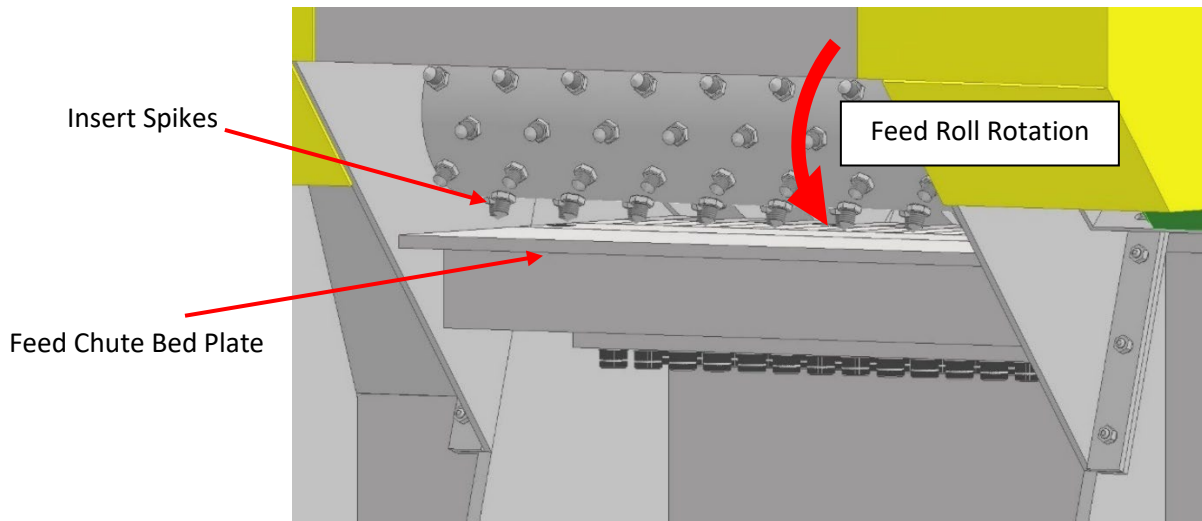


Figure 2.4: Spike Clearance

➤ SETTING THE FEED HEIGHT ADJUSTERS

The maximum thickness of scrap that can be processed using a feed roll is 4" for FS-HZF and HD-HZF hogs, and 6" for PM-HZF hogs.

In the fully lowered position, the minimum distance between the feed roll insert spikes and the feed chute bed plate is approximately 1/8". This minimum distance may be increased as needed by using the feed height adjusters.

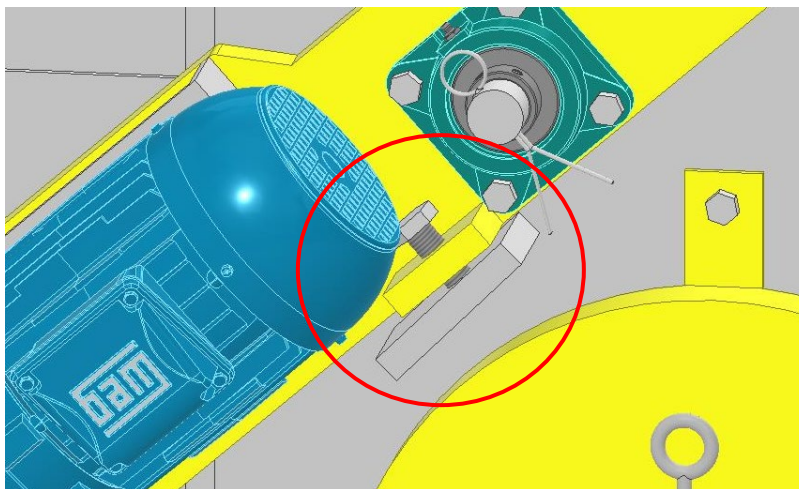


Figure 2.5: Feed Height Adjuster

Use of the feed height adjusters may become necessary when the scrap to be processed is thick enough that operation of the feed roll becomes more efficient by increasing the minimum distance between the feed chute bed plate and the bottom of the feed roll.



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1. Move the feed roll to the fully upright position and secure in place using the locking padeyes, locking bolts, lock washers, and hex nuts.
2. Loosen the lock nuts on the feed height adjusters. There will be one on each side of the infeed opening.
3. Rotate the feed height adjusters until the adjusting bolts extend beyond the pivot arms by the desired length. **Make sure that both adjusting bolts extend equally** to prevent unnecessary torque on the feed roll.
4. Tighten the lock nuts on the feed height adjusters to secure their positions.
5. Secure the feed roll using an external holding device attached to the cradle padeye. Loosen the locking bolt from the locking padeye and remove.
6. **Gently** lower the feed roll to its down position. The feed height adjusters should now make contact with the stop plates on the hog housing.



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7. With the feed roll in the “down” position, verify that the desired distance between the bottom of the feed roll insert spike and the infeed chute bed plate has been achieved.
8. If the desired minimum distance in the down position has not been achieved, repeat steps 1 through 7, adjusting the feed height adjusters as necessary.

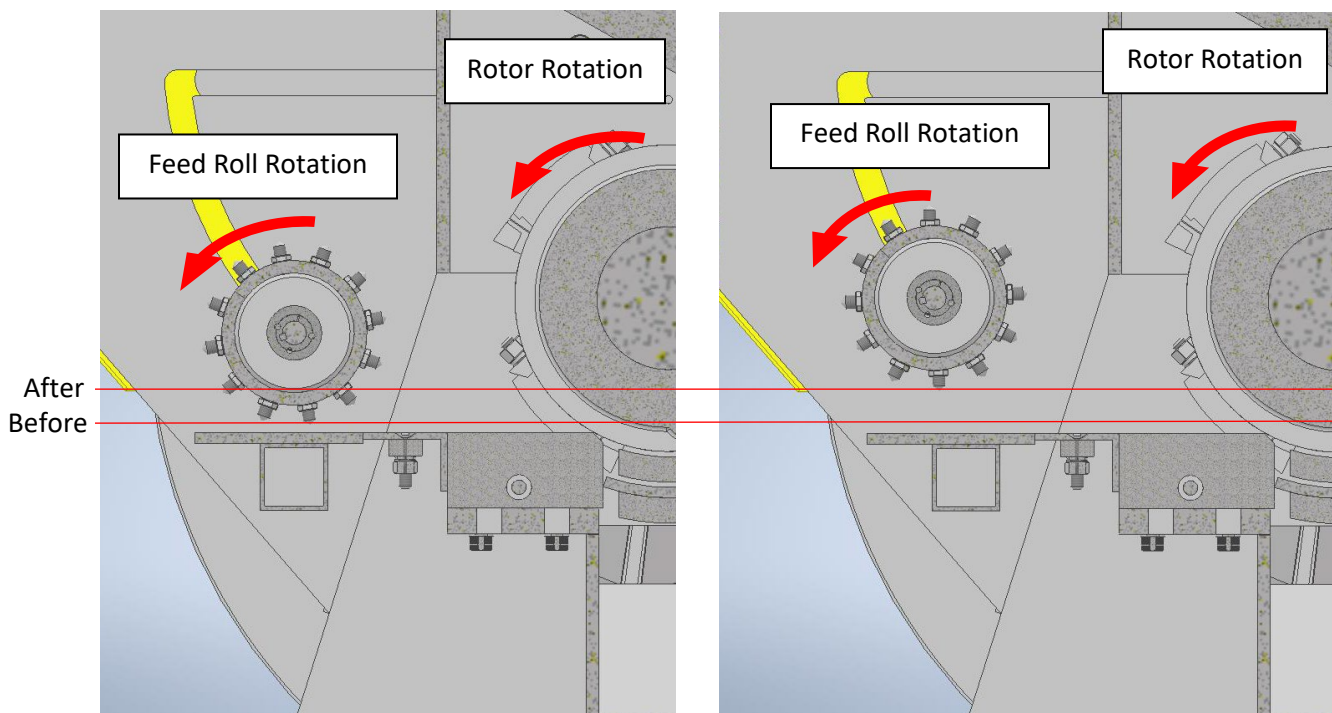


Figure 2.6: Before and After Adjusting Height



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➤ ADJUSTING THE COUNTERWEIGHT SYSTEM

The feed roll uses a mechanical counterweight system to control the amount of downward pressure that is applied from the feed roll to the incoming material. When shipped from the factory, the cradle contains all counterweights needed to keep the feed roll in balance at the pivot point. However, this can be adjusted by the user to achieve different results.

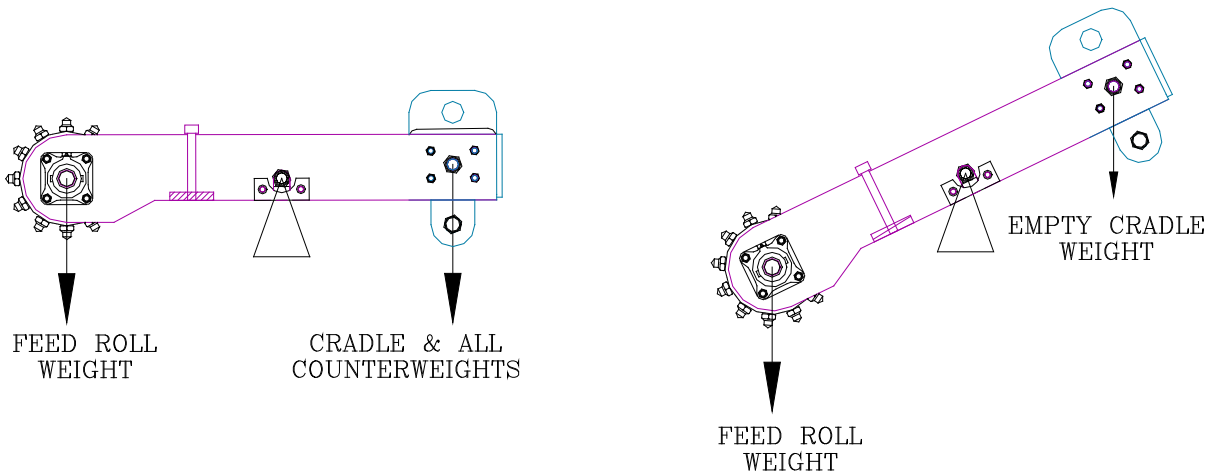


Figure 2.7: Feed Roll Counterweight System

When the cradle contains all included counterweights, the system is in near balance about the pivot shaft, and a minimum amount of downward pressure is applied from the feed roll to the incoming material.

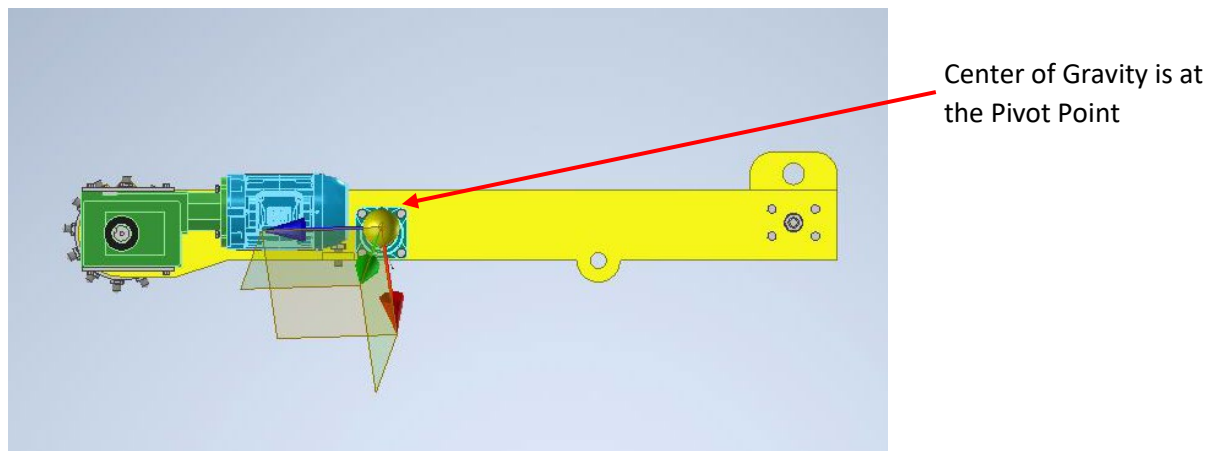


Figure 2.8: Feed Roll Center of Gravity (Including Counterweights)

In this configuration, the feed roll can easily “walk” up material, allowing for large variations in the thickness of scrap that can be successfully processed without using the feed height adjusters.



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When the cradle contains none of the counterweights, the system applies a maximum amount of downward pressure from the feed roll to the incoming material. The force exerted is nearly equal to the full weight of the feed roll.

In this configuration, the feed roll tends to *restrain* the rate at which the material is pulled into the hog. Use of the feed height adjusters may be required for thicker scrap.

Depending upon each particular application, the optimum number of counterweights required to achieve the desired downward pressure will vary. Determining this number will require a trial-and-error process. For reference, each counterweight weighs approximately 13 lbs.

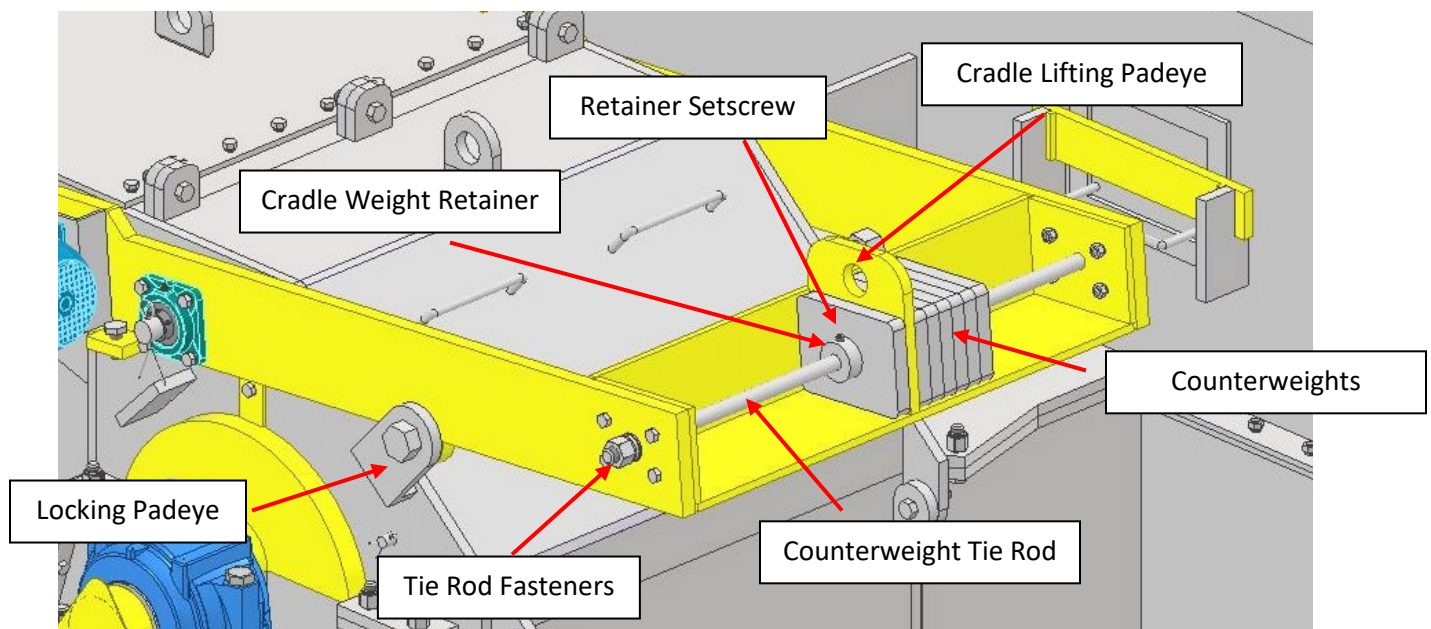


Figure 2.9: Cradle Components

1. To add or remove counterweights from the cradle, move the feed roll to the fully upright position and secure in place using the locking padeyes, locking bolts, lock washers, and hex nuts.
2. Remove the hex nuts, lock washers, and flat washers from the counterweight tie rod. **Do not remove the bolts connecting the counterweight cradle to the pivot arms.**
3. Loosen the setscrews in the cradle weight retainers.
4. Remove the threaded counterweight tie rod by sliding out one side.
5. Remove or add counterweights as needed. Each counterweight weighs approximately 13 lbs. Ensure most of the weight is on the bearing side, **not** the motor side. This will help balance out any torques put on the system by the weight of the motor and gear reducer.



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6. Once the desired counterweight has been achieved, reinsert the threaded counterweight tie rod through all the counterweights in the cradle and both cradle weight retainers.
7. Tighten the set screws in both cradle weight retainers. Lock the tie rod in place by putting the flat washers, lock washers, and hex nuts in place on both sides and tightening all components.
8. **Do not operate the feed roll unless all counterweights have been secured.**
9. Secure the feed roll using an external holding device attached to the cradle padeye. Then, loosen the locking bolts from the locking padeyes and remove.
10. **Gently** lower the feed roll back down into operating position.



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➤ START-UP CHECKLIST

Start-Up Checkpoint	Completed
(1) Verify power wiring to the feed roll motor starter has been installed properly	
(2) Make certain that all guard covers are in place and secure	
(3) Ensure all insert spikes have been properly secured	
(4) Verify that the current sensing unit has been properly wired to the feed roll starter relay and the infeed conveyor starter relay	
(5) If the feed height adjusters have been adjusted, ensure both sides have been extended to the same height and are properly tightened	
(6) If the counterweight system has been adjusted, ensure the fasteners for the counterweight tie rod and cradle weight retainers have been properly tightened	
(7) Turn on feed roll and verify that rotation is correct prior to feeding any material into the hog	



NORMAL OPERATION OF THE FEED ROLL

It is recommended that the feed roll be interlocked with the infeed conveyor through a current sensing unit. Refer to *Bulletin 23-70-13 (Installation and Operating Instructions for Current Sensing Unit)* for further information.

1. Turn on discharge equipment.
2. Turn the hog motor on and wait for the hog motor to get up to operating speed.
3. Turn on the power to the feed roll motor and starter.
4. Turn on the power to the infeed conveyor motor and starter.
5. Turn on the current sensing unit (for setup, see *Bulletin 23-70-13*)



Figure 3.1: Current Sensing Unit Operation

Turn the “**OFF/ON**” switch to the “**ON**” position. The green “**ON**” indicating light should illuminate.

Turn the “**HAND/OFF/AUTO**” switch to the “**AUTO**” position. The feed roll and infeed conveyor should start to operate, and the green “**RUN**” light should illuminate.



MAINTENANCE PROCEDURES



ENSURE THAT ALL POWER AND DISCONNECT SWITCHES ARE IN THE “OFF” POSITION SO THAT THE UNIT CANNOT BE ACCIDENTALLY STARTED.



ENSURE THAT BOTH THE HOG AND THE FEED ROLL ROTORS ARE COMPLETELY STOPPED AND SECURED BEFORE ATTEMPTING TO REMOVE OR INSTALL INSERT SPIKES/ANVILS.



SECURE HOG AND FEED ROLL ROTORS SO THEY CANNOT SHIFT PRIOR TO BEGINNING WORK ON THE UNIT. THE ROTOR IS TOO HEAVY TO LIFT WITHOUT MECHANICAL ADVANTAGE. ALWAYS USE A SUITABLE LIFTING DEVICE.

➤ REPLACING FEED ROLL INSERT SPIKES

Be careful when installing new insert spikes as fingers are easily smashed.

Check insert spikes in rotor monthly to make certain they are tight and have not worn down. Prolonged operation may cause these parts to loosen. If not checked on a regular basis, the parts may come loose and enter the hog, causing damage to the unit and possibly causing severe injury to personnel in the area.

Insert spikes should be replaced before the welded-on jam nut is worn off.

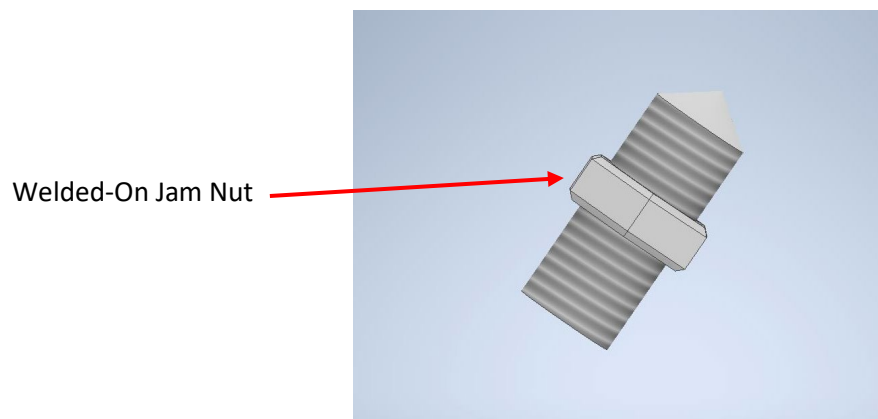


Figure 4.1: Feed Roll Insert Spike



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1. Move the feed roll to the fully upright position and secure in place using the locking padeyes, locking bolts, lock washers, and hex nuts.
2. Remove the feed roll guard covers and the feed roll infeed chute to gain access to the spikes.

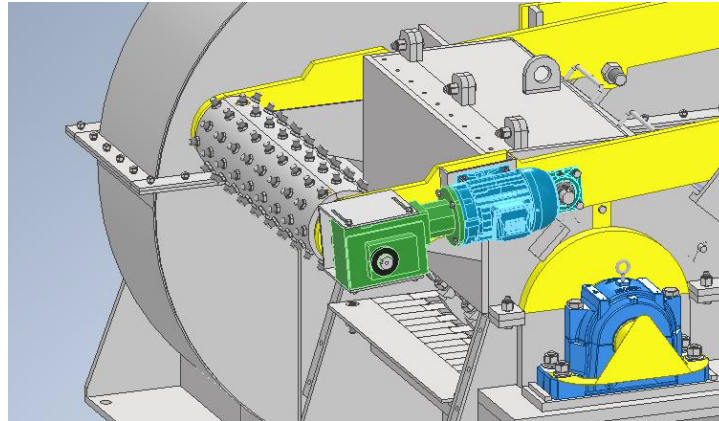


Figure 4.2: Guard Covers and Infeed Chute Removed

3. Wedge a piece of 4" X 4" lumber cut to length (approximately 10") between the rotating drum and hog housing. This blocks the feed roll from rotating while maintenance is being performed.

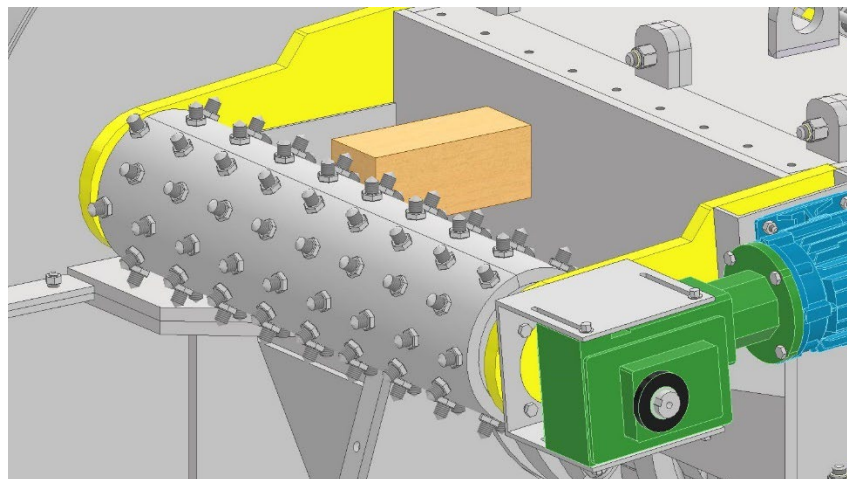


Figure 4.3: 4" x 4" Wedge Blocking Feed Roll Rotation

4. The insert spikes have been spot welded in place. Break the welds and then unscrew the insert spikes using a 1-1/8" deep well impact socket.
5. Screw in new insert spikes until the welded-on jam nut is flush with the rotating feed roll drum. Torque insert spikes to 100 ft-lbs.
6. Spot weld the new spikes into place. This helps prevent the spikes from vibrating loose and falling into the hog.
7. Remove the 4" X 4" wedge from between the feed roll and the hog housing. Reattach the infeed chute and guard covers.



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- Secure the feed roll using an external holding device attached to the cradle padeye. Then, loosen the locking bolts from the locking padeyes and remove.
- Gently** lower the feed roll down into operating position.



ALLOWING THE FEED ROLL TO SLAM DOWN INTO OPERATING POSITION PLACES EXCESS WEAR ON COMPONENTS AND MAY CAUSE PARTS TO CRACK. THIS DAMAGE IS NOT COVERED BY THE WARRANTY.

► GAINING ACCESS TO ANVILS

Unobstructed access to the anvils will be required whenever anvils are being replaced.

- Move the feed roll into the “up” position and secure in place using the locking padeyes, locking bolts, lock washers, and hex nuts.
- Remove the feed roll guard covers and the infeed chute.

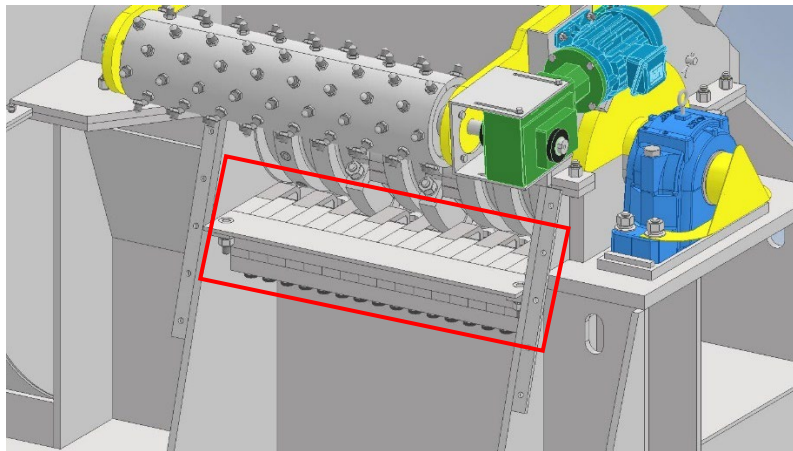


Figure 4.4: Access to Anvils

- Remove and replace the anvils as instructed in the hog operating and maintenance manual. (See *Bulletin 23-10-14: Operating, Maintenance, Lubrication, and Safety Instructions for Models FS, HD, & PM Hogs*)
- Reinstall the feed roll infeed chute and guard covers.
- Secure the feed roll using an external holding device attached to the cradle padeye. Then, loosen the locking bolts from the locking padeyes and remove.
- Gently** lower the feed roll to its “down” position.



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► GAINING ACCESS TO THE REAR DOOR

For certain maintenance procedures like changing teeth or replacing a screen, the rear door of the hog must be opened. The feed roll must be in the “down” operating position for the rear door to open. The rear door will **not** clear the feed roll cradle while it is in the “up” position.

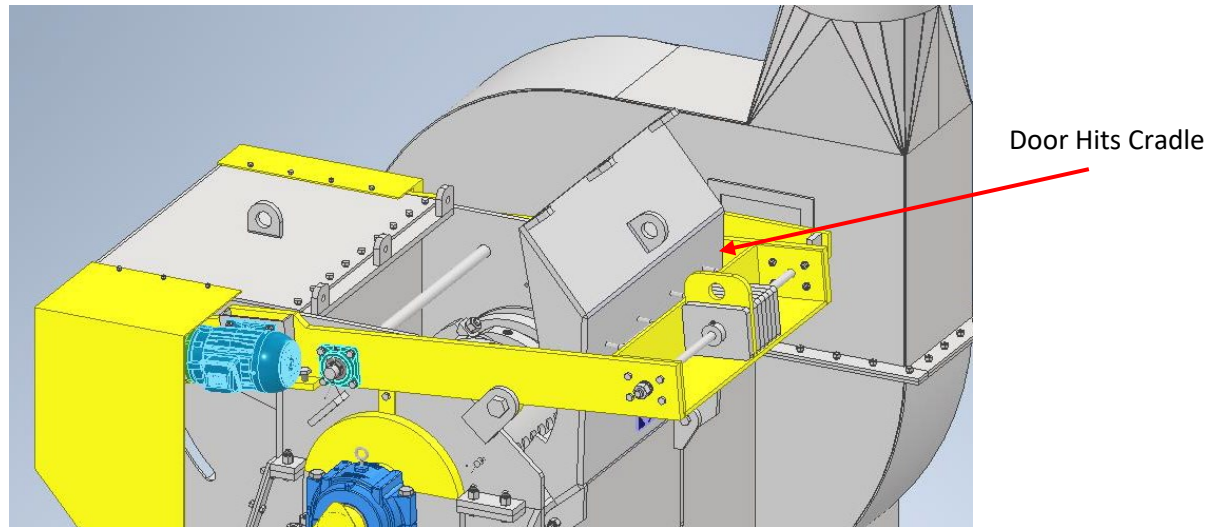


Figure 4.5: Feed Roll Up - Door Can't Open

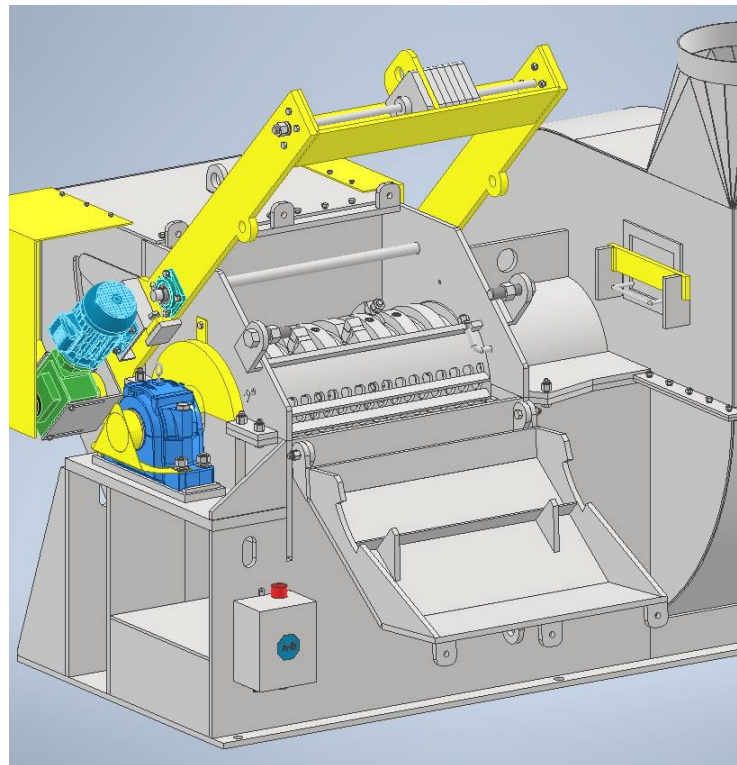


Figure 4.6: Feed Roll Down - Door Clears



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➤ FEED ROLL BEARINGS AND GEAR REDUCER

The gear reducer is attached to the feed roll arm on the motor side.

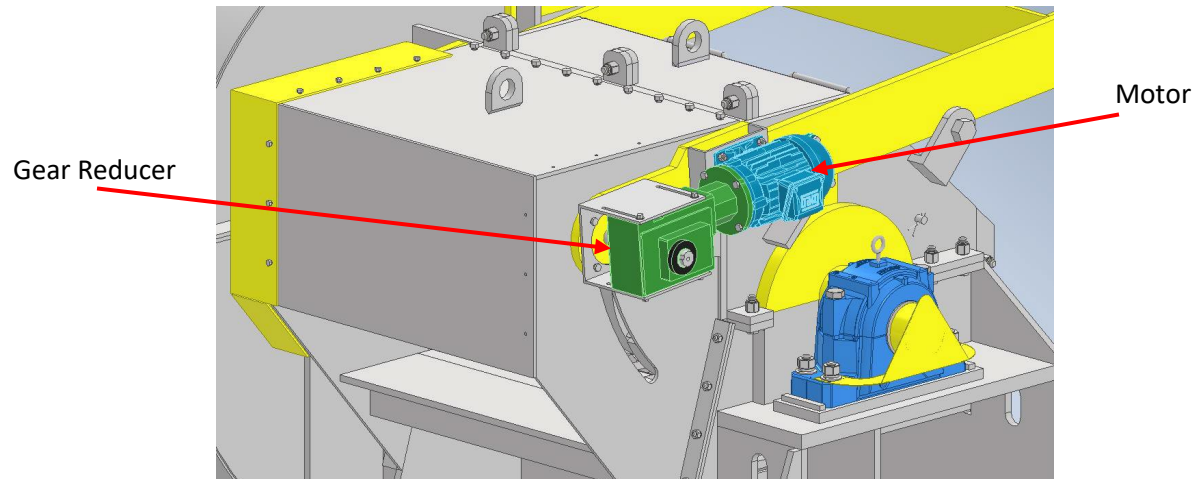


Figure 4.7: Gear Reducer

No periodic maintenance is required of the gear reducer other than visual inspections for hardware security and oil leakage. Build-up of dirt and dust will cause overheating and can be prevented by occasional wash down.

There are three flange bearings on the feed roll—one on either side of the hog on the pivot shaft, and one on the feed roll drum shaft on the side opposite the motor. They should periodically be lubricated with Shell Alvania #2 lubricant (or equivalent).

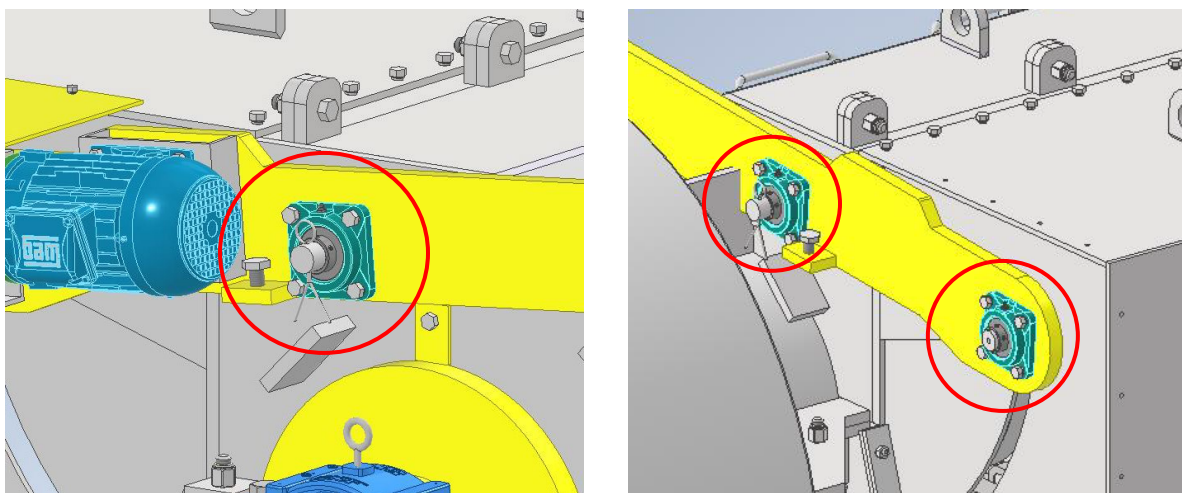


Figure 4.8: Flange Bearings



WARRANTY INFORMATION

The Warranty on parts manufactured by Montgomery Industries is for one year from the date of shipment excluding normal wear and tear and excluding abuse of the equipment.

The Warranty on parts manufactured by Montgomery Industries covers replacement cost of the parts only. No labor expense incurred in replacing the parts under the Warranty is covered.

The Warranty on components not manufactured by Montgomery Industries is the standard Warranty offered by the actual manufacturer of the parts. These components include all electrical components, all hydraulic system components, and all mechanical drive components.

DO NOT ATTEMPT TO ALTER THE EQUIPMENT IN ANY WAY OR DO ANYTHING YOU ARE NOT SPECIFICALLY QUALIFIED TO DO. If there is any question whatsoever concerning the safety or advisability of your intended action, do not proceed without written permission from Montgomery Industries.

Any malfunction or operation problems not covered in this manual should be reported to the factory, as a quick and simple answer may save many hours of unsatisfactory operation.

A factory engineer is available for discussion of any problems which may arise.

**USING PARTS NOT MANUFACTURED BY MONTGOMERY INDUSTRIES MAY
ENDANGER THE SAFETY OF PERSONNEL AND VOIDS ALL WARRANTIES.**