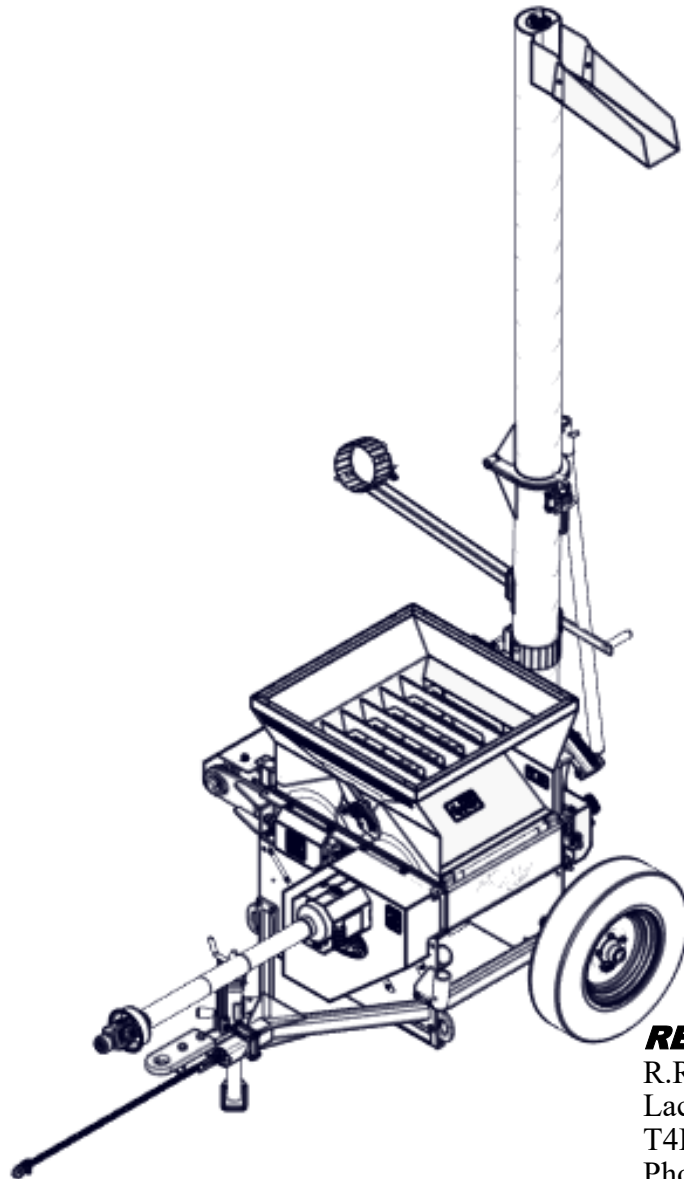


RENN

A DIVISION OF *Degelman*

RMC-24 Operator's & Parts Manual P.T.O. Model No. 912400-0450.06



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INTRODUCTION

Congratulations on your decision to purchase a Renn Roller Mill. This machine has been designed to provide you with the highest standards of quality, reliability and durability. This manual has been prepared to familiarize you with the operation and maintenance of your mill. We urge you to read the publication carefully and refer to it extensively for correct operating procedure.

The Renn Roller Mill is designed to give the operator a maximum capacity and working surface through the use of a large diameter roll. Added to this is a convenient method of roll removal and a new process of roll adjustment, giving the operator infinite control of feed quality. The unit is constructed in a solid manner, giving you value for your dollar and a mill that will last.

This manual includes a Warranty Policy, a Safety Section, and a Lubrication and Maintenance Schedule. We urge you to read through this information carefully. This will help ensure the safe and trouble-free operation of your mill. All information, illustrations and specifications in this manual are based on the latest product information available. We, the manufacturer, reserve the right to make any changes at any time without prior notice.

LIMITED WARRANTY



A DIVISION OF *Degelman*

• NEW EQUIPMENT WARRANTY

Subject to the limitations and exclusions set out herein, RENN Mill Center LP. ("Renn") warrants that if any component or part of a machine manufactured by RENN proves to be defective in material or workmanship within

1. (1) year from the delivery date of the original sale to a purchaser who purchases the equipment for their own farming operation use; OR
2. (90) days from the delivery date of the original sale to any other purchaser.

Renn will at RENN's option either repair or replace the defective part without charge. No payments will be made in lieu of repair to the machine. This limited warranty may be enforced by the first purchaser or first consumer user; all subsequent purchasers acquire the product "as is" without any benefit of this limited warranty.

• LIMITATIONS AND EXCLUSIONS

This limited warranty by RENN does not extend to or include:

1. New tires - installed on the equipment which are subject to a separate warranty by the tire manufacturer—see warranty sheet included with your owners manual. All warranty claims must be submitted to the tire manufacturer for approval and payment.
2. Used tires
3. Drive Belts
4. Drive Chains

This limited warranty covers defects in material and workmanship in the parts manufactured by RENN except:

1. Damage resulting from accident, misuse, abuse, neglect or from other than normal and ordinary use of the equipment.
2. Damage resulting from failure to clean or use the product in accordance with the manufacturer's instructions.
3. RENN reserves the manufacturer's right to determine the responsibility for damage as detailed in 1 and 2 above.

RENN shall, as to each defect, be released from all obligations and liabilities under this warranty if;

1. The equipment shall have been operated with any accessory, equipment, component or part not manufactured by RENN or not approved for use by RENN.
2. The equipment shall have been repaired, altered or modified without RENN's approval or if the equipment shall have been operated subsequent to its involvement in an accident or breakdown unless the purchaser furnishes reasonable evidence that such repair, modification or operation subsequent to its involvement in an accident or breakdown was not the cause of the defect;
3. If the purchaser or consumer does not, within 30 days from the date of discovery of the defect, return the defective machine, accessory, equipment component or part at the purchaser's or users expense to an authorized dealer, purchaser shall be responsible for submission of reasonable evidence or proof of date of discovery of subsequent defect.

• WARRANTY AND PARTS REPLACED BY WARRANTY

RENN further warrants that if any genuine RENN part or component utilized by authorized RENN dealers in accordance with this limited warranty proves to be defective in material or workmanship within 90 days of such utilization, RENN will, at RENN's option either repair or replace the defective part without charge. Purchaser shall be responsible for any shipping charges including freight to and from the place where the warranty work is done or performed.

• WHAT YOU MUST DO TO ENFORCE THIS WARRANTY

1. Warranty services must be performed by a dealer authorized by RENN. The purchaser must, at the purchaser's expense, deliver, mail or ship the defective part to any duly authorized dealer in the purchasers area. If the purchaser is unable to locate a dealer in the purchaser's area, please contact RENN. RENN will either refer you to an authorized dealer or instruct you where to return the product. Do not return the product to RENN, without RENN's prior authorization
2. Purchaser must pay any postage, shipping charges, insurance costs, freight and other expenses to and from the place where the warranty work is done or performed if required to return equipment or any component or part to an authorized dealer or as directed by RENN. Purchaser shall be obligated to pay any premium payable for overtime labour if overtime is incurred as a result of a request by the purchaser.

• UNAPPROVED SERVICE OR MODIFICATION

All obligations of RENN under this warranty shall be terminated:

1. If service is performed by someone other than a dealer authorized by RENN or,
2. If equipment is altered or modified in ways not approved by RENN.

Accidents and normal maintenance

This warranty covers only defective material and workmanship. It does not cover depreciation or damage caused by normal wear, accident, improper maintenance, improper protection in storage or improper use. The cost of normal maintenance and replacement of service items, oil filters, cutting parts, tires, bearings, chains, sprockets or brake parts shall be paid for by the purchaser.

• NO REPRESENTATION OR IMPLIED WARRANTY

1. Where permitted by law, neither RENN nor any company affiliated with it makes any warranties, representation or promises expressed or implied as to the quality or performance of its products other than those set forth above.
2. RENN makes no warranty of merchantability or fitness for a particular purpose.

• IMPROVEMENTS OR CHANGES

RENN reserves the right to make improvements or changes in design and specifications at any time without incurring any obligation to owners of previously sold units.

• WARRANTY CLAIM PROCEDURE

Warranty Claim Form must be delivered to RENN within 60 days after the warranty work was performed. Defective parts must be held for inspection for 90 days after the work was performed. RENN may request that parts be returned to the RENN factory for inspection. If approved, RENN will issue a credit within 60 days of receiving the warranty claim.

• ACKNOWLEDGEMENT REQUIRED

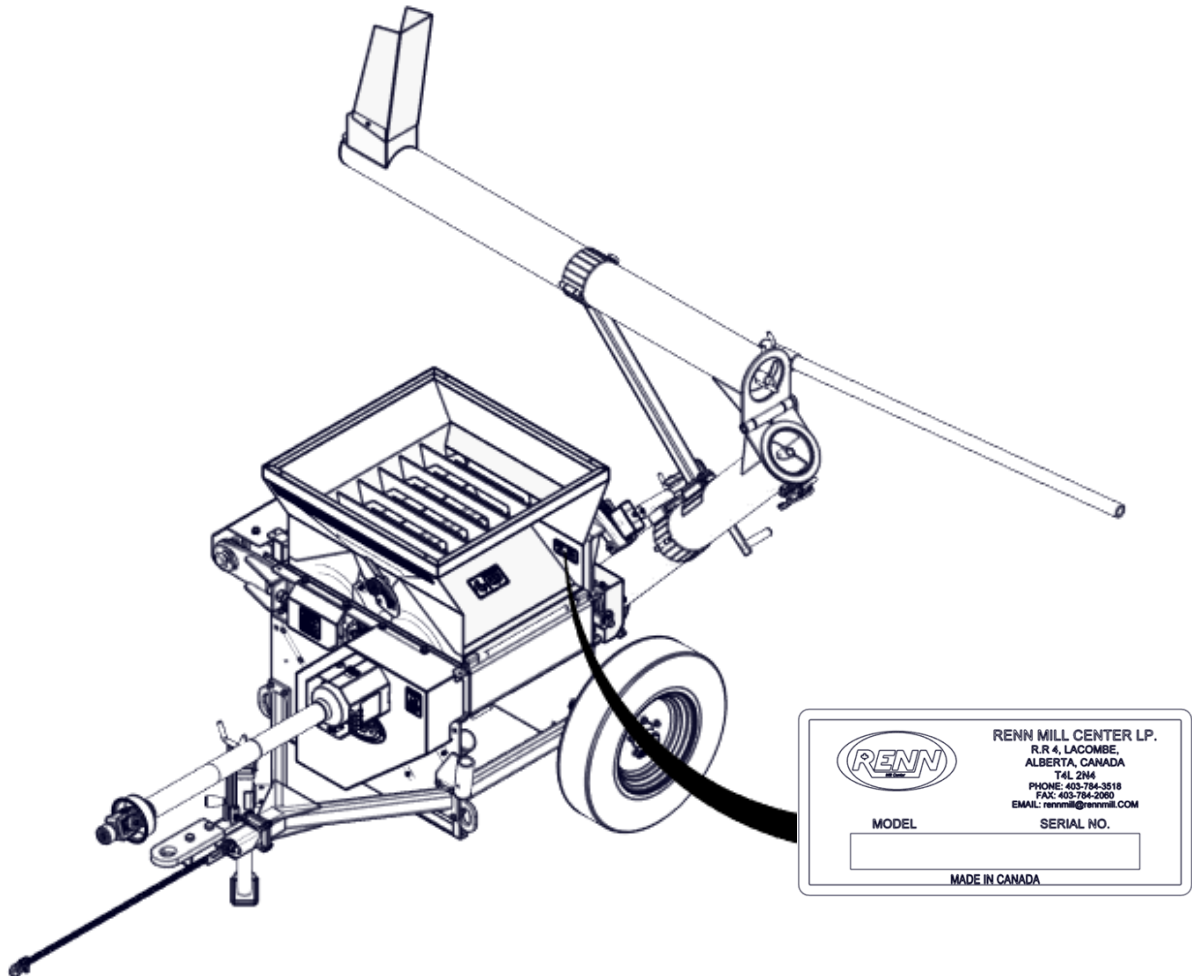
RENN shall have no obligation under this warranty unless the "Warranty Registration" included with your owners manual signed by purchaser and dealer is delivered to RENN within 30 days from the date of sale.

IMPORTANT NOTICE

To activate warranty coverage, the owner / dealer must complete the Warranty Registration form that can be found online and return to RENN Mill Center LP. R.R. 4, Lacombe, Alberta, Canada, T4L 2N4 within 30 days of retail sale.

MILL SERIAL NUMBER LOCATION

The serial number plate is located on the inside face of the back panel of the top hopper, on the driver's side of the machine.



IMPORTANT: For fast, correct service when ordering parts, supply the following information to your local Renn Dealer:

- 1) The model number
- 2) The serial number

This information is essential when ordering parts for your Renn Roller Mill.



2 SAFETY

Safety Alert Symbol

This Safety Alert symbol means

**ATTENTION!
BE ALERT!
YOUR SAFETY IS
INVOLVED!**



The Safety Alert symbol identifies important safety messages on the Renn Mill and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons

Accidents Disable and Kill

Accidents Cost

Accidents Can Be Avoided

SIGNAL WORDS:

Note the use of the signal words **DANGER**, **WARNING**, and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guidelines:

DANGER -

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

WARNING -

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION -

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

2 SAFETY



You are responsible for the SAFE operation and maintenance of your Renn Roller Mill. YOU must ensure that you and anyone else who is going to operate, maintain or work around the mill be familiar with the operating and maintenance procedures and related SAFETY information contained in this manual. This manual will take you step-by-step through your working day and will alert you to all good safety practices that should be adhered to while operating the mill.

Remember, YOU are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that EVERYONE operating this equipment is familiar with the recommended operating and maintenance procedures and follows all of the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Mill owners must give operating instructions to operators or employees before allowing them to operate the mill, and at least annually thereafter per OSHA regulation 1928.57.
- The most important safety device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think SAFETY! Work SAFELY!

2.1 General Safety

1. Only trained, competent persons should operate the mill. An untrained operator is not qualified to operate the machine.
2. Have a first-aid kit available for use, should the need arise, and know how to use it.
3. Have a fire extinguisher available for use, should the need arise, and know how to use it.
4. Wear appropriate protective gear. This list includes but is not limited to:
 - A hard hat
 - Protective shoes with slip resistant soles
 - Protective goggles
 - Hearing protection
5. Review safety related items with all personnel annually.

2 SAFETY



2.2 Operating Safety

1. Read and understand the Operator's Manual and all safety signs before using the machine.
2. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
3. Do not allow riders on the mill or tractor during operation or transportation.
4. Clear the area of all bystanders, especially children, before starting.
5. Be aware of overhead power lines at all times.
6. Attach any necessary flags and signs to the mill before transporting.
7. Attach securely to the towing unit using a hardened pin with a retainer and a safety chain. The pin should be the maximum allowable size possible.
8. The mill is designed to mill GRAIN. It is not suggested to use the mill for other materials without receiving consent from the factory to do so. Failure to heed this warning will result in forfeiture of warranty.
9. Ensure that there is adequate lighting when operating at night.
10. Use caution while using the machine on uneven terrain.
11. Never unhook the mill while it is in use.
12. Review safety instructions annually.

2.3 Maintenance Safety

1. Place all controls in neutral, stop the engine, set the parking brake, remove the ignition key, wait for all moving parts to stop and disengage the PTO before servicing, adjusting, repairing or unplugging.
2. Perform a lock out tag out (LOTO) procedure if required.
3. Relieve pressure from the hydraulic circuit before servicing or disconnecting from the tractor.
4. Place stands or blocks under the frame before working beneath the machine or when changing tires.
5. Only use tools, jacks and hoists appropriate for the job.
6. Install and secure all guards and shields before resuming operation.

2.4 Storage Safety

1. Store the unit in an area away from human activity.
2. Do not permit children to play on or around the stored mill.

2.5 Safety Decals

1. Keep safety decals clean and legible at all times.
2. Replace safety decals that are missing or have become illegible.
3. Replaced parts that displayed a safety decal should also display the same decal.
4. Safety decals are available through your authorized Renn Dealer.

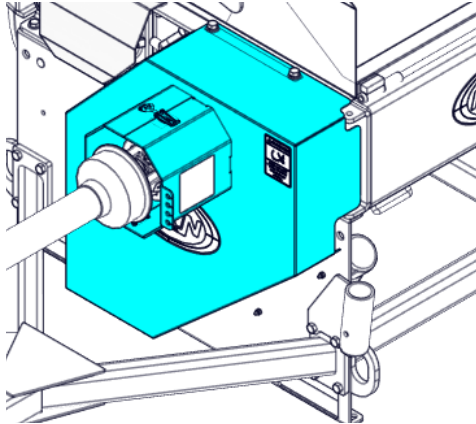
2 SAFETY



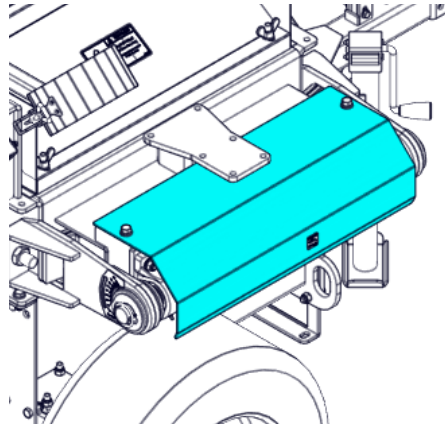
2.6 Safety Shield Placement

After servicing or maintenance, these shields should be back in place.

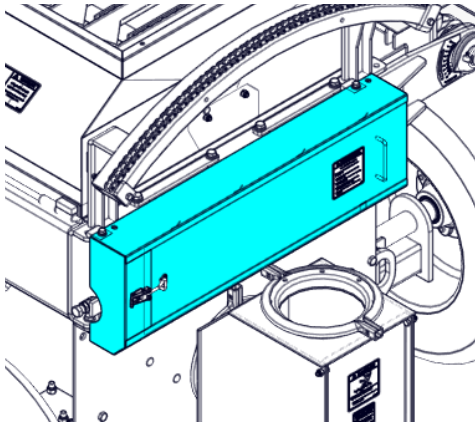
Main / PTO Shield



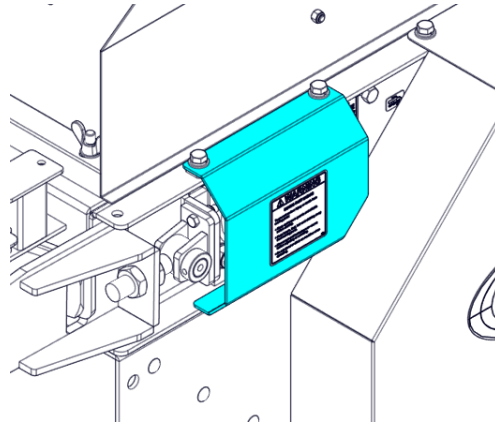
Cam Shield



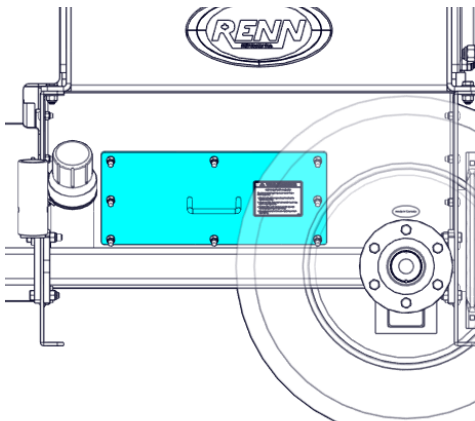
Rear Shield with Slide



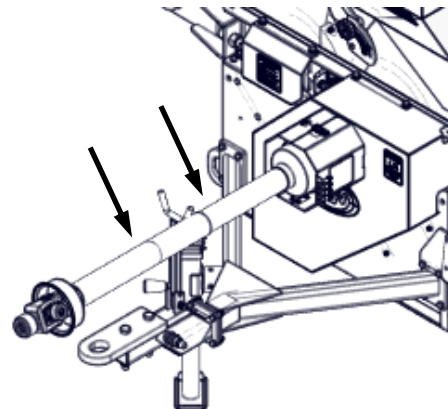
Front Bearing Shield



Inspection Plate



PTO: Front and Rear Covers



2 SAFETY



2.7 Sign-off Form

Anyone operating and/or maintaining the mill must read and clearly understand ALL Safety, Operating, and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Review this information annually, before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. We feel that an untrained operator is unqualified to operate this machine. A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the operation of the equipment.

Sign-off Form

<i>DATE</i>	<i>EMPLOYEE SIGNATURE</i>	<i>EMPLOYER SIGNATURE</i>

3 DECAL LOCATIONS

3.1 Safety Decal Locations

The types of safety decals and locations on the equipment are shown in the following illustrations. Good safety requires that you familiarize yourself with the various safety decals, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- THINK SAFETY!!, WORK SAFELY!!



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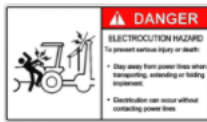
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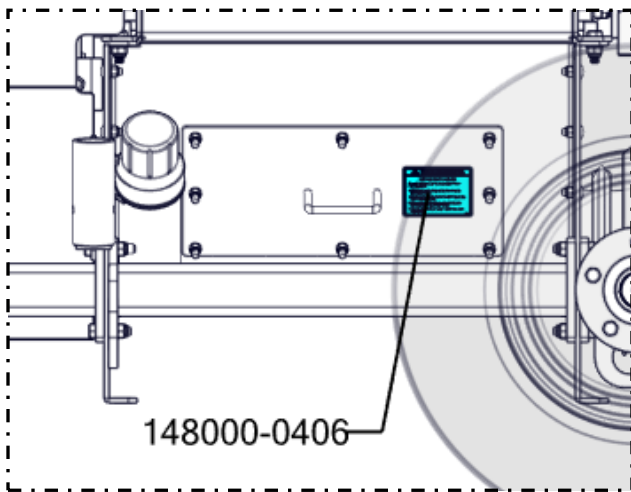
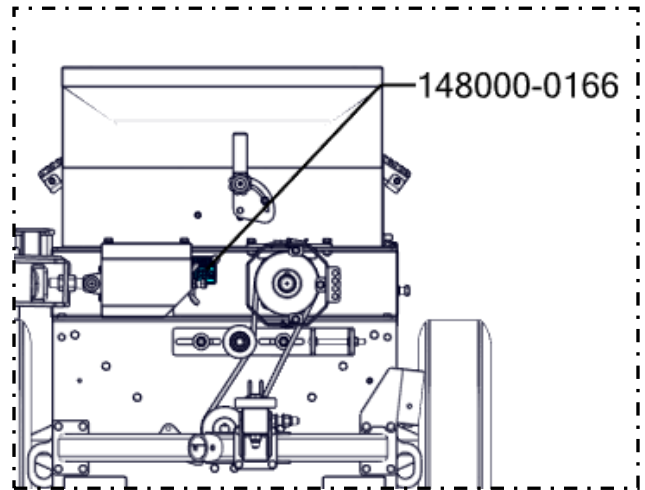
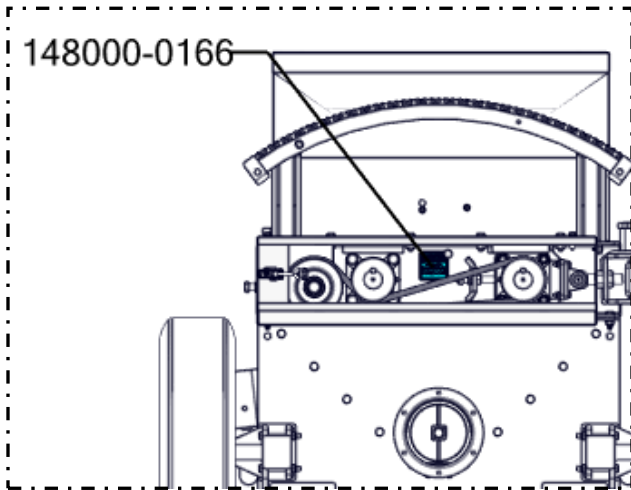
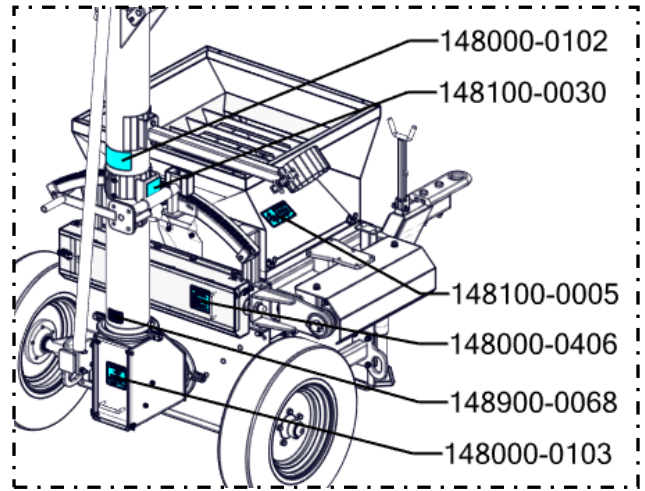
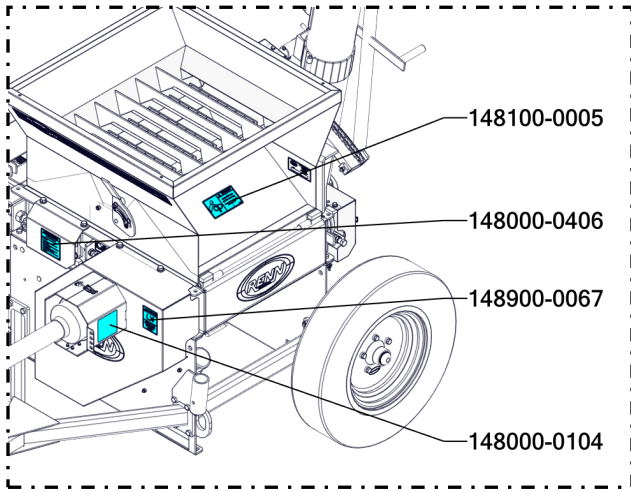


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REMEMBER - If safety decals have been damaged, removed, or become illegible, or if parts have been replaced that previously displayed safety decals but no longer display them, new decals must be applied. New safety decals are available from your authorized dealer.

3 DECAL LOCATIONS

3.1 Safety Decal Locations



3 DECAL LOCATIONS

3.2 Information Decal Locations

The types of informational and operational decals and locations on the equipment are shown in the following illustrations. Good operation requires that you familiarize yourself with the various operational decals, the type of warning and the area, or particular function related to that area, that requires your AWARENESS.

- WORK SAFELY!!



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GREASE

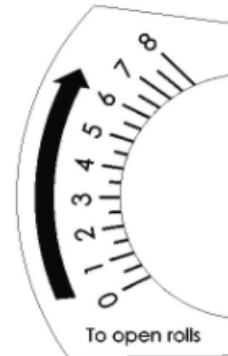


50 HOURS
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GREASE
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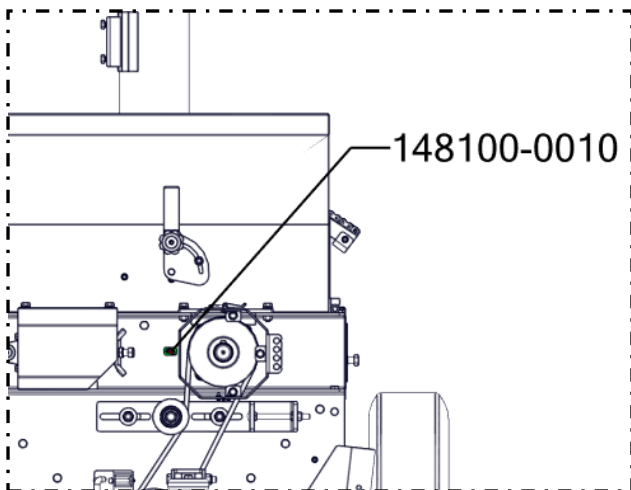
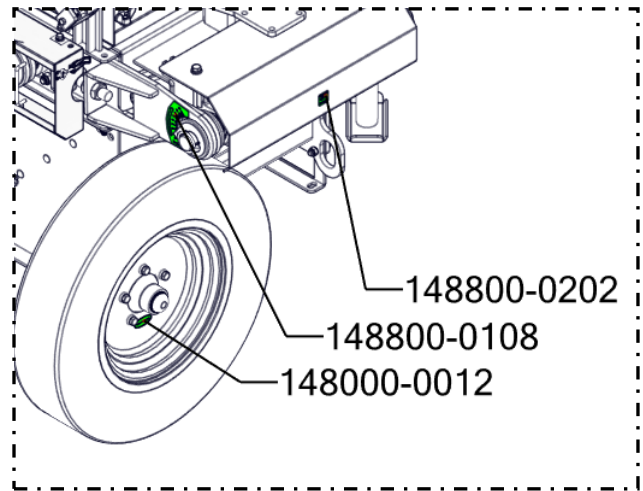
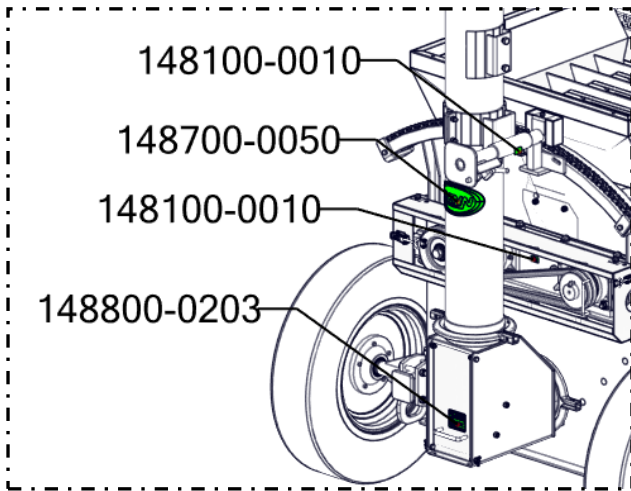
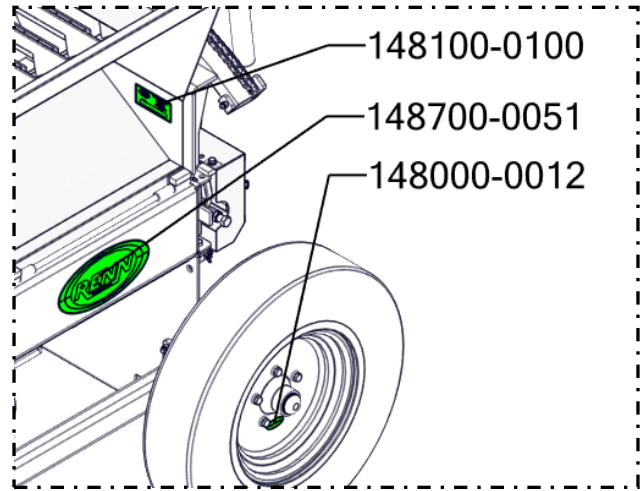
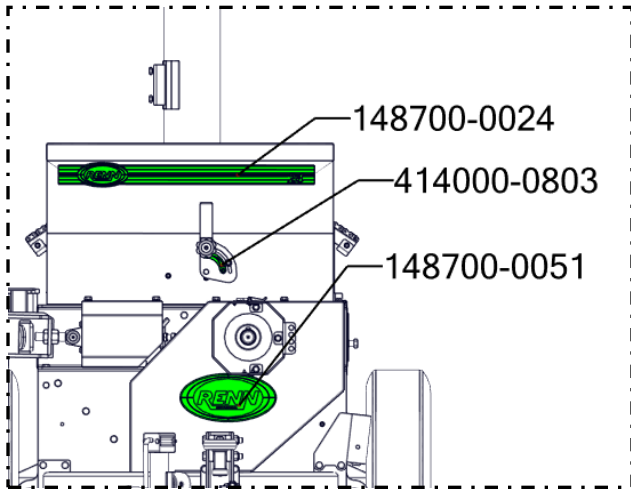
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3 DECAL LOCATIONS

3.2 Information Decal Locations



4 OPERATION

4.1 To the New Operator or Owner

The Renn Mill is designed to receive dry grain from an auger, process it, and deposit it via the discharge auger. Be familiar with the machine before starting.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, and prudence of personnel involved in the operation, transportation, maintenance and storage of equipment or in the use and maintenance of facilities.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the work site. Untrained operators are not qualified to operate the machine.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and efficiently. By following the operating instructions in conjunction with a good maintenance program, your Roller Mill will provide you with many years of trouble-free service.

For more information, please refer to Section 2.3 & Section 5 for further maintenance directions.

4.2 Before You Begin

Read the set-up instructions completely. Decide in advance where and how much you're going to roll, and how you plan to unload the grain from the roller mill. Thinking through the process can prevent panic and frustration later. Set up your roller mill before you need it, not when you need it. Do a small trial run if this is your first time using the machine or the process.

4.3 Pre-Operational Checklist

The efficient and safe operation of the Renn Roller Mill requires that each operator read and understand the operating procedures and all related safety precautions outlined in this section. A pre-operational checklist is provided for the operator. It is important for both personal safety and for maintaining the good mechanical condition of the mill that this checklist be followed.

Before operating the mill, and each time thereafter, the following areas should be checked:

1. Inspect the machine if it is the start of the season (see section 8.2).
2. Lubricate the machine per the schedule outlined in the Maintenance Section (section 5).
3. Be sure that the machine is properly attached to the tractor. Be sure that a mechanical retainer is installed through the drawbar pin and the safety chain is installed.
4. Adjust the hitch position to level the mill with the tractor.
5. Inspect all hydraulic lines, fittings and couplers.
6. Check all bearing locking collars to ensure that they are tight on the shafts and in good condition. Check that all set screws on the bearing collars are tight. Check that all bearing mounting hardware is secure.
7. Make sure all safety shields are properly installed.

4 OPERATION

4.4 Setting up the Roller Mill

4.4.1 Roll Setting

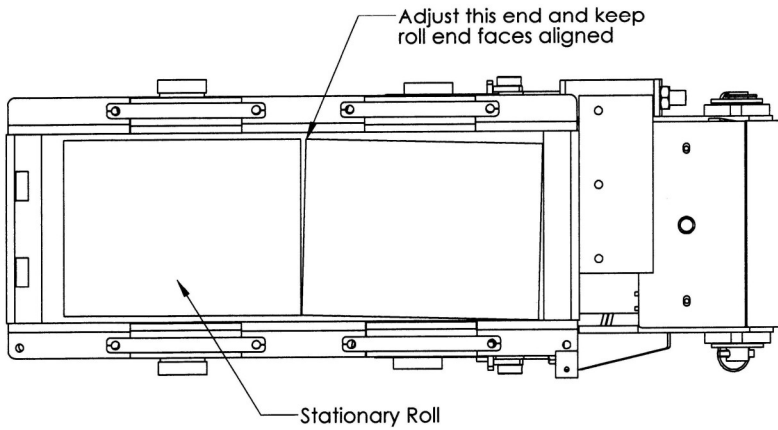


Figure 4.1

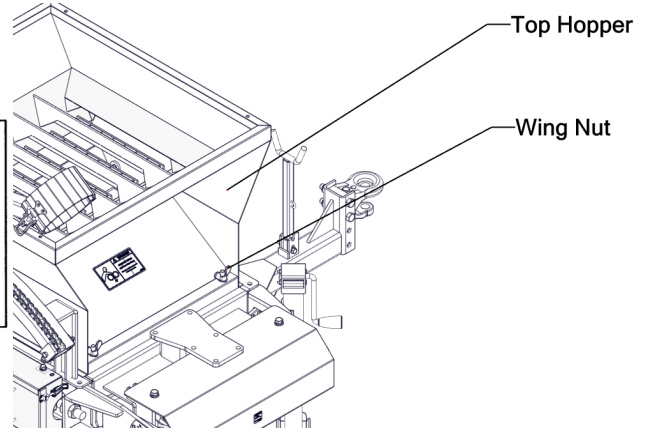


Figure 4.2

Loosen the wing nuts holding down the top hopper (Figure 4.2) and tip it over center, rotating on the hinge pin until it hits the stoppers.

If using flat rolls to roll dry grain, set the rolls a very small distance apart. Using a sheet of lined paper or feeler gauge, sweep from end to end as you reduce the gap on each end of the roll using the cam linkage adjustment nut (Figure 4.3). Ensure that the positional indicator on the spring cam is in position 1 (Figure 4.3). Turn the adjustment nuts in 1/2 turn segments (less as you near the goal) to adjust the bearing as required. Continue to adjust the roll until some resistance is felt on the paper or feeler gauge.

Turn the roll by hand to confirm that the roll has clearance all the way around. When adjustments are complete, set the jam nuts. Replace the top hopper.

For grooved rolls, the gap may vary based on the required final product. The process for this is the same but with a thicker piece of paper (or multiple pieces) or a feeler gauge.

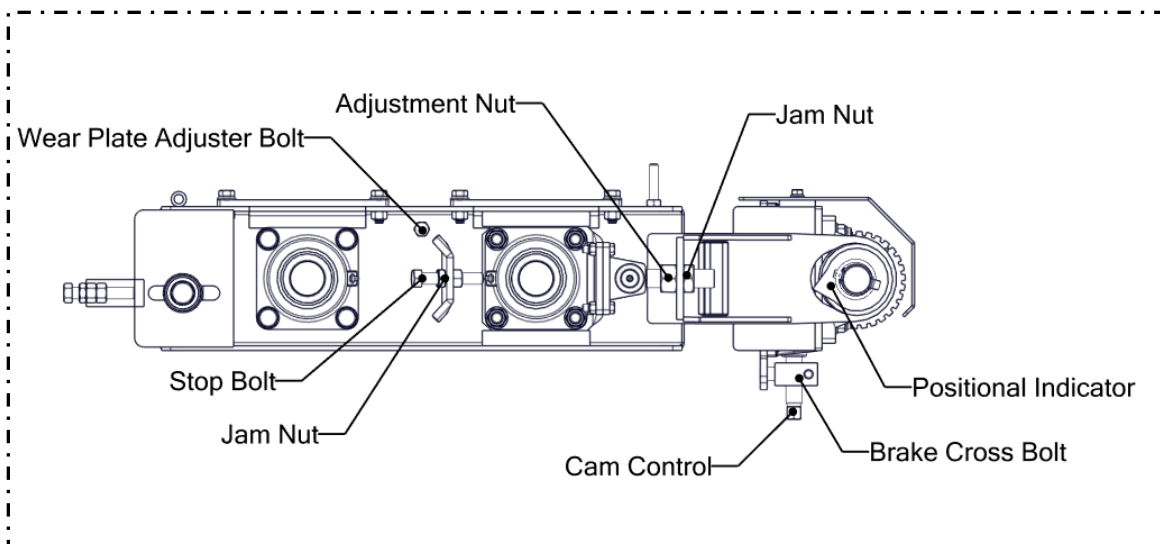


Figure 4.3

4 OPERATION

4.4.2 Roll Gap Adjustment

The cam control (Figure 4.4) serves as a mechanism to make roll gap adjustments accurately and quickly using a 3/4" wrench or socket. The cam positional indicator is set at the factory to the "1" position with 5 thousandths of clearance between the rolls. The adjustment nuts are also set at this position to maintain the minimum clearance required to keep the rolls from touching—See 4.4.1 Roll Setting.

To obtain a setting with greater roll gap, rotate the cam control in a clockwise direction after releasing the brake. The brake is released by loosening the brake cross bolt. Rotating the control by more than a half turn at a time is not advised without checking a feed sample. Once the desired setting is obtained, reset the brake to maintain the setting. The cam control may be adjusted while the machine is in operation.

To obtain a setting that delivers a smaller particle size, rotate the cam control in a counter clockwise direction (equates to lower numbers on positional indicator).

To release trapped items, or to unplug the rolls, rotate the cam control so that the positional indicator rotates clockwise and points vertically. Continue turning clockwise until it points horizontally away from the indicated scale. (Figure 4.5).

This is the maximum gap attainable to release articles caught above the rolls. Larger particles should be removed from above the rolls with the machine powered down. Return the indicator to the former position to resume grinding.

Additionally, the spring pressure can be increased to control the outcome of the final product. Adjusting the spring pressure is not an exact science and may take some trial and error to achieve the desired results. To adjust the spring pressure, loosen the jam nuts on the spring push bolts and turn the spring bolts in and out until the desired pressure is reached.

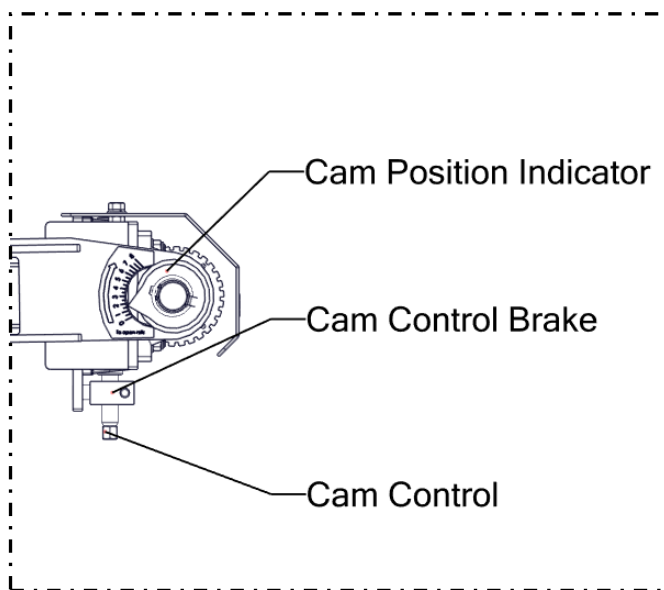


Figure 4.4

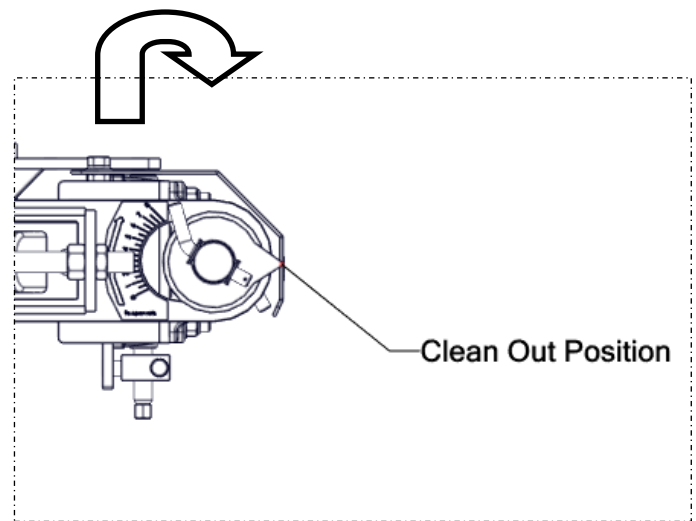


Figure 4.5

4 OPERATION

4.4.3 Feed Gate Control

Set the friction nut/washer (Figure 4.6) so that it supports the weight of the feed gate and yet allows the gate to be opened and closed by hand. Note that the setting of the feed gate helps to spread the feeding of grain evenly across the face of the roll. The feed gate also serves to limit the overall flow of grain through the rolls.

4.4.4 Setting Wear Plates

Wear plates (Figure 4.7) are used to keep grain from escaping around the ends of the rolls. The positioning of the wear plates can be seen when the feed gate is fully open. A noise can be heard if the wear plates are contacting the rolls. To remedy this, loosen the jam nut and wear plate adjustment bolt (Figure 4.6) until the noise stops. Alternately, if the gap is excessive, turn the bolt into the plate until the plate touches the roll, then back off until the noise stops. Tighten the jam nuts when the desired setting is obtained. Be sure to maintain the position of 'UHMW wear plate' (Figure 4.7) to cover chamfer at ends of rolls. Replace as necessary.

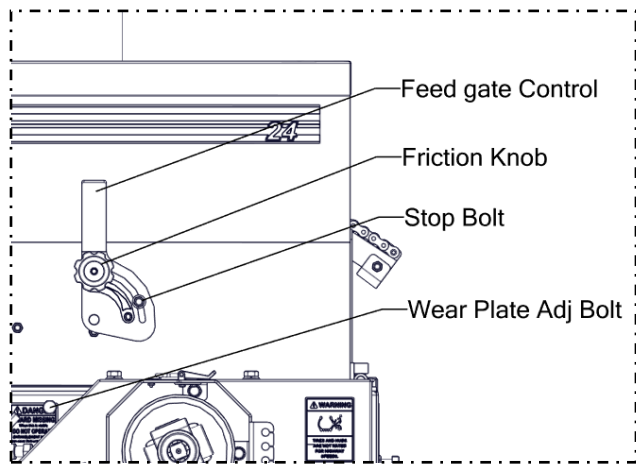


Figure 4.6

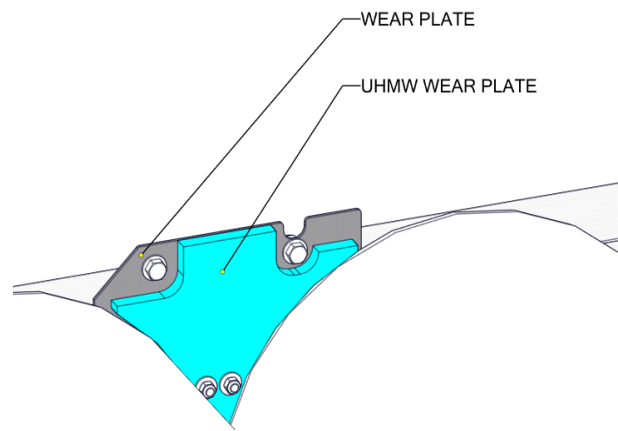


Figure 4.7

4.4.5 Grate Magnet

The grate magnet has slits on the edges (Figure 4.8). These can be removed with pliers to expand the top opening. This modification may aid in improving material flow when milling wet grain.

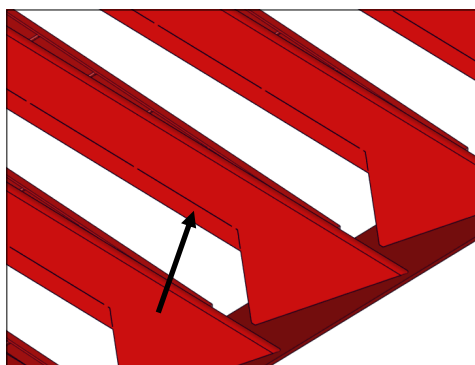


Figure 4.8

4 OPERATION

4.4.6 Roll Drive Belt Tension

To increase belt tension, loosen the jam nut and turn the tensioning bolt until approximately 15lbs of force at the center of the longest belt span causes a 3/8" deflection. Reset the jam nut to lock the adjustment bolt in place. Always leave a minimum of 1/16" of room for take-up in the coils of the spring (Figure 4.9).

4.4.7 Cross Auger Drive Belt Tension

Follow the same steps as outlined in 4.4.5. Refer to the Cross Auger Belt Tension diagram (Figure 4.10).

Roll Drive Belt

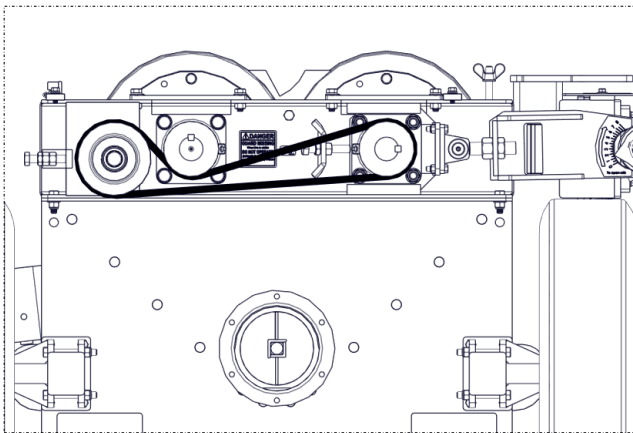


Figure 4.9

Cross Auger Drive Belt

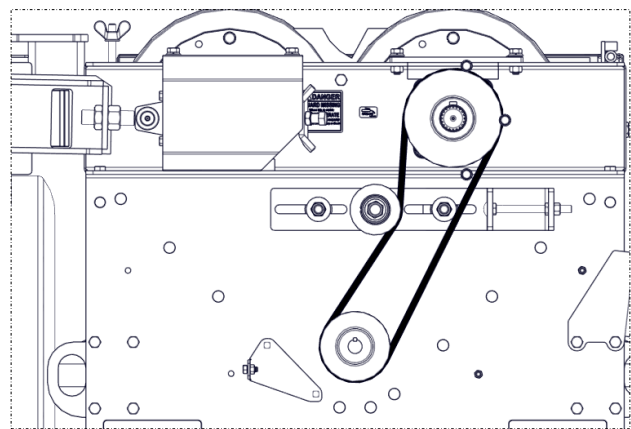


Figure 4.10

4.4.8 Spring Pressure

To increase spring pressure, loosen the jam nut and turn the spring push bolt inward a 1/4 turn at a time. Setting the pressure higher than necessary is hard on the bearings and the roll surfaces when hard particles like rocks go through the rolls. Always turn the bolts (if more than one) so that the load carried by each is the same. The factory setting for the deflection of the spring is 0.625 in with 442 lbs/in.

(Note: Figure shows top view of the mill; shield removed for illustration purposes only)

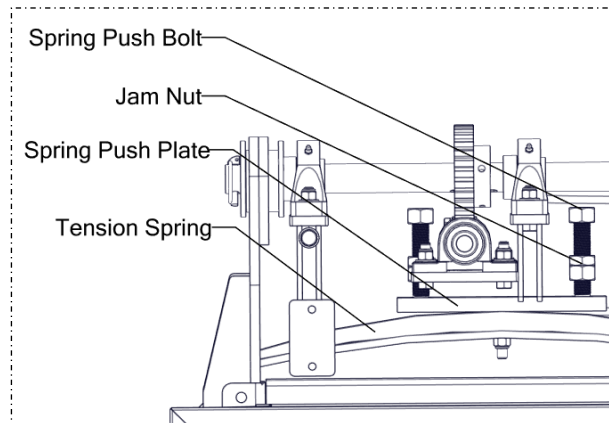


Figure 4.11

4 OPERATION

Leaf Spring Pressure (24" Roller Mill)		
Deflection (in)	lbs/in	
0.625	442	Factory Setting
0.750	515	Max for bearings

4.4.9 Auger Set Up

Setting Up The Discharge Auger:

The discharge auger is equipped with a central hinged folding section, allowing the auger to be folded up, thus reducing height for storage.

- 1) Remove the lever pipe from the holder on the front of the mill by removing the hair pin and bent pin (Figure 4.12).
- 2) Insert the lever pipe into the receiver tube on the upper section of the discharge auger, installing the bent pin and hair pin to secure it in place (Figure 4.13).
- 3) Using the lever pipe, unfold the discharge auger until it is completely in line with the lower section and secure it into place with the over-center latch (Figure 4.14).
- 4) Return the lever pipe to the holder on the front of the mill.

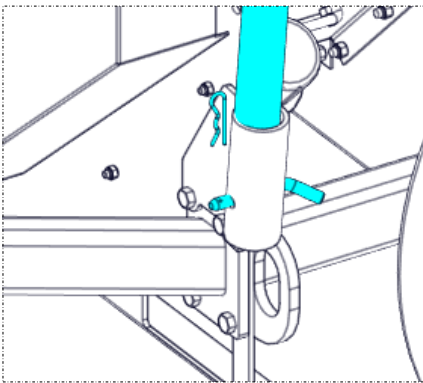


Figure 4.12

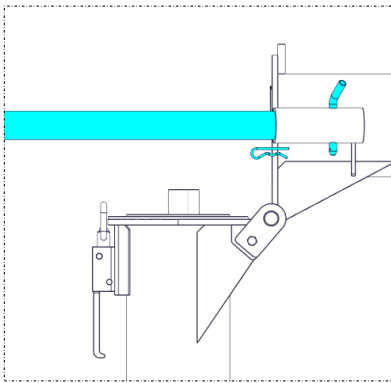


Figure 4.13

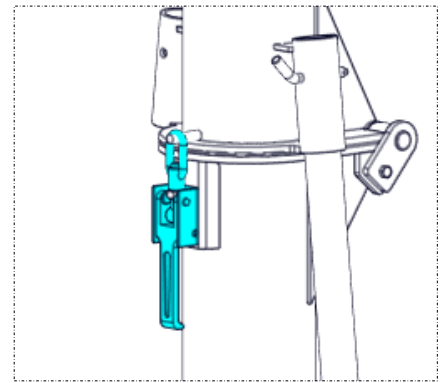


Figure 4.14

4.4.10 Axil Placement

The trailer is equipped with an adjustable axil and is recommended to place the spindle plate 6" from the Bottom Hopper as shown in figure 4.15.

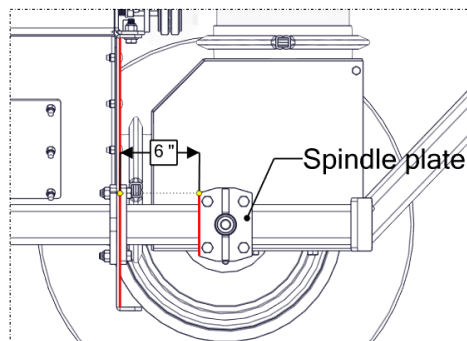


Figure 4.15

4 OPERATION

4.5 Operating the Roller Mill

1. Make sure to read and understand all of the safety items in Section 2.
2. Ensure that the feed gate is closed (Figure 4.6) before starting the mill. Even a few grains will keep the rolls from turning. Start the rolls turning at minimum RPM and slowly increase the RPM speed to 540.
3. Check the wear plate, roll gap, and feed gate friction nut settings.
4. Open the gate slowly and increase the flow, continuing to check grain quality as you do.
Note: Rolling quality is impacted by three variables: roll speed, spring pressure, and feed rate. If grain quality is good at low feed rates, but decreases quickly as feed rate increases, the spring pressure may be too low. To increase pressure, loosen the jam nuts and turn the spring push bolts (Figure 4.11) inward a 1/2 turn at a time. Keep the pressure even on both bolts (if applicable). In difficult cases, reducing the feed rate is one more way to control feed quality.
5. Always ensure that the belt tension is adequate on the cross auger drive belt. Plugging of the mill can occur if the belts begin to slip significantly (see sections 4.4.5 & 4.4.6).
6. When finishing the rolling process, always clean the top hopper out completely and close the feed gate. Note that the feed gate stop bolt (Figure 4.6) can be used to set a consistent opening point. This maintains product consistency each time rolling is performed.
7. If not using the mill for some time, clean the grain out of the gearbox using the rear door access. Best practice is to store the mill under cover.

4.6 Roller Mill Break-in

It is recommended that the mill be run at moderate to full operational speed and at 1/2 to 2/3 capacity during the first hour of operation. This allows the frictional forces to diminish significantly within the auger tube, and allows the free flow of grain to approach acceptable levels in the system. Keep this in mind after the mill has been stored for extended periods of time as well.

It is also recommended that the following mechanical items be checked:

1. At start up:

- Check wear plate settings.
- Check roll gap settings.
- Check operation of the feed gate; set the friction nut.

2. After operating for a 1/2 hour:

- Re-torque all fasteners and hardware.
- Lubricate all grease fittings.
- Check operation of the feed gate; reset the friction nut as needed.
- Check the roll gap setting. Due to the use of mechanical means to hold the rolls in place, “settling” can occur within the system due to spring impact and other factors.
- Check the setting of the gap between the rolls, not only for a change in gap setting, but also for gap consistency from one end of the roll to the other.

A half hour of running will take care of any inconsistencies in the roll surface, and allow an accurate setting of the roll gap. See 4.4.1 for setting of the roll gap.

3. After 5 hours and 10 hours of operation:

- Re-torque all wheel bolts, fasteners and hardware.
- Lubricate all grease fittings - do not over-grease.
- Proceed to the normal servicing and maintenance schedule as defined in the Maintenance Section (section 5).

5 SERVICE AND MAINTENANCE

5.1 Servicing Record

See Lubrication and Maintenance sections for details of service. Copy this page to continue record.

ACTION CODE: CL.....CLEAN T.....TIGHTEN
 L.....LUBRICATE CH.....CHECK

<div style="display: flex; justify-content: space-between;"> MAINTENANCE Hours Serviced By </div>									
8 Hours of Driveline Use									
L U-Joint									
L Main Bearings - Rolls									
50 Hours of Use									
CH Rolls Position - Square									
L Gear Box - Replace Oil - 200 hrs. - Check Level - 50 hrs.									
L Cam Bearings									
Annually									
T All Fasteners									
L Wheel Hubs									
L Lift & Swing Pole Bearings									
CL Machine									
CH Cross Auger Bearing									
CH Wear Plates									
L Jack									

5 SERVICE AND MAINTENANCE

5.2 Servicing Intervals

Grease

Use an S.A.E. multi-purpose high temperature grease with extreme pressure (EP) performance. An S.A.E. multi-purpose lithium base grease is also acceptable.

Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.

1. Only use a hand-held grease gun for all greasing.
2. Wipe grease fittings with a clean cloth before greasing to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If a fitting will not take grease, remove and clean thoroughly. Clean the lubricant passage-way also. Replace fittings as necessary.

Oil

Use 80W90 oil for discharge auger gearbox.

Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.

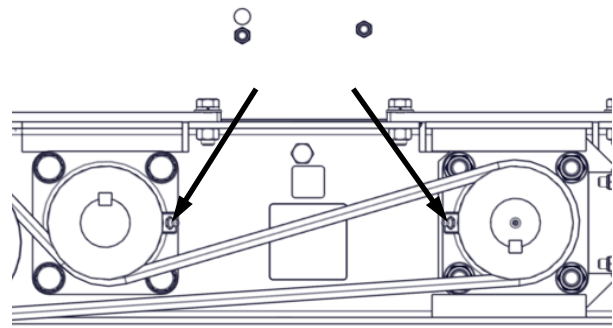
PTO, front and rear yoke: grease zerk (every 8 hours)



PTO, mid: grease zerk, extend PTO and rotate shield to find zerk (every 8 hours)



Main bearings: grease zerk front and rear (every 8 hours)

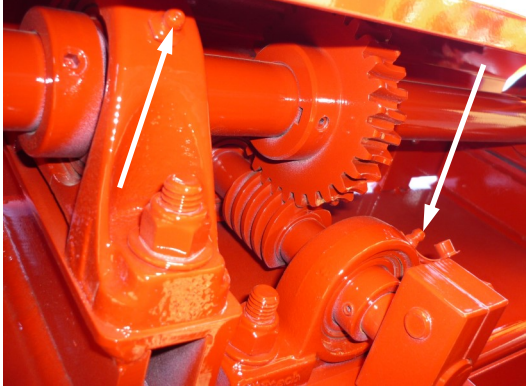


IMPORTANT: Retorque wheels after 100Kms of towing or 8 hours of operation. Refer section 10 for torque specification.

5 SERVICE AND MAINTENANCE

5.2 Servicing Intervals

Cam adjuster bearings
(grease lightly every 50 hours)



Jack, grease zerk
(once per season)



Wheel hub, grease zerk and torque bolts
(once per season)



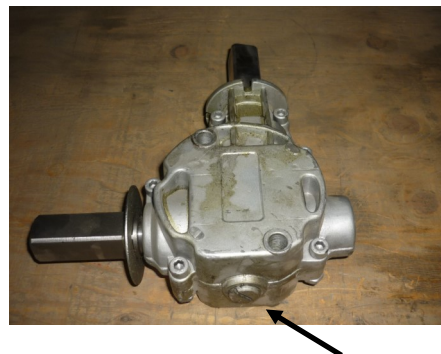
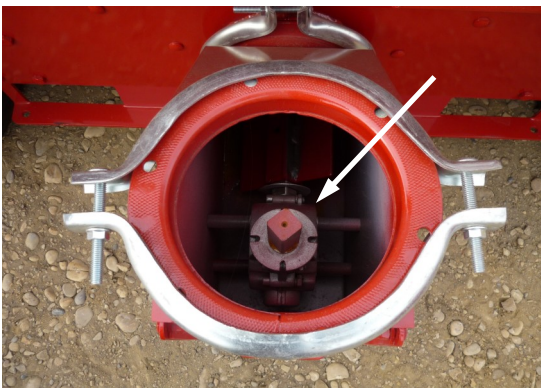
Discharge auger crank
(every 50 hours)



Discharge Auger
(Check every 50hrs, replace every 200hrs)

For checking the discharge gearbox oil level:

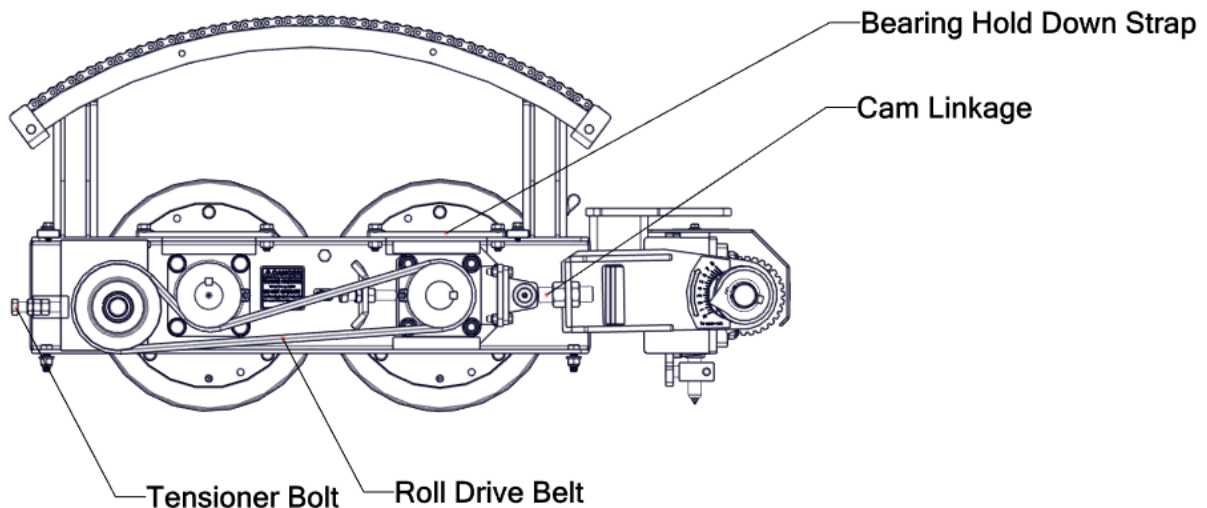
1. Take out the gearbox.
2. Locate the oil plug (located on the bottom of the gearbox).
3. Fill with 200ml of oil. Lay the gearbox down flat. Oil should trickle out of the hole.
4. Reinsert the plug.
5. Torque the bolts to spec when reattaching to the gearbox housing (30 ft. lbs.).



5 SERVICE AND MAINTENANCE

5.3 Removal Of Rolls For Servicing

1. With the power disconnected, loosen the jam nuts on each of the spring tension bolts and relieve all pressure from the spring (Figure 4.8).
2. Relieve tension on the drive motor belts and remove (Figure 4.9).
3. Relieve tension on the cross auger drive belts and remove the belts (Figure 4.10).
4. Loosen the wing nuts holding the top hopper down and lift the topper up, over center, gently setting it on the rests.
5. Loosen and remove the bearing hold-down straps.
6. Remove the bolts that tie the cam linkage to the bearing.
7. Loosen the brake and turn the cam controller to create space between the bearings and cam linkage (section 4.4.2).
8. Remove 1 roll at a time. *Note: Rolls are heavy, take appropriate precautions.*



TO SET DRIVE ROLLS AFTER RE-INSTALLATION

- Refer to Section 4.4.1.

OPERATION

- Prior to start-up, ensure that the roll gap is preset to the desired setting by putting a 1 bushel sample through the rolls at rated speed. This will indicate what the sample will look like during normal operation. Adjust the gap and spring pressure as necessary, based on the rolled sample.
- See section 4.4.2 for roll setting procedures. When using the cam system, loosen the brake cross bolt at the base of the vertical shaft found at the center of the system, then proceed to turn the cam adjuster at the bottom of the vertical shaft to adjust the roller setting. Always tighten the brake when finished. Adjustments can be made under load without issue.

6 PDI SETUP

Shipping Parts

The mill has been shipped with components that secure it in position when in the container. These are to be removed and discarded.

- 1) Auger stabilizer, clamped around discharge auger and bolted to top hopper (Figure 6.2).
- 2) The upper portion of the discharge auger is secured to the discharge auger clamp band with a two piece clamp (Figure 6.3).
- 3) There are two chain tabs at the axles that act as a mounting point for the shipping chains (Figure 6.4).
- 4) The front of the mill has a support stand bolted to the front end (Figure 6.5).

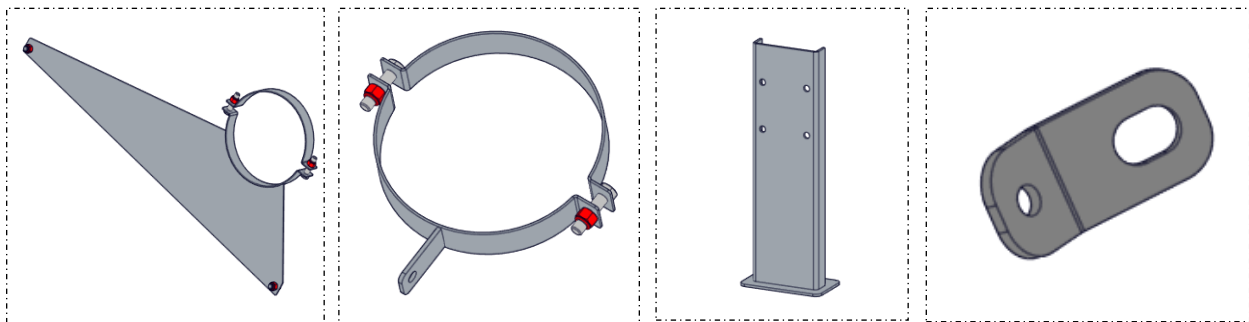


Figure 6.2

Figure 6.3

Figure 6.4

Figure 6.5

Setup

- 1) Loosen the 2 carriage bolts/nuts on the forward gearbox band clamp so as to remain attached but allowing for rotation of the auger.
- 2) Remove the nut/bolt holding the stopper to the left end of the arc.
- 3) Remove the nuts/bolts from the clamp portion of the auger crank.

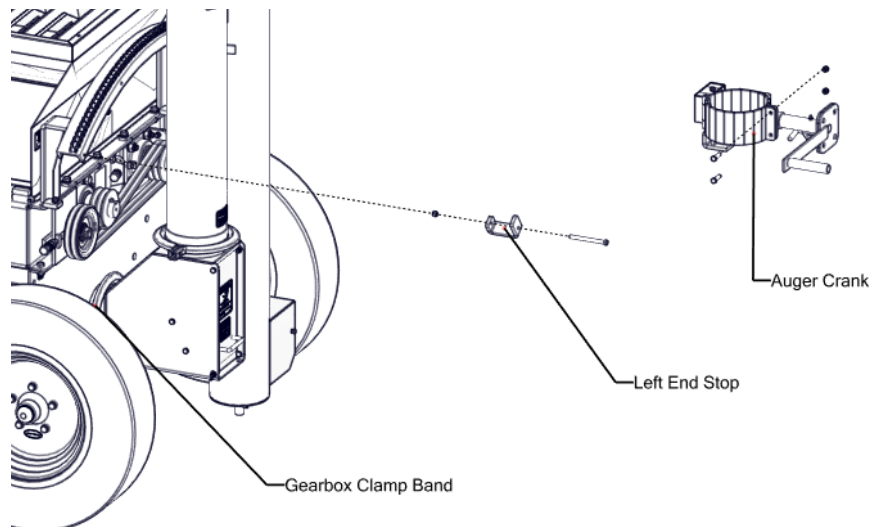


Figure 6.6

6 PDI SETUP

- 4) Rotate the discharge auger until it comes to rest on the driver's side tire (Figure 6.7).
- 5) Install the lever pipe into the upper section of the discharge auger and secure with the included pin.
- 6) Using the lever pipe, unfold the upper section of the auger and lock it into place using the over-center latch (the auger may need to be lifted off of the tire to completely unfold). After assembly is completed, store the lever pipe in the holder on the front of the mill.

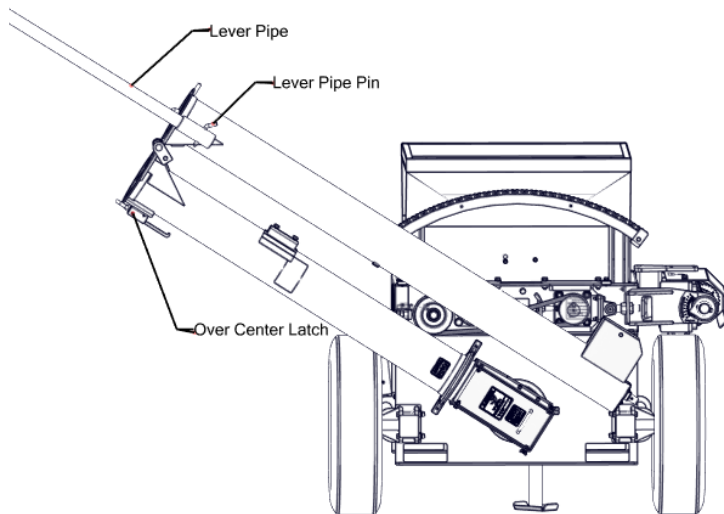


Figure 6.7

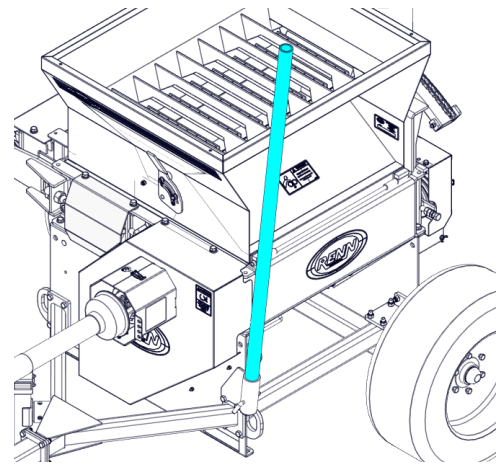


Figure 6.8

- 7) Disengage the lock on the crank handle. Run the auger crank onto the arc (leaving at the left end of arc).
- 8) Reinstall the left end stop.

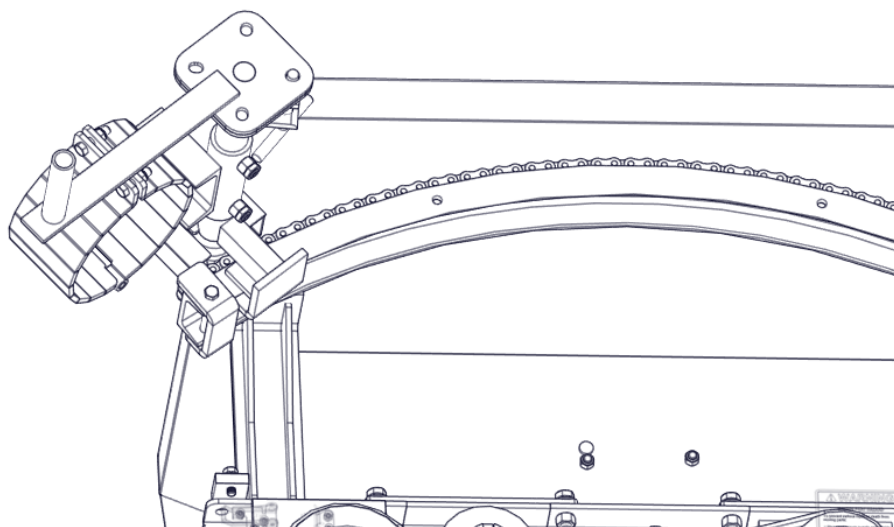


Figure 6.9

6 PDI SETUP

- 9) Remove the bolts from the auger support bracket and install the auger support.

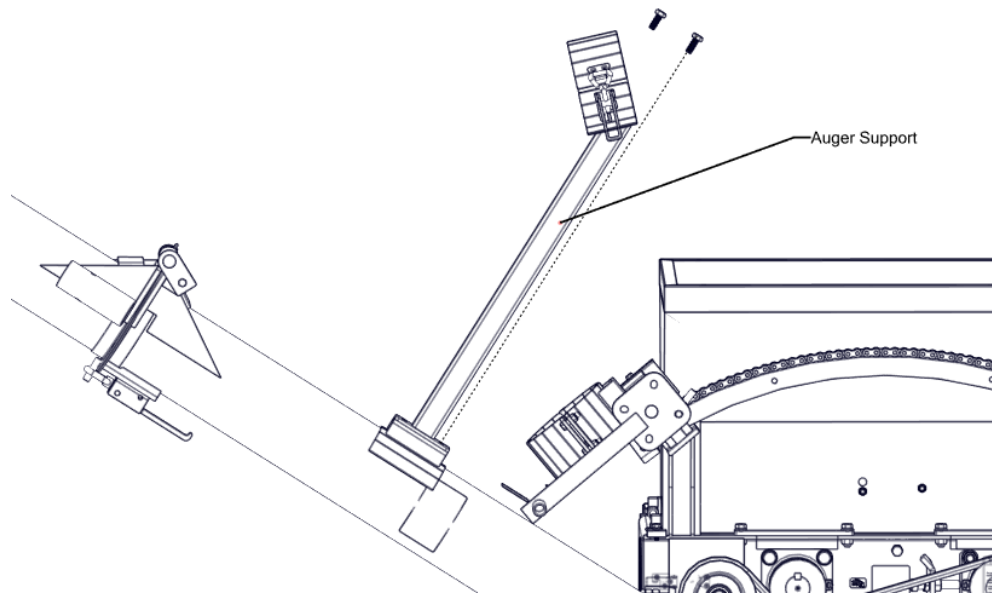


Figure 6.10

- 10) Lift the discharge up to, and tighten into, the auger crank (clamp portion) using the nuts/bolts removed earlier.

IMPORTANT: To avoid the risk of personal injury, use proper lifting techniques.

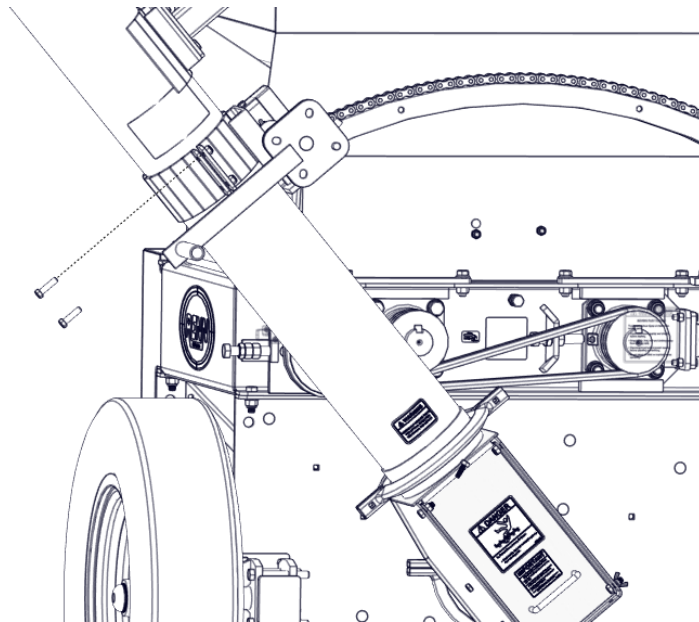


Figure 6.11

6 PDI SETUP

- 11) Attach the discharge spout using the nuts/bolts provided.
- 12) Attach the Base Hitch & Hitch Plate to the front of the unit using the provided bolts.

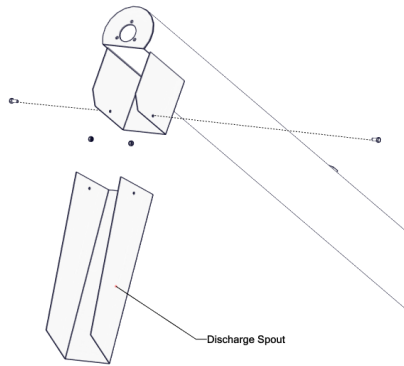


Figure 6.12

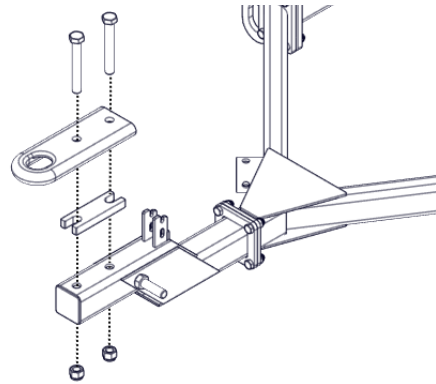


Figure 6.13

- 13) Bolt the front half of the hitch assembly to the hitch A-frame.
- 14) Bolt the safety chain to the hitch using the already installed bolts.

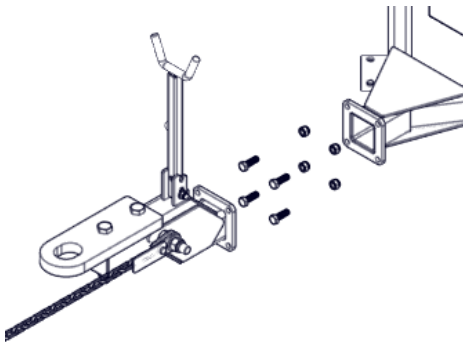


Figure 6.14

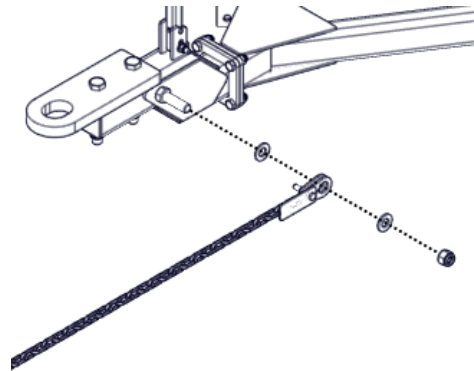


Figure 6.15

- 15) Attach the PTO stand to the hitch assembly.
- 16) Install the PTO.

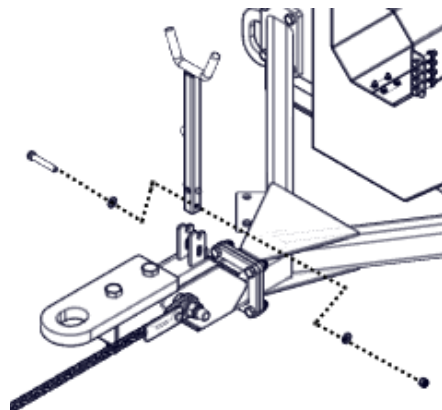
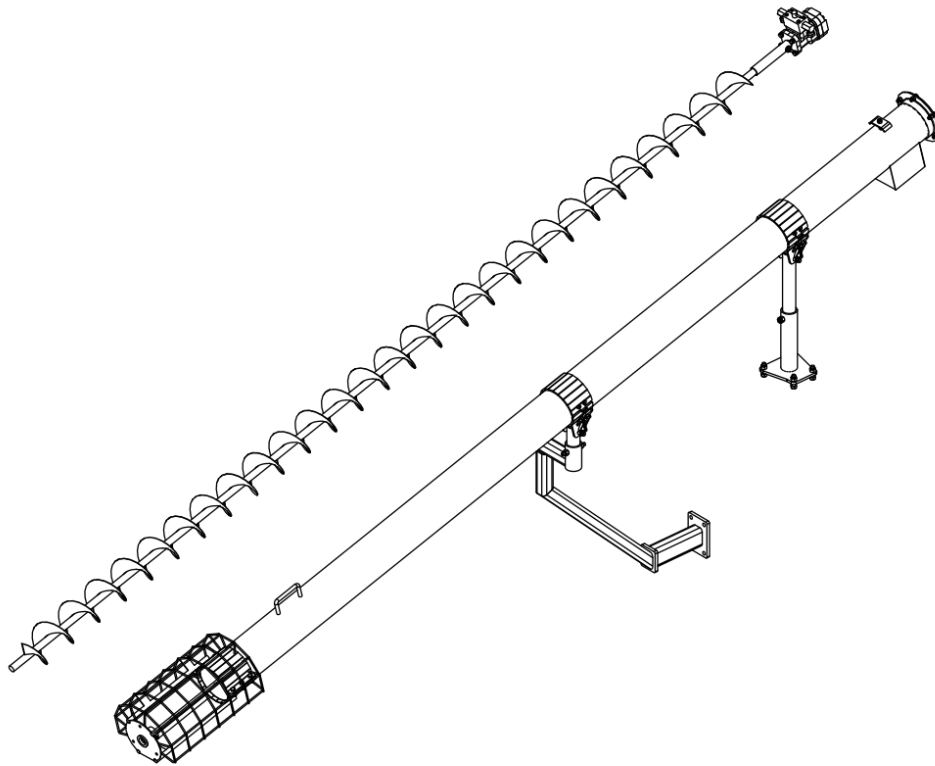


Figure 6.16

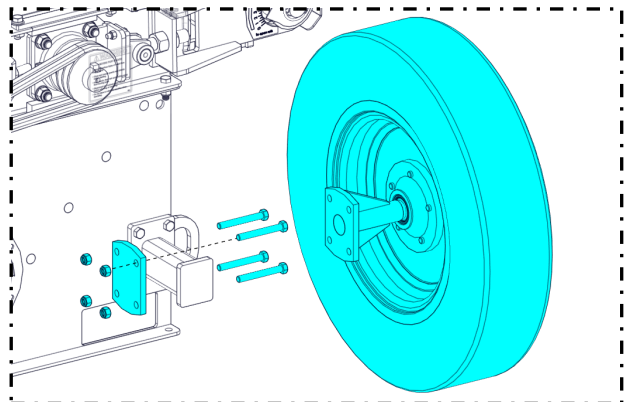
6 PDI SETUP

6.1 6" Transfer Auger Set-up (Optional)



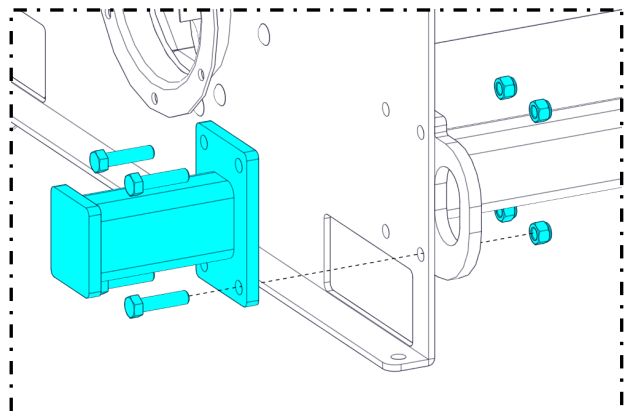
- 1) Remove the passenger side wheel and hub assembly.

Save for re-installation later.



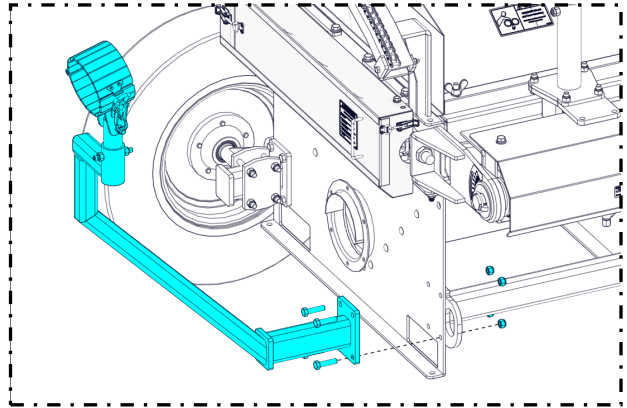
- 2) Remove the nuts/bolts holding the existing axle stub from onto the back end of the mill.

Save the nuts/bolts for re-installation.

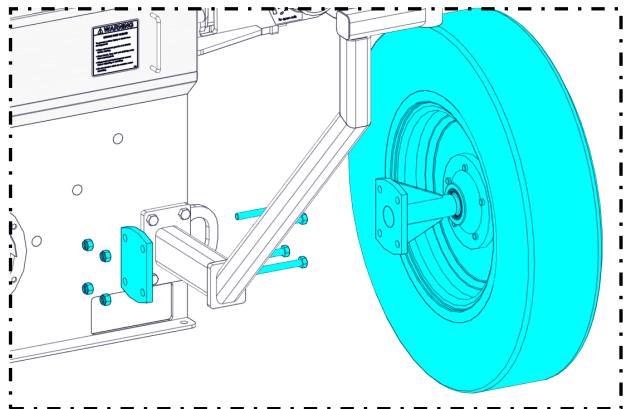


6 PDI SETUP

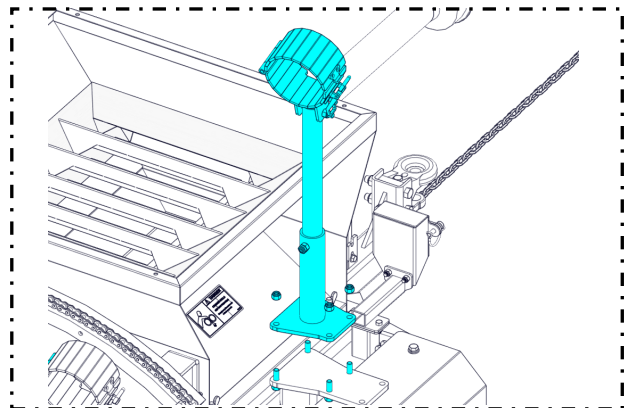
- 3) Install the rear auger transport support to the back end of the mill using the nuts/ bolt removed in step 2



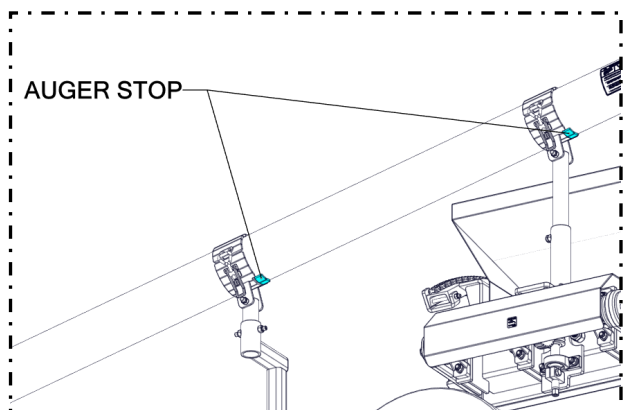
- 4) Re-install the hub and wheel assembly removed in step 1 onto the rear auger transport support.



- 5) Install the pivot mount using the provided 1/2" x 1-3/4" bolts and Nyloc nuts.



- 6) Lift the transfer auger into the two auger support clamps, using the welded auger stops, on the bottom of the auger to set the auger into the correct position. The auger stops orient and set the height of the auger properly.



7 TRANSPORTATION



1. Check with local authorities regarding mill transportation on public roads. Obey all applicable laws and regulations.
2. Always travel at a safe speed. Use caution when going around corners or meeting traffic.
3. Make sure an SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by local highway and transportation authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.
4. If possible use a light kit when transporting. Be sure all lights attached to the rear of the mill are working to safeguard against rear end collisions. Daybreak and dusk are particularly dangerous and pilot vehicles are recommended.
5. Be sure that the mill is hitched positively to the towing vehicle and that a retainer is used through the drawbar pin. Always use a safety chain between the machine and the towing unit.
6. Keep to the side and yield the right-of-way to allow faster traffic to pass. Drive on the shoulder of the road if safe to do so and permitted by law.
7. Do not exceed a 25mph (40kph) travelling speed. Reduce speed on rough roads and surfaces. Reduce speed when going around tight bends and corners in the road. Be especially careful when traveling on roads with a significant center crown, or when moving to the shoulder of the road with one wheel.
8. Always use the hazard warning flashers on the tractor when transporting unless prohibited by law.
9. When transporting a mill with a conveyor discharge, be aware of overhead power lines at all times.
10. Have a minimum distance of 18 inches from the machine hitch to the tractor PTO, otherwise damage may occur to the tractor or mill.

Do not transport the mill without all of the transport pins and clamps installed and fastened.

8 STORAGE

8.1 Placing in Storage

At the end of the operating season the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the beginning of the next season. Follow this procedure:

1. Thoroughly clean the machine to remove all dirt, mud, debris or residue.
2. Lubricate all grease points. Make sure all grease cavities have been filled with grease to remove any water left over from clean up.
3. Inspect all hydraulic hoses, couplers and fittings. Tighten any loose fittings. Replace any hose that is badly cut, nicked, abraded or is separating from the crimped end of a fitting.
4. Touch up all paint nicks and scratches to prevent rusting.
5. Move the machine to the storage location.
6. Select an area that is dry, level and free of debris.
7. Chock the tires, front and rear, to prevent the machine from rolling.
8. Place planks under the jack for added support if required.
9. Unhook the machine from the tractor.

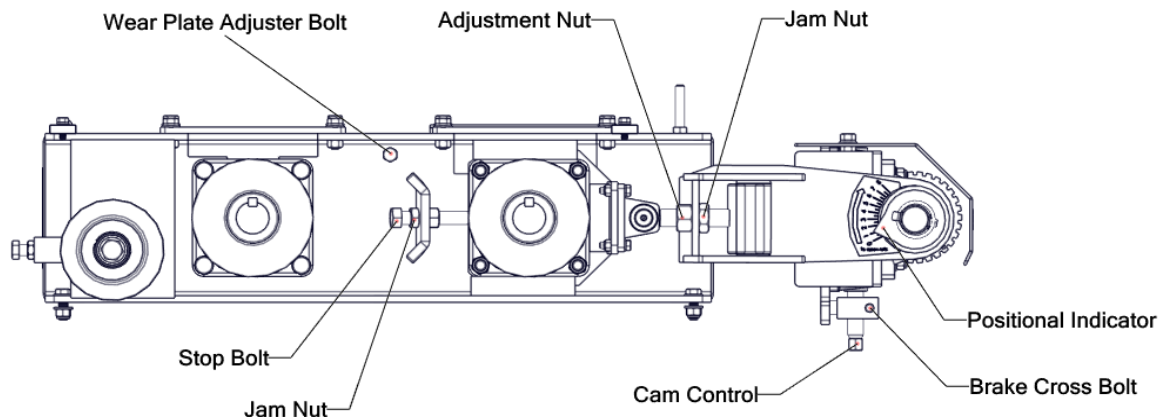
8.2 Removing from Storage & Pre-Season Preparation

When removing from storage and preparing to use, follow this procedure:

1. Clear the area of bystanders, especially small children, and remove foreign objects from the machine and the working area.
2. Remove any storage covers used to protect the machine.
3. Attach the roller mill to the tractor.
4. **INSPECTION:**
 - a) Check that all hydraulic lines are seated and completely coupled.
 - b) Check that all the bearing locking collars on the shafts are tight and in good condition.
 - c) Check that all set screws on the bearing collars are tight.
 - d) Check that all bearing mounting bolts are tight.
 - e) Check that all tires are inflated per the recommended pressures.
 - f) Re-torque all wheel bolts.
5. Lubricate all grease fittings.
6. Replace any defective parts.
7. Go through the **Pre-Operational Checklist** (Section 4.3) before using.

9 TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	REMEDY
Whole grain in sample	Wear plate not adjusted.	With power disconnected & rolls not rotating, use a 3/4" wrench to loosen the jam nut on the wear plate adjuster. Adjust the wear plates in so that there is minimal clearance between the end of the rolls & the wear plates and tighten the jam nuts. This will prevent any whole grain from passing around the end of the rolls. Maintain the position of the poly 'V' section to cover the chamfer at the ends of the rolls. Replace as necessary.
Wear plates and poly 'V' adjusted, roll gap at desired setting, <u>whole grain in sample</u> when gate is opened for increased flow	Rolls are opening up when negative pressure is applied from grain going between rolls.	Decrease the flow of grain by closing the inlet gate or Increase spring pressure by turning the spring adjusting bolts clockwise. <i>NOTE : When increasing spring pressure, add pressure by turning the adjusting bolts in increments of 1/2 turn inward at a time. i.e. (1) adjust in 1/2 turn increments (2) check sample, if not as desired repeat steps 1 & 2.</i>
Wear plates checked, spring pressure is sufficient, cam positional indicator adjusted to the #1 position or less, gap still too wide for desired rolling	Roll has worn or is out of adjustment.	See Sections 4.4.1 & 4.4.2 for resetting the roll gap.



9 TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	REMEDY
Wear plates and poly 'V', roll gap & spring pressure set properly, still <u><i>whole grain in sample</i></u>	Grain smaller than the space between the grooves.	Need finer groove pattern. Rolls need re-grooving or are no longer true (badly worn).
Grain is rolled too fine	Roll gap is too narrow.	Using the cam control, release the cam brake and move the indicator toward the #2 position (or next largest number - a 1/2 turn at a time, checking a sample at each 1/2 turn).
Grain is rolled too fine, gap is set to the desired setting Coarse grains (corn, peas, lupins) Small grains (wheat , oats, barley, milo)	Roll pattern is too fine (i.e. more grooves per inch than necessary). Rolls are turning faster than through-put.	Change roll to a coarser groove pattern. Slow the R.P.M. down. The closer the roll speed is to the grain through-put the more consistent the rolled product will be.

10 SPECIFICATIONS

10.1 General Specifications

Weight.....3065 lbs
Minimum Tractor Horsepower.....60 hp - PTO
Auger Discharge Size.....7"

10.2 Tire Specifications





Tire/Rim..... P225/75R15 x 5BL
Tire Pressure Check Tire for Info

10.3 Bolt Torque Specifications

Wheel 5 Bolts/Nuts 511 Hub 72 ft./lbs.
PTO shear bolts 3/8" NC x 2" Gr.5 Shear Bolt 30 ft.lbs.
..... *All Other Bolts—Refer to Bolt Torque Chart On Following Page*

10 SPECIFICATIONS

BOLT TORQUE CHART

SIZE							
	SAE GRADE 2		SAE GRADE 5		SAE GRADE 8		L9
	ASSEMBLY TORQUE DRY	LUBRICATED	ASSEMBLY TORQUE DRY	LUBRICATED	ASSEMBLY TORQUE DRY	LUBRICATED	ASSEMBLY TORQUE LUBRICATED
1/4-20	66*	49*	8	75*	12	9	11
1/4-28	76*	56*	10	86*	14	10	13
5/16-18	11	8	17	13	20	18	21
5/16-24	12	9	19	14	25	20	23
3/8-16	20	15	30	23	45	30	33
3/8-24	23	17	35	25	50	35	38
7/16-14	30	24	50	35	70	55	60
7/16-20	35	25	55	40	80	60	65
1/2-13	50	35	75	55	110	80	95
1/2-20	55	40	90	65	120	90	105
9/16-12	65	50	110	80	150	110	140
9/16-18	75	55	120	90	170	130	150
5/8-11	90	70	150	110	220	170	185
5/8-18	100	80	180	130	240	180	205
3/4-10	160	120	260	200	380	280	290
3/4-16	180	140	300	220	420	320	355
7/8-9	190	140	400	300	600	460	505
7/8-14	210	155	440	320	660	500	585
1-8	220	160	580	440	900	680	775
1-14	240	170	640	480	1000	740	900
1 1/8-7	300	220	800	600	1280	960	1150
1 1/8-12	340	260	880	660	1440	1080	1325
1 1/4-7	420	320	1120	840	1820	1360	1600
1 1/4-12	460	360	1240	920	2000	1500	1750
1 3/8-6	560	420	1460	1100	2380	1780	—
1 3/8-12	640	460	1680	1260	2720	2040	—
1 1/2-6	740	560	1940	1460	3160	2360	3250
1 1/2-12	840	620	2200	1640	3560	2660	3650

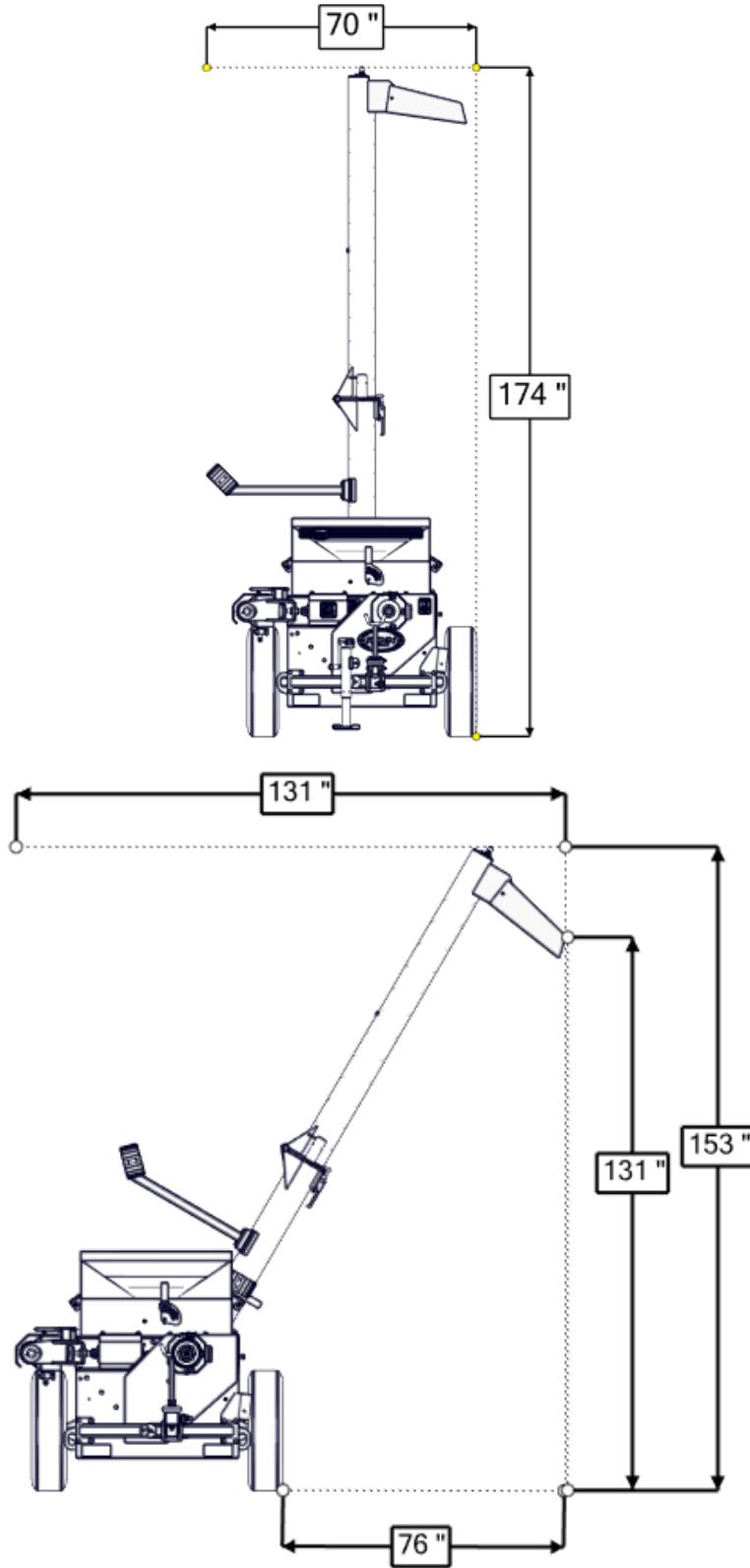
**ITEMS WITH * = INCH POUNDS
ALL OTHERS = FOOT POUNDS**

**"LUBRICATED"
INCLUDES LUBRICANTS, LUBRIZING, PLATING, AND HARDENED WASHERS**

10 SPECIFICATIONS

10.4 Overall Dimensions

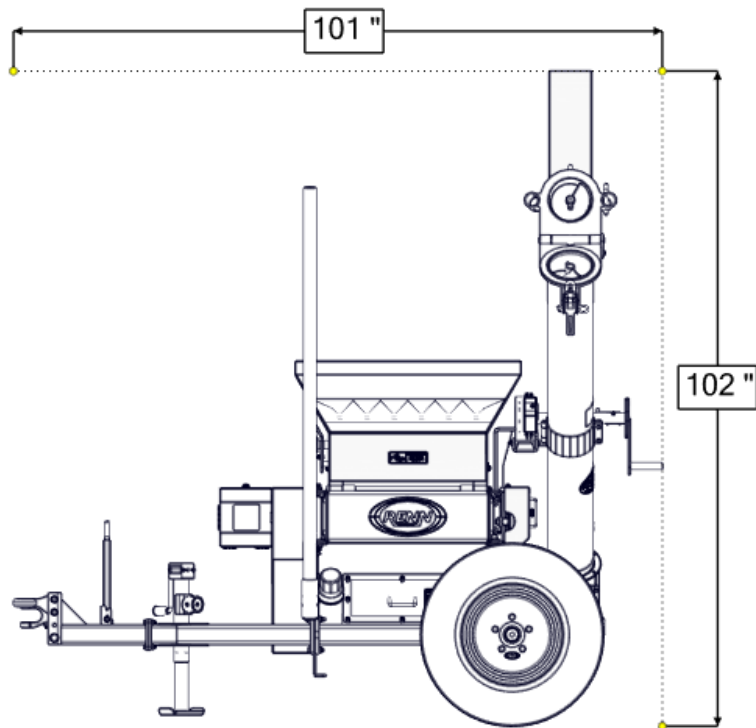
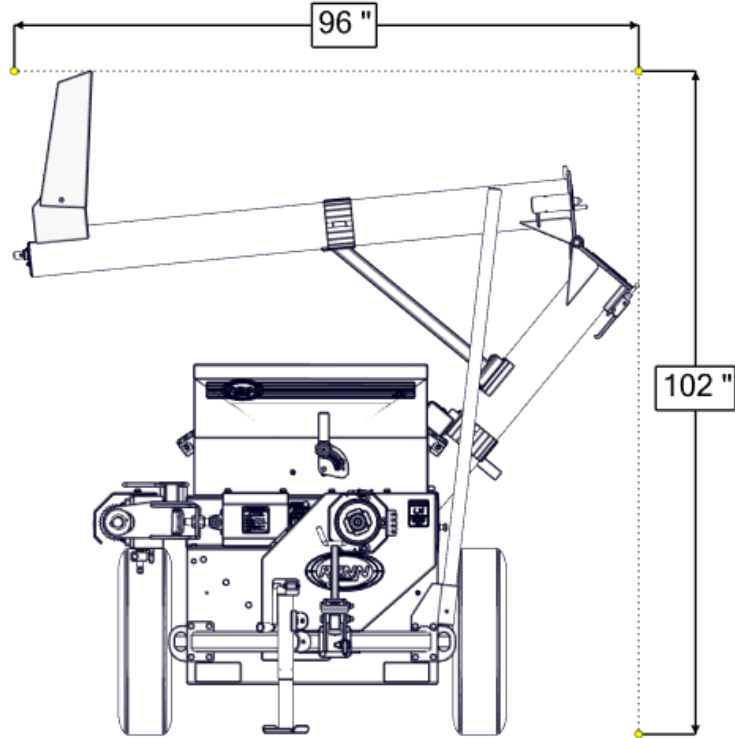
10.4.1 Working Mode



10 SPECIFICATIONS

10.4 Overall Dimensions

10.4.2 Transport Mode



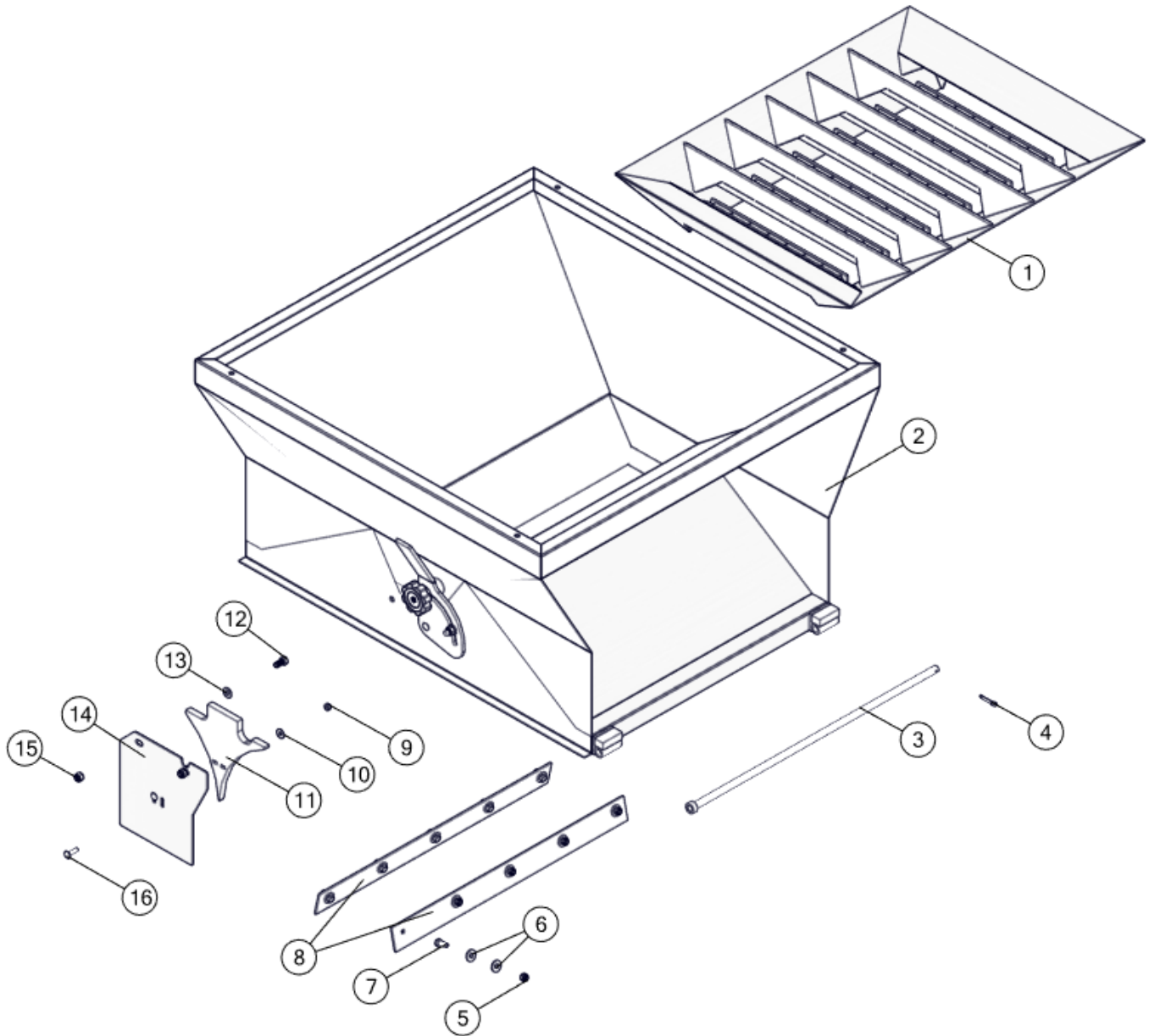
11 PARTS

11.1 Top Hopper

REF #	PART #	DESCRIPTION	QTY
1	612400-0047.00	Grate Magnet - 24" RM (Small Grain)	1
2	612400-0578.00	Top Hopper Weldment - 24"	1
3	612400-0006.00	Hinge Pin - Top Hopper	1
4	170000-0180	Cotter Pin - 3/16" x 1"	1
5	167200-0648	Nyloc Nut - 5/16" NC Gr.5 PL	10
6	168000-0040	Flat Washer - 5/16" USS PL	20
7	159300-0730	Hex Bolt - 5/16" NC x 3/4" Gr.5 PL	10
8	412400-0537.01	Grain Containment Belt - 24"	2
9	167200-0642	Nyloc Nut - 1/4" NC Gr.5 PL	4
10	168000-0022	Flat Washer - 1/4" USS PL	4
11	147100-0287	UHMW Wear Plate Insert - 8"	2
12	159300-0944	Hex Bolt - 3/8" NC x 3/4" Gr.5 PL	4
13	168000-0540	Flat Washer - 3/8" SAE	4
14	414000-0872.00	Wear Plate - 8" Frame - Shell Cast Rolls - Mills	2
15	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	4
16	163100-0103	Carriage Bolt - 1/4" NC x 1" Gr.5 PL	4

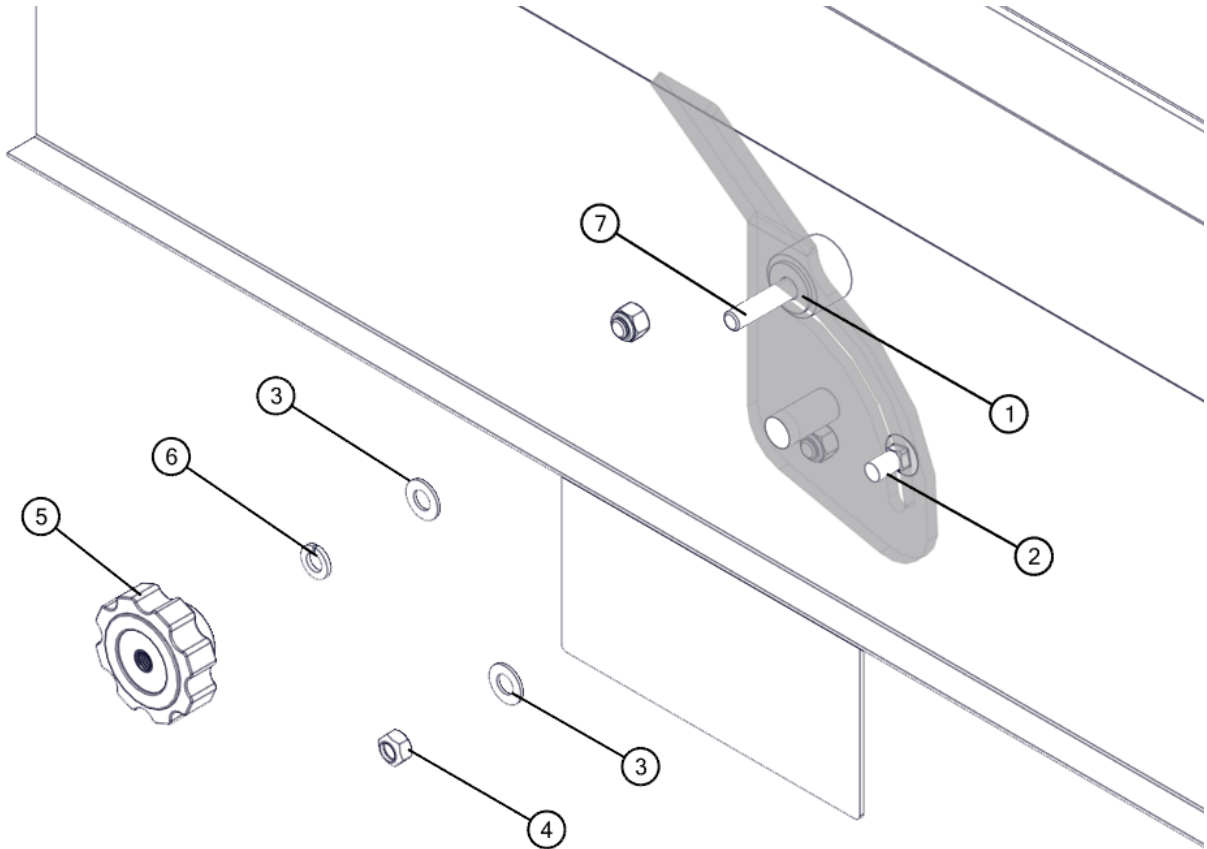
11 PARTS

11.1 Top Hopper



11 PARTS

11.1.1 Top Hopper (Knob)



REF #	PART #	DESCRIPTION	QTY
1	168000-0049	Flat Washer - 3/8" USS PL	1
2	163000-0506	Carriage Bolt 3/8" NC x 3/4" Gr.5 PL	1
3	168000-0540	Flat Washer - 3/8" SAE	2
4	167200-0412	Lock Nut - 3/8" NC	1
5	140000-0224	Lock Knob	1
6	168600-0071	Lock Washer - 3/8" PL	1
7	159400-0004	Hex Bolt - 3/8" NC x 2-1/2" Gr.5 PL	1

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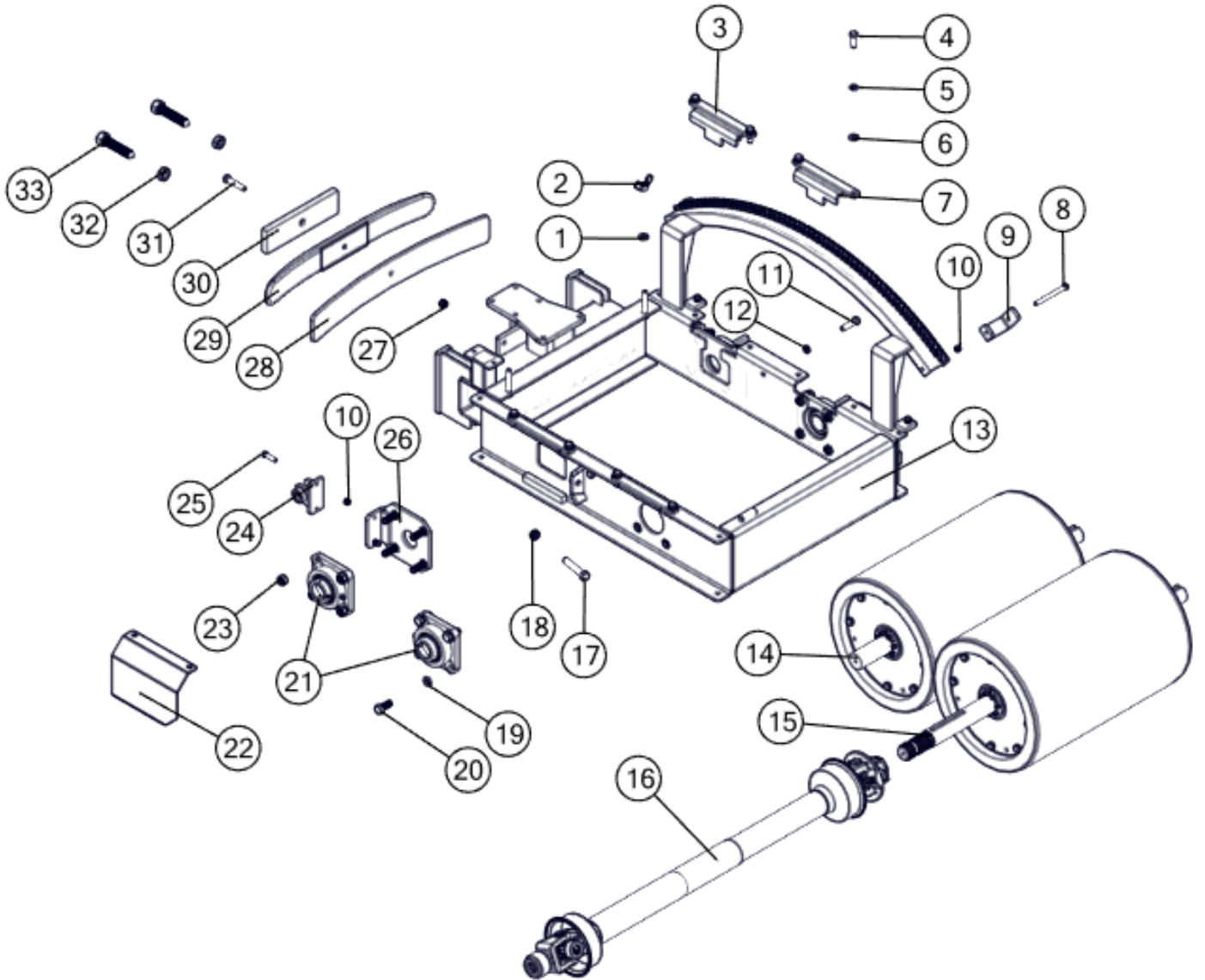
11 PARTS

11.2 Roller Mill - Upper Half

REF #	PART #	DESCRIPTION	QTY
1	168000-0065	Flat Washer 1/2" USS PLTD	10
2	167100-0995	Wing Nut 1/2" NC	2
3	612400-0541.00	Main Frame Insert	2
4	159400-0401	Hex Bolt - 1/2" NC x 1-1/2" Gr.5 PL	8
5	168600-0098	Lock Washer - 1/2" PL	8
6	168000-0544	1/2" Flat Washer SAE PLTD	8
7	614000-0182.04	Main Frame Insert - Idler Roll	2
8	159400-0015	Hex Bolt - 3/8" NC x 4-1/2" Gr.5 PL	2
9	414000-0811.02	Crank Stop Bracket	2
10	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	6
11	159600-0420	Hex Bolt - Full Thread - 1/2" NC x 2" Gr.5 PL	2
12	167000-0650	Jam Nut - 1/2" NC Gr.5 PL	2
13	612400-0553.01	Standard Mill Frame With Arc - 24"	1
14	712400-0814.00	24" Idler Roll B-Loc - 1 15/16"	1
15	712400-0812.00	24" Drive Roll B-Loc 1 15/16"	1
16	375000-0354	PTO Shaft - 35 Series - 1-3/4" 20 Spline x 1-3/8" 6 Spline	1
17	159600-0535	Hex Bolt - Full Thread - 5/8" NC x 3-1/2" Gr.5 PL	2
18	167000-0658	Jam Nut - 5/8" NC Gr.5 PL	2
19	168600-0120	Lock Washer - 5/8" PL	8
20	159400-0594	Hex Bolt - 5/8" NC x 1-1/2" Gr.5 PL	8
21	114000-0250	Bearing - 4-Bolt Flange 1-15/16" ID NTN (UELFU-1.15/16M)	4
22	414000-0975.01	Bearing Shield - Weld-on Hose Hanger	1
23	167200-0690	Nyloc Nut - 5/8" NC Gr.5 PL	8
24	613000-0069.00	Clevis Weldment	2
25	159300-0988	Hex Bolt - 3/8" NC x 1-1/2 Gr.5 PL	4
26	615000-0695.01	Bearing Slide - Bolted Head 8" Frame	2
27	167200-0688	Nyloc Nut - 1/2" NC Gr.5 PL	1
28	412400-0098.00	Inside Leaf - Mono Spring	1
29	303000-0025	Mono Leaf Spring	1
30	414000-0062.03	Spring Push Plate	1

11 PARTS

11.2 Roller Mill - Upper Half



REF #	PART #	DESCRIPTION	QTY
31	159400-0430	Hex Bolt - 1/2" NC x 2-1/2" Gr.5 PL	1
32	167000-0693	Jam Nut - 7/8" NC Gr.5 PL	2
33	614000-0328.00	Spring Adjustment Screw - 7/8" NC	2

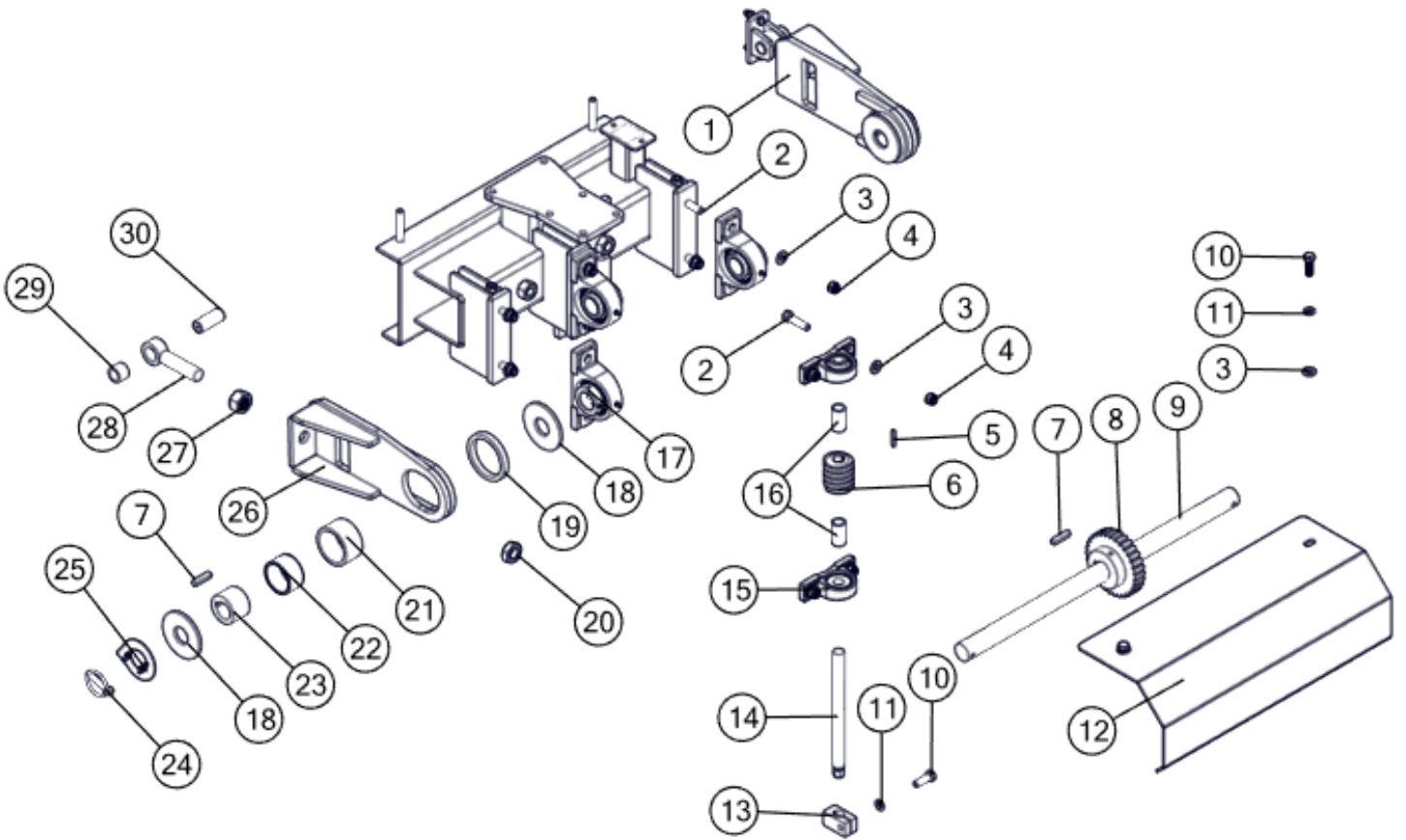
11 PARTS

11.3 Worm Drive Roll Adjustment

REF #	PART #	DESCRIPTION	QTY
1	615100-0219.00	Pull Plate - RH	1
2	159400-0427	Hex Bolt - 1/2" NC x 2" Gr.5 PL	10
3	168000-0544	Flat Washer - 1/2" SAE PLTD	12
4	167200-0688	Nyloc Nut - 1/2" NC Gr.5 PL	10
5	414000-0582.00	3/16"Keystock x 1-1/2"	1
6	120000-0601	Steel Worm 6DP Single Start RH 7/8" ID	1
7	414000-0652.00	3/8" Keystock X 1-3/4"	3
8	121000-0630	Worm Gear - 6DP - Single Start, 30 Tooth, 1-1/2 " ID	1
9	415100-0201.03	Cam Shaft - Spring Can Assembly	1
10	159400-0401	Hex Bolt - 1/2" NC x 1-1/2" Gr.5 PL	3
11	168600-0098	Lock Washer - 1/2" PL	3
12	415100-0353.01	Spring Cam Adjuster Shield	1
13	414000-0243.01	Worm Wheel Brake	1
14	615100-0361.00	Worm Shaft - 7/8" x 11"-3/4"	1
15	113900-0914	7/8" Bearing - Pillow Block	2
16	413600-0114.00	Worm Gear Spacer	2
17	114000-0260	Bearing - Pillow Block 1-1/2" ID NTN (UELP-1 1/2M)	3
18	415100-0361.00	Capping Washer	4
19	415100-0362.01	0.5" Spacing Washer - SCA - w/bushing	2
19	167000-0697	Jam Nut - 1" NF RH Gr.5 BL	2
20	415100-0215.00	Outer Band - 2-3/4" x 3-1/4" x 1-3/4"	2
21	415100-0217.00	Oilite Bushing - 2-3/8" x 2-3/4" x 1-1/2"	2
22	415100-0034.01	Spring Cam Hub	2
23	161500-0455	Lynch Pin - 7/16" x 1-3/4"	2
24	483100-0707.00	Cam Position Indicator - 1-1/2"	2
25	615100-0220.00	Pull Plate - LH	1
26	167000-0870	Hex Nut - 1" NF Gr.5 BL RH	2
27	615100-0304.00	Adjuster Eye Rod	2
28	113500-0126	Oilite Bushing - 1" x 1-1/4" x 1"	2
29	414000-0239.00	Cam Pivot Pin - 1" x 2-1/2"	2

11 PARTS

11.3 Worm Drive Roll Adjustment



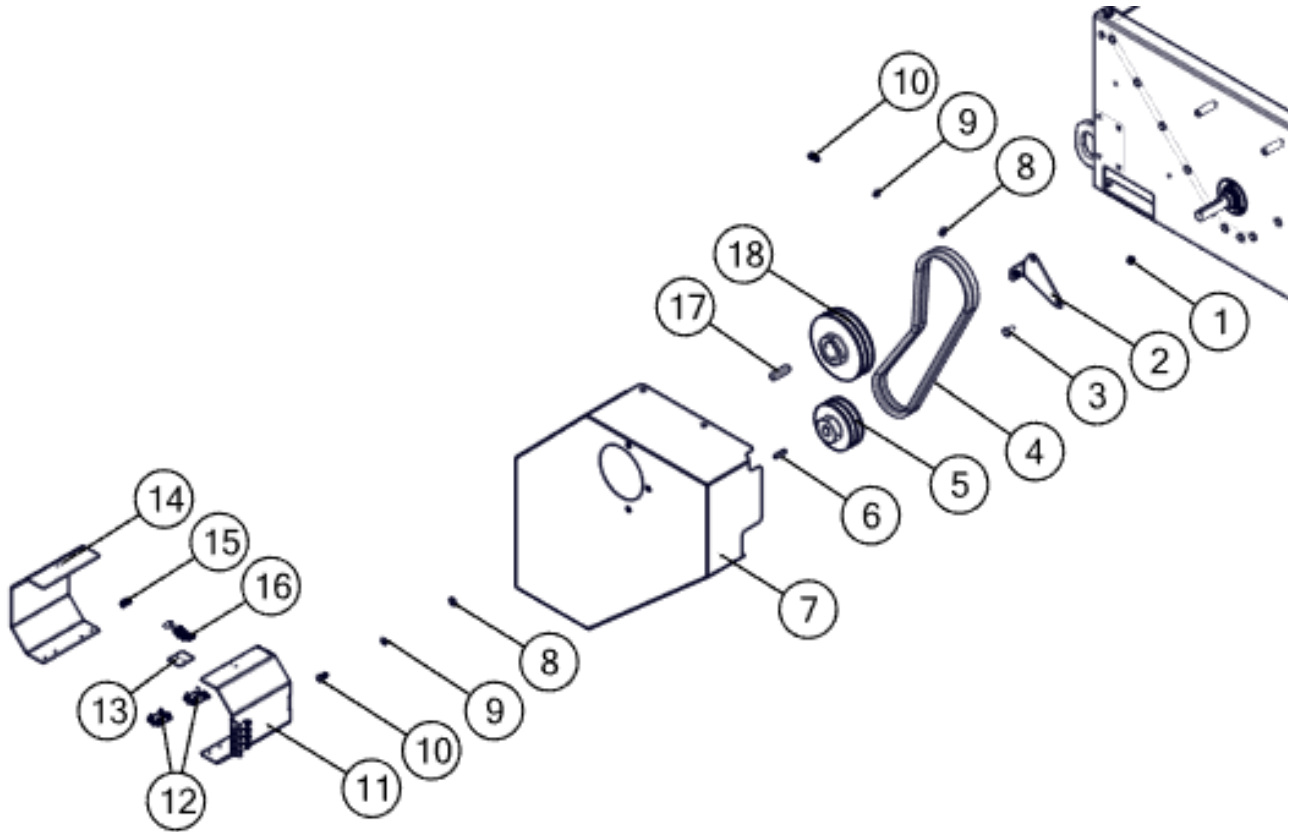
11 PARTS

11.4 Roll Drive - Front

REF #	PART #	DESCRIPTION	QTY
1	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	1
2	613000-0518.00	Front Shield Bolt Plate - 12"- 24" BH	1
3	163000-0507	Carriage Bolt - 3/8" NC x 1" Gr.5 PL	1
4	144000-0370	V-Belt - B52	2
5	124000-0007	Pulley - 2 Groove 5"x 1" ID	1
6	414000-0646.00	1/4" Keystock x 1-1/2"	1
7	614000-0285.00	Front Shield Weldment	1
8	168000-0540	Flat Washer - 3/8" SAE	4
9	168600-0071	Lock Washer - 3/8" PL	4
10	159300-0944	Hex Bolt - 3/8" NC x 3/4" Gr.5 PL	4
11	414000-0905.00	PTO Shield	1
**	159400-0003	Hex Bolt - 3/8" NC x 2" Gr.5 PL	4
**	167200-0412	Lock Nut - 3/8" NC	4
12	153000-0800	Butt Hinge - 2" x 1-1/2"	2
**	159300-0501	Stove Bolt - #10-24 x 5/8"	8
**	167000-0520	Hex Nut - #10-24 PL	8
13	414000-0906.01	Lap Flat	1
14	414000-0904.01	PTO Shield	1
15	154000-0143	Catch - Overcenter Latch - 3.5"	1
**	159300-0515	Stove Bolt - 8-32 x 1/2"	2
**	167000-0519	Hex Nut - 8-32 PL	2
16	154000-0142	Overcenter Latch - 3.5"	1
**	159300-0515	Stove Bolt - 8-32 x 1/2"	2
**	167000-0519	Hex Nut - 8-32 PL	2
17	414000-0553.01	1/2" Keystock x 2-1/4"	1
18	124000-0008	Pulley - 2 Groove 7" x 1-15/16"	1

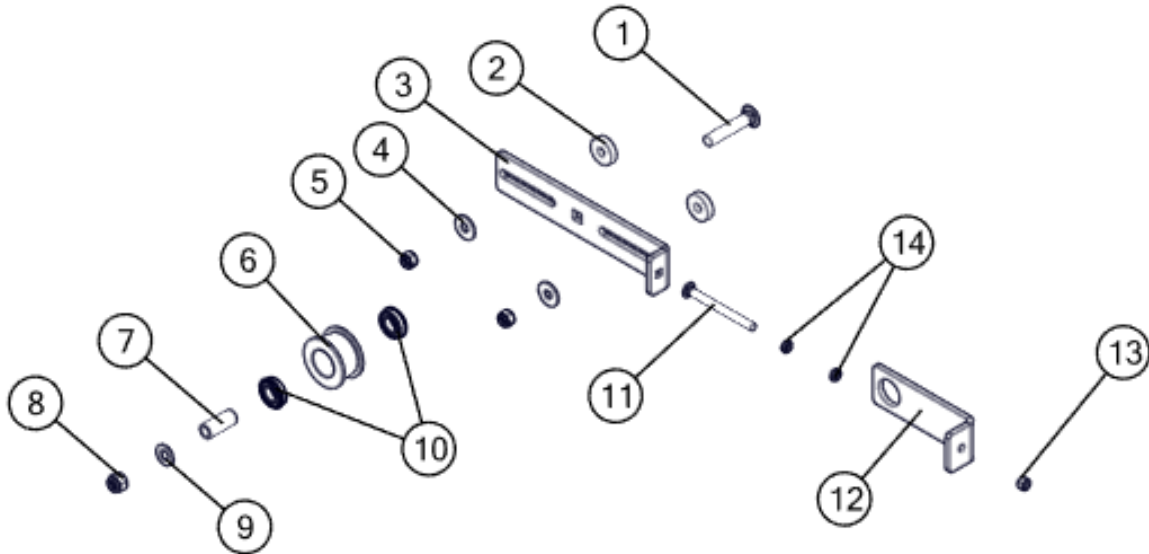
11 PARTS

11.4 Roll Drive - Front



11 PARTS

11.5 Pully Tensioner



REF #	PART #	DESCRIPTION	QTY
1	163100-0140	Carriage Bolt - 3/4" NC x 4" Gr.5 PL	1
2	412400-0518.04	1/2" Spacer - Idler Tensioner	2
3	412400-0517.03	Tensioner Bracket	1
4	168000-0080	Flat Washer - 5/8" USS PL	2
5	167200-0690	Nyloc Nut - 5/8" NC Gr.5 PL	2
6	124000-0035	Idler Pulley - 3-1/2" x 1.999"	1
7	414000-0093.01	Sleeve - 3-1/2" Double Idler Pulley	1
8	167200-0692	Nyloc Nut - 3/4" NC Gr.5 PL	1
9	168000-0587	Flat Washer - 3/4" SAE PL	1
10	114000-0098	1" Bearing - 52mm Cylindrical OD	2
11	163100-0120	Carriage Bolt - 1/2" NC x 6" Gr.5 BL	1
12	412400-0532.02	Tensioner Bracket	1
13	167000-0809	Hex Nut - 1/2" NC Gr.5 PL	1
14	167000-0650	Jam Nut - 1/2" NC Gr.5 PL	2

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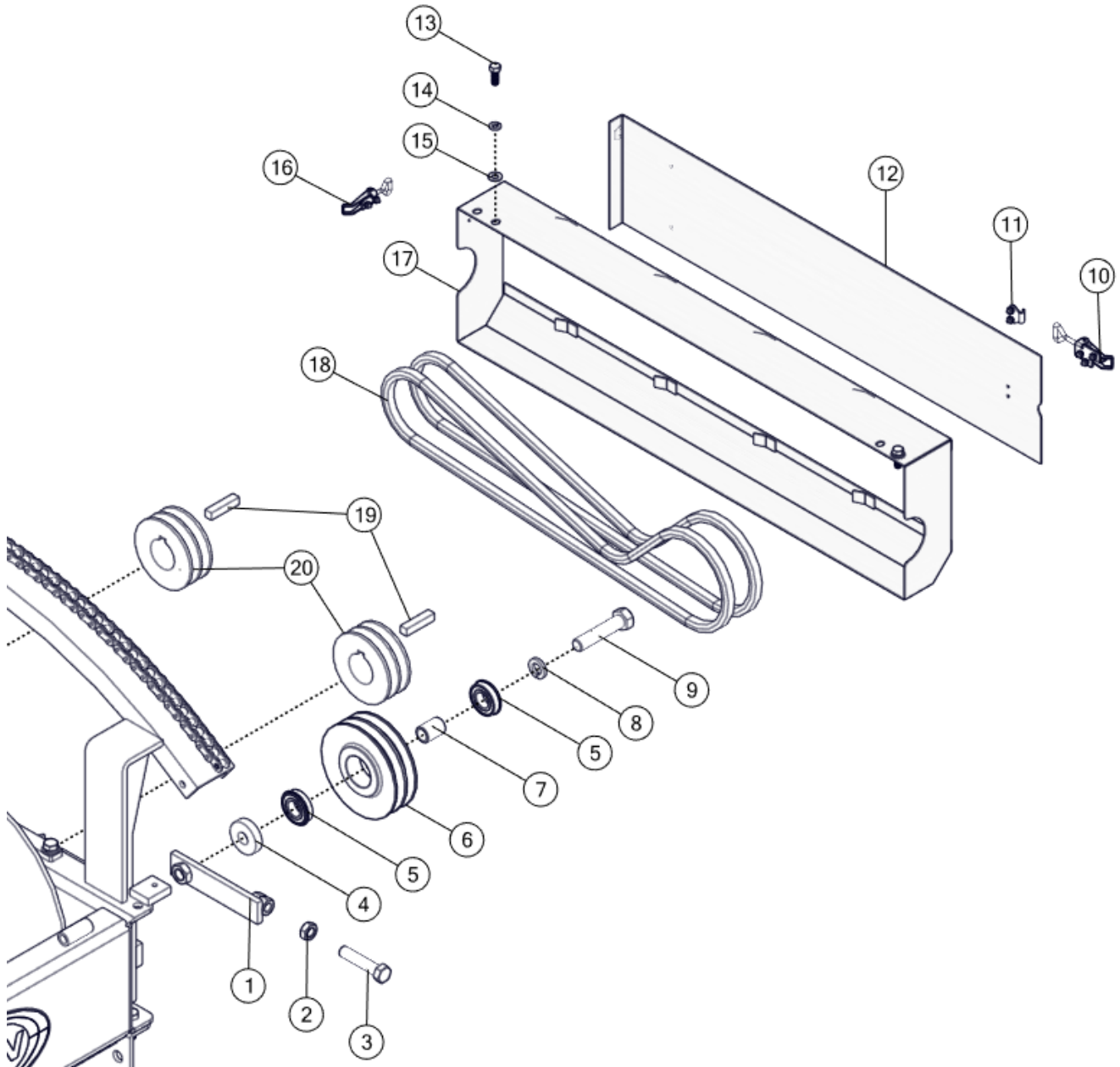
11 PARTS

11.6 Roll Drive - Rear

REF #	PART #	DESCRIPTION	QTY
1	614000-0505.01	Rear Belt Tensioner Weldment	1
2	167000-0658	Jam Nut - 5/8" NC Gr.5 PL	1
3	159600-0530	Hex Bolt - Full Thread - 5/8" NC x 3" Gr.5 PL	1
4	414000-0812.01	Washer	1
5	114000-0098	1" Bearing - 52mm Cylindrical OD	2
6	124000-0006	Pulley - 2 Groove 6" x 2"	1
7	414000-0676.02	Pulley Sleeve - 6" Idler	1
8	168600-0127	Lock Washer - 3/4" NC PL	1
9	159400-0812	Hex Bolt 3/4" NC x 4" Gr.5	1
10	154000-0140	Overcenter Latch - 4.7"	1
*	159300-0520	Stove Bolt - #10-24 x 1/2"	3
*	167000-0520	Hex Nut - #10-24 PL	3
11	154000-0141	Catch - Overcenter Latch - 4.7"	1
*	159300-0515	Stove Bolt - 8-32 x 1/2"	2
*	167000-0520	Hex Nut - #10-24 PL	2
12	614000-0293.00	Shield Slide - 8" Frame	1
13	159300-0988	Hex Bolt 3/8" NC x 1-1/2 Gr.5 PL	2
14	168600-0071	Lock Washer - 3/8" PL	2
15	168000-0540	Flat Washer - 3/8" SAE	2
16	154000-0142	Overcenter Latch - 3.5"	1
*	159300-0515	Stove Bolt - 8-32 x 1/2"	2
*	167000-0519	Hex Nut - 8-32 PL	2
17	614000-0292.01	Rear Shield Body	1
18	144000-0664	V-Belt - BB60	2
19	414000-0553.01	1/2" Keystock x 2-1/4"	2
20	124000-0005	Pulley - 2 Groove 4-1/2" x 1-15/16"	2

11 PARTS

11.6 Roll Drive - Rear



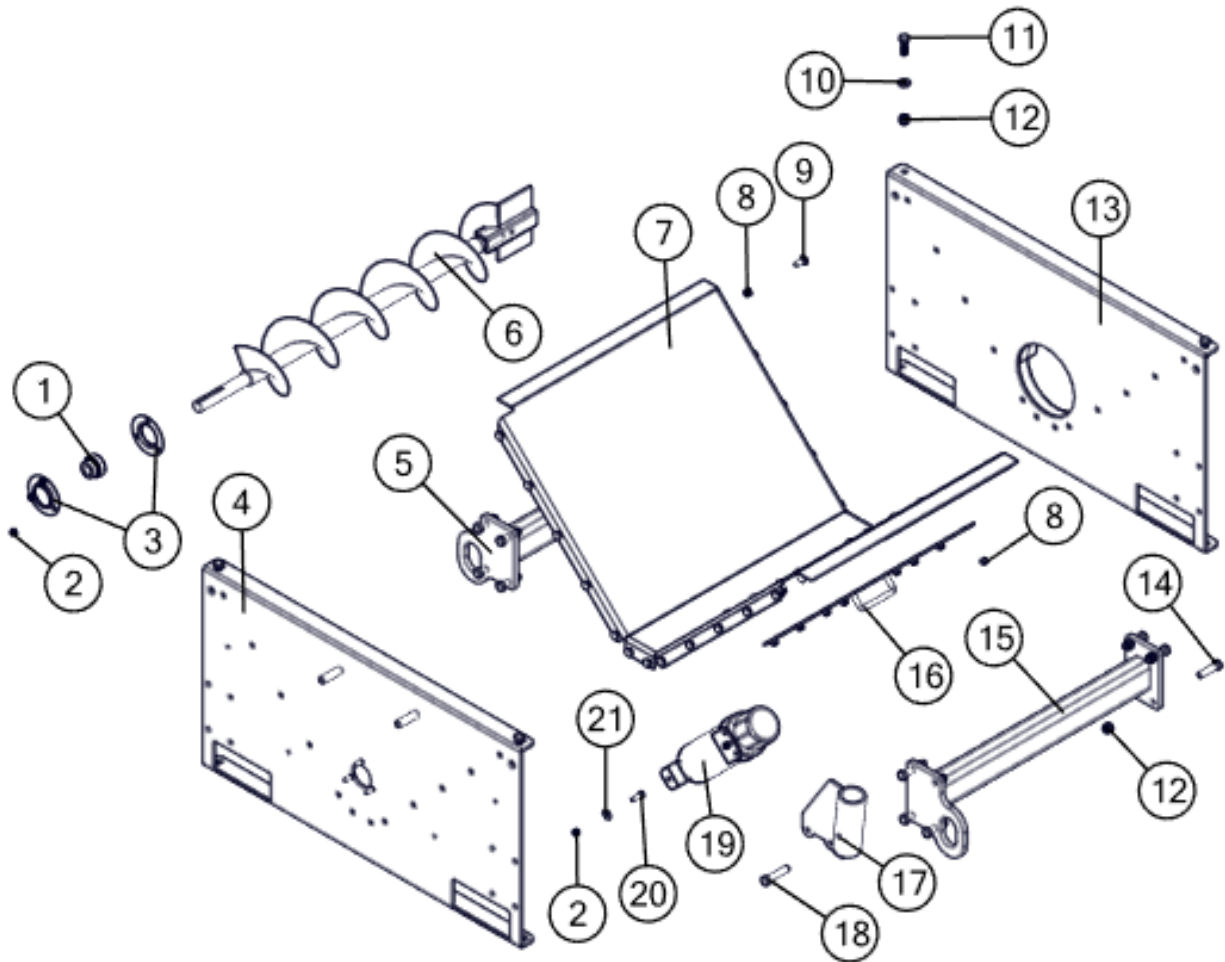
11 PARTS

11.7 Bottom Hopper

REF #	PART #	DESCRIPTION	QTY
1	114000-0115	1" Bearing - 52mm Cylindrical OD, Ecc. Lock	1
2	167200-0648	Nyloc Nut - 5/16" NC Gr.5 PL	5
3	114000-0152	Flangette 52mm	2
4	614000-0501.03	Front Panel - 7" X-Auger	1
5	612400-0584.00	R.H. Strut Weld't w/ Tie Down	1
6	871300-0504.08	Cross Auger - 7"	1
7	612400-0545.00	24" Wrap	1
8	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	32
9	163000-0507	Carriage Bolt - 3/8" NC x 1" Gr.5 PL	32
10	168000-0544	Flat Washer - 1/2" SAE PLTD	4
11	159400-0401	Hex Bolt - 1/2" NC x 1-1/2" Gr.5 PL	4
12	167200-0688	Nyloc Nut - 1/2" NC Gr.5 PL	20
13	614000-0502.00	Rear Panel Weldment - 7" Cross auger	1
14	159400-0427	Hex Bolt - 1/2" NC x 2" Gr.5 PL	14
15	612400-0583.00	L.H. Strut Weld't w/ Tie Down	1
16	673600-0096.00	Inspection Plate - Bottom Hopper	1
17	614100-0005.00	Lever Pipe Receiver	1
18	159400-0430	Hex Bolt - 1/2" NC x 2-1/2" Gr.5 PL	2
19	147000-0010	Manual Canister	1
20	159300-0735	Hex Bolt - 5/16" NC x 1" Gr.5 PL	2
21	168000-0040	Flat Washer - 5/16" USS PL	2

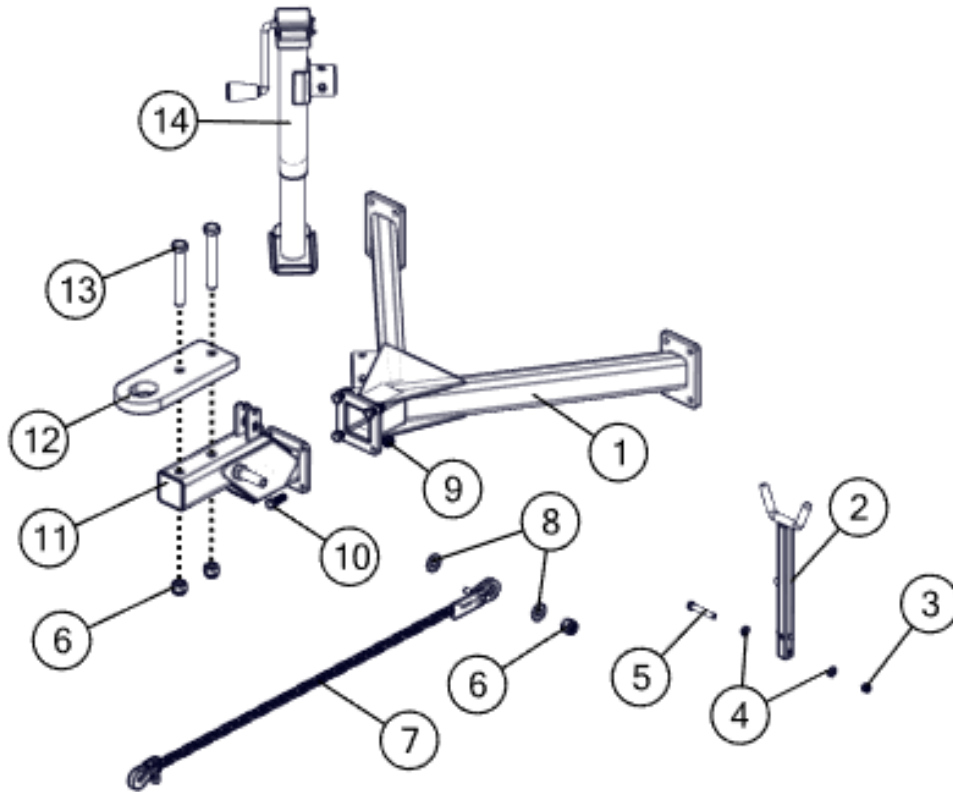
11 PARTS

11.7 Bottom Hopper



11 PARTS

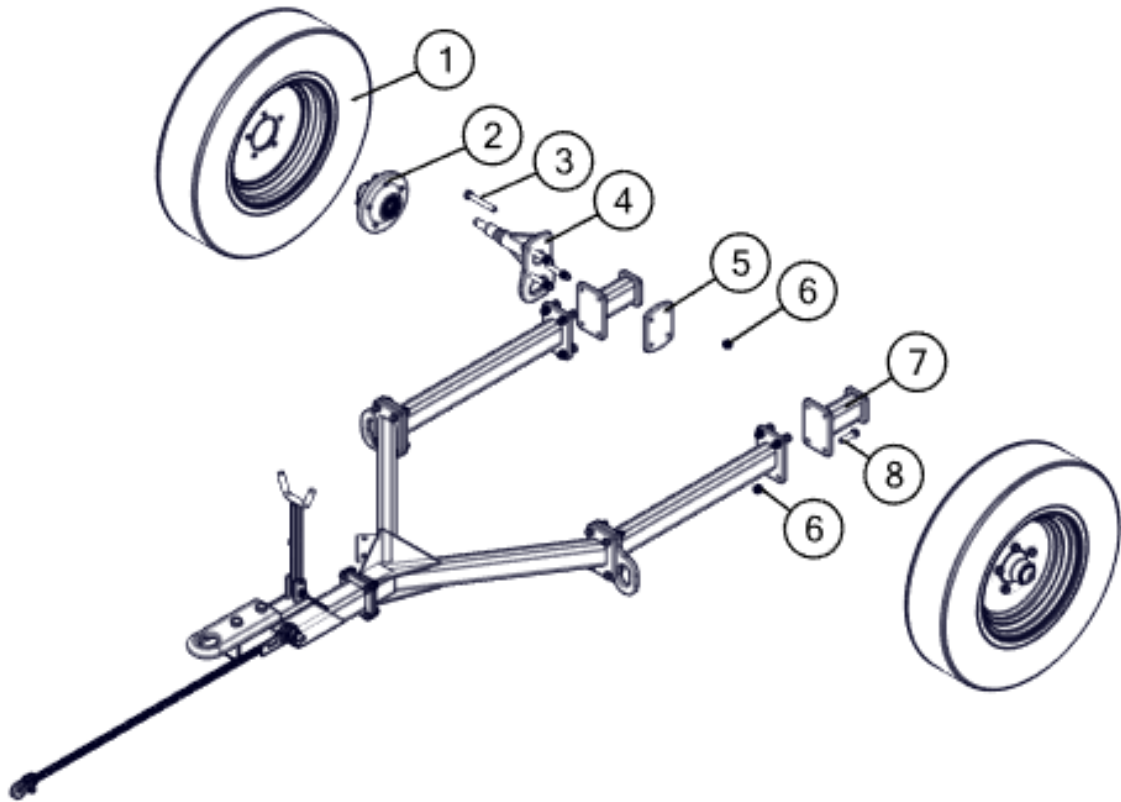
11.8 Hitch Assembly



REF #	PART #	DESCRIPTION	QTY
1	612400-0574.00	Hitch Weldment	1
2	614000-0305.00	PTO Stand	1
3	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	1
4	168000-0540	Flat Washer - 3/8" SAE	2
5	159400-0004	Hex Bolt - 3/8" NC x 2-1/2" Gr.5 PL	1
6	167200-0692	Nyloc Nut - 3/4" NC Gr.5 PL	3
7	140000-0490	Safety Chain	1
8	168000-0587	Flat Washer - 3/4" SAE PL	2
9	167200-0688	Nyloc Nut - 1/2" NC Gr.5 PL	4
10	159400-0401	Hex Bolt - 1/2" NC x 1-1/2" Gr.5 PL	4
11	612400-0587.01	Front Hitch Weldmt - Bolt-on - JK Ver. (Sea Can) 2023	1
12	414000-1113.00	Base Hitch - ES Mills	1
13	159400-0817	Hex Bolt - 3/4" NC x 5-1/2" Gr.5 PL	2
14	341100-0050	Jack - 7000lb x 10" - Side Wind	1

11 PARTS

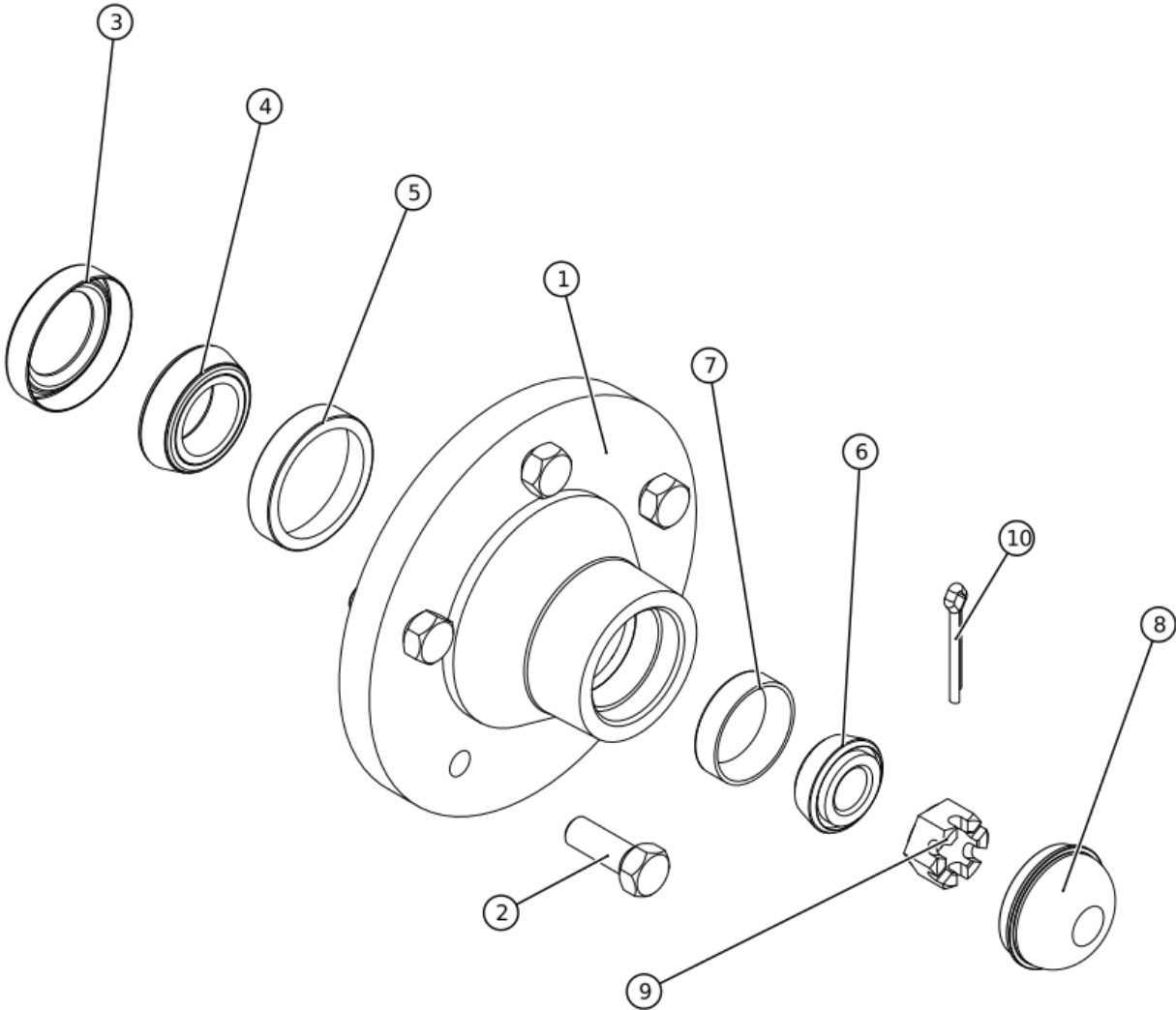
11.9 Trailer Assembly



REF #	PART #	DESCRIPTION	QTY
1	100100-0410	Tire & Rim - P225/75R15 - 5 Bolt	2
2	340800-0511	Hub Assembly Complete - 511	2
3	159400-0488	Hex Bolt - 1/2" NC x 4" Gr.5 PL	8
4	612400-0585.00	Stub Axle w/ Tie-down Anchor - 511	2
5	412400-0524.04	Axle Bolt Plate	2
6	167200-0688	Nyloc Nut - 1/2" NC Gr.5 PL	8
7	611200-0503.01	Stub Axle Assembly	2
8	159400-0427	Hex Bolt - 1/2" NC x 2" Gr.5 PL	8

11 PARTS

11.9.1 Hub Assembly (340800-0511)



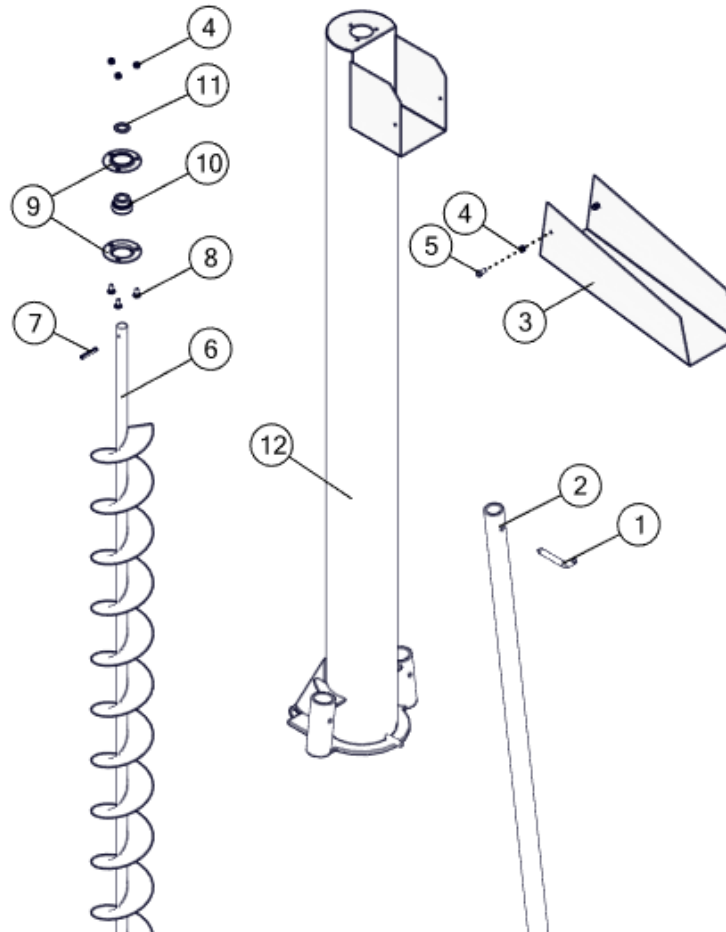
REF #	PART #	DESCRIPTION	QTY
1	340000-0511	511 Hub	1
2	340300-0010	Wheel Bolt 1/2"-20 UNF x 1-1/4"	5
3	340100-0011	511 Hub Seal	1
4	114500-0015	Inner Cone - LM67048	1
5	115000-0015	Inner Cup - LM67010	1
6	114400-0919	Outer Cone - LM11949	1
7	114900-0919	Outer Cup - LM11910	1
8	340200-0012	Dust Cap - 511	1
9	340700-0030	Spindle Nut - 3/4"-16 UNF	1
10	170000-0190	Cotter Pin - 3/16" x 1.5"	1

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11 PARTS

11.10 Discharge Auger

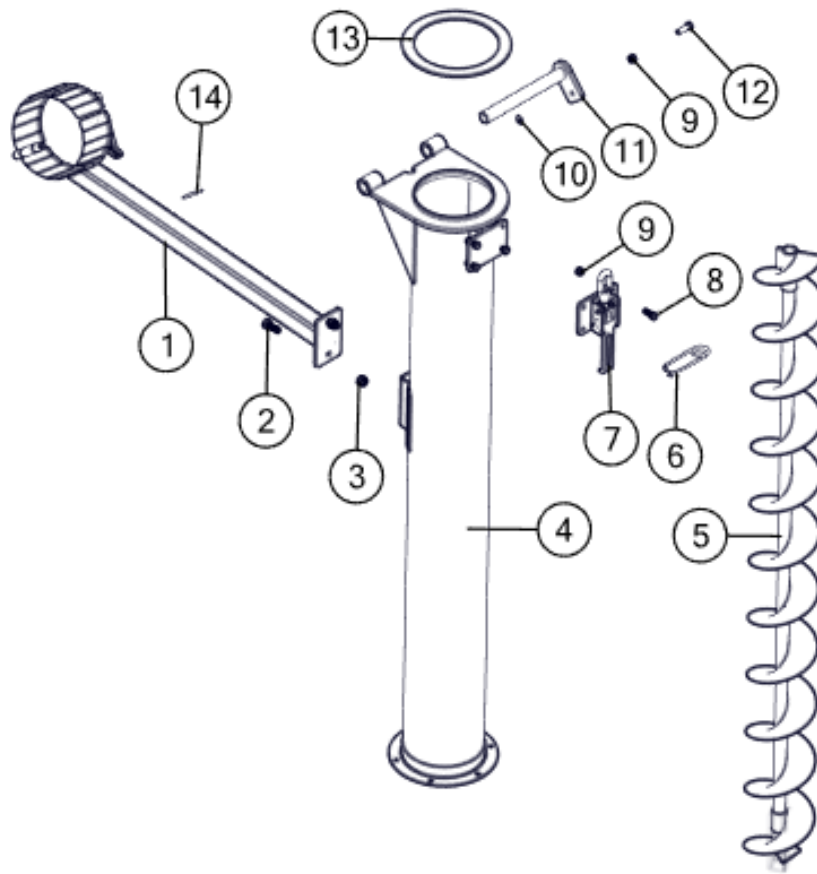
11.10.1 Discharge Auger - Upper Assembly



REF #	PART #	DESCRIPTION	QTY
1	161800-0008	Bent Pin - 1/2" x 3"	1
2	471300-0213.00	Lever Pipe	1
3	471300-0074.00	Discharge Spout - 7"	1
4	167200-0648	Nyloc Nut - 5/16" NC Gr.5 PL	5
5	159300-0730	Hex Bolt - 5/16" NC x 3/4" Gr.5 PL	2
6	671300-0226.01	Top Auger Weldment - 7"	1
7	172200-0793	Spring Pin - 5/16" x 2"	1
8	163000-0296	Carriage Bolt - 5/16" NC x 3/4" PL	3
9	114000-0152	Flangette 52mm	2
10	114000-0115	1" Bearing - 52mm Cylindrical OD, Ecc. Lock	1
11	168000-0615	Machinery Bushing - 1" ID x 14 Ga	1
12	671300-0593.01	7" Upper Tube Weldment	1

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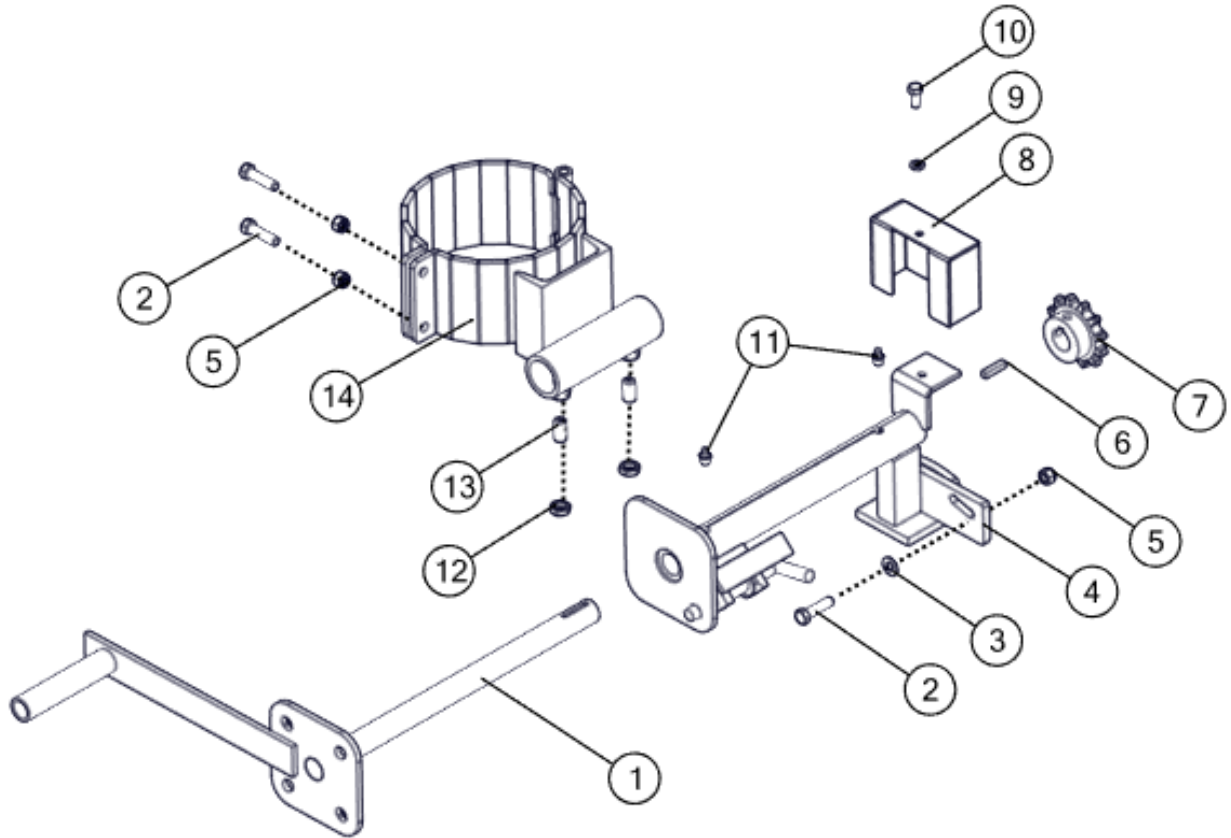
11.10.2 Discharge Auger - Lower Assembly



REF #	PART #	DESCRIPTION	QTY
1	671300-0446.01	7" Folding Auger Support - 2018	1
2	159400-0395	Hex Bolt - 1/2" NC x 1-1/4" Gr.5 PL	2
3	167200-0688	Nyloc Nut - 1/2" NC Gr.5 PL	2
4	671300-0764.00	7" Lower Tube Weldment	1
5	671300-0051.01	Bottom Auger Weldment - 7"	1
6	161500-0505	Safety Pin - 1/8"	1
7	671300-0685.00	Over-center Latch Clamp Weldment (14mm Thread)	1
8	159300-0961	Hex Bolt - 3/8" NC x 1" Gr.5 PL	4
9	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	5
10	133200-0040	Grease Nipple - 1/8" NPT	1
11	671300-0530.00	Folding Transfer Auger Main Pin Weldment - 9.625"	1
12	159300-0979	Hex Bolt - 3/8" NC x 1-1/4" Gr.5 PL	1
13	147800-0127	Auger Seal Gasket - 7.47" I.D. x 9.5" O.D. x .1875"	1
14	161300-0778	PIN - HAIR 1/8" x 2-5/8" - #11	1

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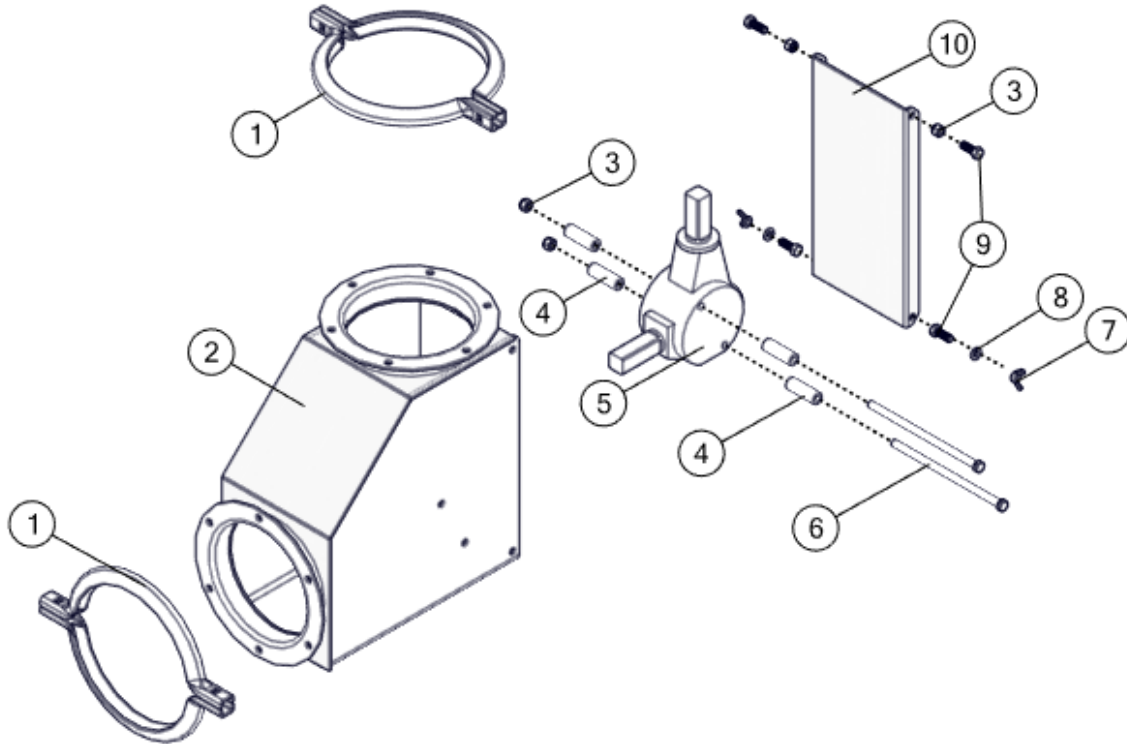
11.10.3 Discharge Auger - Crank Assembly



REF #	PART #	DESCRIPTION	QTY
1	614000-0118.00	Crank Shaft Assembly	1
2	159300-0988	Hex Bolt - 3/8" NC x 1-1/2 Gr.5 PL	3
3	168000-0540	Flat Washer - 3/8" SAE	1
4	614000-0125.00	Discharge Crank - 7" & 8"	1
5	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	3
6	414000-0891.00	1/4" Keystock x 1-3/16"	1
7	129000-0612	Sprocket - 12 Tooth #60 x 1"	1
8	670800-0103.00	Sprocket Shield	1
9	168600-0062	Lock Washer - 5/16" PL	1
10	159300-0730	Hex Bolt - 5/16" NC x 3/4" Gr.5 PL	1
11	133200-0040	Grease Nipple - 1/8" NPT	2
12	167000-0650	Jam Nut - 1/2" NC Gr.5 PL	2
13	160200-0830	Socket Set Screw - 1/2" NC x 1"	2
14	614000-0202.02	Clamp Assembly - 7"	1

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11.10.4 Discharge Auger - Gearbox Assembly



REF #	PART #	DESCRIPTION	QTY
1	155500-0070	Band Clamp - 7"	2
2	671300-0019.00	Gearbox Housing - 7" x 7"	1
3	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	4
4	471300-0144.01	Spacer - 7" Gearbox	4
5	342100-0011	Gearbox - 1010 1:1 90 - Square Drive	1
6	159400-0098	Hex Bolt - 3/8" NC x 8" Gr5 PL	2
7	167100-0979	Wing Nut - 3/8" NC PL	2
8	168600-0071	Lock Washer - 3/8" PL	2
9	159300-0988	Hex Bolt 3/8" NC x 1-1/2 Gr.5 PL	4
10	671300-0004.00	Cleanout Door	1

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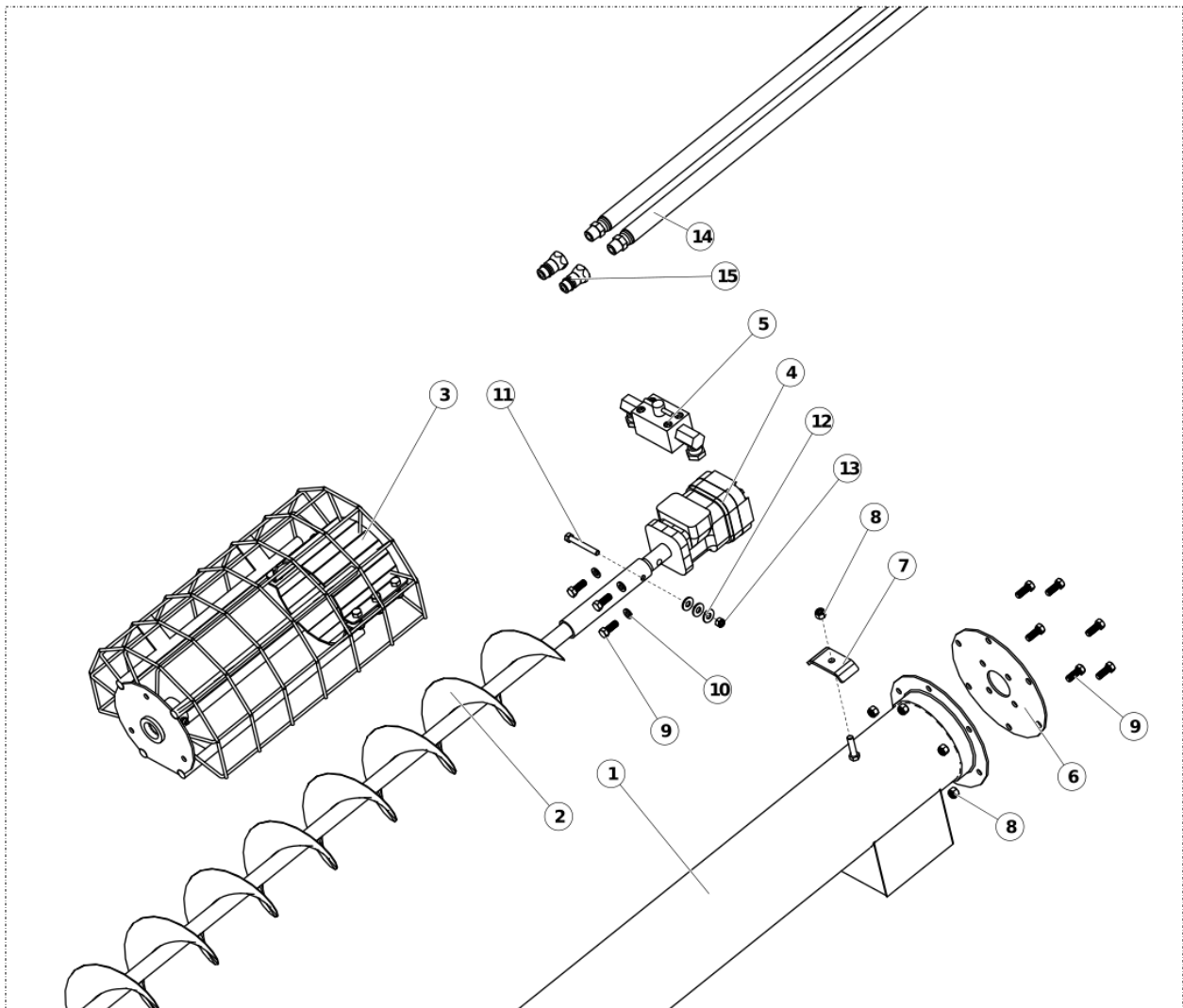
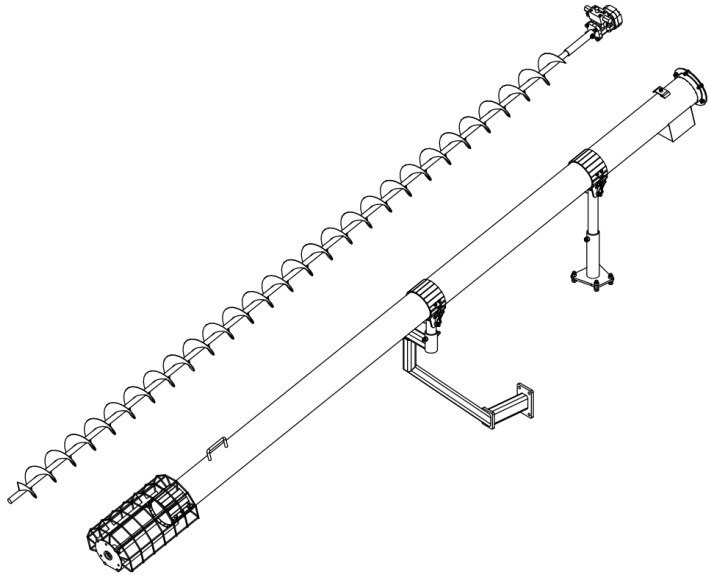
11.11 Feed Auger - 871300-0086.02 (Optional)

11.11.1 Feed Auger – Auger Assembly

REF #	PART #	DESCRIPTION	QTY
1	671300-0273.02	Transfer Auger Tube - 6"	1
2	671300-0036.01	Transfer Auger - 6"	1
3	275000-0006	Feed Auger Cage - 6"	1
4	111100-0306	Hydraulic Motor - 4.5 cu.in. - Orbital	1
5	111100-0000	Hydraulic Speed Control Valve	1
6	471300-0188.02	Feed Auger End Plate	1
7	480100-0722.01	Hose Clamp	1
8	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	7
9	159300-0961	Hex Bolt - 3/8" NC x 1" Gr.5 PL	10
10	168600-0071	Lock Washer - 3/8" PL	4
11	159300-0800	Hex Bolt 5/16" NC x 2-1/2" Gr.5 PL	1
12	168000-0040	Flat Washer - 5/16" USS PL	3
13	167200-0648	Nyloc Nut - 5/16" NC Gr.5 PL	1
14	392800-0144	Hydraulic Hose - 1/2" x 144" x 1/2" MPT x 1/2" MPT	2
15	104000-0610	Hydraulic - Q/C Male Poppet 1/2" FNPT	2

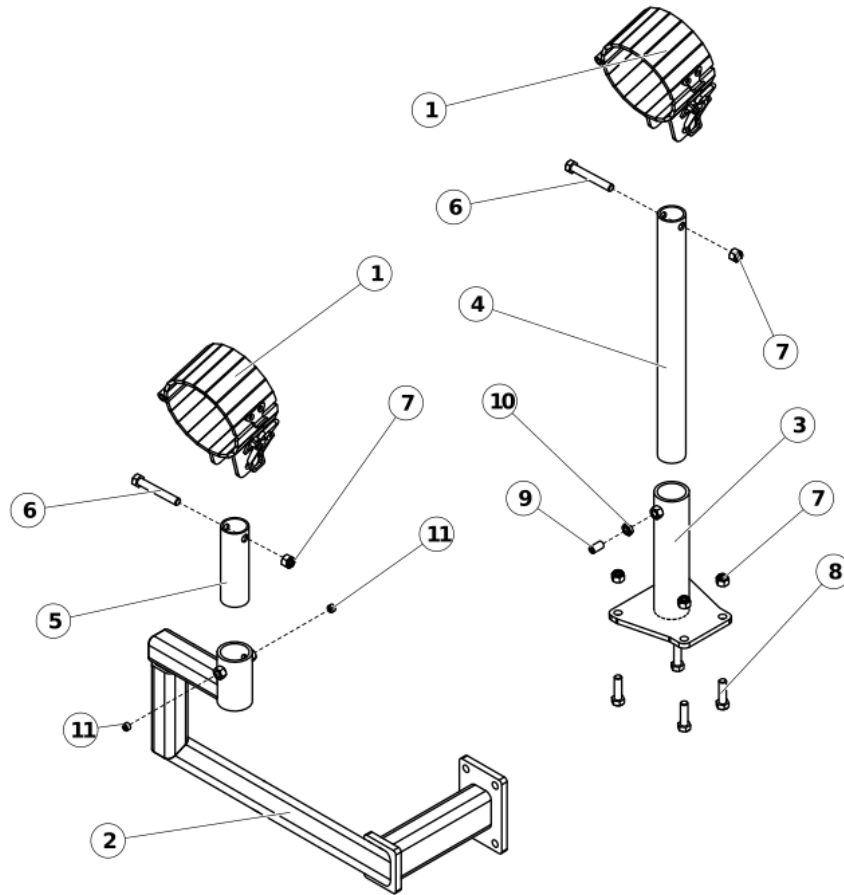
11 PARTS

11.11.1 Feed Auger – Auger Assembly (Optional)



11 PARTS

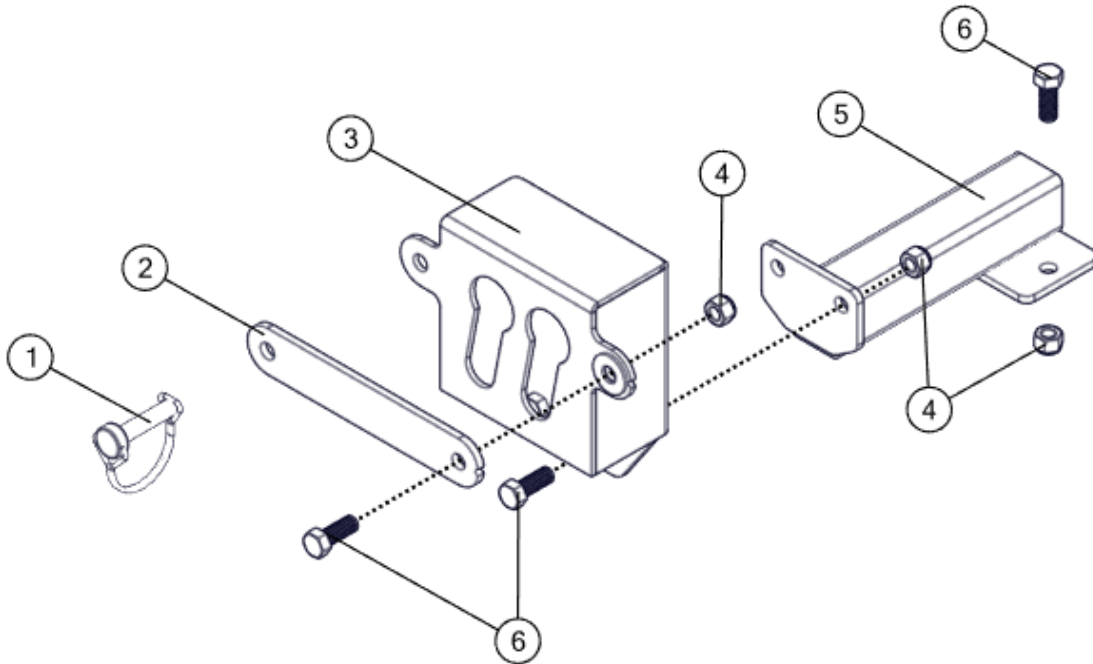
11.11.2 Transfer Auger - Auger Support (Optional)



REF #	PART #	DESCRIPTION	QTY
1	671300-0006.01	Feed Auger Clamp - 6"	2
2	611200-0528.00	Rear Transfer Auger Transport Support	1
3	614000-0514.00	Pivot	1
4	471300-0455.00	Front Pivot Tube	1
5	471300-0131.00	Rear Pivot Tube	1
6	159400-0485	Hex Bolt - 1/2" NC x 3-1/2" Gr.5 PL	2
7	167200-0688	Nyloc Nut - 1/2" NC Gr.5 PL	6
8	159400-0410	Hex Bolt - 1/2" NC x 1-3/4" Gr.5 PL	4
9	160200-0830	Socket Set Screw - 1/2" NC x 1"	1
10	167000-0650	Jam Nut - 1/2" NC Gr.5 PL	1
11	160200-0825	Socket Set Screw - 1/2" x 1/2" NC	2

11 PARTS

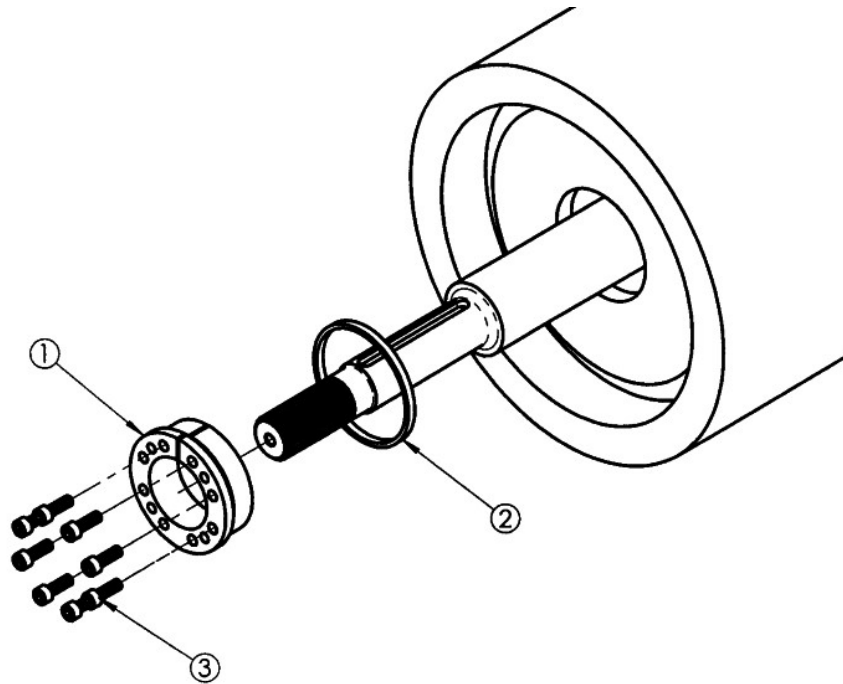
11.11.3 Hose Hanger (Optional)



REF #	PART #	DESCRIPTION	QTY
1	161500-0498	Quick Pin, 3/8" x 1-5/8"	1
2	414000-0991.00	Lock Plate - Hose Hanger (1 set)	1
3	614000-0320.00	Hose Hanger (1 set)	1
4	167200-0652	Nyloc Nut - 3/8" NC Gr.5 PL	3
5	670000-0211.00	Mounting Bracket - Hose Hanger - Bolt on	1
6	159300-0961	Hex Bolt - 3/8" NC x 1" Gr.5 PL	3

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11.12 Roll Bushing Assembly - B-Loc Bushing



Roll Size Dia. x Length	[#1] B-Loc Hub Part # & I/D	[#2] B-Loc Spacer Ring & Size	[#3] Socket Head Cap Screw (QTY) & Size	Tightening Torque (ft-lbs)
8-5/8" n x 10"	141000-0001 1-3/8"	N/A	(8) 6mm x 1.0 x 20mm	12
10-5/8" n x 16"	141000-0002 1-15/16"	N/A	(7) 8mm x 1.25 x 25mm	30
12 3/4" n x 12"	141000-0003 2-15/16"	141000-0006	(8) 10mm x 1.5 x 30mm	60
16" n x 12"	141000-0002 1-15/16"	N/A	(7) 8mm x 1.25 x 25mm	30
16" n x 18"	141000-0002 1-15/16"	N/A	(7) 8mm x 1.25 x 25mm	30
16" n x 24"	141000-0002 1-15/16"	N/A	(7) 8mm x 1.25 x 25mm	30
16" n x 24H	141000-0004 2-7/16"	N/A	(9) 8mm x 1.25 x 25mm	30
16" n x 30"	141000-0004 2-7/16"	N/A	(9) 8mm x 1.25 x 25mm	30
16" n x 30H	141000-0003 2-15/16"	141000-0006	(8) 10mm x 1.5 x 30mm	60
16" n x 36"	141000-0003 2-15/16"	141000-0006	(8) 10mm x 1.5 x 30mm	60
16" n x 48"	141000-0003 2-15/16"	141000-0006	(8) 10mm x 1.5 x 30mm	60
16" n x 60"	141000-0010 3-7/16"	N/A	(8) 10mm x 1.5 x 30mm	60

Locking screws, taper, shaft & bore contact areas should be clean and lightly oiled, all collar slits should be aligned.

DO NOT use Molybdenum Disulfide (e.g. Molykote, Never-Seize or similar lubricants) in any locking assembly.

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