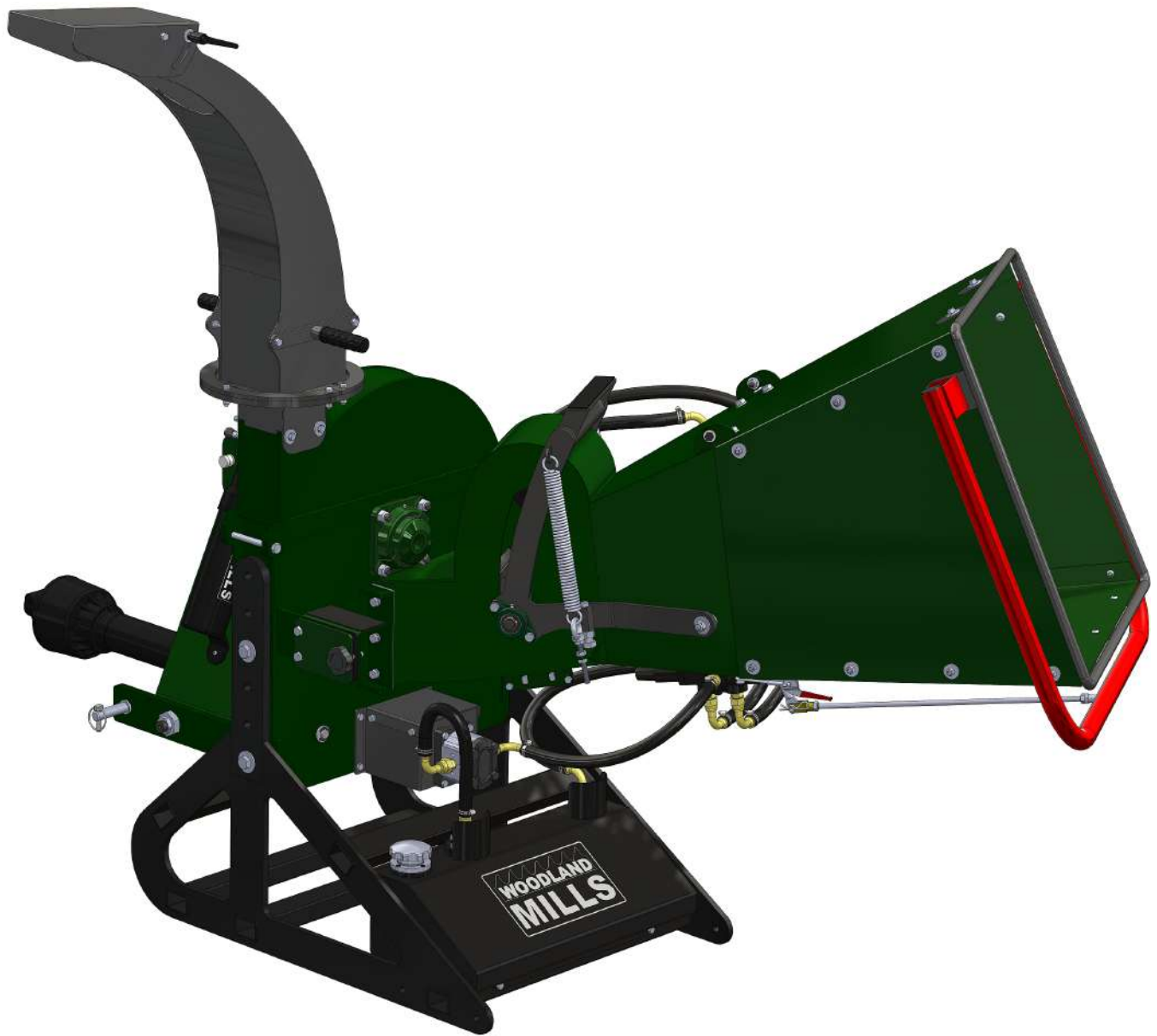


# WC88 PTO WOOD CHIPPER



## OPERATOR'S MANUAL



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## INTRODUCTION

Congratulations on your purchase and welcome to Woodland Mills! This manual gives you the necessary information about your machine so you will be able to use it properly. The entire manual must be read and understood before you start using the machine. If any questions should arise that are not covered by this manual, please contact Woodland Mills Inc.

### OWNER'S RECORD

Please take a moment to record the following information about your wood chipper. If you need to call for assistance, please be ready to provide your model and serial numbers. This information will allow us to help you more quickly when you call.

#### MODEL NUMBER

#### SERIAL NUMBER

#### DATE OF PURCHASE

This machine is designed for certain applications only. We strongly recommend that this machine is not modified and/or used for any application other than that for which it was designed. If you have any questions relative to a particular application, DO NOT use the machine until you have first contacted us to determine if it can or should be performed on the product.

For technical questions and replacement parts, please contact Woodland Mills Inc.

## INTENDED USE

Woodland Mills wood chippers are designed for acreage owners to aid in chipping natural, untreated wood only. Materials that are processed may contain chemicals or by-products that could corrode the machine or damage it, resulting in safety concerns.



## SAFETY GUIDELINES

### **\*\*SAVE THESE INSTRUCTIONS\*\***

- Do not operate this machine until this manual has been read and fully understood; serious injury or severe machine damage could occur if these safety warnings are ignored.
- Never allow more than one person to operate this machine at one time. If two people are working together it will increase the chance of your workmate engaging the machine or causing you to fall into the machine.
- If your hand is ever near the chipping or feeding area, serious injury could occur.
- Never place your hands or feet on or near the machine while it is engaged.
- Never place your hands or feet on or near the material while it is feeding.
- DO NOT wear loose clothing, jewelry, or anything that can catch a branch that is feeding into the wood chipper.
- DO NOT stand directly in front of the infeed chute when loading material into the hopper; always load from the side of the hopper. This will help prevent any part of your body from being pulled into the machine.
- Always wear safety hearing protection, eye wear, gloves, and long pants when operating the wood chipper.
- Never place your hands beyond the opening of the hopper while the wood chipper is running.
- Never allow children, disabled, or untrained persons to operate the wood chipper.
- Do not operate the wood chipper near bystanders, public roads, or anywhere that debris may travel far enough to injure another person.
- Never move the wood chipper while it is running.
- Shut off the tractor and allow the wood chipper to come to a complete stop before removing any debris.
- Never perform any maintenance or repair while the wood chipper is running.



## ROTATING DRIVELINES

**\*\*STAY CLEAR OF ROTATING DRIVELINES\*\***



- Entanglement in rotating driveline can cause serious injury or death.
- Keep tractor master shield and driveline shields in place at all times. Make sure rotating shields spin freely.
- Wear close-fitting clothing.
- Shut off the engine and be sure the PTO driveline has stopped before making adjustments, connections, or cleaning out PTO-driven equipment.
- Do not install any adapter device between the tractor and the primary implement PTO drive shaft that would allow a 000 RPM tractor shaft to power a 540 RPM implement at speeds higher than 540 RPM.
- Do not install any adapter device that results in a portion of the rotating implement shaft, tractor shaft, or the adapter to be unguarded. The tractor master shield shall overlap the end of the splined shaft.



### WARNING!

Read and understand all instructions. Failure to properly follow the instructions listed below may result in serious injury or death.



### WARNING!

The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions or situations that could occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product but must be supplied by the operator.



## PERSONAL SAFETY

- **Stay alert**, watch what you are doing and use common sense when operating a power tool. Do not use a power tool when you are tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating power tools may result in serious personal injury.
- **Dress properly**. Do not wear loose clothing, dangling objects, or jewelry. Keep your hair, clothing, and gloves away from moving parts. Loose clothes, jewelry, or long hair can be caught in moving parts. Air vents often cover moving parts and should be avoided.
- **Use safety apparel and equipment**. Use safety goggles or safety glasses with side shields that comply with current national standards, or when needed, a face shield. Use a dust mask in dusty work conditions. This applies to all persons in the work area. Also use non-skid safety shoes, a hardhat, gloves, dust collection systems, and hearing protection when appropriate.
- **Do not over reach**. Keep proper footing and balance at all times.
- **Remove adjusting keys or wrenches** before connecting to the power supply or turning on the tool. A wrench or key that is left attached to a rotating part of the tool may result in personal injury.
- **Never remove or install blades, conduct any maintenance, or make any other adjustments while the tractor engine is running**. Always shut the engine off, remove the ignition key, and disconnect the PTO shaft prior to carrying out any of the aforementioned procedures. Consult your tractor's manual for safe shutdown procedures to prevent accidental ignition.



## WORK AREA

- **Keep work area clean**, free of clutter and well lit. Cluttered and dark work areas can cause accidents.
- **Do not use your wood chipper where there is a risk of causing a fire or an explosion;** e.g. in the presence of flammable liquids, gasses, or dust. Power tools create sparks which may ignite the dust or fumes.
- **Keep children and bystanders** away while operating a power tool. Distractions can cause you to lose control, therefore, visitors should remain a safe distance from the work area.
- **Be aware of all power lines, electrical circuits**, water pipes and other mechanical hazards in your work area, particularly those hazards below the work surface hidden from the operator's view that may be unintentionally contacted and cause personal harm or property damage.
- **Be aware of your surroundings.** Using power tools in confined work areas may put you dangerously close to cutting tools and rotating parts.



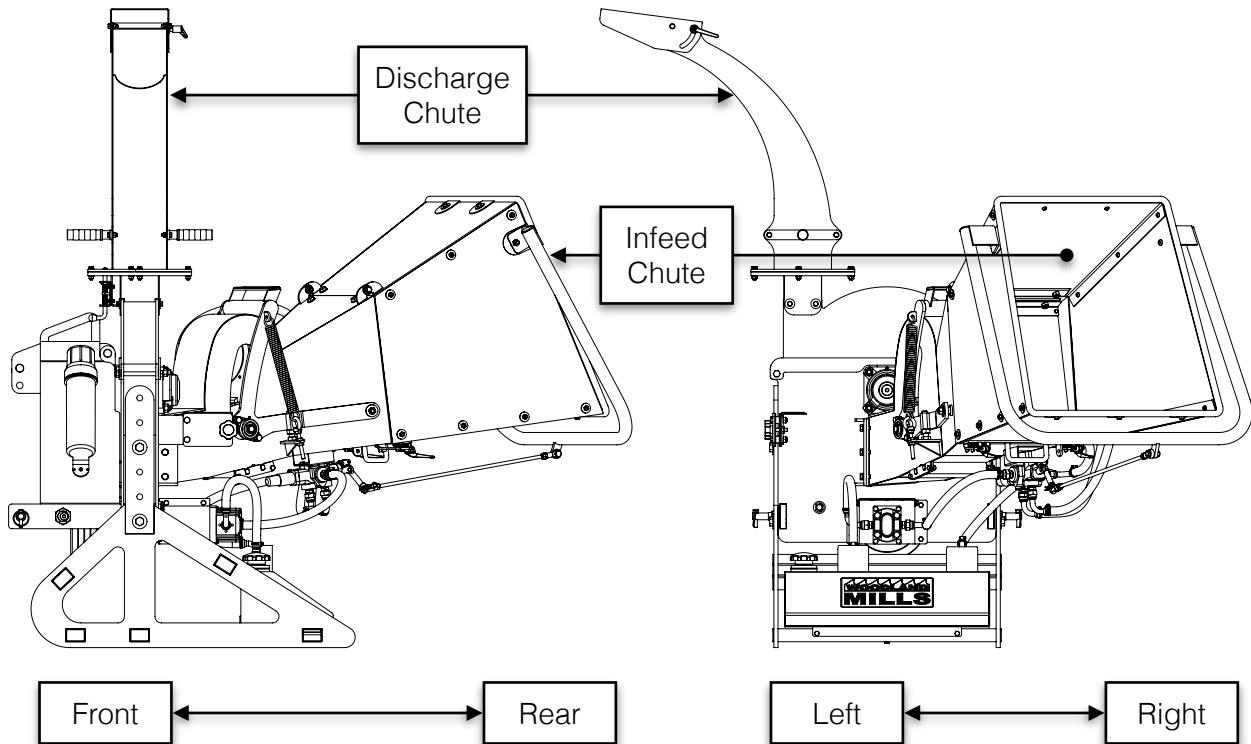
## TOOL USE AND CARE

- **Always be sure the operator is familiar** with proper safety precautions and operation techniques before using machine.
- **Do not force the tool.** Tools do a better and safer job when used in the manner for which they are designed.
- **Turn off the tractor engine** and disconnect the PTO shaft before servicing, adjusting, installing accessories or attachments, or storing. Such preventive safety measures reduce the risk of starting the power tool accidentally.
- **Storing the wood chipper.** When the wood chipper is not in use, store it in a dry, secure place or keep it well covered and out of reach of children. Inspect the wood chipper for good working condition prior to storage and before re-use.
- **Maintain your wood chipper.** It is recommended that the general condition of the wood chipper be examined before it is used. Keep your wood chipper in good repair by adopting a program of conscientious repair and maintenance in accordance with the recommended procedures found in this manual. If abnormal vibration or noise occurs, turn the wood chipper off immediately and have the problem corrected before further use.
- **Keep blades sharp and clean.** Properly maintained wood chipper blades are less likely to bind and make feeding-in brush easier.
- **Cleaning and Lubrication.** Use only soap and a damp cloth to clean your wood chipper. Many household cleaners are harmful to plastic and rubber components on the wood chipper.
- **Use only accessories that are recommended** by the manufacturer for your model. Suitable accessories for another wood chipper may create an injury risk when used on this wood chipper.
- **Always** operate the machine with all safety devices and guards in place and in working order. DO NOT modify or make changes to safety devices. DO NOT operate the machine if any safety devices or guards are missing or inoperative.
- **Never leave wood chipper running unattended.**
- **Never use the equipment to chip brush with trunks exceeding 8" (203 mm) in diameter** or for any purpose other than chipping brush as described in this manual.



# TECHNICAL SPECIFICATIONS

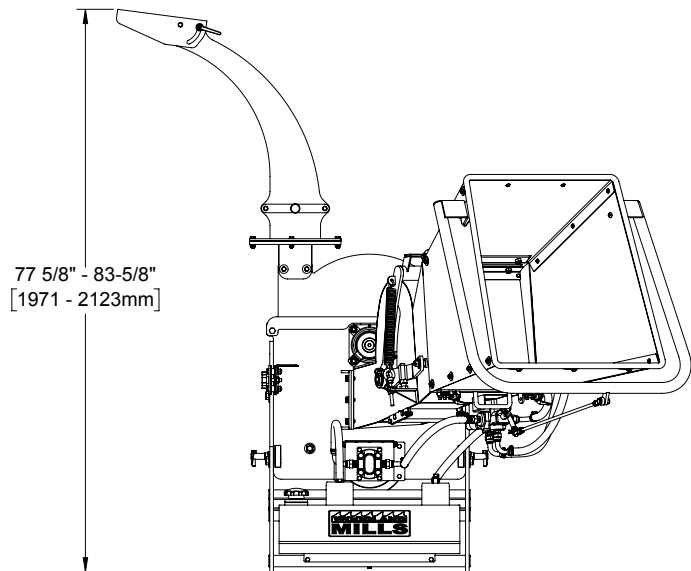
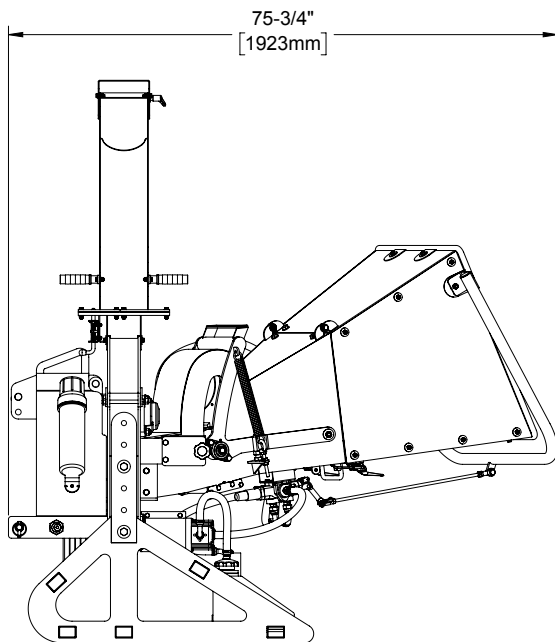
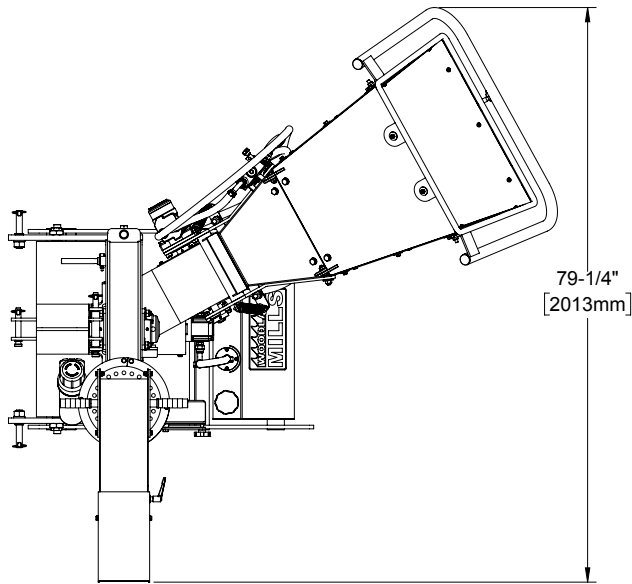
Component	WC88 Specification
Drive System	PTO
Transport	3-Point Hitch
Minimum HP Required (at PTO)	35 hp
In-Feed System	Hydraulic
Hydraulic Oil	ISO 32 (ISO 46 for warmer climates)
Hydraulic Tank Volume	5 gal [19 L]
Hydraulic Requirement (Tractor)	None. Self contained.
PTO Shear Bolt	M8 X 50 mm Hex Bolt - Class 8.8 (Grade 5)
Blade Quantity and Dimensions	Four (4); 4.45 X 2.72 X 5/16" [113 X 69 X 8 mm]
Blade Hardware	M10 X 40 mm Flat Head, M10 Lock Nuts - Class 10.9
Infeed Roller Diameter	7-11/16" [195 mm] at Tooth Tip
Infeed Chute Dimensions (H X W)	27-9/16" X 25-11/16" [700 mm x 652 mm]
Product Weight	1050 lb [475 kg]
Product Shipping Weight	1160 lb [525 kg]





## i. OVERALL DIMENSIONS—OPERATING STATE

Because the base offers up to 6 in (152 mm) of total vertical adjustment in 3 in (76 mm) increments, the overall height can vary by this amount as well.

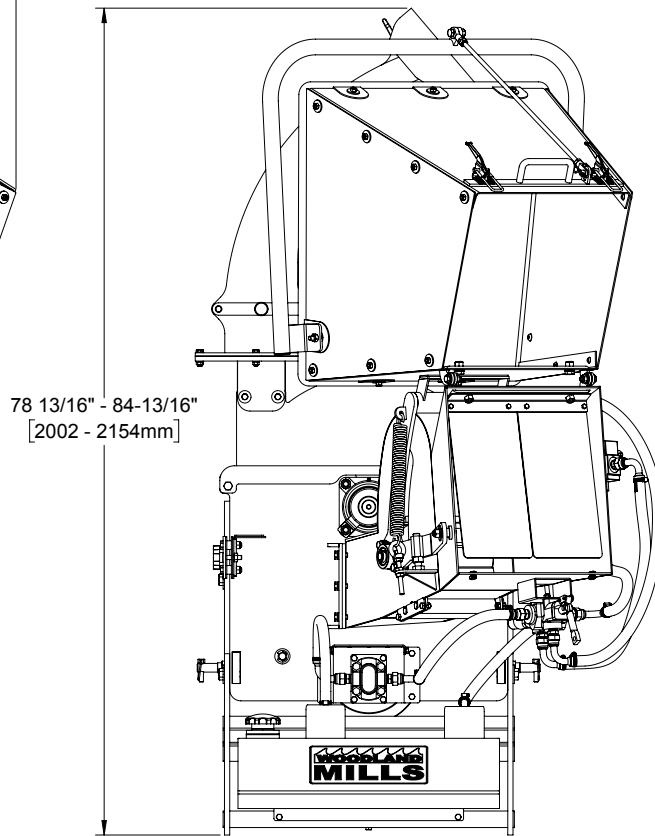
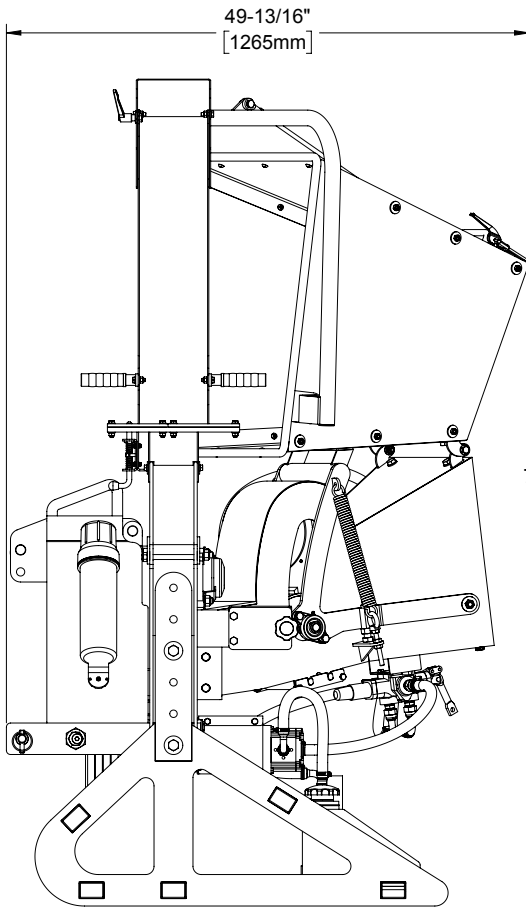
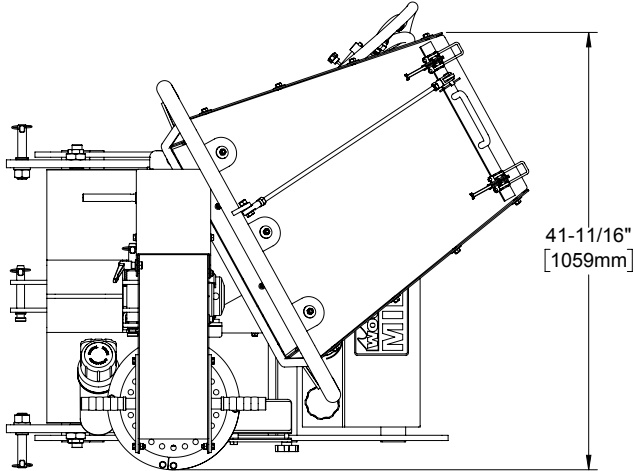






## ii. OVERALL DIMENSIONS—STORED STATE

The discharge chute deflector must be pointing down in order to clear the control arm on the infeed chute when it is flipped upward for storage. See section, **Storage**, for more information.

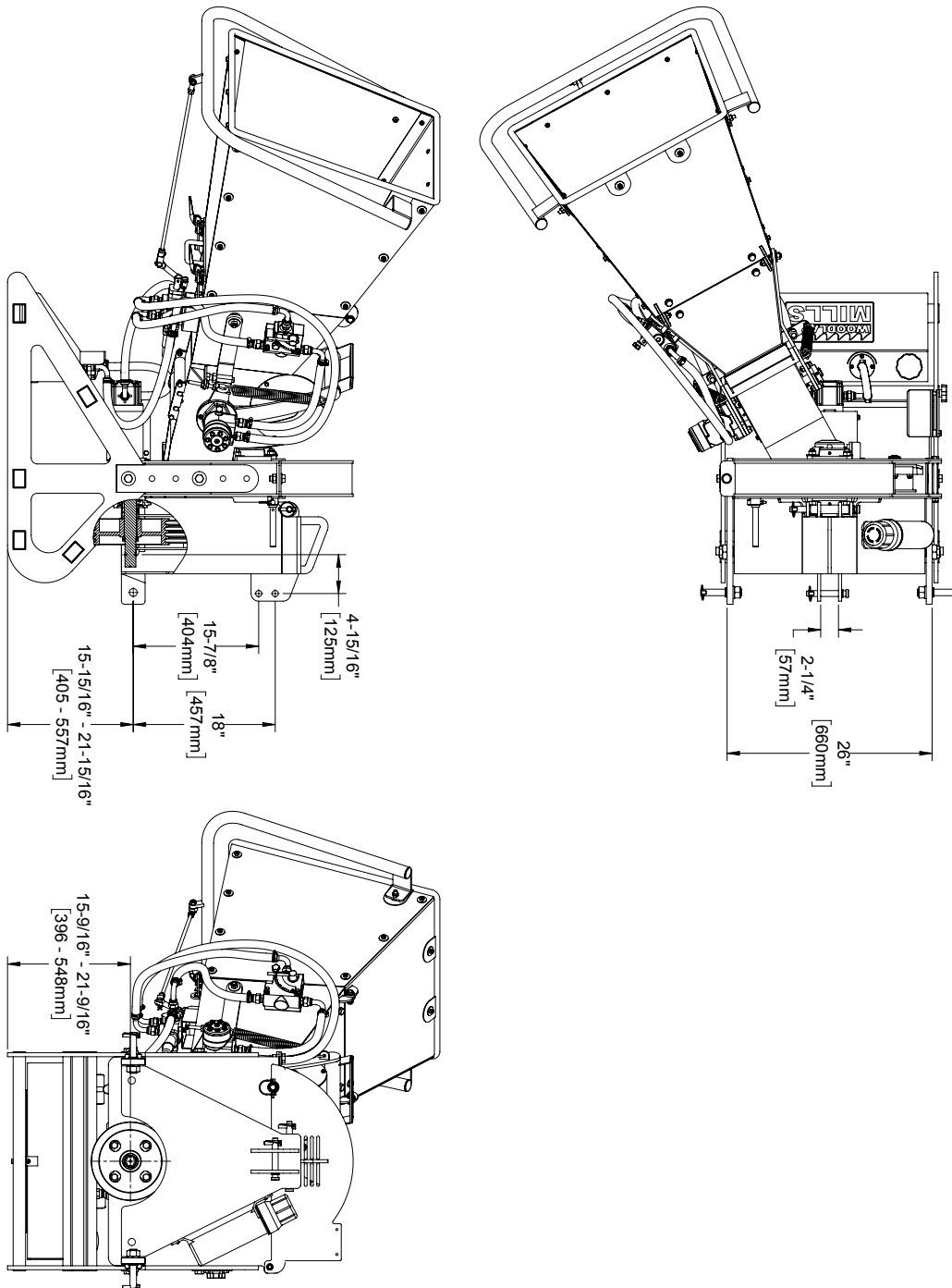




### iii. 3-POINT HITCH DIMENSIONS

The wood chipper 3-point hitch is a *Category 1* system design to work with tractors in the horsepower range of 35-100+ hp. Top link pin is  $\frac{3}{4}$ " (19 mm) diameter and the lift arm pins are  $\frac{7}{8}$ " (22 mm) diameter.

Discharge chute removed from views for clarity.



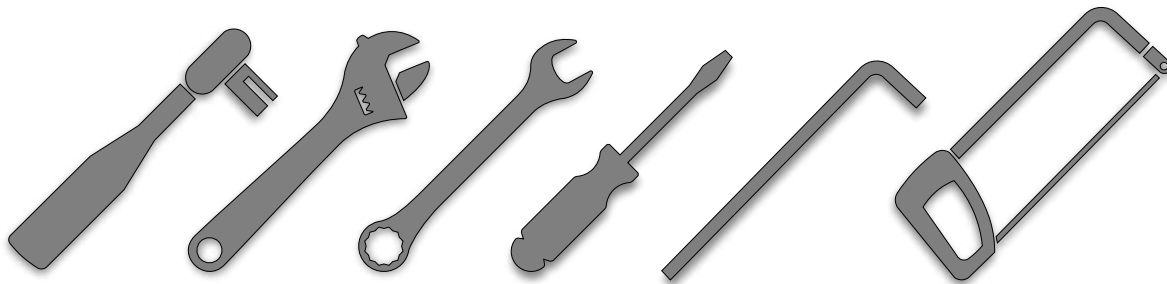


# ASSEMBLY

## 1. TOOLS REQUIRED

Tool	Specification
Wrench/Socket	13 mm (2X)
Wrench/Socket	16 mm (2X)
Wrench/Socket	17 mm
Wrench/Socket	24 mm or Adjustable Wrench
Wrench	27 mm or Adjustable Wrench
Hex Key	Set of Metric Hex Keys (e.g. 2-10 mm)
Hacksaw*	Any metal-cutting saw (Sawzall, etc.)

\* Only if PTO shaft requires trimming. See [Trimming the PTO Shaft](#) section for more detail.

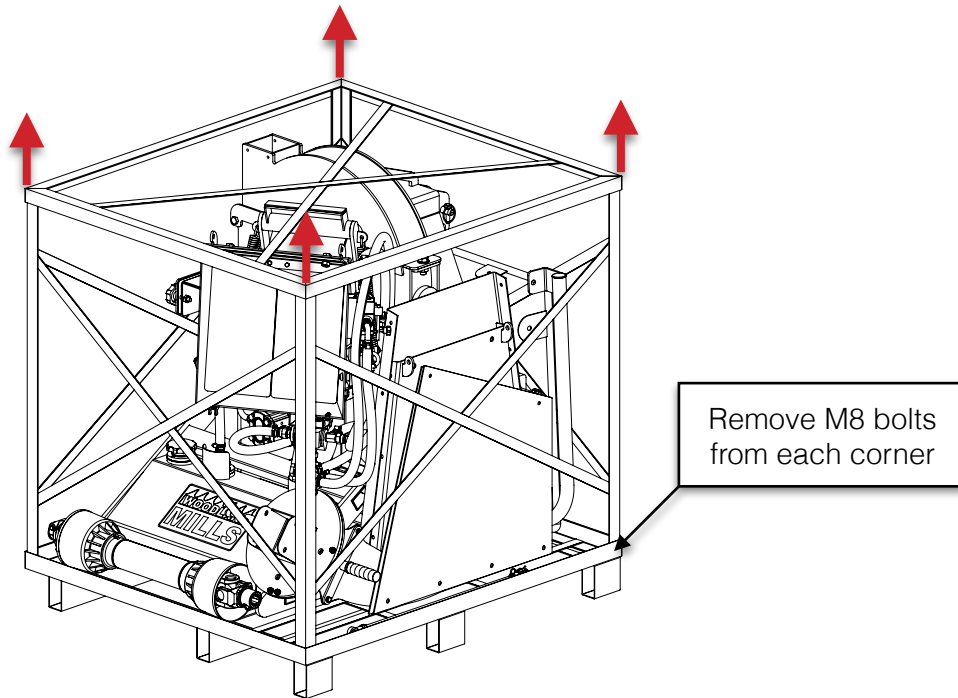




## 2. UNPACKING

### A. UNBOXING THE CRATE

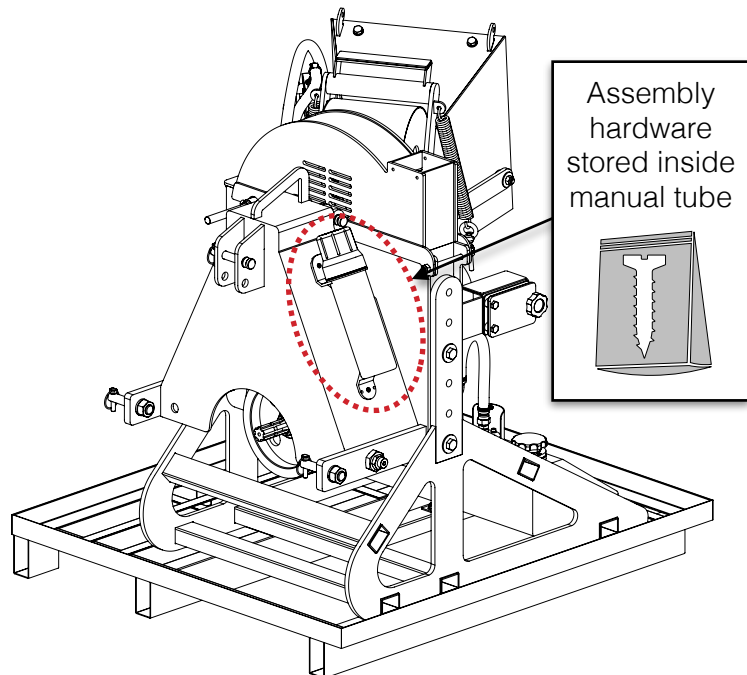
Unpack the contents of the crate by first cutting the nylon strapping and then remove the cardboard top and sides. Remove the four (4) M8 hex bolts and nuts located at each bottom corner of the crate and then lift it off the skid. Discard the crate.



Remove all the loose components from the skid (infeed chute panels, control arm, edge bar, control arm linkage, discharge chute, discharge chute handles, PTO shaft) and set them to the side. Leave the wood chipper on the skid.

Hardware for assembly is stored inside the manual tube.

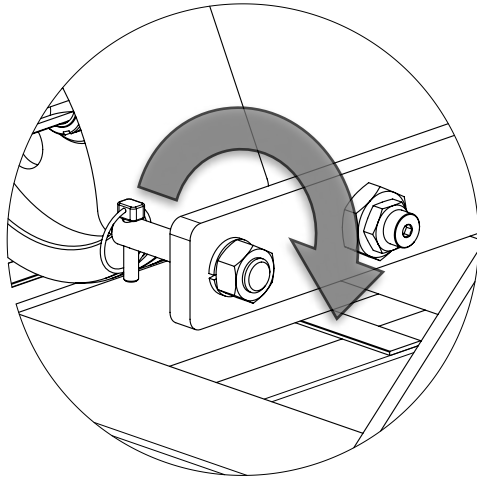
Note that the wood chipper is shipped dry (i.e. no hydraulic fluid) from the factory. See the ***Technical Specifications*** section for the volume and type of oil required.



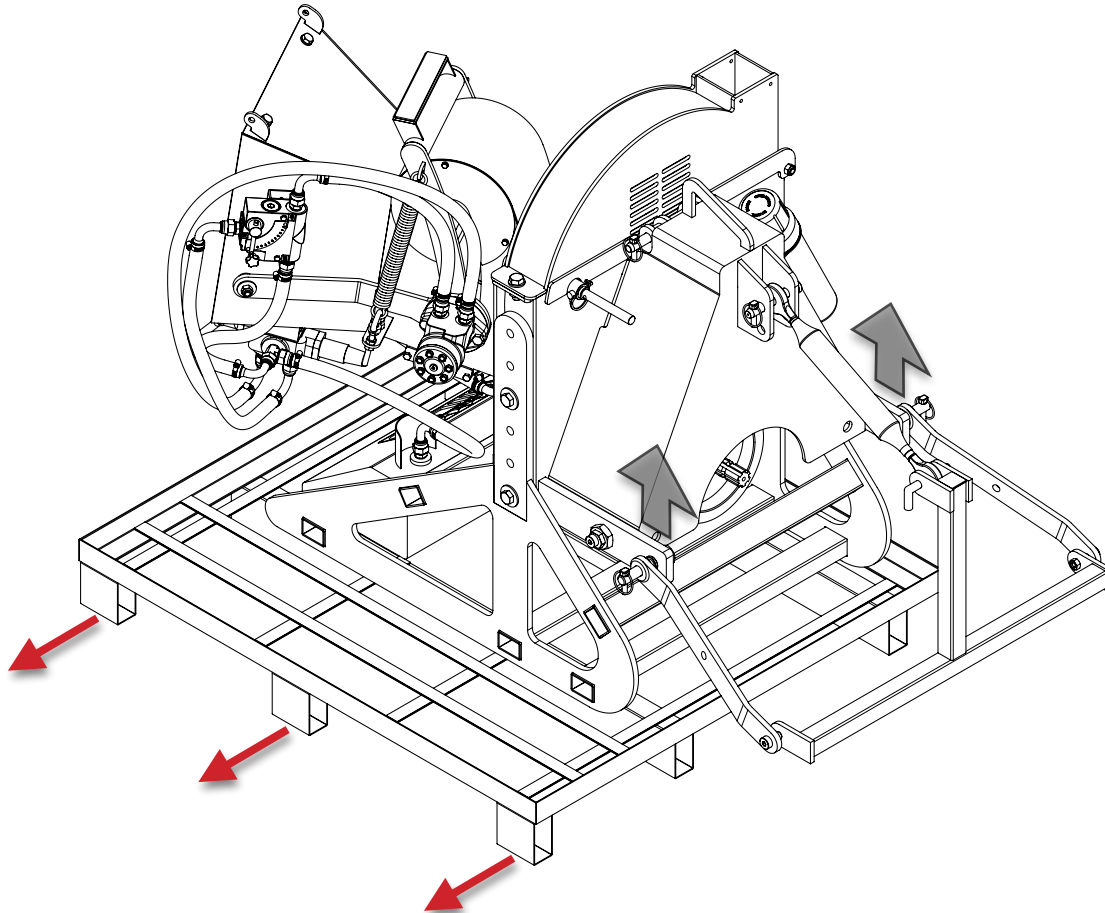
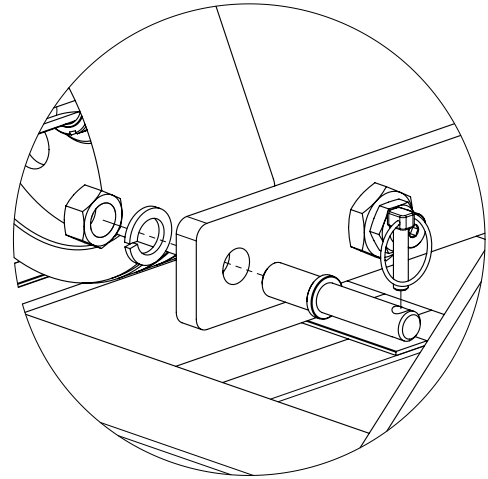


## B. REMOVING THE SKID

With the wood chipper still resting on the skid, attach the tractor's 3-point hitch and raise it up off the skid. Slide the skid out from under the wood chipper and discard it. Carefully set the wood chipper down on the ground.



Before the 3-point hitch system can be connected to the wood chipper, the lower-left hitch pin must be reversed. It ships backwards due to shipping space constraints.

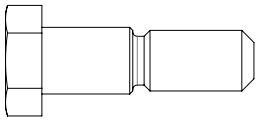
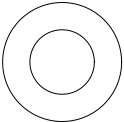
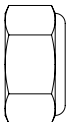
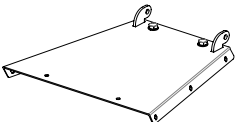


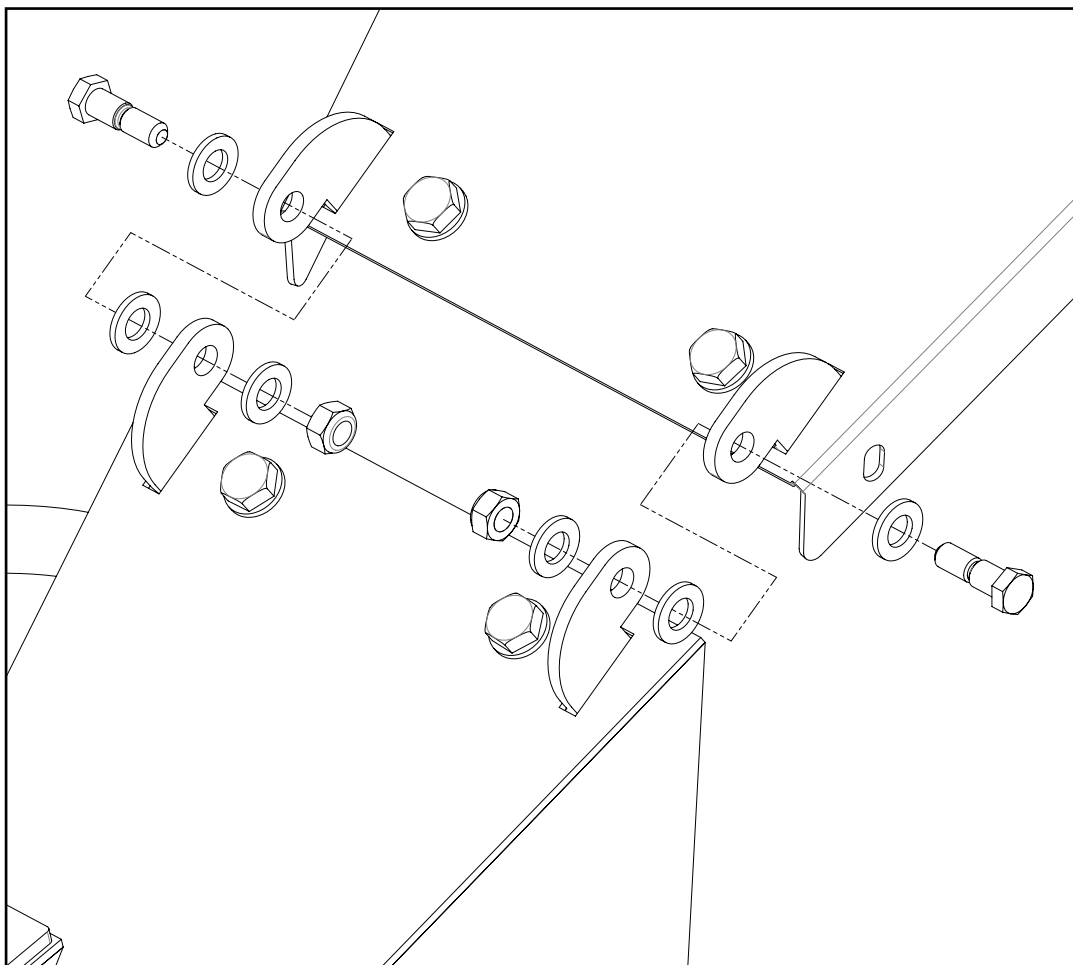


### 3. INFEED CHUTE

#### A. TOP PANEL

The wood chipper infeed chute consists of four (4) metal panels that are bolted together. The first step is bolting the top panel to the lower flywheel housing that forms the hinge. Using the hardware listed in the table below, assemble the hinge connection. Note that the infeed chute top panel and hinge bracket come pre-assembled from the factory.

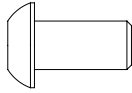
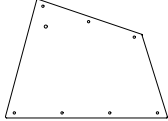

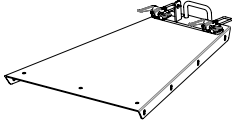
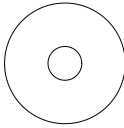
2x	M10 X 15 X 20 mm Shoulder Bolt		6x	M12 Nylon Flat Washer	
2x	M10 Lock Nut		1x	Infeed Chute Top Panel	



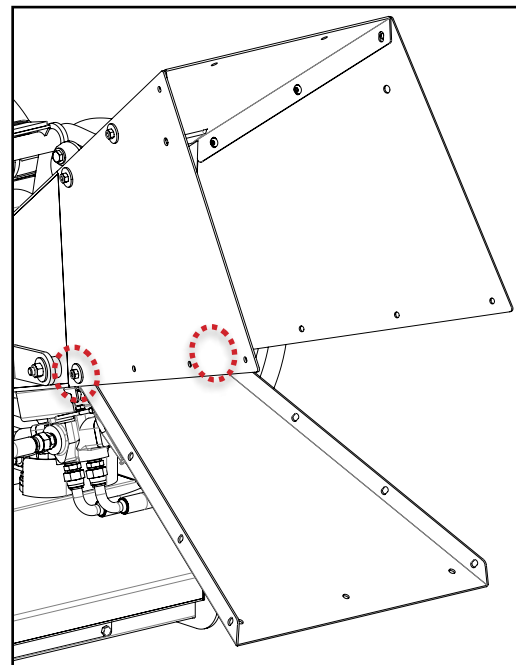
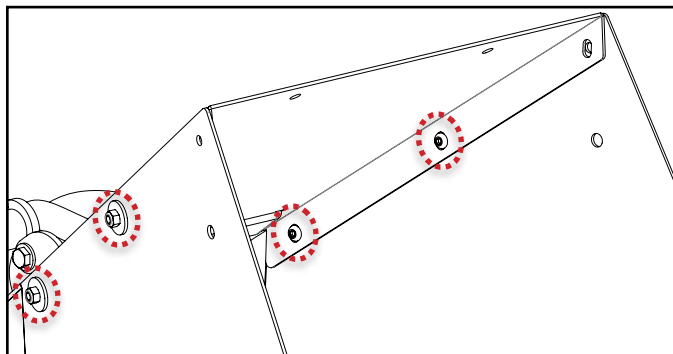


## B. SIDE PANELS AND BOTTOM PANEL

With the top panel bolted to the hinge, assemble each side panel to the sides of the top panel using the M8 X 18 mm button head screws, M8 lock nuts, and M8 fender washers. Use a hex key for the screws and a socket/wrench for the lock nuts.

6x	M8 X 18 mm Button Head Screw		2x	Infeed Chute Side Panel	
6x	M8 Lock Nut		1x	Infeed Chute Bottom Panel	
6x	M8 X 30 mm Fender Washer				

Install two (2) screws per side along the top edge leaving the last holes empty. Do not fully tighten the screws. Be sure to assemble the screws with the heads on the inside of the chute pointing outwards. Next, install the bottom panel using only the first two (2) bolts as shown below (right). This will allow it to swing up to join the side panels in the coming steps. Note that the infeed chute bottom panel and latches come pre-assembled from the factory.

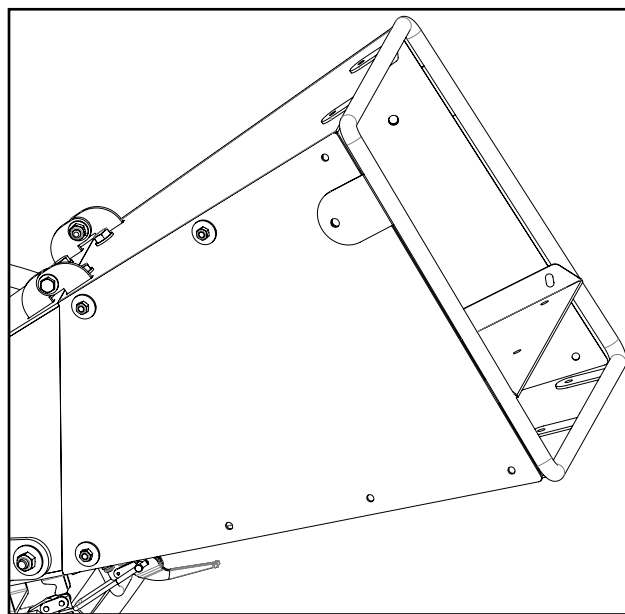
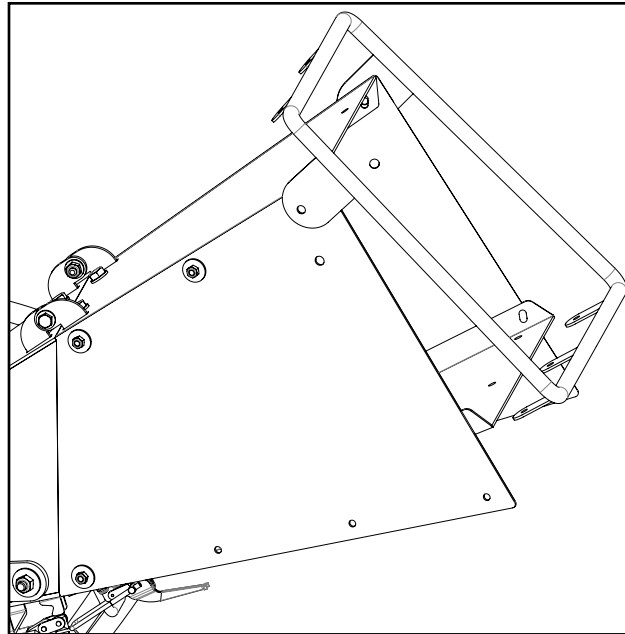




### C. EDGE BAR

The round edge bar is designed to add additional strength to the infeed panels as well as act as a rounded edge, eliminating branches from getting caught on the edge of the infeed panels.

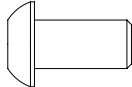
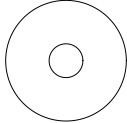

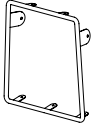
To install the edge bar, swing the bottom panel up as shown below and fit the tabs over the outside of the panels. There are two tabs on the side of the round edge bar which will be bolted to the side panels in a later step.

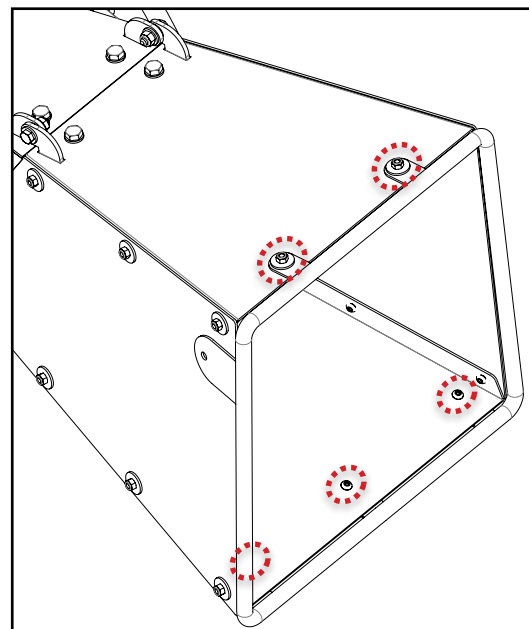
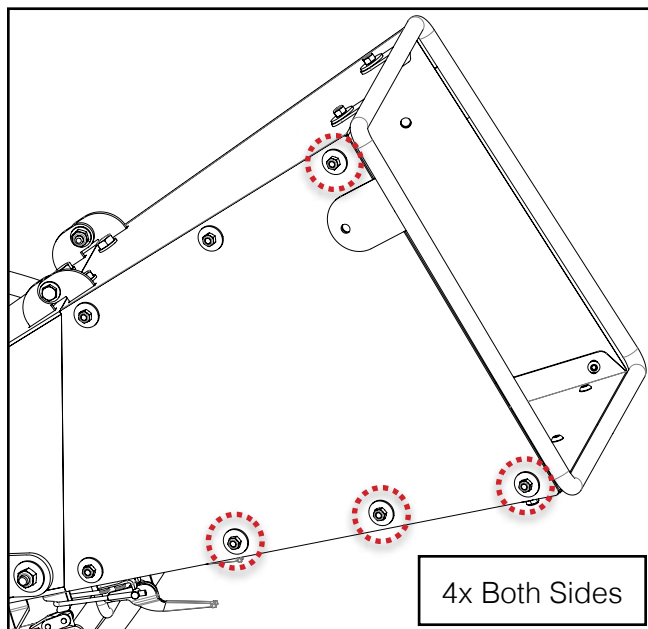






With the edge bar in place, use the hardware listed below to assemble the panels and the edge bar. Use a hex key for the button head screws and a socket/wrench for the lock nuts. Install the remaining thirteen (13) M8 X 18 mm button head screws, M8 lock nuts, and M8 X 30 mm fender washers as shown below to secure the panels and edge bar in place. Do not fully tighten the screws.

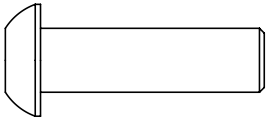
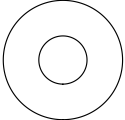

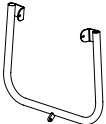
13x	M8 X 18 mm Button Head Screw		13x	M8 X 30 mm Fender Washer	
13x	M8 Lock Nut		1x	Infeed Chute Round Edge Bar	



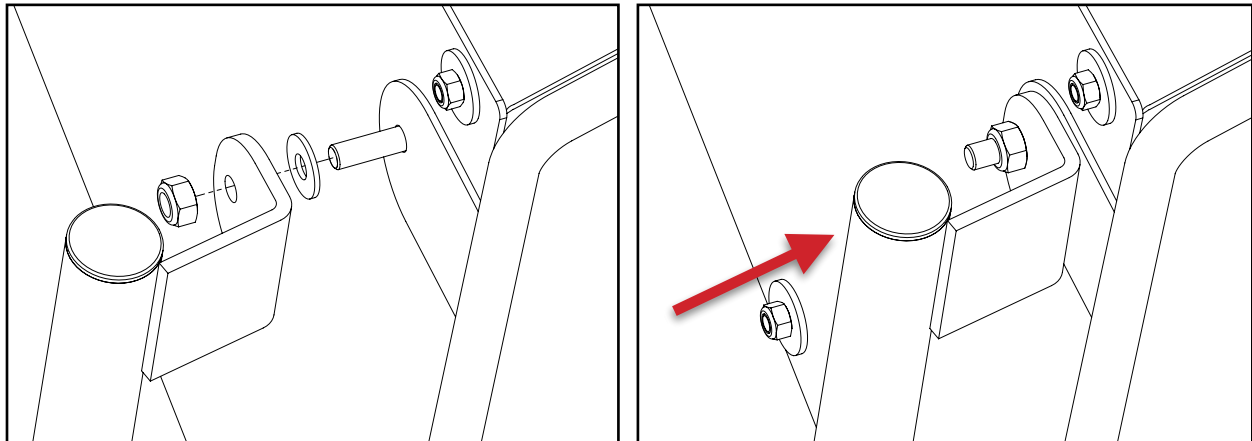


### D. CONTROL ARM

The large red infeed control arm is attached using the hardware below.

2x	M10 X 35 mm Button Head Screw		2x	M10 X 26 mm Fender Washer	
2x	M10 Lock Nut		1x	Control Arm	

The screw passes through the green chute panel, the grey edge bar side tab, and finally through the red control arm tab as shown below.



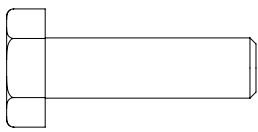
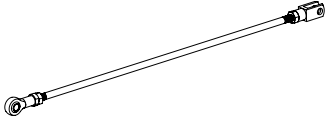
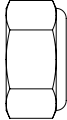
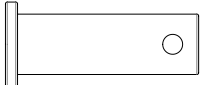
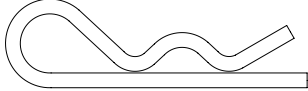
Note that the distance between the unassembled red infeed control arm mounting tabs can be significantly wider than the infeed chute. This is normal and the arm will flex when compressed. Assemble one side of the control arm first (but do not fully tighten it), then pull the other end in and secure that side.

With all of the infeed panel, edge bar, and control arm screws now loosely assembled, tighten all screws securely.

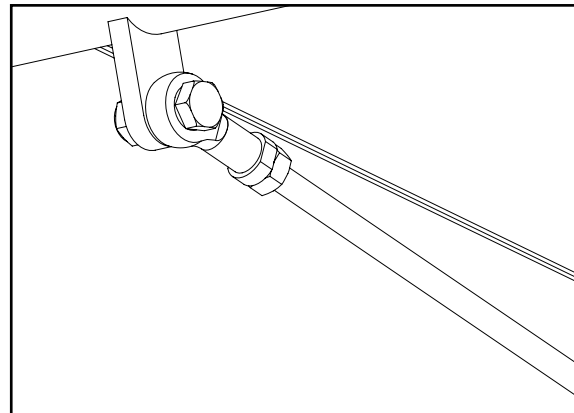
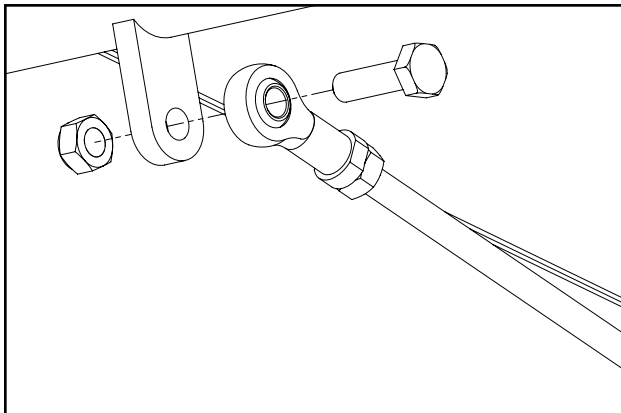


## E. CONTROL ARM LINKAGE

With the control arm fastened to the infeed chute, the linkage assembly can now be connected between it and the hydraulic directional control valve.

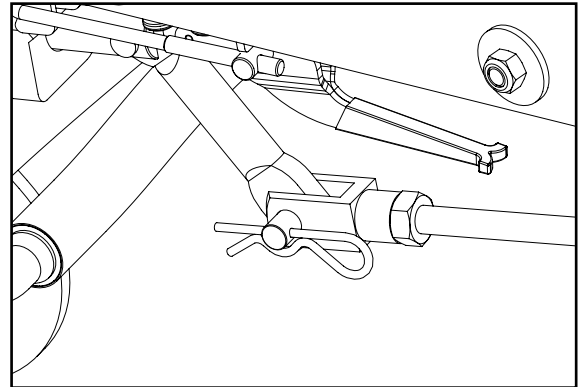
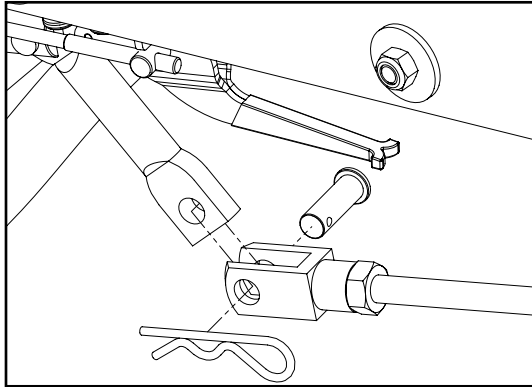
1x	M10 X 35 mm Hex Bolt		1x	Control Arm Linkage Assembly	
1x	M10 Lock Nut		1x	10 mm Clevis Pin	
			1x	Hairpin Cotter Pin	

Fasten the rod end bearing to the red control arm with the M10 X 35 mm hex bolt and M10 lock nut as shown below.

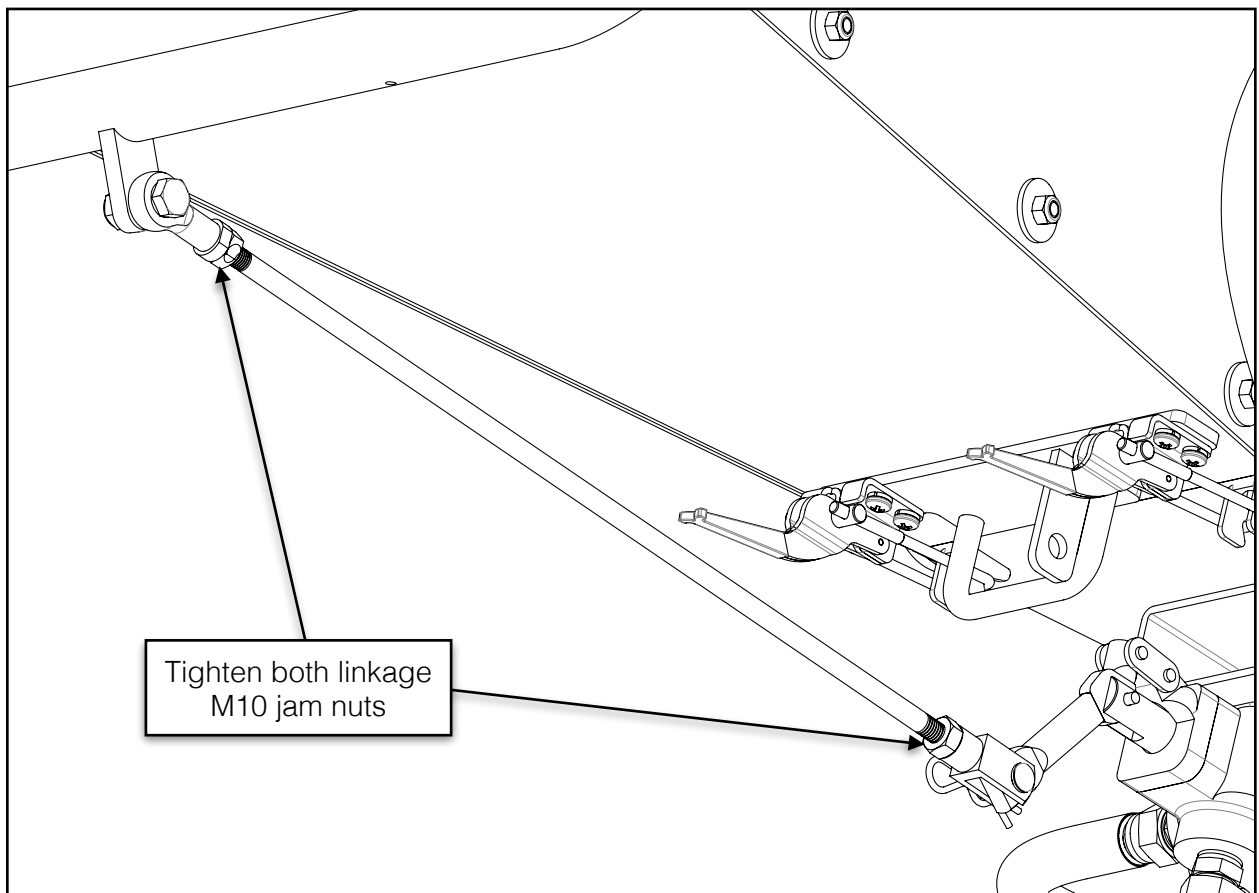




On the opposite end of the linkage, secure the linkage to the the hydraulic directional control valve actuator using the clevis pin and hairpin cotter pin.



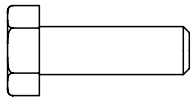
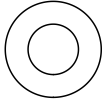
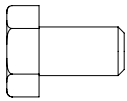
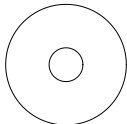
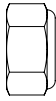
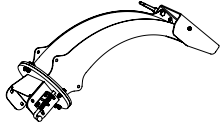
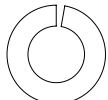
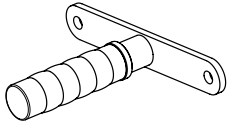
Once the linkage has been assembled, ensure both M10 jam nuts are tight.



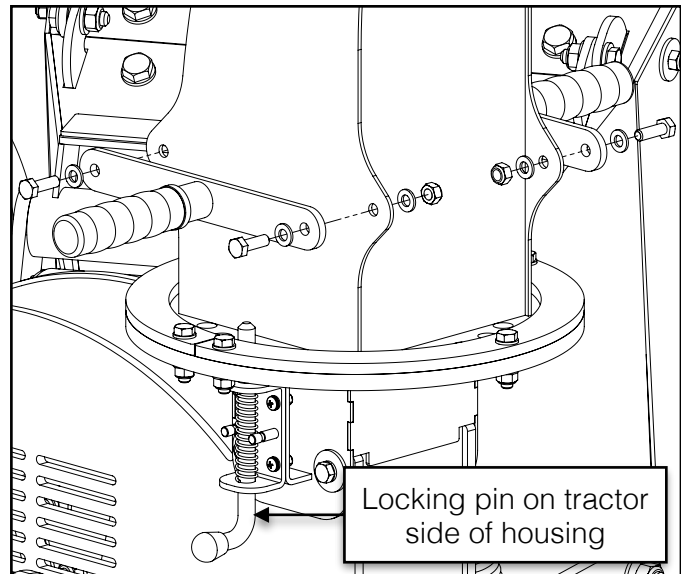
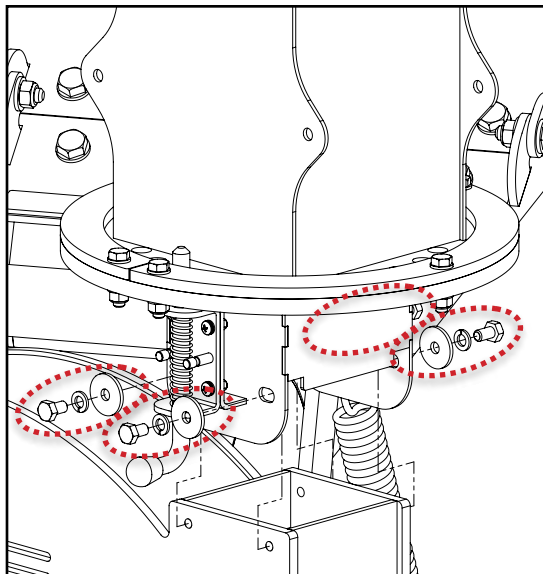


## 4. DISCHARGE CHUTE

The discharge chute assembly comes pre-assembled from the factory. With the hardware listed below, fasten the discharge chute assembly to the upper flywheel housing first and then assemble the handles to the discharge chute.

4x	M8 X 25 mm Hex Head Bolt		8x	M8 Flat Washer	
4x	M8 X 14 mm Hex Head Bolt		4x	M8 X 30 mm Fender Washer	
4x	M8 Lock Nut		1x	Discharge Chute Assembly	
4x	M8 Lock Washer		2x	Discharge Chute Handle with Grip	

Connect the chute using four (4) M8 X 14 mm hex bolts, M8 lock washers, and M8 X 30 mm fender washers as shown below. Then assemble both handles to the chute using four (4) M8 X 25 mm hex bolts, eight (8) M8 flat washers, and four (4) M8 lock nuts.



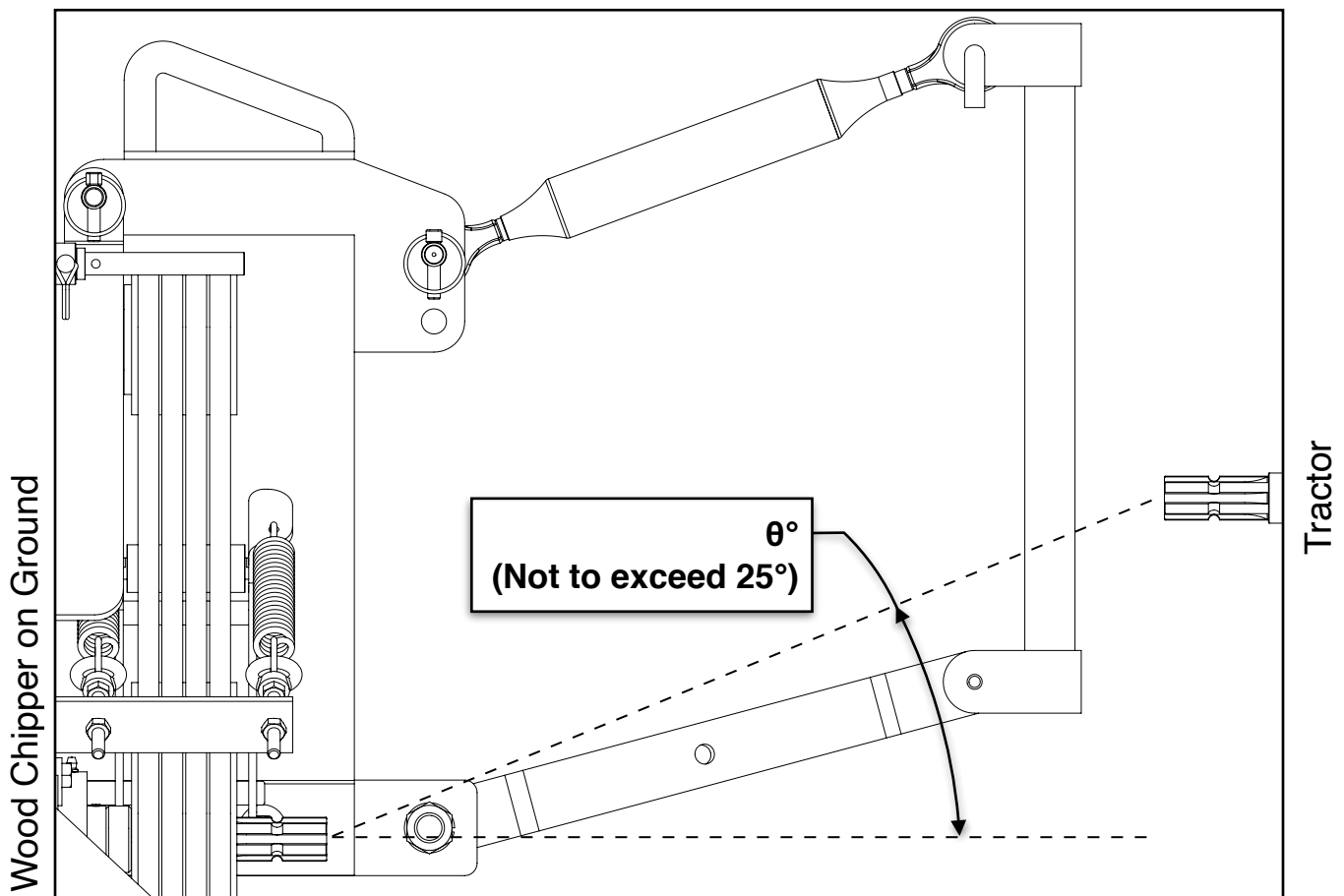
## TRIMMING THE PTO SHAFT

The wood chipper is shipped with a PTO shaft that can be fitted to most Category 1 tractors. The PTO shaft may need to be trimmed depending on your tractor and configuration. Follow the steps below to ensure the PTO shaft is correctly fitted to your tractor.

**\*\*Note: the shear bolt end of the PTO shaft mounts to the wood chipper.\*\***

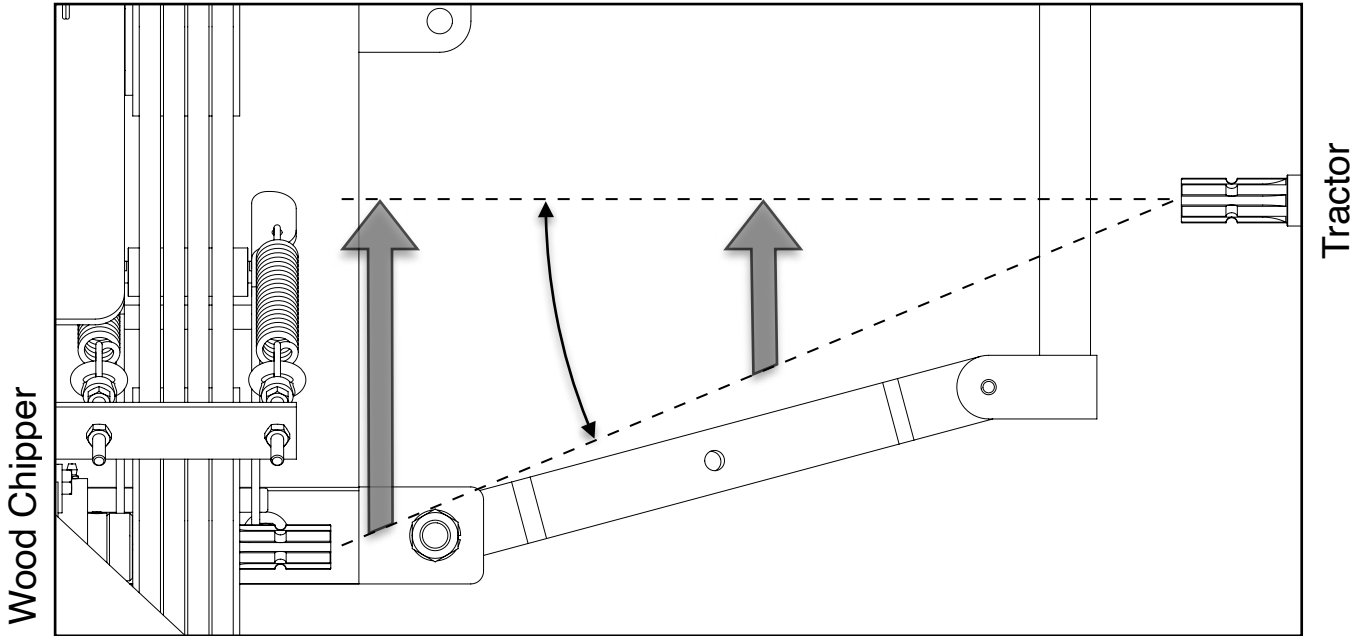
1. Attach the wood chipper to the tractor's 3-point hitch system. Do not install the PTO shaft.
2. With the wood chipper resting on flat ground, note the angle ( $\theta$ ) between the two shafts as shown in the graphic below. If this angle exceeds  $25^\circ$ , stop, and proceed to the sub-section, ***Adjusting the Base Height*** (Page 27), to raise the height of the chipper. Continue on to *Step 3* on the next page after raising the base height.

If angle  $\theta$  is  $25^\circ$  or less, proceed to *Step 3* on the next page and ignore the ***Adjusting the Base Height*** sub-section.

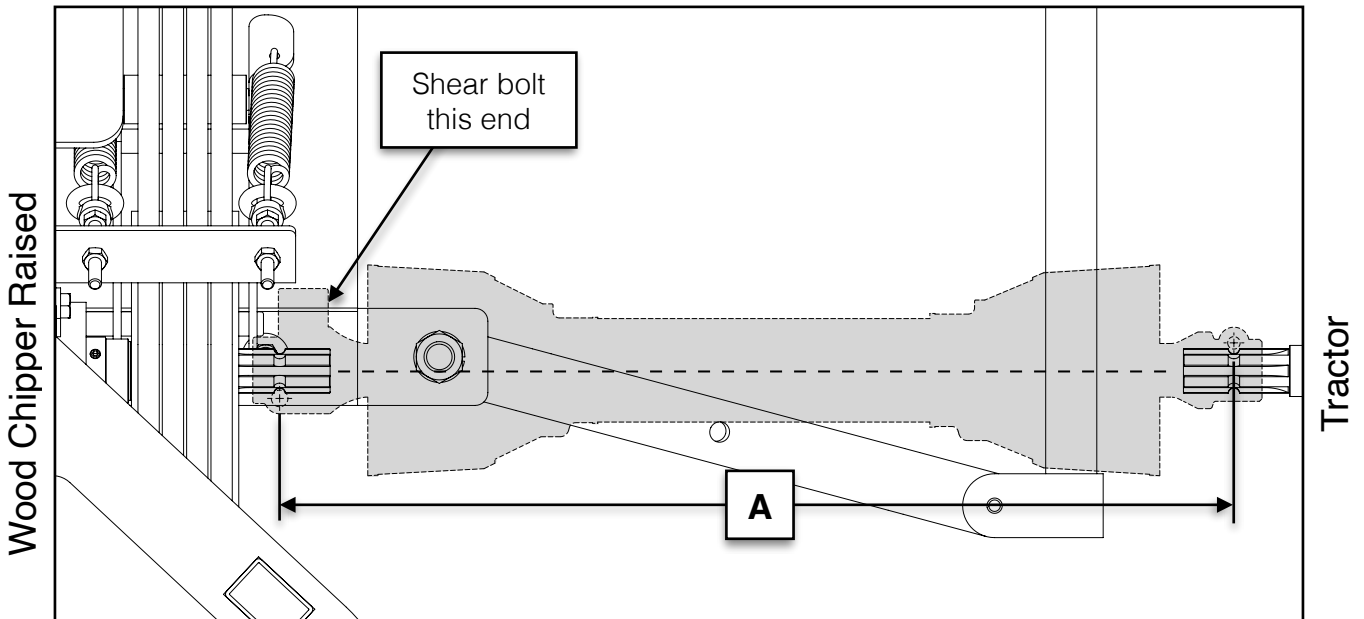




3. Use the 3-point hitch system to raise the wood chipper (shown below) so that the tractor output shaft and the wood chipper driveshaft are in-line (bottom image).

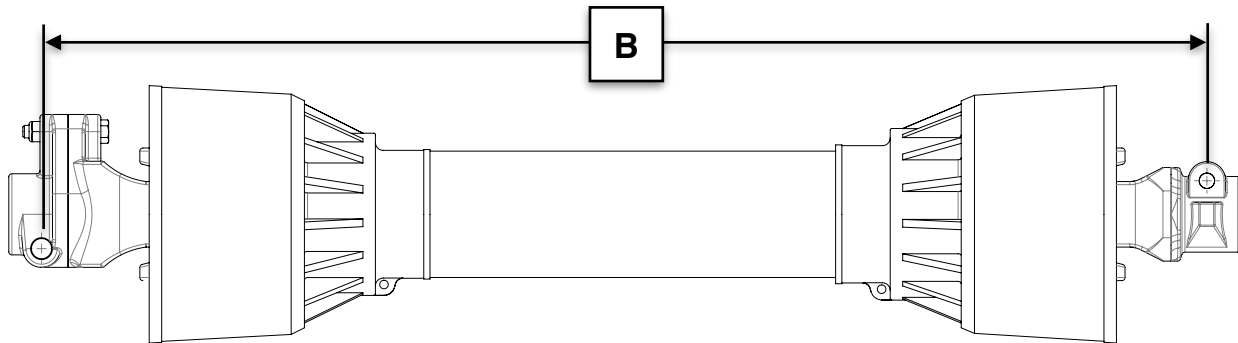


4. Measure the straight-line distance between the locking grooves on the splined shafts of the tractor and wood chipper (**Dim A** below).





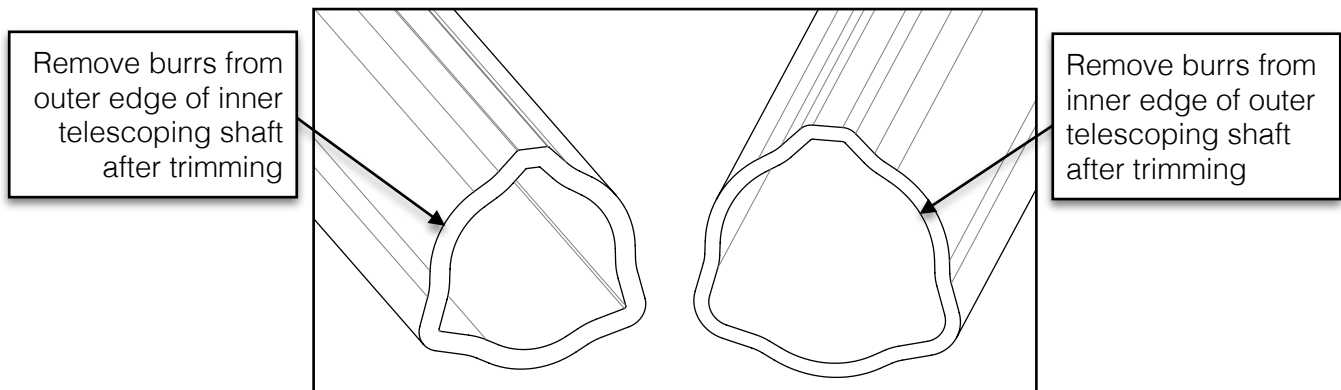
- Verify the distance between the locking pins on the PTO shaft while in the compressed state (**Dim B**) as shown in the image below. It should measure 29-7/16" (747 mm).



- If **Dim A** is at least 1" (25 mm) longer than **Dim B**, the PTO shaft does not require trimming. It is recommended the shaft not be used if there is less than 6" (150 mm) of overlap between the two halves of the PTO shaft when the equipment is in the operating position.
- If **Dim B** is longer than **Dim A**, the PTO shaft will require trimming. Use this equation to calculate the correct amount to trim:

$$(B - A) + 1 \text{ inch} = C \text{ (Amount to Trim)}$$

- Once **C** has been calculated, trim that amount from **BOTH** halves of the PTO shaft safety cover *first*, then trim the same amount from both shafts. This will ensure the safety cover on each end remains a few inches back from the ends of the shafts, otherwise PTO shaft reassembly could be difficult.
- After trimming both halves of the PTO shaft, use a file to remove any burrs or sharp edges and slide the halves back together, ensuring they telescope in-and-out freely. The PTO shaft is now ready to connect the wood chipper to the tractor for operation.





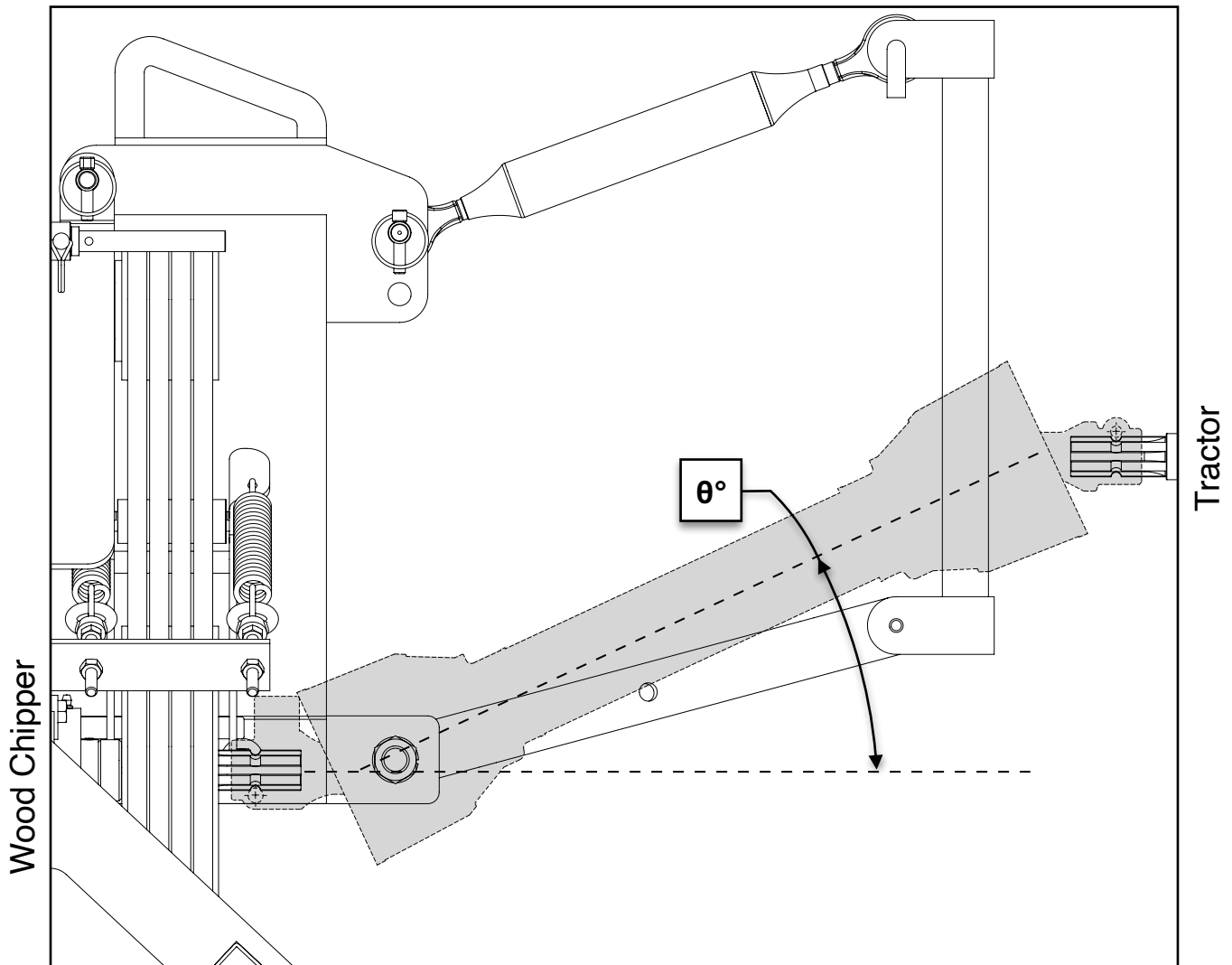
## ADJUSTING THE BASE HEIGHT (IF REQUIRED)

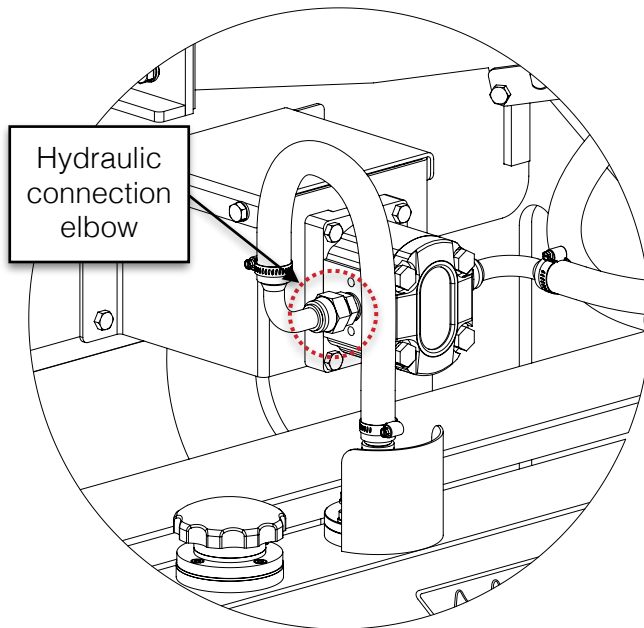
If the wood chipper will be driven by a large tractor, the base can be adjusted to raise the wood chipper an additional 3-6" (76-152 mm) to allow for better PTO shaft alignment. When the angle ( $\theta$ ) between the tractor output shaft and wood chipper driveshaft exceeds 25°, the base height needs to be increased or the PTO shaft could be damaged.

Follow the instructions on the next page to adjust the base height.

**\*\*If angle  $\theta$  is 25° or less, ignore the *Adjusting the Base Height* section.\*\***

**\*\*If angle  $\theta$  exceeds 25°, the base height must be increased.\*\***





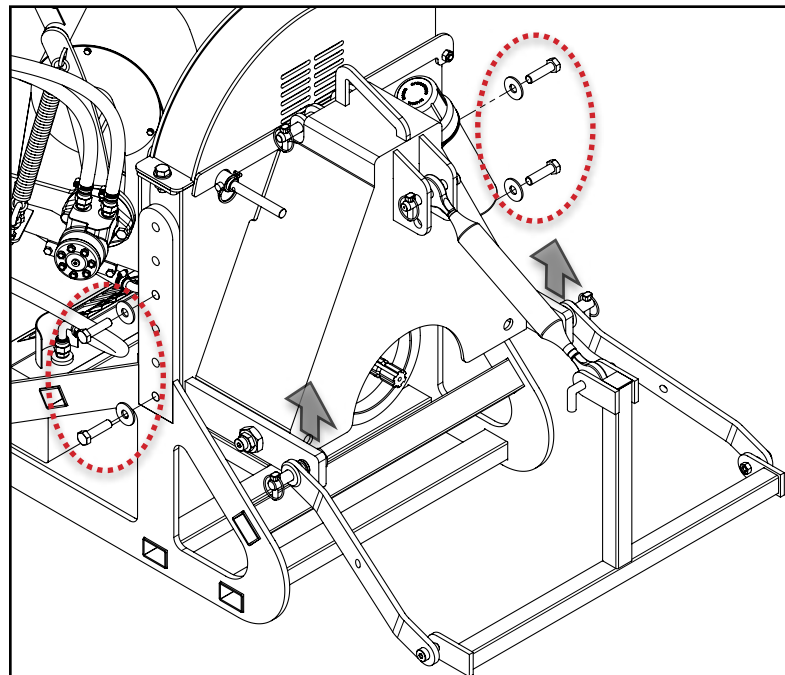
With the 3-point hitch system connected to the wood chipper, leave the chipper resting on the ground.

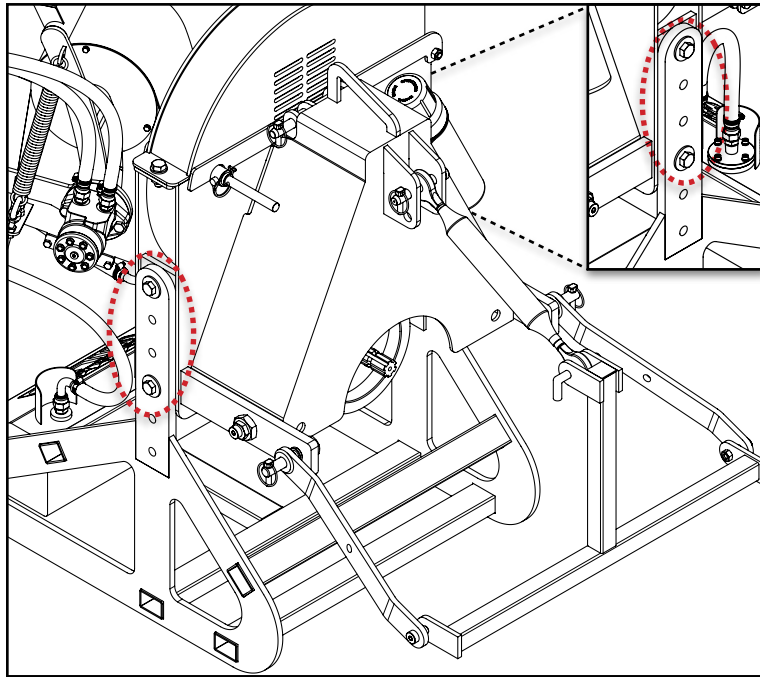
Loosen the hydraulic connection elbow at the pump inlet first. This will allow the fitting to rotate downward as the housing is raised.

There are six (6) mounting holes on each side of the base. The spacing between each hole is 3" (76 mm), with a maximum adjustment of 6" (152 mm), as there must always be two (2) empty holes between both bolts. Depending on how steep the measured angle ( $\theta$ ) is between the shafts, the base may only require 3" (76 mm) of adjustment which would move the chipper housing up one (1) hole.

Remove the four (4) M16 X 60 mm bolts and M16 X 45 mm fender washers from the base. Note that there are M16 lock nuts on the bottom bolts but not the top bolts—those bolts are secured into threaded holes in the housing.

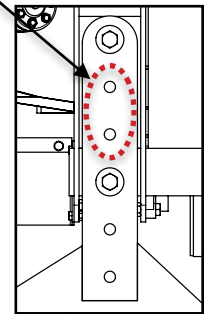
Using the 3-point hitch system, carefully raise the housing from the base. The spacing between each hole in the base is 3" (76 mm), so either raise the housing up one hole (3") or two holes (6") depending on the steepness of the angle ( $\theta$ ) measured between the shafts.



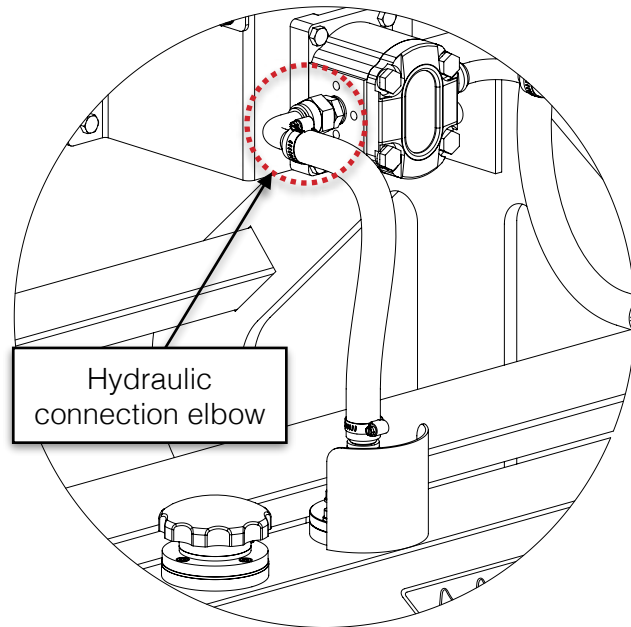


Reattach the base to the housing using the four (4) M16 X 60 mm hex bolts and M16 X 45 mm fender washers. Secure the bottom two (2) bolts with the M16 lock nuts.

Remember to space the bolts so there are two (2) empty holes between them.



As the housing was raised, the loosened hydraulic connection elbow should have rotated downward from its original as-shipped position. If not, wiggle the hose and it should rotate down. Retighten the connection after the base height has been set.



Continue to *Step 3* (Page 25) in the previous section, ***Trimming to PTO Shaft***, once the base height has been raised.



## OPERATION

### 1. START UP

The following steps in the sub-section below (*a.* through *i.*) are a summarization of the steps necessary to safely and properly operate the wood chipper. Please follow the references to other sections that provide further detail into the step being performed.

- a. Place the tractor transmission in neutral, set the parking brake, then turn the tractor engine off.
- b. Connect the 3-point hitch linkages to the wood chipper and secure them with linch pins.
- c. Adjust the top link of the 3-point hitch so that the wood chipper sits level.
- d. Connect the PTO shaft to the tractor with the shear bolt end of the PTO on the wood chipper. Make sure the PTO safety chains are attached to both the tractor and the wood chipper to keep the protective PTO safety cover from rotating.
- e. Rotate the discharge chute towards a safe direction and lock it in place with the spring-loaded latch and indexing holes. Adjust the chip deflector to the desired position based on how far they should be thrown.
- f. Push the red control arm all the way in until it stops, then pull it out one click to ensure the infeed roller is in the neutral position.
- g. Start the tractor engine and hold the engine RPM's at a strong idle. Engage the PTO slowly. If the tractor is running at a high speed when the PTO is engaged, you could damage the drive belts or break the shear bolt on the PTO shaft. After the rotor is spinning freely increase the tractor RPM's until the PTO speed is 540 RPM. Most tractor tachometers commonly indicate this with a line and/or text.
- h. Pull the red control arm all the way out until it stops (forward position). This will start the infeed roller rotating. Set the infeed roller control to the desired speed.
- i. With the wood chipper now running and the infeed roller rotating, it is safe to begin chipping. Start by feeding smaller diameter branches until better acquainted with the machine and its operation. Once comfortable, begin feeding in larger pieces. Adjust the infeed roller control as necessary to regulate the infeed rate of the branches.



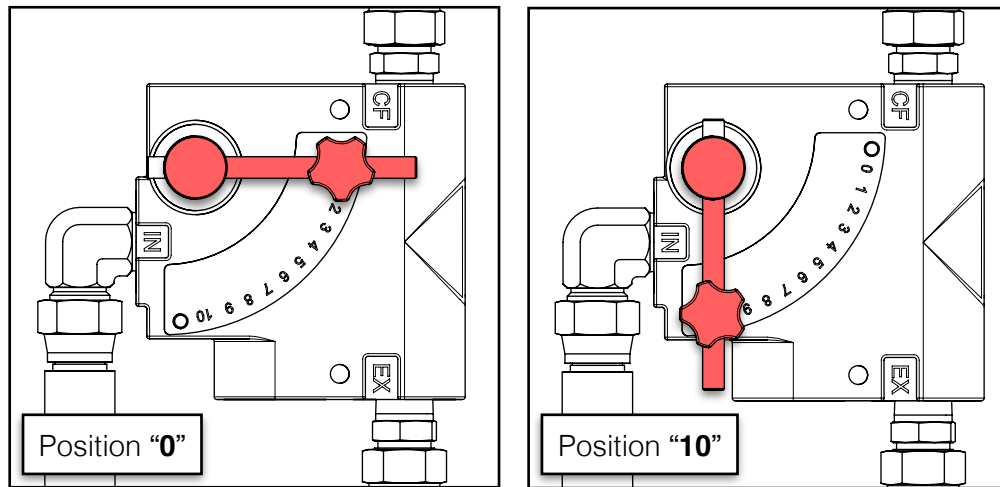
### **WARNING!**

To avoid serious injury or death, do not chip brush containing embedded foreign objects such as nails, wire, metal fragments, etc. The operator and any assistants must always stay clear of the infeed chute of the wood chipper whenever it is running.

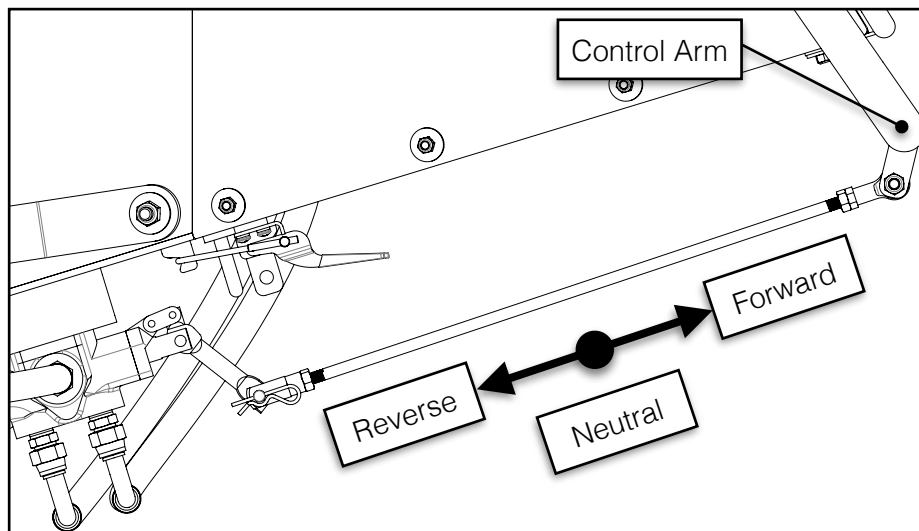


## 2. INFEEED ROLLER CONTROL

The wood chipper infeed roller speed control valve is located to the right of the infeed chute. Rotating the arm as shown in the pictures below will increase or decrease the speed of the infeed roller. The number "0" (left image) represents no infeed roller rotation while "10" (right image) represents full speed. Effective working range is from 0-4. It is normally not necessary to move the arm past "4."



The infeed roller can be set to three (3) different rotation settings—*forward*, *neutral* and *reverse*—by pushing or pulling the red control arm. The *forward* position pulls branches into the wood chipper; *neutral* stops the roller from rotating; and *reverse* pushes the branches back out the wood chipper towards the operator. The diagram below illustrates the 3 positions:

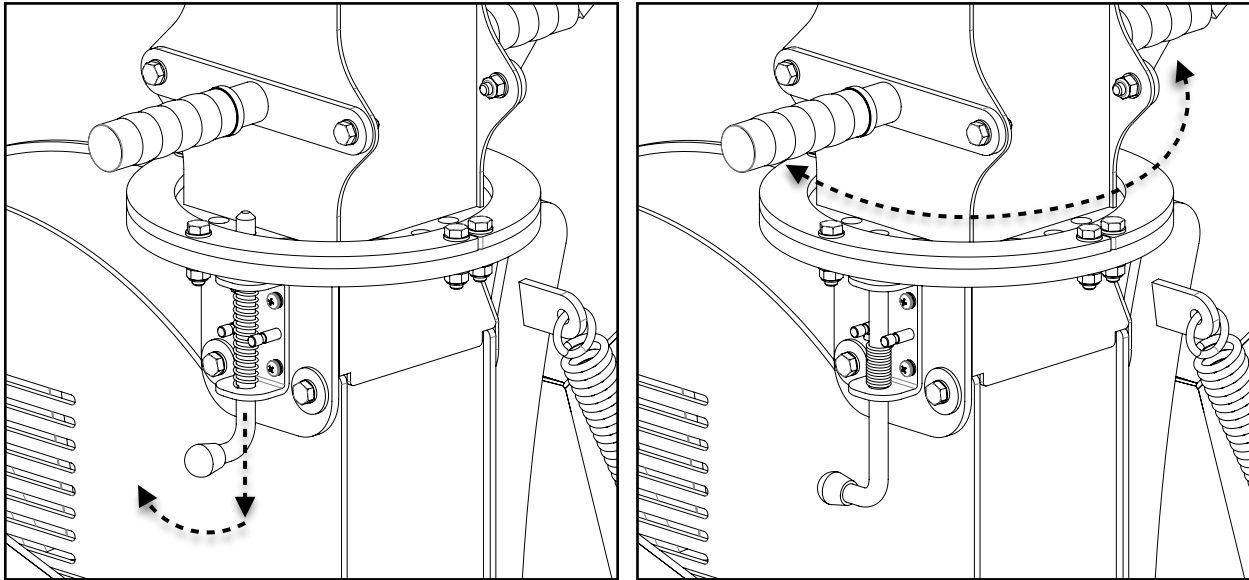


To change the speed of the infeed roller, place the red control arm in the *neutral* position. This stops the infeed roller from rotating. The speed control valve can now be moved to the desired position/speed. Reengage the infeed roller via the control arm.

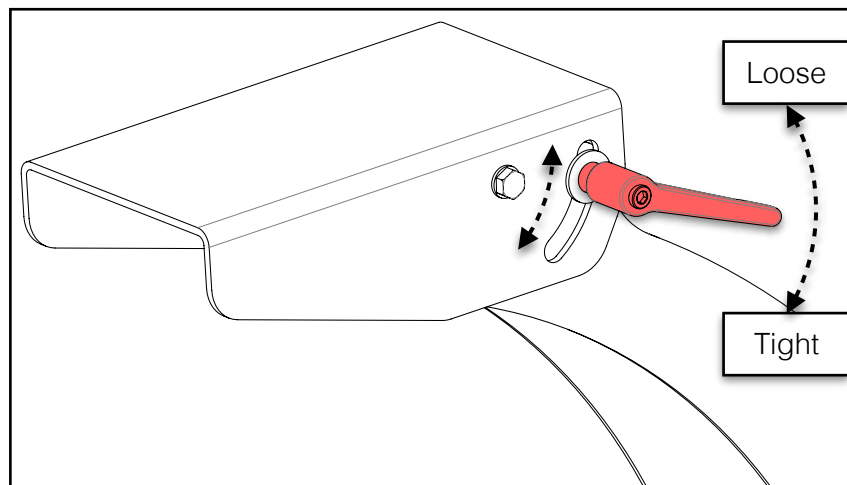


### 3. DISCHARGE CHUTE

To rotate the discharge chute, push down all the way on the spring-loaded locking pin and twist it 90° to temporarily lock it in the open position. The discharge chute is now free to rotate a full 360°. Using the handles, rotate it to the desired position and then twist the locking pin back 90° so that it extends into the closest locking hole to secure the chute in position.



The chip deflector easily adjusts to regulate the distance the chips are thrown. Rotate the handle counterclockwise to loosen the deflector, adjust the deflector to the desired angle, then re-tighten the handle by rotating it clockwise to secure the deflector.





## 4. CHIPPING

Keep your face and body away from the feed opening. Do not over reach. Keep proper balance and footing at all times. The wood chipper is designed to chip a variety of materials into a more readily decomposing or handled condition. The following guidelines can be used to help you get started. Please read and follow all safety instructions in this manual. Failure to operate the wood chipper in accordance with the safety instructions **MAY RESULT IN PERSONAL INJURY!**

- Ensure the wood chipper is at full operating speed before starting to chip material.
- Select limbs up to 8" (203 mm) in diameter. Trim side branches that cannot be bent enough to feed into the wood chipper infeed chute. Hold small diameter branches in a bundle and feed simultaneously.
- Feed brush from the side of the infeed chute rather than from the front. Step aside to avoid being hit by brush moving into the wood chipper.
- Never lean into the infeed chute or extend any parts of your body inside the infeed chute to push objects further into the wood chipper. Use another stick or branch.
- Do not use hand tools to push brush into the wood chipper. They can go through the wood chipper and cause injury or damage to the wood chipper.
- Place branches, butt end first, into the wood chipper infeed chute until it contacts the infeed roller. Once the infeed roller makes contact with the branches, it will pull the material inwards.
- **NOTE:** The wood chipper blades dull with use and require periodic sharpening and sometimes replacing. Refer to the section under service and maintenance, "Sharpening Wood Chipper Blades," for further instructions.

## 5. STOPPING

Do not leave the wood chipper unattended or attempt any inspection/service unless the PTO is disengaged and the tractor engine is turned off. Allow time for the wood chipper to come to a complete stop. To stop the wood chipper, follow the steps below:

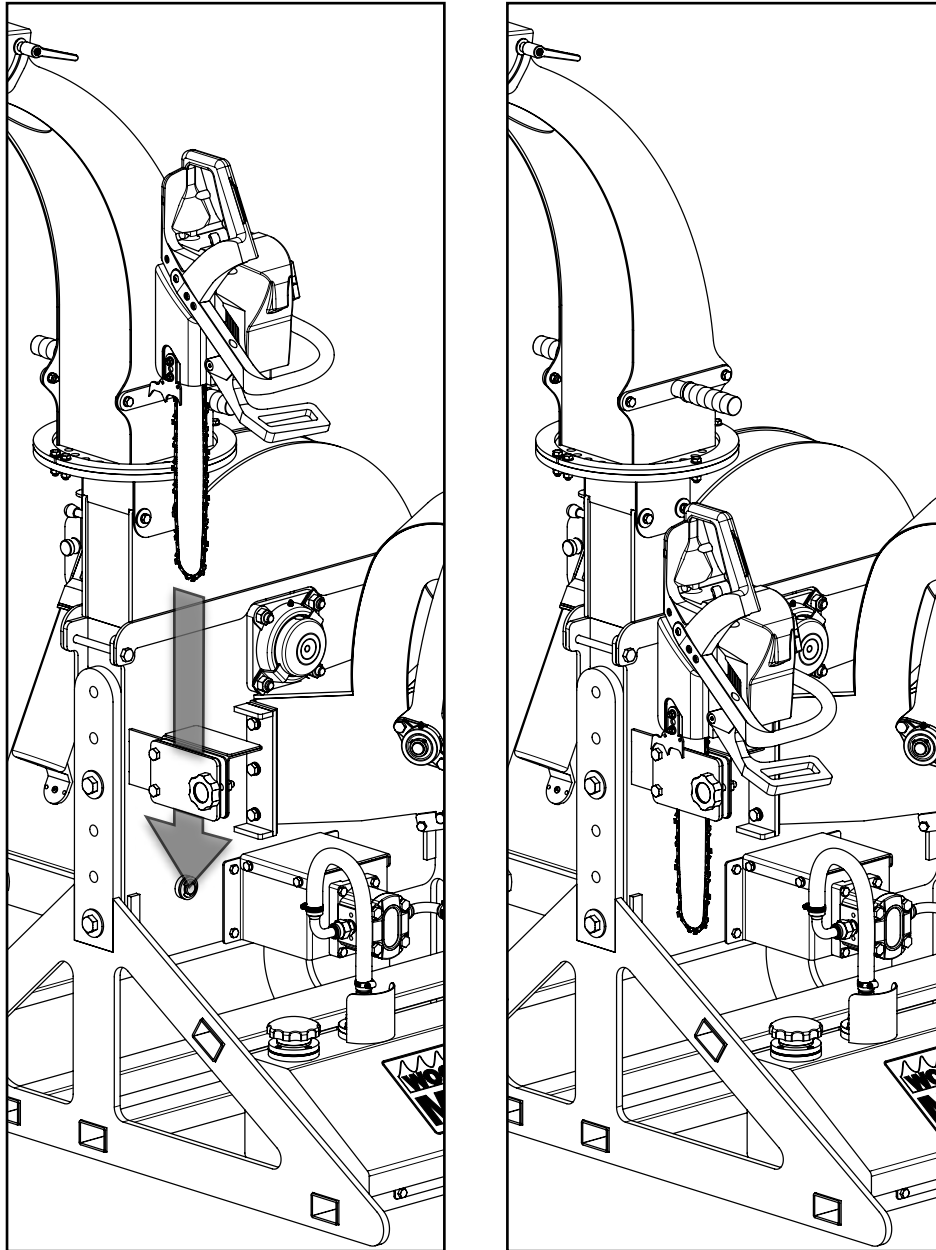
1. Move the tractor throttle to the SLOW/IDLE position.
2. Disengage the PTO lever and turn off the tractor engine.
3. Allow time for the wood chipper to come to a complete stop.

**NOTE:** The flywheel continues to spin for some time after the engine or tractor has been turned off. The flywheel has stopped spinning when noise and/or machine vibration are no longer detectable. The PTO shaft will also no longer be spinning.

## 6. CHAINSAW HOLDER

On the rear side of the flywheel housing there is a holder to conveniently secure a chainsaw while transporting the wood chipper or to store it out of the way while chipping brush.

Loosen the knob, slide the chainsaw down between the rubber pads, and retighten the knob to secure it in place.



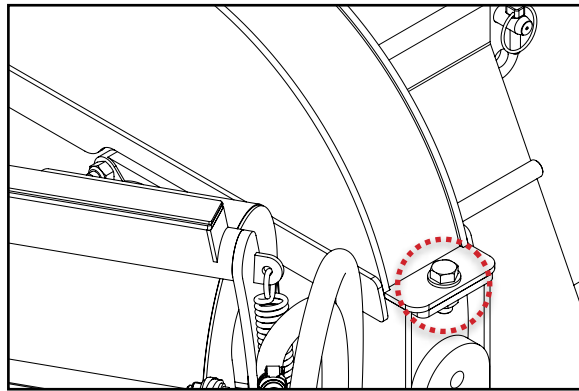


## MAINTENANCE

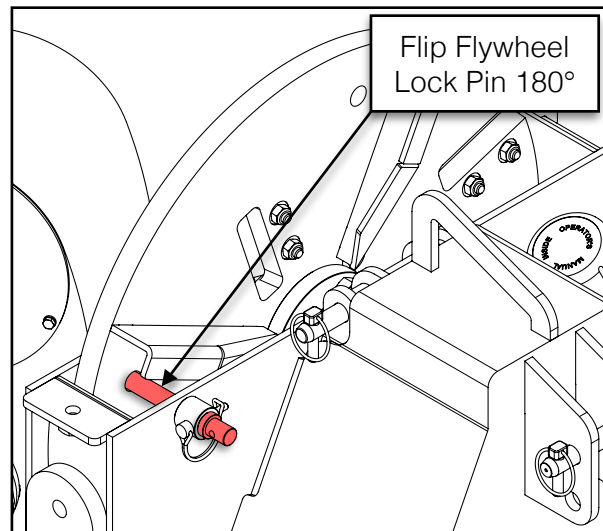
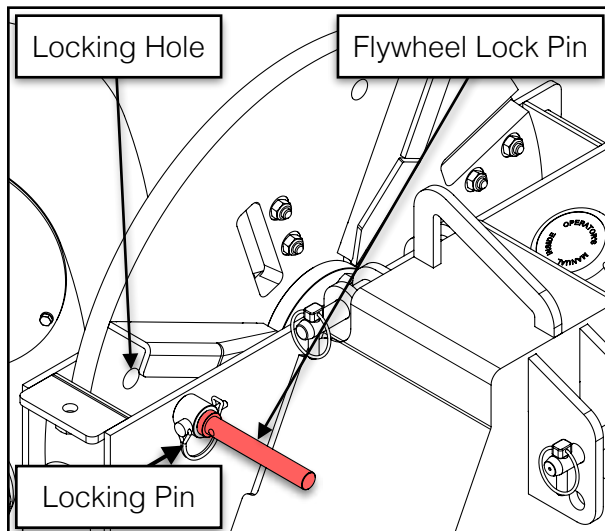
### REPLACING BLADES

Follow these steps when replacing blades. The WC88 wood chipper uses four (4) reversible hardened steel blades. Each blade is 4.45 X 2.72 X 5/16" (113 X 69 X 8 mm) in size.

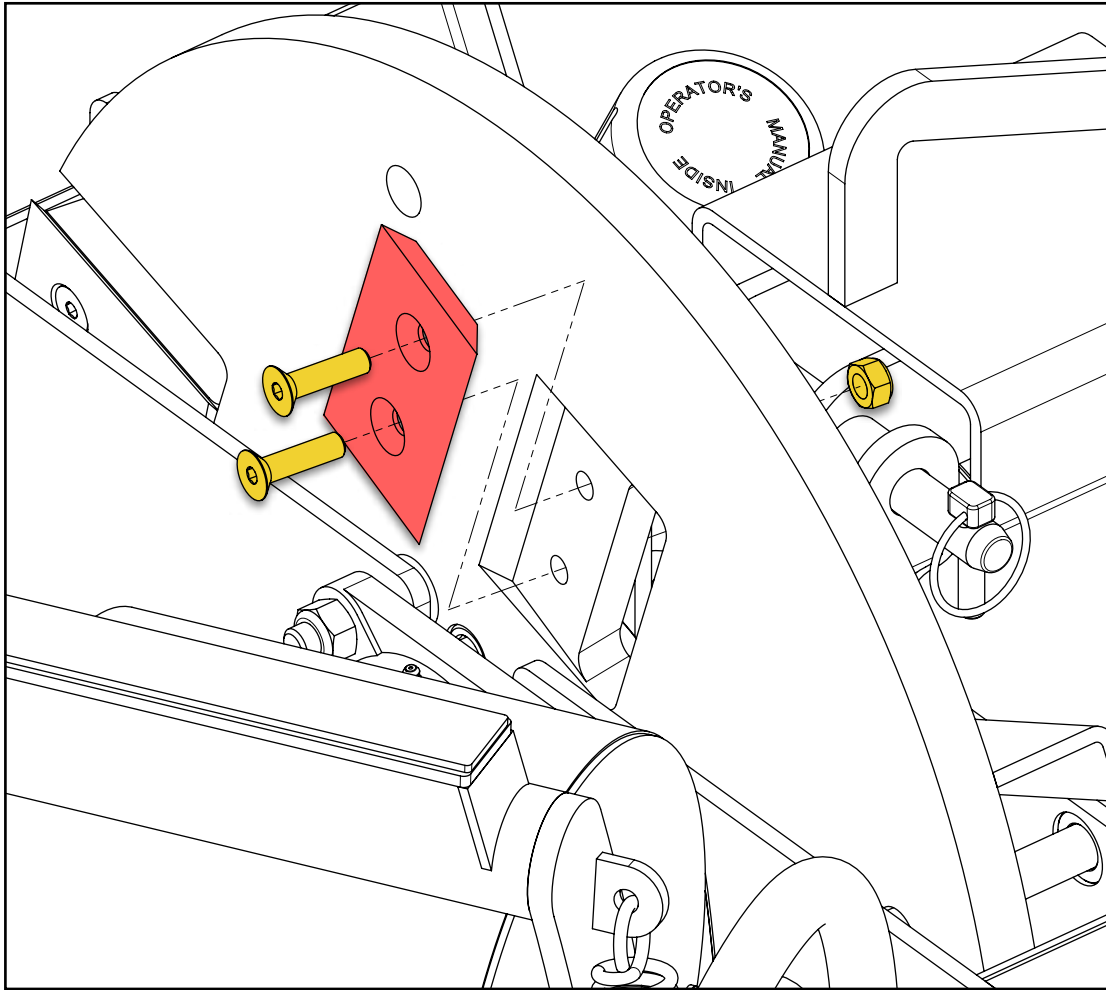
1. If installed, disconnect the PTO shaft from the tractor for safety.
2. Open the upper flywheel housing using a 24 mm socket/wrench by removing the M16 X 40 mm bolt and flat washer securing the upper and lower housings together.



3. With the flywheel exposed, manually rotate it so that one of the four (4) locking holes in the flywheel (near the front of the blade) approximately lines up with the flywheel lock pin at the rear of the housing. Remove the small locking pin from the flywheel lock pin and flip the flywheel lock pin around 180°, passing it through the housing and into the locking hole in the flywheel. Reinstall the smaller locking pin to the flywheel lock pin.



4. Remove the two (2) M10 X 40 mm flat head bolts and M10 lock nuts that fasten the blade to the flywheel using a 6 mm hex key on the bolts and a 17 mm socket/wrench on the lock nuts. Take care not to drop the hardware into the lower flywheel housing. However, should this occur, a telescoping pen magnet can be used to retrieve them.



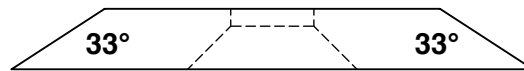
5. Repeat Steps 3 & 4 above to remove the remaining three blades. If this is the first time the blades have been removed following either the original wood chipper purchase or a recent blade sharpening, the blades can be reversed to utilize the other cutting edge. Or, the entire blade can be removed and sharpened or it can be replaced with a new blade. Torque the M10 X 40 mm flat head bolts to 40-45 ft•lb (54-60 N•m) when installing blades. Always replace the M10 lock nuts with a new set when changing or reversing blades. Refer to section, ***Blade Sharpening*** for blade sharpening instructions
6. Once the blades have been reversed or new blades installed, proceed to section, ***Setting the Bed Plate Gap***, to properly set the spacing between the blades and bed plate.



## BLADE SHARPENING

The wood chipper blades will dull, making chipping difficult and cause your tractor to labour. It is recommended to sharpen the blades every 25-50 hours of operation. The WC88 wood chipper uses four (4) hardened steel blades. The blades are reversible and can be sharpened on both sides. Follow the below steps to sharpen the blades.

1. Follow the steps from the previous section, ***Replacing Blades***, to safely remove the blades from the flywheel.
2. Hand-grind the angled edges of the blade at 33° (see diagram below) using a whetstone or have them sharpened by a professional. A pedestal style bench grinder will likely yield poor results if not used properly. If sharpened quickly or aggressively on a bench grinder, the blade edge can get too hot and change colour, thus removing the heat treating-properties from the steel. Use short grinding times and cool frequently with water. Remove an equal and consistent amount of material from each blade to maintain proper balance when reassembled to the flywheel.

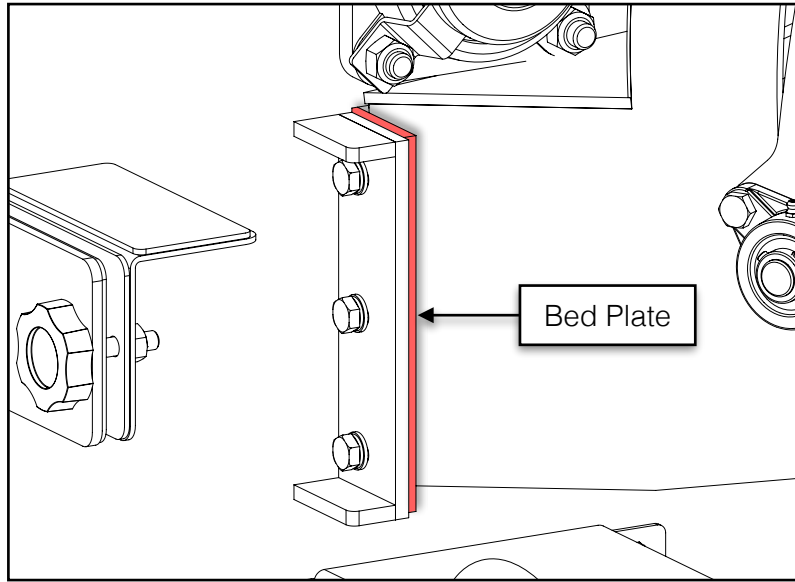


**Blade Profile**

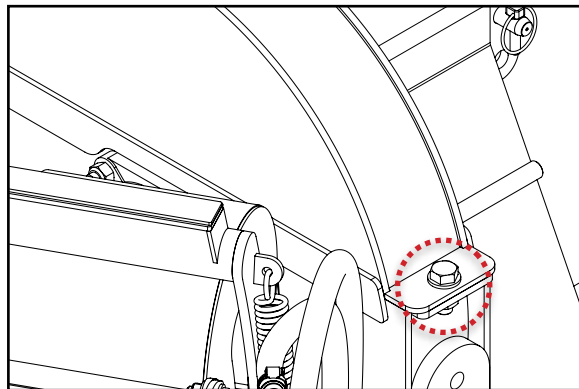
3. Reinstall the sharpened blades on the flywheel and torque the M10 X 35 mm flat head bolts to 40-45 ft•lb (54-60 N•m). Always replace the lock nuts with new hardware when changing or reversing the blades.
4. Once the blades have been sharpened, proceed to the next section, ***Setting the Bed Plate Gap***, to properly set the spacing between the newly sharpened blades and the bed plate.

## SETTING THE BED PLATE GAP

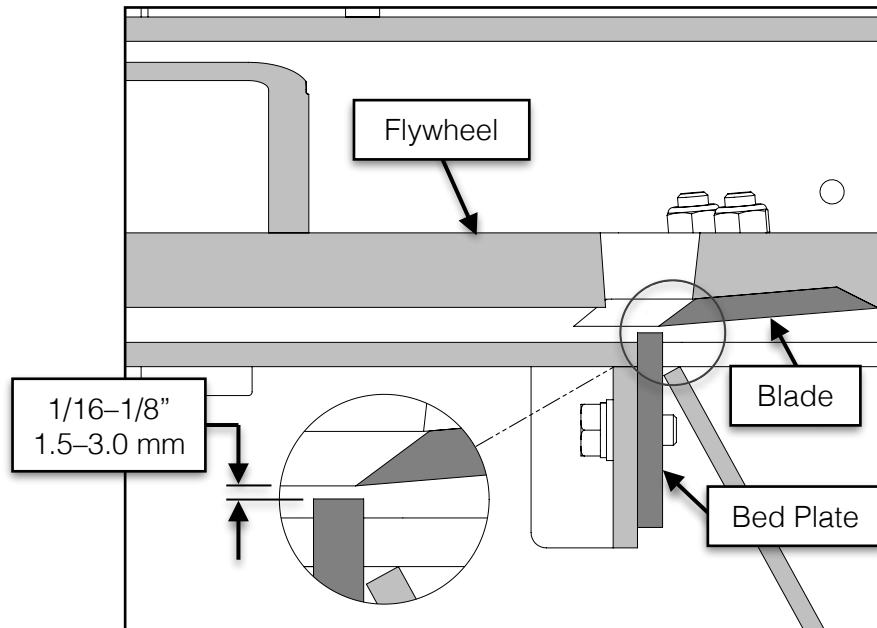
The bed plate (also known as the *anvil plate*) is located on the left side of the flywheel housing (when facing the infeed chute). For ideal chipping performance, the gap between the bed plate and the blades should be set to 1/16-1/8" (1.5-3 mm). Follow the steps below to set the gap properly. Failure to set the proper gap can lead to poor chipping performance and/or clogging.



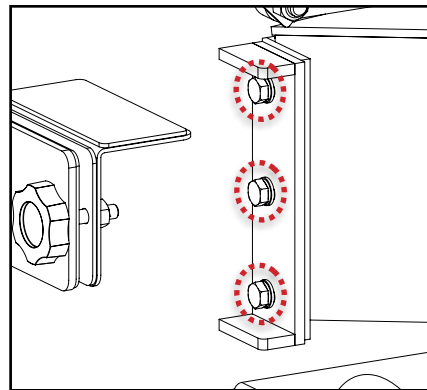
1. If installed, disconnect the PTO shaft from the tractor for safety.
2. Open the upper flywheel housing using a 24 mm socket/wrench by removing the M16 X 40 mm bolt and flat washer securing the upper and lower housings together.



3. With the flywheel exposed, manually rotate it so that the first blade lines up with the bed plate and note the gap between them. Use a flash light for better viewing if necessary. Repeat this process for the remaining three blades, noting which blade is closest. Use this blade to set the bed plate gap.



4. Use a socket/wrench to loosen the three (3) M10 X 25 mm hex bolts securing the bed plate to the lower flywheel housing so the bed plate is free to slide in and out. This movement will increase or decrease the gap between the bed plate and the cutting edge of the blade. Slide the bed plate by gripping the knob and adjust its position so that it is within 1/16-1/8" (1.5-3.0 mm) of the cutting edge of the blade. Ensure the gap is uniform along the entire edge of the blade.

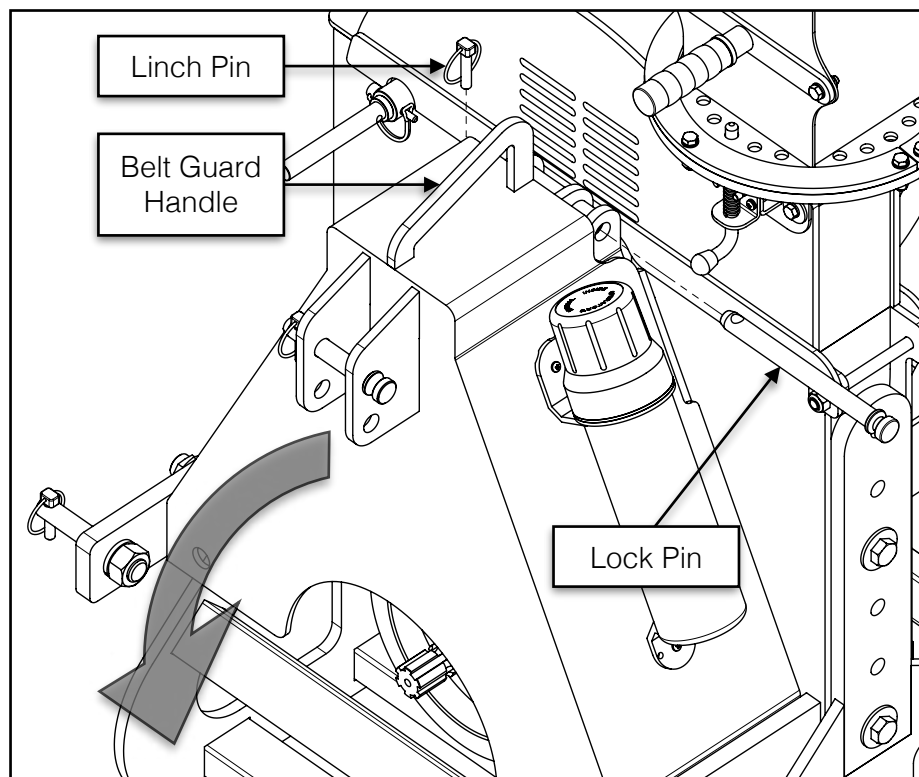


5. Torque the three (3) M10 X 25 mm bed plate hex bolts to 40 ft•lb (54 N•m) once the gap has been set correctly.
6. Rotate the flywheel by hand and note the gap at each blade. Again, the gap should be no more or less than 1/16-1/8" (1.5-3.0 mm) at each blade edge.
7. Close the upper flywheel housing and secure it to the lower housing by reinstalling the M16 X 40 mm bolt and flat washer.

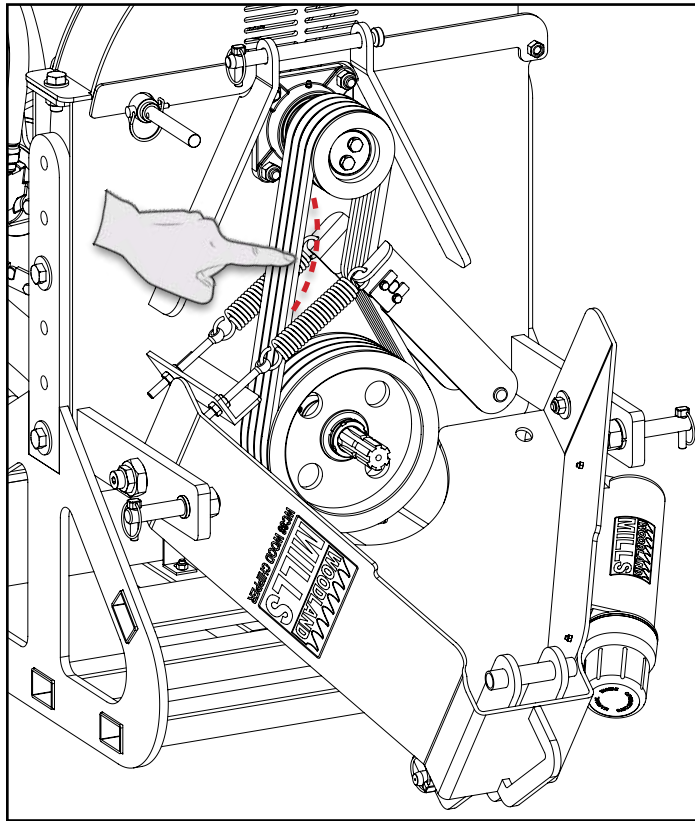
## ADJUSTING THE DRIVE BELTS' TENSION

Check the condition and tension of the drive belts after every 30 hours of operation. The belts are self-tensioning via two (2) extension springs. The amount of tension can be adjusted by following these steps:

1. If installed, disconnect the PTO shaft from the wood chipper for safety and to allow rotation of the belts and pulleys.
2. Remove the belt guard lock pin by first removing the linch pin and then sliding the lock pin out. Firmly grasp the handle on the top of the belt guard and rotate it downward. Warning: the belt guard is heavy.



3. Check the tension on the belts by pressing on them with your finger (see "**Checking Belt Tension**" below). There should not be any free slack in the belts. They should be under firm tension and not deflect more than ¼" (6 mm).
4. If the belts require more tension, the eyebolts connected to the spring can be adjusted by moving the M8 hex nuts (see "**Adjusting Belt Tension**" below). This will stretch the springs and increase the belt tension until the proper tension is achieved.
5. The belt guard can now be rotated back upwards and the lock pin reinstalled; secured with the linch pin.



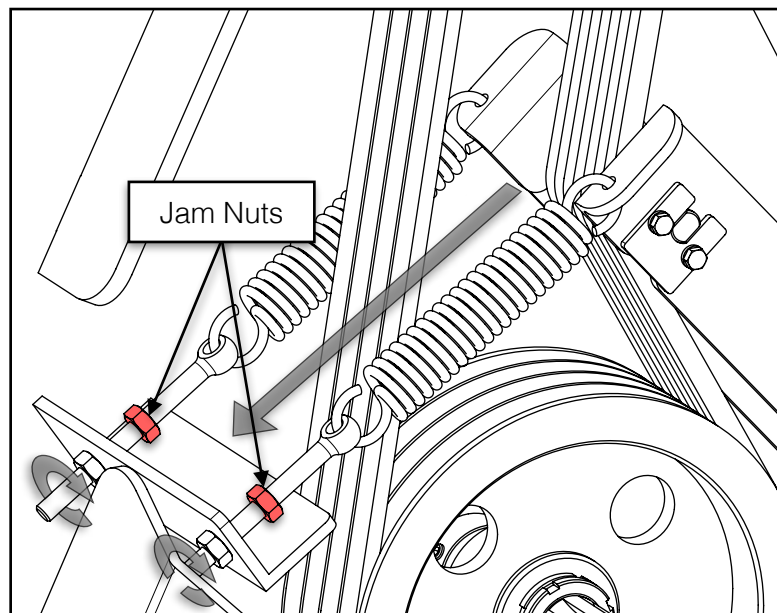
### Checking Belt Tension

The belts should not deflect more than 1/4" (6 mm) when firm pressure is applied. If the belts are too loose, adjust the tension as shown in "**Adjusting Belt Tension**" shown below.

### Adjusting Belt Tension

To increase the tension on the belts, first loosen the jam nuts on both of the eyebolts by rotating them clockwise until they are clear of the support bracket. Then rotate the bottom nuts clockwise, making sure each eyebolt nut is turned an equal amount so that the tension arm belt roller doesn't become skewed.

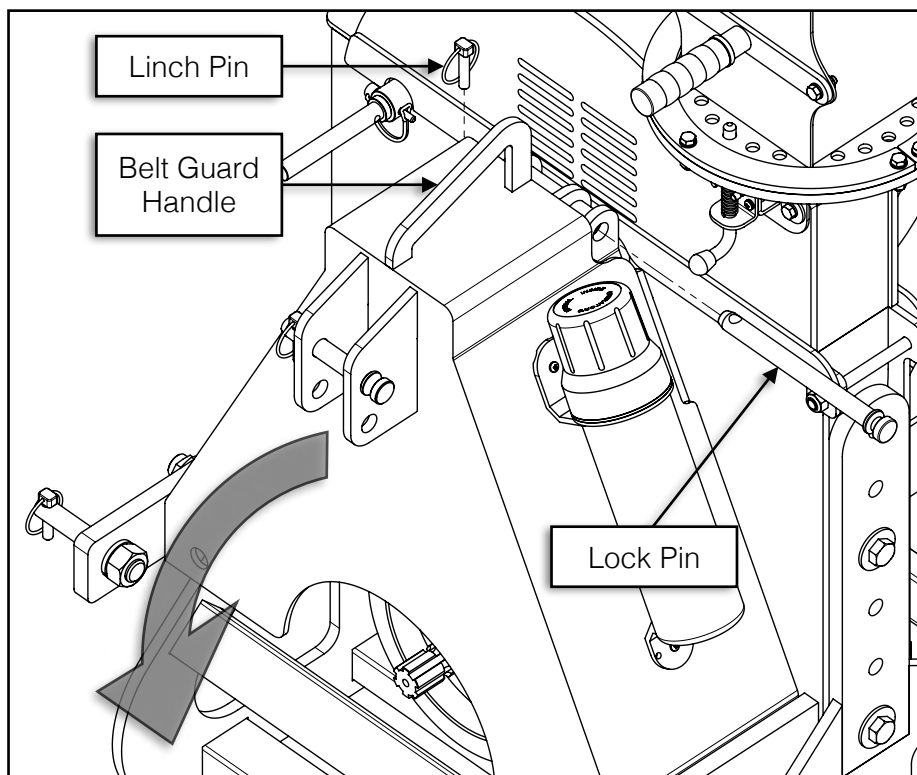
Once sufficient tension has been imparted to the belts, retighten the jam nuts securely to the support bracket.



## REPLACING THE DRIVE BELTS

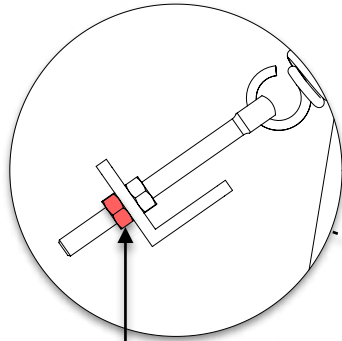
Check the condition and tension of the drive belts after every 30 hours of operation. If the infeed roller is not rotating, or it is rotating slowly, the belt could be slipping. A squealing noise may also be heard. In either case, these conditions can occur due to worn belts or improper belt tension (see the previous section, ***Adjusting the Drive Belts' Tension***). To replace worn belts, follow the steps below:

1. If installed, disconnect the PTO shaft from the wood chipper for safety.
2. Remove the belt guard lock pin by first removing the linch pin and then sliding the lock pin out. Firmly grasp the handle on the top of the belt guard and rotate it downward. **Warning: the belt guard is heavy.**

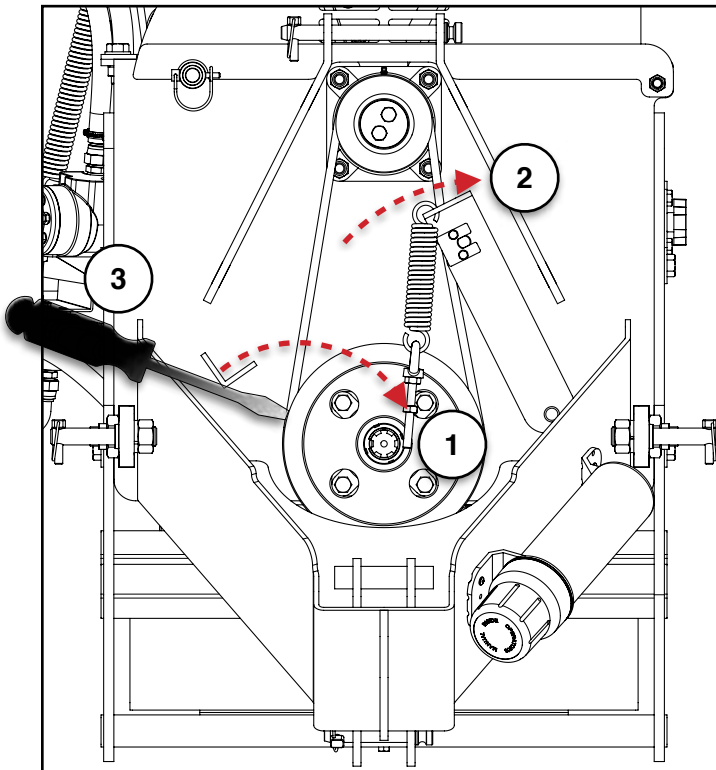
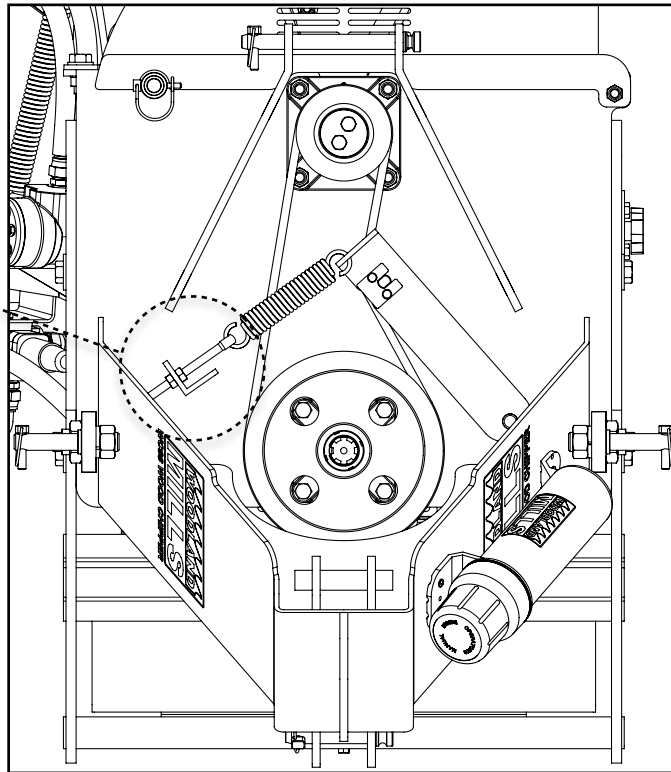


3. Using a 13 mm wrench, loosen the lower M8 hex nuts that secure the eyebolts to the support bracket until sufficient tension has been removed from the springs so the eyebolts can be completely removed from the support bracket. The belt tensioner arm can now be swung up out of the way allowing for removal of the belts from the pulleys.
4. Install the new belt around the pulleys first and then reinstall the spring. Re-tension the spring by tightening the lower M8 hex nut on the eyebolt. Refer to the previous section, ***Adjusting the Drive Belts' Tension***, for instructions on how to properly re-tension the belts.





Loosen and remove the lower M8 hex nuts from both of the eyebolts. Be sure to loosen each nut a little at a time so that the tension is released equally from both eyebolts.



With the eyebolts disconnected from the bracket, let them hang loose from the springs while still attached to the tension arm<sup>1</sup>.

With tension removed from the springs, the tension arm can be swung up out of the way<sup>2</sup>.

Use a pry bar or screwdriver to remove the old belts from the pulleys and install new BX53 belts<sup>3</sup>.

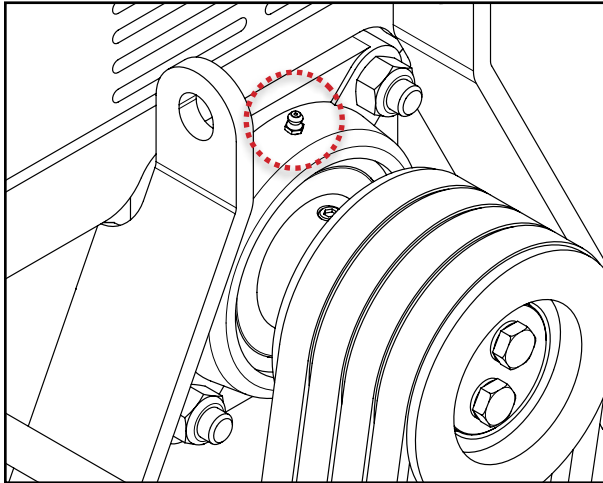
Reassemble the eyebolts to the bracket using the M8 hex nuts and re-tension the springs. Follow the steps in the ***previous section*** to ensure the correct tension is applied to the belts.

Rotate the belt guard up and secure it with the belt guard lock pin and linch pin.

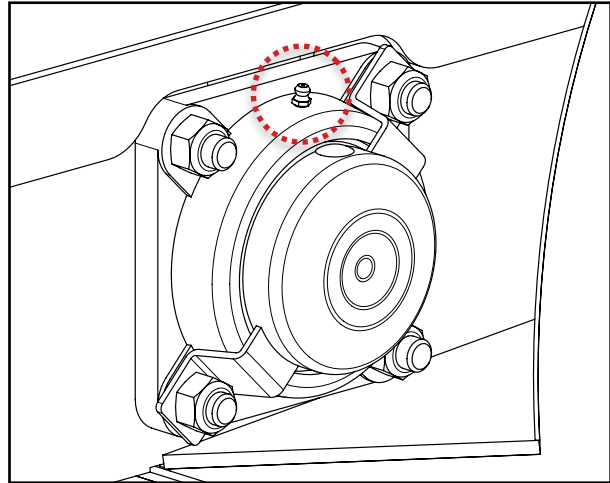


## GREASING BEARINGS AND PTO SHAFT

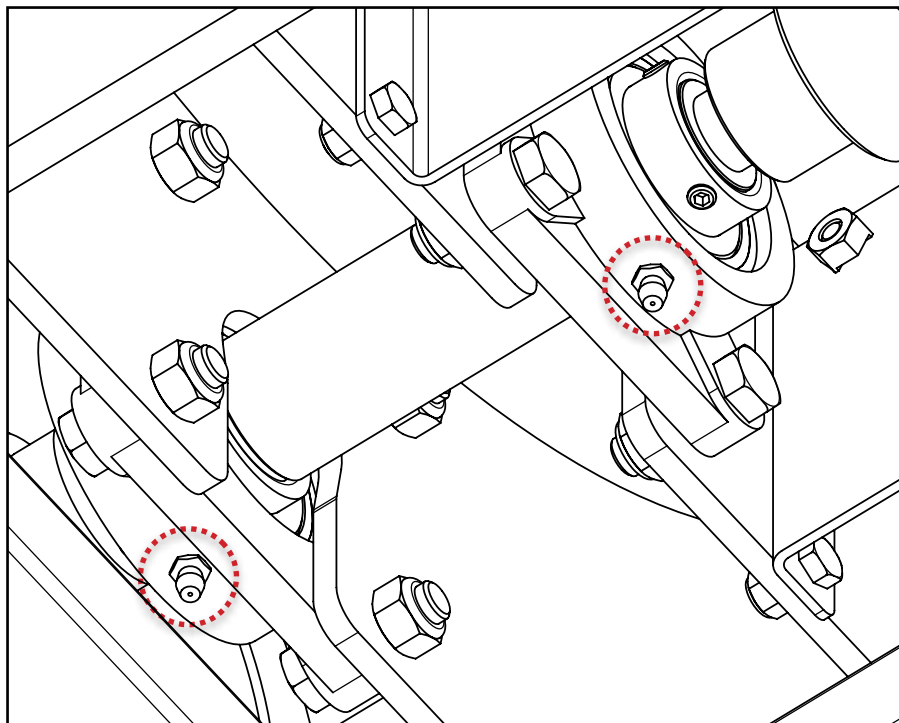
The wood chipper has seven (7) Zerk fitting grease points: two (2) flywheel shaft bearings, two (2) pump shaft bearings, one (1) infeed roller bearing, and two (2) U-joints—one at each end of the PTO shaft. Check each grease point prior to use and add grease as necessary.



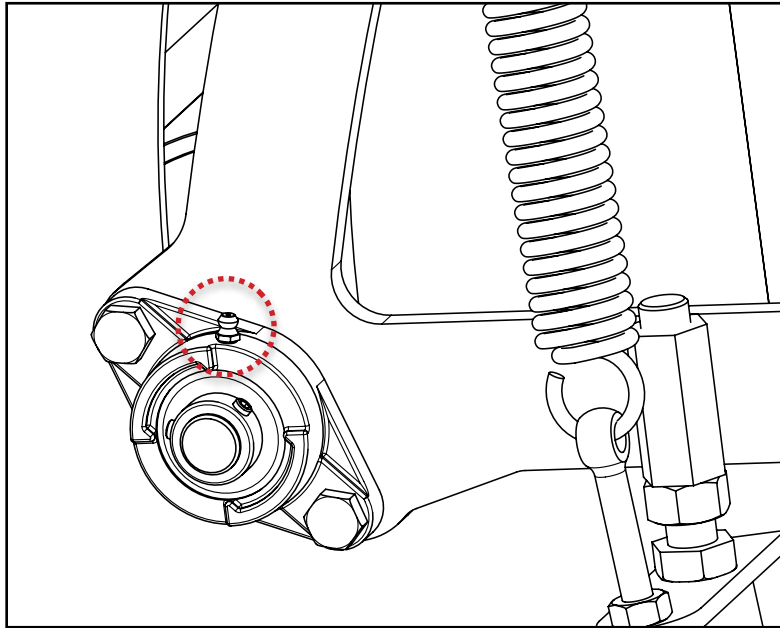
**Front Flywheel Shaft Bearing**



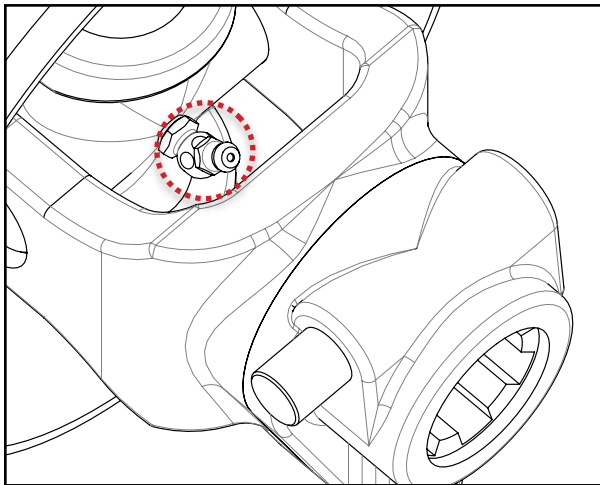
**Rear Flywheel Shaft Bearing**



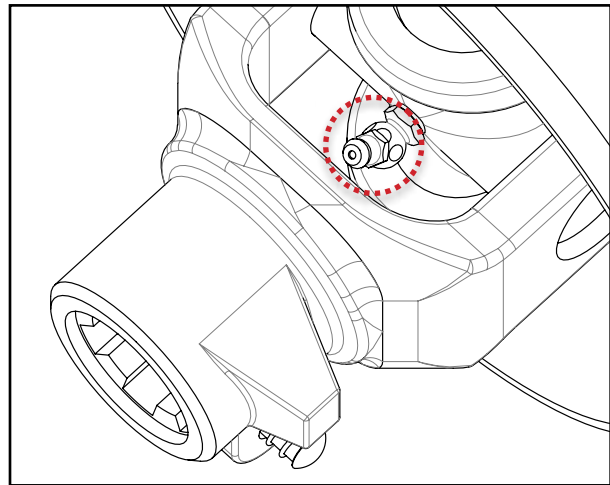
**Front and Rear Pump Shaft Bearings**  
(Underside of flywheel housing)



**Infeed Roller Bearing**



**PTO Shaft U-Joint 1**

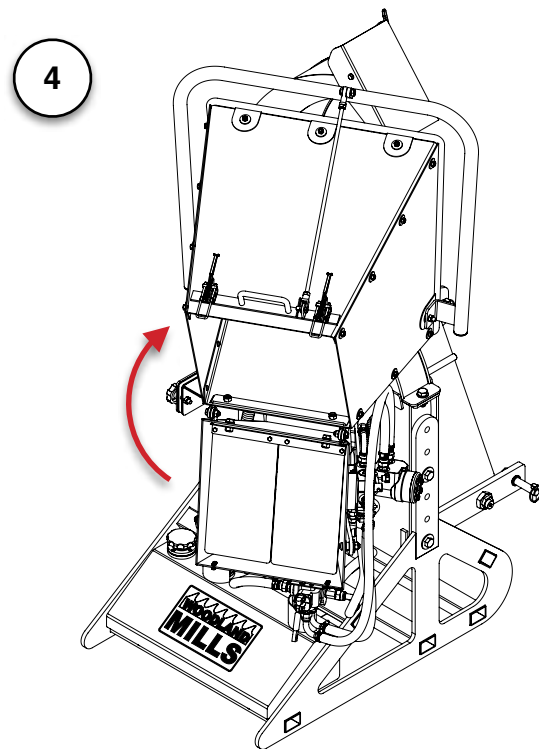
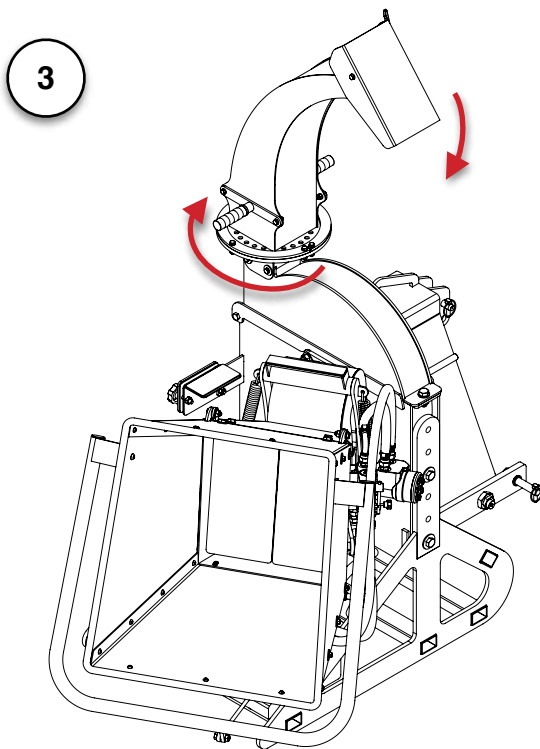
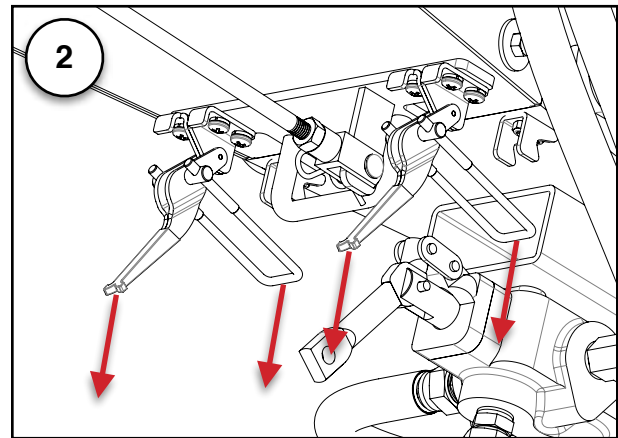
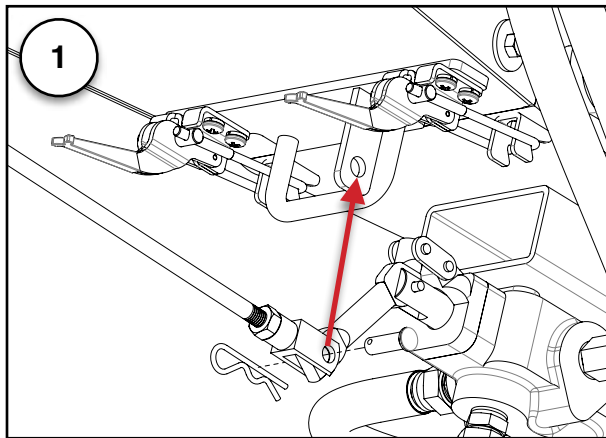


**PTO Shaft U-Joint 2**

## STORAGE

When the wood chipper is not in use, it can be stored to utilize a smaller footprint to save space. Follow these steps to put the wood chipper in its storage state:

1. Disconnect the control bar linkage from the directional control valve and reconnect it to the tab on the underside of the infeed chute bottom panel.
2. Disengage the two (2) latches on the underside of the infeed chute bottom panel.
3. Rotate the discharge chute so that it points to the right and then rotate the deflector until it points down.
4. Swing the infeed chute up until it is resting on the swingarm.





## TROUBLESHOOTING

Problem/Issue	Possible Causes	Resolution Options
Brush is feeding too slowly	<ol style="list-style-type: none"> <li>1. Infeed roller control set too low.</li> <li>2. PTO RPM below 540.</li> <li>3. Blades are dull.</li> <li>4. Improper bed plate gap.</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase infeed roller control to a higher value. Refer to <a href="#">page 31</a>.</li> <li>2. Adjust tractor RPMs to 540 at output.</li> <li>3. Reverse, sharpen, or replace blades. Refer to <a href="#">page 35</a> &amp; <a href="#">page 37</a>.</li> <li>4. Re-set bed plate gap. Refer to <a href="#">page 38</a>.</li> </ol>
Brush exiting discharge chute is stringy	<ol style="list-style-type: none"> <li>1. Blades are dull.</li> <li>2. Brush is excessively sappy.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reverse, sharpen, or replace blades. Refer to <a href="#">page 35</a> &amp; <a href="#">page 37</a>.</li> <li>2. Clean blades and bed plate.</li> </ol>
Excessive clogging	<ol style="list-style-type: none"> <li>1. Blades are dull.</li> <li>2. Improper bed plate gap.</li> <li>3. PTO RPM below 540.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reverse, sharpen, or replace blades. Refer to <a href="#">page 35</a> &amp; <a href="#">page 37</a>.</li> <li>2. Re-set bed plate gap. Refer to <a href="#">page 38</a>.</li> <li>3. Clean blades and bed plate.</li> <li>4. Adjust tractor RPMs to 540 at output.</li> </ol>
Drive belts slipping or squeaking	<ol style="list-style-type: none"> <li>1. Belt tension not set properly.</li> <li>2. Belts are old/worn.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust belts' tension. Refer to <a href="#">page 40</a>.</li> <li>2. Replace belts. Refer to <a href="#">page 42</a>.</li> </ol>
Excessive noise coming from flywheel bearings	<ol style="list-style-type: none"> <li>1. Bearings not sufficiently lubricated.</li> <li>2. Bearings are worn.</li> </ol>	<ol style="list-style-type: none"> <li>1. Grease bearings. Refer to <a href="#">page 44</a>.</li> <li>2. Replace bearings. Please contact Woodland Mills for bearing replacement instructions.</li> </ol>



## PARTS LIST

Item	Qty	Part No.	Description
1	1	0001248	BASE
2	1	0001168	HYDRAULIC TANK, 20 L [5.3 gal]
3	1	0001164	HYDRAULIC TANK INTAKE LINE
4	1	0001752	HYDRAULIC INTAKE FILTER, 1/2 NPT
5	1	0001159	OIL SCREEN, 50 mm DIA X 116 mm LG SCREEN
6	1	0001257	LOWER FLYWHEEL HOUSING
7	2	0001284	BOTTOM INFEED ROLLER SHAFT
8	2	0001285	BOTTOM INFEED ROLLER
9	2	0001286	BOTTOM INFEED ROLLER LOCKING PLATE
10	1	0001295	SWINGARM
11	2	0001872	SWINGARM PIVOT BUSHING, 6 mm SHOULDER
12	2	0001812	EXTENSION SPRING, 33 mm OD, 5 mm WIRE, 285 mm LG
13	1	0001179	HYDRAULIC MOTOR BEARING HOUSING, FOR BEARING 6205-2RS
14	1	0001589	INFEED ROLLER
15	1	0001201	INFEED ROLLER COVER PLATE
16	1	0001258	INNER INFEED CHUTE HINGE BRACKET
17	2	0001304	LATCH-STYLE TOGGLE CLAMP
18	1	0001298	PLASTIC CURTAIN "L" BAR
19	2	0001299	PLASTIC CURTAIN
20	1	0001301	PLASTIC CURTAIN PLATE
21	1	0001294	BED PLATE
22	1	0001264	LOWER SHAFT
23	1	0001571	FLEXIBLE SHAFT COUPLING, 24 mm SHAFT TO 12 mm SPLINED SHAFT
24	1	0001271	LOWER SHAFT SPACER
25	2	0001734	SPACER, 40.6 ID X 46 OD X 1.5 mm THK
26	1	0001875	PULLEY, 4-GROOVE, 250 mm DIA, 40 mm SHAFT
27	1	0001274	HYDRAULIC PUMP HOUSING, SIDE
28	1	0001275	HYDRAULIC PUMP HOUSING, TOP
29	1	0001272	FLYWHEEL
30	1	0001269	FLYWHEEL SHAFT
31	4	0001158	SPACER, 50.6 ID X 56 OD X 1.5 mm THK
32	1	0001874	PULLEY, 4-GROOVE, 120 mm DIA, 40 mm SHAFT
33	1	0001270	FLYWHEEL SHAFT RETAINING PLATE
34	1	0001184	FLYWHEEL SHAFT COVER, UCF210 BEARING
35	1	0001795	FLYWHEEL SHAFT COVER PLUG
36	4	0001273	FLYWHEEL BLADE, 113 X 69 X 8 mm
37	1	0001568	FLYWHEEL LOCKING PIN
38	1	0001265	BELT TENSIONER ARM
39	1	0001266	BELT TENSIONER SHAFT
40	1	0001267	BELT TENSIONER ROLLER
41	2	0001268	BELT TENSIONER ARM LOCKING PLATE
42	1	0003552	BELT TENSIONER ARM BUSHING
43	1	0003882	SPACER, POM, 20 ID X 32 OD X 3 mm LG
44	2	0001873	EXTENSION SPRING, 33 mm OD, 5 mm WIRE, 165 mm LG
45	1	0003142	BELT HOUSING



Item	Qty	Part No.	Description
46	2	0001577	ECCENTRIC BUSHING, M30 X 3.5, 30 mm LG, 16 mm THRU, 3 mm ECCENTRICITY
47	1	0001575	BELT HOUSING LOCKING PIN
48	1	0001655	MANUAL TUBE
49	2	0001576	LOWER 3-POINT HITCH PIN, 21 mm DIA X 80 mm LG, M24 X 3 THD
50	1	0001156	UPPER 3-POINT HITCH PIN, 19 mm DIA X 135 mm LG
51	1	0001259	INFEED CHUTE TOP PANEL
52	1	0001262	OUTER INFEED CHUTE HINGE BRACKET
53	2	0001261	INFEED CHUTE SIDE PANEL
54	1	0001260	INFEED CHUTE BOTTOM PANEL
55	1	0001288	ROUND EDGE BAR, INFEED CHUTE
56	1	0001287	CONTROL ARM, INFEED ROLLER
57	2	0001781	PLASTIC END CAP, 38 mm DIA
58	1	0001289	LINKAGE ROD, INFEED ROLLER
59	1	0002807	UPPER FLYWHEEL HOUSING
60	1	0002806	DISCHARGE CHUTE NOZZLE
61	1	0001441	DISCHARGE CHUTE
62	2	0001170	DISCHARGE CHUTE RETAINER PLATE
63	1	0001172	DISCHARGE CHUTE LOCK PIN ASSEMBLY, 12 mm DIA
64	2	0001175	DISCHARGE CHUTE ROTATION HANDLE
65	2	0001030	HANDLE GRIP, GROOVED, 26 mm ID, 108 mm LG
66	1	0001177	DISCHARGE CHUTE DEFLECTOR
67	1	0001786	ADJUSTABLE HANDLE, 78 X 54 mm, M10 X 1.5
68	1	0001276	CHAINSAW HOLDER MOUNTING BRACKET
69	1	0001277	CHAINSAW HOLDER CLAMPING PLATE
70	2	0001236	CHAINSAW HOLDER RUBBER MAT
71	1	0001283	CHAINSAW HOLDER TOP RUBBER PAD
72	2	0002699	SPACER, 11 ID X 21 OD X 11 mm LG
73	1	0001910	KNOB, MULTI-LOBE, 58 mm OD, M10 X 1.5, 45 mm LG
74	1	0001761	PTO SHAFT, TRIMMABLE, 31-37 in (790-951 mm)
75	2	0003297	HYDRAULIC LINE ASSEMBLY, STR AND ELB FITTINGS, 350 mm LG
76	3	0003298	HYDRAULIC LINE ASSEMBLY, STR AND ELB FITTINGS, 500 mm LG
77	1	0003300	HYDRAULIC LINE ASSEMBLY, STR AND ELB FITTINGS, 600 mm LG
78	1	0003303	HYDRAULIC LINE ASSEMBLY, STR AND ELB FITTINGS, 1450 mm LG
79	4	BX53	V-BELT, COGGED, BX53
80	1	UCFL204	FLANGE BEARING, OVAL, 2-BOLT, UCFL204, 20 mm BORE, 90 mm C-C
81	1	UCF207	FLANGE BEARING, SQ, 4-BOLT, UCF207, 35 mm BORE, 92 mm C-C
82	1	UCF208	FLANGE BEARING, SQ, 4-BOLT, UCF208, 40 mm BORE, 102 mm C-C
83	2	UCF210	FLANGE BEARING, SQ, 4-BOLT, UCF210, 50 mm BORE, 111 mm C-C
84	1	CBT-F310F3L34HL	HYDRAULIC GEAR PUMP, 10 mL/r, SPLINE SHAFT
85	1	DCV	DIRECTIONAL CONTROL VALVE
86	1	FC51-NPT1/2	VARIABLE FLOW CONTROL VALVE, 1/2 in NPT, 0-16 gal/min
87	1	02816A1WU	HYDRAULIC MOTOR
88	6	6003-2RS	BALL BEARING, SEALED, 6003-2RS, 17 mm BORE, 35 mm OD, 10 mm WIDE
89	1	6205-2RS	BALL BEARING, SEALED, 6205-2RS, 25 mm BORE, 52 mm OD, 15 mm WIDE
90	10	HDW	FITTING, COUPLER, 1/2 NPT TO 7/8-14 UNF
91	1	HDW	FITTING, ELBOW, 90°, 1/2 NPT TO 7/8-14 THD
92	1	HDW	FITTING, TEE, 1/2 NPT TO 7/8-14 (2X)
93	1	HDW	CLEVIS PIN, 10 mm DIA, 24 mm USABLE LG, 30 mm LG





Item	Qty	Part No.	Description
94	1	HDW	CLEVIS ROD END, M10 X 1.5 THD, 10 mm ID, 10 mm JAW OPENING
95	1	HDW	ROD END BALL JOINT, 10 mm, M10 X 1.5 FEM THD
96	1	HDW	HAIRPIN COTTER PIN, 10-16 mm CLEVIS, 3 mm WIRE DIA
97	1	HDW	LOCKING PIN, ROUND, 1/4 in DIA, 1-3/8 in USEABLE LG
98	4	HDW	LINCH PIN, 10 mm DIA, 38 mm USEABLE LG
99	3	HDW	HEX BOLT, M6 X 1, 10 mm LG
100	4	HDW	HEX BOLT, M6 X 1, 12 mm LG
101	4	HDW	HEX BOLT, M6 X 1, 20 mm LG
102	2	HDW	HEX BOLT, M6 X 1, 60 mm LG, 18 mm LG THD
103	4	HDW	HEX BOLT, M8 X 1.25, 14 mm LG
104	6	HDW	HEX BOLT, M8 X 1.25, 16 mm LG
105	10	HDW	HEX BOLT, M8 X 1.25, 20 mm LG
106	5	HDW	HEX BOLT, M8 X 1.25, 25 mm LG
107	4	HDW	HEX BOLT, M8 X 1.25, 30 mm LG
108	6	HDW	HEX BOLT, M8 X 1.25, 35 mm LG
109	1	HDW	HEX BOLT, M8 X 1.25, 50 mm LG
110	1	HDW	HEX BOLT, M8 X 1.25, 55 mm LG, 22 mm LG THD
111	2	HDW	HEX BOLT, M8 X 1.25, 80 mm LG, 22 mm LG THD
112	5	HDW	HEX BOLT, M10 X 1.5, 25 mm LG
113	3	HDW	HEX BOLT, M10 X 1.5, 35 mm LG
114	2	HDW	HEX BOLT, M10 X 1.5, 45 mm LG
115	2	HDW	HEX BOLT, M12 X 1.75, 20 mm LG
116	2	HDW	HEX BOLT, M12 X 1.75, 25 mm LG
117	8	HDW	HEX BOLT, M12 X 1.75, 40 mm LG
118	2	HDW	HEX BOLT, M12 X 1.75, 50 mm LG
119	1	HDW	HEX BOLT, M12 X 1.75, 140 mm LG, 30 mm LG THD
120	1	HDW	HEX BOLT, M16 X 2, 40 mm LG
121	4	HDW	HEX BOLT, M16 X 2, 60 mm LG, 38 mm LG THD
122	2	HDW	HEX BOLT, M16 X 2, 80 mm LG, 38 mm LG THD
123	4	HDW	EYEBOLT, DIN444, M10 X 1.5, 120 mm LG
124	19	HDW	BUTTON HEAD SCREW, M8 X 1.25, 18 mm LG
125	2	HDW	BUTTON HEAD SCREW, M10 X 1.5, 35 mm LG
126	2	HDW	BUTTON HEAD SCREW, M12 X 1.75, 50 mm LG
127	4	HDW	SCREW, PPH, M5 X 0.8, 16 mm LG
128	3	HDW	SCREW, PPH, M5 X 0.8, 20 mm LG
129	8	HDW	SCREW, PPH, M6 X 1, 10 mm LG
130	4	HDW	SCREW, PPH, M6 X 1, 14 mm LG
131	8	HDW	SCREW, HFH, M10 X 1.5, 40 mm LG, CL 10.9
132	8	HDW	SCREW, HFH, M14 X 2, 45 mm LG
133	4	HDW	SHCS, M5 X 0.8, 14 mm LG
134	4	HDW	SHCS, M6 X 1, 20 mm LG
135	4	HDW	SHCS, M16 X 2, 50 mm LG
136	2	HDW	SHLDR SCREW, HEX HEAD, 11 X 15 mm LG SHLDR, M10 X 1.5 X 20 mm LG THD
137	2	HDW	SHLDR SCREW, 16 X 55 mm SHLDR, M12 X 1.75 X 18 mm LG THD
138	2	HDW	SET SCREW, FLAT TIP, M6 X 1, 6 mm LG
139	1	HDW	SET SCREW, FLAT TIP, M6 X 1, 8 mm LG
140	8	HDW	FLAT WASHER, M5
141	24	HDW	FLAT WASHER, M8

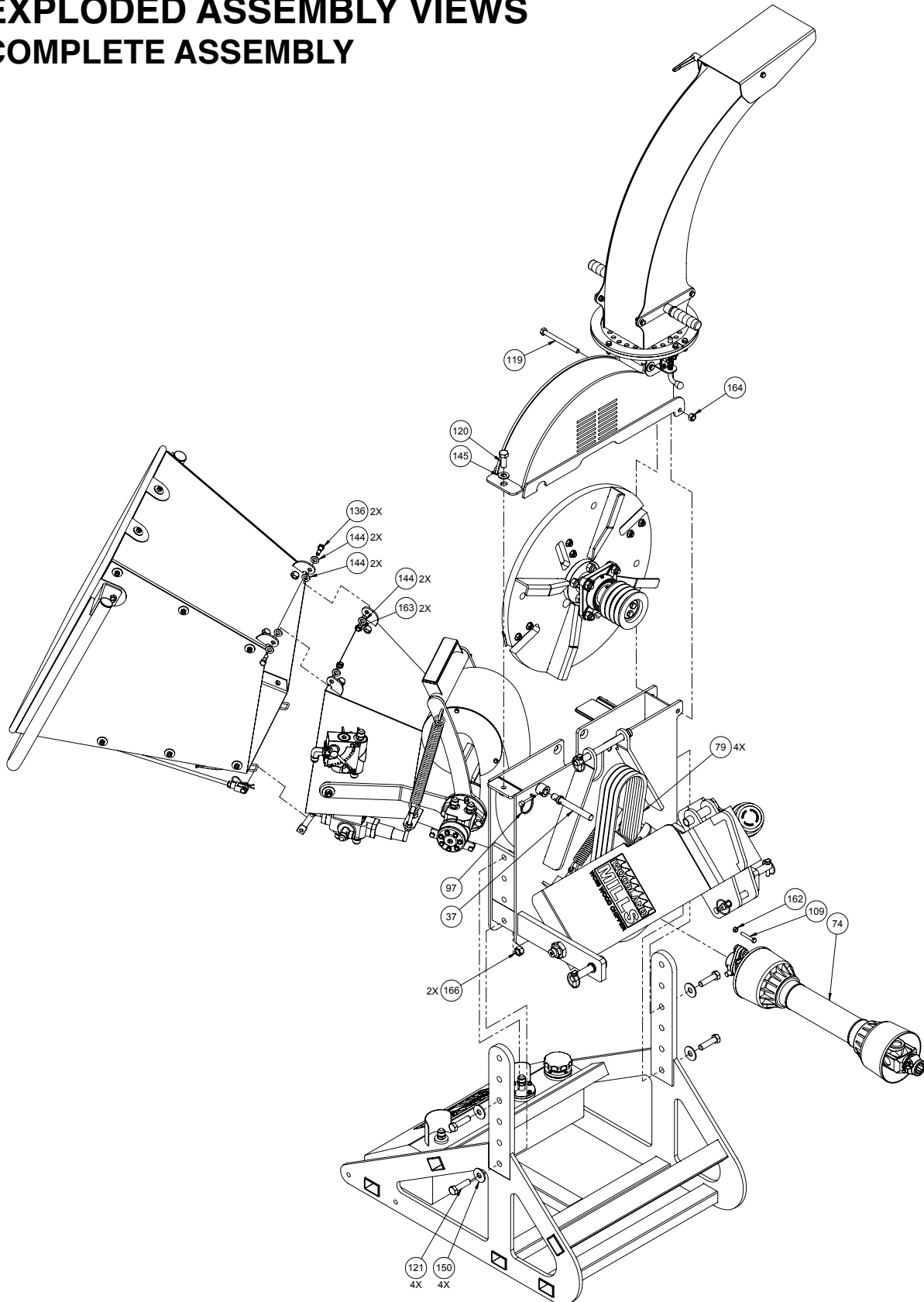




Item	Qty	Part No.	Description
142	3	HDW	FLAT WASHER, M10
143	4	HDW	FLAT WASHER, M12
144	6	HDW	FLAT WASHER, M12, 24 mm OD, NYLON
145	3	HDW	FLAT WASHER, M16
146	24	HDW	FENDER WASHER, M8, 30 mm OD
147	1	HDW	FENDER WASHER, M10, 26 mm OD
148	2	HDW	FENDER WASHER, M10, 30 mm OD
149	4	HDW	FENDER WASHER, M12, 37 mm OD
150	4	HDW	FENDER WASHER, M16, 45 mm OD
151	19	HDW	SPLIT LOCK WASHER, M6
152	11	HDW	SPLIT LOCK WASHER, M8
153	5	HDW	SPLIT LOCK WASHER, M10
154	2	HDW	SPLIT LOCK WASHER, M24
155	1	HDW	HEX NUT, M10 X 1.25
156	9	HDW	HEX NUT, M10 X 1.5
157	2	HDW	HEX NUT, M16 X 2
158	2	HDW	HEX NUT, M24 X 3
159	2	HDW	HEX NUT, THIN, M30 X 3.5, 15 mm THK
160	7	HDW	LOCK NUT, M5 X 0.8
161	10	HDW	LOCK NUT, M6 X 1
162	47	HDW	LOCK NUT, M8 X 1.25
163	17	HDW	LOCK NUT, M10 X 1.5
164	19	HDW	LOCK NUT, M12 X 1.75
165	8	HDW	LOCK NUT, M14 X 2
166	6	HDW	LOCK NUT, M16 X 2
167	2	HDW	SLOTTED NUT, ROUND, M40 X 1.5
168	1	HDW	PARALLEL KEY, 8 X 7 X 25 mm LG
169	1	HDW	PARALLEL KEY, 8 X 8 X 40 mm LG
170	1	HDW	PARALLEL KEY, 12 X 10 X 60 mm LG
171	1	HDW	PARALLEL KEY, 12 X 12 X 50 mm LG
172	6	HDW	RETAINING RING, EXTERNAL, 17 mm SHAFT (16.2 mm GROOVE)
173	1	HDW	O-RING, 50 mm ID / 57 mm OD, 3.5 mm THK

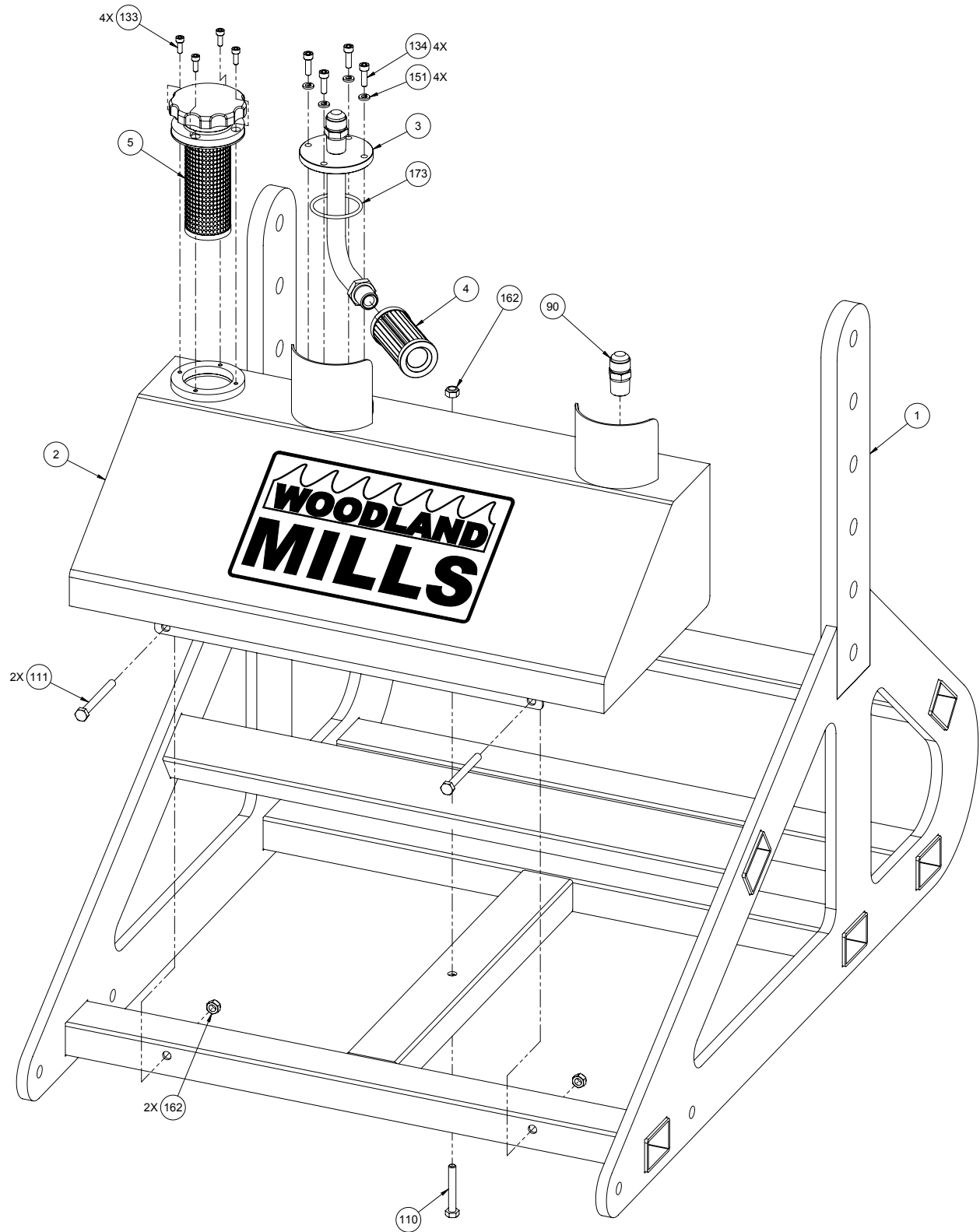


# EXPLODED ASSEMBLY VIEWS COMPLETE ASSEMBLY



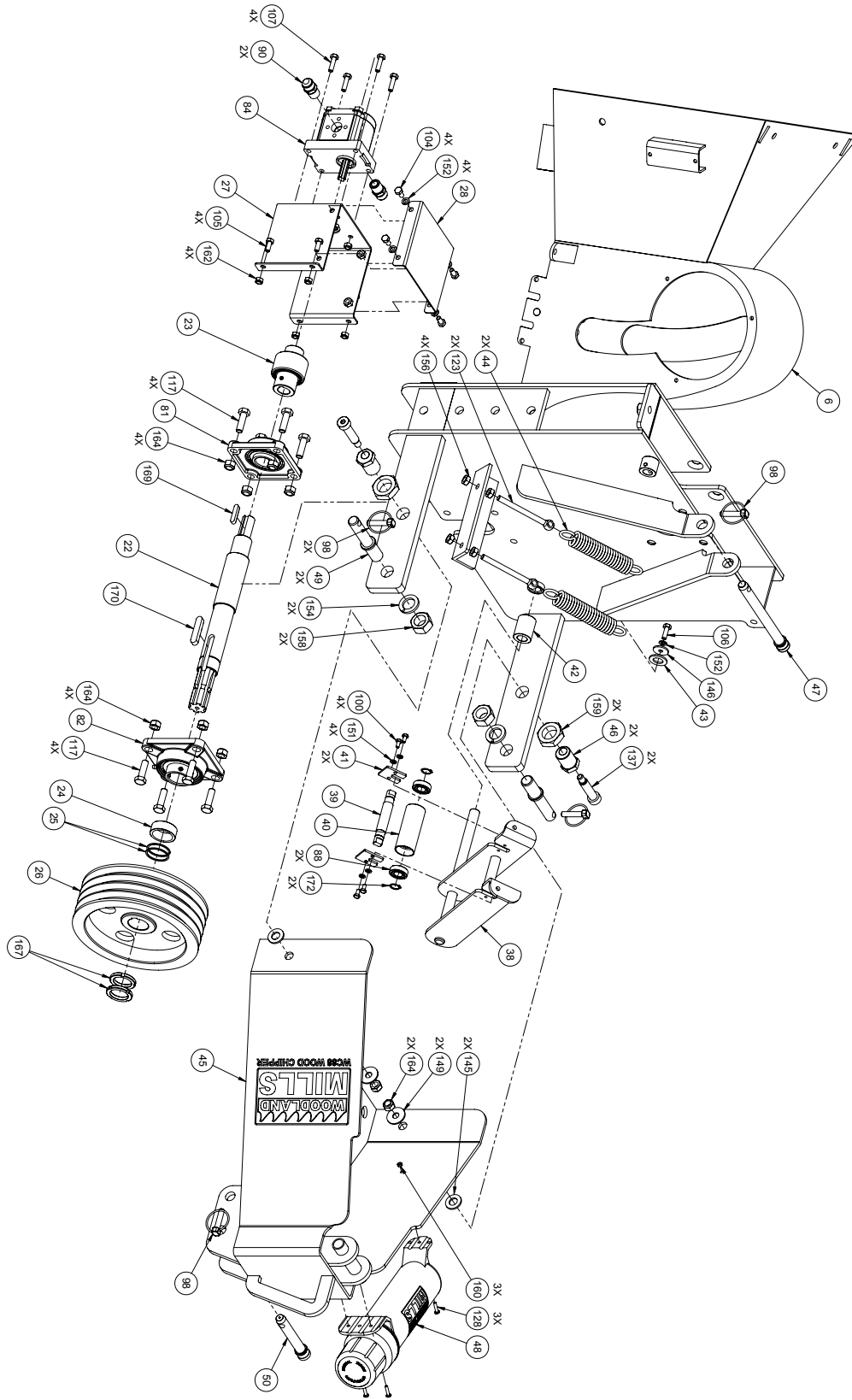


# BASE



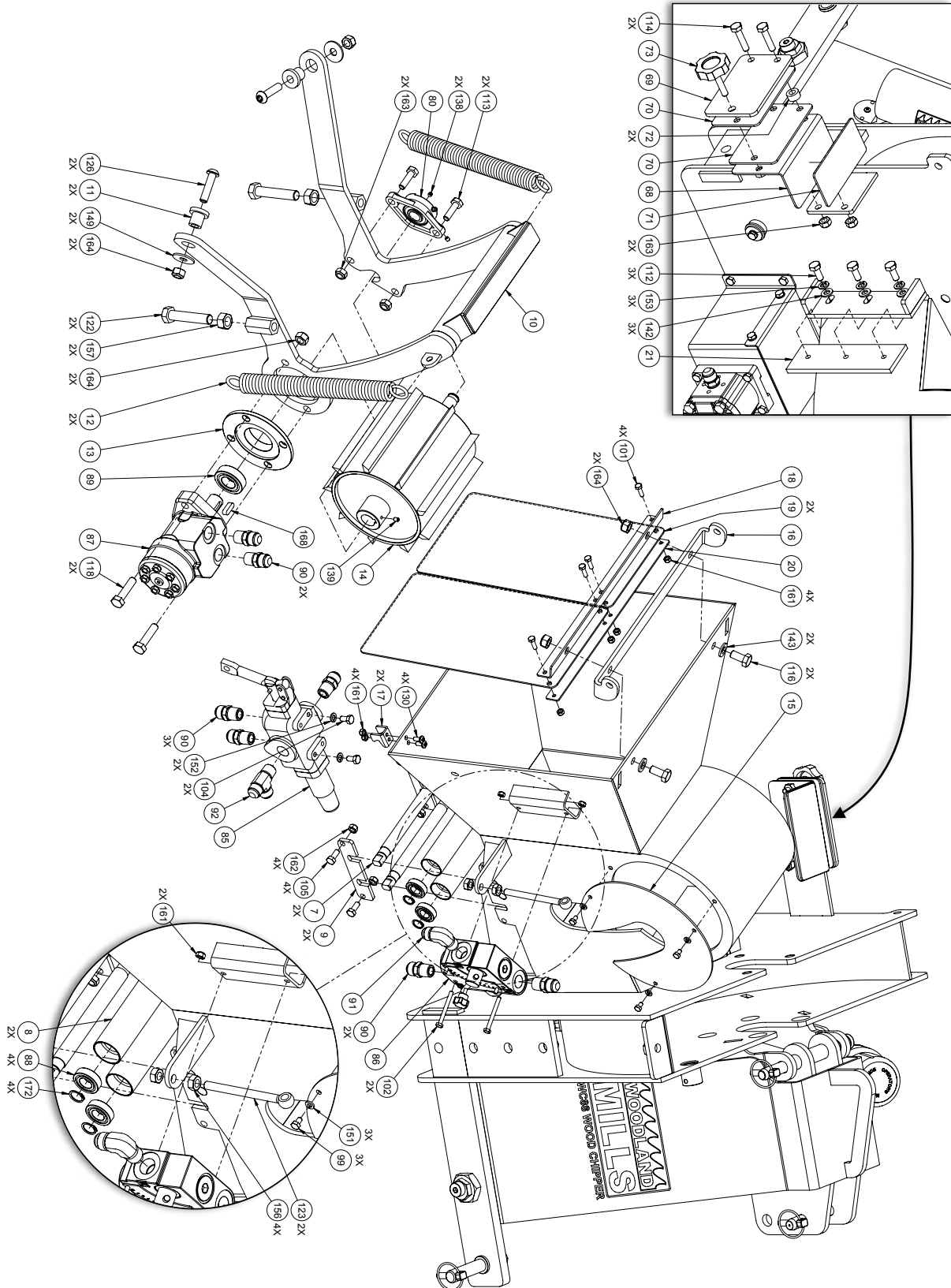


# LOWER FLYWHEEL HOUSING [FRONT]



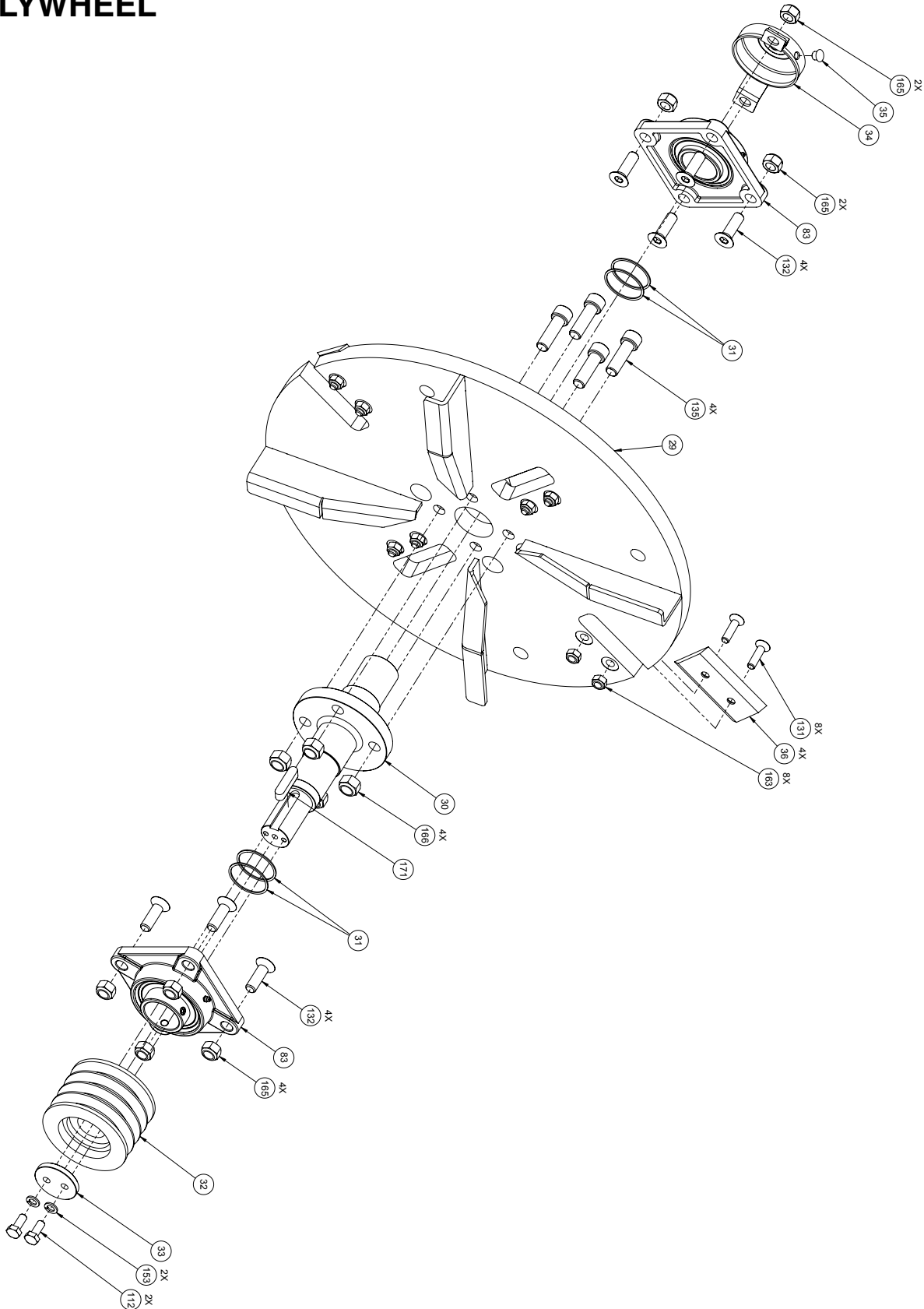


# LOWER FLYWHEEL HOUSING [REAR]



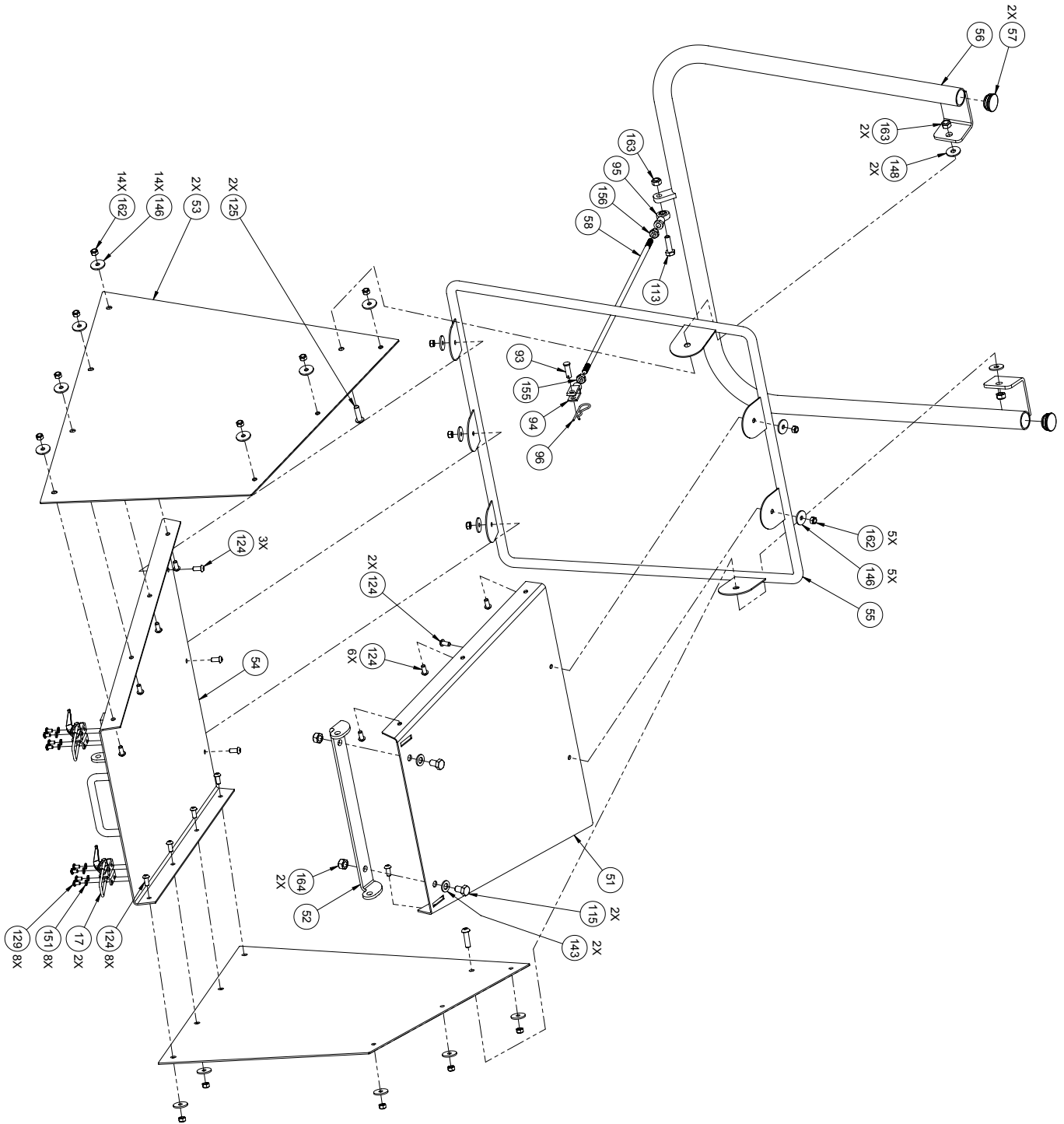


# FLYWHEEL



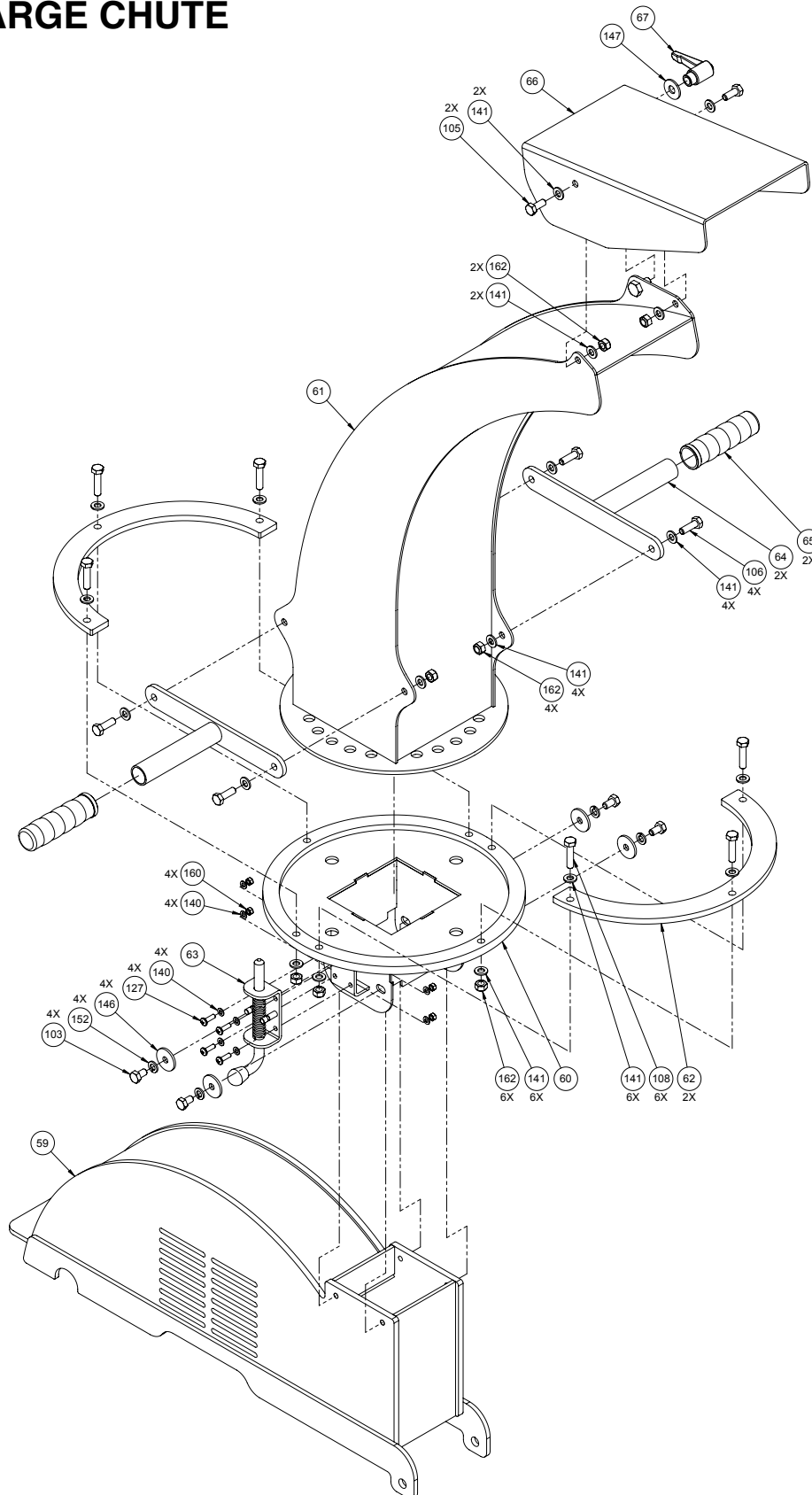


# INFEED CHUTE





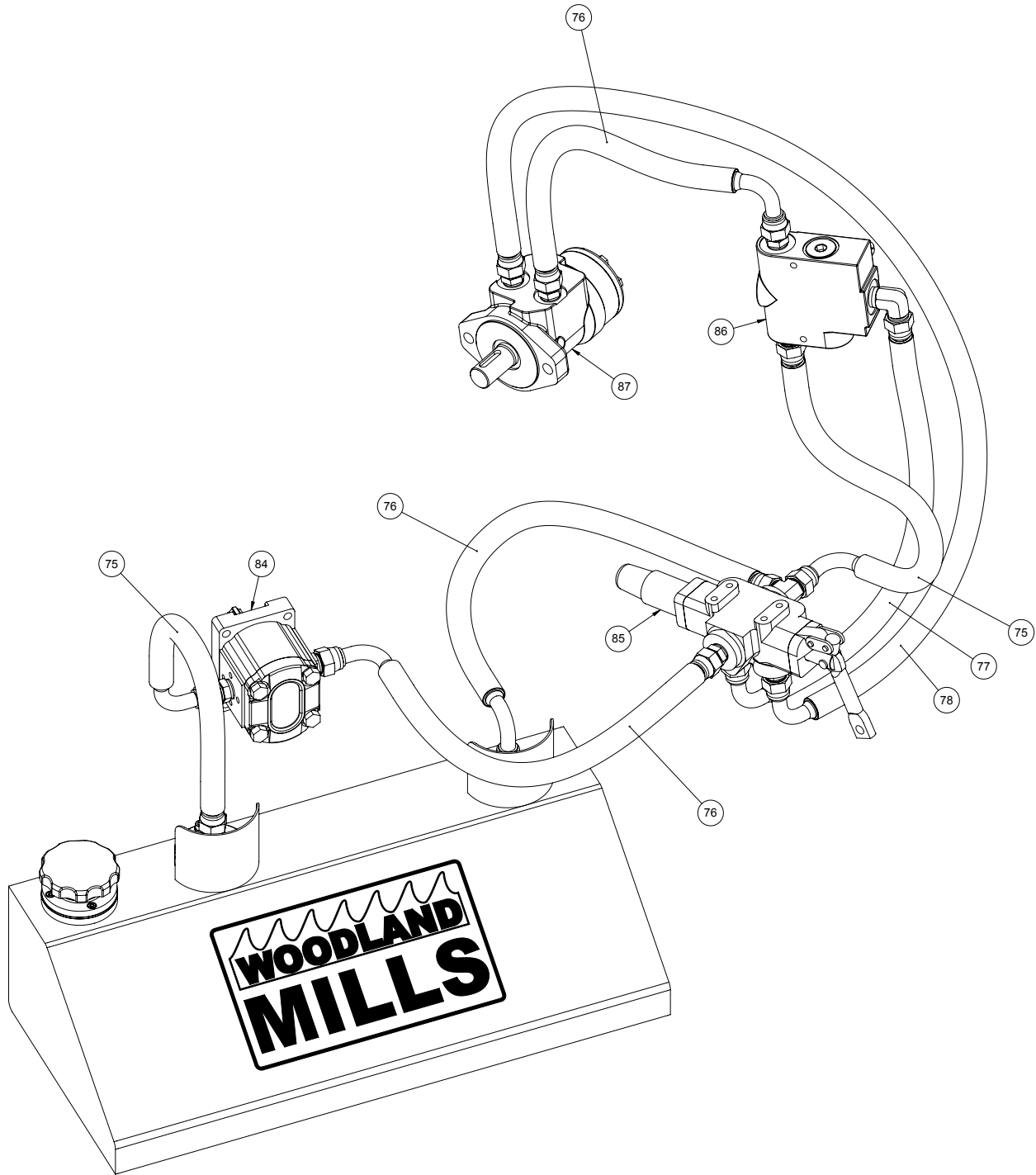
# DISCHARGE CHUTE







# HYDRAULIC LINES





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