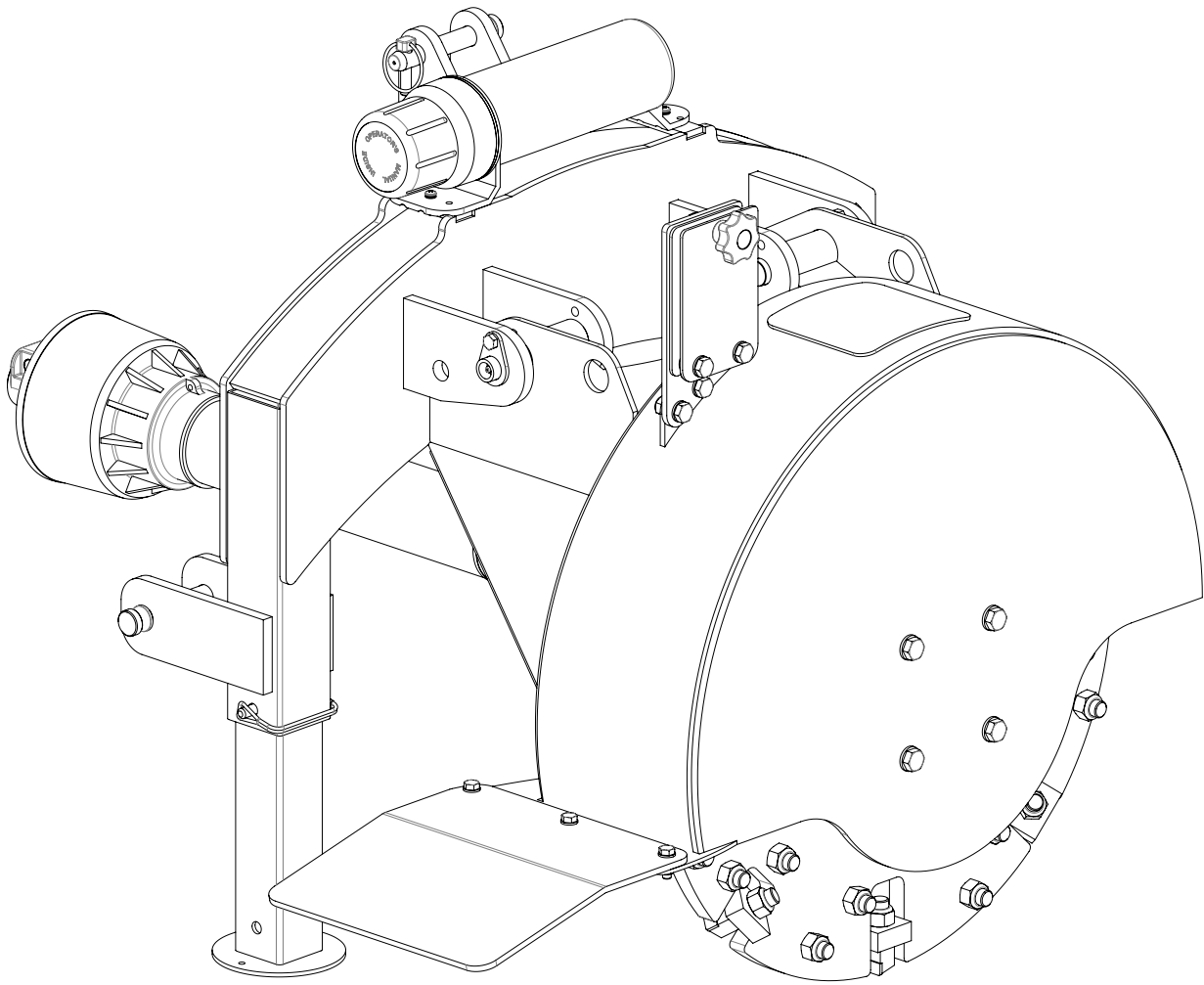


# WG24 PTO STUMP GRINDER



## 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 stump grinder. 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 not be 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 with the product.

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



## INTENDED USE

This stump grinder is designed for grinding stumps using a tractor's Power Take-Off (PTO) at an operating rpm of 540.

## TECHNICAL SPECIFICATIONS

Item	Specification
Recommended Horsepower	20 - 45 hp
Flywheel Diameter	24" (610 mm)
Number of Teeth	34
Tooth	Grade 8.8 Carbide Steel, Bolt-in
Tooth Torque Specification	160 ft•lb (215 N•m)
Required PTO Speed	540 rpm
Maximum Cutting Depth Per Pass	5" (127 mm)
Maximum Depth Below Grade	6" (152 mm)
Shipping Weight	470 lb (213 kg)

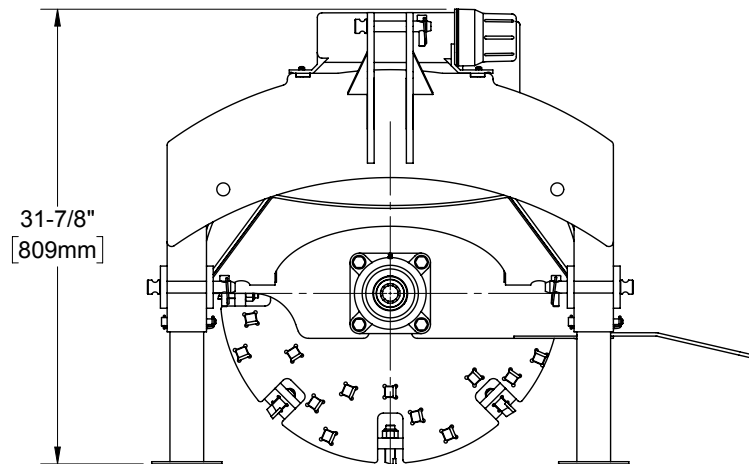
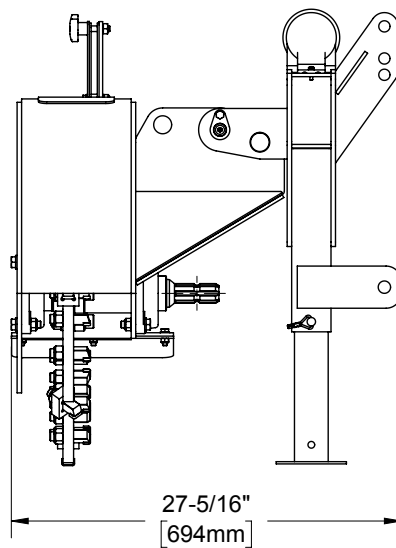
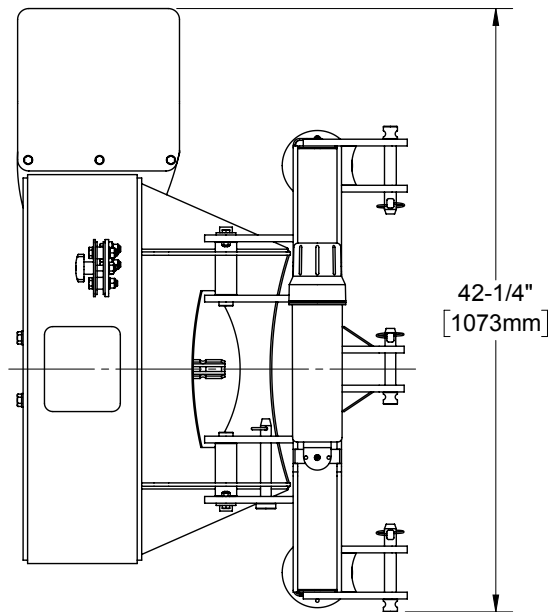
## TOOLS REQUIRED

Tool	Specification	Use
Phillips Head Screwdriver	No. 3	Assembly
Wrench/Socket	13 mm (2X)	Assembly
Wrench/Socket	16 mm (2X)	PTO Clutch Run-In
Wrench/Socket	17 mm	PTO Clutch Lock Pin
Wrench/Socket	24 mm	Tooth Replacement
Torque Wrench	Capable of 160 ft•lb (215 N•m)	Multiple
Calliper*	Vernier, Dial, or Digital	PTO Clutch Run-In
Hacksaw**		PTO Trimming
Coloured Pencil/Marker		PTO Clutch Run-In

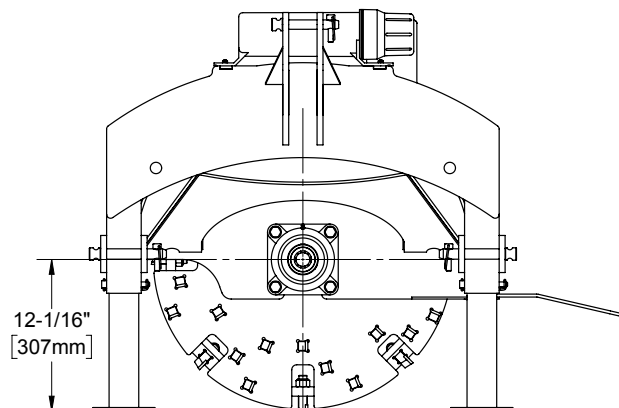
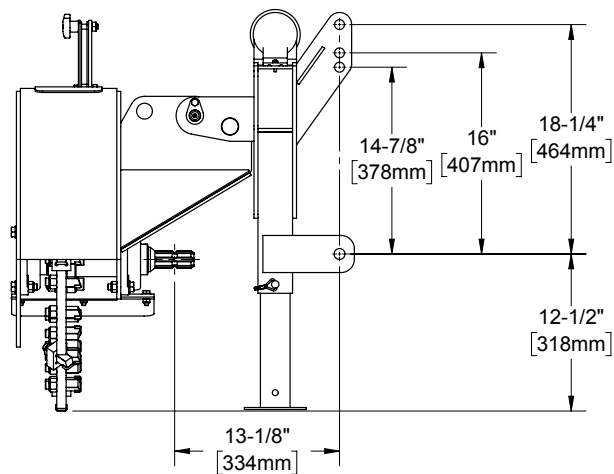
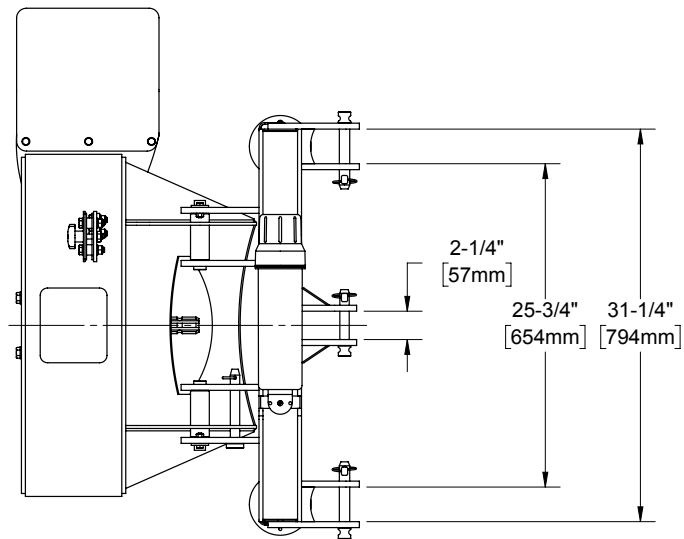
\* Recommended but not required.

\*\* Only if PTO shaft requires trimming. See *Trimming the PTO Shaft* section for more detail.

## OVERALL DIMENSIONS



## 3-POINT HITCH DIMENSIONS





## GENERAL SAFETY RULES



### WARNING!

Read and understand all instructions. Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury.



### 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.

- All Federal and State laws and any regulation having jurisdiction covering the safety requirements for use of the machine take precedence over the statements in this manual. Users of this machine must adhere to such regulations.
- Only people that have read and understood these instructions are permitted to use the stump grinder.
- Inspect the stump grinder and tractor at the beginning of every working day and repair any defects.
- Stop the engine and make sure that the machine will not start accidentally while repairing defects or performing maintenance.
- Do not disable or remove the stump grinder's safety devices.
- Always locate and mark buried wires, cables, and pipelines prior to grinding.





## PERSONAL SAFETY

- **Stay alert**, watch what you are doing and use common sense when operating machinery. Do not use a machine when you are tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating machinery 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 which 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, hardhat, gloves, dust collection systems, and hearing protection when appropriate.
- **Do not overreach.** Keep proper footing and balance at all times.
- **Remove adjusting keys or wrenches** before connecting to the power supply or turning on the machine. A wrench or key that is left attached to a rotating part of the machine may result in personal injury.
- **Never conduct any maintenance or make any other adjustments while the tractor engine is running.** Always shut the tractor engine off, remove the ignition key, and keep the engine off before carrying out any of the following procedures. Consult your tractor's operator manual for safe shutdown procedures to prevent accidental ignition.
- **Never** allow passengers to ride on the stump grinder.



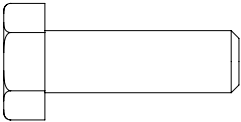
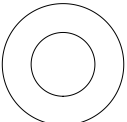
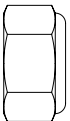
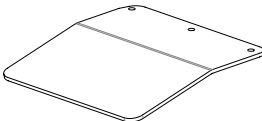
## MACHINE USE AND CARE

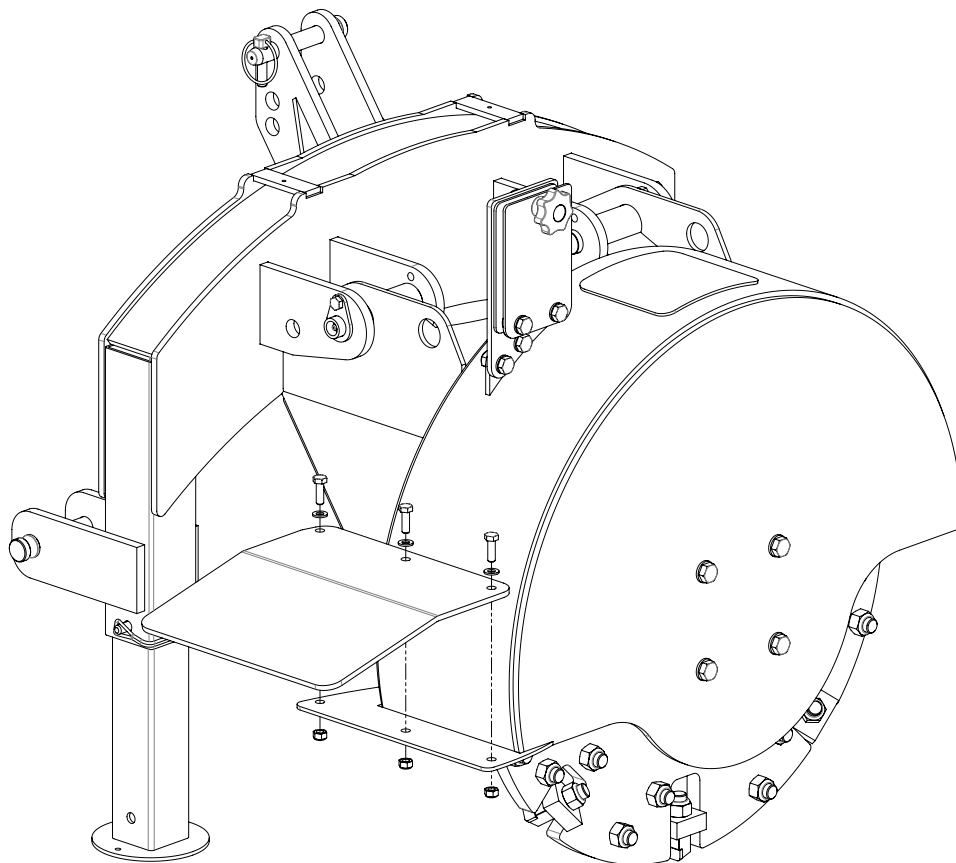
- **Always be sure the operator is familiar** with proper safety precautions and operation techniques before using machine.
- **Do not force the machine.** Machines do a better and safer job when used in the manner for which they are designed.
- **Storing the machine.** When the machine is not in use, store it in a dry, secure place or keep it well-covered and out of the reach of children. Inspect the machine for good working condition prior to storage and before each use.
- **Maintain the machine.** It is recommended that the general condition of the machine be examined before it is used. Keep your machine in good working order by adopting a program of conscientious repair and maintenance in accordance with the recommended procedures found in this manual. If any abnormal vibrations or noise occurs, turn the machine off immediately and have the problem corrected before further use.
- **Cleaning.** Use a pressure washer to clean the carbide teeth while taking care not to pressure-wash the bearings as this could introduce water into areas of the machine that may cause malfunction or damage.
- **Use only accessories that are recommended** by the manufacturer. Accessories that may be suitable for another machine may create a risk of injury when used on this machine.
- **Always** operate the machine with all safety devices and guards in place and in good 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 the machine running unattended.**
- **Never use the machine to grind anything other than stumps** or for any purpose other than grinding stumps as described in this manual.

## ASSEMBLY

### 1. DEFLECTOR

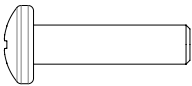


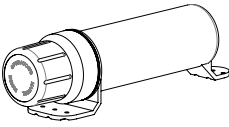
Using the hardware listed below and two (2) 13 mm sockets/wrenches, assemble the deflector to the flywheel housing as shown.

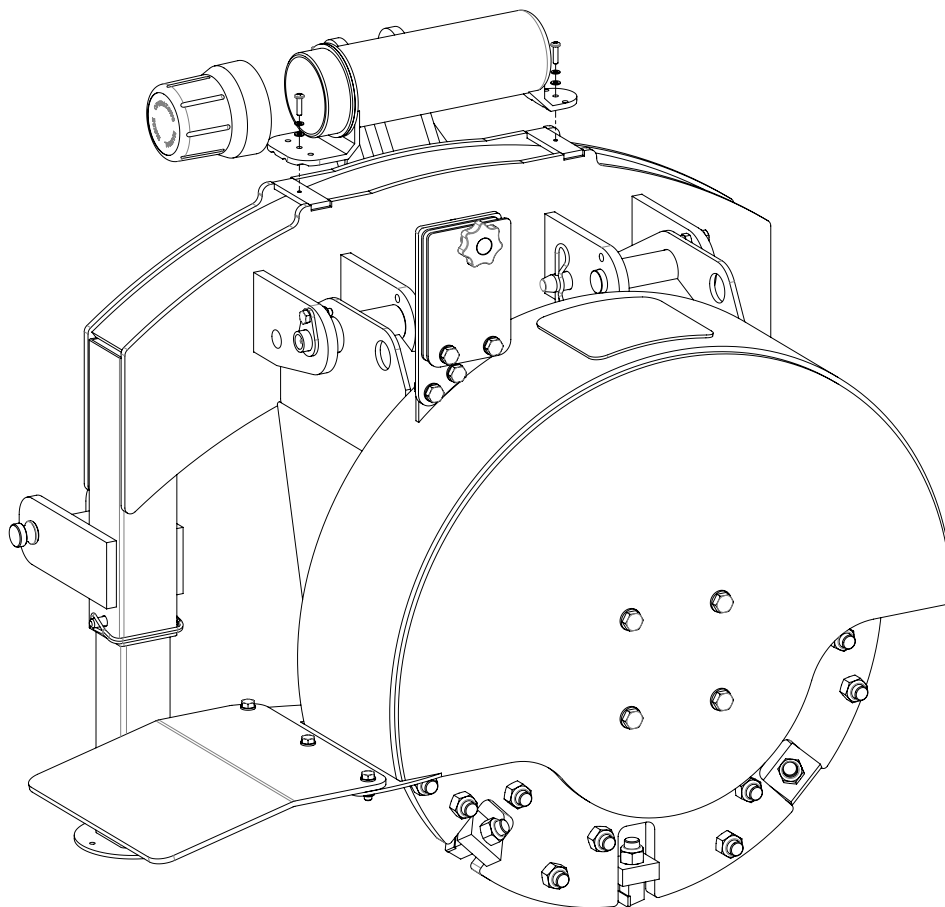
3x	M8 X 25 mm Hex Bolt		3x	M8 Flat Washer	
3x	M8 Lock Nut		1x	Deflector	



## 2. MANUAL TUBE

Using the hardware listed below and a No. 3 Phillips head screwdriver, assemble the manual tube to the back frame as shown. Remove the cap from the manual tube to gain access to the centre mounting hole.

2x	M5 X 20 mm Phillips Pan Head Screw		2x	M5 Flat Washer	
2x	M5 Split Lock Washer		1x	Manual Tube	



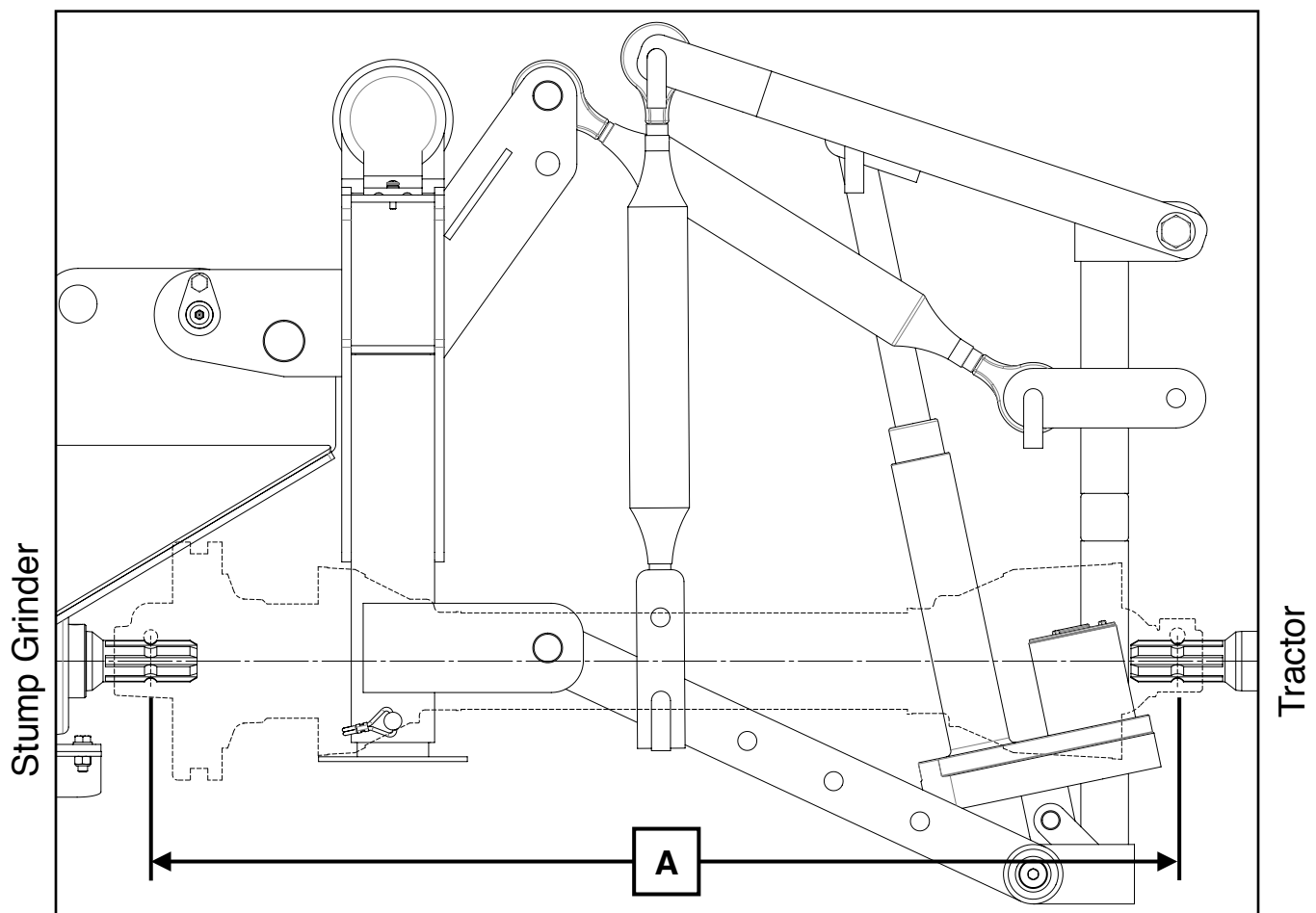
## SET-UP PROCEDURES

### TRIMMING THE PTO SHAFT

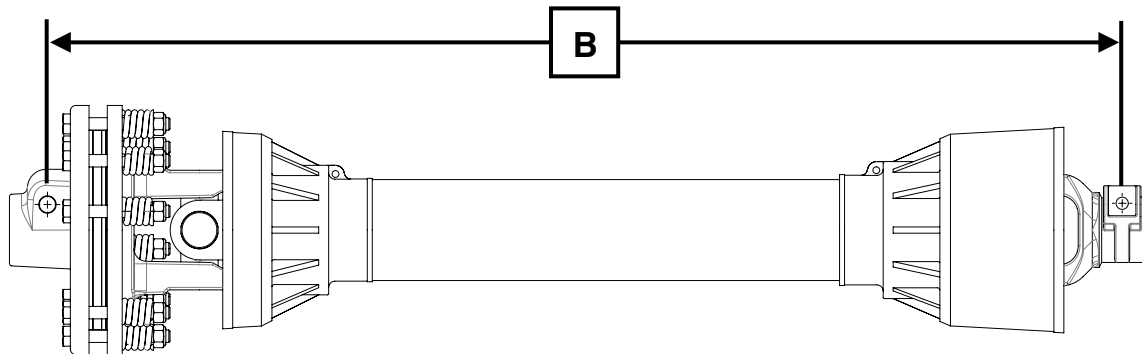
The stump grinder is shipped with a slip clutch PTO shaft that can be fitted to most Category 1 tractors. The PTO shaft may need to be trimmed depending on your tractor and configuration. Follow the steps below to ensure the PTO shaft is correctly fitted to your tractor.

**\*\*Note: the slip clutch end of the PTO shaft mounts to the stump grinder.\*\***

1. Attach the stump grinder to the tractor's 3-point hitch system. Do not install the PTO shaft.
2. Raise the stump grinder so that the shaft on the tractor is in line with the shaft on the stump grinder.
3. Measure the distance between the locking grooves on the splined shafts of the tractor and stump grinder (**Dim A**) as shown below:



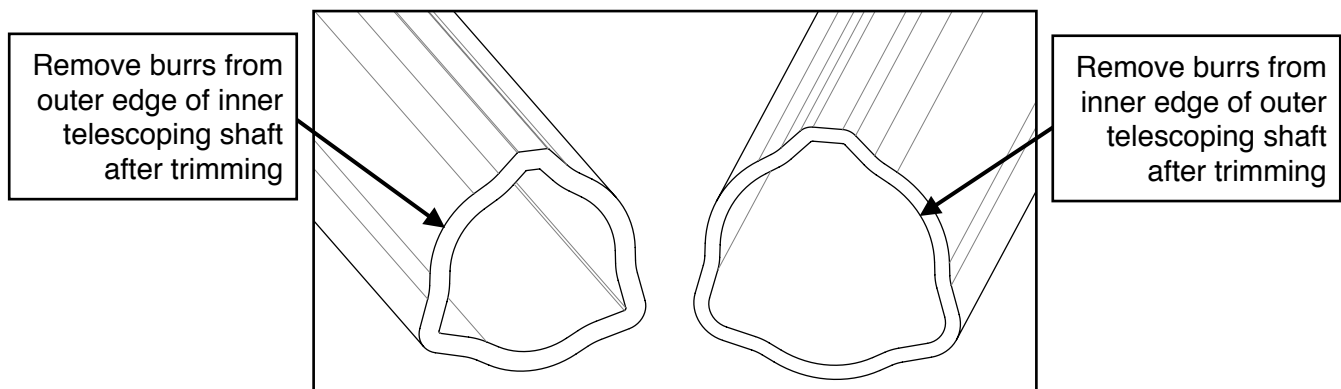
4. Verify the distance between the locking pins on the PTO shaft while in the compressed state (**Dim B**) as shown in the image below. It should measure 34" (862.5 mm).



5. 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.
6. If **Dim B** is longer than **Dim A**, the PTO shaft will require trimming. Use this equation to calculate the correct amount to trim:

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

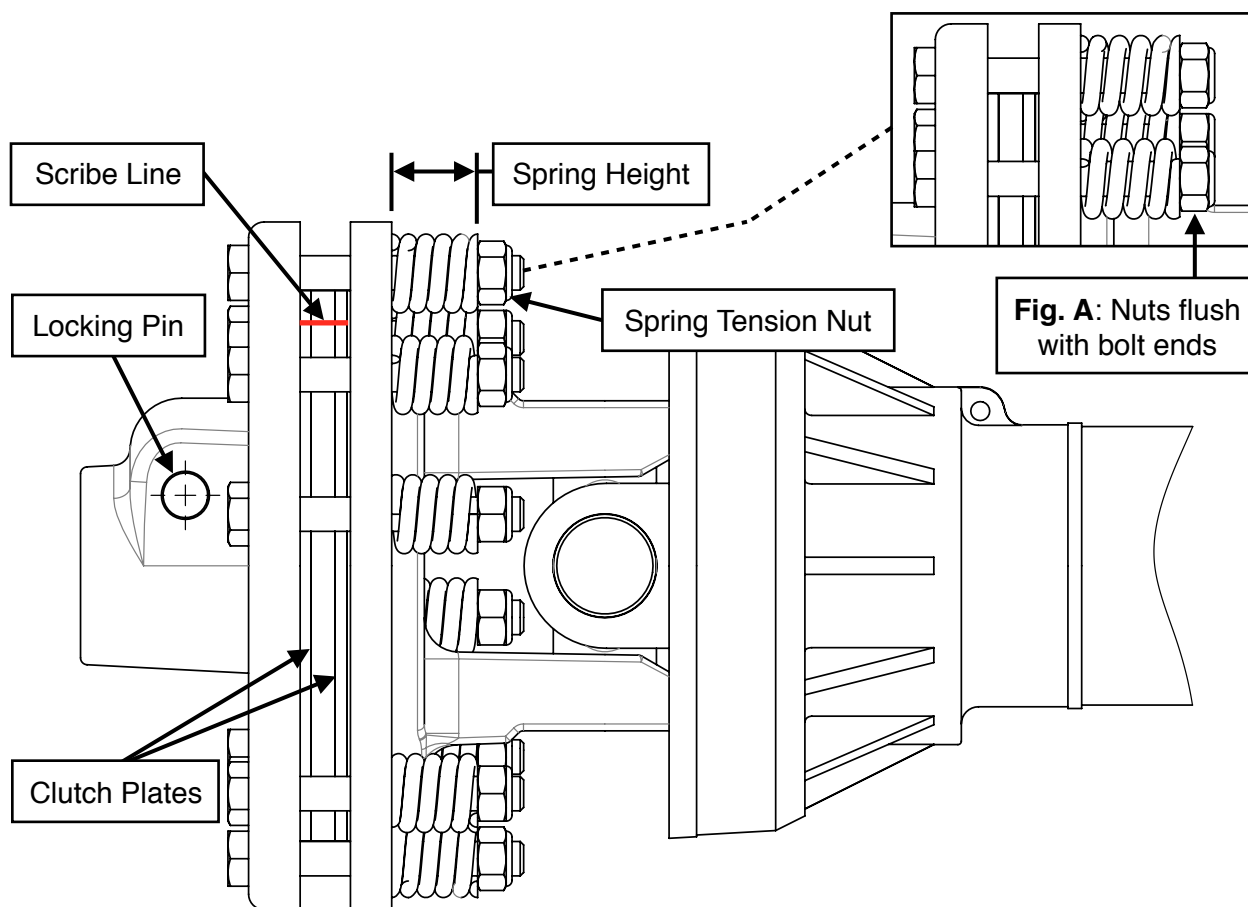
7. Once **C** has been calculated, trim that amount from **BOTH** halves of the PTO shaft safety cover *first*, then trim the same amount from both shafts. This will ensure the safety cover on each end remains a few inches back from the ends of the shafts, otherwise PTO shaft reassembly could be difficult.
8. 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 stump grinder to the tractor for operation.



## PTO SHAFT CLUTCH RUN-IN

The stump grinder is shipped with a slip clutch PTO shaft. Follow the steps below before using your stump grinder to ensure the PTO shaft clutch plates are set properly.

1. Connect the PTO shaft to the stump grinder and tractor with the clutch end of the PTO shaft mounted to the stump grinder. Insert the locking pin on the clutch yoke and tighten the nut using a 17 mm wrench or socket.
2. Using a coloured pencil or marker, scribe a line across the exposed edges of the clutch plates.
3. Using a 16 mm wrench or socket, loosen all 8 spring tension nuts uniformly until the ends of the nuts are flush with the ends of the bolts (**Fig. A**).



4. Start the tractor and engage the PTO for 2-3 seconds to permit slippage of clutch surfaces. Disengage the PTO then re-engage a second time for 2-3 seconds. Disengage the PTO again, shut off the tractor, and remove the key. Wait for all components to stop rotating before removing the PTO shaft from tractor.
5. Inspect the clutch and ensure that the scribed markings made across the clutch plates have changed position. Slippage has not occurred if the two marks on the clutch plates are still aligned. A clutch that has not slipped must be disassembled to separate the clutch plates.

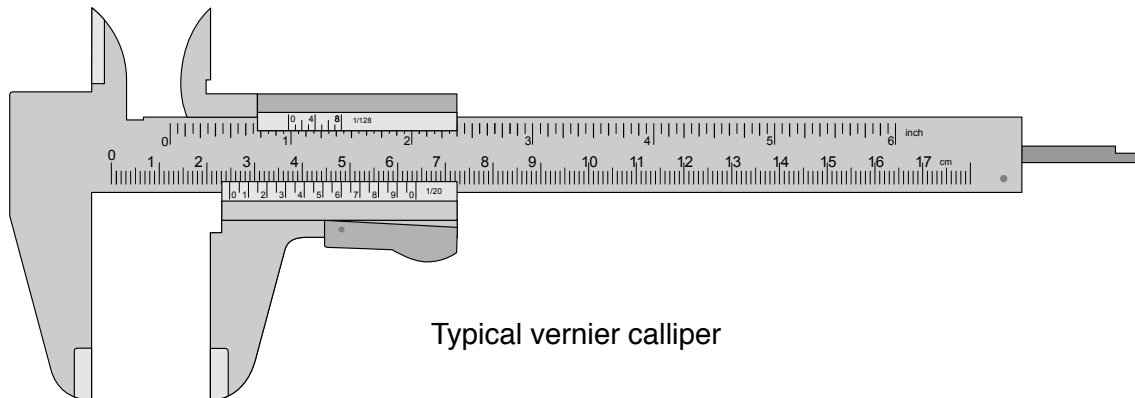


6. Tighten all 8 nuts until the proper spring height dimension values are achieved per the “*PTO Shaft Clutch Spring Height vs. Horsepower*” table for your PTO output horsepower. It is recommended that a calliper (either digital, dial, or vernier—similar to the one shown below) be used to accurately verify the spring height measurements. After setting all 8 spring heights, the clutch is now ready for use.

**PTO Shaft Clutch Spring Height vs. Horsepower**

PTO Shaft	Clutch Flange	PTO hp	Spring Height	Total Output Torque
5S.FF2	7-5/8" (200 mm)	20 hp	1.26" (31.9 mm)	195 ft•lb (265 N•m)
		25 hp	1.25" (31.7 mm)	243 ft•lb (330 N•m)
		30 hp	1.24" (31.4 mm)	292 ft•lb (396 N•m)
		35 hp	1.22" (31.1 mm)	341 ft•lb (462 N•m)
		45 hp	1.20" (30.5 mm)	443 ft•lb (600 N•m)

All ratings are at 540 rpm PTO speed



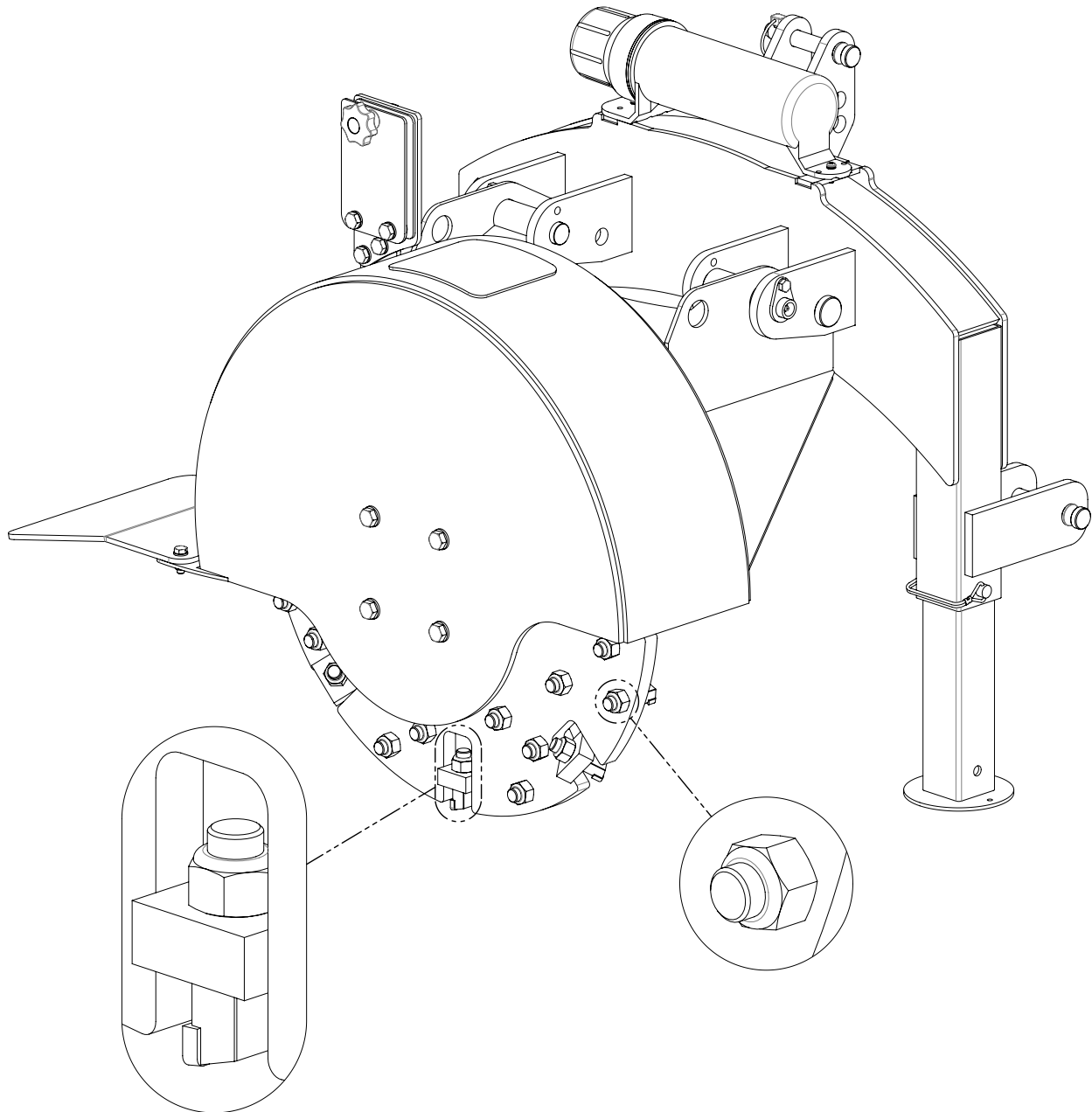
Typical vernier calliper

7. The clutch should be checked during the first hour of use and periodically each week thereafter. Excessive clutch plate slippage, burning odour, or visible smoking should not be observed during use.



## FLYWHEEL TOOTH TORQUING

Prior to operation, ensure all 34 teeth are torqued to 160 ft•lb (215 N•m) using a torque wrench with a 24 mm socket.



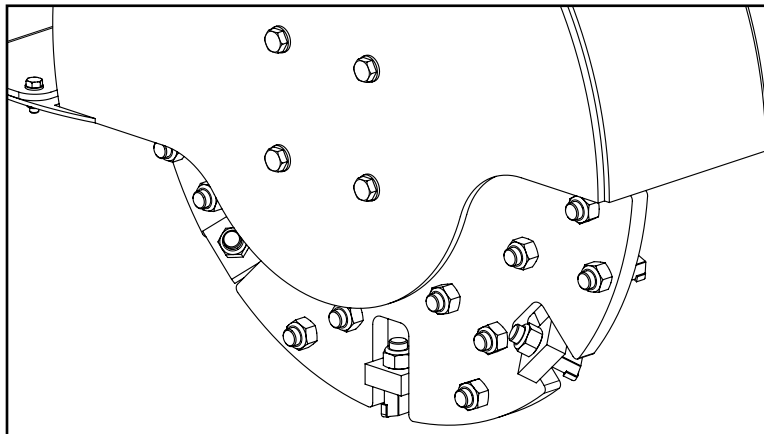
## EQUIPMENT OPERATION



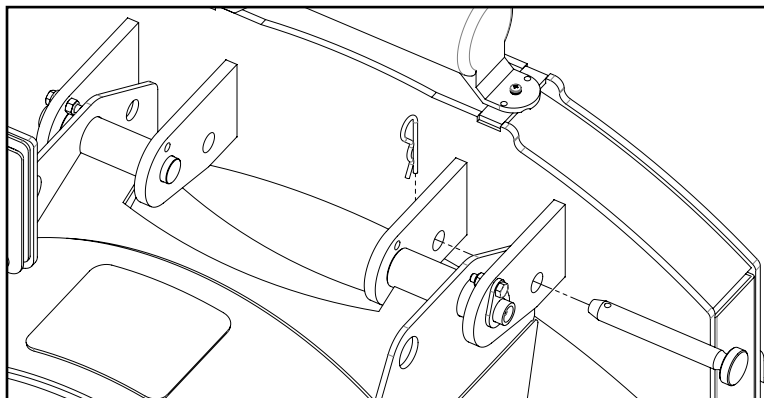
### WARNING!

To avoid death or serious injury, do not grind stumps containing embedded foreign objects such as nails, wire, metal fragments, etc.

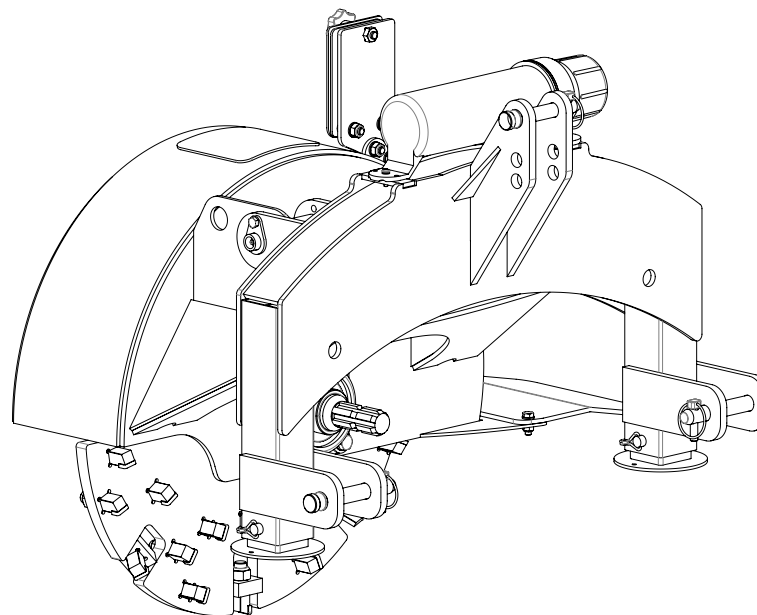
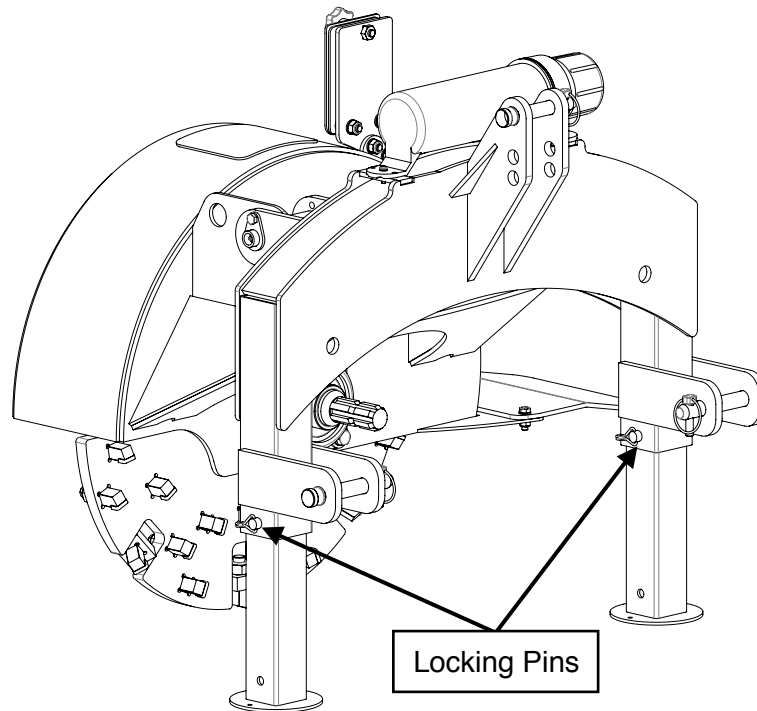
1. Wear heavy-duty work gloves, ANSI-approved goggles behind a full face shield, steel-toed work boots, and a dust mask.
2. Securely attach the stump grinder to the tractor's 3-point hitch system and install the PTO shaft.
3. Prior to each daily use, check all 34 teeth and ensure they are not loose, missing, or damaged, and are torqued to the proper specification. Torque any undamaged loose teeth to 160 ft•lb (215 N•m) using a torque wrench with a 24 mm socket.



4. Remove the stabilizer pin prior to operation as shown below:



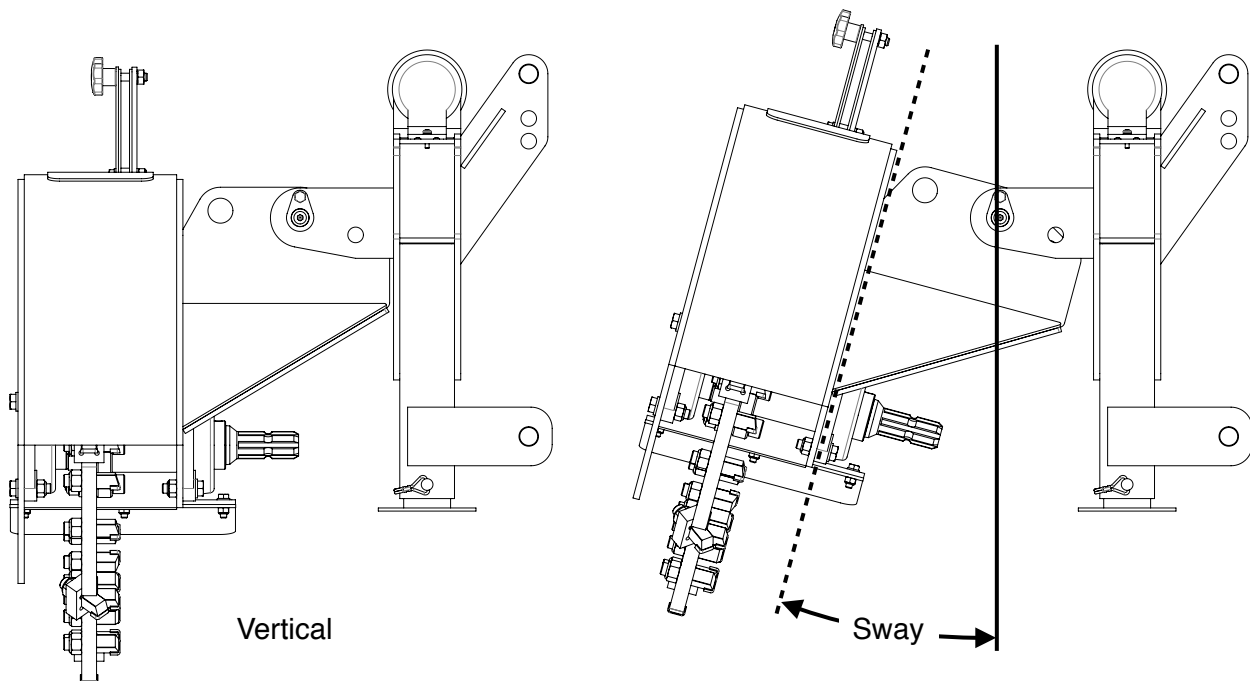
5. Remove the leg locking pins, slide the legs up inside the tubes, and reinstall the locking pins to secure them in place.



6. Reverse over a tree stump and lower the stump grinder so it will remove 2" (50 mm) per pass. Always ensure the grinder is cutting properly and not jumping around erratically.

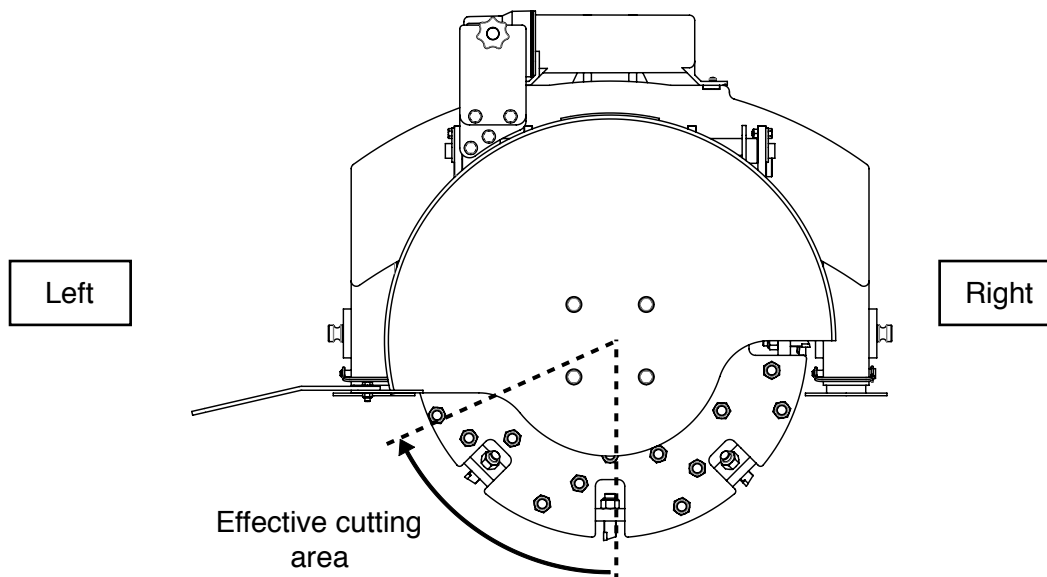


7. Once the stump is at ground level, continue to take up to 2" (50 mm) deep passes until the stump and roots are 4-6" (100-150 mm) below grade. Keep a watch out for foreign objects below the soil like rocks or buried metal. These can damage or break the teeth resulting in poor grinding performance.
8. During use, it is important to never let the stump grinder sway beyond an angle that will allow the PTO shaft to separate. Do not operate the stump grinder with less than 6" (150 mm) of overlap between the two halves of the PTO shaft. If the stump grinder begins to sway, it means either the tractor is advancing faster than the grinder can remove material or that too much material is being removed per pass. If this is observed, immediately stop moving forward and position the tractor and stump grinder in a manner so that it is in the vertical position. Take a slower pass and/or shallower cut if necessary.

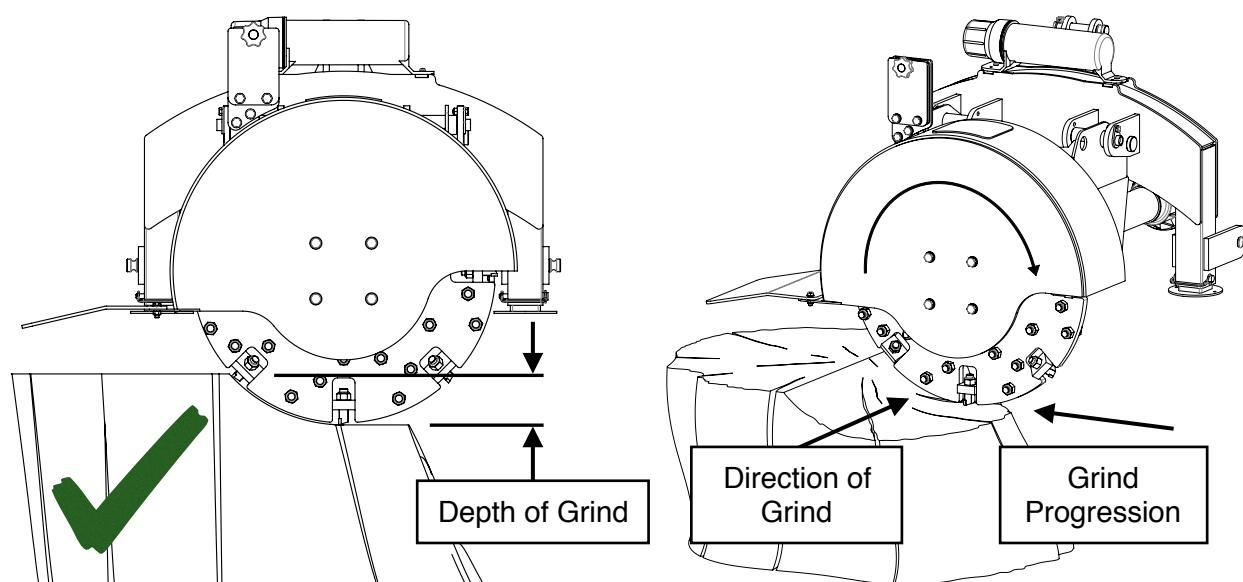


## STUMP GRINDING PROCEDURE

The flywheel spins in a clockwise manner (when facing the rear of the machine) with the effective cutting area in the lower-left quadrant as shown below:



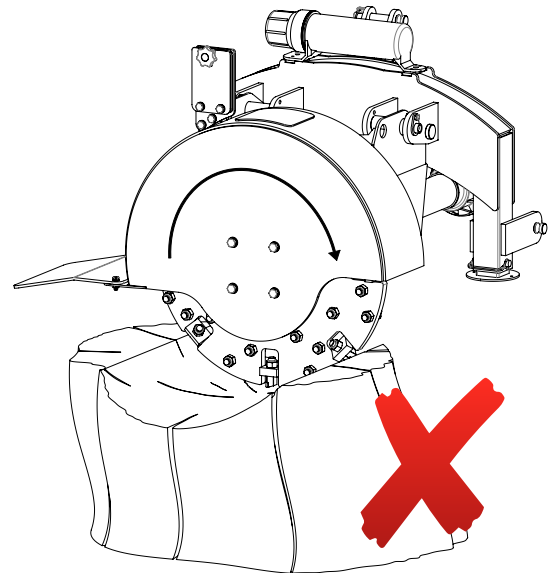
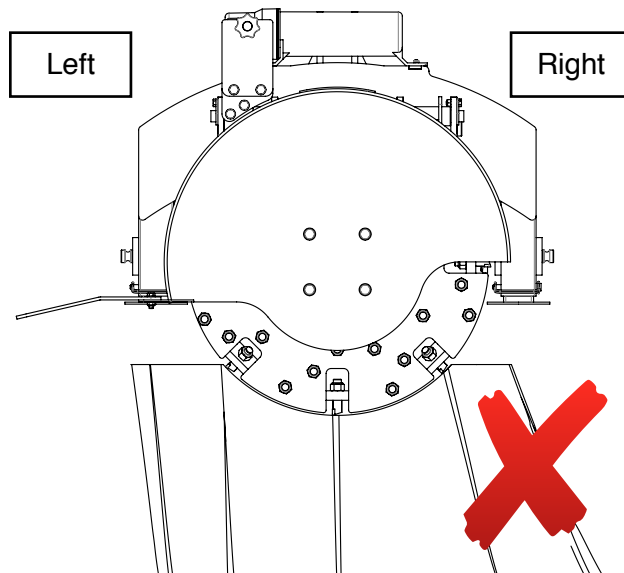
Therefore, when grinding a tree stump, always start from the right side of the stump, moving incrementally to the left, pulling the grinder straight forward through the stump on each pass. When grinding softwoods like pine, spruce, or poplar, it may be permissible to remove upwards of 2" (50 mm) of material per pass. However, hardwoods like oak, ash, and birch can be much more dense and the depth of grind may only be up to 1" (25 mm). If the chassis is swaying like described in the previous section, or the grinder is vibrating or bouncing, reduce the depth of cut or feed rate accordingly.



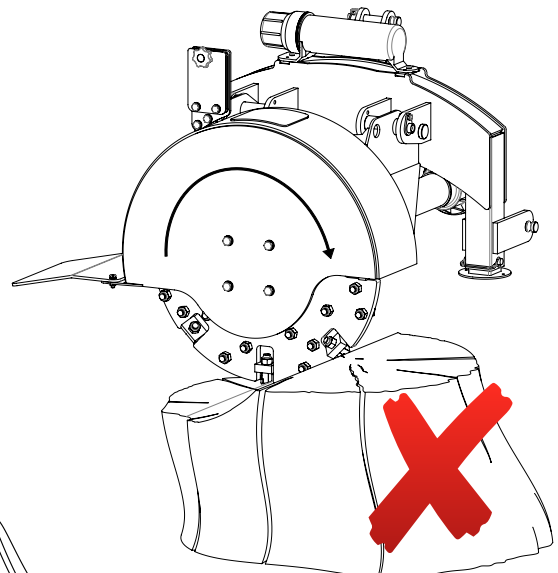
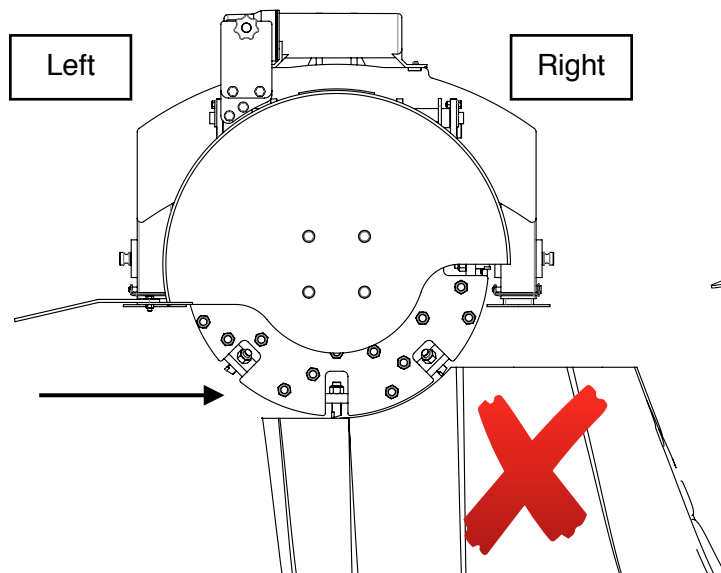
## INCORRECT GRINDING PROCEDURES

It is critical that the stump grinder is never pulled through the centre of a stump or ground from left-to-right. This will induce severe vibration and cause the grinder to sway and bounce. It may also damage the machine and/or break teeth. Follow the directions on the *previous page* to ensure efficient and safe grinding.

### PULLING THROUGH THE CENTRE

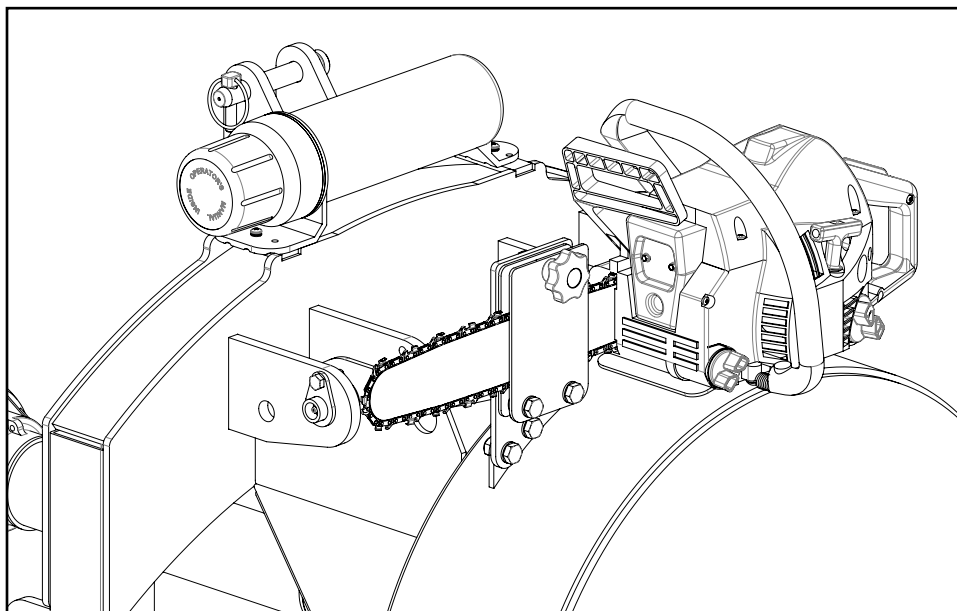


### GRINDING LEFT-TO-RIGHT



## CHAINSAW HOLDER

Use the chainsaw holder only during transport. Always remove the chainsaw from the holder prior to grinding stumps.



## STORAGE

1. Lower both support legs and reinsert the locking pins.
2. Insert the stabilizer pin in either the left or right side of machine. It does not matter which side is selected.
3. Lower the stump grinder onto a flat, level surface.
4. Disconnect the PTO shaft.
5. Remove the stump grinder from the tractor's 3-point hitch system.

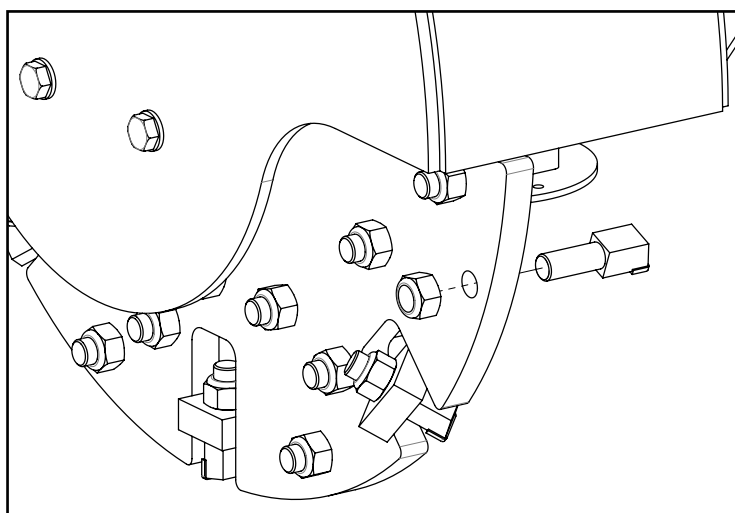


## MAINTENANCE

- Proper routine maintenance is critical to operator safety, achieving proper stump grinding results, and prolonging the life of the machine.
- Before cleaning and/or any maintenance is performed on the stump grinder, always turn off the tractor engine and disconnect the PTO shaft.
- Inspect the machine before each use for loose nuts and worn cutting teeth and clean any debris that has built-up.
- After 2 hours of operation, check for loose nuts and worn cutting teeth. Tighten and replace as necessary.
- Grease the bearings and the pivot pins on the main housing as needed before each use. Do not over-grease the bearings as this can blow out the seals and cause premature bearing failure.
- Inspect the clutch plates on the PTO shaft periodically to ensure that they are not seized together. Refer to *PTO Shaft Clutch Run In* in the *Set Up Procedures* section of the manual.

## REPLACING TEETH

1. Disconnect the PTO shaft from the tractor and set the stump grinder on a flat, level surface.
2. Remove the M16 X 1.5 lock nut (fine thread) from the back of the tooth using a 24 mm wrench or socket.
3. Remove the worn cutting tooth while noting its orientation so that the replacement tooth will be installed in the same manner.



4. Install the replacement tooth and lock nut using a torque wrench set to 160 ft•lb (215 N•m). Refer to section *Flywheel Tooth Torquing* for more detail.





## PARTS LIST

Item	Qty	Part No.	Description
1	1	0001229	FLYWHEEL HOUSING
2	1	0001227	BACK FRAME
3	2	0001228	BACK SUPPORT LEG
4	1	0001231	FLYWHEEL
5	34	0001232	FLYWHEEL TOOTH
6	1	0001233	FLYWHEEL SHAFT
7	2	0001238	GREASE PIN ASSEMBLY
8	1	0001230	DEFLECTOR
9	1	0001234	CHAINSAW HOLDER MOUNTING PLATE
10	1	0001235	CHAINSAW HOLDER CLAMPING PLATE
11	2	0001236	CHAINSAW HOLDER RUBBER MAT
12	1	0001237	CHAINSAW REST RUBBER MAT
13	1	0001751	KNOB, MULTI-LOBE, 50 mm OD, M10 X 1.5, 40 mm LG
14	1	0001156	UPPER 3-POINT HITCH PIN, 19 mm DIA X 135 mm LG
15	2	0001240	LOWER 3-POINT HITCH PIN, 21 mm DIA X 135 mm LG
16	1	0001750	LOCKING PIN, 19 mm DIA X 150 mm LG
17	1	0001239	PTO SHAFT W/ CLUTCH, TRIMMABLE, 36-44 in (914-1121 mm)
18	1	0001655	MANUAL TUBE
19	2	UCF210	FLANGE BEARING, 4-BOLT, UFC210-50, 143 WD X 55 mm H, 50 mm BORE
20	5	HDW	HEX BOLT, M8 X 1.25, 25 mm LG
21	2	HDW	HEX BOLT, M10 X 1.5, 30 mm LG
22	2	HDW	HEX BOLT, M10 X 1.5, 45 mm LG
23	8	HDW	HEX BOLT, M12 X 1.75, 45 mm LG
24	2	HDW	SCREW, PPH, M5 X 0.8, 20 mm LG
25	4	HDW	SHCS, M16 X 60 mm LG
26	2	HDW	FLAT WASHER, M5
27	3	HDW	FLAT WASHER, M8
28	8	HDW	FLAT WASHER, M10
29	8	HDW	FLAT WASHER, M12
30	4	HDW	FLAT WASHER, M16
31	2	HDW	SPLIT LOCK WASHER, M5
32	5	HDW	LOCK NUT, M8 X 1.25
33	4	HDW	LOCK NUT, M10 X 1.5
34	8	HDW	LOCK NUT, M12 X 1.75
35	34	HDW	LOCK NUT, M16 X 1.5
36	4	HDW	LOCK NUT, M16 X 2
37	2	HDW	SPACER, 11 ID X 21 OD X 11 mm LG
38	1	HDW	COTTER PIN, HAIRPIN, 4 mm DIA, 16-20 mm CLEVIS
39	2	HDW	LOCKING PIN, 70 mm WIDE X 10 mm DIA
40	3	HDW	LINCH PIN, 10 mm DIA x 45 mm LG
41	2	HDW	GREASE FITTING, STRAIGHT, M6 X 16mm LG

This diagram illustrates the exploded assembly of a mechanical device, showing the relationship between various components. The parts are numbered as follows:

- Top Section (Right):** Includes components 8, 12, 20 (3X), 27 (3X), 33 (2X), 37 (2X), 10, 11, 9, 21 (2X), 28 (2X), 22 (2X), 28 (2X), 13, and 28 (2X).
- Central Section (Right):** Includes components 1, 32 (3X), 23 (4X), 29 (4X), 1, 3, (2X), 39 (2X), 15 (2X), 41 (2X), 20 (2X), 7 (2X), 2, 16, 32, 38, 14, 40 (3X), 18, 26 (2X), 31 (2X), 24 (2X), and 17.
- Bottom Section (Left):** Includes components 19, 34 (4X), 36 (4X), 30 (4X), 4, 35 (34X), 5 (34X), 6, 25 (4X), 34 (4X), 19, 29 (4X), 23 (4X), and 17.

The diagram uses dashed lines to indicate the assembly path and alignment of the parts. The components are shown in their relative positions as they would be assembled.

[illegible]



Lined area for notes or calculations, consisting of 25 horizontal lines.



Lined area for notes or additional information, consisting of multiple horizontal lines.

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