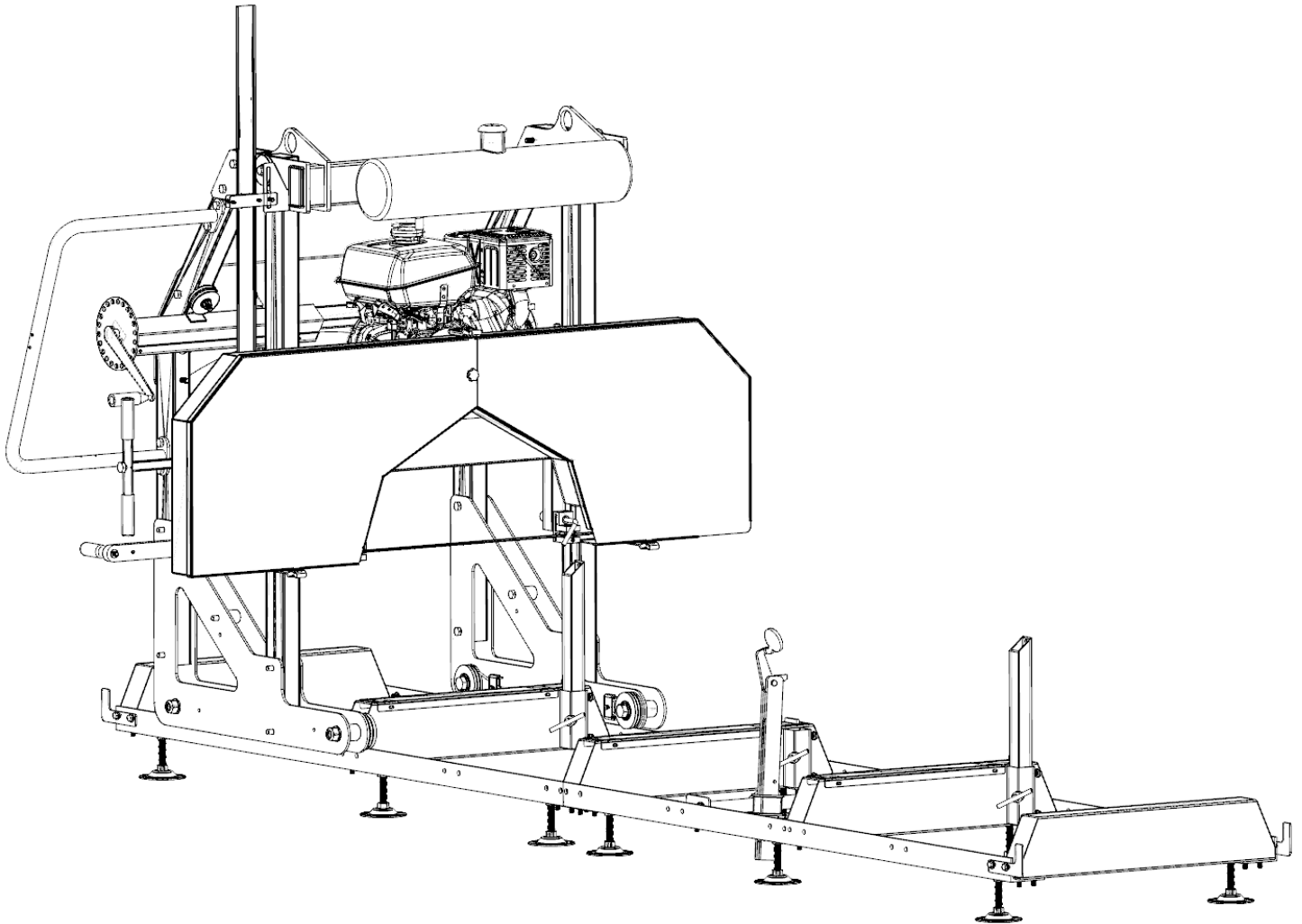


# HM130 PORTABLE SAWMILL



## OPERATOR'S MANUAL



DISCOVER THE WOODLAND™

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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 portable sawmill. 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

This sawmill is designed for sawing logs while the mill is firmly supported on the ground.

## TECHNICAL SPECIFICATIONS

ITEM	DESCRIPTION
Gasoline Engine	14 HP Kohler
Maximum Log Diameter	30" (762mm)
Maximum Board Width	22" (558mm)
Maximum Board Thickness	7" (178mm)
Blade Size	1-1/4" x 144" (32mm x 3657mm)

## 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.



### WARNING!

Only operate the engine in a well ventilated area. Carbon Monoxide produced by the engine during use can kill. Do not use indoors, near windows or in other sheltered areas.

NOTE: 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.



## SAVE THESE INSTRUCTIONS

### WORK AREA

- **Keep work area clean**, free of clutter and well lit. Cluttered and dark work areas can cause accidents.
- **Do not use your sawmill 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, so visitors should remain at 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 may cause personal harm or property damage.
- **Be alert of your surroundings**. Using power tools in confined work areas may put you dangerously close to cutting tools and rotating parts.

### INTERNAL COMBUSTION ENGINE SAFETY



#### WARNING!

Internal combustion engines present special hazards during operation and fuelling. Read and follow the warning instructions in the engine Owner's Manual and the safety guidelines below. Failure to follow the warnings and safety standards could result in severe injury or death.

- **DO NOT** run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Exhaust gas from the engine contains poisonous carbon monoxide gas; exposure to carbon monoxide can cause loss of consciousness and may lead to death.
- **DO NOT** smoke while operating the machine.
- **DO NOT** smoke when refuelling the engine.
- **DO NOT** refuel a hot or running engine.
- **DO NOT** refuel the engine near an open flame.
- **DO NOT** spill fuel when refuelling the engine.
- **DO NOT** run the engine near open flames.
- **ALWAYS** refill the fuel tank in a well-ventilated area.
- **ALWAYS** replace the fuel tank cap after refuelling.
- **ALWAYS** check the fuel lines and the fuel tank for leaks and cracks before starting the engine. Do not run the machine if fuel leaks are present or the fuel lines are loose.
- **ALWAYS** avoid contact with hot fuel, oil, and exhaust fumes.



## PERSONAL SAFETY

- **Stay alert**, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while 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 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 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 make blade guide adjustments, remove or install blades or conduct any other maintenance or make any other adjustments when the engine is running**. Always shut the engine off, remove the ignition key, and keep the engine off before carrying out any of the aforementioned procedures. Consult your engine manual for safe shutdown procedures to prevent accident ignition.



## TOOL USE AND CARE

- **Always** be sure operator is familiar with proper safety precautions and operation techniques before using machine.
- **Never touch** the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.
- **Always** close fuel valve on engines when machine is not being operated.
- **Do not force the tool.** Tools do a better and safer job when used in the manner for which they are designed.
- **Never use the sawmill** with a malfunctioning switch or throttle. Any power tool that cannot be controlled with the switch is dangerous and must be repaired before using.
- **Turn off the engine** and place the switch in the locked or off position before servicing, adjusting, installing accessories or attachments, or storing. Such preventive safety measures reduce the risk of starting the power tool accidentally.
- **Secure logs** with the log screw clamping device instead of with your hand or another individual's help. This safety precaution allows for proper tool operation using both hands.
- **Storing sawmill.** When the sawmill is not in use, store it in a dry, secure place or keep well covered and out of the reach of children. Inspect the sawmill for good working condition prior to storage and before re-use.
- **Maintain your sawmill.** It is recommended that the general condition of the sawmill be examined before it is used. Keep your sawmill in good repair 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 sawmill off immediately and have the problem corrected before further use.
- **Keep saw blades sharp and clean.** Properly maintained bandsaw blades are less likely to bind and are easier to control.
- **Cleaning and Lubrication.** Use only soap and a damp cloth to clean your sawmill. Many household cleaners are harmful to plastic and rubber components on the sawmill.
- **Use only accessories that are recommended** by the manufacturer for your model. Accessories that may be suitable for another sawmill may create a risk of injury when used on the sawmill.
- **Always** operate 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 machine if any safety devices or guards are missing or inoperative.
- **Never leave sawmill running unattended.**
- **Coiled blades can spring apart with considerable force and unpredictably in any direction.** Always deal with coiled blades, including those packaged in boxes, with the utmost care.
- **Never use the equipment to cut anything other than lumber** or for any purpose other than cutting lumber as described in this manual.



## EQUIPMENT OPERATION

1. Wear heavy-duty work gloves, ANSI-approved goggles behind a full face shield, steel-toed work boots, and a dust mask.
2. Operate only with assistance.
3. Fill the lubrication tank with clean water and liquid soap.
4. Start and operate the engine according to the provided engine manual.
5. Depress the throttle to bring the blade up to speed.
6. Throttle should be fully depressed when the saw is under load.
7. Cut branches off the lumber to be processed.
8. Place the lumber to be cut on the supports.
9. Move the saw head slowly along the track and against the lumber to make the cut.
10. Trim off the rounded sides of the log.
11. When the log is squared-off, boards or posts can be cut to custom specifications.
12. To prevent accidents, turn off the engine and disconnect its spark plug wire after use. Wait for the engine to cool, clean external parts with a clean cloth, then store the equipment out of children's reach.



### WARNING!

To avoid death or serious injury. Do not cut lumber with foreign objects in it such as nails, any metal pieces, etc.



### WARNING!

The operator and any assistants must stay clear of the front and back of the blade whenever the engine is on.



## MAINTENANCE

Proper and routine maintenance is critical to operator safety, achieving good milling results and to prolonging the life of your investment.

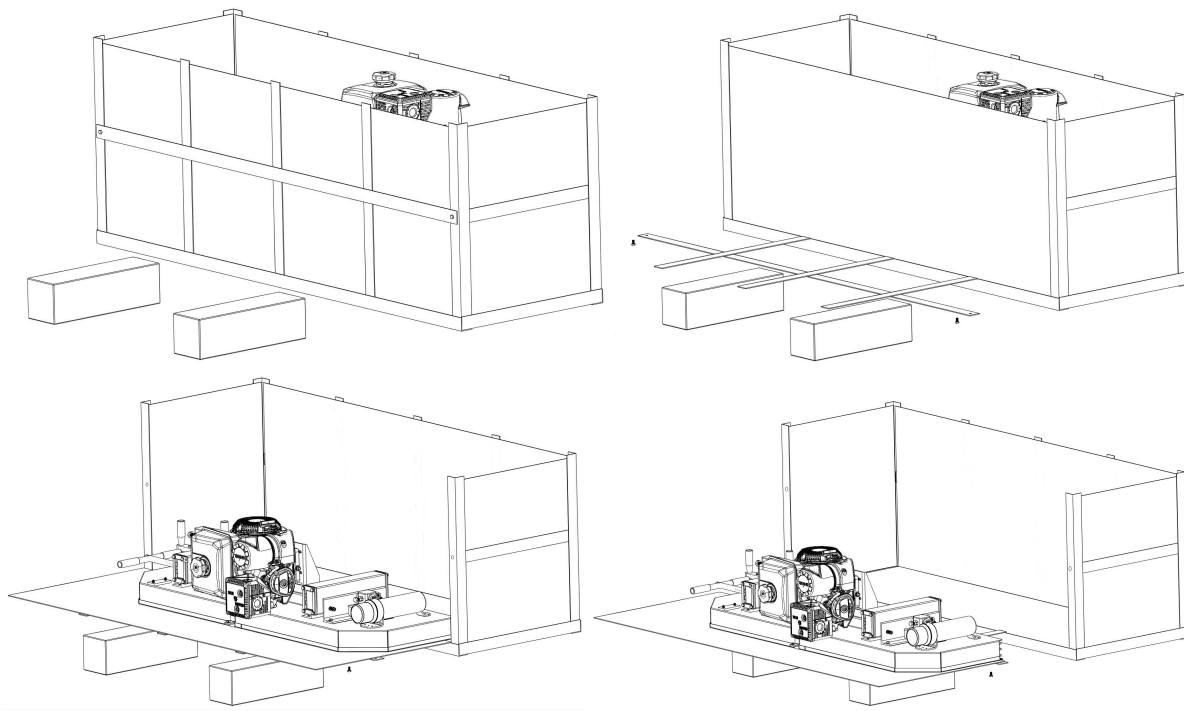
- **Band Wheel Bearings** — Inspect before use to ensure they are not worn. Bearings are sealed and do not need to be greased.
- **Blade Guide Bearings** — Inspect before use for excessive grooves or scoring in the bearing case. Replace if necessary.
- **Blade Tension** — Grease threads of tensioning “T” handle when dry or as required. Use multi-purpose, extreme-pressure grease.
- **Log Clamps** — Spray cam mechanism with dry silicone spray frequently.
- **Belts** — Periodically check the condition and wear of the drive and idler belt. Ensure that the blade does not ride on the band wheels.
- **Drive Belt** — Periodically check the tension of the drive belt.
- **Saw Head Vertical Posts** — Spray posts before use with a silicone spray lubricant such as 3-in-1 or Jig-A-Loo.
- **Band Wheel Guards** — Routinely remove any build-up of sawdust that may collect inside the band wheel guards.
- **Lubrication Tank** — Only fill with a water and dish soap mixture or in winter months, use windshield washer fluid. Do not leave lubricant in tank if temperature falls below 0° C.
- **Blade Lubricant** — Never use diesel fuel or kerosene as blade lubricant. These substances lead to premature wear of your belts and poor sawing performance. For winter operations, replace the water lubricant with windshield washer fluid.
- **Engine** — Check the engine oil level before each use and maintain the engine as per the instructions set out by the engine manufacturer in the engine manual. The engine is equipped with an oil alert system and will not start without adding oil before starting.
- **Saw Head Lifting Cables** — Regularly before, during, and after operations; inspect the cables for any wear or kinks. Ensure that the cables are in perfect condition. Oil coiled part of cable often to prevent premature wear. Replace with new cables as necessary.



# SAWMILL ASSEMBLY

## 1. UNPACKING

Unpack the contents of the crate except for the sawmill head and the two long boxes in the bottom that contain the two sections of track. Unbolt the front of the crate and lay 6" (150mm) high support blocks in front of the crate. Bend the front of the crate down. Carefully lay the sawmill head and the cardboard down onto the 6" (150mm) support blocks. Slide the sawmill head out of the crate as shown below.



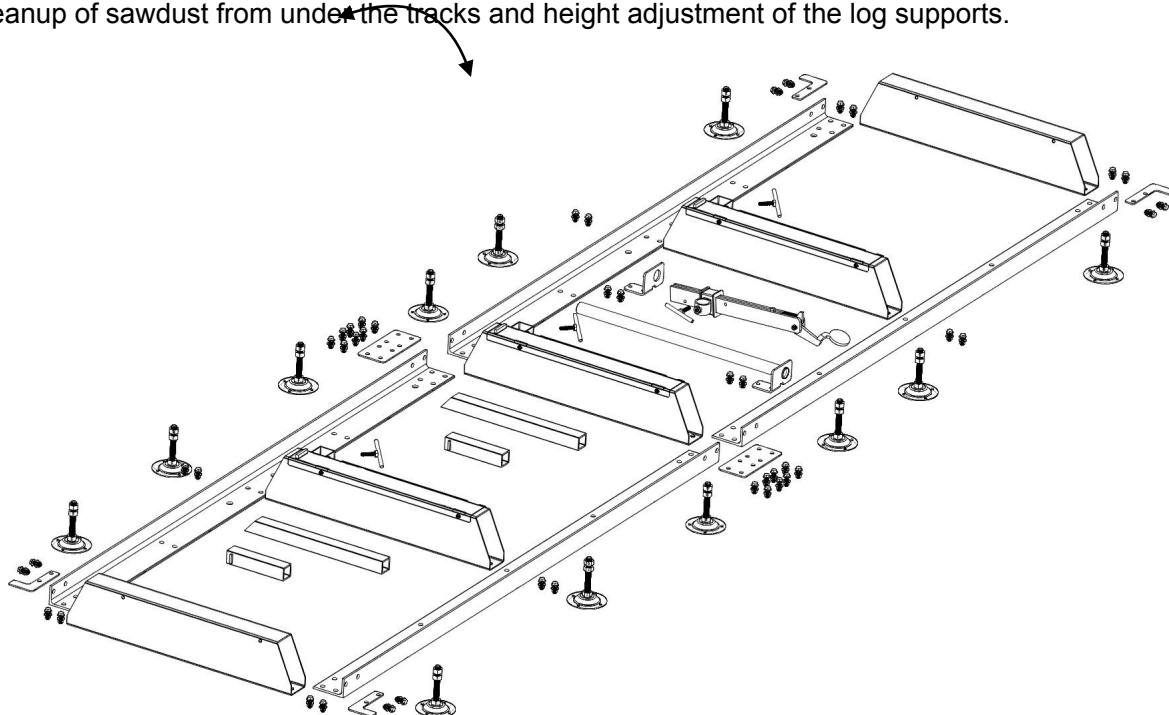
The two long track boxes may now be removed from the crate and the crate be placed out of the way.



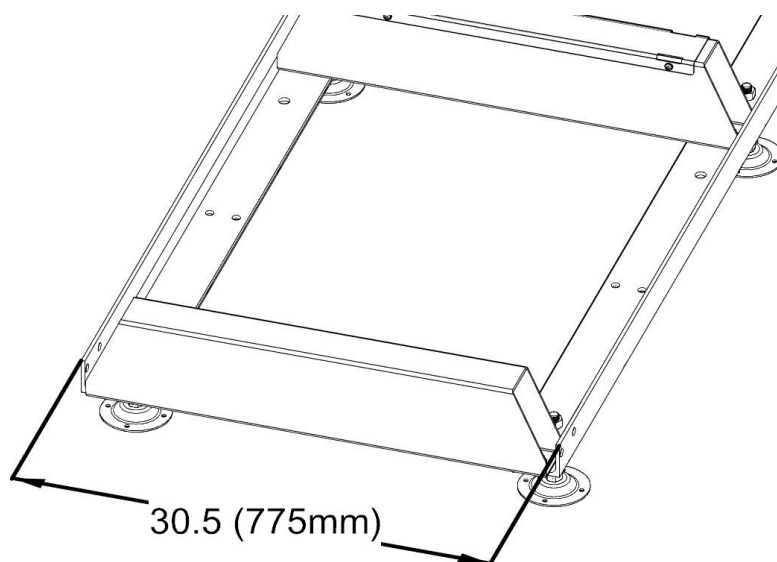


## **2. TRACKS**

Assemble the track system with the provided nuts & bolts. It is important to assemble and level the track on a firm foundation before tightening all of the nuts and bolts. It is ideal to assemble the tracks on a solid and level footing that is a minimum of 4" (100mm) off of the ground. This will allow for easy cleanup of sawdust from under the tracks and height adjustment of the log supports.

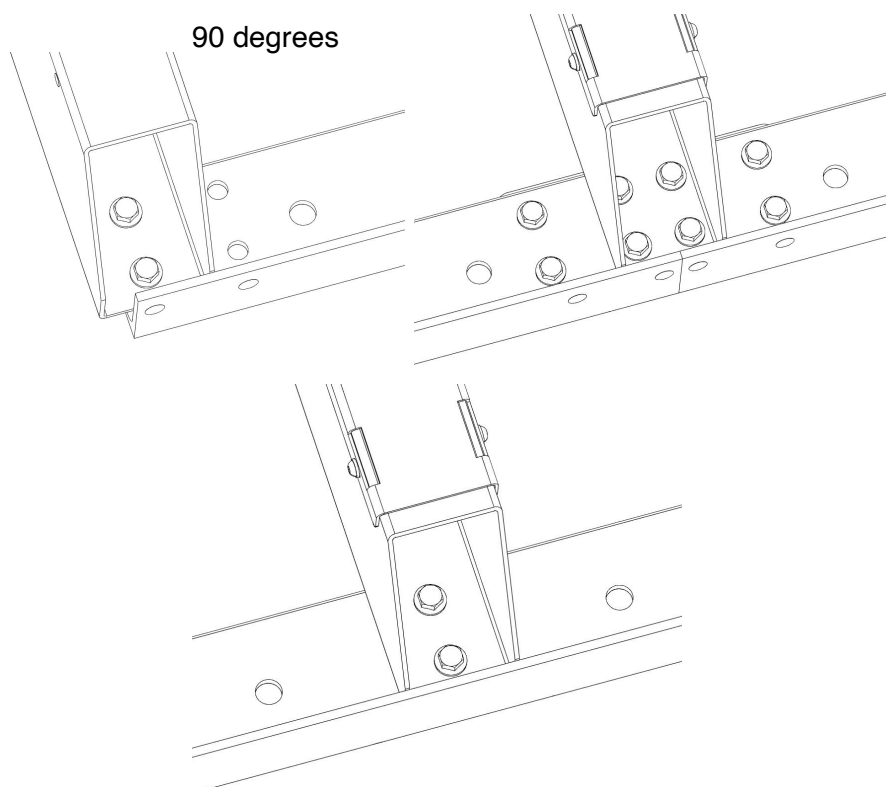


The width of the track should be assembled so that it is 30.5" (775mm) wide when measuring the width from the outside to outside of the "L" rails.

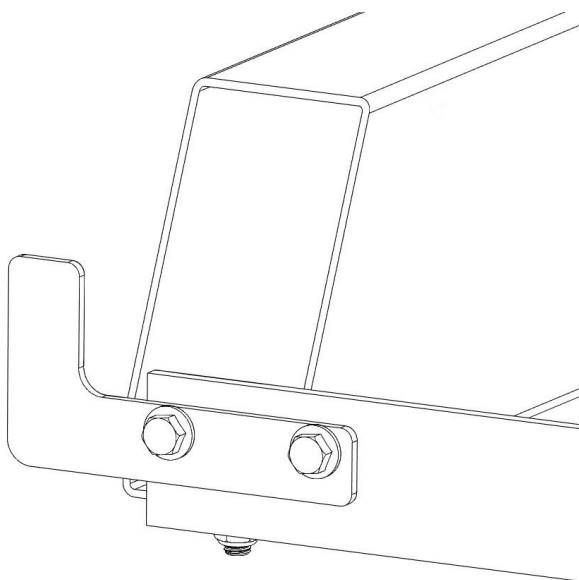




The below pictures show the assembly of the log bunks to the "L" rails. Ensure that the two end bunks are square (90 degrees) to the track 'L' rails.



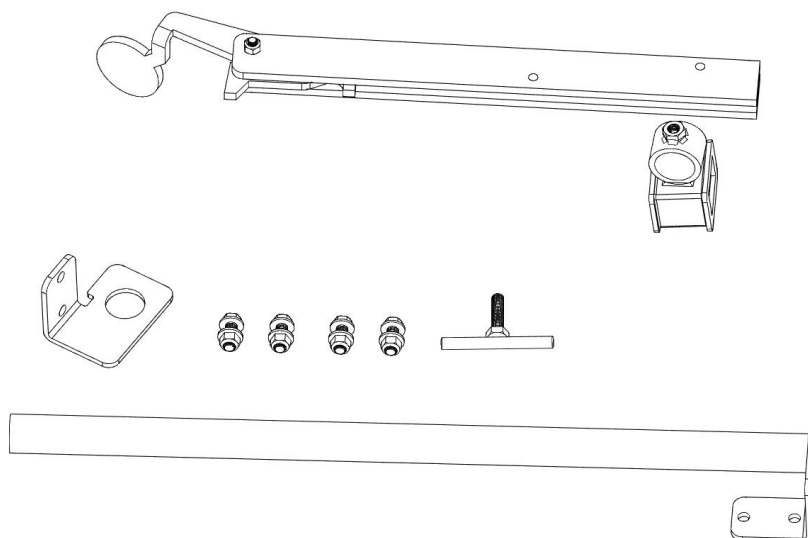
Assemble carriage stops at the ends of the tracks (4 stops total) and tighten bolts as shown below.



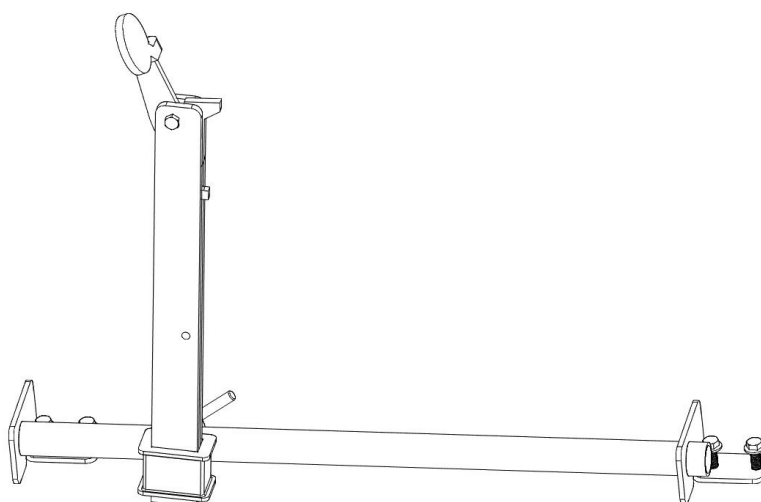


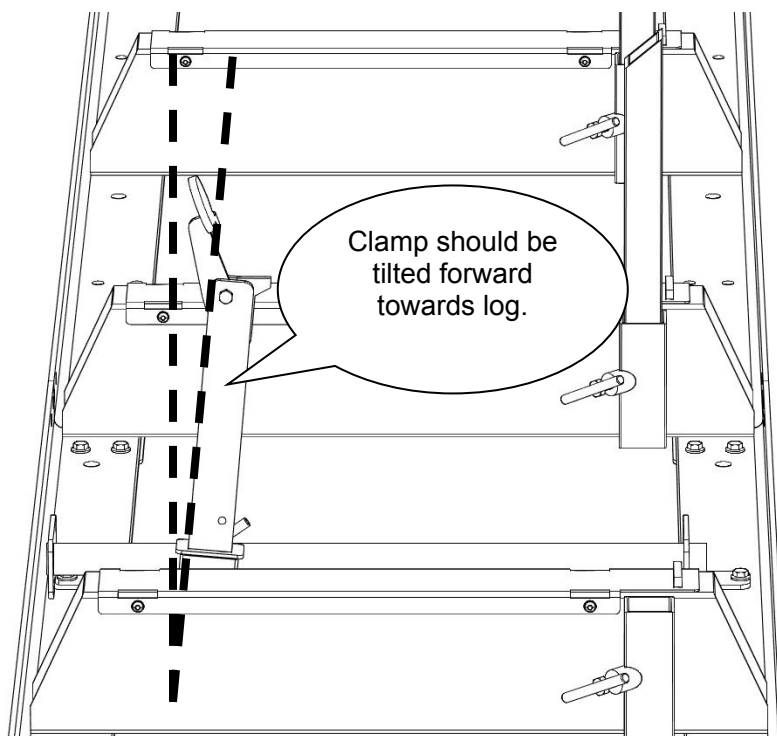
### **3. LOG DOG + SUPPORTS**

Assemble log dog pieces as shown below and use grease on threaded handle and "T" handle. Attach assembly to the track using the provided nuts & bolts and tighten.

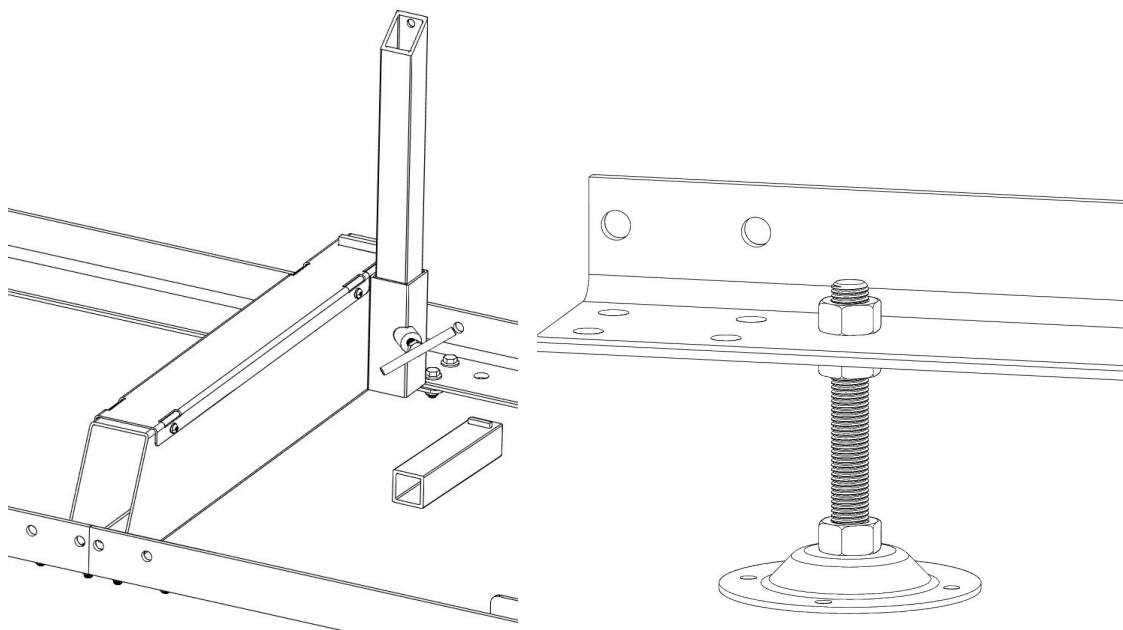


Attach log dog assembly to track as shown below with the 4 nuts and bolts provided. Note that there are various locations along the track where this assembly can be bolted. Depending on how many track sections are being used, select a log clamp position that will secure the log firmly against the log supports.



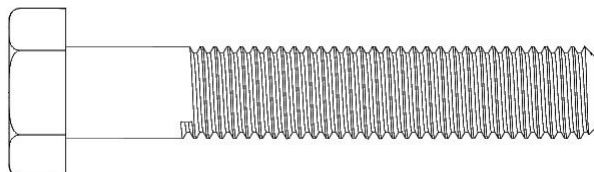


Insert log supports into track cross supports and secure with “T” handles as shown in the picture below. The “T” handle threads should be coated with grease. The sawmill includes two sets of log supports – a short set and a long set. The longer set is ideal for larger logs and the shorter set is ideal for small logs and square cants. The picture below shows how to attach the levelling feet to the track. The bolt can be turned to either raise or lower the round feet to get your track level. If setting the track on wood blocks, screws may be used in the four holes to secure the foot in place.

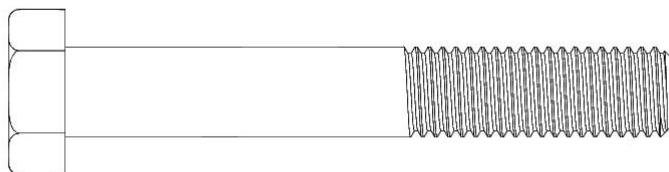


## **4. SAWMILL HEAD ASSEMBLY**

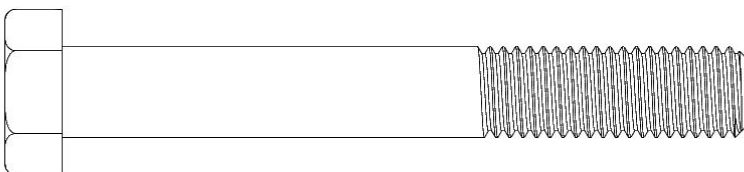
The below chart shows the various bolts that will be used to assemble the head of the sawmill. This chart may be used to ensure the correct bolts are used.



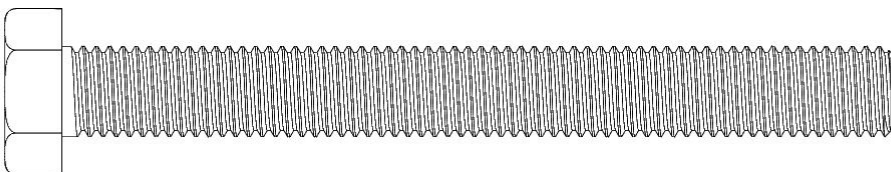
**M12 x 70**



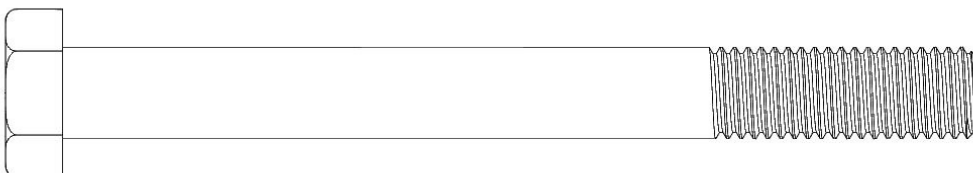
**M12 x 80**



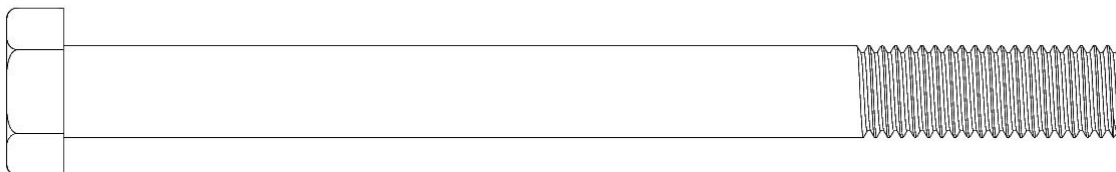
**M12 x 90**



**M12 x 110**



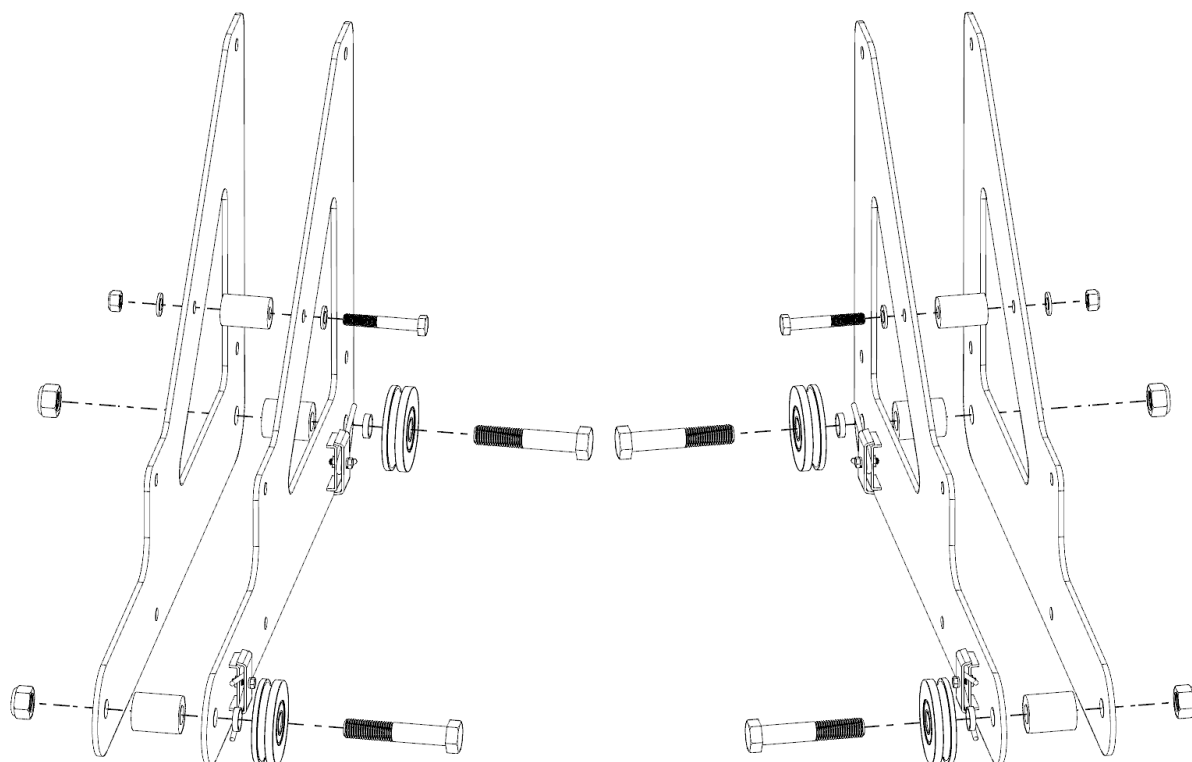
**M12 x 120**



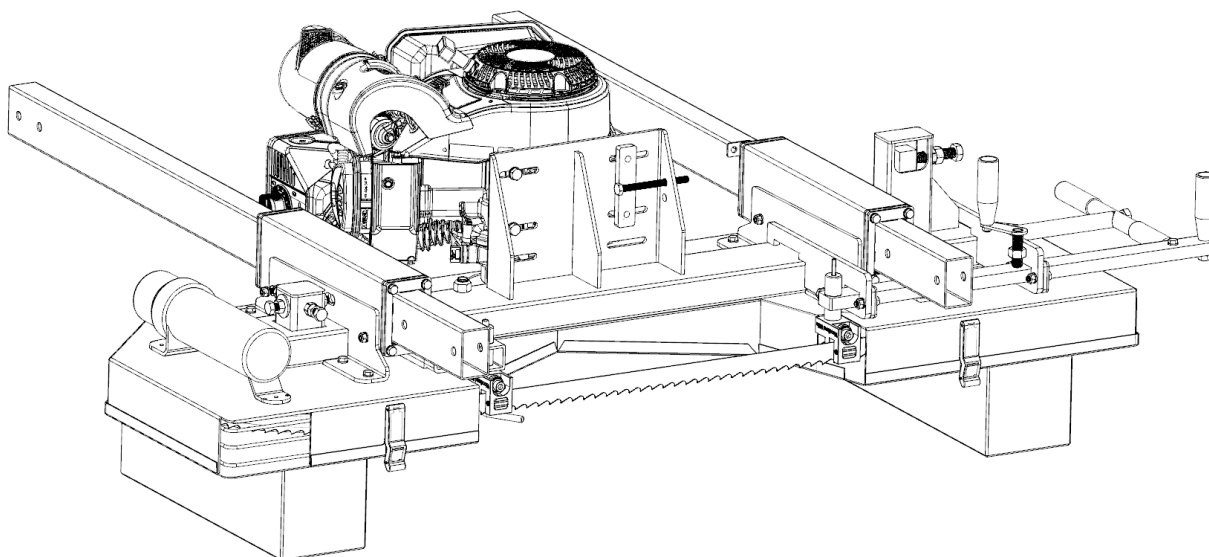
**M12 x 140**



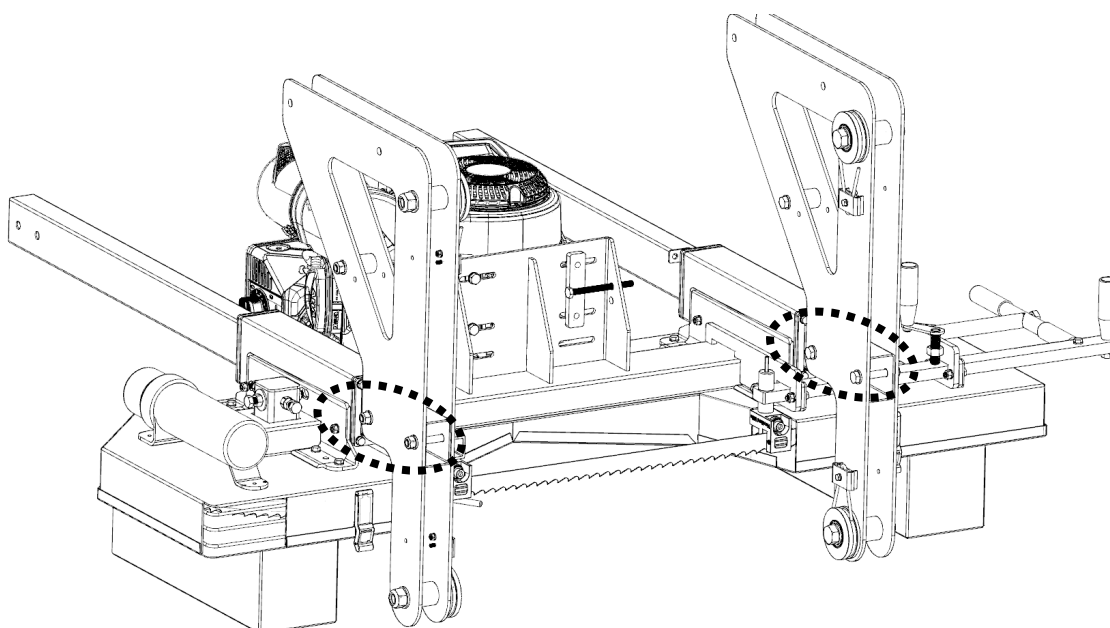
Assemble the carriage base legs as shown below. At this point all bolts should only be loosely tightened. Final tightening of these bolts will be done in a later step.



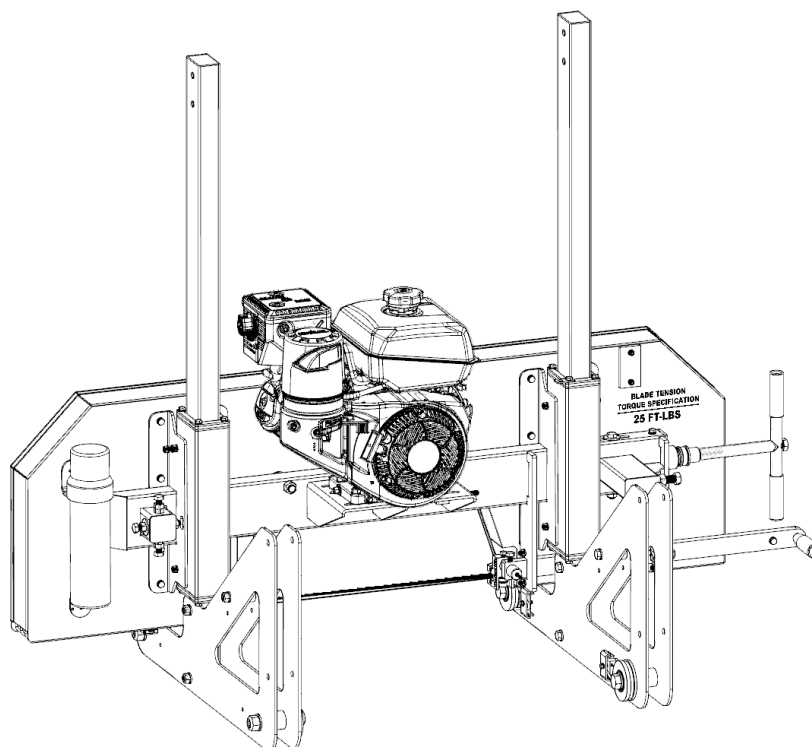
With the saw head resting about 6" (150mm) above the ground. Slide the 2 front posts into the slots as shown below.



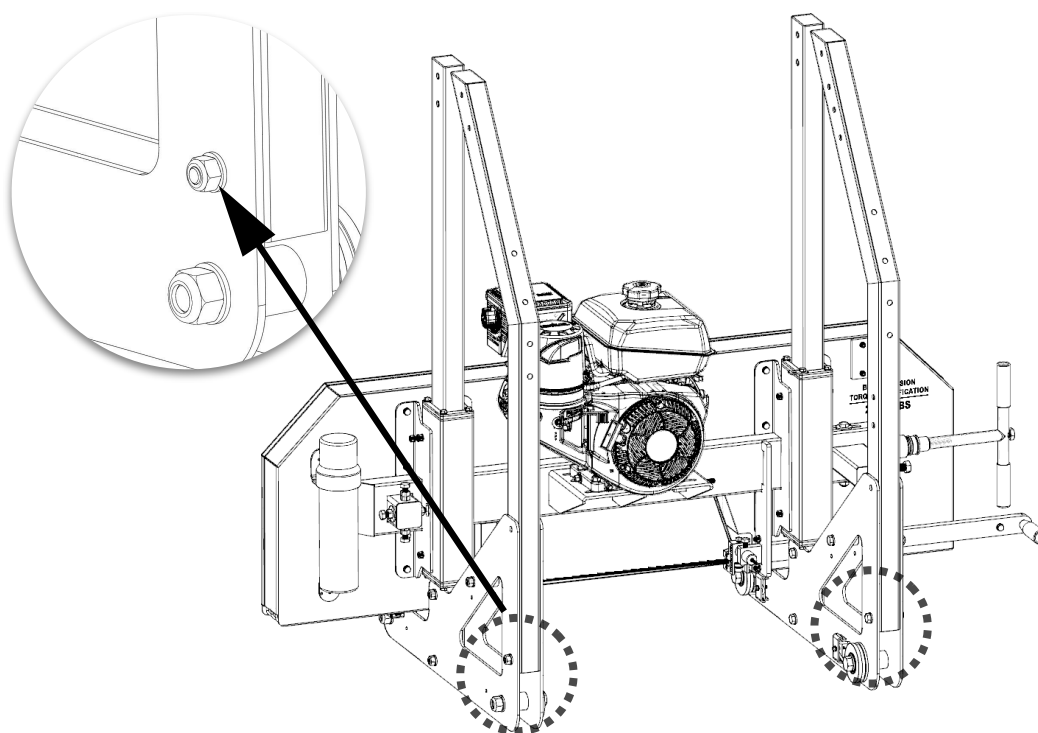
Using 4 of the M12 x 80 bolts, washers and lock nuts, attach the saw head carriage plate assembly to the bottom of the posts. Be sure the carriage wheels are located to the inside. Fully tighten these 4 bolts so the plates are firmly attached to the posts. The posts should be pushed all the way up until the carriage plates contact the sawmill head.



With the help of another person, stand the saw head to its upright position.



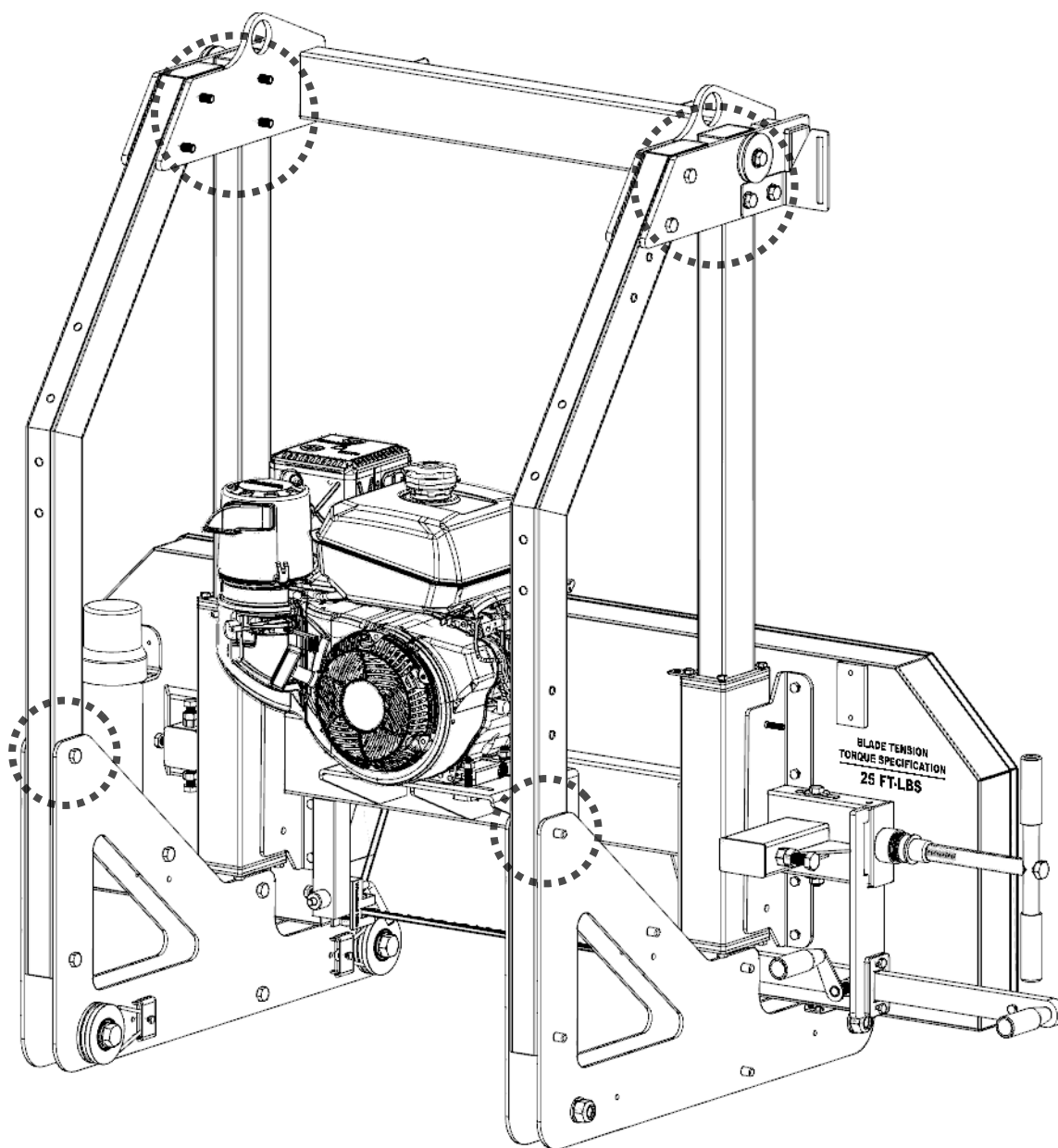
Attach the back posts between the plates using only 1 of the M12 x 80 bolts per side. Be sure to place the post with the extra holes on the right side. These holes are used to mount the D-Handle.



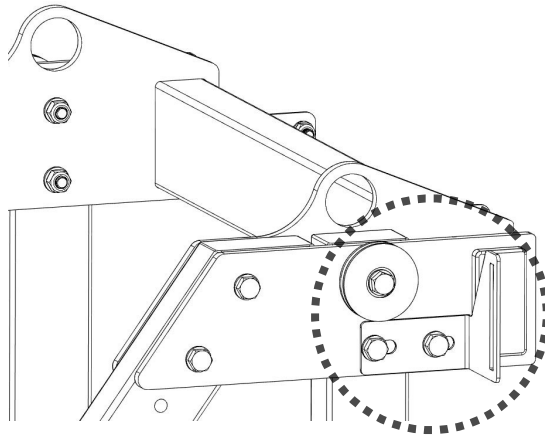




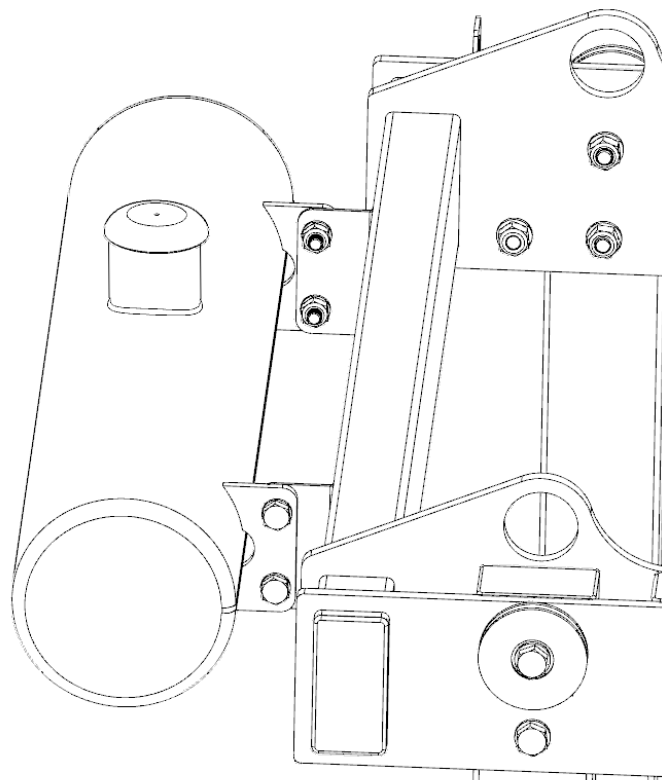
Using 7 of the M12 x 90 bolts and 2 of the M12 x 110 bolts (with the pulleys attached), with the help of another person attach the top cross support to the posts. Also install the other 2 M12 x 80 bolts in the side plates. Do not fully tighten these bolts at this time.



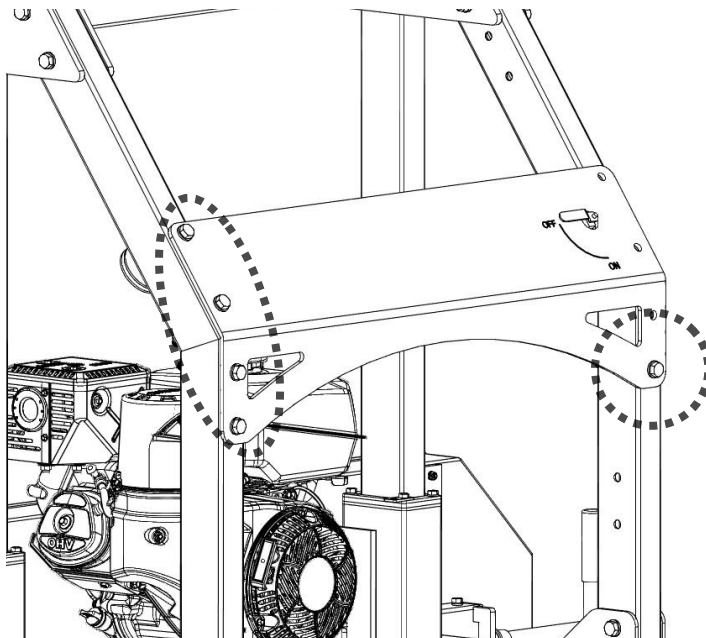
Be sure to attach the scale bracket as shown below.



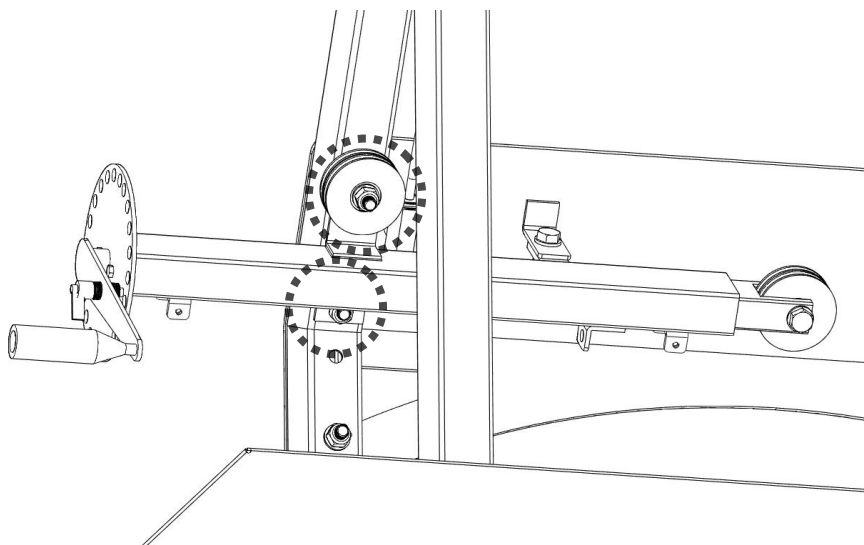
Attach the lubrication tank using the attached hardware as shown below.



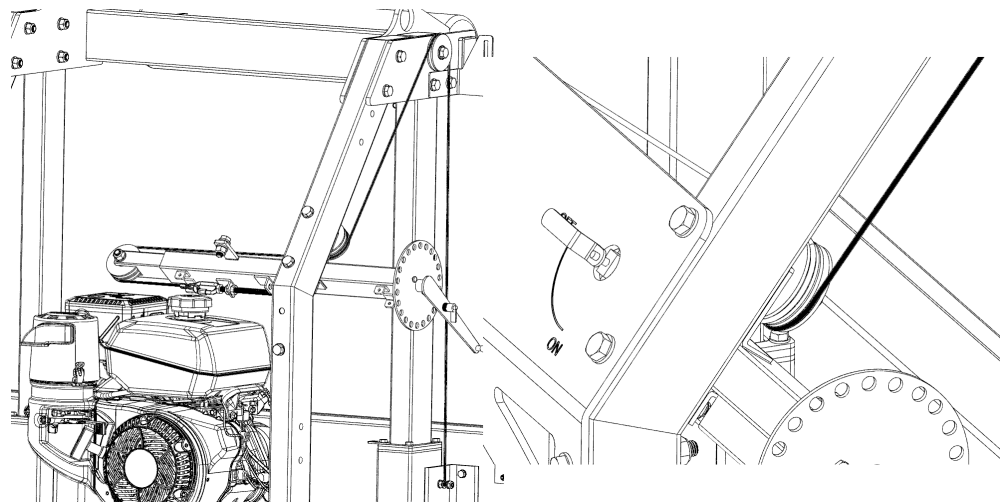
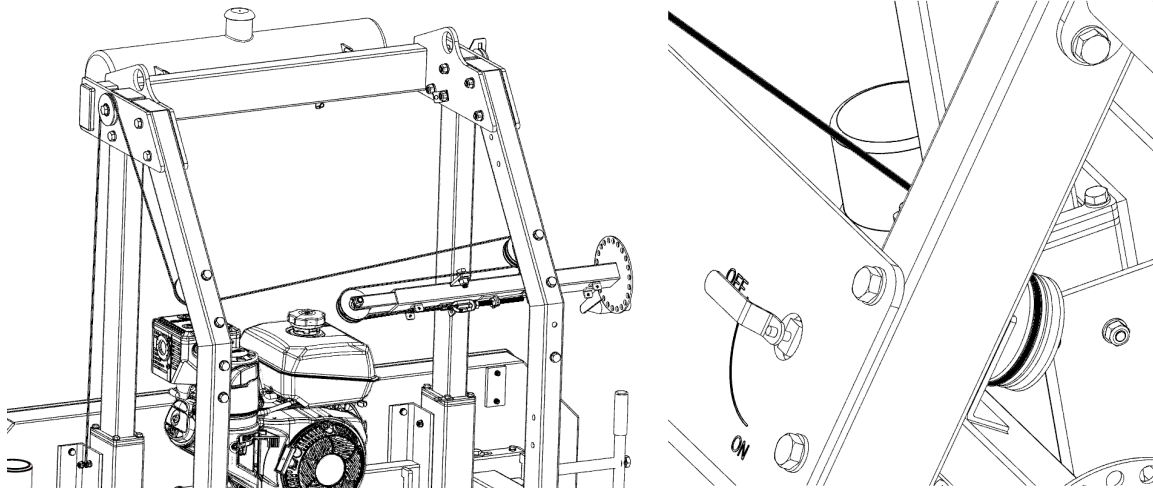
Attach the dashboard plate to the posts using 4 of the M12 x 110 bolts and the 1 M12 x 120 bolt with the roller attached as illustrated in the picture below. Do not fully tighten these bolts at this time.



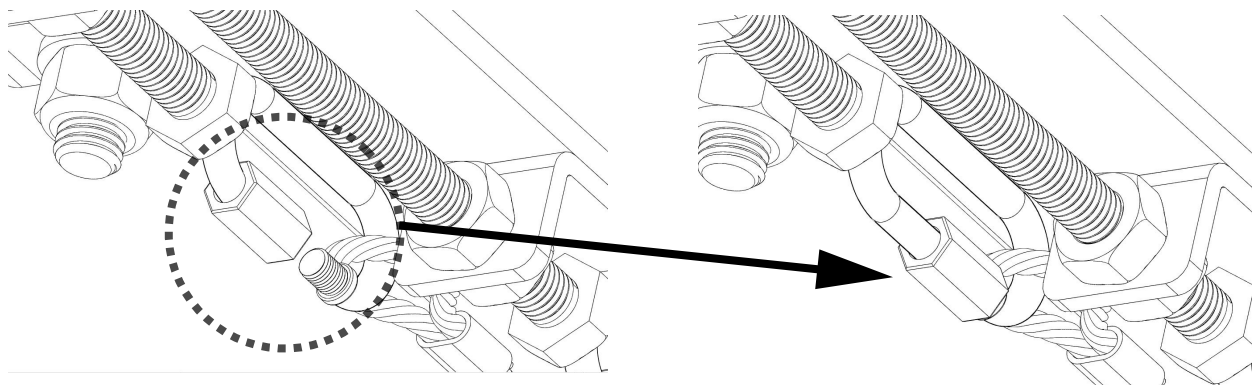
Attach the crank handle assembly to the underside of the angled post using the M12 x 140 bolt with double roller and 1 of the M12 x 110 bolts as illustrated below. Do not fully tighten these bolts at this time.



Route the cables as shown below.

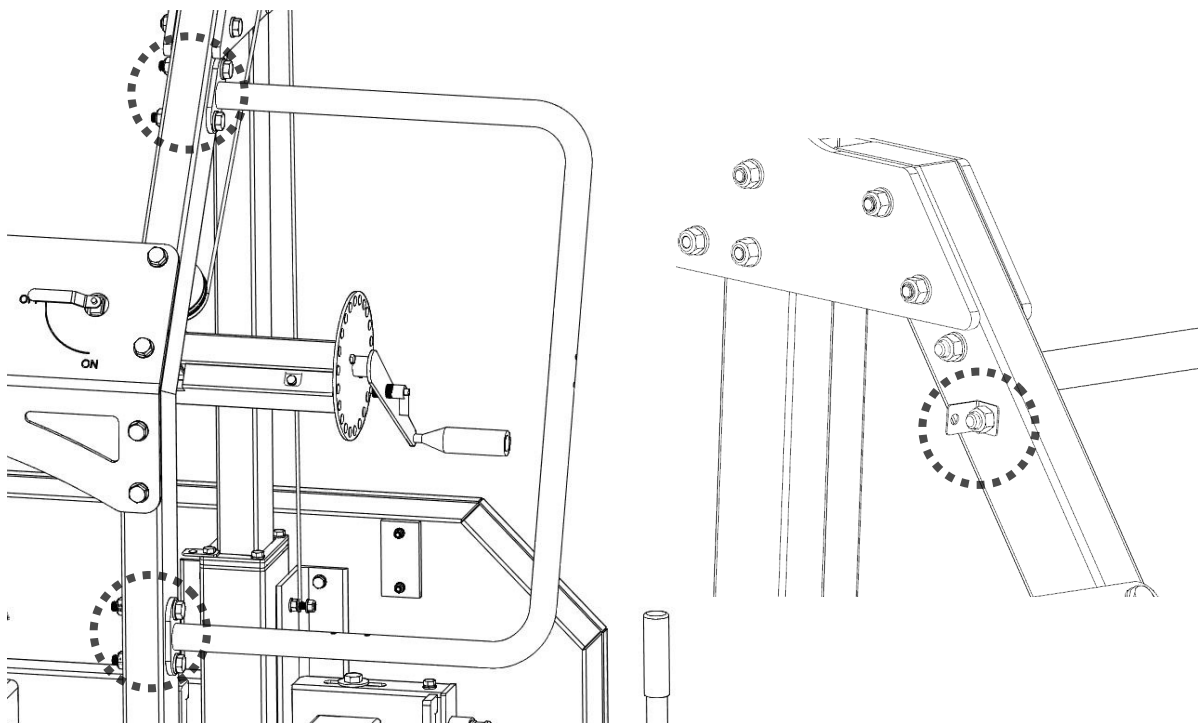


Be sure to tighten the oval chain link with a wrench after the cable loop ends have been attached.

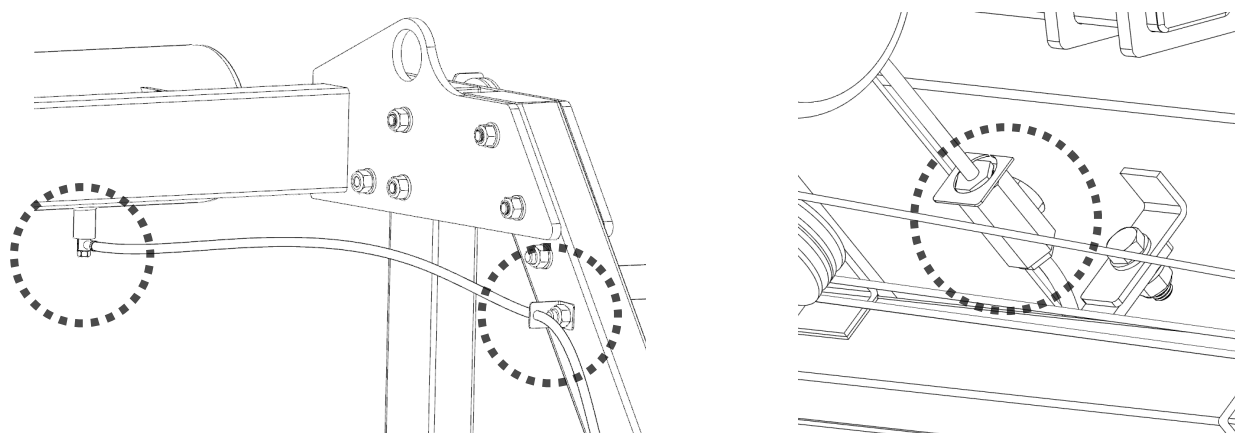




Attach the 'D' handle to the side of the post using all 4 of the M12 x 70 bolts, washers, and lock nuts as shown below. Be sure to attach the water line bracket as shown below. These bolts can be tightened.

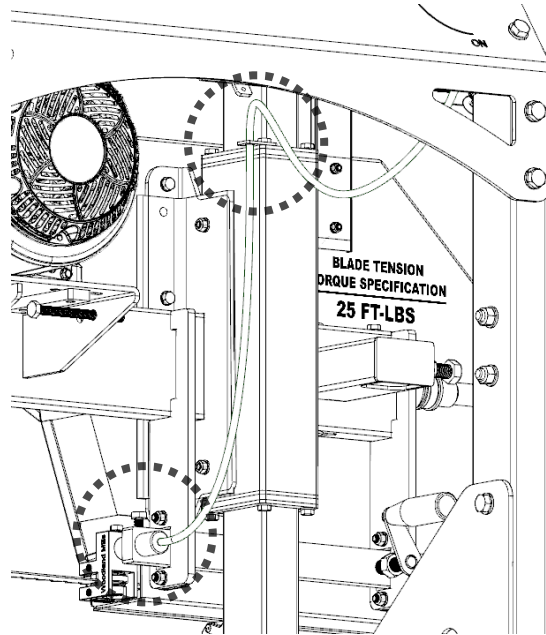


Insert the lubrication tube into the fitting on the tank by pushing the blue collar in at the same time the tube is inserted. Once inserted, release the blue collar and the tube will be secure. Feed the tube through the bracket as shown below. Attach the other end to the water valve.

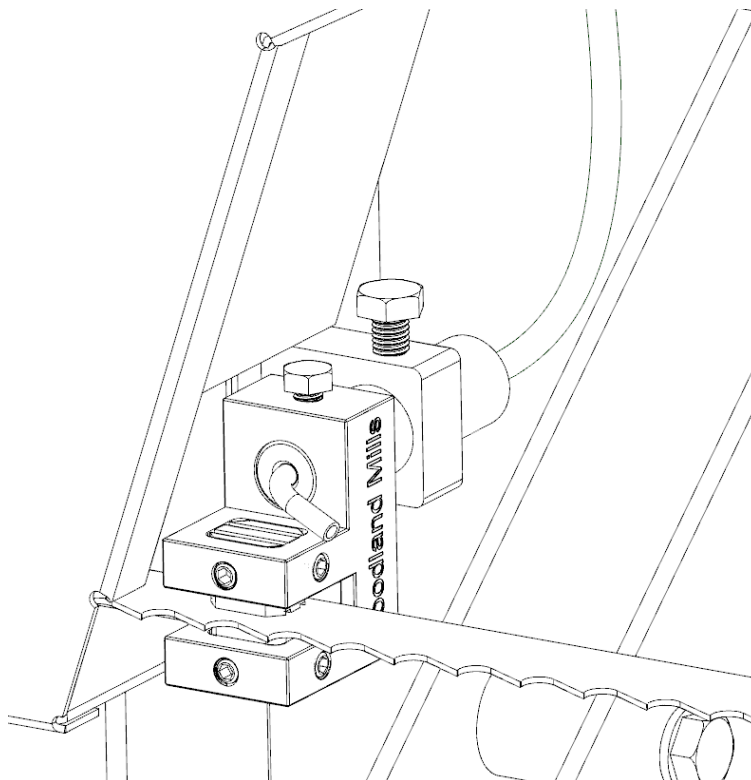




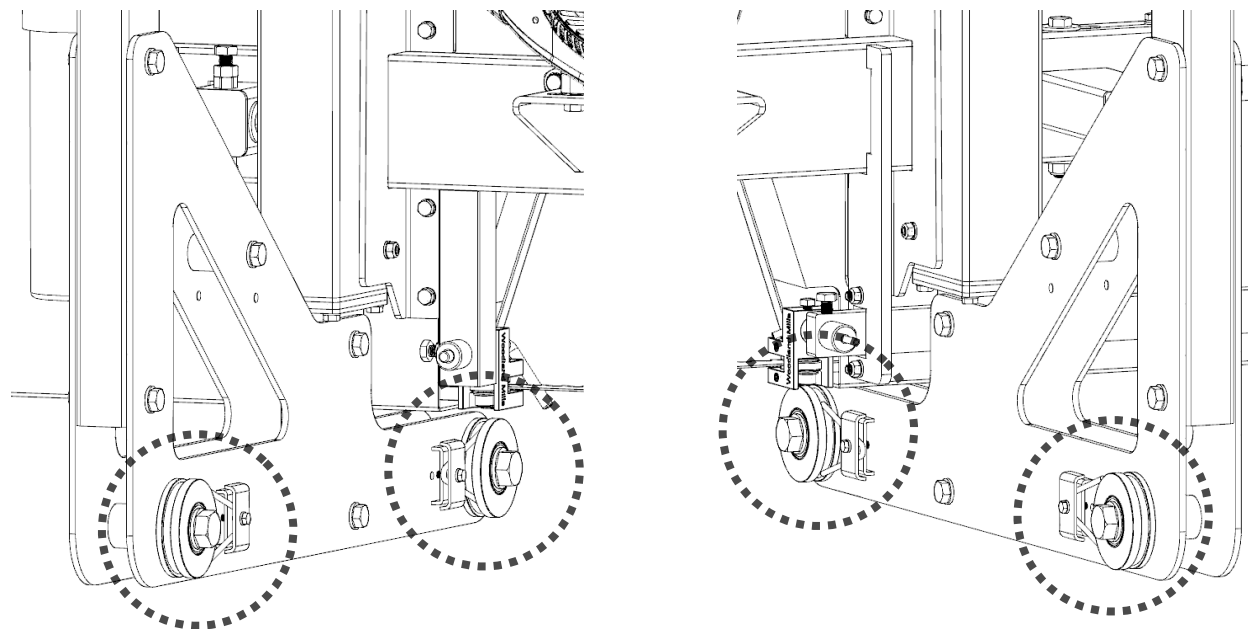
Attach the other lubrication tube from the valve on the dashboard and feed it through the water tube bracket and fit it over the end of the copper tube.



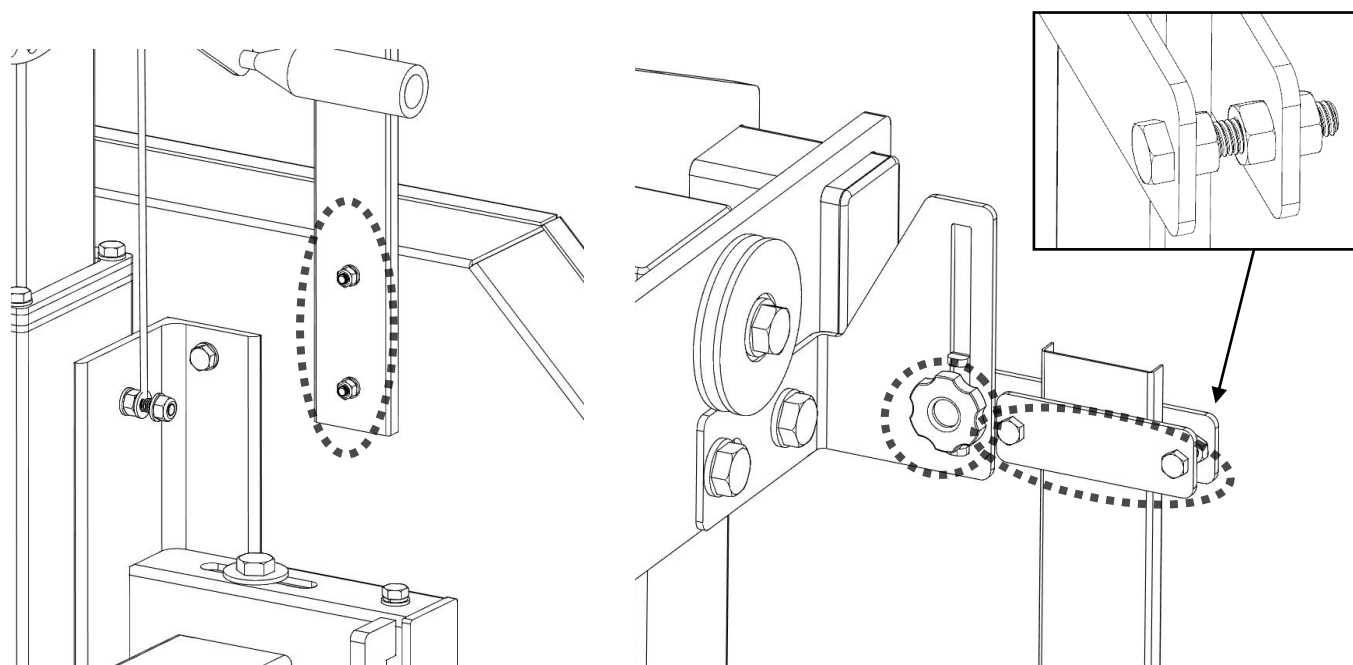
Insert the lubrication hose as shown below. Use a hex wrench to secure the copper end in position by tightening the set screw so that it lightly pinches the copper tube. Do not over tighten or crush the copper end.



Tighten all 4 bolts that hold the wheels to the carriage plates as shown below.

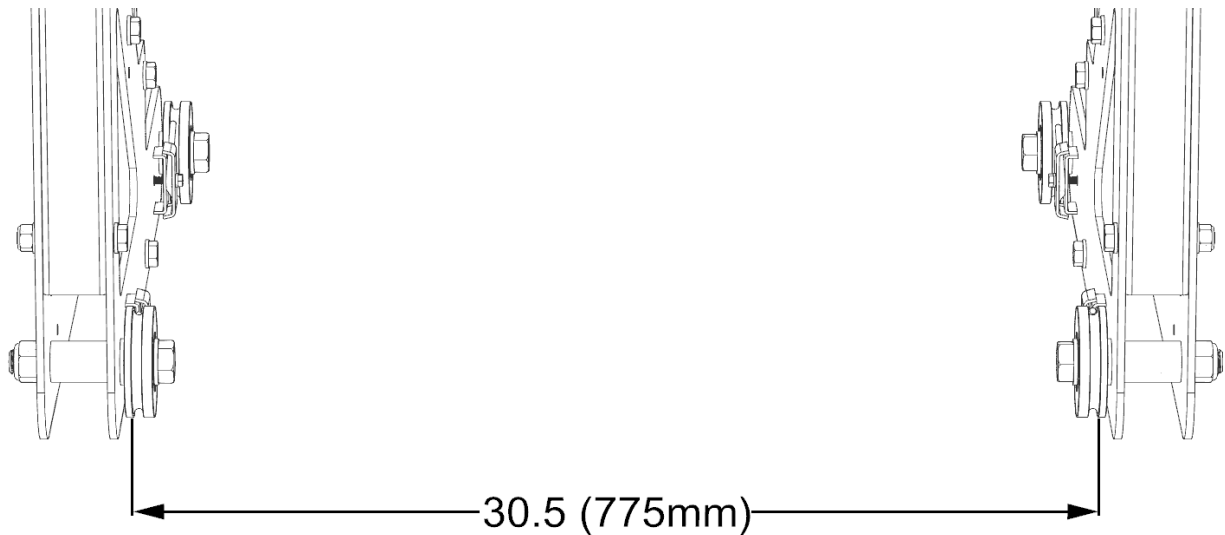


Bolt the log scale to the band wheel housing using the bolts provided as shown below. Attach the log scale back bracket to the log scale bracket using the threaded knob as shown below. Attach the scale indicator face to the log scale back bracket using the nuts and bolts provided as shown below.

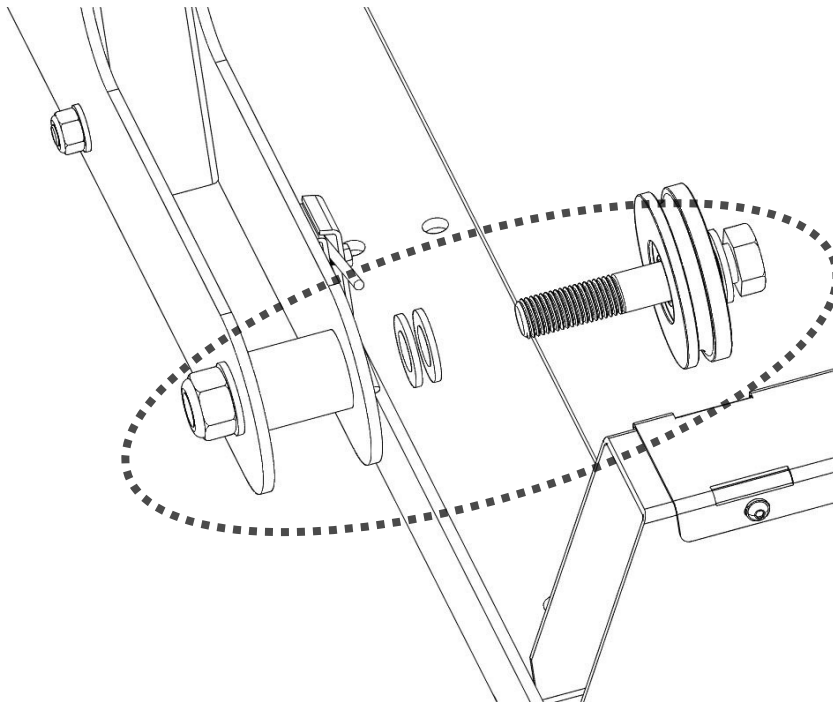


## **5. PLACING THE HEAD ON THE TRACK**

Before placing the head on the track, the carriage wheel spacing can be set to ensure they will fit properly on the "L" rails. Check the wheel spacing to ensure that a distance of 30.5" (775mm) is measured from outside to outside of the wheel grooves as shown below.



To adjust the width of the wheels, washers may be added or removed from each wheel to ensure a distance of 30.5" (775mm) is achieved as shown below.

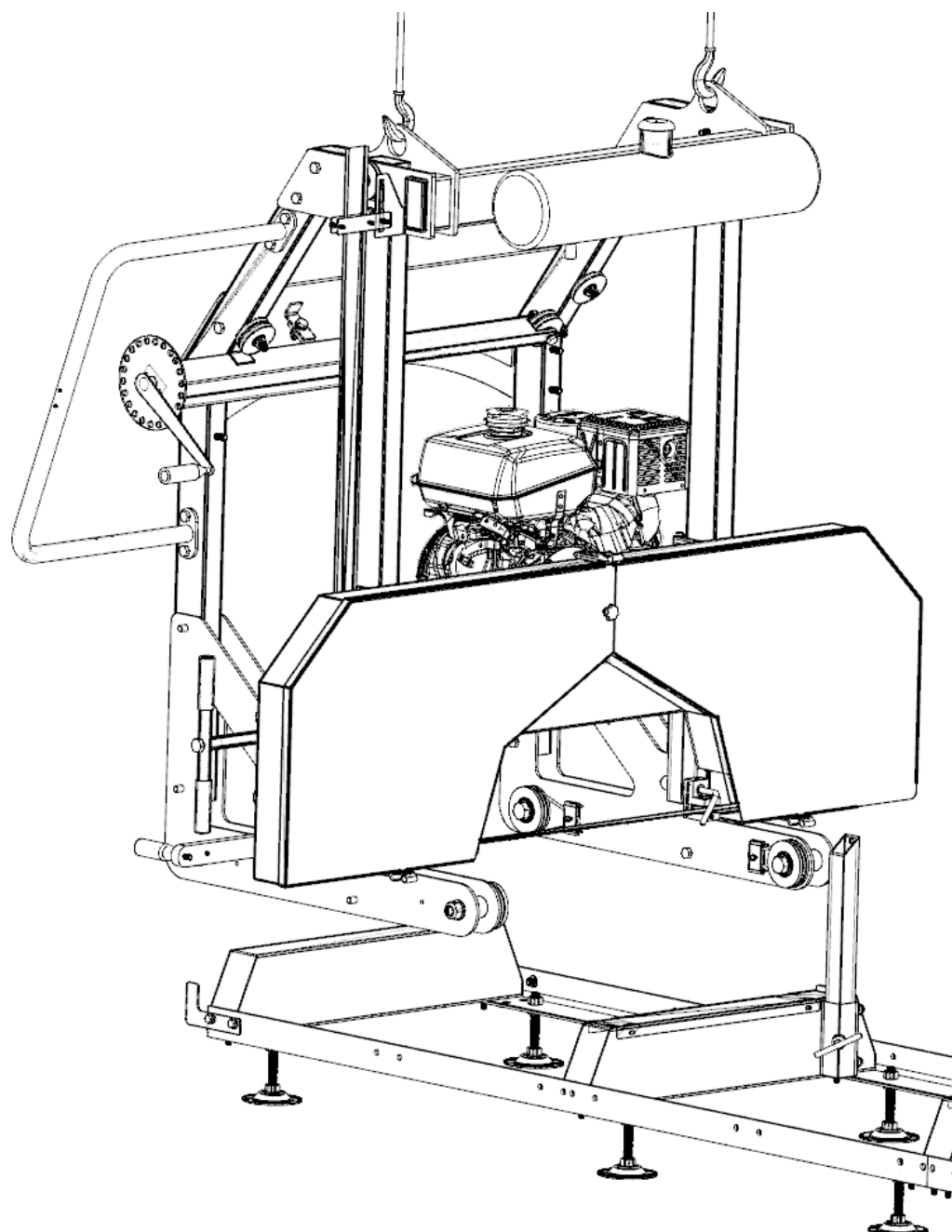




There are two methods in which the sawmill head can be lifted onto the track assembly. At this point, most of the sawmill head bolts should only be hand tight. They will be fully tightened when the head is on the track and has settled in a true and square state.

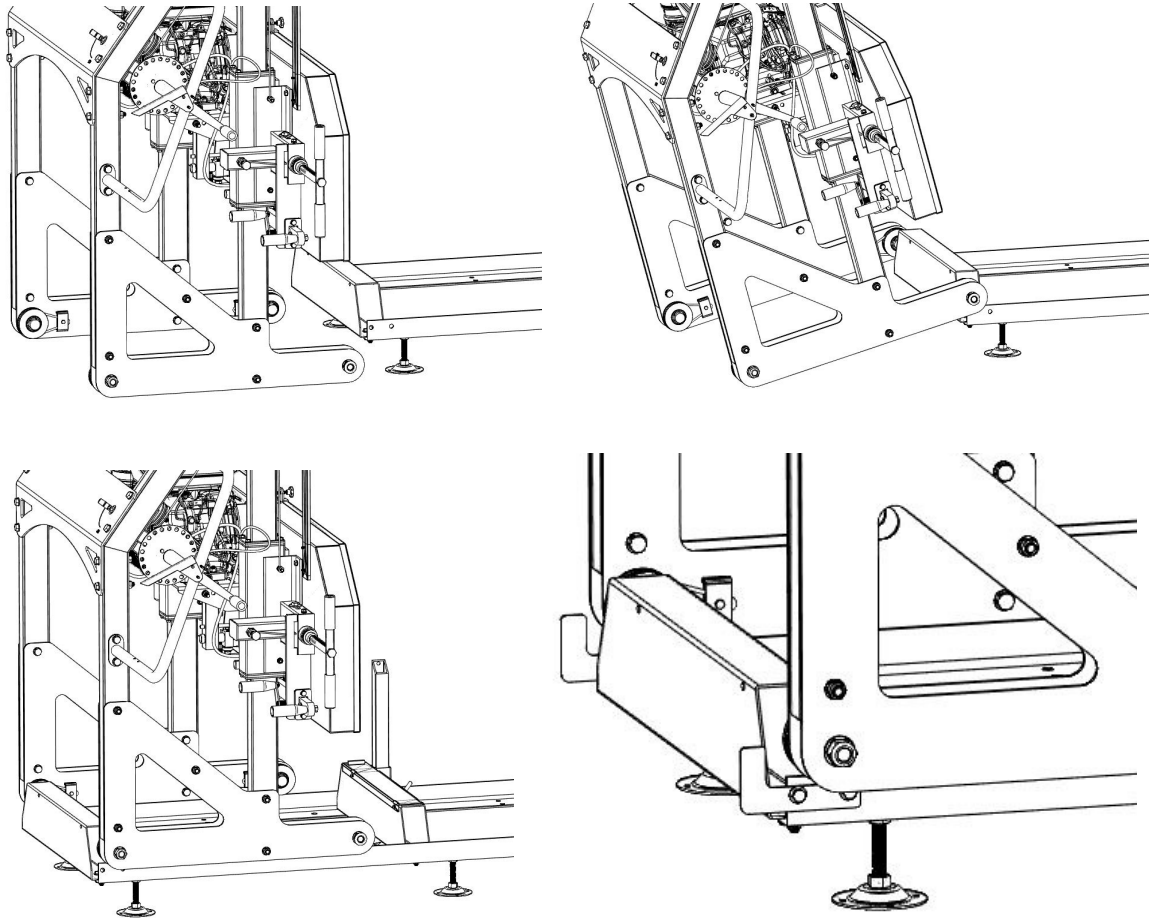
## METHOD 1

If a tractor or forklift is available, the head may be lifted onto the track with a lifting strap or chain rated for at least 1,000 lb (450 kg). Attach the lifting strap/chain to the lifting hooks and pick the head up and rest it on the track so that the grooves in the carriage wheels fit around the "L" rails. Two people are recommended for this procedure.



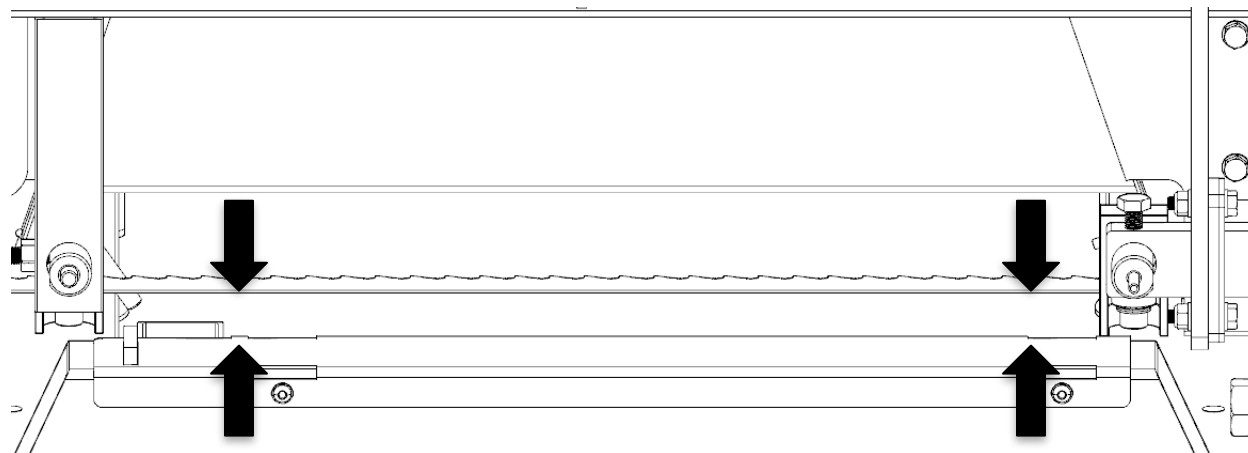
## METHOD 2

Two people are needed for this method. Start by removing the “L” shaped brackets on the end of the tracks. The head can be walked over to the track until it is positioned behind the track as shown below. Once in this position, the head can be tilted backwards so that the front two wheels are off the ground. The head can then be walked in place whereas the two front wheels rest it on the track so that the grooves in the carriage wheels fit around the “L” rails. Next, two people can lift up on the back of the sawmill head and walk it forward so that two back wheels are situated on the track. Finally, the “L” shaped brackets can be re-attached to the track rails.

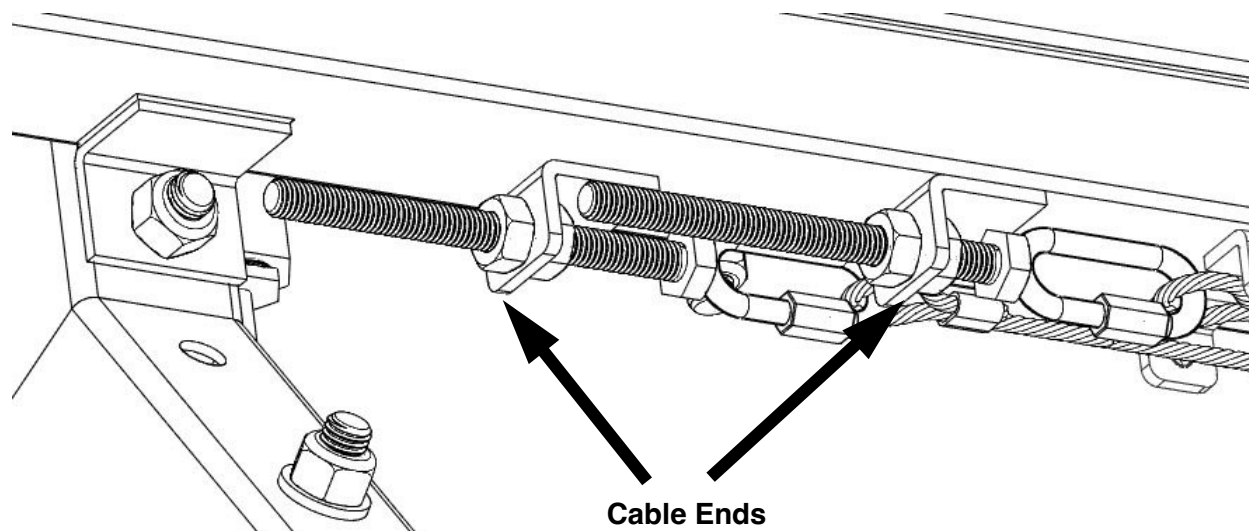


With the saw head now resting on the track, all of the saw head bolts may be tightened up.

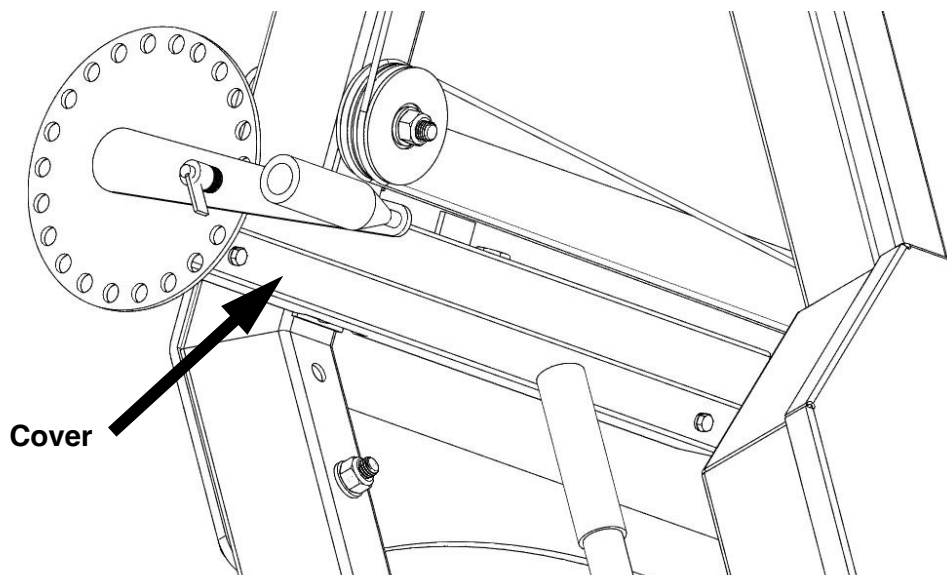
Using a tape measure, take a measurement from the blade to the top of the log bunk on both the left and right side. The distance should be equal on both sides. If it isn't, you will need to adjust the cable ends at the rear handle to either raise or lower one side. Refer to step below for adjustment instructions.



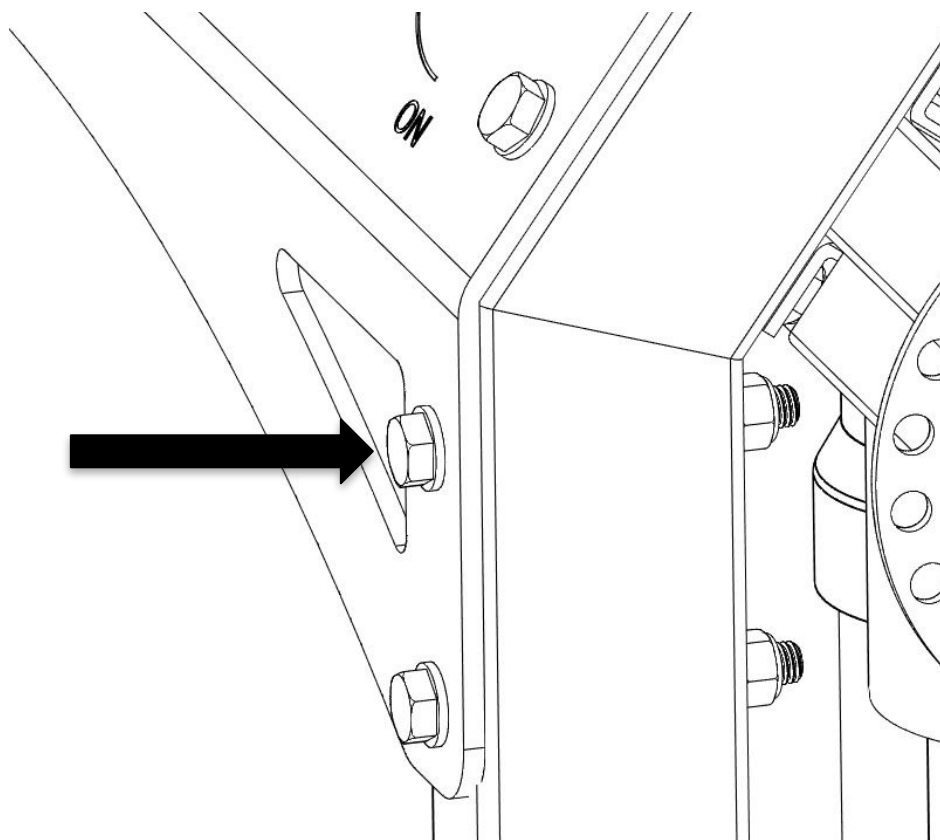
Using a 14mm socket, turn the nut either clockwise to raise one side of the saw head or counter-clockwise to lower one side of the saw head. Double check the blade height as discussed in the previous step. Once measurement is consistent on both sides, tighten the corresponding nut to clamp securely against tab.



Install the cover and tighten the two bolts on the top and two on the bottom to secure it in place. Use a 10mm socket for all four bolts.

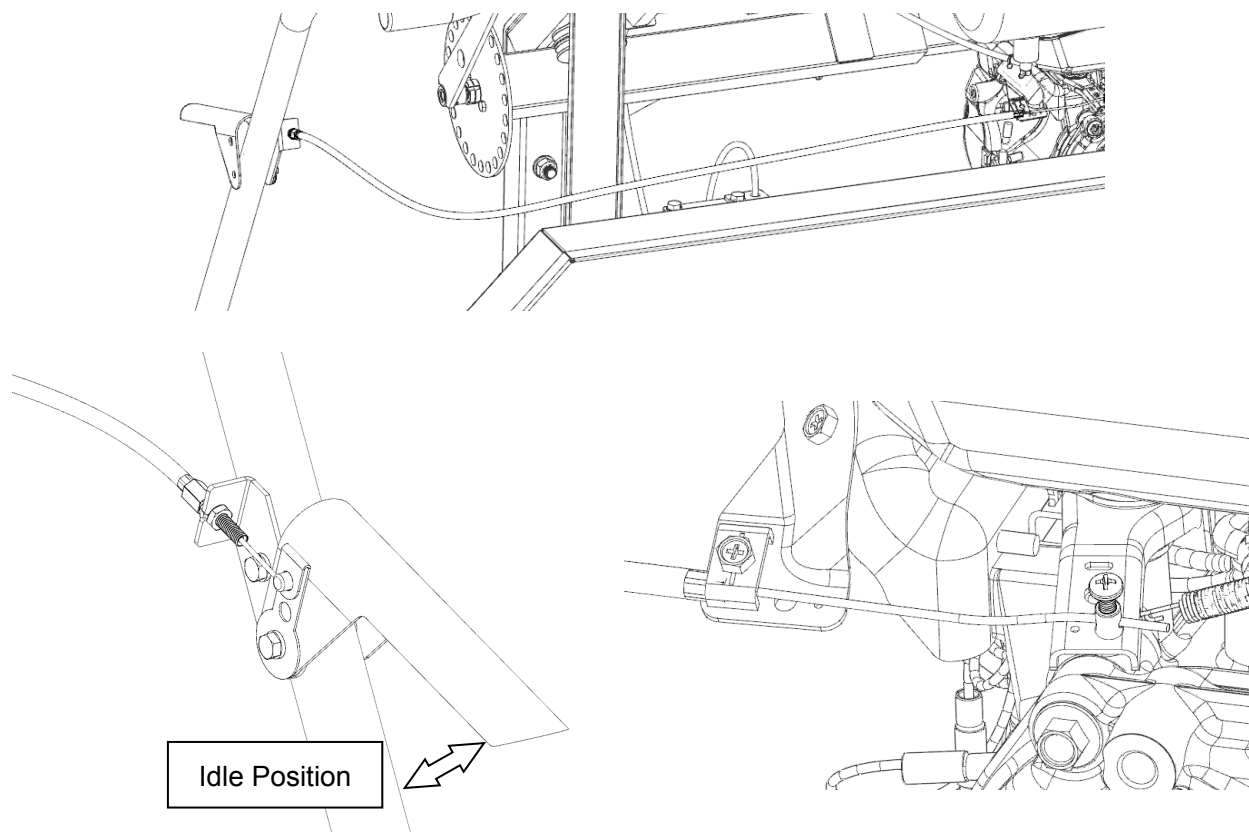


Install the last M12 x 110 bolt into the dashboard.

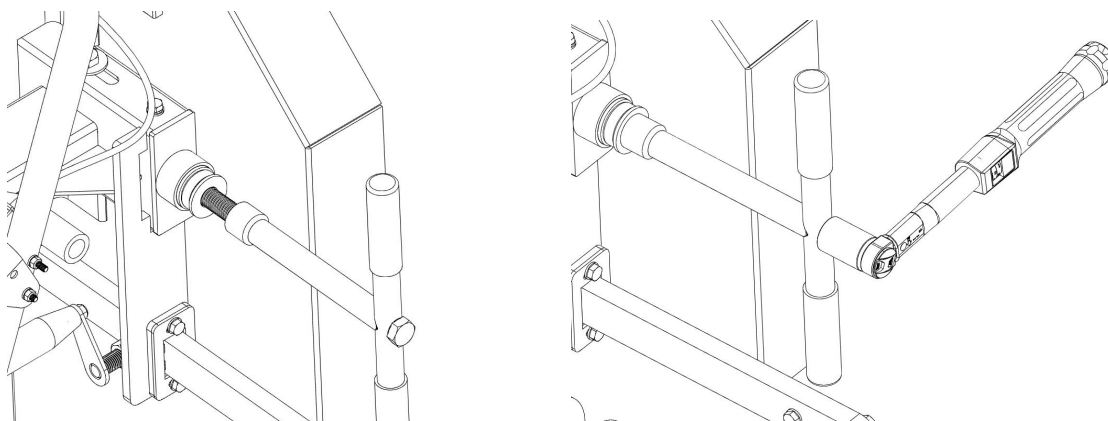




Install the throttle handle to the round bar as shown in below left image. With the throttle lever in the idle position/fully open, pull the cable tight at the engine and tighten the screw to hold it in place. This will take all of the slack out of the cable.

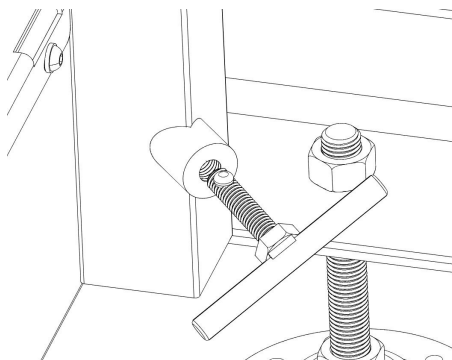


Add waterproof grease to the threads of the blade tension “T” handle and to the washer face that it meets before use. Proper blade tension is achieved when a 24mm socket is used on a torque wrench to tighten the “T” handle to 25 ft-lbs (34 N-m) torque. See below right image.

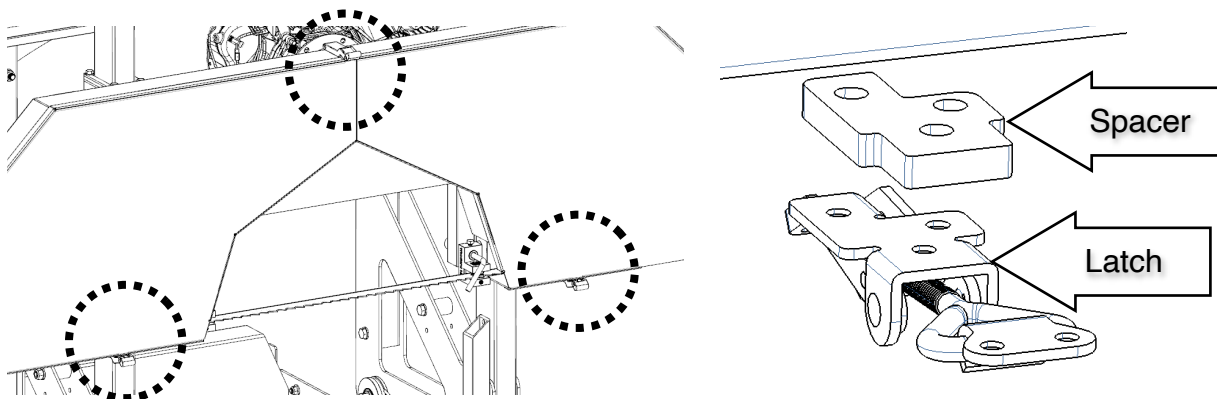


***\*Note – It is very important to take the tension off of the blade by turning the “T” handle in the counter-clockwise direction when the sawmill is not in use. Failure to do so, will result in flat spots on the rubber belts. These flat spots will cause the mill to vibrate excessively during next use.\****

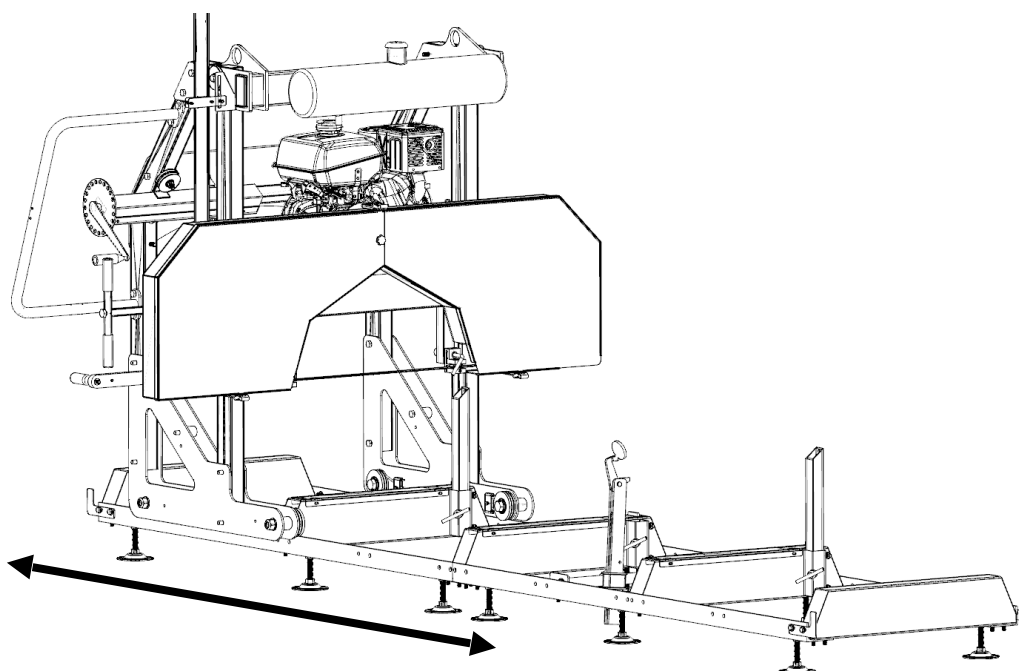
Add grease to all "T" handle threads on the sawmill.



Install the 3 latches on the band wheel housing doors, if they are not already installed. Only the 2 bottom latches require a spacer.



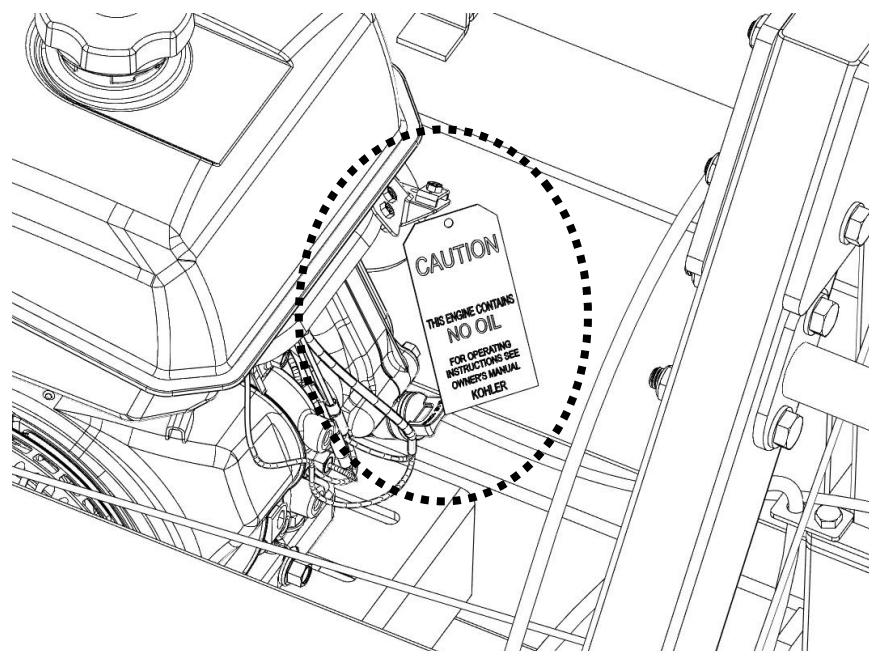
Push the saw head up and down the track system to ensure that the width of the track allows for the saw head to move freely. If it binds or feels tight, the carriage wheel spacing can be adjusted again by adding or removing washers.



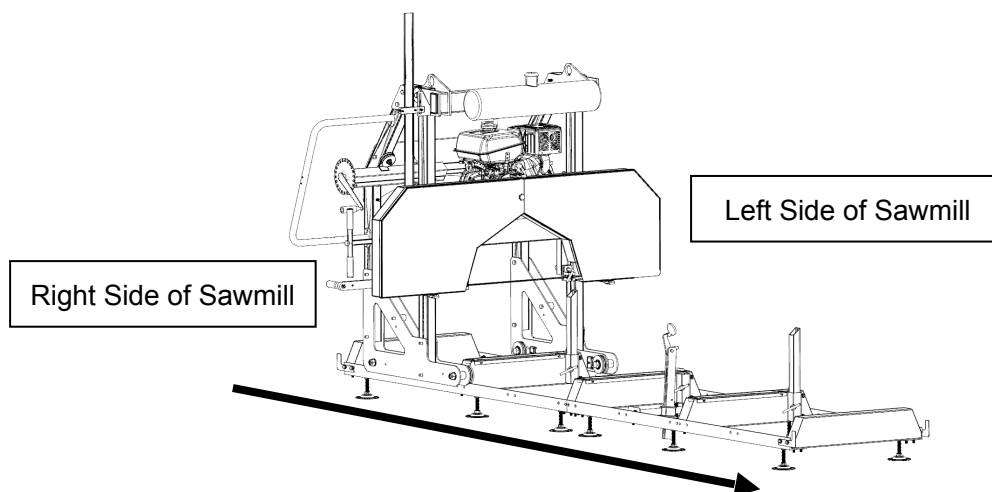


## 6. ENGINE

Refer to the engine manual before using your sawmill. Please note that the engine does not contain any gasoline or engine oil when it is shipped. Furthermore, the engine is equipped with an oil alert system, meaning that if the crankcase oil level is low or empty, the power is cut to the spark plug and it will not start.



Always cut in the direction shown below. The log clamp should always be on the right side of the log and the log supports should always be on the left. Failure to cut in this direction can cause the log to come loose and possibly even cause damage or injury.



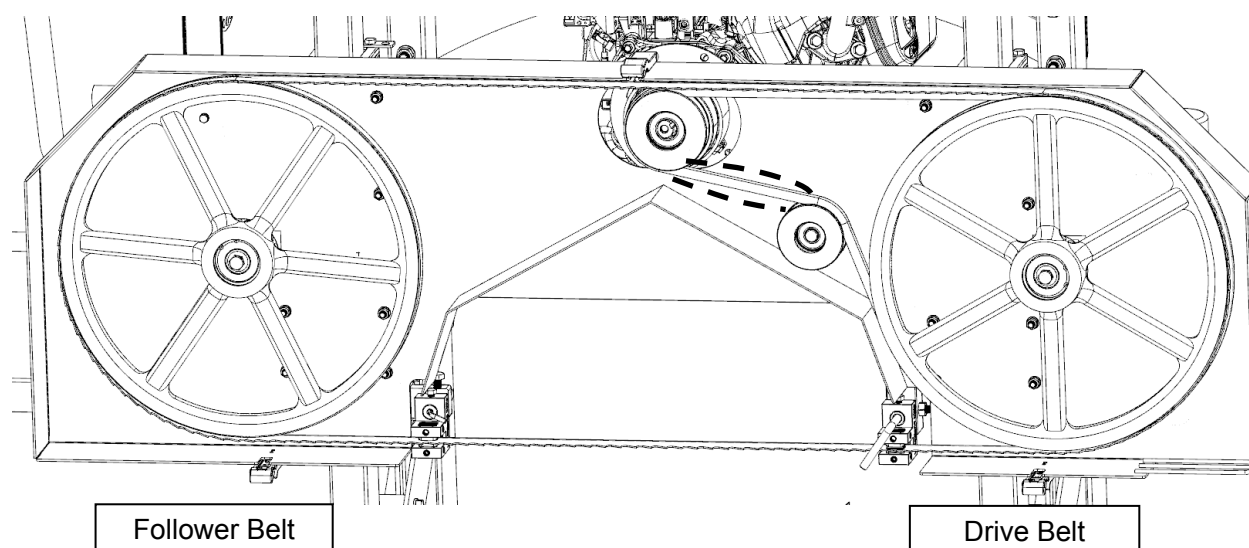
***\*Now that your sawmill is assembled, please run through the “SAWMILL SET-UP PROCEDURES” in the following section. Failure to do so may result in poor sawing performance, damage or injury. See next page.\****

# SAWMILL SET-UP PROCEDURES

## 1. BELT TENSION

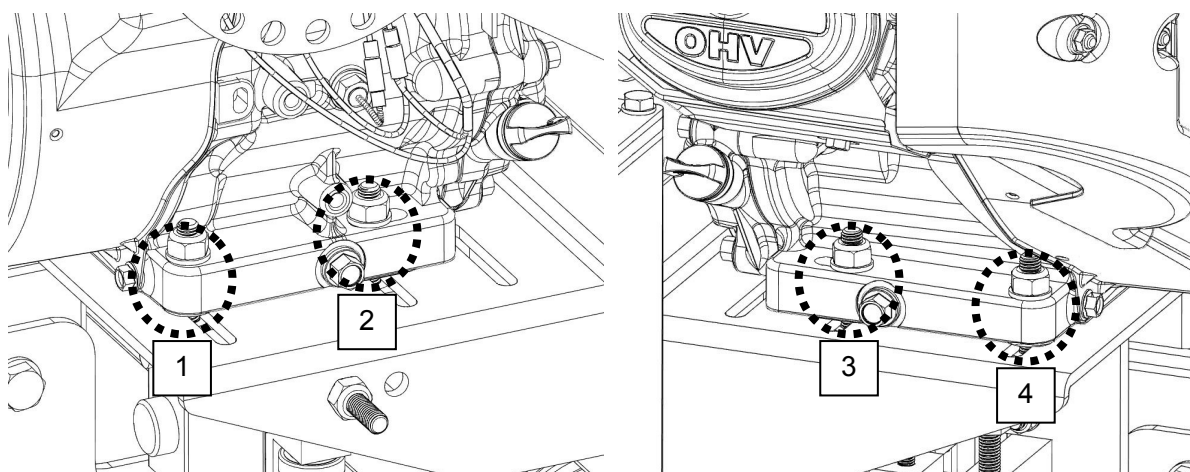
**Follower Belt** – This is a polyurethane belt and will be seated tightly in the band wheel vee groove. No adjustment is required for this belt.

**Drive Belt** - To check the belt tension, with your hand, firmly try to deflect the belt up and down. There should be no more than 1/4" (6mm) of deflection. If the belt deflects more than this, it will need to be tightened as described below.



Never attempt to adjust the belt tension with the engine running. As a safety precaution, remove the spark plug cap.

To tighten the drive belt, start by loosening the four bolts that secure the engine to the engine mount.

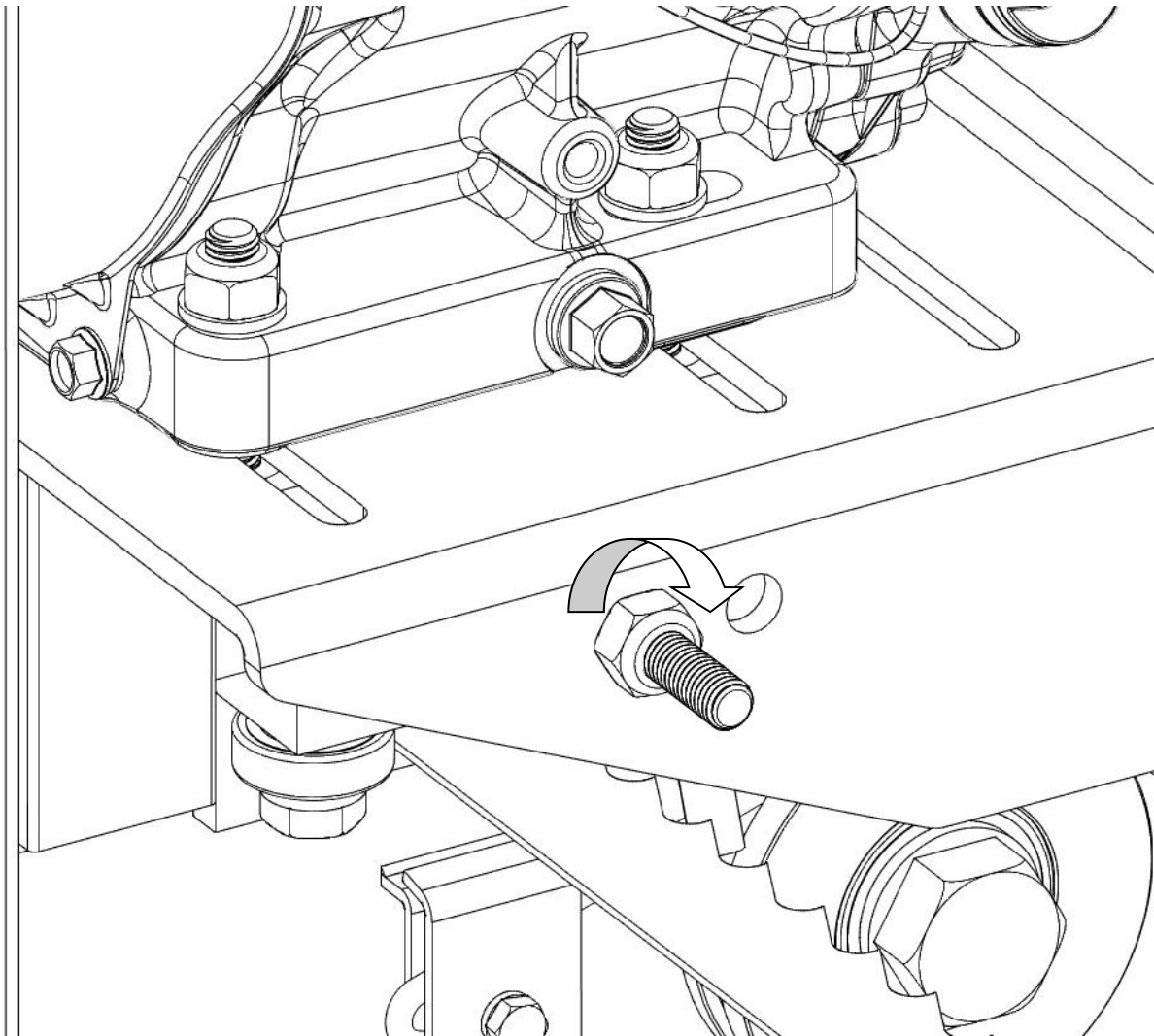






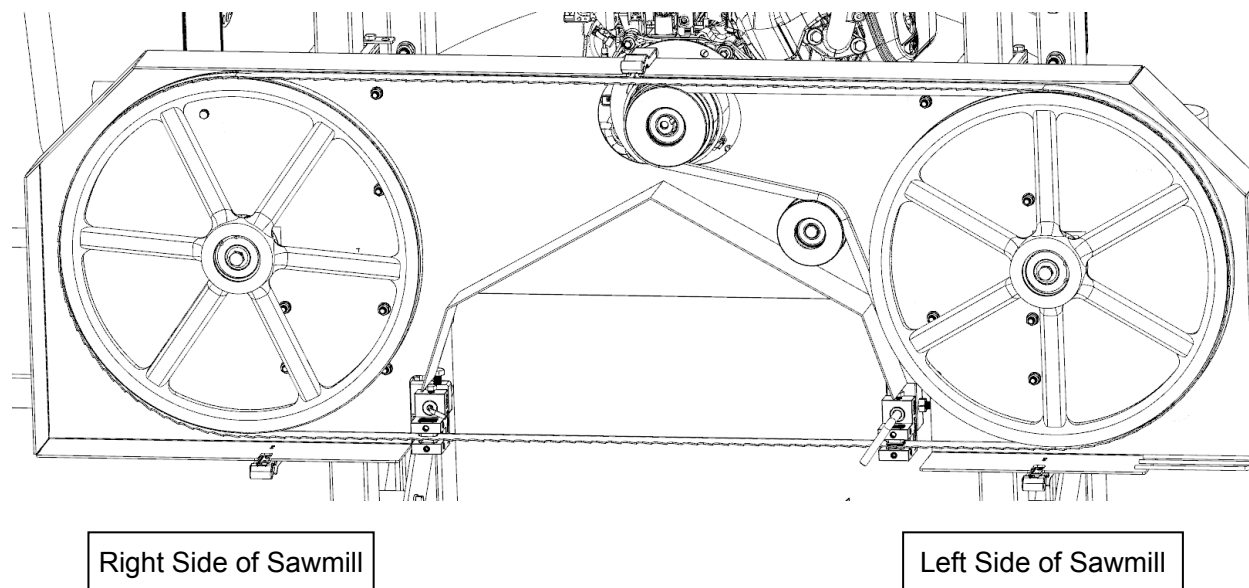
Now that the engine is free to slide on the engine mounting plate, turn the nut on the horizontal stud in the clockwise direction. This will pull the engine towards the stud and apply more tension on the belt. Do this step incrementally while checking the belt for proper deflection. It is also important to ensure that the engine remains perpendicular to the drive belt. Over tightening can cause the engine to twist on the mounting plate, resulting in belt alignment issues and premature wear. Once the desired belt tension is set, tighten the four engine bolts.

Alternatively, if the drive belt is too tight, the nut on the horizontal stud can be turned counter-clockwise.

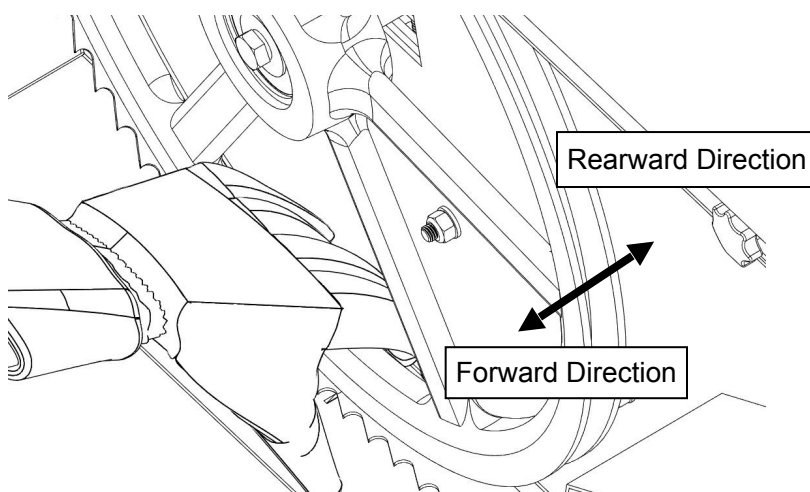


## **2. BLADE TRACKING**

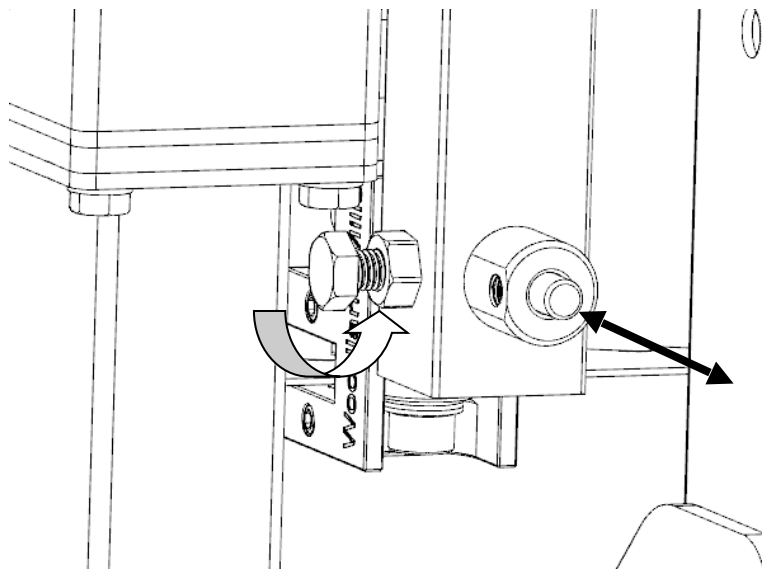
Never attempt to adjust the blade tracking with the engine running. As a safety precaution, remove the spark plug cap. It is also advised to wear gloves and safety glasses when working with the blade as it is extremely sharp.



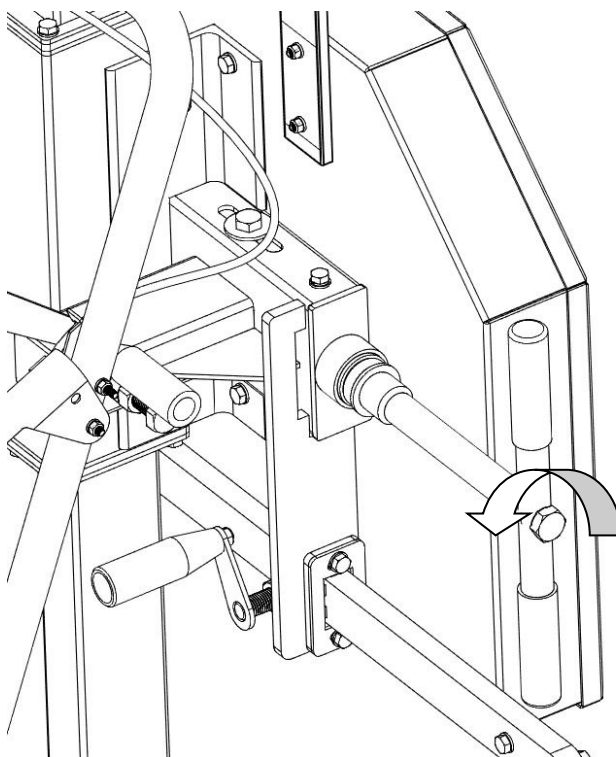
The blade should run with the same tooth to band wheel face distance on both sides. 3/8" (9mm) is ideal. The back of the blade will be flush with the back of the band wheel at this distance and is a quicker check than measuring with a tape measure. If an adjustment on either side is required, the below steps will detail this procedure.



Loosen the blade guide assembly bolt with a 16mm socket. The round shaft should now be free to slide rearward and out of the way. Perform this step on both guide assemblies. This will ensure that the guide bearings do not influence tracking of the blade while adjusting.

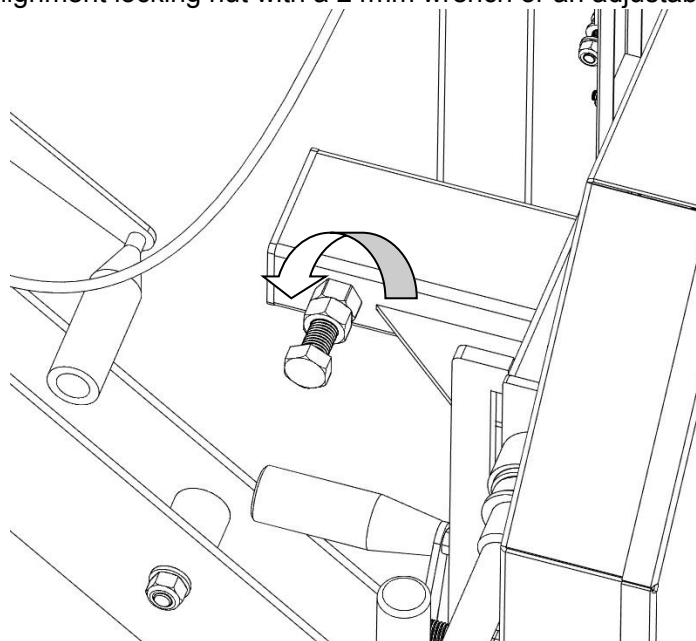


Take some tension off of the blade by turning the "T" handle in the counter-clockwise direction one full turn from full tension position.

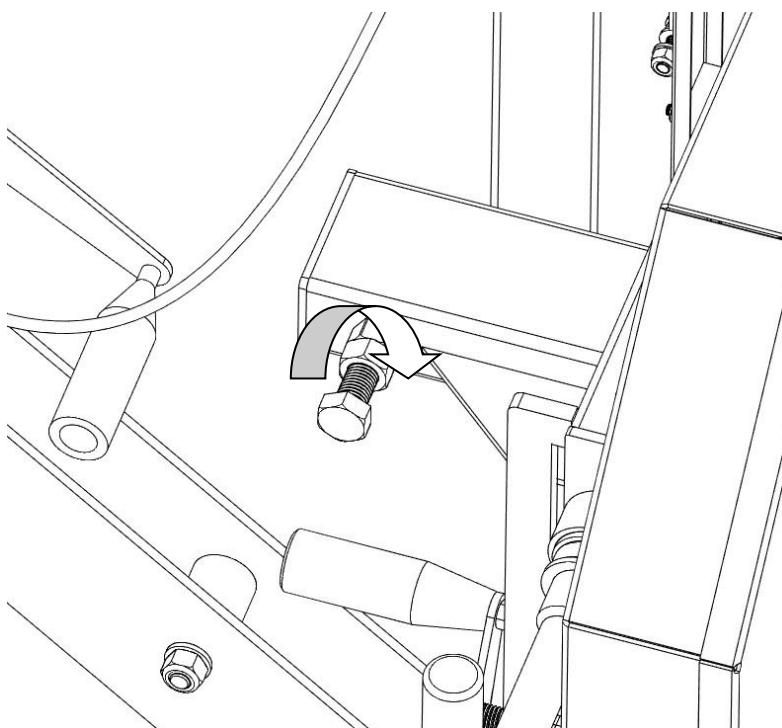


### **Adjusting The Right Hand Side**

Loosen the tracking alignment locking nut with a 24mm wrench or an adjustable wrench.

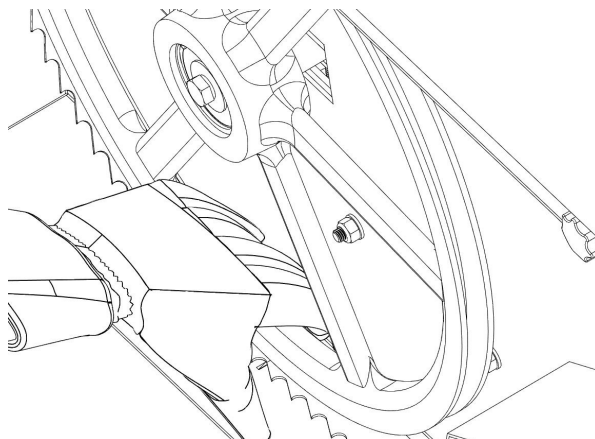
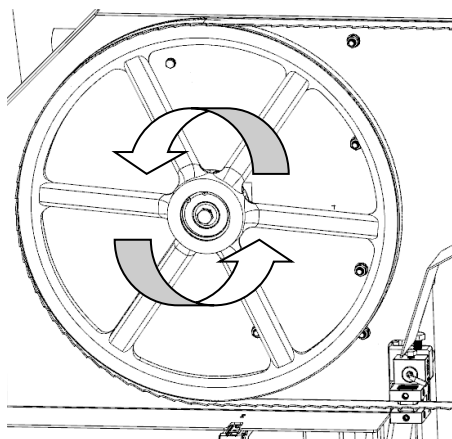


The alignment bolt can now be turned to change the angle of the band wheel and track the blade. To move the blade more rearward on the band wheel, this bolt will need to be turned clockwise. Alternatively, turning the bolt in the counter-clockwise direction would force the blade to run more forward on the band wheel. Turn the bolt a 1/2 turn and re-tension the blade.

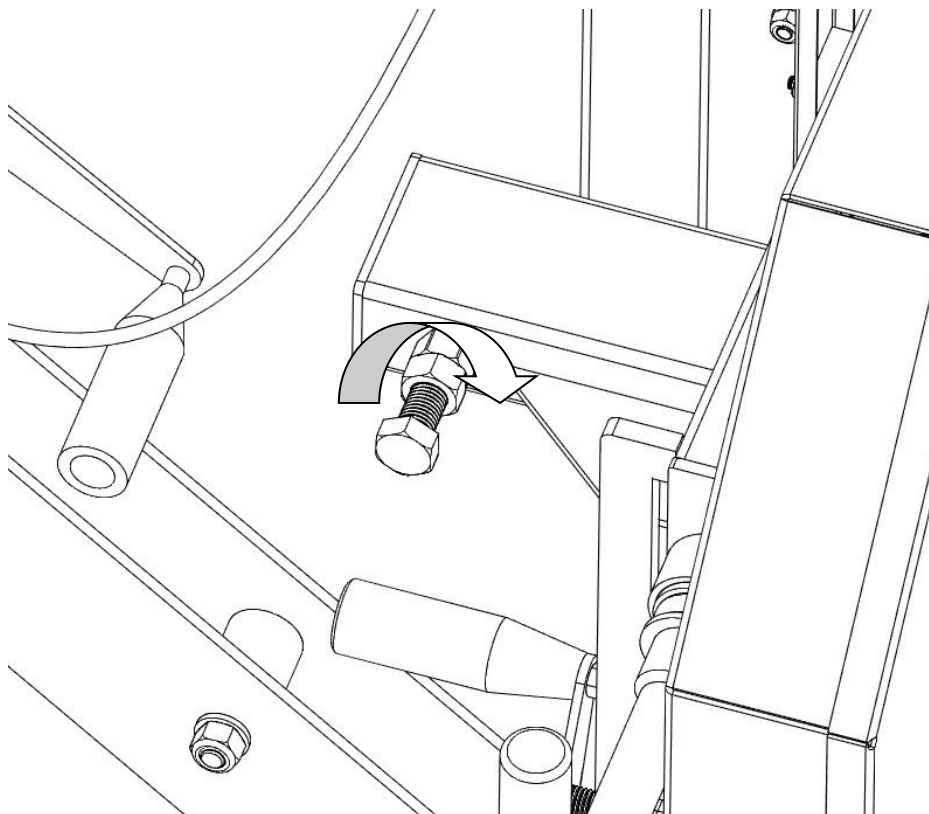




Tighten the blade tension back to 25 ft-lbs (34 N-m). Wearing gloves, spin the band wheel with your hand and observe how the blade has changed tracking. Measure the distance again and repeat the above step to further compensate if required. The ideal measurement is 3/8" (9mm) or check for the back of the blade to be flush with the back of the band wheel.

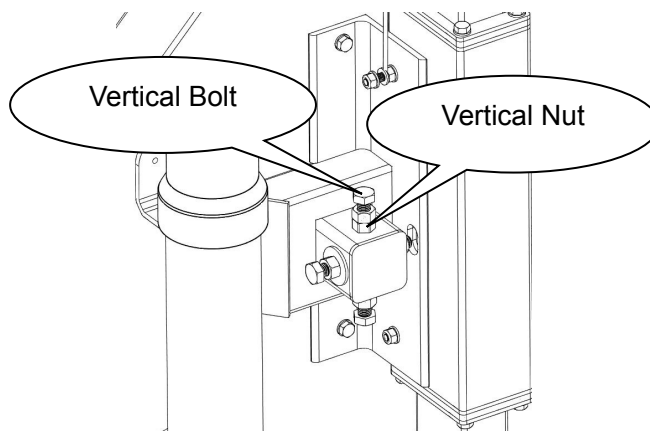


Once satisfied with the measurement, tighten the locking nut clockwise.



### Adjusting The Left Hand Side

To adjust the left side of the sawmill, again start by taking the tension off of the blade by turning the "T" handle one turn in the counter-clockwise direction. Using an 18mm wrench, loosen the "**vertical nut**" a  $\frac{1}{2}$  turn. Next, loosen the "**vertical bolt**" a  $\frac{1}{2}$  turn. This will take the clamping force off of the band wheel shaft caused by these two bolts and allow it to move freely in the following steps.



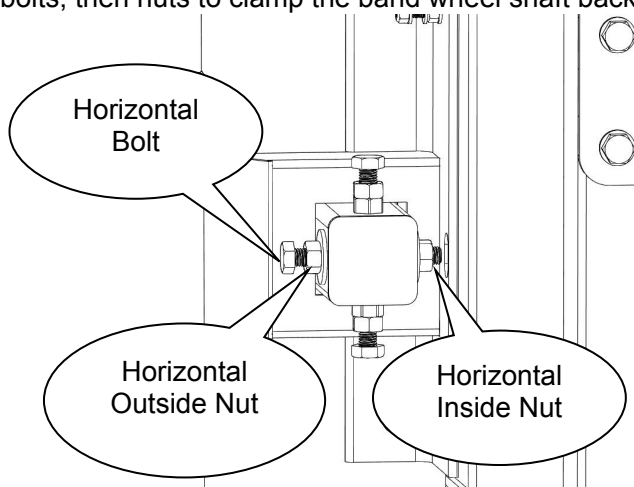
### Moving the Blade Forward

Using a wrench, hold the "**horizontal bolt**" stationary with a wrench and turn the "**horizontal inside nut**" counter-clockwise a  $\frac{1}{2}$  turn. Still holding the "**horizontal bolt**" stationary, turn the "**horizontal outside nut**" clockwise a  $\frac{1}{2}$  turn. This has now shifted the "**horizontal bolt**" and band wheel shaft, causing the blade to track more forward.

### Moving the Blade Rearward

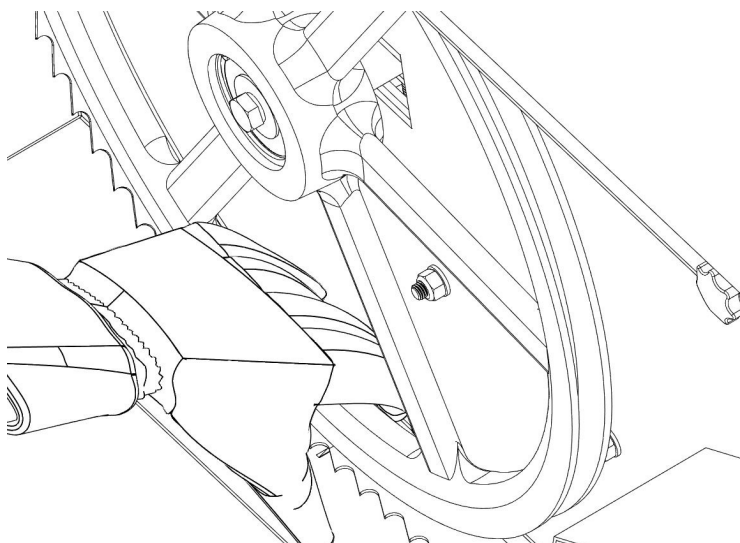
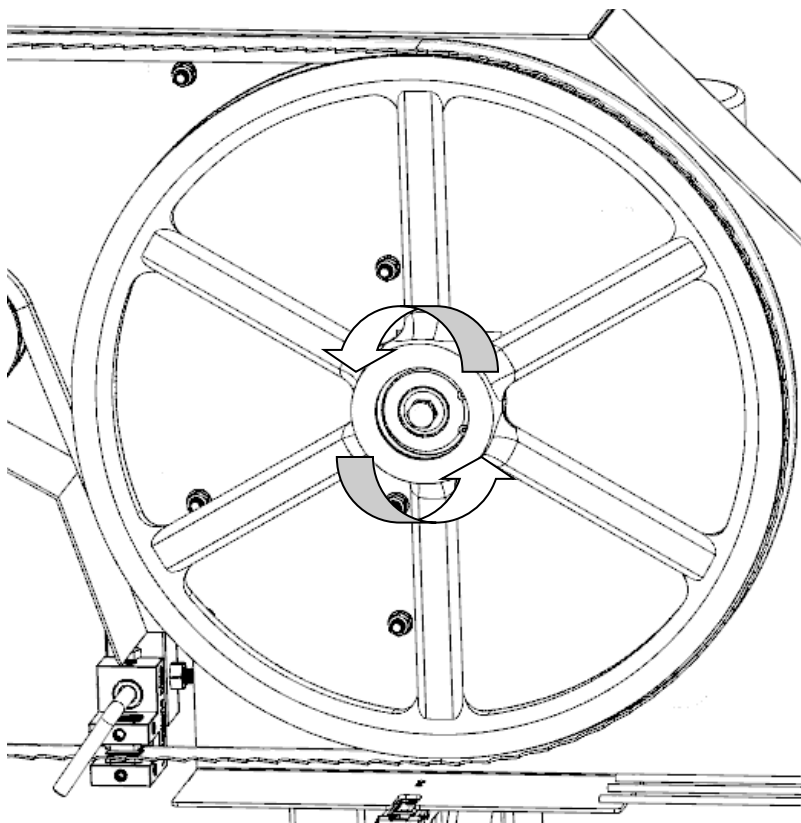
Using a wrench, hold the "**horizontal bolt**" stationary with a wrench and turn the "**horizontal outside nut**" counter-clockwise a  $\frac{1}{2}$  turn. Still holding the "**horizontal bolt**" stationary, turn the "**horizontal inside nut**" clockwise a  $\frac{1}{2}$  turn. This step has now shifted the "**horizontal bolt**" and band wheel shaft, causing the blade to track more rearward.

Tighten the vertical bolts, then nuts to clamp the band wheel shaft back into vertical position.



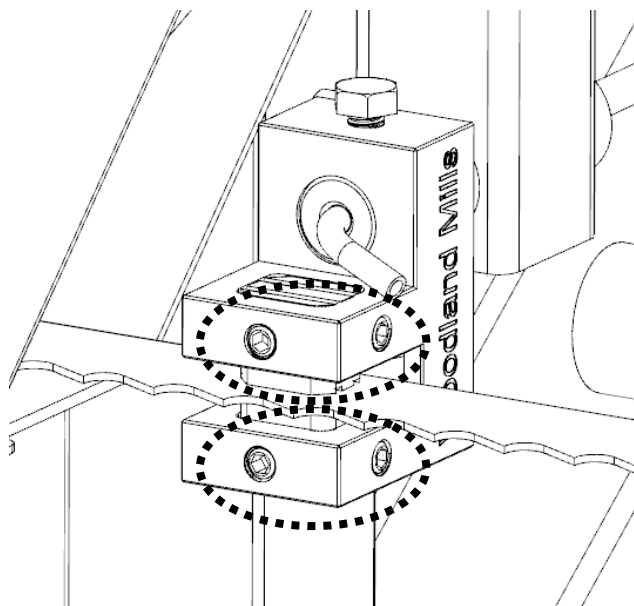


Re-tension the blade by turning the "T" handle a full turn in the clockwise direction (to achieve 25 ft-lbs (34 N-m)). Wearing gloves, spin the band wheel with your hand and observe how the blade has changed tracking. Measure the distance again and repeat the above step to further compensate if required. The ideal measurement is 3/8" (9mm) or check for the back of the blade to be flush with the back of the band wheel. Once the blade is tracking true, bring the blade guide assemblies back up to the blade. Keep a paper width distance between the blade guide bearing and the back of the blade. More information on this set up can be found in the next section – **"BLADE GUIDE ADJUSTMENT"**

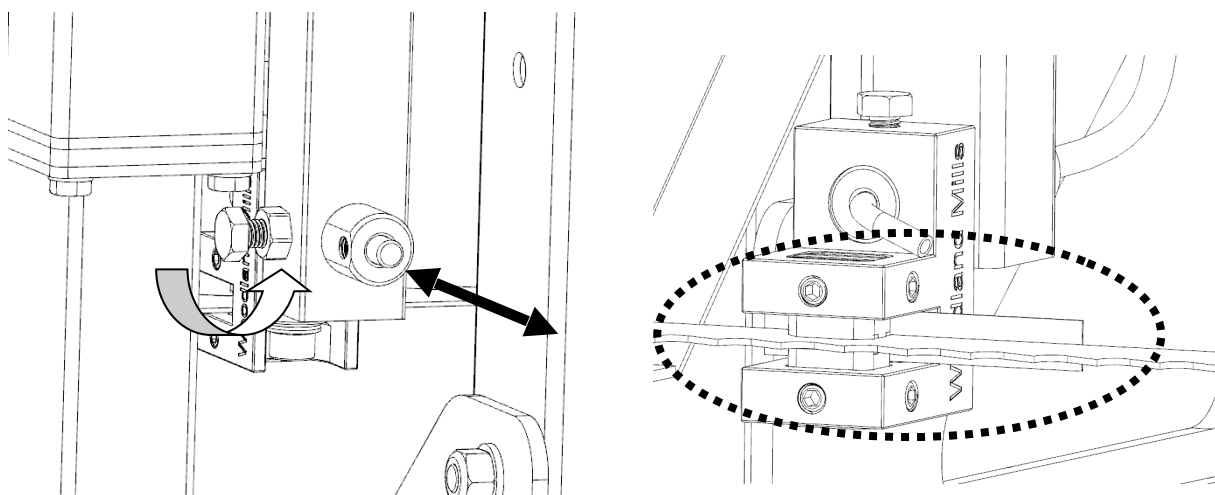


### **3. BLADE GUIDE ADJUSTMENT**

Never attempt to adjust the guide blocks or the guide bearing with the engine running. As a safety precaution, remove the spark plug cap. It is also advised to confirm that the blade is tracking properly before performing the below. Blade tracking is covered in the previous page. Using a 4mm allen key, loosen the blade guide blocks on both the left and right sides. They should be free to slide up and down.



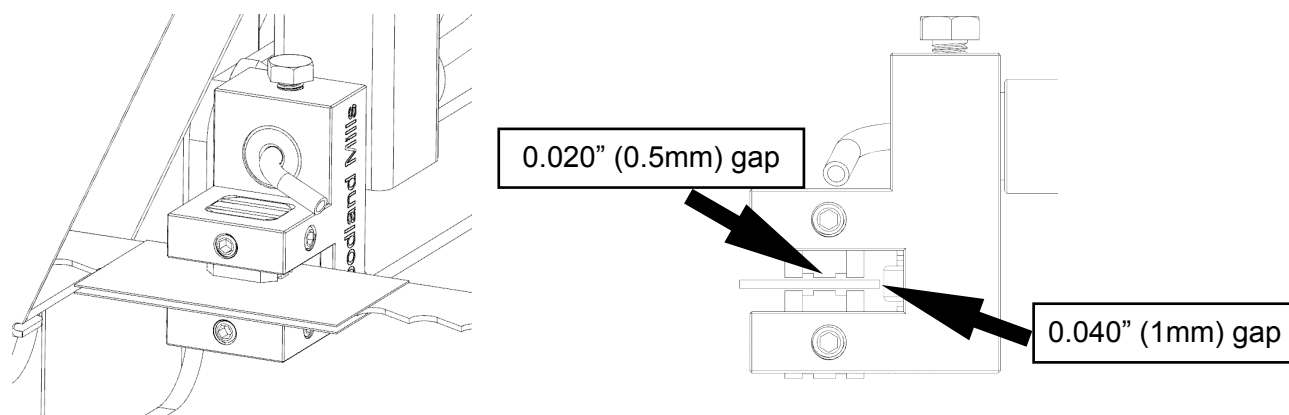
Loosen the blade guide assembly bolt with a 16mm wrench. The round shaft should now be free to slide back and forth. Position it so that there is a thick paper width gap (0.040" or 1mm) between the bearing and the back of blade. Tighten the bolt against the flat on the shaft to secure assembly back in position.



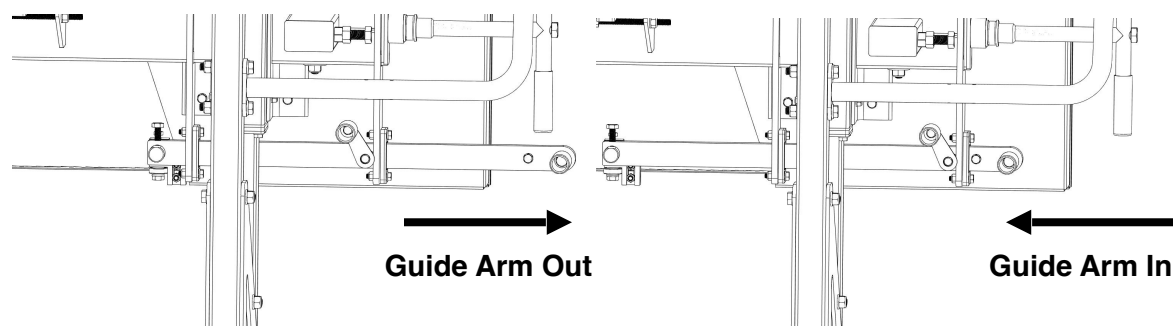




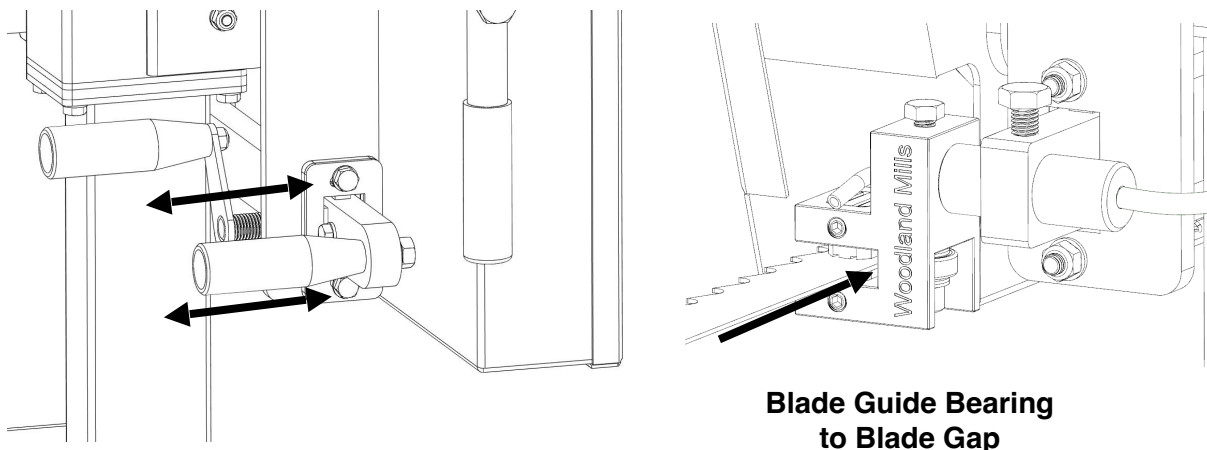
Using a thick piece of paper (0.020" or 0.5mm) in between the blade and both blade guide blocks, tighten the set screws.



After the guide blocks and guide rollers are set, slide the adjustable blade guide in and out while noting the blade guide bearing to blade gap and the guide block to blade gap. If either of these gaps change while sliding the adjustable arm in and out, the guide angle can be adjusted as detailed in the below steps.

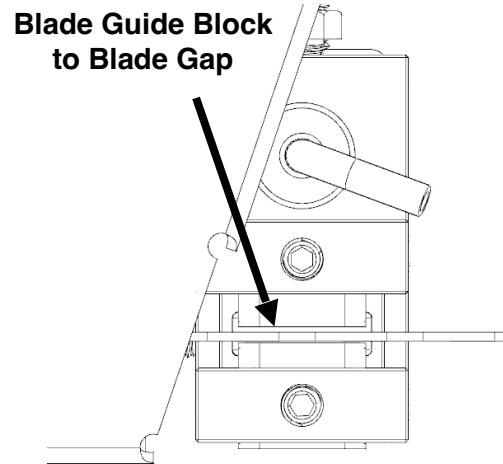
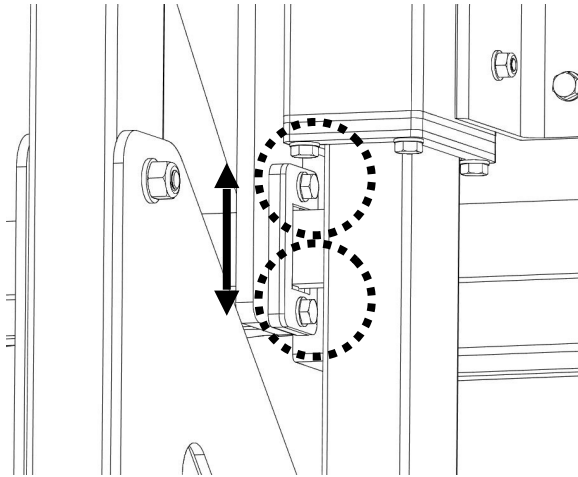


If the blade guide bearing to blade gap needs to be adjusted, loosen the bolts shown below and move the arm in or out to align it to be parallel to the blade. Once the bearing is parallel to the blade through the entire movement of the adjustable guide arm, the two bolts can be tightened again.





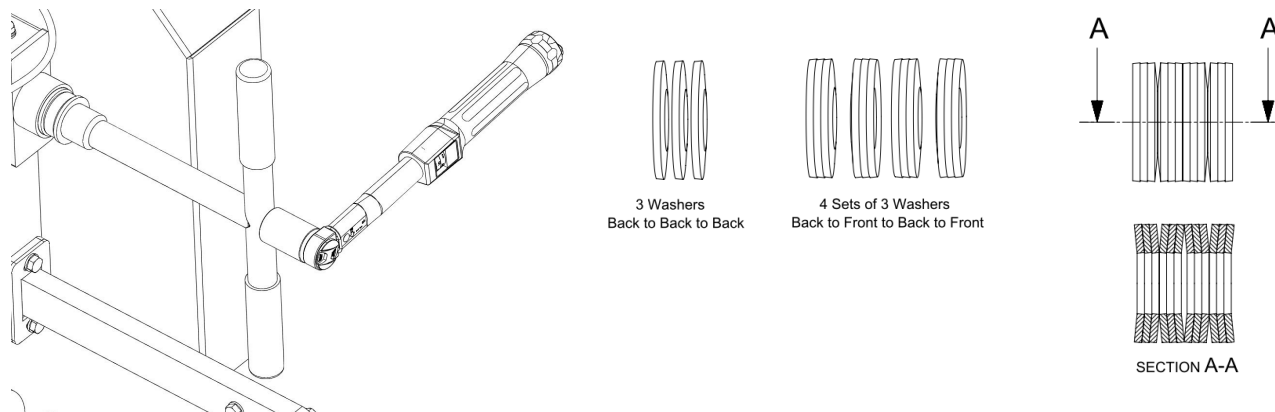
If the blade guide blocks to blade gap needs to be adjusted, loosen the bolts shown below and move the arm up or down to align them to be parallel to the blade. To check for parallelism, slide the guide arm all the way out and all the way in, noting the blade guide block to blade gap. Once the blocks are parallel to the blade through the entire movement of the guide arm (sliding in and out), the two bolts can be tightened to lock the guide arm in the proper alignment position.



# SAWMILL MAINTENANCE

## 1. BLADE TENSION

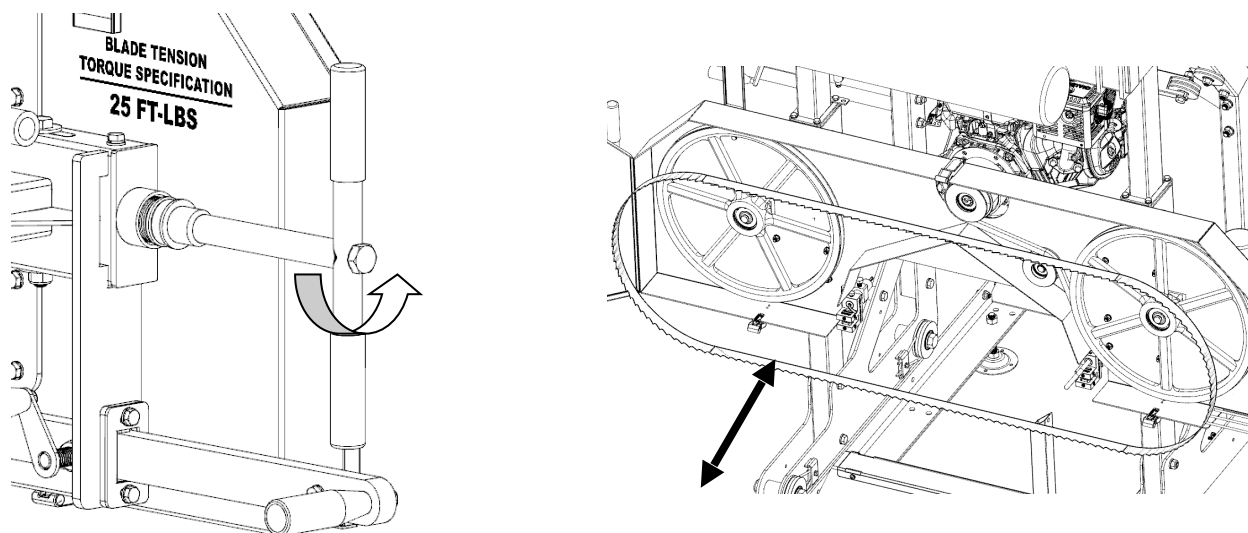
Proper blade tension is achieved when a 24mm socket is used on a torque wrench to tighten the “T” handle to 25 ft-lbs (34 N-m) torque. Make sure the spring washers are installed like the picture below.



## 2. CHANGING THE BLADE

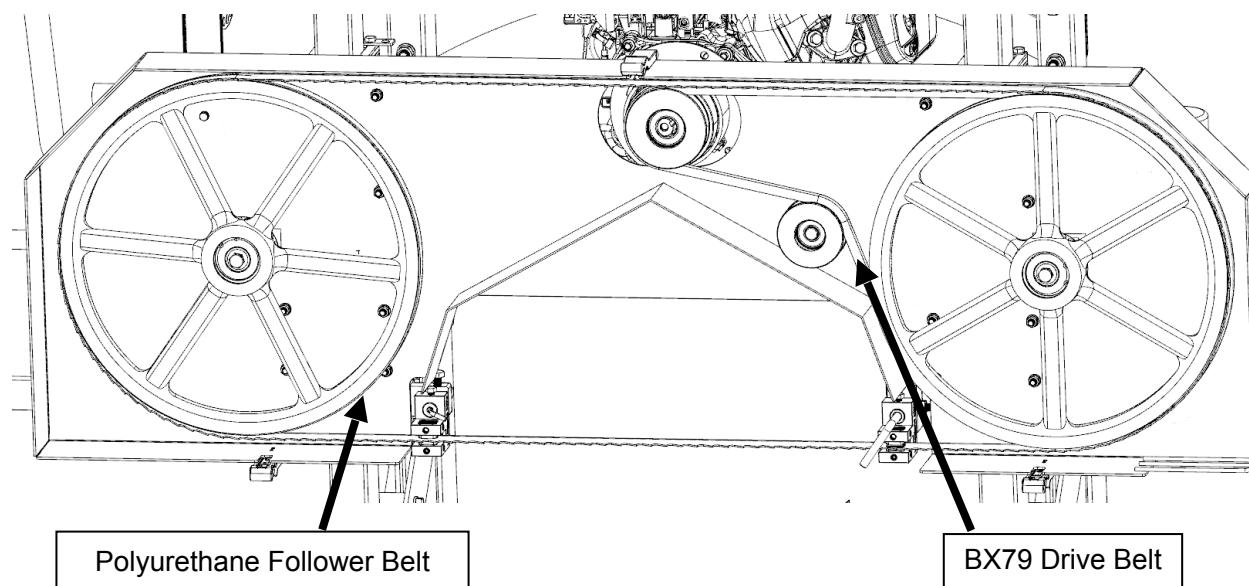
Never attempt to change the blade with the engine running. As a safety precaution, remove the spark plug cap. Gloves and safety glasses must be worn when changing the blade.

Remove the tension in the blade by turning the “T” handle in the counter-clockwise direction and then open the blade guard cover. The blade should now be loose and free to pull straight out the front. The new blade can now be installed, guards closed and proper blade tension set.

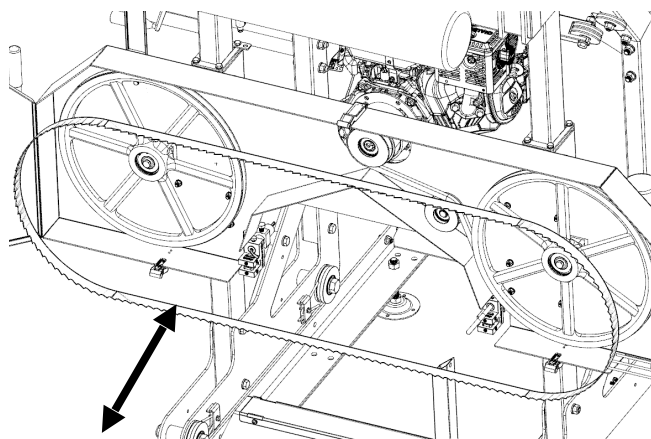
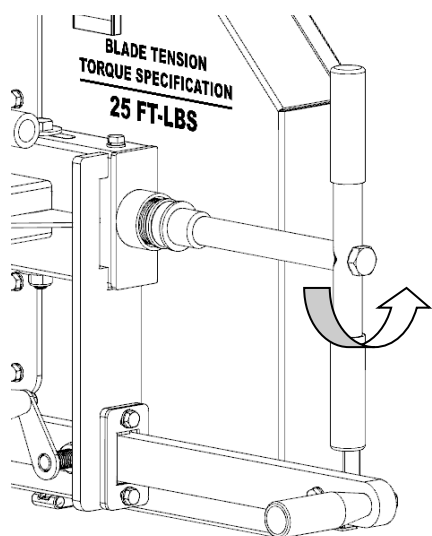


### **3. REPLACING BELTS**

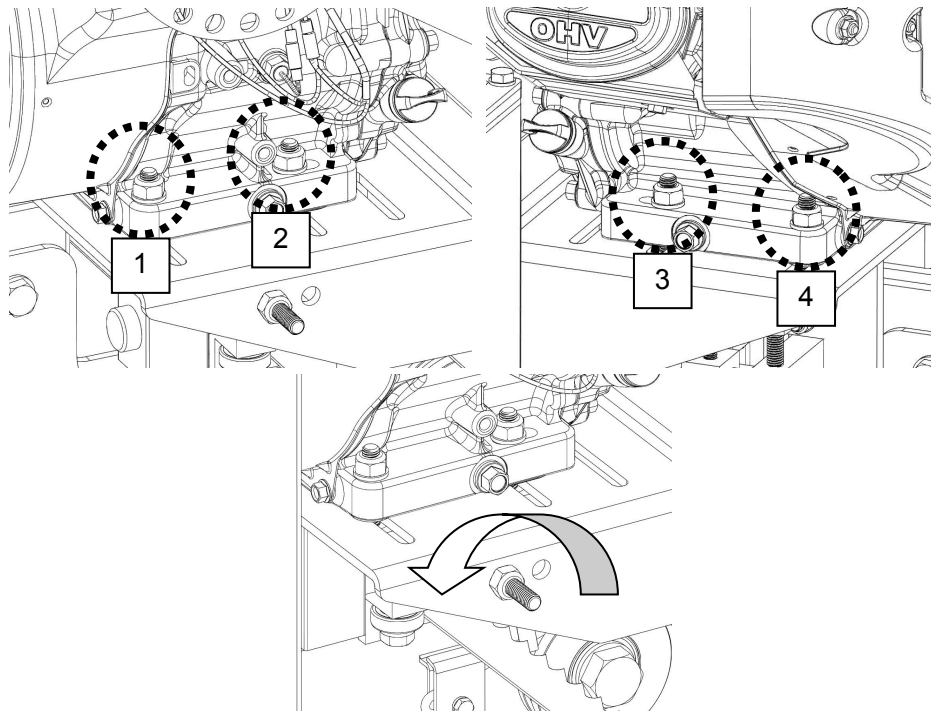
Never attempt to replace the belts with the engine running. As a safety precaution, remove the spark plug cap. Gloves and safety glasses must be worn when replacing the belts. There are two vee belts on the sawmill. It is recommended to use a BX79 cogged belt for the drive side and a Woodland Mills polyurethane follower belt.



Remove the tension in the blade by turning the "T" handle in the counter-clockwise direction and then open the blade guard cover. The blade should now be loose and free to pull straight out the front.



To change the drive side belt, loosen the four bolts that secure the engine to the engine mount using wrenches.



Now that the engine is free to slide on the engine mounting plate, turn the 17mm nut on the horizontal stud in the counter-clockwise direction. This will allow the engine to move and will also take the tension off of the belt. The old belt can be removed and the new belt can be installed. Tension the new belt and refer to the **BELT TENSION** instructions described in the sawmill set up section of the manual.

The follower belt can now be changed by prying it off and installing the new one with the aid of slotted screw drivers. The blade can now be re-installed, guards closed and proper blade tension set.

***\*Note that blade tracking is likely to change and need adjusting when new belts are installed. Refer to "BLADE TRACKING" for more information.\****

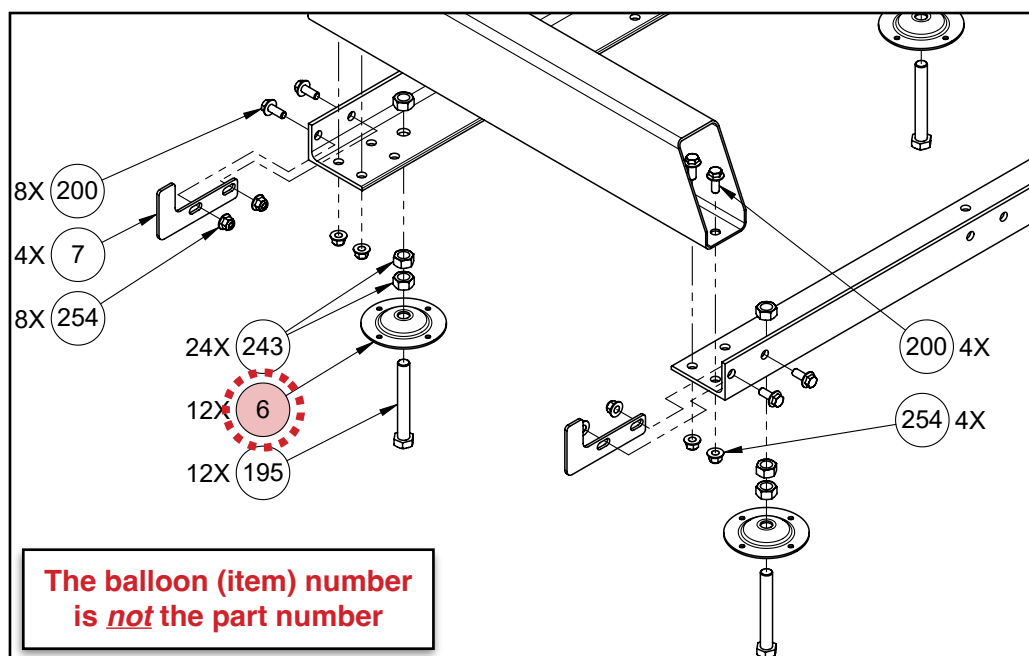


## TROUBLESHOOTING

Problem/Issue	Possible Causes	Resolution Options
Producing wavy cuts.	<ol style="list-style-type: none"> <li>1. Inadequate blade tension.</li> <li>2. Improper blade guide set up.</li> <li>3. Improper blade tracking.</li> <li>4. Sap build up on blade.</li> <li>5. Dull blade.</li> <li>6. Pushing mill too quickly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten blade. Refer to page 44.</li> <li>2. Gap between guide blocks and blade are incorrect. Refer to page 41.</li> <li>3. Adjust blade tracking. Refer to page 35.</li> <li>4. Install new blade. Refer to page 44. Always use blade lubricant.</li> <li>5. Install new blade. Refer to page 44.</li> <li>6. Slow feed rate down and push head slower through log.</li> </ol>
Last board is tapered or narrow in middle.	<ol style="list-style-type: none"> <li>1. Tracks are not level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tracks need to be checked with level and adjusted to be square. They also need to be set up on firm, sturdy base so deflection does not occur from logs or sawmill head.</li> </ol>
Blade dulls quickly.	<ol style="list-style-type: none"> <li>1. Logs are not clean.</li> <li>2. Foreign objects in log.</li> </ol>	<ol style="list-style-type: none"> <li>1. Logs may contain dirt/sand causing blades to wear prematurely.</li> <li>2. Tree may contain nails, staples, old fencing etc.</li> </ol>
Blade comes off of bandwheels.	<ol style="list-style-type: none"> <li>1. Inadequate blade tension.</li> <li>2. Improper blade guide set up.</li> <li>3. Improper blade tracking.</li> <li>4. Belts are worn.</li> <li>5. Dull blade.</li> <li>6. Pushing mill too quickly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten blade. Refer to page 44.</li> <li>2. Gap between guide blocks and blade are incorrect. Refer to page 41.</li> <li>3. Adjust blade tracking. Refer to page 35.</li> <li>4. Install new belts. Refer to page 45.</li> <li>5. Install new blade. Refer to page 44.</li> <li>6. Slow feed rate down and push head slower through log.</li> </ol>
Blades are breaking.	<ol style="list-style-type: none"> <li>1. Too many blade sharpenings.</li> <li>2. Inadequate blade tension.</li> <li>3. Improper blade guide set up.</li> <li>4. Improper blade tracking.</li> <li>5. Pushing mill too quickly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace blade. Refer to page 44.</li> <li>2. Binding between guide blocks when blade is too loose. Tighten blade. Refer to page 44.</li> <li>3. Gap between guide blocks and blade are incorrect. Refer to page 41.</li> <li>4. Adjust blade tracking. Refer to page 35.</li> <li>5. Slow feed rate down and push head slower through log.</li> </ol>
Blade is slowing down or stopping when milling.	<ol style="list-style-type: none"> <li>1. Inadequate blade tension.</li> <li>2. Improper drive belt tension.</li> <li>3. Pushing mill too quickly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten blade. Refer to page 44.</li> <li>2. Belts are worn or too loose. Replace. Refer to page 45.</li> <li>3. Slow feed rate down and push head slower through log.</li> </ol>
Mill is not cutting/ cutting very slowly.	<ol style="list-style-type: none"> <li>1. Dull blade.</li> <li>2. Blade is on backwards.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install new blade. Refer to page 44.</li> <li>2. Remove blade and flip it inside out. The teeth should be facing in the direction of the log supports.</li> </ol>
Mill is vibrating excessively.	<ol style="list-style-type: none"> <li>1. Log is not clamped securely.</li> <li>2. Belts are deformed.</li> <li>3. Bandwheel bearing issue.</li> <li>4. Pushing mill too quickly.</li> <li>5. Loose bolts.</li> </ol>	<ol style="list-style-type: none"> <li>1. Ensure log is clamped firmly resting on log bunks and against log supports.</li> <li>2. Belts may have flats in them from leaving blade tension tight when not in use. Replace them. Refer to page 45.</li> <li>3. Inspect and replace the band wheel bearings if worn.</li> <li>4. Slow feed rate down when milling.</li> <li>5. Check all bolts to ensure they are tight.</li> </ol>

## REPLACEMENT PARTS ORDERING

When ordering replacement parts, first locate the balloon number(s) from the appropriate ***exploded assembly view*** as shown in the example below:



Next, turn to the ***Parts List*** section and locate the balloon number in the “**Item**” column:

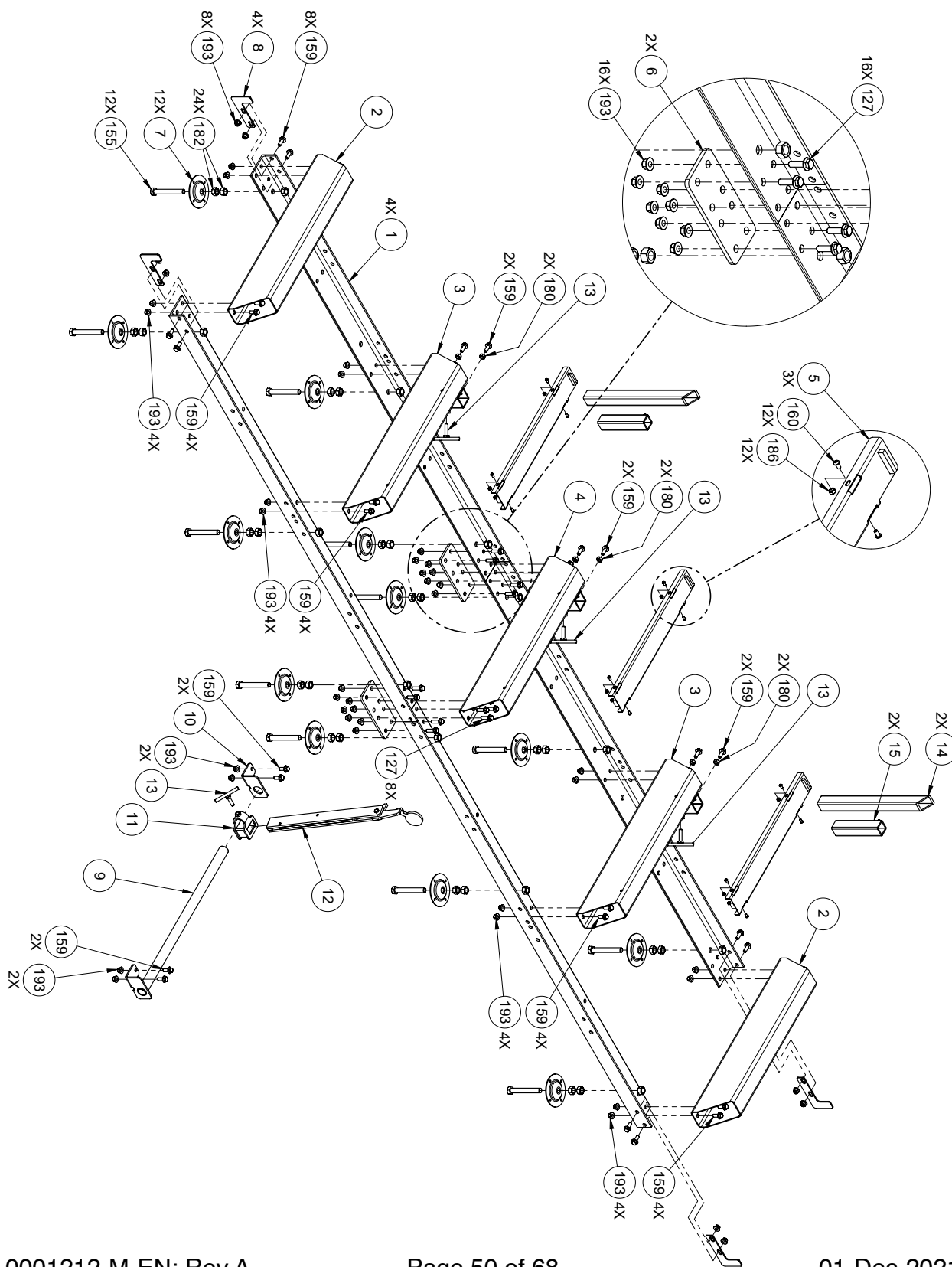
### PARTS LIST

Item	Quantity		Part No.	Description
	14 hp	9.5 hp		
1	4	4	0001073	TRACK RAIL, 58.5 mm TALL
2	2	2	0001075	LOG BUNK, END
3	2	2	0001080	LOG BUNK, MID
4	1	1	0001084	LOG BUNK, CENTER
5	2	2	0001072	REINFORCEMENT PLATE, 90 X 200 mm
6	12	12	0001071	LEVELLING FOOT BASE
7	4	4	0001055	CARRIAGE STOP
8	1	1	0001062	LOG CLAMP SHAFT AND BRACKET WELDMENT

Record the part number (e.g. 0001071, HHB-MBM080FCJ, etc.) in the “**Part No.**” column.

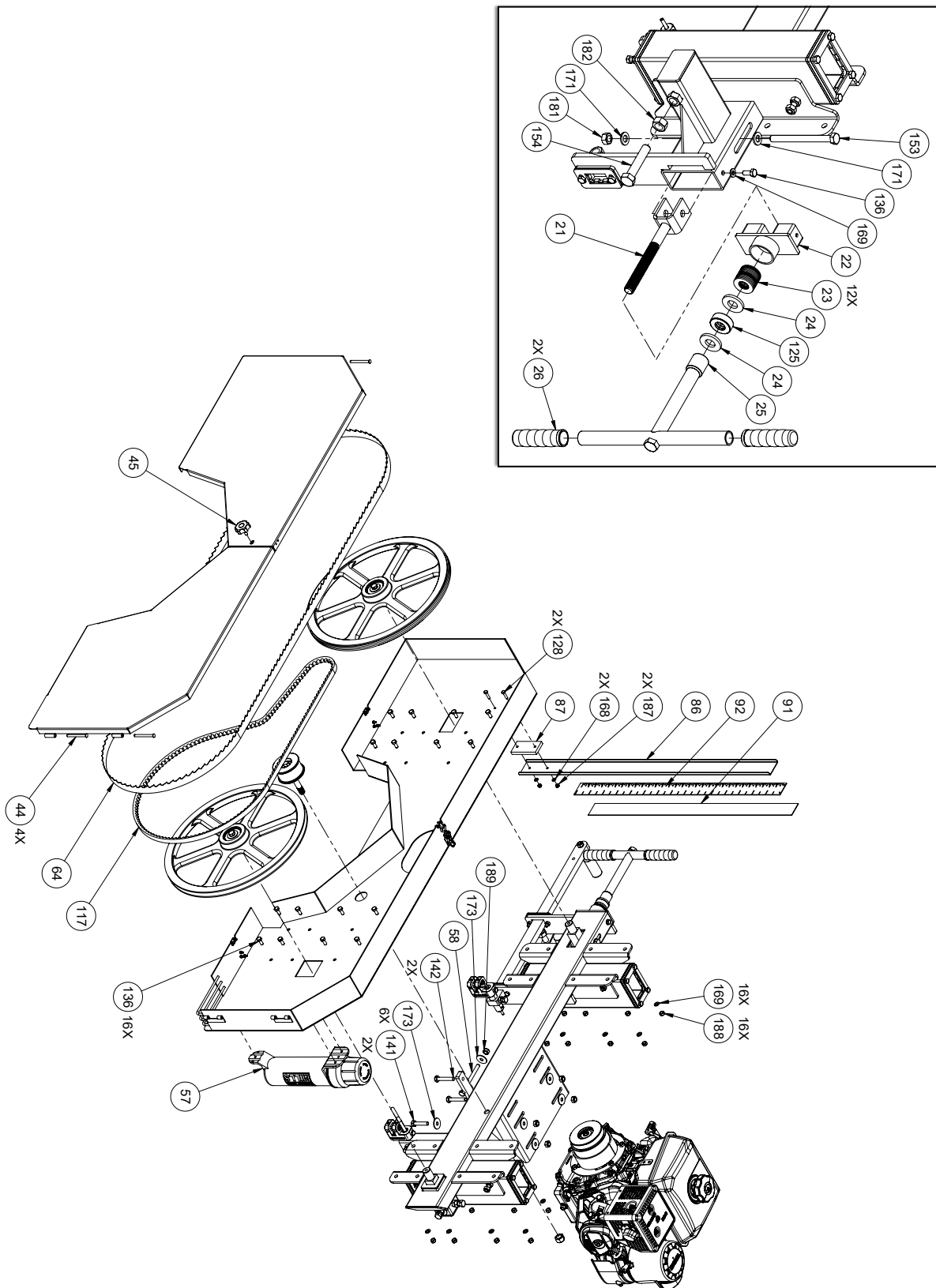
Contact Woodland Mills through the website (or via phone/email) and provide the list of part numbers, including quantities for each item.

# EXPLODED ASSEMBLY VIEWS TRACK

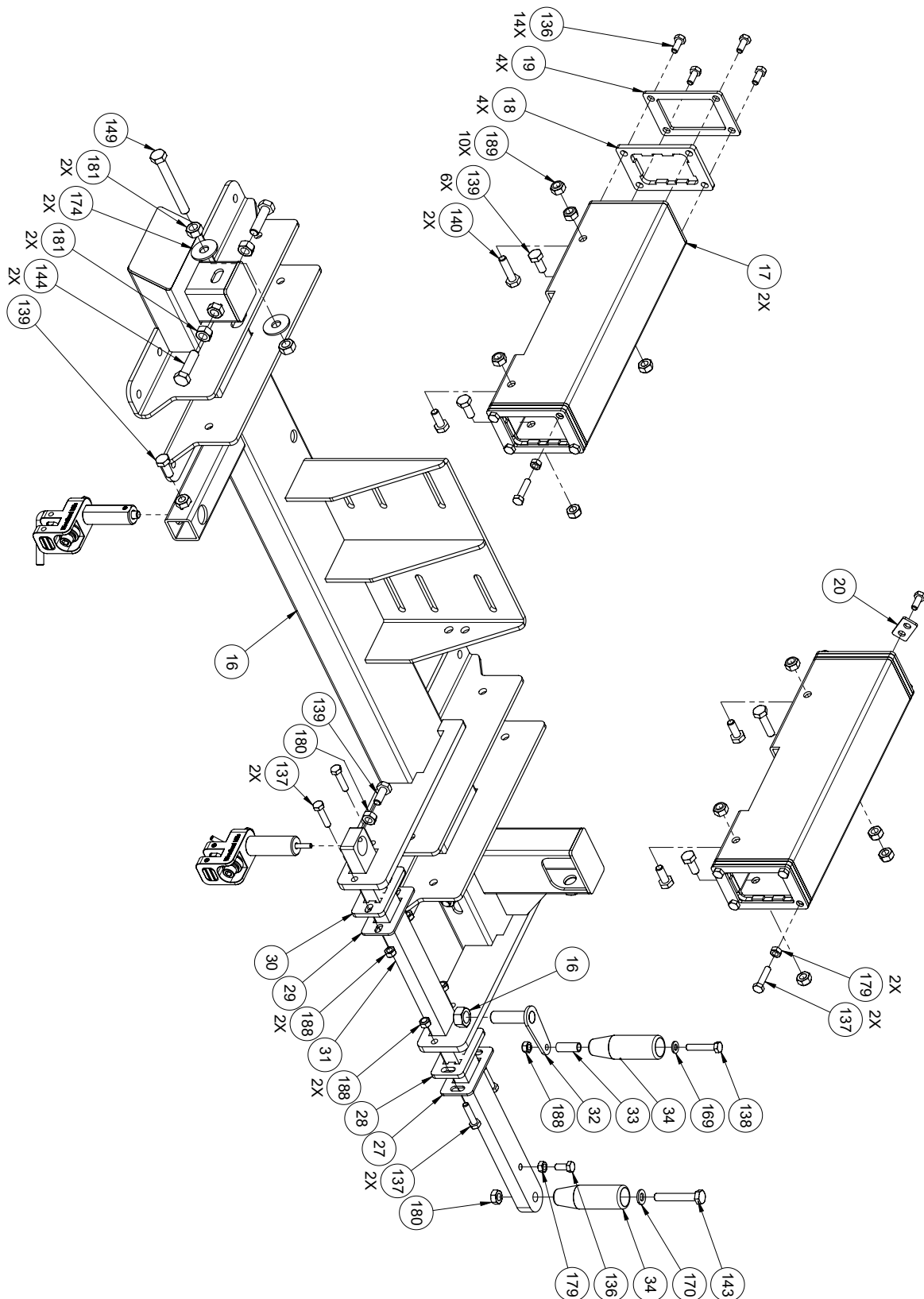




# SAWHEAD

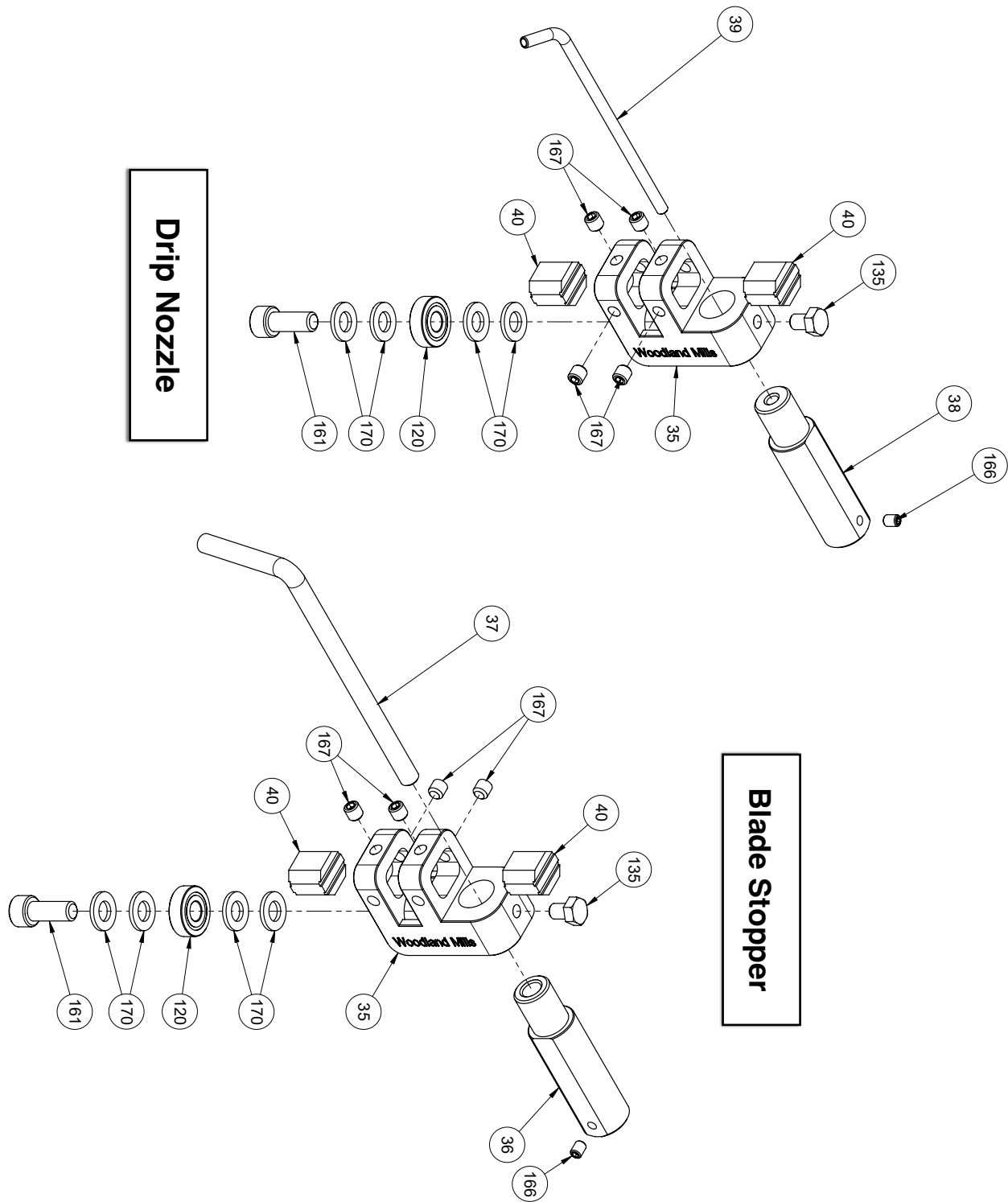


## BACK BEAM



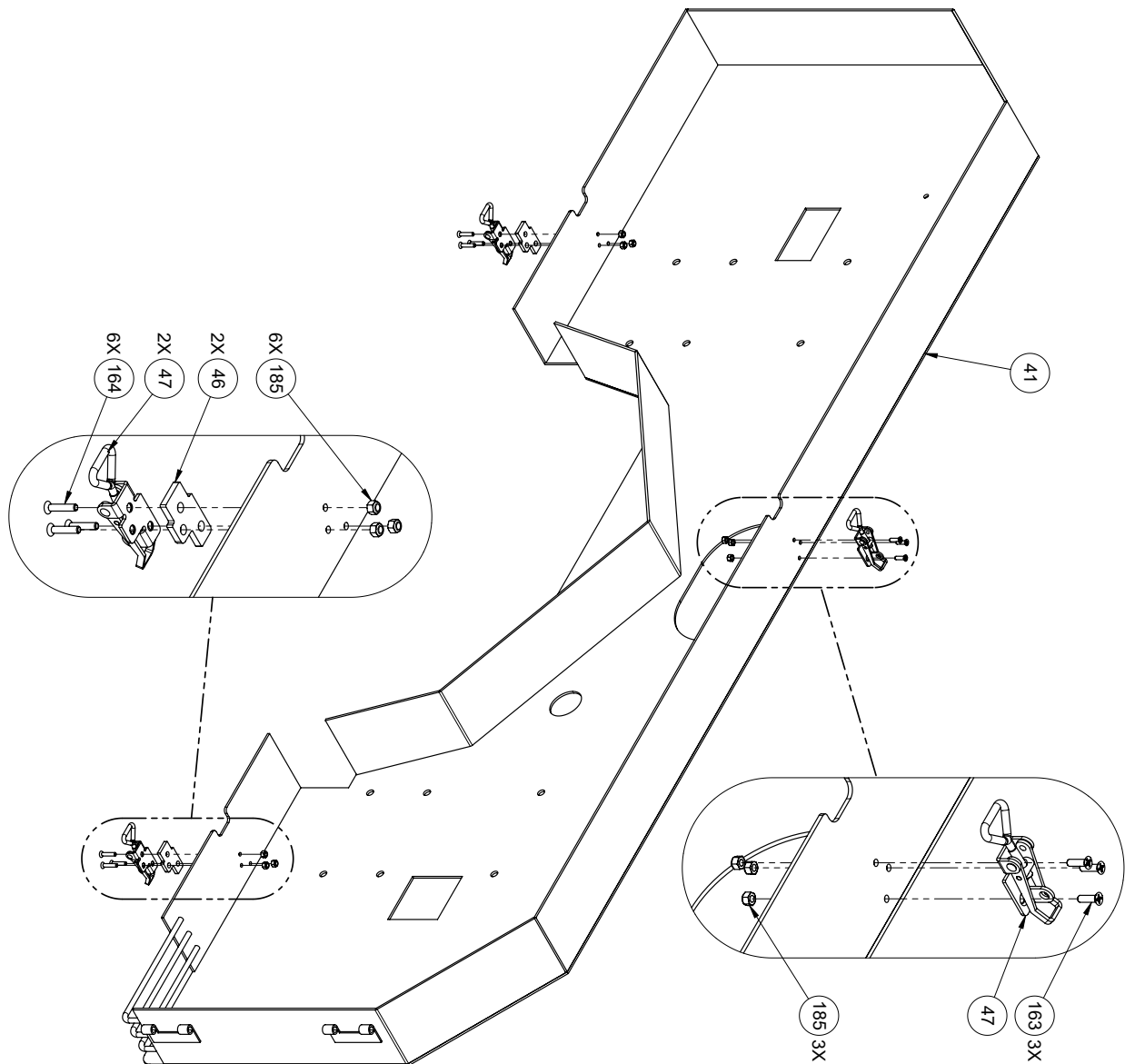


## GUIDE BLOCK HOLDERS

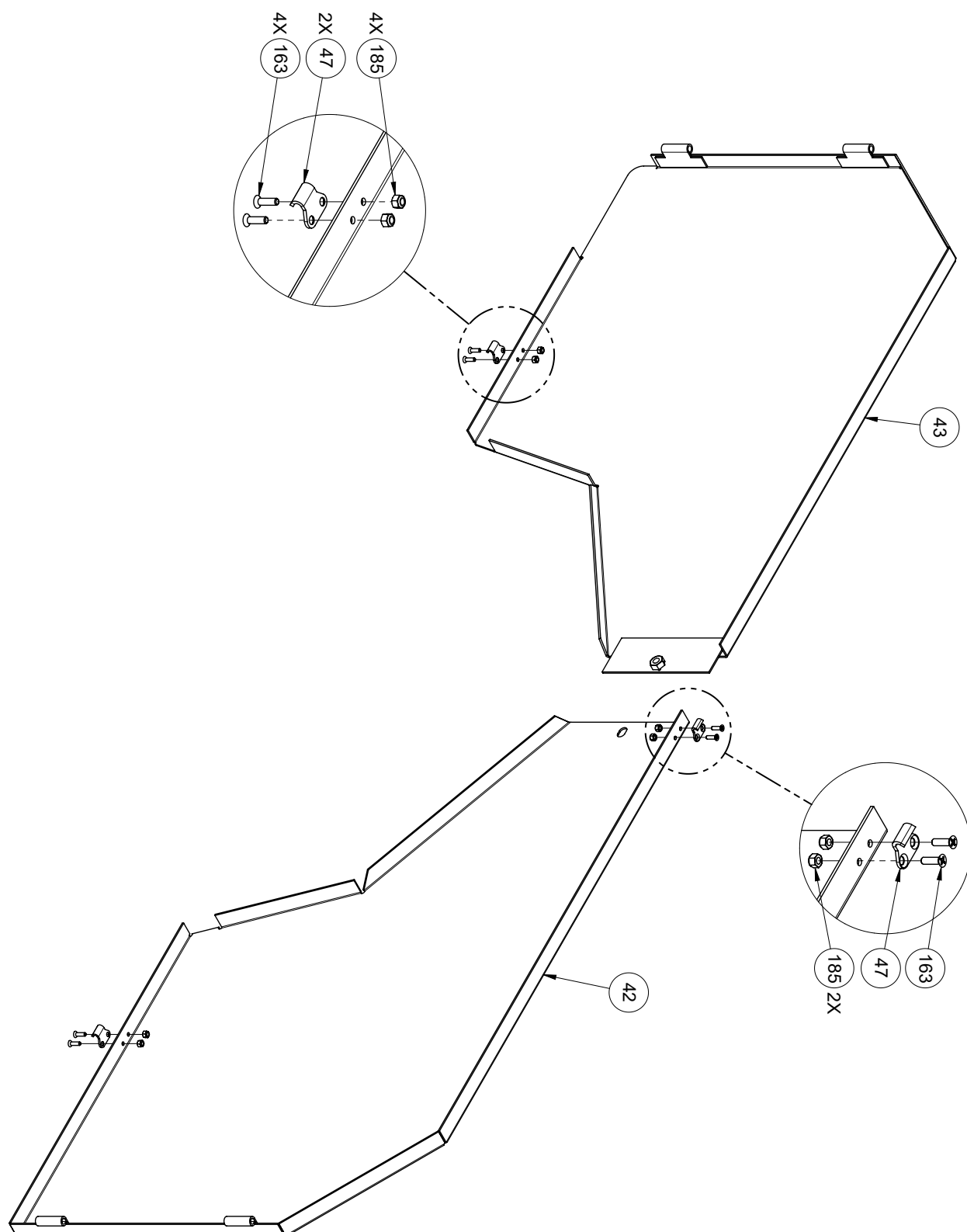




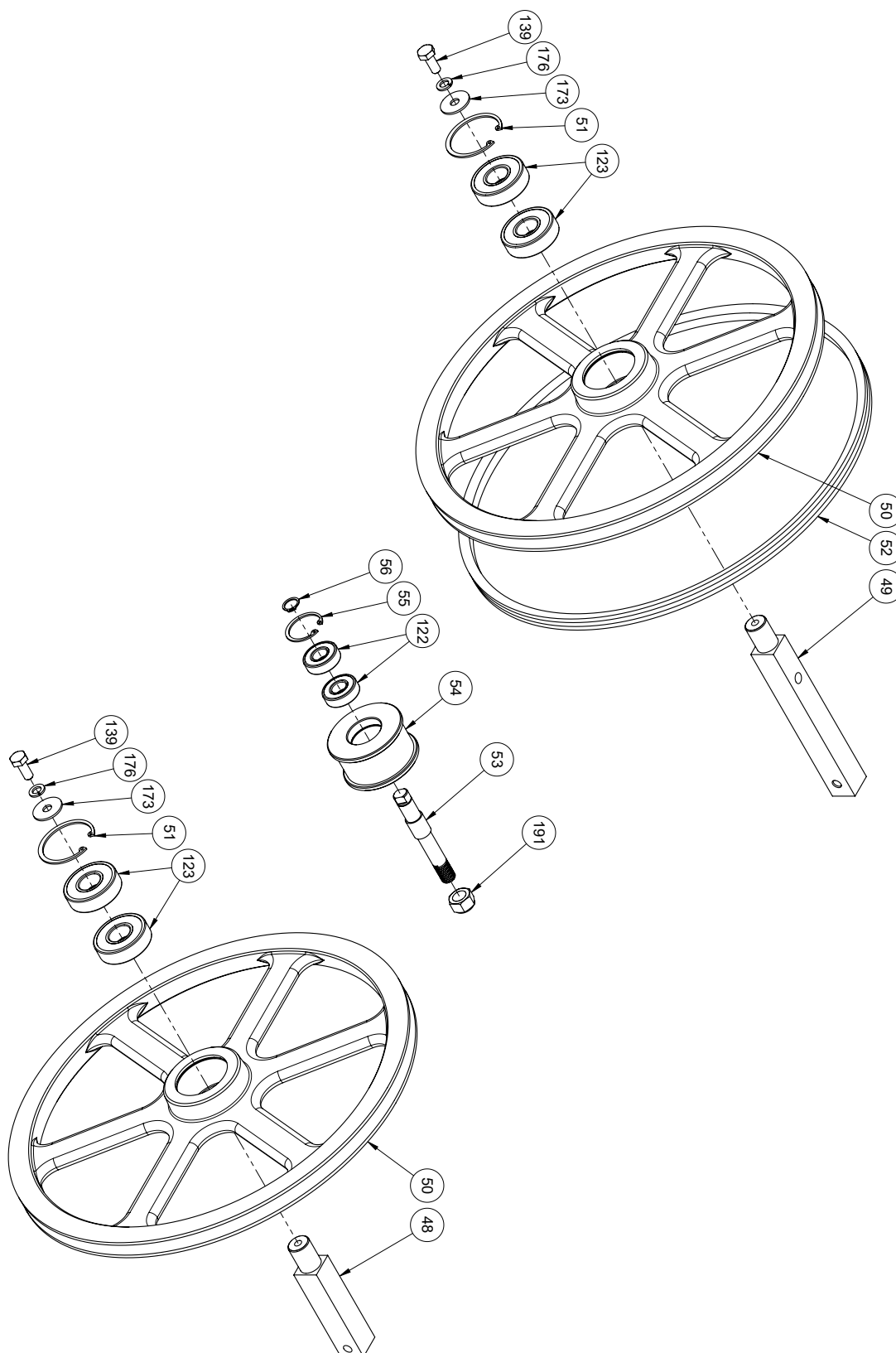
## BAND WHEEL HOUSING



## BAND WHEEL HOUSING DOORS



## BAND WHEELS AND BELT TENSIONER

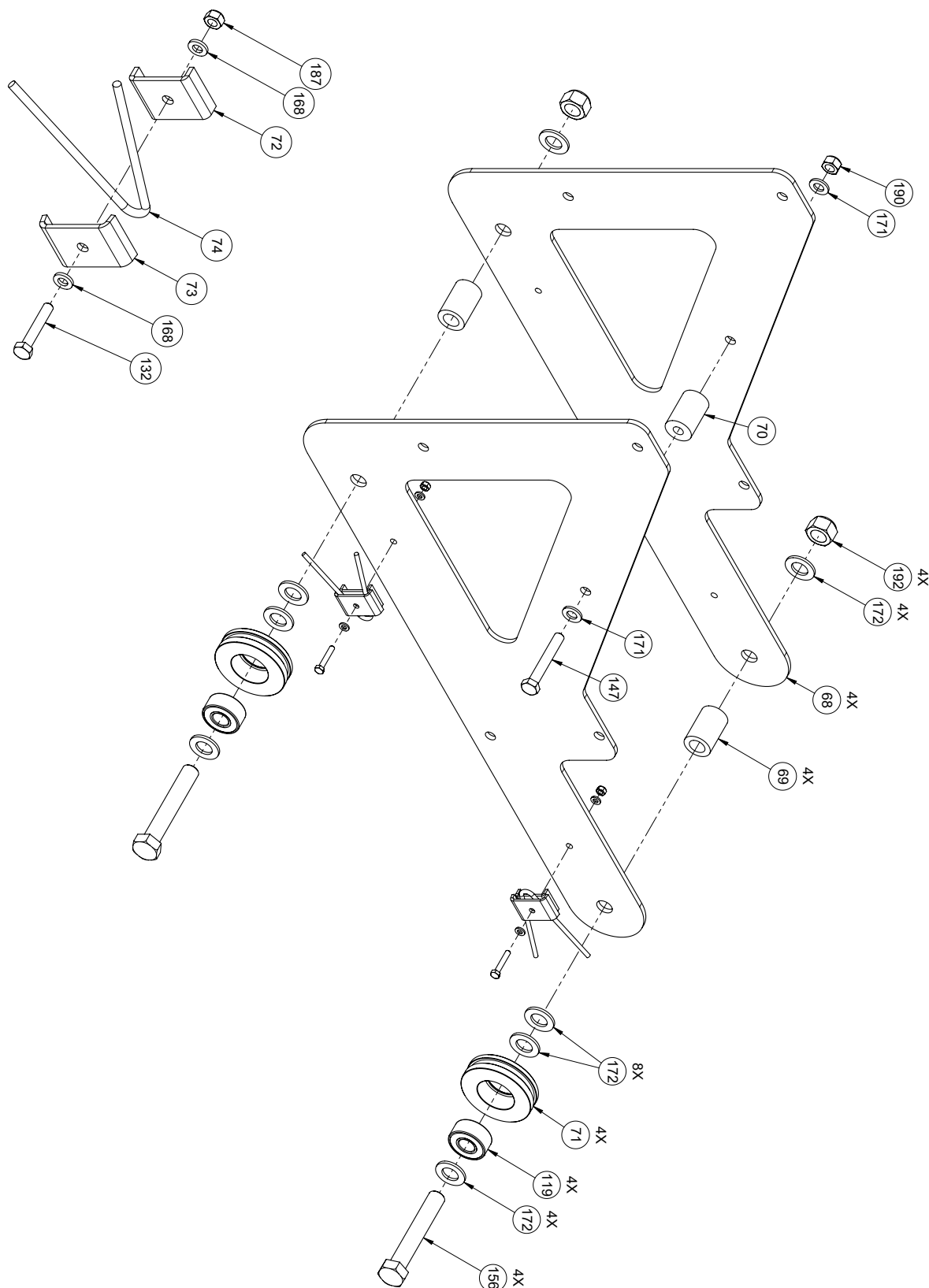


This exploded view diagram illustrates the assembly of a generator. The main components shown include the generator housing (118), the generator unit (162), and the control panel (165). The control panel features a digital display and several buttons, with the brand name 'KOTER' visible. The generator unit is mounted on a base and includes a cooling fan (163) and a fan guard (164). The control panel is secured to the base with screws (166). The generator unit is secured to the base with screws (167). The control panel is secured to the base with screws (168). The generator unit is secured to the base with screws (169). The control panel is secured to the base with screws (170). The generator unit is secured to the base with screws (171). The control panel is secured to the base with screws (172). The generator unit is secured to the base with screws (173). The control panel is secured to the base with screws (174). The generator unit is secured to the base with screws (175). The control panel is secured to the base with screws (176). The generator unit is secured to the base with screws (177). The control panel is secured to the base with screws (178). The generator unit is secured to the base with screws (179). The control panel is secured to the base with screws (180). The generator unit is secured to the base with screws (181). The control panel is secured to the base with screws (182). The generator unit is secured to the base with screws (183). The control panel is secured to the base with screws (184). The generator unit is secured to the base with screws (185). The control panel is secured to the base with screws (186). The generator unit is secured to the base with screws (187). The control panel is secured to the base with screws (188). The generator unit is secured to the base with screws (189). The control panel is secured to the base with screws (190). The generator unit is secured to the base with screws (191). The control panel is secured to the base with screws (192). The generator unit is secured to the base with screws (193). The control panel is secured to the base with screws (194). The generator unit is secured to the base with screws (195). The control panel is secured to the base with screws (196). The generator unit is secured to the base with screws (197). The control panel is secured to the base with screws (198). The generator unit is secured to the base with screws (199). The control panel is secured to the base with screws (200).

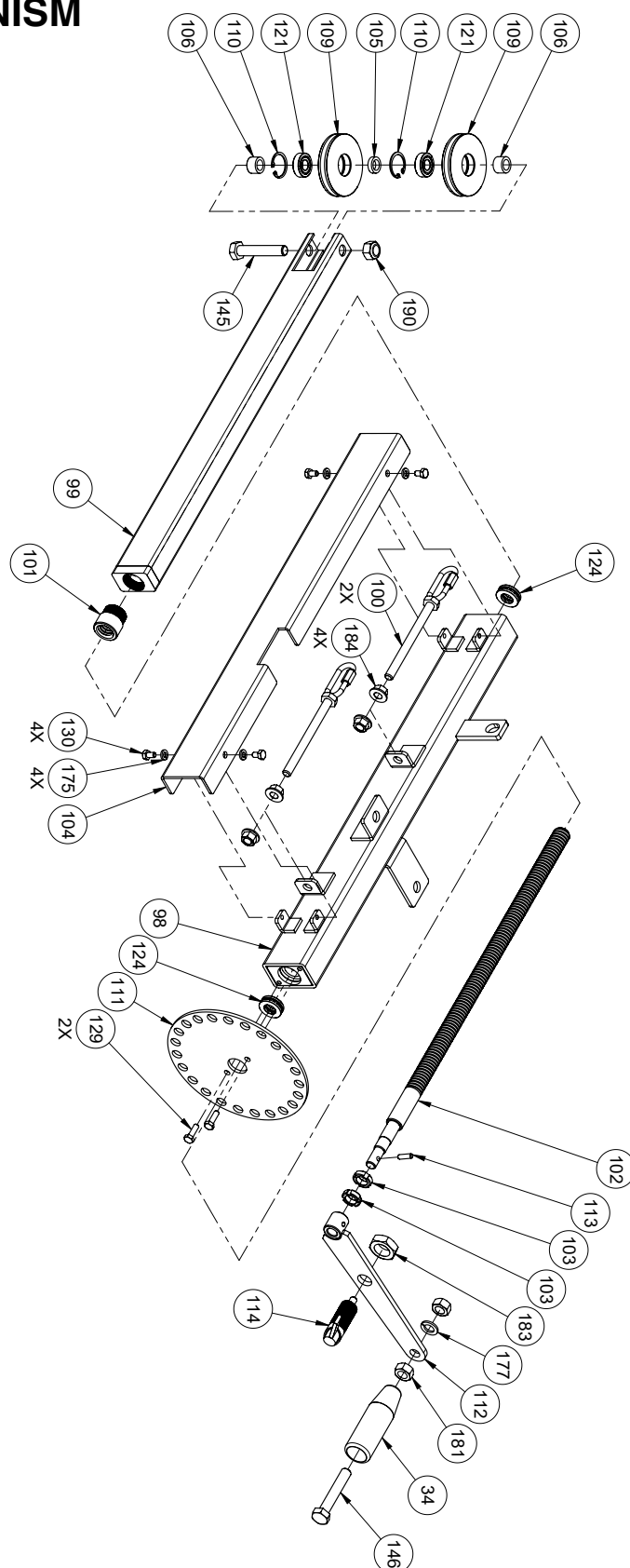
This diagram is an exploded view of a mechanical assembly, likely a piece of industrial equipment. It shows the main frame, a large horizontal beam, and various internal components like gears, pulleys, and structural supports. The assembly is shown in a disassembled state to illustrate the relationship between parts. Numbered callouts (1-152) identify individual components, and quantity indicators (e.g., 2X, 4X, 6X, 8X) specify the number of each part required. The diagram is oriented horizontally, with the main frame on the left and the horizontal beam extending to the right.



## CARRIAGE LEG, WHEEL, AND SWEEPER

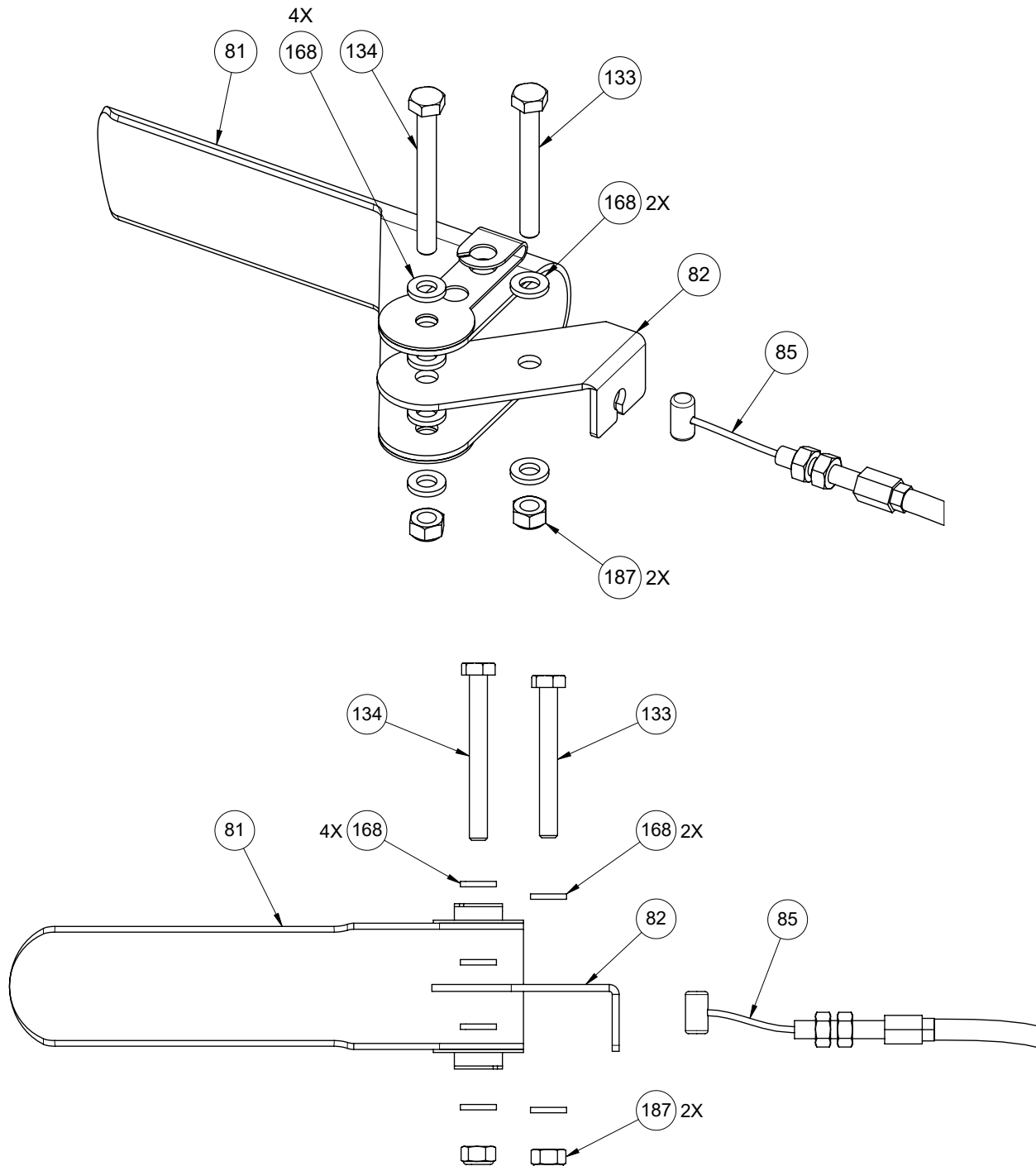


## LIFT MECHANISM

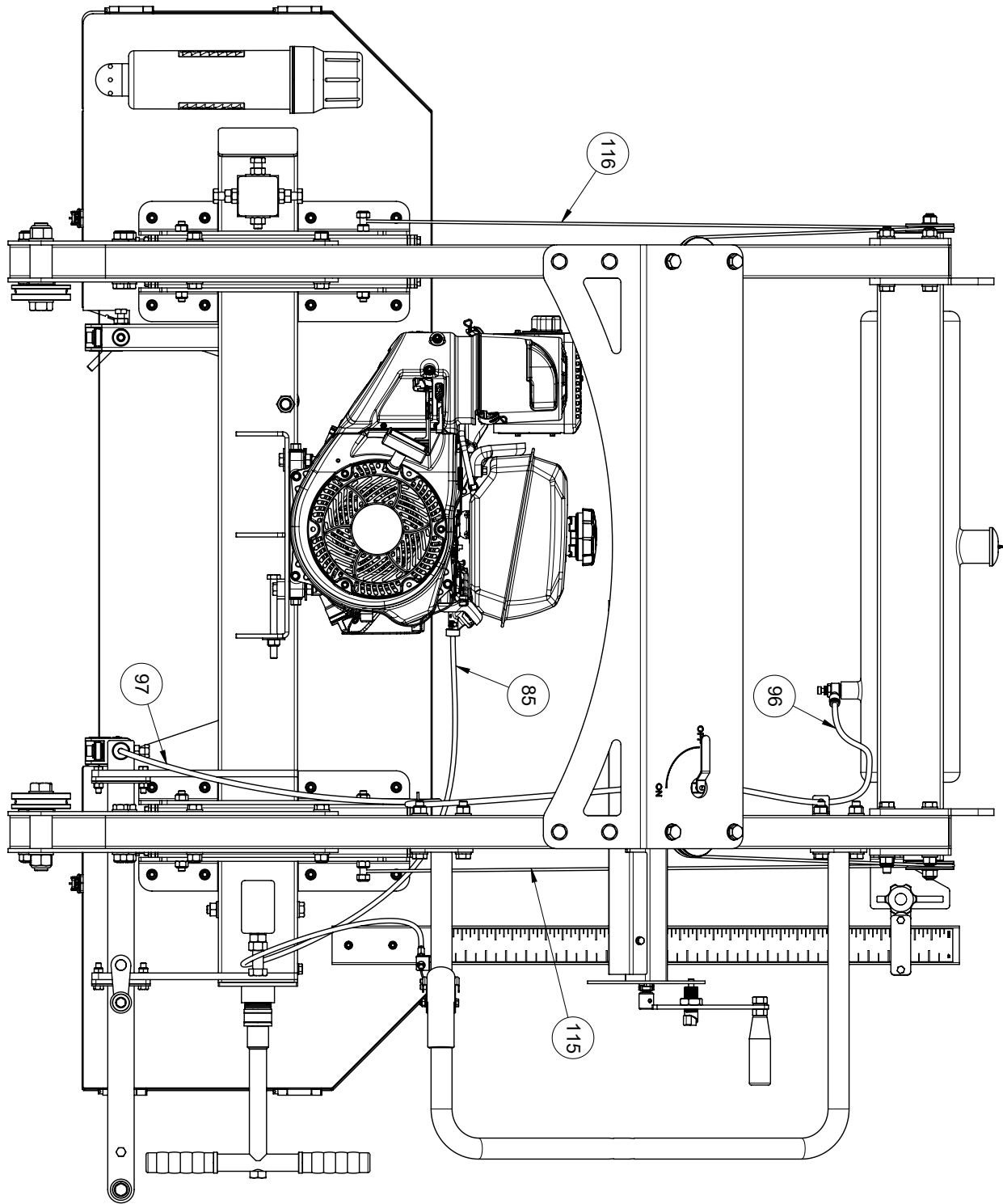




## THROTTLE HANDLE



## CABLES, TUBING & LABELS





## PARTS LIST

Item	Qty	Part No.	Description
1	4	0001073	TRACK RAIL, 100 X 58.5 mm, 1950 mm LG
2	2	0001075	LOG BUNK, END
3	2	0001080	LOG BUNK, MID
4	1	0001084	LOG BUNK, CENTER
5	3	0001213	LOG BUNK CAP
6	2	0001072	REINFORCEMENT PLATE, 90 X 200 mm
7	12	0001071	LEVELLING FOOT BASE
8	4	0001055	CARRIAGE STOP
9	1	0001062	SHAFT WELDMENT, QUICK-LOCK LOG CLAMP
10	1	0001069	MOUNTING BRACKET, QUICK-LOCK LOG CLAMP
11	1	0001061	RECEIVER, QUICK-LOCK LOG CLAMP
12	1	0001211	QUICK-LOCK LOG CLAMP
13	4	0001059	T-BOLT, M10 X 1.5, 40 mm LG
14	2	0001056	LOG SUPPORT, BEVELLED, 450 mm LG
15	2	0001465	LOG SUPPORT, KEY STOP, 190 mm LG
16	1	0001408	BACK BEAM
17	2	0001409	POST SLEEVE
18	4	0001411	POST SLEEVE BUSHING, 50 X 80 mm POST
19	4	0001410	POST SLEEVE LOCKING PLATE, 50 X 80 mm POST
20	1	0001020	LUBRICATION TUBING BRACKET, FLAT
21	1	0001025	TENSION ROD, TR18X3 THD, 175 mm LG
22	1	0001034	SPRING WASHER HOLDER, 120 X 50 mm, 25 mm LG TUBE
23	12	0006088	BELLEVILLE WASHER, 20.4 ID, 40 OD, 2.5 THK, 3.45 mm TALL, 2111 lb WORKING LOAD
24	2	0001046	SPACER, 42 OD X 20 ID X 5 mm THK
25	1	0001029	TENSION HANDLE, 220 mm LG
26	2	0001030	HANDLE GRIP, GROOVED, 26 mm ID, 108 mm LG
27	1	0001427	LOCKING PLATE, HORIZONTAL, ADJUSTABLE BLADE GUIDE
28	1	0001428	NYLON BUSHING, HORIZONTAL, ADJUSTABLE BLADE GUIDE
29	1	0001437	LOCKING PLATE, VERTICAL, ADJUSTABLE BLADE GUIDE
30	1	0001438	NYLON BUSHING, VERTICAL, ADJUSTABLE BLADE GUIDE
31	1	0001425	ADJUSTABLE BLADE GUIDE ARM, 700 mm LG
32	1	0001426	LOCKING HANDLE, ADJUSTABLE BLADE GUIDE
33	1	0004930	SPACER, 9 ID X 12 OD X 32 mm LG
34	3	0001085	HANDLE, TAPERED, 32 mm DIA, 105 mm LG, M12 THRU
35	2	0001093	GUIDE BLOCK HOLDER
36	1	0001096	GUIDE BLOCK HOLDER SHAFT, BLADE STOPPER
37	1	0001095	SAW BLADE STOPPER, 67.5 mm LG
38	1	0001091	GUIDE BLOCK HOLDER SHAFT, DRIP NOZZLE
39	1	0001092	DRIP NOZZLE, 6 mm DIA
40	4	0001090	GUIDE BLOCK
41	1	0001412	BAND WHEEL HOUSING
42	1	0001052	BAND WHEEL DOOR, LEFT
43	1	0001049	BAND WHEEL DOOR, RIGHT
44	4	0001097	HINGE PIN, 7 mm DIA, 68 mm USEABLE LG
45	2	0001659	KNOB, MULTI-LOBE, 48 mm OD, M8 X 1.25, 17 mm LG
46	2	0001001	DOOR LATCH SPACER
47	3	0001656	ADJUSTABLE DRAW LATCH, PADLOCKABLE



Item	Qty	Part No.	Description
48	1	0001104	DRIVE SHAFT, 30 mm SQ, 125 mm LG, 25 mm DIA
49	1	0001108	FOLLOWER SHAFT, 30 mm SQ, 216.5 mm LG, 25 mm DIA
50	2	0001105	BAND WHEEL, 19 in
51	2	0004820	RETAINING RING, INTERNAL, 62 mm BORE (65 mm GROOVE)
52	1	0001107	V-BELT, FOLLOWER, B1448Li, 19 in DIA
53	1	0001045	IDLER PULLEY SHAFT, 16 mm DIA, 130 mm LG, M16 X 2 THD
54	1	0001047	IDLER PULLEY, DUAL BEARING, 37 mm WD, 80 mm DIA
55	1	0004816	RETAINING RING, INTERNAL, 40 mm BORE (42.5 mm GROOVE)
56	1	0004798	RETAINING RING, EXTERNAL, 17 mm SHAFT (16.2 mm GROOVE)
57	1	0001655	MANUAL TUBE
58	1	0001218	BELT TENSIONER SCREW PLATE
59	1	0001217	CLUTCH SPACER, 27 ID X 50.5 OD X 30 mm LG
60	1	0001137	PARALLEL KEY, 1/4 X 1/4 in, 1 in LG
61	1	0001824	CLUTCH ASSEMBLY, 1 in [25.4 mm] SHAFT, 108 mm DIA PULLEY
62	1	0001098	CLUTCH HOUSING GUARD, 123 mm DIA
63	1	0001136	EXHAUST REDIRECT, 9.5 & 14 hp KOHLER ENGINES
64	1	0001123	SAW BLADE, 7/8 in PITCH, 165 TEETH, 1-1/4 WD X 144 LG X .042 in THK
65	2	0001416	FRONT POST, 50 X 80 mm, 1425 mm LG
66	1	0001414	BACK POST, 50 X 80 mm, LEFT
67	1	0001415	BACK POST, 50 X 80 mm, RIGHT
68	4	0001417	CARRIAGE SIDE PLATE
69	4	0001101	SPACER, 20 ID X 33.5 OD X 50 mm LG
70	2	0001102	SPACER, 13 ID X 33.5 OD X 50 mm LG
71	4	0001037	CARRIAGE WHEEL
72	4	0001019	WHEEL SWEEPER INNER BRACKET
73	4	0001017	WHEEL SWEEPER OUTER BRACKET
74	4	0001018	WHEEL SWEEPER CABLE
75	1	0001418	CROSS BEAM
76	2	0001661	PLASTIC END CAP, RECT, 100 X 50 mm
77	1	0001433	LUBRICATION TUBING BRACKET, BENT
78	1	0001419	DASHBOARD
79	1	0001658	VALVE, ON/OFF, M20 X M20, 6 mm TUBE FTG
80	1	0001420	PUSH HANDLE
81	1	0001021	THROTTLE HANDLE
82	1	0001024	THROTTLE HANDLE CABLE MOUNT, LEFT
83	1	0001111	THROTTLE CABLE STOP BUSHING
84	1	0001112	THROTTLE CABLE BARREL CLAMP
85	1	0001219	THROTTLE CABLE
86	1	0001429	SCALE SUPPORT
87	1	0001038	SCALE SUPPORT SPACER PLATE
88	1	0001042	LOG SCALE MOUNTING BRACKET
89	1	0001044	SCALE INDICATOR SIGHT BRACKET
90	1	0001041	SCALE INDICATOR SIGHT
91	1	0001215	MAGNETIC SCALE, 30 in, YELLOW
92	1	0001836	MAGNETIC SCALE, 30 in, WHITE
93	1	0001430	LUBRICANT TANK, 13 L [3.4 gal]
94	1	0001132	TANK CAP
95	1	0005221	BEAD CHAIN, 3 mm BEAD, 140 mm LG
96	1	0001222	LUBRICANT LINE, VALVE-TO-TANK
97	1	0001223	LUBRICANT LINE, VALVE-TO-BLADE
98	1	0001421	LIFT MECHANISM HOUSING



Item	Qty	Part No.	Description
99	1	0001422	LIFT MECHANISM EXTENSION ARM
100	2	0001100	LIFT CABLE HOOK
101	1	0001048	BRONZE NUT, LH TR20X4 FEM THD, M27 X 1.5 MALE THD
102	1	0001424	LEAD SCREW, LH TR20X4 X 430 mm LG THD
103	2	0006079	SLOTTED NUT, ROUND, M14 X 1.5
104	1	0001423	LIFT MECHANISM COVER
105	1	0004939	SPACER, 12.5 ID X 19 OD X 5 mm LG
106	2	0004940	SPACER, 12.5 ID X 19 OD X 12 mm LG
107	3	0004952	SPACER, 13 ID X 18 OD X 5 mm LG
108	2	0004953	SPACER, 13 ID X 18 OD X 12 mm LG
109	7	0001099	WIRE ROPE PULLEY, 6001-2RS BEARING, 73 mm DIA
110	7	0004813	RETAINING RING, INTERNAL, 28 mm BORE (29.4 mm GROOVE)
111	1	0001039	CRANK HANDLE INDEX PLATE, 178 mm DIA
112	1	0001086	CRANK HANDLE ARM WELDMENT
113	1	0004777	SPRING PIN, SLOTTED, 5 mm DIA, 20 mm LG
114	1	0001657	INDEX PLUNGER, M20 X 1.5
115	1	0001225	LIFT CABLE A, 4 mm DIA
116	1	0001224	LIFT CABLE B, 4 mm DIA
117	1	BX79	V-BELT, COGGED, BX79
118	1	CH440-3149	ENGINE, KOHLER COMMAND PRO HORIZONTAL, 14 hp
119	4	5204-2RS	BALL BEARING, SEALED, ANG-CONT, DOUBLE ROW, 20 mm SFT, 47 mm HSG, 20.6 mm WD
120	2	6000-2RS	BALL BEARING, SEALED, 10 mm SFT, 26 mm HSG, 8 mm WD
121	7	6001-2RS	BALL BEARING, SEALED, 12 mm SFT, 28 mm HSG, 8 mm WD
122	2	6203-2RS	BALL BEARING, SEALED, 17 mm SFT, 40 mm HSG, 12 mm WD
123	4	6305-2RS	BALL BEARING, SEALED, 25 mm SFT, 62 mm HSG, 17 mm WD
124	2	51102	THRUST BEARING, SINGLE DIR, 15 mm SFT, 28 mm HSG, 9 mm WD
125	1	51204	THRUST BEARING, SINGLE DIR, W/ HSG, 20 mm SFT, 40 mm HSG, 14 mm WD
126	1	SLS-03-08	FLOW CONTROL VALVE, RA, 3/8 NPT, 8 mm QUICK-CONNECT TUBE
127	16	FHH-MBM090PCM	HEX BOLT, FLANGED, CLS 10.9, M10 X 1.5, 35 mm LG, 26 mm LG THD
128	2	HHB-MBE080FCJ	HEX HEAD BOLT, CLS 8.8, M6 X 1, 25 mm LG, FULL
129	2	HHB-MBE075FCJ	HEX HEAD BOLT, CLS 8.8, M6 X 1, 20 mm LG, FULL
130	4	HHB-MBE059FCJ	HEX HEAD BOLT, CLS 8.8, M6 X 1, 10 mm LG, FULL
131	2	HHB-MBE085FCJ	HEX HEAD BOLT, CLS 8.8, M6 X 1, 30 mm LG, FULL
132	4	HHB-MBE090FCJ	HEX HEAD BOLT, CLS 8.8, M6 X 1, 35 mm LG, FULL
133	1	HHB-MBE105FCJ	HEX HEAD BOLT, CLS 8.8, M6 X 1, 50 mm LG, FULL
134	1	HHB-MBE110PCJ	HEX HEAD BOLT, CLS 8.8, M6 X 1, 55 mm LG, 18 mm LG THD
135	2	HHB-MBJ063FCJ	HEX HEAD BOLT, CLS 8.8, M8 X 1.25, 12 mm LG, FULL
136	32	HHB-MBJ075FCJ	HEX HEAD BOLT, CLS 8.8, M8 X 1.25, 20 mm LG, FULL
137	6	HHB-MBJ090FCJ	HEX HEAD BOLT, CLS 8.8, M8 X 1.25, 35 mm LG, FULL
138	1	HHB-MBJ100FCJ	HEX HEAD BOLT, CLS 8.8, M8 X 1.25, 45 mm LG, FULL
139	15	HHB-MBM080FCJ	HEX HEAD BOLT, CLS 8.8, M10 X 1.5, 25 mm LG, FULL
140	2	HHB-MBM095FCJ	HEX HEAD BOLT, CLS 8.8, M10 X 1.5, 40 mm LG, FULL
141	2	HHB-MBM105FCJ	HEX HEAD BOLT, CLS 8.8, M10 X 1.5, 50 mm LG, FULL
142	2	HHB-MBM115PCJ	HEX HEAD BOLT, CLS 8.8, M10 X 1.5, 60 mm LG, 26 mm LG THD
143	1	HHB-MBM120PCJ	HEX HEAD BOLT, CLS 8.8, M10 X 1.5, 65 mm LG, 26 mm LG THD
144	2	HHB-MBR100FCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 45 mm LG, FULL
145	1	HHB-MBR120PCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 65 mm LG, 30 mm LG THD
146	1	HHB-MBR125PCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 70 mm LG, 30 mm LG THD
147	14	HHB-MBR135PCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 80 mm LG, 30 mm LG THD
148	5	HHB-MBR145PCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 90 mm LG, 30 mm LG THD



Item	Qty	Part No.	Description
149	1	HHB-MBR155FCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 100 mm LG, FULL
150	2	HHB-MBR155PCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 100 mm LG, 30 mm LG THD
151	8	HHB-MBR165PCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 110 mm LG, 30 mm LG THD
152	1	HHB-MBR175PCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 120 mm LG, 30 mm LG THD
153	2	HHB-MBR195PCJ	HEX HEAD BOLT, CLS 8.8, M12 X 1.75, 140 mm LG, 30 mm LG THD
154	1	HHB-MCA135PCJ	HEX HEAD BOLT, CLS 8.8, M16 X 2, 80 mm LG, 38 mm LG THD
155	12	HHB-MCA175FCJ	HEX HEAD BOLT, CLS 8.8, M16 X 2, 120 mm LG, FULL
156	4	HHB-MCF175PCJ	HEX HEAD BOLT, CLS 8.8, M20 X 2.5, 120 mm LG, 46 mm LG THD
157	4	HHB-UBU015FGE	HEX HEAD BOLT, GR 5, 3/8-16, 5/8 in LG, FULL
158	1	HHB-UBV025FGJ	HEX HEAD BOLT, GR 8, 3/8-24, 1-1/4 in LG, FULL
159	34	FHH-MBM080FCM	HEX BOLT, FLANGED, CLS 10.9, M10 X 1.5, 25 mm LG, FULL
160	12	BHS-MBE063FTA	BUTTON HEAD SCREW, SST, M6 X 1, 12 mm LG, FULL
161	2	SHC-MBM080FCP	SHCS, CLS 12.9, M10 X 1.5, 25 mm LG, FULL
162	1	PPH-MAW063FTA	SCREW, PPH, SST, M4 X 0.7, 12 mm LG, FULL
163	9	PFH-MAW067FCM	SCREW, PFH, CLS 10.9, M4 X 0.7, 14 mm LG, FULL
164	6	PFH-MAW075FCM	SCREW, PFH, CLS 10.9, M4 X 0.7, 20 mm LG, FULL
165	2	PST-UBC015FAJ	SCREW, PPH, ST, NO. 10, 5/8 in LG
166	2	FTS-MBE055TA	SET SCREW, FLAT TIP, SST, M6 X 1, 8 mm LG
167	8	FTS-MBJ055TA	SET SCREW, FLAT TIP, SST, M8 X 1.25, 8 mm LG
168	16	FTW-MBE000AJ	FLAT WASHER, M6
169	18	FTW-MBJ000AJ	FLAT WASHER, M8
170	9	FTW-MBM000AJ	FLAT WASHER, M10
171	63	FTW-MBR000AJ	FLAT WASHER, M12
172	16	FTW-MCF000AJ	FLAT WASHER, M20
173	10	FDW-MBM083000AJ	FENDER WASHER, M10, 34 mm OD
174	2	FDW-MBR086000AJ	FENDER WASHER, M12, 37 mm OD
175	4	SLW-MBEAJ	SPLIT LOCK WASHER, M6
176	4	SLW-MBMAJ	SPLIT LOCK WASHER, M10
177	1	SLW-MBRAJ	SPLIT LOCK WASHER, M12
178	8	HXN-MBECH	HEX NUT, CLS 8, M6 X 1
179	3	HXN-MBJCH	HEX NUT, CLS 8, M8 X 1.25
180	8	HXN-MBMCH	HEX NUT, CLS 8, M10 X 1.5
181	7	HXN-MBRCH	HEX NUT, CLS 8, M12 X 1.75
182	37	HXN-MCACH	HEX NUT, CLS 8, M16 X 2
183	1	THN-MCHCC	HEX NUT, THIN, CLS 4, M20 X 1.5
184	4	FHN-MBMCH	HEX NUT, FLANGED, CLS 8, M10 X 1.5
185	15	HLN-MAWCH	LOCK NUT, CLS 8, M4 X 0.7
186	12	HLN-MBETA	LOCK NUT, SST, M6 X 1
187	8	HLN-MBECH	LOCK NUT, CLS 8, M6 X 1
188	21	HLN-MBJCH	LOCK NUT, CLS 8, M8 X 1.25
189	20	HLN-MBMCH	LOCK NUT, CLS 8, M10 X 1.5
190	32	HLN-MBRCH	LOCK NUT, CLS 8, M12 X 1.75
191	1	HLN-MCACH	LOCK NUT, CLS 8, M16 X 2
192	4	HLN-MCFCH	LOCK NUT, CLS 8, M20 X 2.5
193	44	FLN-MBMCL	LOCK NUT, FLANGED, CLS 10, M10 X 1.5





NOTES

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